April 18, 2020

Joel Waxdeck
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Engineering Division
City of Livermore
1052 South Livermore Avenue
Livermore, California 94550
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Re: **Site Assessment and Summary Report – Old Train Depot**
APN: 098-0289-02100
20, 22 & 24 S. L Street & 2009 – 2073 Railroad Avenue
Livermore, California

Dear Mr. Waxdeck:

As requested, Pangea Environmental Services, Inc prepared this site assessment report and summary of site assessment data for the above-referenced project area (Site). This report describes procedures and results of Pangea's site assessment conducted in 2018. The report also summarizes historical assessment data and compares all data to current regulatory screening levels revised by the San Francisco Bay Regional Water Quality Control Board in January 2019, and discusses the prospective development of a multifamily residential structure at the Site. Historic Site operations included a former railroad depot, former lumber storage, and multiple railroad lines. Site assessment activities by the City of Livermore have identified chemicals of potential concern in subsurface media, primarily tetrachloroethene, petroleum hydrocarbons, and select metals.

Pangea is pleased to provide this report to the City of Livermore. If you have any questions, feel free to contact me at (510) 435-8664 or briddell@pangeaenv.com.

Sincerely,
PANGEA Environmental Services, Inc.

Bob Clark-Riddell, P.E.
Principal Engineer

Attachment: *Site Assessment and Summary Report*

cc: Cheri Sheets, City of Livermore (electronic copy)

SITE ASSESSMENT AND SUMMARY REPORT

Old Train Depot
20, 22 & 24 S. L Street & 2009 – 2073 Railroad Avenue
Livermore, California 94550

April 18, 2020

Prepared for:

City of Livermore
Engineering Division
1052 South Livermore Avenue
Livermore, California 94550

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Written by:



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SITE ASSESSMENT AND SUMMARY REPORT

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20, 22 & 24 S. L Street & 2009 – 2073 Railroad Avenue
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1.0 INTRODUCTION

As requested by the City of Livermore, Pangea Environmental Services, Inc (Pangea) prepared this site assessment report and summary of site assessment data for the project area at 20, 22 and 24 S. L Street and 2009 to 2073 Railroad Avenue (Site)(Figure 1). The Site is located within a Livermore Downtown Core Development project area (Figure 2). Prospective development of the Site consists of construction of four multi-family residential buildings and a communal park as a subset of the larger project area development (Figure 3). Historically, the Site was historically used as a lumber yard and a train depot with multiple railroad lines (Figure 4). This report describes procedures and results of Pangea's site assessment conducted in 2018. The report also summarizes historical assessment data and compares all data to current regulatory screening levels revised by the San Francisco Bay Regional Water Quality Control Board in January 2019. Site assessment activities by the City of Livermore have identified chemicals of potential concern in subsurface media, primarily tetrachloroethene, petroleum hydrocarbons, and select metals. Site investigation locations are shown on Figure 5 and subsurface data is summarized on Figures 6 through 11. This report describes the Site background, site assessment by Pangea in 2018, subsurface conditions based on all assessment data, and conclusions with respect to the prospective development.

2.0 SITE BACKGROUND

This section describes the planned development, site history, prior environmental investigation, and constituents of concern from historical assessment data.

2.1 Prospective Development

Prospective development of the Site consists of construction of four multi-family residential buildings with approximately 130 units over underground or podium parking and a communal park (Veteran's Park).

The multifamily residences and Veteran's Park are a subset of the larger Downtown Core Development project (Figure 2). The Livermore Downtown Core Development project will involve several work phases by numerous contractors. The project area was initially developed with multiple single-story commercial retail buildings and paved and unpaved parking lots. The first development project consisted of a six-phase temporary parking plan. The future development project consists of construction of the following: (1) multi-family residential buildings with 130 units over a multi-level parking structures; (2) a multi-level parking structure at L Street; (3) several one-story commercial retail and two-story arts and science buildings; (4) a four-story hotel; (5) communal landscaped areas surrounding the proposed buildings, and (6) surface parking areas.

The footprint of the old train depot and lumber yard is located within Veteran's Park and overlaps some planned multifamily residences. The City's grading plan for the project will include the import of top soil for the upper 2 ft of all lawn/landscaping areas. The location of former Site buildings and proposed buildings are shown on Figure 5.

2.2 Site History

According to project documents (Fugro, 2007a; Fugro, 2007b; SCI, 1998), historical site use for the Site included:

- Multiple railroad lines that ran parallel and approximately 100 to 350 ft south of Railroad Avenue;
- Former railroad depot building (Southern Pacific Railroad) at 22 South L Street; and
- Former lumber storage yard located at the corner of Railroad Avenue and L Street.

According to project documents (Fugro, 2007a; Fugro 2007b; SCI, 1998), historical site use for nearby properties within the Livermore Downtown Core Development project area has included, but was not limited to, the following:

- Former dry cleaner operations (J Cleaners) at 2093 Railroad Avenue and former dry cleaner operations (Quality Cleaners) at 2048 First Street;
- Auto body operations at 2121 and 2139 Railroad Avenue; and
- Various other commercial and industrial site uses, as well as paved parking lots.

2.3 Prior Environmental Investigation

Multiple environmental investigations have been performed for the Site and Downtown Core project area. Documents that provided subsurface data for the Site project work areas referenced above include:

- 2009-2111 Railroad (Lucky): Phase 2 Summary Report, May 2005, Fugro West Inc.,(Fugro, 2005); and
- 3Various Addresses: Soil Data Tables, April and May 2018, BSK Associates (BSK, 2018).

These investigations involved sampling of soil and/or groundwater.

2.4 Constituents of Concern from Historical Data

Constituents of concern from *historical* assessment include the following:

- Metals arsenic, lead, and nickel in shallow soil,
- Petroleum hydrocarbons in soil and groundwater, including naphthalene, total petroleum hydrocarbons in the gas range (TPHg), diesel range (TPHd), and motor oil range (TPHmo), and
- Volatile organic compounds (VOCs) in groundwater including tetrachloroethene (PCE) and breakdown product trichloroethene (TCE).

Data from the 2005 assessment by Fugro indicated the presence of petroleum hydrocarbons in soil and groundwater, and VOCs in groundwater at the Site. The detected petroleum hydrocarbons at the Site were primarily TPHg, TPHd, and TPHmo. The VOC primarily detected in groundwater beneath the Site was PCE (a common degreasing chemical), with a much smaller fraction of breakdown product TCE. Select concentrations detected in Site soil and groundwater exceed current 2019 Tier 1 environmental screening levels (ESLs) established by the San Francisco Regional Water Quality Control Board.

In April and May 2018, BSK Associates performed shallow soil sampling for analysis of petroleum hydrocarbons and metals. Arsenic, lead, and nickel were detected at concentrations above 2019 Tier I ESLs. Most metal concentrations above Tier 1 ESL screening levels may represent background soil conditions (Lawrence Berkeley National Laboratory [LBNL], 2009). Arsenic concentrations in select samples above background conditions within the upper 2 ft of soil were located on the Site, possibly associated with the former lumber and/or railroad depot operations. Arsenic was reportedly used historically as a rodenticide in this area. Historical property redevelopment reportedly involved the import of shallow material, an explanation for higher arsenic concentrations detected at 10 to 16 inches bgs than at 0 to 6 inches bgs.

Historical soil analytical data (and 2018 assessment data) is summarized on Table 1 and Figure 6. Historical groundwater analytical data (and 2018 assessment data) is summarized on Table 2 and Figures 9 and 10.

Note that for adjacent parcels within the Downtown Core project area, assessment from 2005 and 2007 also indicated the presence of petroleum hydrocarbons in soil and groundwater and VOCs in groundwater. The petroleum hydrocarbon impact in soil is limited to relatively low concentrations of TPHd and TPHmo throughout shallow soil on the Site.

3.0 SITE ASSESSMENT IN 2018

In June, July, August and November 2018, subsurface assessment was conducted by Pangea to further evaluate site conditions at the Site.

3.1 Site Assessment Objectives and Scope Overview

The objectives of the additional assessment were to:

- Provide additional soil data for metals and petroleum hydrocarbons,
- Further delineate the extent of PCE in groundwater near boring B-1 where PCE was detected in perched groundwater in 2005;
- Determine if PCE or other VOCs in soil gas represent a vapor intrusion concern for the planned Site use; and
- Evaluate if VOCs in soil gas and groundwater is migrating onto the Site from PCE releases at the former Quality Cleaners at 2048 First Street and the former J Cleaners at 2093 Railroad Avenue.

To address these objectives, the following assessment was conducted by Pangea on/near the Site:

- *Soil gas sampling* in June 2018 in three shallow soil gas monitoring wells (SG-4-5, SG-5-5, and SG-6-5) and one deeper well (SG-4-20).
- Subsequent *soil gas sampling* in November 2018 in three shallow soil gas monitoring wells (SGMF-1-5, SGMF-2-5, and SGMF-4-5) and six deeper soil gas wells (SGMF-2-15, SGMF-2-25, SGMF-3-15, SGMF-3-25, SGMF-4-15 and SGMF-4-25) near the former site operations, and five soil gas wells upgradient toward the former Quality Cleaners (SGQC-6-5, SGQC-6-15, SGQC-6-30, SGQC-7-5, and SGQC-7-15).
- *Soil* sampling during select soil gas well installation (SG-4 and SGMF-2).
- *Groundwater sampling* in July 2018 from *shallow* zone groundwater monitoring well MW-4, and grab sampling of perched groundwater in the boring for well MW-4.
- *Groundwater sampling* in November 2018 from shallow zone groundwater using discrete-depth sampling techniques at locations HP-1-MF, HP-2-MF, and HP-3-MF to delineate PCE impact in indicated by data from groundwater monitoring well MW-4. Also included shallow zone groundwater using discrete-depth sampling techniques at locations HP-4-QC and HP-5-QC closer to the upgradient former Quality Cleaners.

Assessment locations are shown on Figure 5.

3.2 Site Assessment Procedures

Site assessment procedures by Pangea on/near the Site included:

- *Preparation:* Prior to commencing field activities, a site safety plan was prepared to protect site workers and the plan was kept onsite during all field activities. Drilling permits were obtained from the Zone 7 Water Agency. Copies of the permits are presented in Appendix A. The proposed drilling locations were marked with white paint and Underground Service Alert was notified at least 48 hours before the proposed field activities.

- *Soil gas sampling* was first conducted in June 2018 on shallow soil gas monitoring wells SG-4-5, SG-5-5, and SG-6-5, and deeper well SG-4-20. Sampling of wells SG-4-5 and SG-4-20 provided vertical CVOC delineation near the prior detection of PCE in groundwater at boring B-1. Soil gas well installation was performed on June 20, 2018 by Penecore Drilling of Woodland, California (Penecore). Sampling of these soil gas wells was conducted by Pangea on June 22, 2018 with sample analysis for VOCs by Method TO-15. Sampling was conducted in accordance with CalEPA DTSC guidance for soil gas investigations. Soil gas sampling field data is included in Appendix D. For quality assurance/control, leak check compound isopropyl alcohol was used with shroud sample laboratory analysis. (Planned soil gas wells SG-3-5 and SG-3-20 were not completed due to project paving work in that area at the time.)

- Subsequent *soil gas sampling* was conducted in November 2018 in soil gas monitoring wells SGMF-1-5, SGMF-2-5, SGMF-2-15, SGMF-2-25, SGMF-3-15, SGMF-3-25, and SGMF-4-5, SGMF-4-15, and SGMF-4-25, and five soil gas wells upgradient toward the former Quality Cleaners (SGQC-6-5, SGQC-6-15, SGQC-6-30, SGQC-7-5, and SGQC-7-15. These wells provided additional lateral and vertical PCE delineation. Soil gas well installation was performed on November 9, 12 and 13, 2018 by Cascade Drilling of Richmond, California (Cascade) using a Geoprobe 8040DT rig with dual tube tooling. Sampling of these soil gas wells was conducted by Pangea on November 27 and 28, 2018 with sample analysis for VOCs by Method TO-15. Sampling was conducted in accordance with CalEPA DTSC guidance for soil gas investigations. For quality assurance/control, leak check compound isopropyl alcohol was used with shroud sample laboratory analysis. Well construction details and soil logging from SGMF-4 are provided in Appendix C. Soil gas sampling field data is included in Appendix D.

- *Soil* sampling was performed during installation of select soil gas wells. Shallow soil samples from SG-4 were analyzed for TPH and CAM17 metals. A samples from 23 ft depth from SGMF-2 was analyzed for VOCs for potential correlation with VOC soil gas data.

- *Groundwater sampling* in July 2018 from shallow zone groundwater monitoring well MW-4 installed on the Site, and grab sampling of perched groundwater in the boring for well MW-4. Groundwater sampling was also conducted from three groundwater monitoring wells (MW-1 through MW-3) installed adjacent and downgradient of the former Quality Cleaner's building at 2048 First Street. The MW-4 well log is included in Appendix C. Well development/sampling logs are presented in Appendix D. Wells MW-2, MW-3 and MW-4 were installed on July 9, 10 and 11, 2018 by Penecore. Well MW-1 was installed during geotechnical investigation by Geosphere Inc on June 18, 2018 by H1 Drilling Company, LLC, of Sacramento. Pangea contracted Confluence Environmental of Sacramento, California to develop the wells on July 19, 2018 and collect low-flow groundwater samples on July 26, 2018 with sample analysis for VOCs by EPA Method 8260. The well elevations will be surveyed to allow estimation of the groundwater flow direction and gradient. Well samples were analyzed for VOCs by EPA Method 8260.

- *Groundwater sampling* in November 2018 at locations HP-1-MF, HP-2-MF, and HP-3-MF to delineate PCE impact in 'shallow-zone' groundwater indicated by data from groundwater monitoring well MW-4. To evaluate onsite conditions closer to the upgradient former Quality Cleaners, shallow zone groundwater sampling was performed at locations HP-4-QC and HP-5-QC. The discrete-depth (e.g., Hydropunch) groundwater sampling was conducted on November 8, 12 and 13, 2018 by Cascade using a Geoprobe 8040DT rig with dual tube tooling. Samples were analyzed for VOCs by EPA Method 8260.

Assessment locations are shown on Figure 5. Assessment observations and analytical data are summarized below. Pangea's standard operating procedures are presented in Appendix B. Boring and well construction logs are included in Appendix C.

3.3 Investigation Derived Waste

Investigation derived waste (IDW) generated during field activities consisted of soil from drilling activities and water from decontamination activities. IDW was temporarily stored on Site in 55-gallon drums and transported to an appropriate disposal facility. Copies of waste manifests are included in Appendix F.

4.0 SUBSURFACE CONDITIONS

This section describes the Site geology/hydrogeology and chemical conditions in Site soil, soil gas, and groundwater based on field observations, information from nearby sites, and current/historical site assessment data. This section also identifies nearby VOC groundwater plumes. The distribution of chemicals of concern is summarized on Figures 6 through 11. The cross section on Figure 11 illustrates subsurface conditions with respect to Site soil type and hydrogeologic conditions.

4.1 Constituents of Concern from Historical and 2018 Data

No new constituents of concern were identified at the Site during the 2018 assessment. Consistent with the historical assessment, the constituents of concern from historical and 2018 assessment include the following:

- Metals arsenic, lead, and nickel in shallow soil,
- Petroleum hydrocarbons in soil and groundwater, including naphthalene, total petroleum hydrocarbons as gasoline (TPHg), diesel (TPHd), and motor oil-range (TPHmo), and
- Volatile organic compounds (VOCs) in groundwater including tetrachloroethene (PCE) and breakdown product trichloroethene (TCE).

However, note that vinyl chloride has been detected immediately upgradient of the Site in shallow-zone groundwater wells MW-2 and MW-3 located near the adjacent former Quality Cleaners. Vinyl chloride is a breakdown product of PCE, the dry cleaning chemical used at the former Quality Cleaners. PCE may have been used at the subject Site as a degreaser.

4.2 Site Geology and Hydrogeology

Based on soil logging data, soil at the Downtown Core project area generally consists of interbedded coarse- and fine-grained materials including silt, clay, silty sand, silty/sandy/clayey gravel. Historically, shallow groundwater was encountered and sampled approximately 31 to 44 ft bgs, apparently perched on a silt or clay layer at the Downtown Core project area. During recent drilling for wells MW-1 and MW-3, a groundwater-confining silt layer was observed approximately 55 to 60 ft bgs and groundwater was first encountered approximately 57 ft bgs, with subsequent static groundwater measured at approximately 36 ft bgs in these wells. These groundwater observations suggest site groundwater is under confined or semi-confined conditions.

For Site drilling of well MW-4 at the Site on July 11, 2018, groundwater was first encountered approximately 41 ft bgs with subsequent static groundwater measured at approximately 35.5 ft bgs. A sandy clay layer at well location MW-4 at approximately 47 to 49 ft bgs may allow perching of groundwater. A confining silt or clay layer was observed approximately 56 to 61 ft bgs at well location

MW-4. Well MW-4 is screened from 62 to 67 ft bgs to monitor this Site 'shallow zone' groundwater. (Well MW-1 is screened from 55 to 60 ft bgs, while wells MW-2 and MW-3 are screened from 60 to 72 ft bgs). From August 2018 well gauging data the depth to static groundwater in well MW-4 was 36.71 ft bgs. The boring log and well construction details for well MW-4 are included in Appendix C.

For Site assessment in November 2018, no soil logging was conducted during discrete-depth sampling at locations HP-1-MF through HP-3-MF within 62 to 70 ft bgs in 'shallow zone' groundwater. Measured depth to water at these locations ranged from 46.8 to 55 ft bgs.

In summary, based on soil logging data from Site documents and available information from nearby sites, soil at and near the Site generally consists of interbedded coarse- and fine-grained materials including silt, clay, silty sand, silty/sandy/clayey gravel. The Site is located in the Mocho Subbasin in the south-central portion of the Livermore Valley. Available documents for the Site and nearby Sites and the well MW-4 soil logging, the subsurface at the Site and nearby is currently generally characterized as follows:

- Sandy or silty gravel from ground surface to approximately 33 ft bgs (historical perched groundwater present in this material about 31 to 33 ft bgs),
- Fine-grain soil (clayey silt and silty clay) from 33 to 41 ft bgs.
- Wet, sandy gravel from 41 to 46 ft bgs (considered perched groundwater zone) underlain by sandy clay from 46 to 49 ft bgs,
- Wet, sandy gravel from 52 to 56.5 ft bgs, considered start of 'Shallow Zone' confined groundwater underlain by clay from 56.5 to 62 ft bgs, (shallow zone found approximately 58 to 70 ft bgs at adjacent J Cleaners site),
- Wet, gravelly sand from 62 to 66 ft bgs (confined shallow zone groundwater),
- An Aquitard starting approximately 66 ft bgs (ending between 80 and 100 ft bgs), and
- 'Deep Zone' groundwater extending to up to 390 ft bgs.

Within the Downtown Core Project area, the historical perched groundwater zone was approximately 31 to 46 ft bgs with the confined shallow groundwater zone approximately 52 to 70 ft bgs within the Downtown Core Project area. For the subject Site, the perched and shallow groundwater zones include thin lenses of fine-grained material within these zones. The site geology and hydrogeology is summarized on cross section Figure 11. The cross section location is shown on Figure 10. Groundwater beneath the Site and vicinity reportedly flows in the approximate northwest direction.

4.3 Water Supply Wells and Nearby VOC Plumes

The Deep Zone is present approximately 100 to 390 ft bgs and is used by the City of Livermore for drinking water purposes. The closest water supply well (CalWater 8P1) is located approximately ½ mile hydraulically downgradient of the Site and apparently screened from 122 to 192 ft bgs.

According to a Lawrence Livermore National Laboratory report, "PCE is nearly ubiquitous in Livermore wells…the Mocho Subbasin has a relative high degree of vulnerability to contamination from surface sources." Select nearby water supply wells have wellhead treatment for contamination. According to the Groundwater Ambient Monitoring and Assessment Program (GAMA) of the State Water Resources Control Board, PCE concentrations in CalWater well 8P1 are typically near 0.5 to 0.6 µg/L with a maximum of 1.1 µg/L. While the PCE concentrations occasionally exceed the Tier 1 ESL of 0.64 µg/L which is protective of vapor intrusion, PCE in well 8P1 has not exceeded the California maximum contaminant level (MCL) for PCE in drinking water of 5.0 µg/L.

From review of the State Board Geotracker database, there are several sites in the Site vicinity with subsurface PCE impact to groundwater. Groundwater beneath the Site and vicinity reportedly flows in the approximate northwest direction. Sites with known PCE groundwater plumes are located upgradient and crossgradient of the Site and include Desert Petroleum/Valley Gas at 2008 First Street, Groth Brothers Chevrolet at 57-59 South L Street, and Mike's and Paul's Cleaners at the Livermore Arcade Shopping Center site.

From historical and 2018 assessment by the City, VOC and TPH groundwater impact has also been identified at adjacent properties 2048 First Street (former Quality Cleaners) and 2093 Railroad Avenue (former J Cleaners).

4.4 Soil Conditions

Soil conditions are summarized as follows:

- The following compounds have been detected in shallow soil above 2019 Tier 1 ESLS: select metals (arsenic, lead, and nickel) and TPHd, and TPHmo. *(No PCE or chlorinated VOCs have been detected in analyzed soil samples for the Site).* Table 1 presents soil analytical data with respect to various environmental screening levels.

- Figure 6 shows the estimated extent of key metal impact in soil.

- The arsenic- and lead-bearing soil merits management during future soil grading and Site use, and profiling for any soil export during construction.

Arsenic, lead, and nickel were detected at concentrations above conservative Tier 1 ESLs. The maximum concentrations of these metals were 55 milligrams/kilogram (mg/kg) arsenic, 200 mg/kg lead, and 370

mg/kg nickel. Most metal concentrations above 2019 Tier 1 ESL screening levels may represent background soil conditions (LBNL, 2009). Arsenic concentrations in select samples above background conditions within the upper 2 ft of soil were located on the Site, possibly associated with the former lumber and/or railroad depot operations. The upper range of background concentrations for arsenic include 11 mg/kg (UCR, 1996) and 19 mg/kg (LBNL, 2009). Arsenic was reportedly used historically as a rodenticide in this area. Figure 6 shows the extent of arsenic in shallow soil above 11 milligrams/kilogram. Historical property redevelopment reportedly involved the import of shallow material, an explanation for higher arsenic concentrations detected at 10 to 16 inches bgs than at 0 to 6 inches bgs. The arsenic impact area is shown on Figure 6. Sampling locations where nickel concentrations exceeded background conditions and the construction worker ESL of 86 mg/kg are noted on Figure 6.

Select samples with metal impact were also analyzed using Toxic Characteristic Leaching Procedure (TCLP) and Waste Extraction Test (WET) test methods to help determine whether any future excavated soil would be classified as a California hazardous waste. As shown on Figure 6 and Table 1, soil samples at B-2 and B-4 from 10 to 16 inches bgs contained STLC *lead* concentrations (WET testing) above the Non-RCRA Class I (California) hazardous waste criteria of 5 mg/L. Lead TCLP data did *not* exceed 5 mg/L, the RCRA Class I (Federal) hazardous waste criteria.

Laboratory analytical reports are provided in Appendix E. Because Pangea performed sampling at the Site in conjunction with sampling at other locations within the Downtown Core Development Project area, laboratory analytical reports include data from other sites not related to the Multifamily Residence Redevelopment.

4.5 Soil Gas Conditions

Soil gas conditions are summarized as follows:

- The following compounds have been detected in soil gas above 2019 residential vapor intrusion ESLS: PCE and benzene. *TCE, trans-1,2-DCE, and ethylbenzene concentrations were below Tier 1 ESLs.* Table 3 presents soil gas analytical data with respect to various screening levels.

- A PCE source could be near the historic railroads based on the highest PCE in shallow soil gas, while PCE concentrations are highest in deeper soil gas near historic perched groundwater. PCE in deeper soil gas could be affected by historical migration of PCE from the upgradient former Quality Cleaners (Figure 8).

- Figure 7 shows the estimated PCE extent in *shallow* soil gas (0-10 ft bgs).

- Figure 8 shows the estimated PCE extent in *deeper* soil gas (15-30 ft bgs).

- Figure 11 shows the estimated PCE extent in cross section.

For shallow soil gas (5 ft bgs), PCE was detected in all shallow *soil gas* monitoring wells at concentrations above the 2019 Tier 1 ESL of 15 µg/m^3. The PCE concentrations in shallow soil gas ranged from 34.6 to 387 µg/m^3, with the highest PCE at SGMF-4-5 near a historic railroad line.

For deeper soil gas (15-25 ft bgs), PCE was detected in all deeper *soil gas* monitoring wells at concentrations above the 2019 Tier 1 ESL of 15 µg/m^3. The PCE concentrations in deeper soil gas ranged from 111 to 5,340 µg/m^3, with the highest PCE at SGMF-3-25 near the former passenger depot and downgradient of the nearby Quality Cleaners at 2048 First Street. The PCE in deeper soil is present in the approximate zone of former perched groundwater that had PCE impact.

Near the former Site operations, benzene was detected primarily in the deeper soil gas wells. Benzene exceeded its Tier 1 ESL of 3.2 µg/m^3 at the following concentrations in *deeper* soil gas sampling locations at 25 ft bgs: 58 µg/m^3 (SGMF-2-25), 14.1 µg/m^3 (SGMF-4-25), and 5 µg/m^3 (SGMF-3-25), while at 15 ft bgs only 3.55 µg/m^3 at SGMF-4-15 slightly exceeded the Tier 1 ESL. However, for the clustered shallow and deeper soil gas wells at SGQC-6 (located closer to the Valley Gas and Quality Cleaner sites), maximum benzene concentrations were higher at 27.1 µg/m^3 (SGQC-6-5), 115 µg/m^3 (SGQC-6-15), and 86.5 µg/m^3 (SGQC-6-30). This data suggests that benzene concentrations are highest in deeper soil gas and closer to the offsite sources of Valley Gas and Quality Cleaners sites.

PCE-breakdown products cis-1,2-dichloroethene and vinyl chloride were not detected in Site soil gas. Other VOCs were detected in soil gas at concentrations below 2019 Tier 1 ESLs, if ESLs established.

Laboratory analytical reports are provided in Appendix E. Because Pangea performed sampling at the Site in conjunction with sampling at other locations within the Downtown Core Development Project area, laboratory reports include data from other sites not related to the Multifamily Residence Redevelopment.

4.6 Groundwater Conditions

Groundwater conditions are summarized as follows:

- The following compounds have been detected in groundwater above Tier 1 ESLs: PCE, chloroform, TPHg and TPHd. The primary chemical of concern is PCE. Table 2 presents groundwater analytical data with respect to environmental screening levels.
- Perched and shallow groundwater data suggest PCE impact is highest near well MW-4 and HP-1-MF near the center of the Site, with additional PCE and VOC impact present at the upgradient edge of Site near wells MW-2 and MW-3 monitoring apparent PCE release at former Quality Cleaners.
- Figure 9 shows the estimated PCE extent in *perched* groundwater (31-44 ft bgs).
- Figure 10 shows the estimated PCE extent in *shallow zone* groundwater (60-72 ft bgs).
- Figure 11 shows the estimated PCE extent in perched and shallow groundwater in cross section.

PCE above Tier 1 ESL: PCE and its breakdown products have been detected in grab groundwater samples collected from borings and in samples collected from Site monitoring well MW-4. PCE was detected in monitoring well MW-4 at a concentration of 10.2 µg/L during the July 26, 2018 sampling. From 2018 grab sampling in shallow zone groundwater (66 to 70 ft bgs), PCE concentrations ranged from 4.6 µg/L to 16 µg/L. For perched zone groundwater in 2018, PCE was detected at a concentration of 4.9 µg/L at 41 to 45 ft bgs. From prior grab sampling of shallow perched groundwater at boring location B-1 in 2005, PCE was detected at 19 µg/L at 31 to 35 ft bgs, and 18 µg/L at 40 to 44 ft bgs. These concentrations exceed the 2019 Tier 1 ESL of 0.64 µg/L

TPHg, TPHd and Chloroform above Tier 1 ESLs: TPHg and TPHd was detected at maximum concentrations of 170 µg/L and 330 µg/L, respectively, above the Tier 1 ESL of 100 µg/L during perched groundwater sampling in 2005. Chloroform detected in the July 11, 2018 grab sample from the boring for well MW-4 contained a concentration of 1.3 µg/L, above the Tier I ESL of 0.81 µg/L.

Chemicals Below Tier 1 ESLs: Other VOCs detected in shallow zone groundwater from monitoring well MW-4 below Tier 1 ESLs included TCE (0.138 µg/L), chloroform (0.708 µg/L), and naphthalene (0.117 µg/L). Bromodichloromethane detected in the July 11, 2018 grab sample from the boring for well MW-4 contained a concentration of 0.57 µg/L, below the Tier I ESL of 0.87 µg/L.

However, note that vinyl chloride has been detected immediately upgradient of the Site in shallow-zone groundwater wells MW-2 and MW-3 located 40 ft south of the Site near the adjacent former Quality Cleaners. Vinyl chloride is a breakdown product of PCE, the dry cleaning chemical used at the former Quality Cleaners. The presence of petroleum hydrocarbons presumably associated with the Valley Gas case could be contributing to PCE degradation, as commonly occurs when PCE and petroleum plumes comingle.

For 2018 shallow zone grab groundwater sampling, no TCE or naphthalene was detected but chloroform was detected at 0.60 to 0.77 µg/L (below Tier I ESL of 0.81 µg/L). From prior grab sampling of shallow perched groundwater at boring location B-1 in 2005, TCE was detected at a maximum of 1.0 µg/L and chloroform was detected at 0.54 µg/L.

Laboratory analytical reports are provided in Appendix E. Because Pangea performed sampling at the Site in conjunction with sampling at other locations within the Downtown Core Development Project area, laboratory analytical reports include data from other sites not related to the Multifamily Residence Redevelopment.

5.0 CONCLUSIONS

Based on the above information, Pangea offers the following conclusions for the Site:

- **Primary chemicals of concern at the Site are PCE and select metals.** PCE has been detected in soil gas and groundwater at concentrations above 2019 Tier 1 screening levels. This PCE impact merits further characterization and possible mitigation and/or remediation with respect to prospective development at the Site. Shallow metal-bearing soil (arsenic, lead and nickel) with concentrations above Tier 1 ESLs merits management during future soil grading and Site use, and profiling for any soil export during construction.

- **PCE in soil gas represents a potential vapor intrusion concern for future structures.** Future action is merited to assess, remediate, and/or mitigate PCE at the Site. A shallow PCE source could be present near the historic railroads based on shallow PCE soil gas data. Site assessment could help determine if any discrete PCE soil impact exists that merits excavation or vapor extraction to remove a source of PCE volatilization into shallow soil gas. Higher PCE concentrations in deeper (15 to 30 ft bgs) soil gas are present near the depth of historical perched groundwater; this PCE in deeper soil gas could be affected by historical PCE migration from the upgradient former Quality Cleaners site. Deeper soil gas impact could also be remediated or mitigated by soil vapor extraction, if merited. For any residual PCE in soil gas above applicable screening levels or human health risk criteria at the time of future occupied Site structures, engineering controls can safeguard future occupants and receptors from potential vapor intrusion. Engineering controls could consist of ventilated parking structures (e.g., podium parking), chemical vapor barriers, and/or passive/active subslab ventilation systems.

- **PCE impact in groundwater merits further investigation.** The PCE impact in Site groundwater monitoring well MW-4 and prior grab groundwater sampling locations exceeded the Tier 1 ESL (0.64 µg/L) and the MCL (5 µg/L). Additional grab groundwater sampling, well monitoring, and/or additional groundwater monitoring well installation is merited to further characterize and monitor the plume stability of PCE and its degradation products near existing well MW-4, and to evaluate the potential for VOC migration onto the Site from offsite sources. The limited PCE impact is unlikely to represent a significant threat to the nearest water supply well (CalWater well 8P1) present approximately ½ mile downgradient of the Site. The PCE impact in CalWater well 8P1, at a maximum of 1.1 µg/L, is likely due to other PCE sources located closer to the well as referenced above in Section 4.3.

- **Soil management**. While arsenic, lead and nickel have been detected above Tier 1 ESLs and background conditions, the shallow soil impact (10 to 24 inches bgs) will likely be removed during site grading and export for the planned structure. A Soil Management Plan can be prepared to facilitate properly handling, management, and disposal of metal-bearing soil during construction. Soil sampling after site excavation can further characterize metal concentrations in Site soil. Any residual metal impact in soil can be removed or capped by clean imported material, hardscape, or building foundations.

- **Regulatory oversight.** Due to the discovery of constituents of concern that exceed ESLs, regulatory agency oversight is merited with respect to future Site activity.

6.0 REFERENCES

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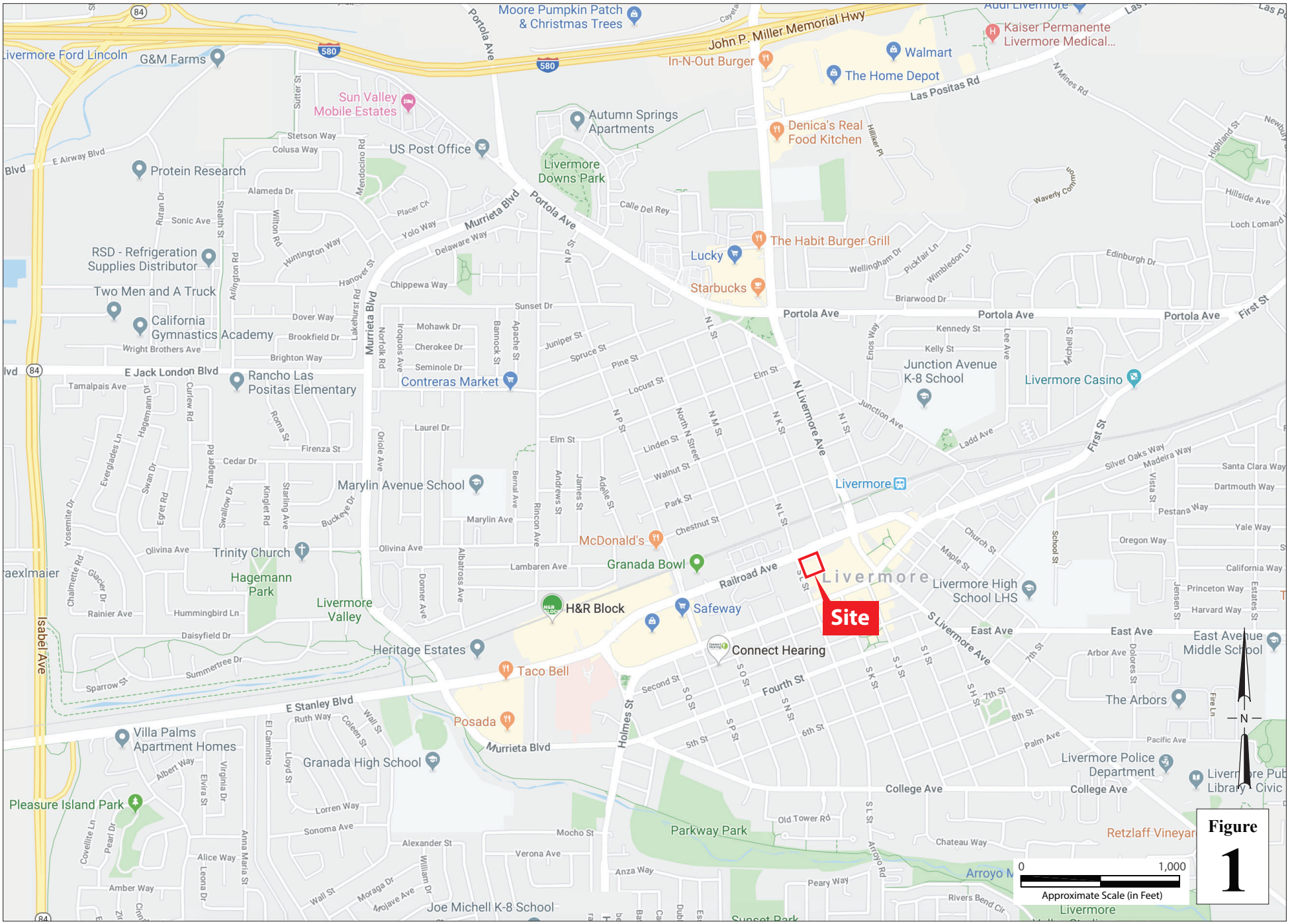


Figure 1

Old Train Depot
20, 24 & 24 L Street & 2009-2073 Railroad Avenue
Livermore, California

PANGEA

Vicinity Map

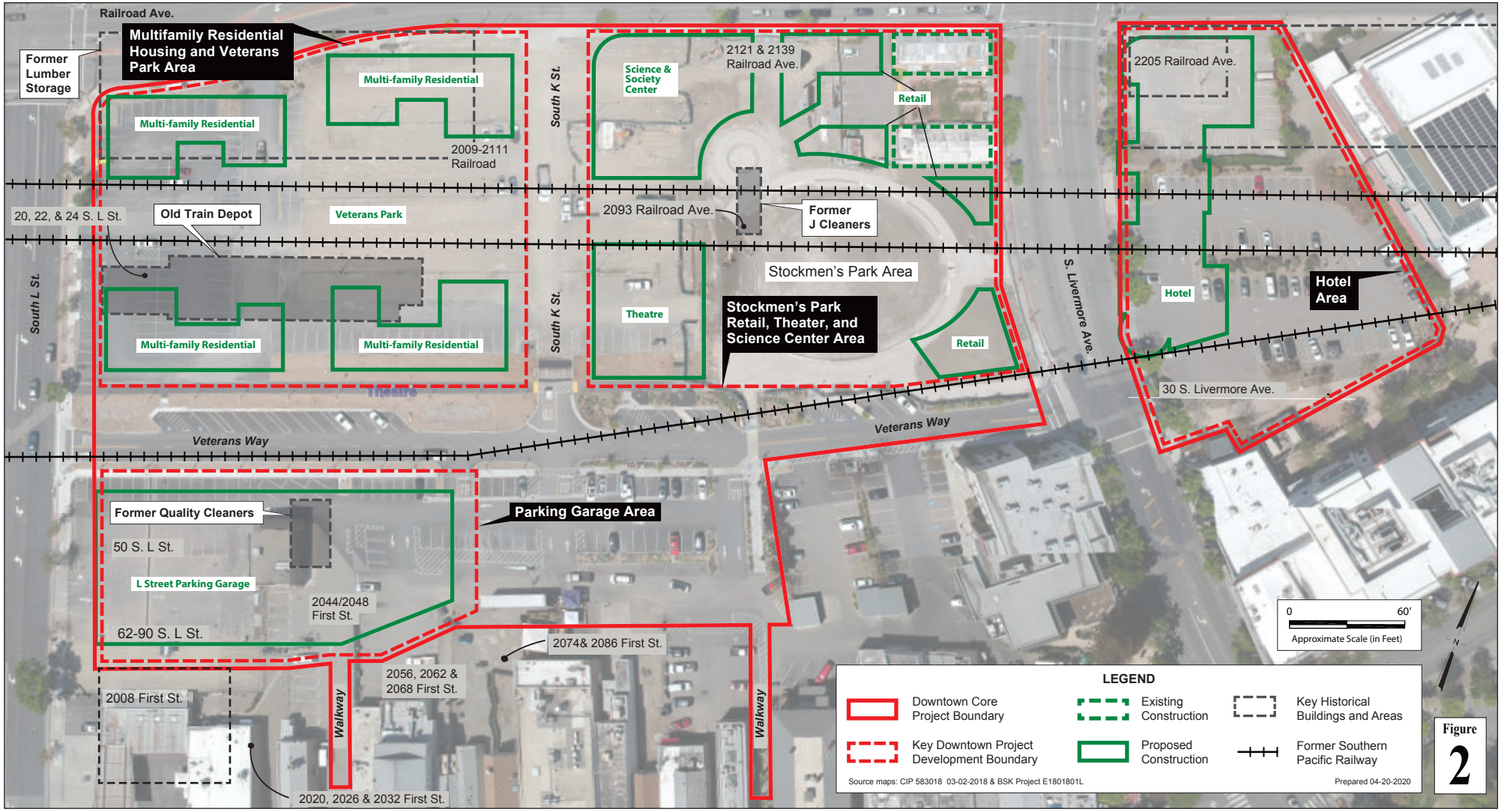


Figure 2

Downtown Core Project Area
Livermore, California

PANGEA

Downtown Core Project Area



Figure 3

Downtown Core Project Area
Livermore, California

PANGEA

Downtown Core Development Map

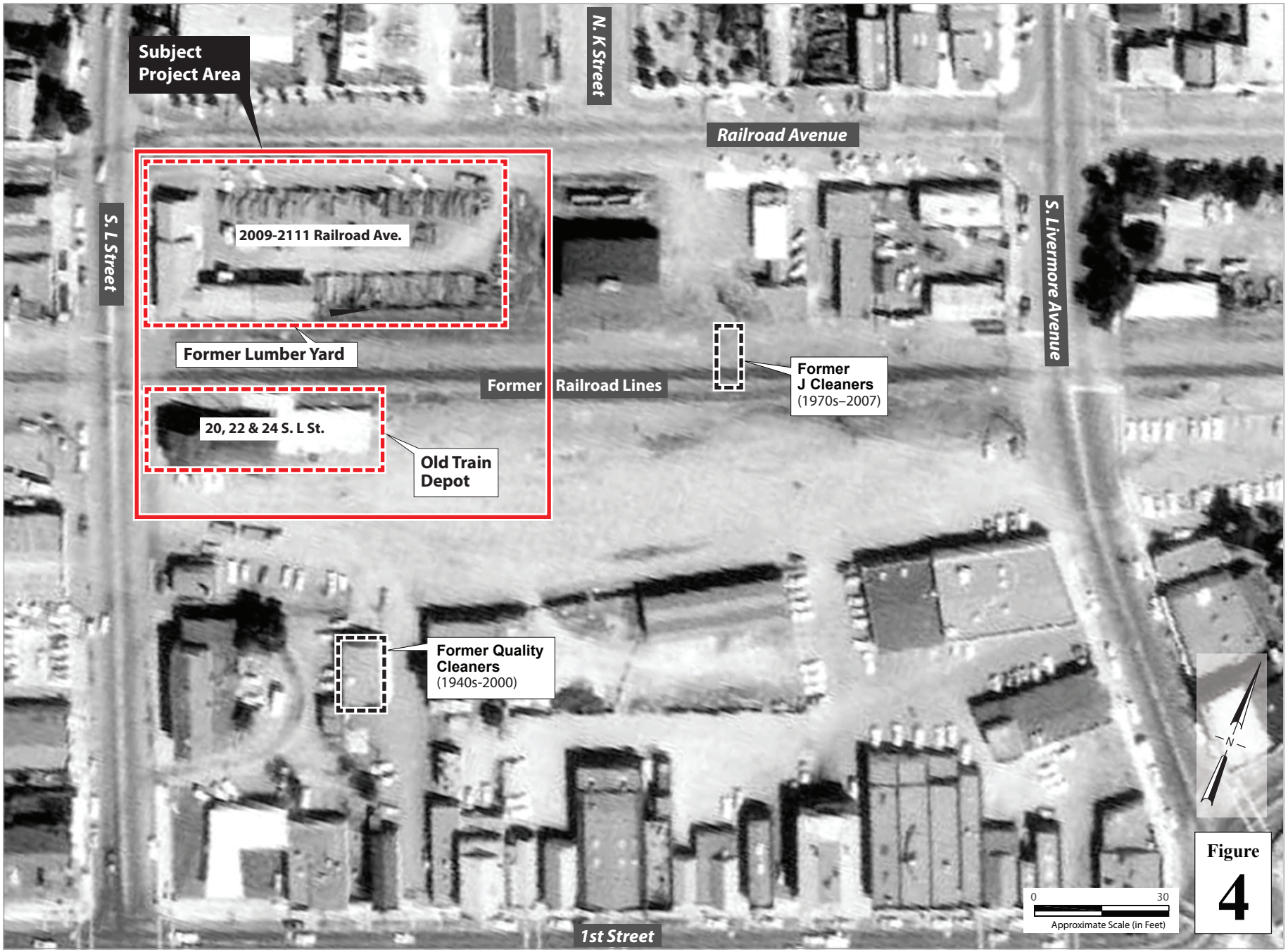
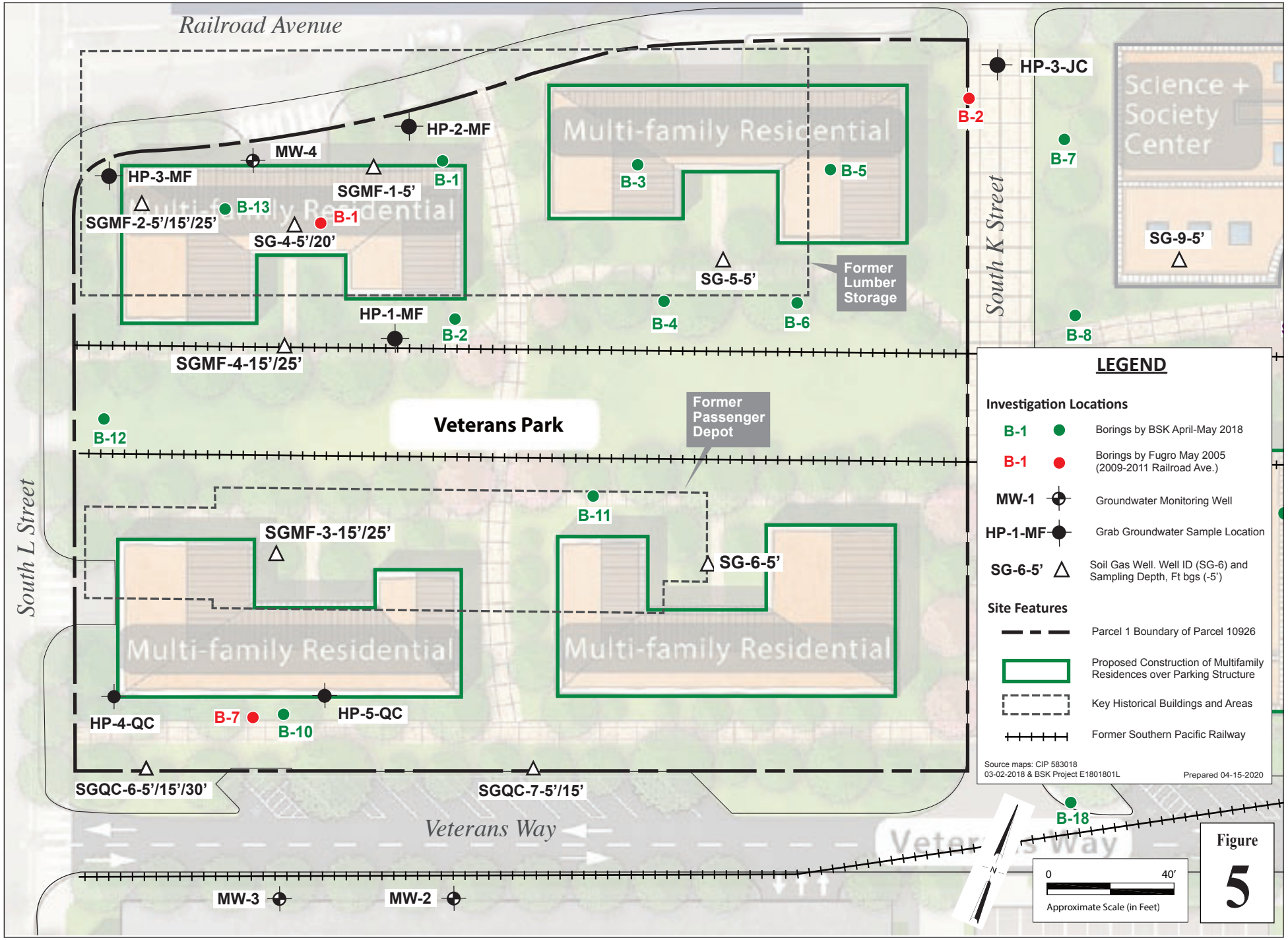


Figure 4

Old Train Depot
20, 22, & 24 S. L St. & 2009-2073 Railroad Ave.
Livermore, California

PANGEA

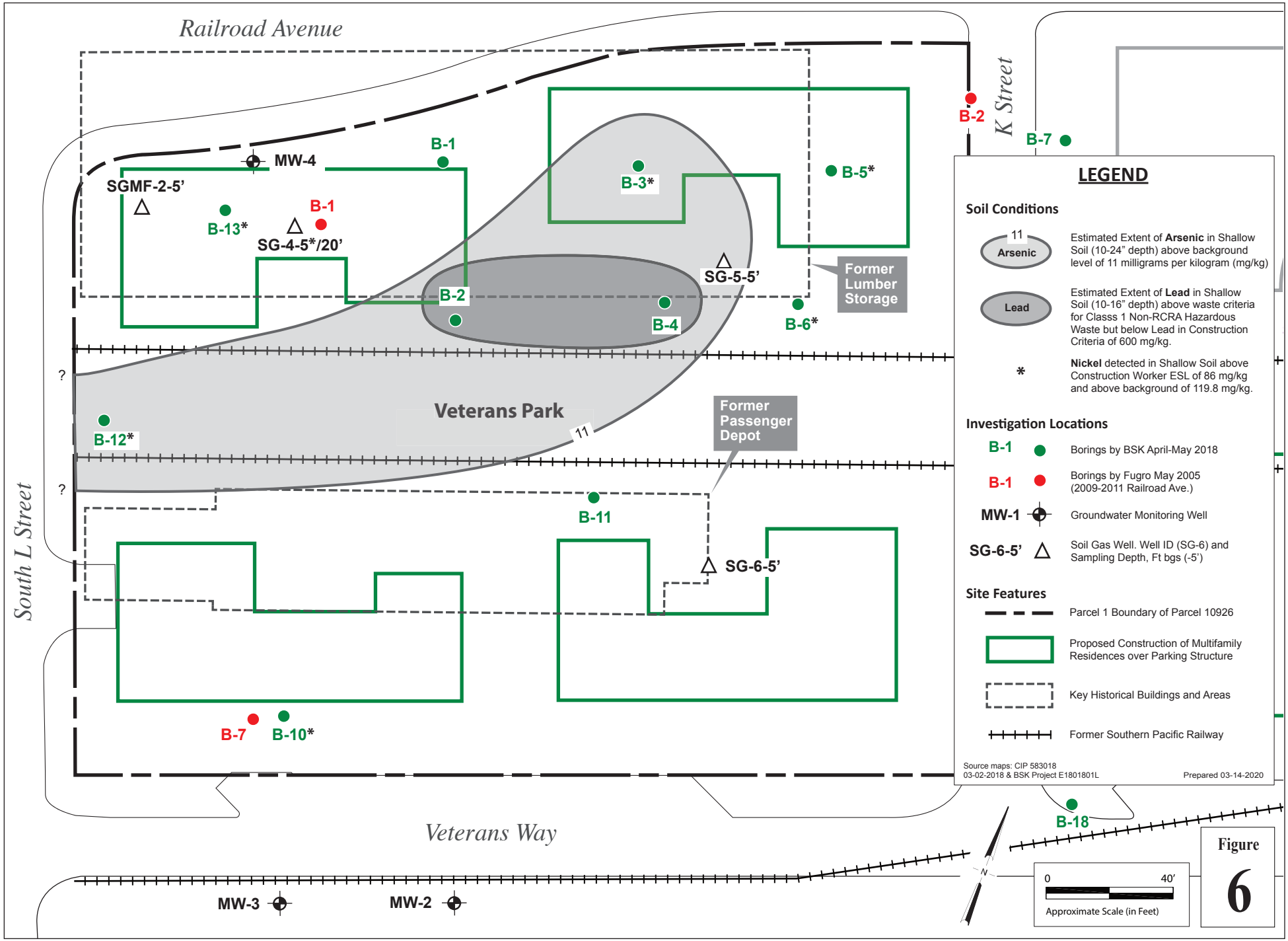
Historical Site Use, 1965



Old Train Depot
20, 24 & 24 L Street & 2009-2073 Railroad Avenue
Livermore, California

PANGEA

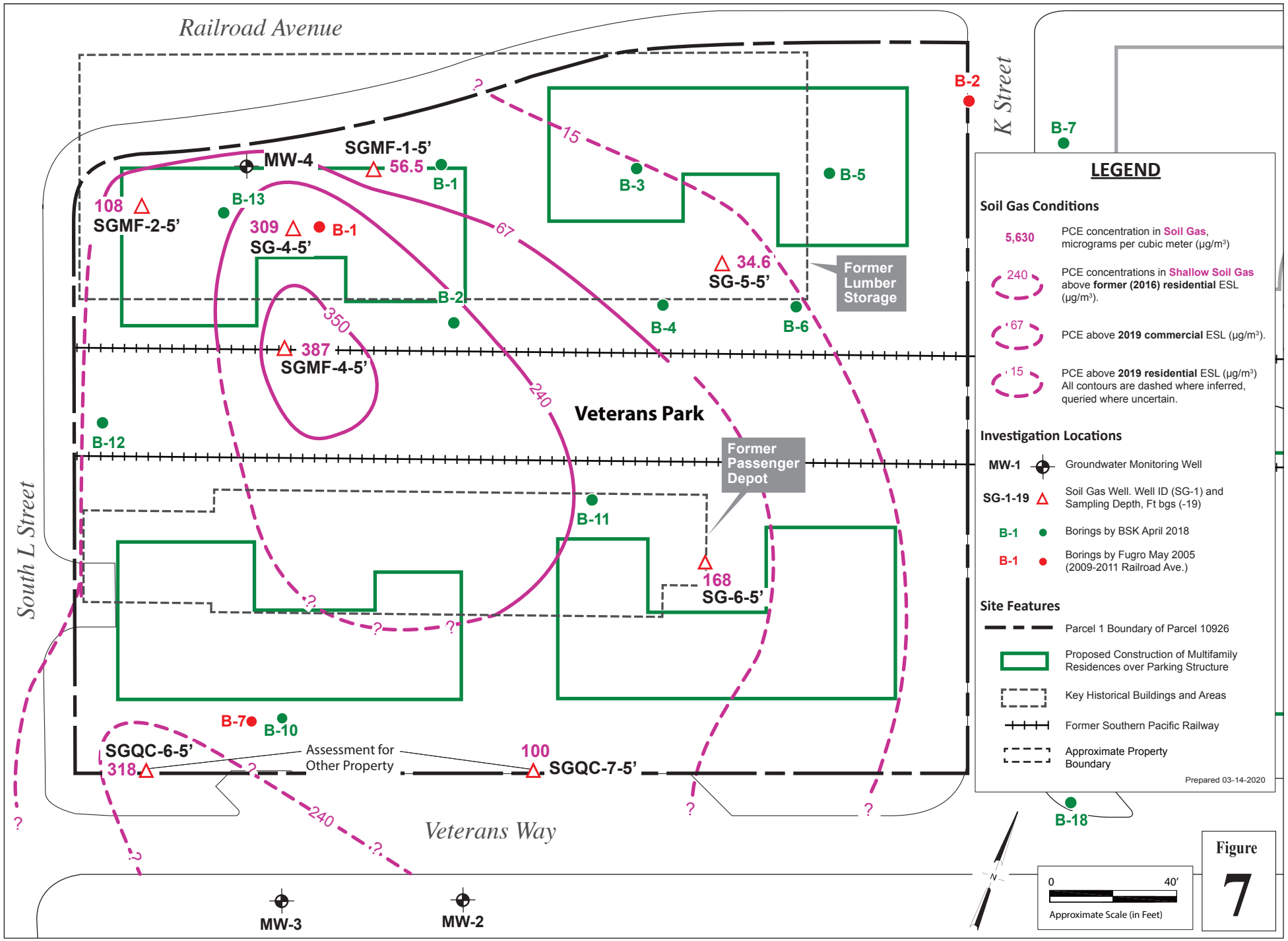
Site Map



Old Train Depot
20, 24 & 24 L Street & 2009-2073 Railroad Avenue
Livermore, California

PANGEA

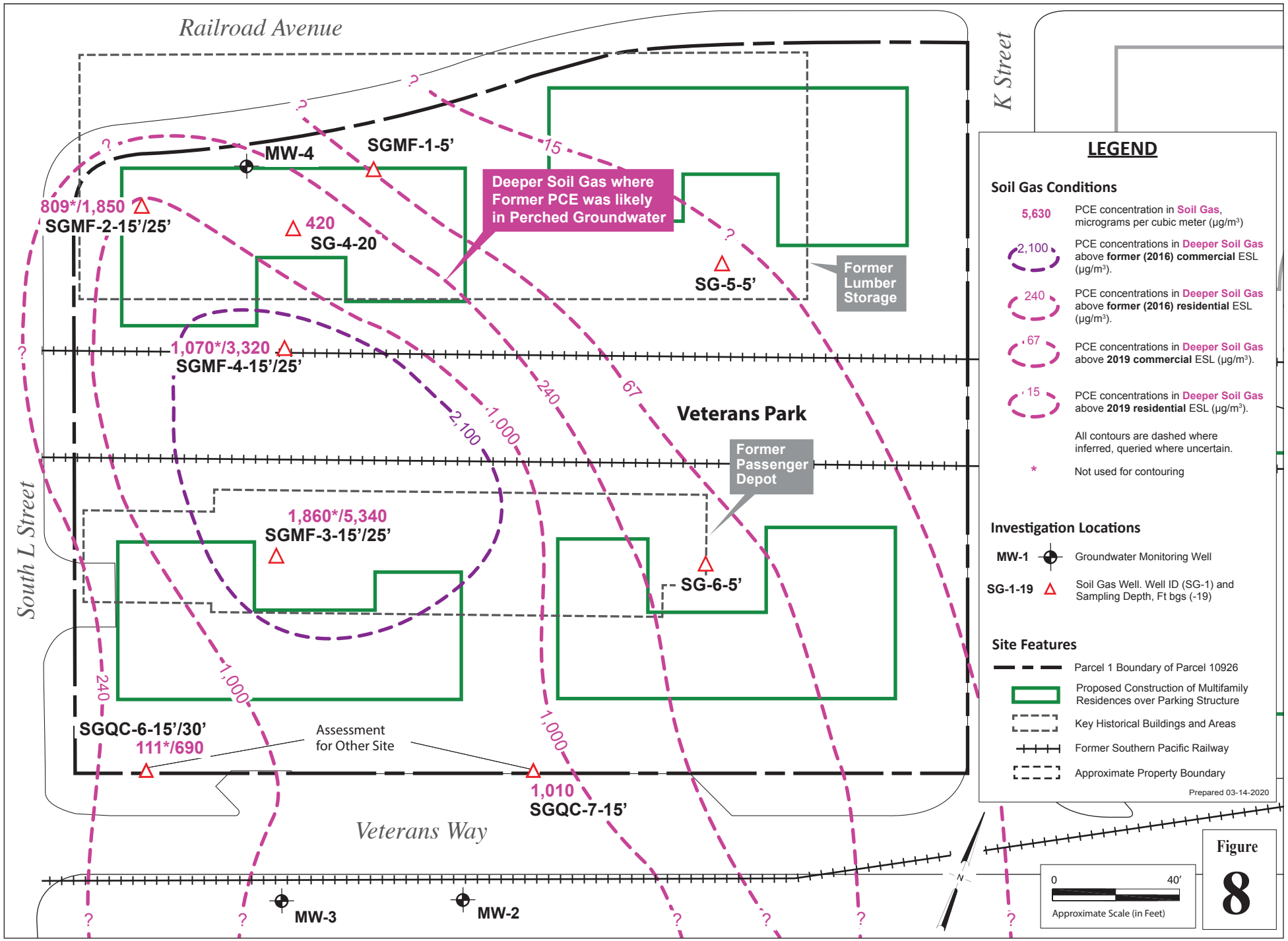
Metals in Shallow Soil



Old Train Depot
20, 24 & 24 L Street & 2009-2073 Railroad Avenue
Livermore, California

PANGEA

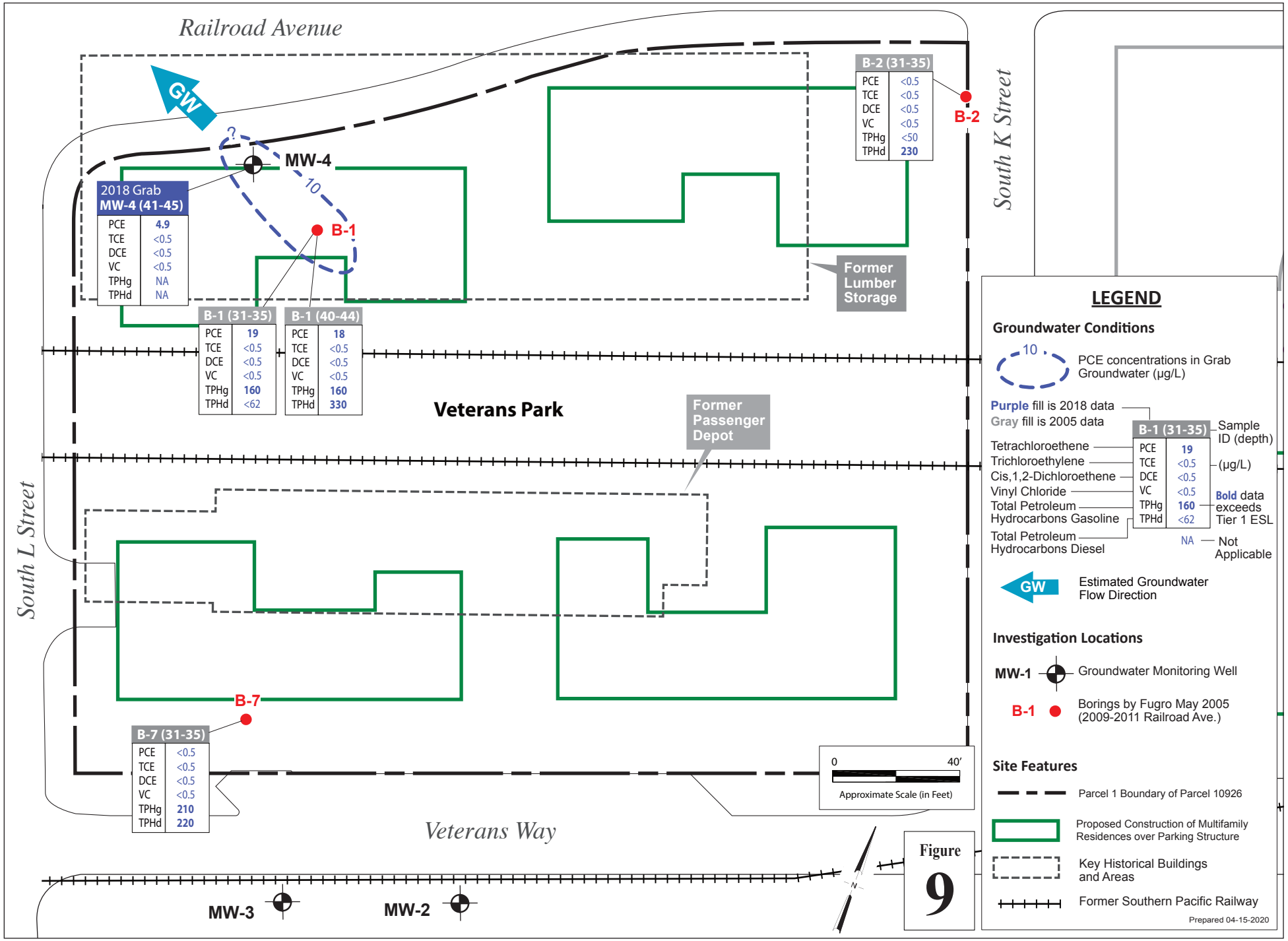
PCE in Shallow Soil Gas (0-10 ft bgs)



Old Train Depot
20, 24 & 24 L Street & 2009-2073 Railroad Avenue
Livermore, California

PANGEA

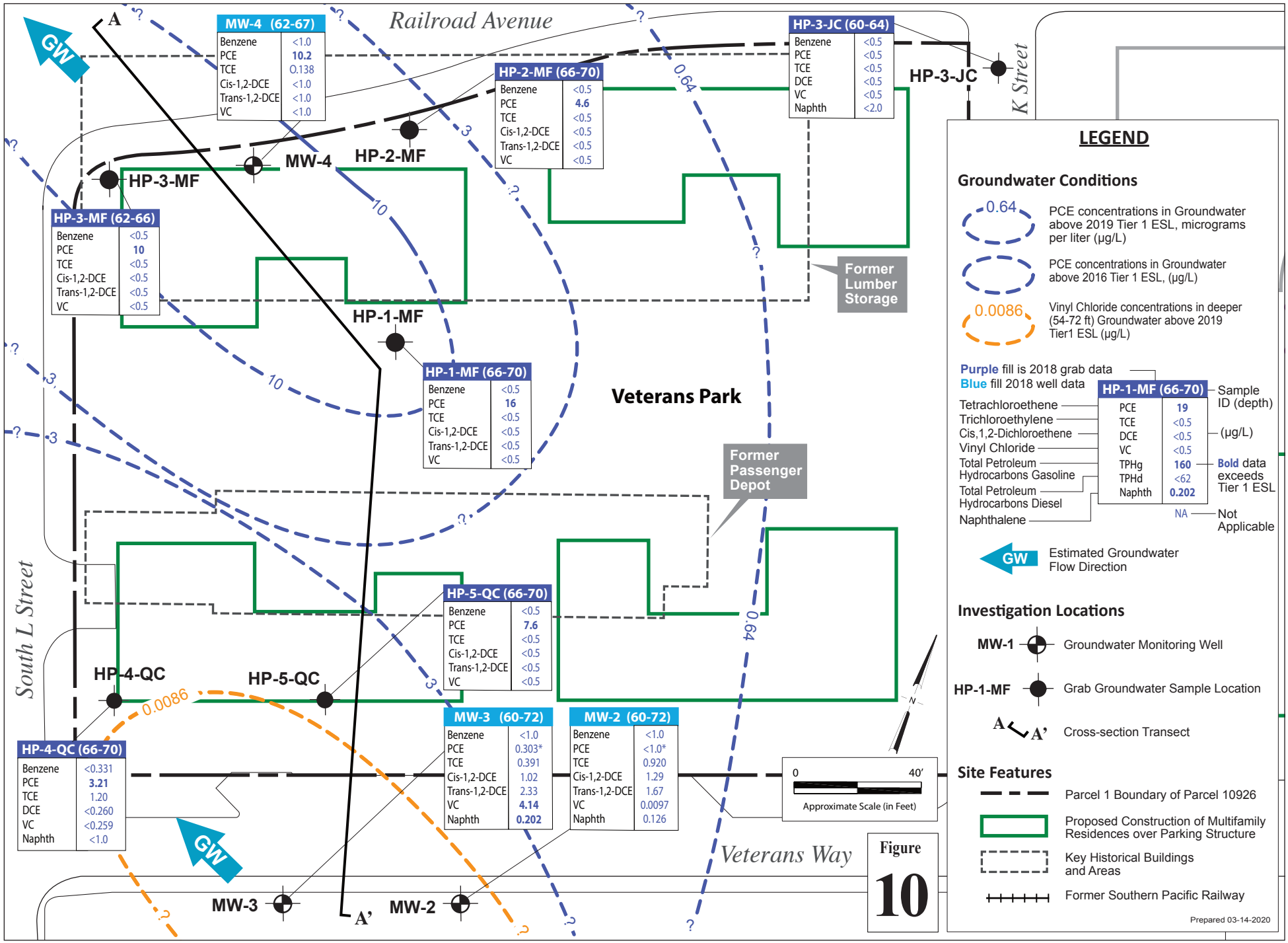
PCE in Deeper Soil Gas (15-30 ft bgs)



Old Train Depot
20, 24 & 24 L Street & 2009-2073 Railroad Avenue
Livermore, California

PANGEA

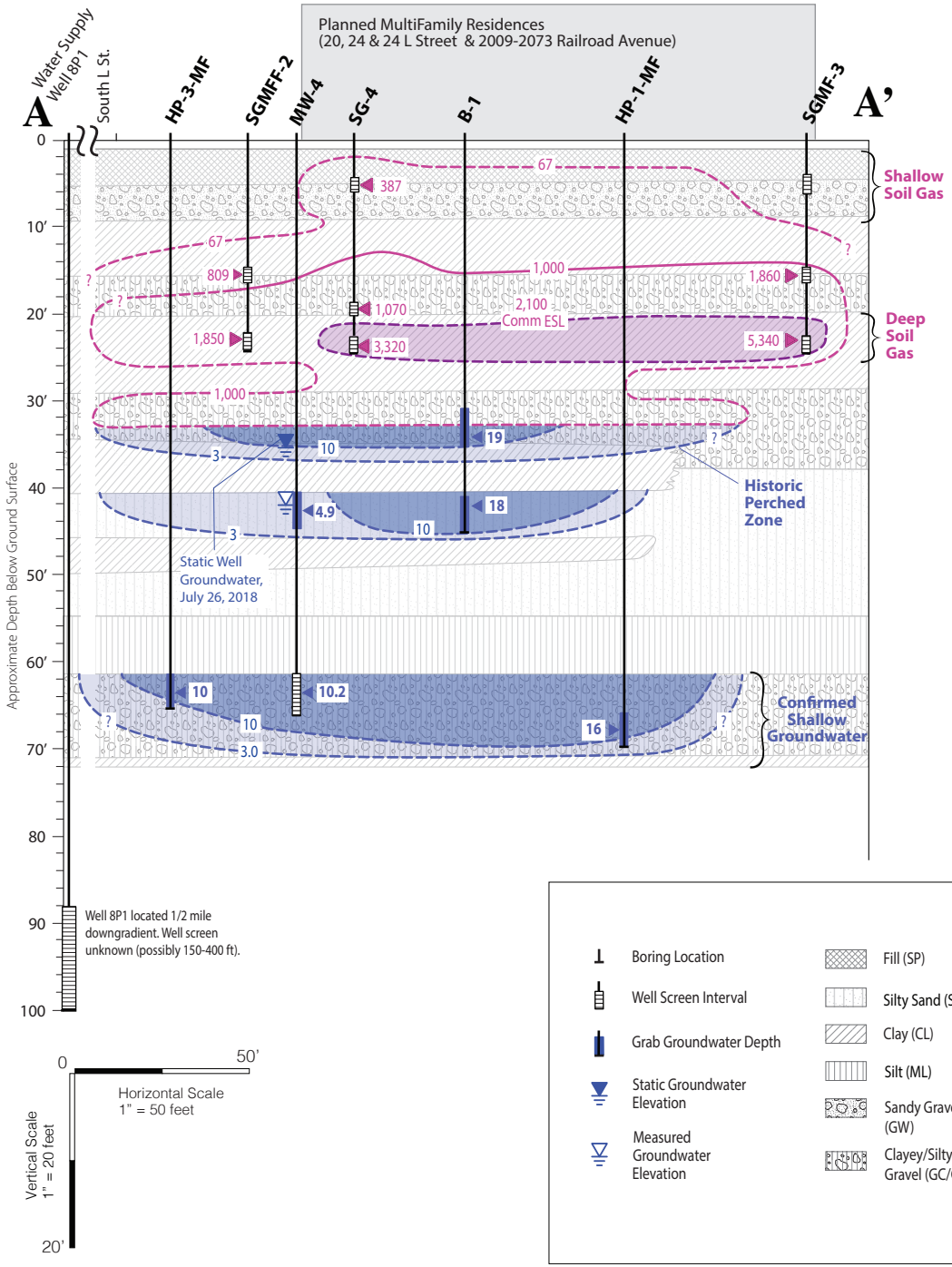
Perched Groundwater Data (31-44 ft bgs)



Old Train Depot
20, 24 & 24 L Street & 2009-2073 Railroad Avenue
Livermore, California

PANGEA

Shallow Groundwater Data
(60-72 ft bgs)



LEGEND

- Boring Location
- Well Screen Interval
- Grab Groundwater Depth
- Static Groundwater Elevation
- Measured Groundwater Elevation
- Fill (SP)
- Silty Sand (SM)
- Clay (CL)
- Silt (ML)
- Sandy Gravel (GW)
- Clayey/Silty Gravel (GC/GM)
- 5,630 — PCE in soil gas (µg/m3)
- 1,000 — **PCE** Isoconcentration contour for **soil gas** (µg/m³)
- 2,100 — **PCE** in **soil gas** above 2016 commercial ESL of 2,100 (µg/m³)
- 3.1 — **PCE** in **groundwater** (µg/L). **Bold** concentrations exceed Tier 1 ESL
- 3 — **PCE** in **groundwater** above Tier 1 ESL of 3 µg/L
- 10 — **PCE** Isoconcentration for **groundwater** (µg/L)

Contours dashed where inferred; queried where uncertain.

(µg/L) Micrograms per liter

(µg/m³) Micrograms per cubic meter

PCE Tetrachloroethylene

* Data not used for contouring

Figure 11

Old Train Depot
20, 24 & 24 L Street & 2009-2073 Railroad Avenue
Livermore, California

PANGEA

PCE Distribution in Cross Section

Pangea

Table 1. Soil Analytical Data - Old Train Depot, Livermore Downtown Core Development, Livermore, California

Boring / Sample ID	Date Sampled	Sample Depth (ft bgs)	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Total Xylenes	PCE	TCE	Cis-1,2-DCE	Trans-1,2-DCE	Vinyl Chloride	Other VOC's	Arsenic	Total Chromium	Chromium STLC (mg/L)	Lead	Lead STLC (mg/L)	Nickel	Nickel STLC (mg/L)	Other Metals	Chlorinated Herbicides	Notes
			mg/kg																						
Tier 1 ESL:			**100**	**260**	**1,600**	**0.025**	**3.2**	**0.4**	**2.1**	**0.08**	**0.085**	**0.19**	**0.65**	**0.0015**	**varies**	**0.067**	**160**	--	**32**	--	**86**	--	varies	varies	
Direct Exposure, Construction Worker ESL			1,800	1,100	54,000	33	4,700	540	2,400	33	130	78	570	3.4	varies	2.00	--	--	160	--	86	--	**varies**	**varies**	
Direct Exposure, Residential, Shallow Soil ESL:			430	260	12,000	0.33	1,100	5.9	580	0.59	0.95	19	130	0.0083	varies	0.067	--	--	80	--	820	--	varies	varies	
Background Levels[1]:			--	--	--	--	--	--	--	--	--	--	--	--	--	**19.1**	**99.6**	--	**16.1**	--	**119.8**	--	**varies**	--	
2009-2111 Railroad Ave, Fugro, 2005																									
B-1	5/2/2005	0.5	<1	35	110	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	30	--	12	--	58	--	+	--	
		3.0	<1	11	40	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	--	--	11	--	--	--	--	--	
B-7	5/3/2005	0.5	<1	43	99	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	32	--	**44**	--	60	--	+	+	
		3.0	<1	2.8	6.8	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	--	--	5.2	--	--	--	--	--	
Various Addresses, BSK, April 2018																									
B-1	4/13/2018	0"-6"	--	5.4	70	--	--	--	--	--	--	--	--	--	--	**7.5**	38	--	**56**	1.8	**81**	--	+	ND	
		10"-16"	--	4.6	24	--	--	--	--	--	--	--	--	--	--	**6.2**	39	--	**65**	2.7	**77**	--	+	ND	
		18"-24"	--	13	60	--	--	--	--	--	--	--	--	--	--	**8.1**	40	--	**100**	3.9	**74.0**	--	+	ND	
B-2	4/13/2018	0"-6"	--	6.2	22	--	--	--	--	--	--	--	--	--	--	**2.8**	30	--	19	--	**68**	--	+	ND	
		10"-16"	--	33	200	--	--	--	--	--	--	--	--	--	--	**55 a**	13	--	**170 b**	9.5	**23**	--	+	ND	
		18"-24"	--	16	78	--	--	--	--	--	--	--	--	--	--	**11**	21	--	**93**	2.1	**46**	--	+	ND	
B-3	4/13/2018	0"-6"	--	6.4	40	--	--	--	--	--	--	--	--	--	--	**20 a**	41	--	**89**	3.0	**96**	--	+	ND	
		10"-16"	--	4.7	32	--	--	--	--	--	--	--	--	--	--	**5.9**	47	--	**120**	1.6	**120 c**	--	+	ND	
		18"-24"	--	8.1	22	--	--	--	--	--	--	--	--	--	--	**8.4**	37	--	**140**	4.3	**90**	--	+	ND	
B-4	4/13/2018	0"-6"	--	4.6	23	--	--	--	--	--	--	--	--	--	--	**5.0**	56	<0.50	**58**	2.1	**110**	--	+	ND	
		10"-16"	--	29	120	--	--	--	--	--	--	--	--	--	--	**28 a**	30	--	**200 b**	7.3	**66**	--	+	ND	
		18"-24"	--	2.3	<2.0	--	--	--	--	--	--	--	--	--	--	**6.4**	36	--	**130**	2.8	**86**	--	+	ND	
B-5	4/13/2018	0"-6"	--	60	280	--	--	--	--	--	--	--	--	--	--	**7.1**	43	--	**41**	--	**98**	--	+	ND	
		10"-16"	--	3.9	24	--	--	--	--	--	--	--	--	--	--	**5.0**	52	<0.50	22	--	**130 c**	--	+	ND	
		18"-24"	--	4.6	16	--	--	--	--	--	--	--	--	--	--	**7.7**	45	--	27	--	**130 c**	--	+	ND	
B-6	4/16/2018	0"-6"	--	3.0	18	--	--	--	--	--	--	--	--	--	--	**4.6**	62	<0.50	11	--	**140 c**	--	+	ND	
		10"-16"	--	9.0	24	--	--	--	--	--	--	--	--	--	--	**8.4**	44	--	**43**	--	**100**	--	+	ND	
		18"-24"	--	11	34	--	--	--	--	--	--	--	--	--	--	**7.5**	38	--	**41**	--	**94**	--	+	ND	
B-10	4/16/2018	0"-6"	--	3.0	19	--	--	--	--	--	--	--	--	--	--	**2.6**	32	--	<6.3	--	**43**	--	+	--	
		10"-16"	--	<1.0	<2.0	--	--	--	--	--	--	--	--	--	--	**3.2**	76	<0.20	8.8	--	**160 c**	--	+	--	
		18"-24"	--	2.6	6.0	--	--	--	--	--	--	--	--	--	--	**3.0**	57	<0.50	9.0	--	**370 c**	1.9	+	--	
B-11	4/17/2018	0"-6"	--	17	120	--	--	--	--	--	--	--	--	--	--	**7.3**	36	--	**63**	1.6	**74**	--	+	--	
		10"-16"	--	14	72	--	--	--	--	--	--	--	--	--	--	**5.1**	30	--	**120**	3.8	**46**	--	+	--	
		18"-24"	--	5.3	15	--	--	--	--	--	--	--	--	--	--	**3.6**	18	--	**55**	1.4	**32**	--	+	--	
B-12	4/17/2018	0"-6"	--	6.1	53	--	--	--	--	--	--	--	--	--	--	**3.2**	25	--	<6.3	--	**53**	--	+	--	
		10"-16"	--	37	130	--	--	--	--	--	--	--	--	--	--	**48 a**	67	<0.50	7.3	--	**120 c**	--	+	--	
		18"-24"	--	37	100	--	--	--	--	--	--	--	--	--	--	**18**	52	<0.50	7.0	--	**140 c**	--	+	--	
B-13	4/17/2018	0"-6"	--	12	18	--	--	--	--	--	--	--	--	--	--	**2.6**	30	--	<6.3	--	**55**	--	+	--	
		10"-16"	--	<1.0	<2.0	--	--	--	--	--	--	--	--	--	--	**2.9**	55	<0.50	9.0	--	**160 c**	--	+	--	
		18"-24"	--	3.1	42	--	--	--	--	--	--	--	--	--	--	**3.4**	52	<0.50	<6.3	--	**140 c**	--	+	--	
Multifamily Residences Area, Pangea, 2018																									
SG-4-3	6/20/2018	3.0	<1.0	<1.0	<5.0	--	--	--	--	--	--	--	--	--	--	**4.0**	54	0.18	7.1	--	**140**	--	+	--	
SG-4-6	6/20/2018	6.0	<1.0	<1.0	<5.0	--	--	--	--	--	--	--	--	--	--	**3.3**	50	<0.10	4.7	--	**110**	--	+	--	
SG-4-12	6/20/2018	12.0	<1.0	<1.0	<5.0	--	--	--	--	--	--	--	--	--	--	**4.3**	48	--	5.3	--	**120**	--	+	--	
SGMF-2-23	11/14/2018	23.0	--	--	--	<3.8	<3.8	<3.8	<7.6	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	--	--	--	--	--	--	--	--	--	

Notes and Abbreviations:

TPH = total petroleum hydrocarbons as gasoline (TPHg), diesel (TPHd), and/or motor oil (TPHmo) range

PCE = tetrachloroethene

TCE = trichloroethene

DCE = dichloroethene

Other VOCs = volatile organic compounds not otherwise listed

ft bgs = feet below ground surface

mg/kg = milligrams per kilogram

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

+ = chemicals detected at relatively low concentrations. See laboratory reports for details.

-- = not applicable

ND = Not Detected at levels above laboratory reporting limits. Limits vary by constituent.

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, January 2019 (Revision 2).

1 = background levels taken from *Analysis of Background Distributions of Metals in the Soil at Lawrence Berkeley National Laboratory* - revised April 2009.

BOLD = Analyte detected above Tier 1 ESL.

GREY HIGHLIGHT = Analyte concentration exceeds construction worker ESL and background level if applicable (see notes a, b, c).

RED HIGHLIGHT = Analyte concentration exceeds criteria for waste soil classification as Class I Non-RCRA (California) hazardous waste.

a = 95UCL concentration of arsenic (14 mg/kg) for the April 2018 BSK data set is below local background concentration of 19.1 mg/kg.

b = 95UCL concentration of lead (75 mg/kg) for the April 2018 BSK data set is below construction worker ESL of 160 mg/kg.

c = 95 UCL concentration of nickel (110 mg/kg) for the April 2018 BSK data set is below local background concentration of 119.8 mg/kg.

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Table 2 - Groundwater Analytical Data - Old Train Depot, Livermore Downtown Core Development, Livermore, California

Sample / Boring ID	TOC Elevation	Date Sampled	Sample Depth (ft bgs)	Depth to Water (feet bTOC)	Groundwater Elevation (feet amsl)	TPHg	TPHd	TPHmo	Benzene	Naphthalene	PCE	TCE	Cis-1,2-DCE	Trans-1,2-DCE	Vinyl Chloride	Chloroform	Other VOCs	Notes
			Tier 1 ESL:			**100**	**100**	**--**	**0.42**	**0.17**	**0.64**	**1.2**	**6.0**	**10**	**0.0086**	**0.81**	**--**	
						µg/L												
2009-2111 Railroad Ave, Fugro, May 2005																		
B-1		5/2/2005	31-35	--	--	**160**	<62	<62	<0.5	--	**19**	<0.5	<0.5	<0.5	<0.5	<0.5	ND	Grab data
		5/2/2005	40-44	--	--	**160**	**330**	480	<0.5	--	**18**	<0.5	<0.5	<0.5	<0.5	<0.5	ND	Grab data
B-2		5/2/2005	31-35	--	--	<50	**230**	72	<0.5	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND	Grab data
B-3		5/2/2005	31-35	--	--	**160**	<56	<56	<0.5	--	**6.8**	<0.5	<0.5	<0.5	<0.5	<0.5	ND	Grab data
B-4		5/2/2005	31-35	--	--	**170**	<57	<57	<0.5	--	**34**	1.0	<0.5	<0.5	<0.5	<0.5	ND	Grab data
B-6		5/2/2005	31-35	--	--	**170**	<56	<56	<0.5	--	**31**	0.91	<0.5	<0.5	<0.5	0.54	<0.5	Grab data
B-7		5/2/2005	31-35	--	--	**210**	**220**	130	<0.5	--	<0.5	<0.5	<0.5	<0.5	<0.5		+	Grab data
Quality Control Samples																		
Duplicate-1(B-1)		5/2/2005	31-35	--	--	**160**	--	--	<0.5	--	**21**	<0.5	--	--	--	--	ND	Grab data. Control sample.
Duplicate-2(B-3)		5/2/2005	31-35	--	--	**150**	<54	56	<0.5	--	**4.8**	<0.5	--	--	--	--	ND	Grab data. Control sample.
Duplicate-3(B-4)		5/2/2005	31-35	--	--	**160**	<59	<59	<0.5	--	**32**	0.88	--	--	--	--	ND	Grab data. Control sample.
Monitoring Well, Pangea, 2018																		
MW-4	484.31	7/26/2018	62-67	36.71	447.60	**--**	--	--	<0.102	0.117	**10.2**	0.138	<0.114	<0.104	<0.129	0.708	<3.45	Well sample after development.
Grab Groundwater Samples, Pangea, 2018																		
MW-4		7/11/2018	41-45	41.00	--	**--**	--	--	<0.50	<0.50	**4.9**	<0.50	<0.50	<0.50	<0.50	**1.3**	a	Perched zone grab data.
HP-1-MF		11/12/2018	66-70	50.10	--	**--**	--	--	<0.5	<2.0	**16**	<0.5	<0.5	<0.5	<0.5	0.60	<1.0	Grab data
HP-2-MF		11/13/2018	66-70	46.80	--	**--**	--	--	<0.5	<0.5	**4.6**	<0.5	<0.5	<0.5	<0.5	0.77	<0.5	Grab data
HP-3-MF		11/13/2018	62-70	52.00	--	**--**	--	--	<0.5	<0.5	**10**	<0.5	<0.5	<0.5	<0.5	0.72	<0.5	Grab data
HP-4-QC		11/8/2018	66-70	52.00	--	**--**	--	--	<0.331	<1.0	**3.21**	1.20	<0.260	<0.396	<0.259		--	Upgradient of Old Train Depot
HP-5-QC		11/12/2018	66-70	45.30	--	**--**	--	--	<0.5	<2.0	**7.6**	<0.5	<0.5	<0.5	<0.5		+	Upgradient of Old Train Depot

Notes & Abbreviations:

TOC Elevation - Top of casing elevation surveyed on October 5, 2018 by Virigl Chvez Land Surveying using NAVD 88 benchmark elevation.

TPH = Total petroleum hydrocarbons as gasoline (TPHg), diesel (TPHd), and/or motor oil (TPHmo) range

PCE = Tetrachloroethene

TCE = Trichloroethene

DCE = Dichloroethene

Other VOCs = Volatile organic compounds not otherwise listed

ft bgs = Feet below ground surface

µg/L = Micrograms per liter

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

-- = Nt applicable or not available

ND = Not Detected at levels above laboratory reporting limits. Limits vary by constituent.

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, January 2019 (Revision 2).

a= Bromodichloromethane detected at 0.57 ug/L, below its Tier 1 ESL of 0.87 ug/L.

BOLD = Analyte detected above Tier 1 ESL.

Pangea

Table 3. Soil Gas Analytical Data - Old Train Depot, Livermore Downtown Core, Livermore, CA

Boring / Sample ID	Date Sampled	Sample Depth (ft bgs)	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	Benzene	Ethylbenzene	TPH (Low Fraction)	2-Propanol (Leak Check)	Other VOCs	Notes	
			µg/m³											
		Tier 1 ESL:	**15**	16	280	2,800	0.32	3.2	37	--	--	--		
		Residential ESL for Vapor Intrusion Human Health Risk:	**15**	16	280	2,800	0.32	3.2	37	--	--	--		
		Commercial ESL for Vapor Intrusion Human Health Risk:	**67**	100	1,200	12,000	5.2	14	160	--	--	--		
Multifamily, Pangea, June 2018														
SG-4-5	6/22/2018	5.0	**309**	<1.07	<0.793	<0.793	<0.511	0.997	2.35	551	5.04	a		
SG-4-20	6/22/2018	20.0	**420**	<1.07	<0.793	<0.793	<0.511	2.70	0.954	1,900	<3.07	a		
SG-5-5	6/21/2018	5.0	**34.6**	<1.07	<0.793	<0.793	<0.511	0.676	<0.867	512	4.70	a		
SG-6-5	6/21/2018	5.0	**168**	<1.07	<0.793	<0.793	<0.511	<0.639	1.27	329	242	a		
Shroud	6/22/2018	--	--	--	--	--	--	--	--	--	219,000	---		
MultiFamily, Pangea, November 2018														
SGMF-1-5	11/27/2018	4.5-5.5	**56.5**	<1.07	<0.908	<0.908	<0.511	<0.639	2.18	<207	7.11	a		
SGMF-2-5	11/27/2018	4.5-5.5	**108**	<1.07	<0.793	<0.793	<0.511	<0.639	<0.867	<207	38.9	a		
SGMF-2-15	11/27/2018	14.5-15.5	**809**	<1.07	<0.793	<0.793	<0.511	1.92	<0.867	960	<3.07	a		
SGMF-2-25	11/27/2018	24.5-25.5	**1,850**	3.9	<0.793	<0.793	<0.511	**58**	1.1	3,870	8.23	a		
SGMF-3-15	11/28/2015	14.5-15.5	**1,860**	1.4	<0.793	<0.793	<0.511	2.1	<0.867	2,130	28.7	a		
SGMF-3-25	11/28/2015	24.5-25.5	**5,340**	7.2	<0.793	<0.793	<0.511	**5.0**	<0.867	3,680	4.86	a		
SGMF-4-5	11/28/2015	4.5-5.5	**387**	<1.07	<0.793	<0.793	<0.511	0.863	4.19	611	14.5	a		
SGMF-4-15	11/28/2015	14.5-15.5	**1,070**	<1.07	<0.793	<0.793	<0.511	**3.55**	10.6	1,540	96.1	a		
SGMF-4-25	11/28/2015	24.5-25.5	**3,320**	12	<0.793	0.826	<0.511	**14.1**	22.1	4,080	7.87	a		
SGQC-6-5	11/9/2018	4.5-5.5	**318**	<1.07	<0.793	<0.793	<0.511	**27.1**	43.6		8.90	a	TPH = 4,060	Short equilibration time ~ 4 hrs
SGQC-6-15	11/9/2018	14.5-15.5	**111**	<1.07	<0.793	<0.793	<0.511	**115**	115		160	a	TPH = 10,200	Short equilibration time ~ 2 hrs
SGQC-6-30	11/9/2018	29.5-30.5	**690**	27.8	<0.793	4.39	0.802	**86.5**	110		<3.07	a	TPH = 8,890	Short equilibration time ~ 2 hrs
SGQC-7-5	11/9/2018	4.5-5.5	**100**	<1.07	<0.793	<0.793	<0.511	**2.65**	3.01		9.12	a	TPH = 360	
SGQC-7-15	11/9/2018	14.5-15.5	**1,010**	<1.07	<0.793	<0.793	<0.511	**11.6**	3.11		59.8	a	TPH = 1,400	
SHROUD	11/12/2018	--	--	--	--	--	--	--	--		2,150,000	--		
	11/28/2018	--	--	--	--	--	--	--	--	--	150,000	---		

Explanation:

PCE = Tetrachloroethene

TCE = Trichloroethene

DCE = Dichloroethene

Other VOCs = Volatile organic compounds by EPA Method TO-15 or EPA Method 8260.

µg/m3 = Micrograms per cubic meter of air results calculated by laboratory from parts per billion results using normal pressure and temperature (NPT).

ft bgs = feet below ground surface.

< n = Chemical not present above laboratory detection limit.

--- = Not analyzed

Bold = Concentrations above ESLs for Residential Land Use for shallow soil gas (SG samples).

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,* January 2019 (Revision 2).

a= Other analytes detected below Tier 1 ESLs, if established, including acetone, bromodichloromethane, carbon disulfide, ethanol, MEK, trichlorofluoromethane, dichlorofluoromethane, propene, toluene, xylenes, 1,1,1-trichloroethane, 1,2,4-trimethylbenzene, n-hexane, and methylene chloride.

Appendix A

Permits

APPLICATION FOR DRILLING PERMIT

Zone 7 Water Agency
100 North Canyons Parkway
Livermore, CA 94551
(925) 454-5000
wellpermits@zone7water.com

For Office Use 132486

Permit No.: 2018087	Permit Date: 06/15/18	Receipt No.: 2018-00000614	Well No.: NA

For Applicant to Complete

Applicant: Pangea Environmental	Client: City of Livermore - Joel Waxdeck
Address: 1710 Franklin St, #200	Address: 1052 S Livermore Ave
City, State, Zip: Oakland, CA 94612	City, State, Zip: Livermore, CA 94550
Phone: 510-836-3700 Email: mgillies@pangeaenv.com	Phone: (925) 580-8276 Email: jhwaxdeck@cityoflivermore.net
	Is Client the Property Owner? (Y) N (If not, attach Prop. Owner info)

Site

Project Location: 2205 Railroad Ave, 30 S Livermore Ave, 20 S L St
GeoTracker or EnviroStor ID: due diligence for development
Assessor's Parcel Number: 98-407-29-2, 98-407-13, 98-289-21
Latitude: Longitude:

Project Type

- ☐ **Well Construction ($397/well)**
- ☐ **Well Destruction ($397/well)**

Proposed or Previous Well Use:

- ☐ Domestic
- ☐ Irrigation
- ☐ Cathodic Protection
- ☐ Geothermal
- ☐ Inclinometer
- ☐ Municipal
- ☐ Dewatering
- ☐ Industrial
- ☐ Monitoring
- ☐ Other: _____

- ☒ **Exploratory Borings ($265/site)**

Type of Investigation:

- ☐ Geotechnical
- ☐ Environmental
- ☒ Soil Vapor
- Backfill with neat cement
- ☐ Other: _____

- ☐ **Remediation System ($265/site)**

Type of System:

- ☐ Groundwater Extraction
- ☐ Vapor Extraction
- ☐ In-Situ Treatment
- ☐ Other: _____

Drilling

Drilling Method:

- ☐ Mud Rotary
- ☐ Air Rotary
- ☐ Cable Tool
- ☐ Hollow Stem Auger
- ☒ Direct Push
- ☐ Other: _____

Drilling Company: Confluence Environmental

Driller's C57 License No.: 913194

Well Specs.

Owner Well ID	Borehole Diameter	Casing Material	Casing Diameter	Surface Seal Depth	Total Well Depth
SG-3-20	2.25"	Teflon Tubing	0.25"	18'	20'
SG-4-20	2.25"	Teflon Tubing	0.25"	18'	20'
SG-15-10, SG-16-10	2.25"	Teflon Tubing	0.25"	8'	10'
SG-17-10	2.25"	Teflon Tubing	0.25"	8'	10'

For Well Destruction Projects

Destruction Method: ☐ Perforate (Mills Knife) ☐ Pressure Grout ☐ Drill Out ☐ Other: _____

For Exploratory Boring Projects

Number of Borings: 5	Borehole Diameter: 2.25"	Maximum Depth: 20'	Estimated Depth-to-Water: 25'

For All Projects

Estimated Starting Date: 6/19/2018	Estimated Completion Date: 6/21/2018

*** Please attach a Site Plan including all proposed drilling locations, existing wells, significant site features, and adjacent streets ***

I hereby agree to comply with all requirements of this permit (see Page 2) and Alameda County Ordinance No. O-2015-20.

Applicant's Signature: _____ Date: 6/11/18

For Office Use

Approved: _____ Date: 06/15/18

Rev 03/29/2017

Appendix B

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.

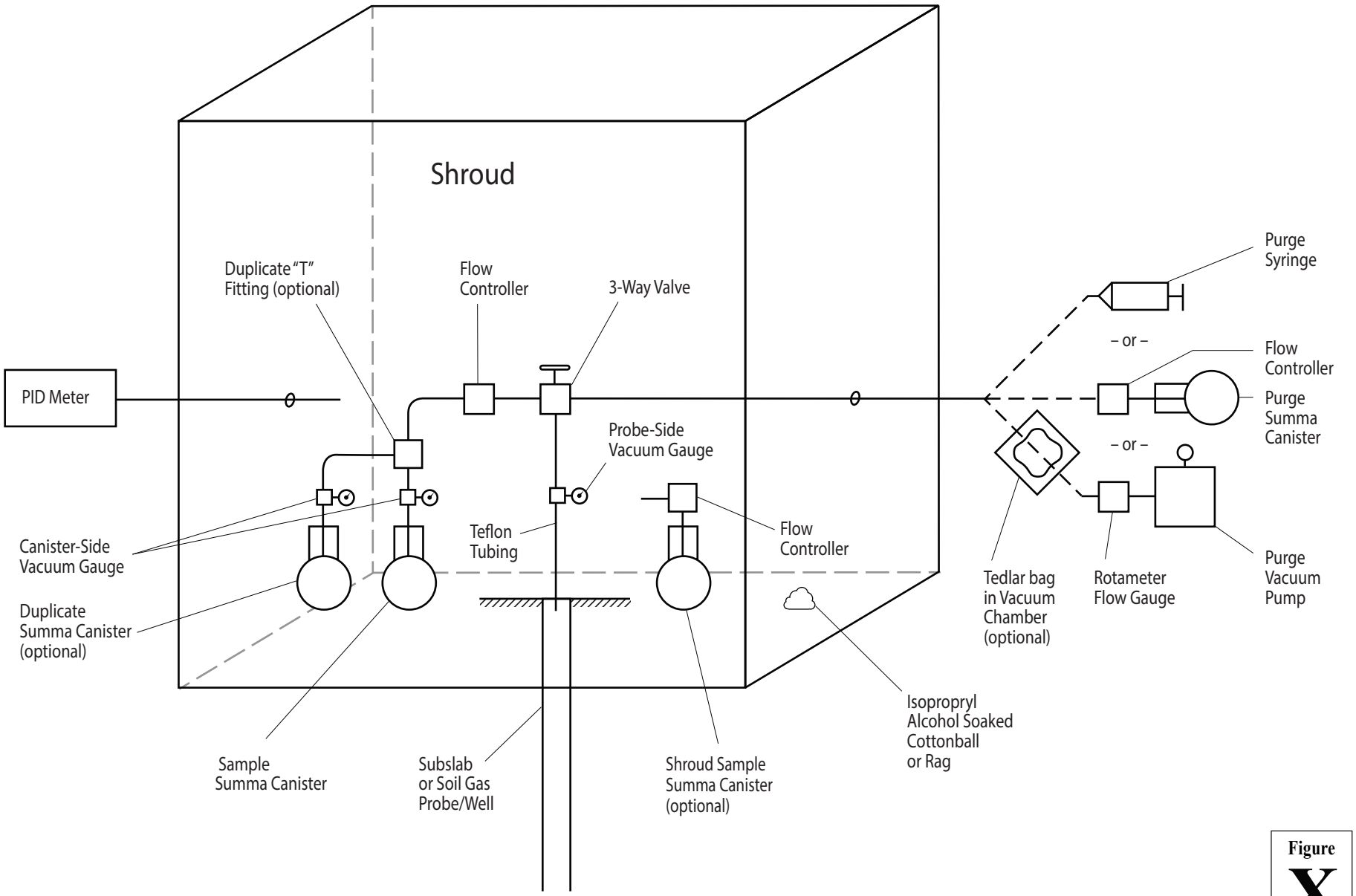


Figure X

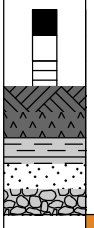
PANGEA

Subslab and Soil Gas Sampling Apparatus Schematic

Appendix C

Boring and Well Construction Logs

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:** Livermore Downtown Core **Project:** 2165.002.210 **Address:** L St, Railroad Ave and S Livermore Ave, Livermore, CA	**WELL LOG** **Well No. SGMF-1-5** **Page: 1 of 1**

Drilling Start Date:	**11/13/2018**	Boring Depth (ft):	**5.5**	Well Depth (ft):	**5**
Drilling End Date:	**11/13/2018**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**0.25**
Drilling Company:	**Cascade Drilling**	Sampling Method(s):	**--**	Screen Slot (in):	**N/A**
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):	**Not Observed**	Riser Material:	**1/4" Teflon Tubing**
Drilling Equipment:	**Hand Auger**	DTW After Drilling (ft):	**Not Observed**	Screen Material:	**Vapor Implant**
Logged By:	**E. Lervaag**	Top of Casing Elev. (ft):	**--**	Seal Material(s):	**Hydrated Bentonite**
Reviewed By:	**Bob Clark-Riddell, PE**	Location (X,Y):	**--**	Filter Pack:	**#2/12 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') Landscape area.			0
								(1') Gravelly SAND with silt (SM); gray, dry, 20% silt, 50% sand, 30% gravel, high permeability.			
5								(5.5') End of Boring. Hydrated bentonite: 3 - 4' Dry bentonite: 4 - 4.5'			5
10											10

NOTES:

PANGEA	**Client:** Livermore Downtown Core **Project:** 2165.002.210 **Address:** L St, Railroad Ave and S Livermore Ave, Livermore, CA	**WELL LOG** **Well No.** SGMF-2-5/15/25 **Page:** 1 of 2

Drilling Start Date:	**11/14/2018**	Boring Depth (ft):	**25.5**	Well Depth (ft):	**5; 15; 25**
Drilling End Date:	**11/14/2018**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**0.25**
Drilling Company:	**Cascade Drilling**	Sampling Method(s):	**--**	Screen Slot (in):	**N/A**
Drilling Method:	**HA & DP**	DTW During Drilling (ft):	**Not Observed**	Riser Material:	**1/4" Teflon Tubing**
Drilling Equipment:	**Geoprobe 8040**	DTW After Drilling (ft):	**Not Observed**	Screen Material:	**Vapor Implant**
Logged By:	**E. Lervaag**	Top of Casing Elev. (ft):	**--**	Seal Material(s):	**Hydrated Bentonite**
Reviewed By:	**Bob Clark-Riddell, PE**	Location (X,Y):	**--**	Filter Pack:	**#2/12 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') Landscape area.			0
									0.0		
5											5
10									0.0		10
15									0.6		15
20									0.4		20

NOTES: HA - Hand Auger
DP - Direct Push

PANGEA	**Client:** Livermore Downtown Core **Project:** 2165.002.210 **Address:** L St, Railroad Ave and S Livermore Ave, Livermore, CA	**WELL LOG** **Well No. SGMF-2-5/15/25** **Page: 2 of 2**

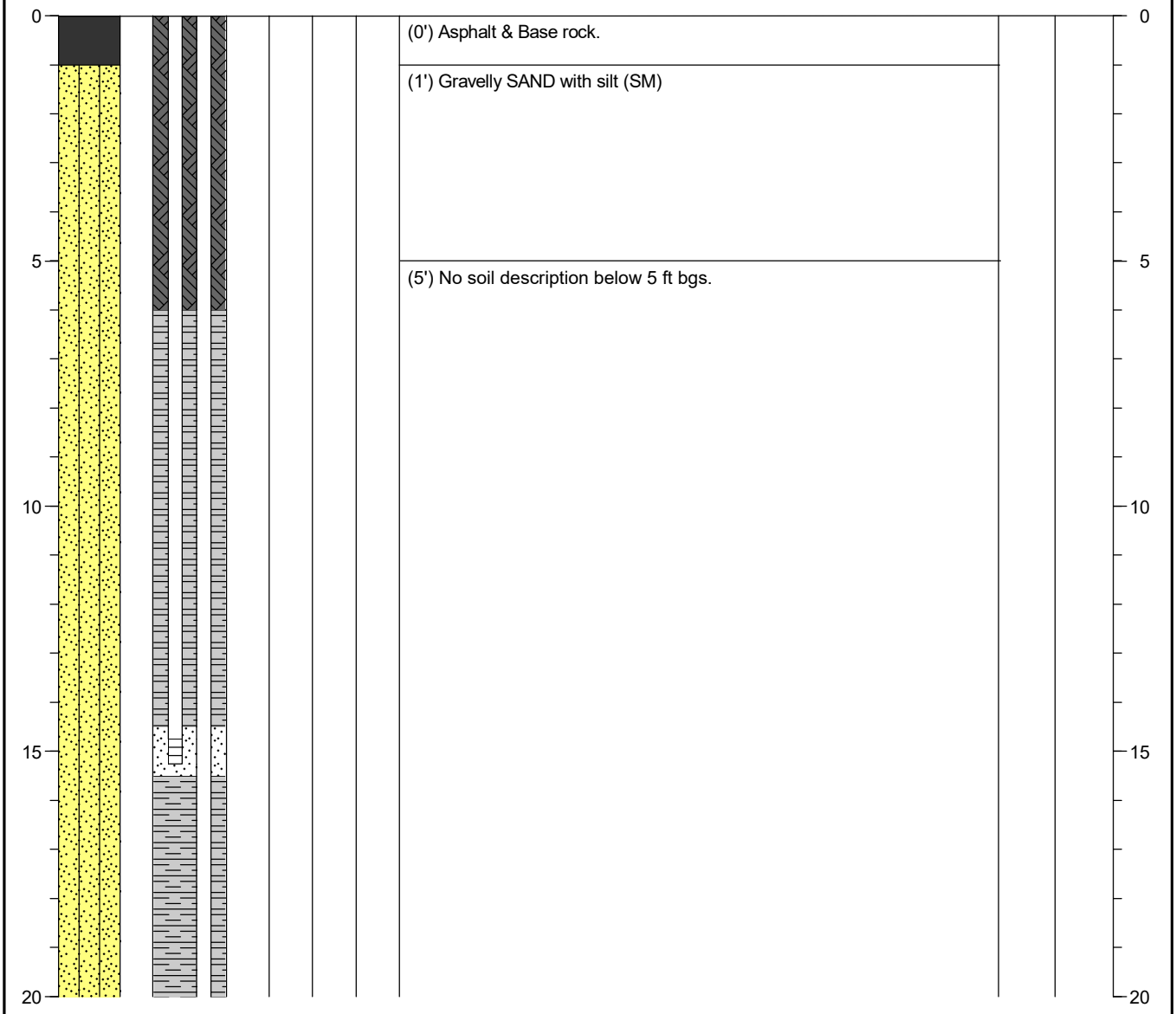
Drilling Start Date:	**11/14/2018**	Boring Depth (ft):	**25.5**	Well Depth (ft):	**5; 15; 25**
Drilling End Date:	**11/14/2018**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**0.25**
Drilling Company:	**Cascade Drilling**	Sampling Method(s):	**--**	Screen Slot (in):	**N/A**
Drilling Method:	**HA & DP**	DTW During Drilling (ft):	**Not Observed**	Riser Material:	**1/4" Teflon Tubing**
Drilling Equipment:	**Geoprobe 8040**	DTW After Drilling (ft):	**Not Observed**	Screen Material:	**Vapor Implant**
Logged By:	**E. Lervaag**	Top of Casing Elev. (ft):	**--**	Seal Material(s):	**Hydrated Bentonite**
Reviewed By:	**Bob Clark-Riddell, PE**	Location (X,Y):	**--**	Filter Pack:	**#2/12 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)
20											20
									1.0	SGMF-2-23	
25									0.7		25
								(25.5') End of Boring. Hydrated bentonite: 3 - 4' & 5.5 - 14' & 15.5 - 24' Dry bentonite: 4 - 4.5' & 14 - 14.5' & 24 - 24.5'			
30											30

NOTES: HA - Hand Auger
DP - Direct Push

PANGEA	**Client:** Livermore Downtown Core **Project:** 2165.002.210 **Address:** L St, Railroad Ave and S Livermore Ave, Livermore, CA	**WELL LOG** **Well No. SGMF-3-15/25** **Page: 1 of 2**

Drilling Start Date:	**11/13/2018**	Boring Depth (ft):	**25.5**	Well Depth (ft):	**15; 25**
Drilling End Date:	**11/13/2018**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**0.25**
Drilling Company:	**Cascade Drilling**	Sampling Method(s):	**--**	Screen Slot (in):	**N/A**
Drilling Method:	**HA & DP**	DTW During Drilling (ft):	**Not Observed**	Riser Material:	**1/4" Teflon Tubing**
Drilling Equipment:	**Geoprobe 8040**	DTW After Drilling (ft):	**Not Observed**	Screen Material:	**Vapor Implant**
Logged By:	**E. Lervaag**	Top of Casing Elev. (ft):	**--**	Seal Material(s):	**Hydrated Bentonite**
Reviewed By:	**Bob Clark-Riddell, PE**	Location (X,Y):	**--**	Filter Pack:	**#2/12 Sand**



NOTES: HA - Hand Auger
DP - Direct Push
Hand augered to 5' bgs.

PANGEA	**Client:** Livermore Downtown Core **Project:** 2165.002.210 **Address:** L St, Railroad Ave and S Livermore Ave, Livermore, CA	**WELL LOG** **Well No. SGMF-3-15/25** **Page: 2 of 2**

Drilling Start Date:	**11/13/2018**	Boring Depth (ft):	**25.5**	Well Depth (ft):	**15; 25**
Drilling End Date:	**11/13/2018**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**0.25**
Drilling Company:	**Cascade Drilling**	Sampling Method(s):	**--**	Screen Slot (in):	**N/A**
Drilling Method:	**HA & DP**	DTW During Drilling (ft):	**Not Observed**	Riser Material:	**1/4" Teflon Tubing**
Drilling Equipment:	**Geoprobe 8040**	DTW After Drilling (ft):	**Not Observed**	Screen Material:	**Vapor Implant**
Logged By:	**E. Lervaag**	Top of Casing Elev. (ft):	**--**	Seal Material(s):	**Hydrated Bentonite**
Reviewed By:	**Bob Clark-Riddell, PE**	Location (X,Y):	**--**	Filter Pack:	**#2/12 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)
20											20
25								(25.5') End of Boring. Hydrated bentonite: 6 - 14' & 15.5 - 24' Dry bentonite: 14 - 14.5' & 24 - 24.5'			25
30											30

NOTES: HA - Hand Auger
DP - Direct Push
Hand augered to 5' bgs.

PANGEA	**Client:** Livermore Downtown Core **Project:** 2165.002.210 **Address:** L St, Railroad Ave and S Livermore Ave, Livermore, CA	**WELL LOG** **Well No.** SGMF-4-5/15/25 **Page:** 1 of 2

Drilling Start Date:	**11/12/2018**	Boring Depth (ft):	**25.5**	Well Depth (ft):	**5; 15; 25**
Drilling End Date:	**11/12/2018**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**0.25**
Drilling Company:	**Cascade Drilling**	Sampling Method(s):	**--**	Screen Slot (in):	**N/A**
Drilling Method:	**HA & DP**	DTW During Drilling (ft):	**Not Observed**	Riser Material:	**1/4" Teflon Tubing**
Drilling Equipment:	**Geoprobe 8040**	DTW After Drilling (ft):	**Not Observed**	Screen Material:	**Vapor Implant**
Logged By:	**E. Lervaag**	Top of Casing Elev. (ft):	**--**	Seal Material(s):	**Hydrated Bentonite**
Reviewed By:	**Bob Clark-Riddell, PE**	Location (X,Y):	**--**	Filter Pack:	**#2/12 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') Asphalt & Base rock.			0
5											5
10											10
15											15
20											20

NOTES: HA - Hand Auger
DP - Direct Push

PANGEA	**Client:** Livermore Downtown Core **Project:** 2165.002.210 **Address:** L St, Railroad Ave and S Livermore Ave, Livermore, CA	**WELL LOG** **Well No. SGMF-4-5/15/25** **Page: 2 of 2**

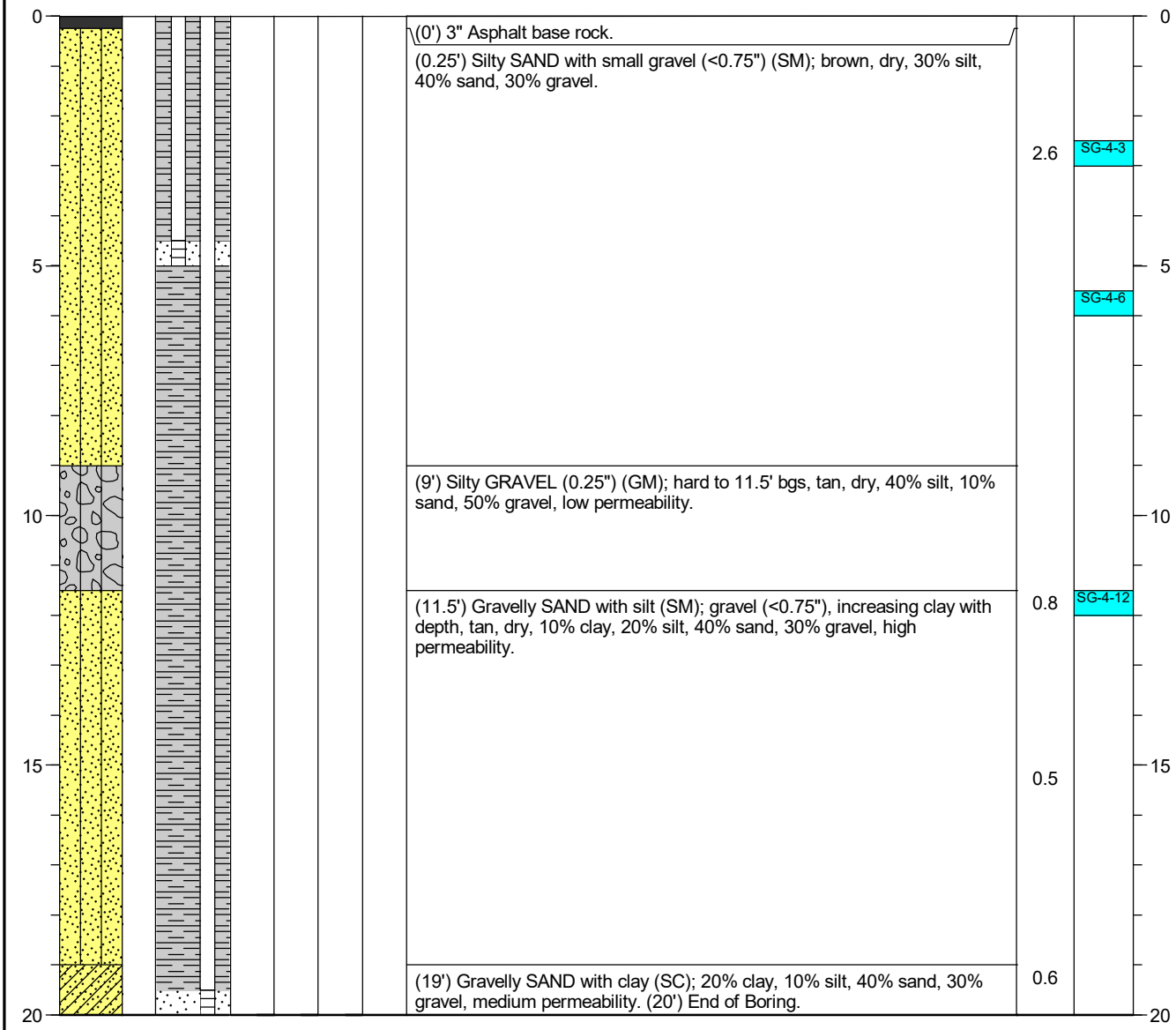
Drilling Start Date:	**11/12/2018**	Boring Depth (ft):	**25.5**	Well Depth (ft):	**5; 15; 25**
Drilling End Date:	**11/12/2018**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**0.25**
Drilling Company:	**Cascade Drilling**	Sampling Method(s):	**--**	Screen Slot (in):	**N/A**
Drilling Method:	**HA & DP**	DTW During Drilling (ft):	**Not Observed**	Riser Material:	**1/4" Teflon Tubing**
Drilling Equipment:	**Geoprobe 8040**	DTW After Drilling (ft):	**Not Observed**	Screen Material:	**Vapor Implant**
Logged By:	**E. Lervaag**	Top of Casing Elev. (ft):	**--**	Seal Material(s):	**Hydrated Bentonite**
Reviewed By:	**Bob Clark-Riddell, PE**	Location (X,Y):	**--**	Filter Pack:	**#2/12 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)
20											20
25								(25.5') End of Boring. Hydrated bentonite: 3 - 4' & 5.5 - 14' & 15.5 - 24' Dry bentonite: 4 - 4.5' & 14 - 14.5' & 24 - 24.5'			25
30											30

NOTES: HA - Hand Auger
DP - Direct Push

PANGEA	**Client:** City of Livermore **Project:** 2165.002 **Address:** L St, Railroad Ave and S Livermore Ave, Livermore, CA	**WELL LOG** **Well No. SG-4-5/20** **Page: 1 of 1**

Drilling Start Date:	**6/20/2018**	Boring Depth (ft):	**20**	Well Depth (ft):	**5; 20**
Drilling End Date:	**6/20/2018**	Boring Diameter (in):	**3.25/2.25**	Well Diameter (in):	**0.25**
Drilling Company:	**Confluence**	Sampling Method(s):	**--**	Screen Slot (in):	**N/A**
Drilling Method:	**HA & DP**	DTW During Drilling (ft):	**--**	Riser Material:	**1/4" Teflon Tubing**
Drilling Equipment:		DTW After Drilling (ft):	**--**	Screen Material:	**Vapor Implant**
Logged By:	**E. Lervaag**	Top of Casing Elev. (ft):	**--**	Seal Material(s):	**Hydrated Bentonite**
Reviewed By:	**Bob Clark-Riddell**	Location (X,Y):	**--**	Filter Pack:	**#2/12 Sand**



NOTES: HA - Hand Auger
DP - Direct Push
Hand Augered to 5' bgs.

PANGEA	**Client:** City of Livermore **Project:** 2165.002 **Address:** L St, Railroad Ave and S Livermore Ave, Livermore, CA	**WELL LOG** **Well No. SG-5-5** **Page: 1 of 1**

Drilling Start Date:	**6/19/2018**	Boring Depth (ft):	**5**	Well Depth (ft):	**5**
Drilling End Date:	**6/19/2018**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**0.25**
Drilling Company:	**Confluence**	Sampling Method(s):	**--**	Screen Slot (in):	**N/A**
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):	**--**	Riser Material:	**1/4" Teflon Tubing**
Drilling Equipment:		DTW After Drilling (ft):	**--**	Screen Material:	**Vapor Implant**
Logged By:	**E. Lervaag**	Top of Casing Elev. (ft):	**--**	Seal Material(s):	**Hydrated Bentonite**
Reviewed By:	**Bob Clark-Riddell**	Location (X,Y):	**--**	Filter Pack:	**#2/12 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') Sandy GRAVEL with silt (GM); brown, dry, 30% silt, 30% sand, 40% gravel, high permeability.			0
5								(5') End of Boring.			5
10											10

NOTES:

PANGEA	**Client:** City of Livermore **Project:** 2165.002 **Address:** L St, Railroad Ave and S Livermore Ave, Livermore, CA	**WELL LOG** **Well No. SG-6-5** **Page: 1 of 1**

Drilling Start Date:	**6/19/2018**	Boring Depth (ft):	**5**	Well Depth (ft):	**5**
Drilling End Date:	**6/19/2018**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**0.25**
Drilling Company:	**Confluence**	Sampling Method(s):	**--**	Screen Slot (in):	**N/A**
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):	**--**	Riser Material:	**1/4" Teflon Tubing**
Drilling Equipment:		DTW After Drilling (ft):	**--**	Screen Material:	**Vapor Implant**
Logged By:	**E. Lervaag**	Top of Casing Elev. (ft):	**--**	Seal Material(s):	**Hydrated Bentonite**
Reviewed By:	**Bob Clark-Riddell**	Location (X,Y):	**--**	Filter Pack:	**#2/12 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 GRAVEL with sand (GM); brown, dry, 30% silt, 30% sand, 40% gravel, high permeability.			0
5								(5') End of Boring.			5
10											10

NOTES:

Client Name
Job / Site Name Downtown Core Dev't
Location Livermore, CA
Project Number 2165.001
Driller Penecore
Drilling Method HA→5', HSA→41, DPush→
Boring Diameter 3.25", 8", 2.5"
Logged by MB
PE/PG Bob Clarke-Riddell

PANGEA

1710 Franklin Street, Suite 200
Oakland, CA 94612

Boring/Well Name MW-4 Page 1 of 3
Hand Augered to 5' bgs
Total Depth 67' bgs (well); 75' bgs (boring)
Date Started 7/11/18
Date Completed "
Well Developent Date (yield)
Ground Surface Elevation
Top of Casing Elevation
Screend Interval 62-67
Depth to Water (first encountered) 41' bgs
Depth to Water (static) 35.5' bgs
Located

Depth/Sample Interval	Time	Sample ID	PID/Odor	Well Construction	USCS	Soil Type and Comments	Color	Moisture	Density / Consistency	Percentages: Clay	Silt	Sand	Gravel	Plasticity	Estimated Permeability
0			(6)		GM	Silty gravel <2" subang.	Brown/Gray	Trace	Loose	–	25	20	55	–	H
						Sandy silt; w.g. sand	Brown	Trace	Soft	–	70	20	10	–	H
5					GM	Silty gravel; <3" subang	Brown/Gray	Moist	Loose/Soft	–	35	15	50	–	H
10															
				Bent. casing											
15															
20					GW	Sandy gravel; w.g. sand → <1.5" subang.	Brown/Gray	Moist	Loose	–	10	25	65	–	H
				(5)											
25															
30															

1710 Franklin Street, Suite 200
Oakland, CA 94612

PANGEA

Boring/Well Name MW-4 Page 2 of 3
Client Name
Job/Site Name Downtown Core Dev't
Project Number 2165.001

Depth/Sample Interval	Time	Sample ID	PID/Odor	Well Construction	USCS	Soil Type and Comments	Color	Moisture	Density / Consistency	Percentages: Clay	Silt	Sand	Gravel	Plasticity	Estimated Permeability
35					ML	Clayey silt	Grayish-Brown	Moist	Soft	25	50	15	10	–	L-M
					CL	Silty clay	Grayish Brown	Moist	Soft	65	20	10	5	L	L
40 (DP)			0.0		GM	Sandy gravel N.O/S	Gray/Brown	Wet	Loose	5	15	20	60	–	H
			0.0												
45			0.0		CL	Sandy clay; p.g coarse grain sand sub. ang < 1/2 N.O/S	Gray/Brown	Wet	Firm	45	10	25	20	L	L
			0.0												
50			0.0		GC	Clayey gravel sub.ang. < 1/2" N.O/S	Gray/Brown	Moist	Med. Dense	20	15	15	50	–	M
			0.0		GC	Sandy gravel; p.g coarse grain; sub.ang < 1/2" N.O/S	Gray/Brown	Wet	Dense	15	10	30	45		
55			0.0	(5)						15	15	35	35		
*	portland cement		0.0		CL	Clay N.O/S	Brown	Moist	Soft	80	10	5	5	L	L
60	bentonite		0.0	(1)						70	20	5	5		
			0.0		CL	Sandy clay				65	5	15	15		
	#3 sand			(4)	GP	Gravel; sub.ang < 2"	Gray	Dry	Loose	–	–	–	100	–	H
65			0.0		GP	Gravelly Sand; p.g. coarse grain; sub.ang < 1" N.O/S	Brown	Wet	Med. Dense	–	15	65	20	–	H

0.01" Screen 62-67'

2" lens

1710 Franklin Street, Suite 200
Oakland, CA 94612

PANGEA

Boring/Well Name MW-4 Page 3 of 3
Client Name
Job/Site Name Downtown Core Dev't
Project Number 2165.001

Depth/Sample Interval	Time	Sample ID	PID/Odor	Well Construction	(4) / USCS	Soil Type and Comments	Color	Moisture	Density / Consistency	Percentages: Clay	Silt	Sand	Gravel	Plasticity	Estimated Permeability
			0.0							10	10	70	10		
					CL	Silty clay	Brown	Moist	Firm	65	30	5	–	L	L
			0.0		(3)										
70						Slough									
			0.0												
			0.0												
73	1200	MW-4 -75	0.0		SC	Sandy gravel (6") f.g. / coarse grain; < 1/2" subang	Brown	Wet	Dense	20	15	40	25	–	M
			(1)			Borehole terminated @ 75' bgs									

Key:
(1) Bentonite chips
(2) Reamed cuttings
(3) 6" wooden plug
(4) Type 3 Filter pack Sand
(5) Portland cement grout
(6) Well vault in concrete grout

Appendix D

Well Development and Field Sampling Sheets

Meter Calibration Log

EQUIPMENT MAKE	EQUIPMENT MODEL	SERIAL NUMBER	DATE	TIME	TEMP OF CALIBRATION STANDARD (°C or °F)	pH STANDAR 4	pH STANDAR 7	pH STANDAR 10	SPECIFIC CONDUCTANCE 1413 µS/cm	ORP _____ mV	DISSOLVED OXYGEN _____ mg/L or %
Myron L	Ultrameter II	6243911	7/19/18	0845	24.9	4.00	7.00	10.00	1413	—	—

Confluence Environmental, Inc.

ORP Values (degrees in C then value): 5:257.0 10:250.5 15:244.0 20:237.5 25:231.0 30:224.5 35:218.0 40:211.5

Development Data Sheet

Job#: IHI-180719	**Developer:** I. Hultquist	**Client:** Pangea
Well ID: MW-4	**Date:** 7/19/18	**Site:** 20 S L St Livermore
Well diam: 1/4" 1" (2") 3" 4" 6" Other	**DTW:** 35.76	**TD Before:** 67.12 **TD After:** 67.22
Purge equip: (ES - diam: 2) Bladder Peri Waterra Positive Air Displacement Ext. System		
(SS) disp bailer teflon bailer other:	**Surge block used:** (Y) N	
Length of time surged prior to development: 10 min		
Pump depth/ intake:	**Multipliers:** 1"= 0.04 2"= 0.16 3"= 0.37 4"= 0.65 5"=1.02 6"= 1.47 Radius² X	
(TD - DTW X Multiplier = 1 Volume	80% Recovery (TD - DTW X 0.20 + DTW)	

1 Volume = 5.01 X **10** = 50.1 (Total Purge) Meter(s): Myron L UltrameterII 62139II LaMotte 2020we 41025-621

Time	Temp (°C / °F)	pH	Cond (mS / µS)	Turbidity (NTU)	Purge Rate (gal or mL/ min)	Volume Removed (gal / L)	DTW	Notes
1511	24.0	8.56	1091	>1000	-	5.01	36.31	Brown / no odor SS bailer
1518	22.5	8.93	1127	>1000	2.0	10.02	36.82	Brown / no odor
1520	20.8	8.70	1116	>1000	|	15.03	37.04	Brown / no odor
1522	20.8	8.24	1100	>1000	|	20.04	37.41	Brown / no odor
1524	20.8	7.91	1098	>1000	|	25.05	37.43	Clearing / no odor
1526	20.7	7.76	1090	>1000	|	30.06	37.43	Clearing / no odor
1528	20.6	7.56	1092	>1000	|	35.07	37.43	Clearing / no odor
1530	20.6	7.50	1087	>1000	|	40.08	37.43	clearing / no odor
1532	20.7	7.55	1086	820	|	45.09	37.43	clearing / no odor
1534	20.7	7.53	1093	436	|	50.10	37.43	clearing / no odor
1536	20.7	7.60	1089	245	|	55.11	37.43	clearing / no odor
1538	20.7	7.55	1087	9.0	|	60.12	37.43	Clear / no odor
1540	20.7	7.52	1088	10.4	|	65.13	37.43	Clear / no odor
			Hard bottom			Development Complete		TD - 67.22

Did well dewater? YES (NO)	Total volume removed: 65.13 (gal / L)	
Sample method (if applicable): Disp Bailer Ded. Tubing New Tubing Ext. Port Other:		
Sample date:	Sample time:	DTW at sample:
Sample ID:	Lab:	Number of bottles:
Analysis:		

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE Development
Project/Task Number:
Date: ~~6.21.18~~ 6.22.18
Sampler(s): E. Lervaag
Sample ID / Time: SG-4-5

PANGEA

Probe / Well ID: SG-4-5
Canister Serial #: 8094
Flow Controller #: 9272
Initial Vacuum: 30
Final Vacuum: 5

SPECIFICATIONS

Tubing Length: feet
Tubing Diameter (ID): inches
Boring Diameter: inches
Dry Bentonite Height: inches
Sandpack height: inches
Probe Length: inches
Probe Diameter: inches
Summa Flow Rate: 200 mL/min
Purge Flow Rate: 200 mL/min

See SG-6-5

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 = 13:26 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 ("H_2O): 1650 / 100.0" end time/pressure ("H_2O): 1656 / 99.0"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1700	0		–		Start Purge
1703	3		–		
1706	6		–		
1709	9		–		
1713	13:26		–		Stop Purge
1714	–		30		Start Sample
1715	–		25		
1716	–		20		
1717	–		15		
1719	–		10		
1720	–		5		Stop Sample
					Post-sampling PID screening (ppm):

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE Development
Project/Task Number:
Date: ~~6.21.18~~ 6.22.18
Sampler(s): E. Lervaag
Sample ID / Time: SG-4-20 / 1916

Probe / Well ID: SG-4-20
Canister Serial #: 8219
Flow Controller #: 9268
Initial Vacuum: 30
Final Vacuum: 5

SPECIFICATIONS

Tubing Length:	23	feet
Tubing Diameter (ID):	0.170	inches
Boring Diameter:	3.5	inches
Dry Bentonite Height:	6	inches
Sandpack height:	6	inches
Probe Length:	1	inches
Probe Diameter:	0.5	inches
Summa Flow Rate:	200	mL/min
Purge Flow Rate:	200	mL/min

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = 115 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= 473 mL
Sandpack = 378 mL
Single Purge Volume = 966 mL
Three Total Purge Volumes = 2898 mL
Total Purge Time = 14:29 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 ("H_2O): 1817 / 100.0 end time/pressure ("H_2O): 1825 / 99.0"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1859	0	2.3	—	2	Start Purge
1902	3	18.8	—	2	
1905	6	17.0	—	2	
1908	9	16.1	—	2	
1911	12	15.8	—	2	
1915	14:29	15.0	—	2	Stop Purge
1916	—	14.8	30	2	Start Sample
1917	—	14.0	25	2	Add IPA
1918	—	15.4	20	2	
1919	—	11.4	15	2	
1921	—	8.3	10	2	add IPA
1922	—	10.6	5	2	Stop Sample

Post-sampling PID screening (ppm): 0.3

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE Development
Project/Task Number:
Date: 6.21.18
Sampler(s): E. Lervaag
Sample ID / Time: SG-5-5 / 1030

Probe / Well ID: SG-5-5
Canister Serial #: 8102
Flow Controller #: 8326
Initial Vacuum: 30
Final Vacuum: 5

SPECIFICATIONS

Tubing Length: feet
Tubing Diameter (ID): inches
Boring Diameter: inches
Dry Bentonite Height: inches
Sandpack height: inches
Probe Length: inches
Probe Diameter: inches
Summa Flow Rate: 200 mL/min
Purge Flow Rate: 200 mL/min

See SG-6-5

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 = 13:26 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 ("H_2O): 1000 / 100.0 end time/pressure ("H_2O): 1009 / 100.0

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1016	0	3.3	—	2	Start Purge
1019	3	15.1	—	2	
1022	6	14.9	—	2	
1025	9	14.7	—	2	
1029	13:26	14.3	—	2	Stop Purge
1030	—	13.9	30	2	Stop Sample
1031	—	13.6	25	2	
1032	—	13.8	20	2	
1033	—	13.5	15	2	
1034	—	13.0	10	2	
1036	—	13.1	5	2	Start Sample
					Post-sampling PID screening (ppm): 0.0

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE Development
Project/Task Number:
Date: 6.21.18
Sampler(s): E. Lervaag
Sample ID / Time: SG-6-5

PANGEA

Probe / Well ID: SG-6-5
Canister Serial #: 8228
Flow Controller #: 9280
Initial Vacuum: 30
Final Vacuum: 5

SPECIFICATIONS

Tubing Length:	9	feet
Tubing Diameter (ID):	0.170	inches
Boring Diameter:	3.5	inches
Dry Bentonite Height:	6	inches
Sandpack height:	6	inches
Probe Length:	1	inches
Probe Diameter:	0.5	inches
Summa Flow Rate:	200	mL/min
Purge Flow Rate:	200	mL/min

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length

Tubing =	45	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=	473	mL
Sandpack =	378	mL
Single Purge Volume =	896	mL
Three Total Purge Volumes =	2688	mL
Total Purge Time =	13:26	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 ("H_2O): 1130 / 100.0" end time/pressure ("H_2O): 1136 / 99.0"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1145 1148	0 3	17.2	–	2	Start Purge
1151	6	16.1	–	2	
1154	9	14.7	–	2	
1155	13:26	13.3	–	2	Stop Purge
1156	–	10.4	30	2	Start Sample
	–	18.2	25	2	ADD IPA
	–	17.4	20	2	
	–	16.8	15	2	
	–	16.0	10	2	
	–	15.5	5	2	Stop Sample
					Post-sampling PID screening (ppm):

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE
Project/Task Number: 2165.002.215
Date: 11.27.18
Sampler(s): E. Lervaag
Sample ID / Time: SGMF-1-5 / 1152

PANGEA

Probe / Well ID: SGMF-1-5
Canister Serial #: 8148
Flow Controller #: 9284
Initial Vacuum: 30
Final Vacuum: 5

SPECIFICATIONS

Tubing Length:		feet
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 ~~SG1SC~~ SGSC-1-5 for 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 = 16:30 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 ("H_2O): 1049 / 100.0" end time/pressure ("H_2O): 1130 / 98.0"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1134	0	0.9	—	2	Start Purge
1137	3	17.9	—	2	
1140	6	18.3	—	2	
1143	9	18.0	—	2	
1146	12	17.9	—	2	
1151	16:30	17.8	—	2	Stop Purge
1152	—	17.5	30	2	Start Sample
1153	—	17.3	25	2	
1154	—	17.2	20	2	
1155	—	17.0	15	2	
1157	—	16.9	10	2	
1158	—	16.8	5	2	Stop Sample
					Post-sampling PID screening (ppm): 0.0

NOTES: _____

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE
Project/Task Number: 2165.002.215
Date: 11.27.18
Sampler(s): E. Lervaas
Sample ID / Time: SGMF-2-5/1315

PANGEA

Probe / Well ID: SGMF-2-5
Canister Serial #: 8266
Flow Controller #: 9267
Initial Vacuum: 30
Final Vacuum: 5

SPECIFICATIONS

Tubing Length: _____ feet
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 SGMC-1-5 For 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 = 16:30 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 ("H_2O): 1146 / 100.0" end time/pressure ("H_2O): 1249 / 98.0"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1257	0	0.6	—	2	Start Purge
1300	3	19.5	—	2	
1303	6	19.3	—	2	
1306	9	18.9	—	2	
1309	12	18.6	—	2	
1314	16:30	18.4	—	2	Stop Purge
1315	—	18.0	30	2	Start Sample
1316	—	17.9	25	2	
1317	—	17.7	20	2	
1318	—	17.6	15	2	
1320	—	17.4	10	2	
1321	—	17.3	5	2	Stop Sample
					Post-sampling PID screening (ppm):
					0.0

NOTES: _____

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE
Project/Task Number: 2165.002.215
Date: 11.27.18
Sampler(s): E. Lervaag
Sample ID / Time: SGMF-~~215~~ 2-15 / 1342

PANGEA

Probe / Well ID: SGMF-2-15
Canister Serial #: 8240
Flow Controller #: 92~~3~~352
Initial Vacuum: 29
Final Vacuum: 5

SPECIFICATIONS

Tubing Length:	18	feet
Tubing Diameter (ID):	0.170	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:	200	mL/min
Purge Flow Rate:	200	mL/min

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = 90 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= ~~5~~ 408 mL
Sandpack = ~~8~~ 652 mL
Single Purge Volume = 1140 mL
Three Total Purge Volumes = 3420 mL
Total Purge Time = 17:06 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 ("H_2O): 1~~3~~17 / 100.0" end time/pressure ("H_2O): 1322 / 100.0"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum "H20 / "Hg)	COMMENTS
1324	0	10.3	–	2	Start Purge
1327	3	17.9	–	2	
1330	6	18.5	–	2	
1333	9	18.0	–	2	
1336	12	17.8	–	2	
1339	15	17.7	–	2	
1341	17:06	17.6	–	2	Stop Purge
1342	–	17.3	30	2	Start Sample
1343	–	17.0	25	2	
1344	–	16.9	20	2	
1345	–	17.2	15	2	
1346	–	17.0	10	2	
1348	–	16.8	5	2	Stop Sample
					Post-sampling PID screening (ppm):
					0.0

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE
Project/Task Number: 2165.002.215
Date: 11.27.18
Sampler(s): E. Lervaag
Sample ID / Time: SGMF-2-25 /

PANGEA

Probe / Well ID: SGMF-2-25
Canister Serial #: 8158
Flow Controller #: 9271
Initial Vacuum: 30
Final Vacuum: 5

SPECIFICATIONS

Tubing Length:	28	feet
Tubing Diameter (ID):	0.170	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:	200	mL/min
Purge Flow Rate:	200	mL/min

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = 140 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= 408 mL
Sandpack = 652 mL
Single Purge Volume = 1200 mL
Three Total Purge Volumes = 3600 mL
Total Purge Time = 18:00 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 ("H_2O): 1330 | 100.0" end time/pressure ("H_2O): 1341 | 98.0"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1343	0				
1345	3			90	- shut down purge for recovery
1417	recover to 0" H_2O		restart		
1420				92	shut down 5:04 cum. Time
1433	recover to	10" H_2O	restart		
1436				92	shut down 7:38 cum.
1447	recover to	10" H_2O	restart		
1450				92	shut down 10:27 cum
1503	recover to	10" H_2O	restart		~~shut d~~
1507				92	shut down 14:47 cum.
1515	recover to	20" H_2O	restart		
1517					shut down 17:31 cum time
1522	recover to	38" H_2O	restart		
1523	shut down	18:00	purge time		
1523	—	16.9	30	~~40~~ 0	
1525	—	17.5	25	~~40~~	
1527	—	17.3	20	682	Post-sampling PID screening (ppm):
1529	—	17.0	15	80	0.6
1531	—	17.1	10	82	
1536		16.9	5	54	

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE
Project/Task Number: 2165.002.215
Date: 11.28.18
Sampler(s): E. Lervaag
Sample ID / Time: SGMF-3-15 / 0946

PANGEA

Probe / Well ID: SGMF-3-15
Canister Serial #: 8131
Flow Controller #: 8344
Initial Vacuum: 30
Final Vacuum: 5

SPECIFICATIONS

Tubing Length:		feet
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 SGMF-2-15 for 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 = 17:06 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 ("H_2O): 0918 / 100.0" end time/pressure ("H_2O): 0925 / 100.0"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
0929	0	0.9	–	2	Start Purge
0932	3	17.6	–	2	
0935	6	17.8	–	2	
0938	9	17.7	–	2	
0941	12	17.5	–	2	
0944	15	17.3	–	2	
0946	17:06		–	2	Stop Purge
0946	–	17.0	30	2	Start Sample
0947	–	16.8	25	2	
0948	–	17.2	20	2	
0949	–	17.0	15	2	
0951	–	16.8	10	2	
0952	–	16.7	5	2	Stop Sample
					Post-sampling PID screening (ppm):
					0.0

NOTES: _____

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE
Project/Task Number: 2165.002.215
Date: 11.28.18
Sampler(s): E. Lervaag
Sample ID / Time: SGMF-3-25 / 1007

PANGEA

Probe / Well ID: SGMF-3-25
Canister Serial #: 8146
Flow Controller #: 8318
Initial Vacuum: 29
Final Vacuum: 5

SPECIFICATIONS

Tubing Length:	feet
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 SGMF-2-25 for 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 = 18:00 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 ("H_2O): 0936 / 100.0" end time/pressure ("H_2O): 0942 / 100.0"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
0948	0	1.4	—	2	Start Purge
0951	3	19.0	—	2	
0954	6	18.6	—	2	
0957	9	18.7	—	2	
1000	12	18.5	—	2	
1003	15	18.6	—	2	
1006	18	18.4	—	2	Stop Purge
1007	—	18.0	30	2	Start Sample
1008	—	17.8	25	2	
1009	—	17.6	20	2	
1010	—	18.0	15	2	
1012	—	17.8	10	2	
1013	—	17.5	5	2	Stop Sample
					Post-sampling PID screening (ppm): 0.6

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE
Project/Task Number: 2165.002.215
Date: 11.28.18
Sampler(s): E. Lerraag
Sample ID / Time: SGMF-4-5 / 1102

PANGEA

Probe / Well ID: SGMF-4-5
Canister Serial #: 8119
Flow Controller #: 8336
Initial Vacuum: 29
Final Vacuum: 5

SPECIFICATIONS

Tubing Length:		feet
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 SGJC-1-5 for 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 = 16:30 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 ("H_2O): 1001 / 100.0" end time/pressure ("H_2O): 1009 / 99.0"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1044	0	0.2	–	2	Start Purge
1047	3	18.6	–	2	
1050	6	18.4	–	2	
1053	9	18.0	–	2	
1056	12	18.9	–	2	
1101	16:30	17.0	–	2	Stop Purge
1102	–	17.3	30	2	Start Sample
1103	–	17.0	25	2	
1104	–	18.0	20	2	
1105	–	18.2	15	2	
1107	–	17.9	10	2	
1108	–	17.6	5	2	Stop Sample
					Post-sampling PID screening (ppm):
					0.0

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE
Project/Task Number: 2165.002.215
Date: 11.28.18
Sampler(s): E. Lerraq
Sample ID / Time: SGMF-4-15 | 1135

PANGEA

Probe / Well ID: SGMF-4-15
Canister Serial #: 8238
Flow Controller #: 8333
Initial Vacuum: 29
Final Vacuum: 5

SPECIFICATIONS

Tubing Length:		feet
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 SGMF-2-15 for 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 = 17:06 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 ("H_2O): 1051 / 100.0" end time/pressure ("H_2O): 1101 / 98.0"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1111	0	0.4	–	3	Start Purge
1114	3	17.1	–	3	
1117	6	17.9	–	3	
1120	9	17.8	–	3	
1123	12	18.2	–	3	
1126	15	18.0	–	3	
1128	17:06	17.6	–	3	Stop Purge
1129	–	16.9	30	3	Start Sample
1130	–	17.7	25	3	
1131	–	16.9	20	3	
1132	–	17.2	15	2	
1134	–	16.8	10	2	
1135	–	16.0	5	2	Stop Sample
					Post-sampling PID screening (ppm):
					0.0

NOTES: Shroud collected

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE
Project/Task Number: 2165.002.215
Date: 11.28.18
Sampler(s): E. Lervaag
Sample ID / Time: Shroud / 1129

Probe / Well ID: Shroud
Canister Serial #: 8258
Flow Controller #: 9259
Initial Vacuum: 30
Final Vacuum: 5

SPECIFICATIONS

Tubing Length:		feet
Tubing Diameter (ID):		inches
Boring Diameter:		inches
Dry Bentonite Height:		inches
Sandpack height:		inches
Probe Length:		inches
Probe Diameter:		inches
Summa Flow Rate:	200	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 ("H_2O): end time/pressure ("H_2O):

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
		No Purge			
1129	—	16.9	30	—	Start Sample
1130	—	17.7	25	—	
1131	—	16.9	20	—	
1132	—	17.2	15	—	
1134	—	16.8	10	—	
1135	—	16.0	5	—	Stop Sample
					Post-sampling PID screening (ppm):

NOTES: ** Shroud collected at SGMF-4-15

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore CORE
Project/Task Number: 2165.002.215
Date: 11.28.18
Sampler(s): E. Lervaag
Sample ID / Time: SGMF-4-25 / 1159

PANGEA

Probe / Well ID: SGMF-4-25
Canister Serial #: 8121
Flow Controller #: 8317
Initial Vacuum: 30
Final Vacuum: 5

SPECIFICATIONS

Tubing Length:		feet
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 SGMF-2-25 for 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 = 18:00 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 ("H_2O): 1120 / 100.0" end time/pressure ("H_2O): 1130 / 99.0"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1140	0	2.2	—	2	Start Purge
1143	3	16.0	—	2	
1146	6	16.3	—	2	
1149	9	15.5	—	2	
1152	12	16.0	—	2	
1155	15	16.5	—	2	
1158	18	16.3	—	2	Stop Purge
1159	—	15.8	30	2	Start Sample
1200	—	15.5	25	2	
1201	—	16.1	20	2	
1202	—	16.3	15	2	
1204	—	16.0	10	2	
1205	—	15.8	5	2	Stop Sample
					Post-sampling PID screening (ppm):
					0.5

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore - 2048 First
Project/Task Number: 2165-002-210
Date: 11/9/18
Sampler(s): EC
Sample ID / Time: SGQC-6-5 / 1643

Probe / Well ID: SGQC-6-5
Canister Serial #: 008263
Flow Controller #: 009256
Initial Vacuum: -30
Final Vacuum: 5

SPECIFICATIONS

Tubing Length: _____ inches (SEE SGQC-3-5 FOR CALCS)
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 = 16m 36 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): 1600 / 100" H_2O end time/pressure ("Hg): 1605 / 100" H_2O

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1618	0	12.7	-	0	
1622	4	19.9	-	0	
1626	8	17.2	-	0	
1630	12	12.1	-	0	
1634	16m 36s	17.4	-	0	
1635	-	14.5	-30	0	
1636	-	13.4	25	0	
1638	-	11.5	20	0	
1639	-	18.9	15	0	
1640	-	14.1	10	0	
1643	-	17.1	5	0	
					Post-sampling PID screening (ppm):
					0.9

NOTES: _____

SOIL GAS PURGING / SAMPLING LOG

Project Name: LIVERMORE - 2048 FIRST
Project/Task Number: 2165.002.210
Date: 11/9/18
Sampler(s): EC
Sample ID / Time: SGQC-6-15/1516

PANGEA

Probe / Well ID: SGQC-6-15
Canister Serial #: 008113
Flow Controller #: 009285
Initial Vacuum: -30
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 SGQC-3-15) FOR 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 = 17min 21 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): 1430, 100" H_2O end time/pressure ("Hg): 1435, 100" H_2O

TIME	PURGE TIME (min./sec.)	~~Hg~~ / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1449	0	14.5	—	0	
1453	4	16.2	—	0	
1457	8	12.4	—	0	
1501	12	12.6	—	0	
1505	16	15.3	—	0	
1506	17m 21s	12.5	—	0	
START	SAMPLING				
1510	—	12.8	30		
1511	—	16.3	25	0	
1512	—	13.2	20	0	
1514	—	18.1	15	0	
1515	—	16.0	10	0	
1516	—	12.4	5	0	
					Post-sampling PID screening (ppm):
					4.2

NOTES: _____

SOIL GAS PURGING / SAMPLING LOG

Project Name: LIVERMORE - 2048 FIRST
Project/Task Number: 2165.002-210
Date: 11/9/18
Sampler(s): EL / EL
Sample ID / Time: SGQC-6-30 / 1558

Probe / Well ID: SGQC-6-30
Canister Serial #: 008094
Flow Controller #: 009259
Initial Vacuum: 29.5
Final Vacuum: 5

SPECIFICATIONS

Tubing Length: _____ inches (SEE SGQC-5-30 FOR CALCS)
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 = 18min 28 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): 1527 / 100" H_2O end time/pressure ("Hg): 1532 / 100" H_2O

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1540	0	12.8	–	20	
1544	4	16.2	–	45	
1547	7	19.3	–	50	STOP PURGE; LOW PERMEABILITY
START	SAMPLING				
1556	–	*	29	0	
1558	–	*	20	24	
1559	–	*	15	34	
1602	–	*	10	38	
1604	–	*	5		
					Post-sampling PID screening (ppm):
					0.5

NOTES: NO WATER IN PROBE TUBING

* Low permeability sampling – no shroud enclosure due to rapid connecting/disconnecting of canister

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore - 2048 First
Project/Task Number: 2165.002.210
Date: 11/9/18
Sampler(s): MB
Sample ID / Time: SGQC-7-5 / 1715

Probe / Well ID: SGQC-7-5
Canister Serial #: 008097
Flow Controller #: 008314
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 SGQC-3-5 for 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 = 16 min, 36 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): 1635/100 end time/pressure ("Hg): 1645/99

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1653	0	15.3	—	0	
1657	4	11.0	—	0	
1701	8	18.5	—	0	
1705	12	17.3	—	0	
1708	16:36	19.7	—	0	
1710	—	16.9	29	0	
1711	—	11.2	25	0	
1712	—	21.8	20	0	
1713	—	12.5	15	0	
1714	—	17.7	10	0	
1715	—	13.8	5	0	
					Post-sampling PID screening (ppm):
					0.1

NOTES: _____

SOIL GAS PURGING / SAMPLING LOG

Project Name: Livermore - 2048 First
Project/Task Number: 2165.002.210
Date: 11/9/18
Sampler(s): MB
Sample ID / Time: SGQC-7-15/1756

Probe / Well ID: SGQC-7-15
Canister Serial #: 008173
Flow Controller #: 009276
Initial Vacuum: 30
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 SGQC-3-15 for 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 = 17 min, 21 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): 1700/100 end time/pressure ("Hg): 1715/100

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1725	0	13.0	—	0	
1729	4	17.3	—	0	
1733	8	15.8	—	0	
1737	12	16.3	—	0	
1741	16	15.7	—	0	
1743	17:21	12.0	—	0	
1746	—	21.3	30	0	
1747	—	13.4	25	0	
1747	—	13.5	20	0	
1748	—	13.1	15	0	
1749	—	11.2	10	0	
1750	—	13.0	5	0	
					Post-sampling PID screening (ppm):
					0.4

NOTES: _____

Appendix E

Laboratory Analytical Reports

McCampbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 1807562

Report Created for: Pangea Environmental Svcs., Inc.

1710 Franklin Street, Ste. 200
Oakland, CA 94612

Project Contact: Morgan Gillies
Project P.O.:
Project: 2165.002; Livermore Downtown

Project Received: 07/12/2018

Analytical Report reviewed & approved for release on 07/19/2018 by:

Yen Cao

Project Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.

McCampbell Analytical, Inc.
"When Quality Counts"

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Glossary of Terms & Qualifier Definitions

Client: Pangea Environmental Svcs., Inc.
Project: 2165.002; Livermore Downtown
WorkOrder: 1807562

Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ERS	External reference sample. Second source calibration verification.
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1807562
Date Received:	7/12/18 14:40	**Extraction Method:**	SW5030B
Date Prepared:	7/17/18	**Analytical Method:**	SW8260B
Project:	2165.002; Livermore Downtown	**Unit:**	µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
MW-4	1807562-001A	Water	07/11/2018 17:30	GC10 07161830.D	161566

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	10	1	07/17/2018 03:01
tert-Amyl methyl ether (TAME)	ND	0.50	1	07/17/2018 03:01
Benzene	ND	0.50	1	07/17/2018 03:01
Bromobenzene	ND	0.50	1	07/17/2018 03:01
Bromochloromethane	ND	0.50	1	07/17/2018 03:01
Bromodichloromethane	**0.57**	0.50	1	07/17/2018 03:01
Bromoform	ND	0.50	1	07/17/2018 03:01
Bromomethane	ND	0.50	1	07/17/2018 03:01
2-Butanone (MEK)	ND	2.0	1	07/17/2018 03:01
t-Butyl alcohol (TBA)	ND	2.0	1	07/17/2018 03:01
n-Butyl benzene	ND	0.50	1	07/17/2018 03:01
sec-Butyl benzene	ND	0.50	1	07/17/2018 03:01
tert-Butyl benzene	ND	0.50	1	07/17/2018 03:01
Carbon Disulfide	ND	0.50	1	07/17/2018 03:01
Carbon Tetrachloride	ND	0.50	1	07/17/2018 03:01
Chlorobenzene	ND	0.50	1	07/17/2018 03:01
Chloroethane	ND	0.50	1	07/17/2018 03:01
Chloroform	**1.3**	0.50	1	07/17/2018 03:01
Chloromethane	ND	0.50	1	07/17/2018 03:01
2-Chlorotoluene	ND	0.50	1	07/17/2018 03:01
4-Chlorotoluene	ND	0.50	1	07/17/2018 03:01
Dibromochloromethane	ND	0.50	1	07/17/2018 03:01
1,2-Dibromo-3-chloropropane	ND	0.20	1	07/17/2018 03:01
1,2-Dibromoethane (EDB)	ND	0.50	1	07/17/2018 03:01
Dibromomethane	ND	0.50	1	07/17/2018 03:01
1,2-Dichlorobenzene	ND	0.50	1	07/17/2018 03:01
1,3-Dichlorobenzene	ND	0.50	1	07/17/2018 03:01
1,4-Dichlorobenzene	ND	0.50	1	07/17/2018 03:01
Dichlorodifluoromethane	ND	0.50	1	07/17/2018 03:01
1,1-Dichloroethane	ND	0.50	1	07/17/2018 03:01
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	07/17/2018 03:01
1,1-Dichloroethene	ND	0.50	1	07/17/2018 03:01
cis-1,2-Dichloroethene	ND	0.50	1	07/17/2018 03:01
trans-1,2-Dichloroethene	ND	0.50	1	07/17/2018 03:01
1,2-Dichloropropane	ND	0.50	1	07/17/2018 03:01
1,3-Dichloropropane	ND	0.50	1	07/17/2018 03:01
2,2-Dichloropropane	ND	0.50	1	07/17/2018 03:01

(Cont.)

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1807562
Date Received:	7/12/18 14:40	**Extraction Method:**	SW5030B
Date Prepared:	7/17/18	**Analytical Method:**	SW8260B
Project:	2165.002; Livermore Downtown	**Unit:**	µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
MW-4	1807562-001A	Water	07/11/2018 17:30	GC10 07161830.D	161566

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.50	1	07/17/2018 03:01
cis-1,3-Dichloropropene	ND	0.50	1	07/17/2018 03:01
trans-1,3-Dichloropropene	ND	0.50	1	07/17/2018 03:01
Diisopropyl ether (DIPE)	ND	0.50	1	07/17/2018 03:01
Ethylbenzene	ND	0.50	1	07/17/2018 03:01
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	07/17/2018 03:01
Freon 113	ND	0.50	1	07/17/2018 03:01
Hexachlorobutadiene	ND	0.50	1	07/17/2018 03:01
Hexachloroethane	ND	0.50	1	07/17/2018 03:01
2-Hexanone	ND	0.50	1	07/17/2018 03:01
Isopropylbenzene	ND	0.50	1	07/17/2018 03:01
4-Isopropyl toluene	ND	0.50	1	07/17/2018 03:01
Methyl-t-butyl ether (MTBE)	ND	0.50	1	07/17/2018 03:01
Methylene chloride	ND	0.50	1	07/17/2018 03:01
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	07/17/2018 03:01
Naphthalene	ND	0.50	1	07/17/2018 03:01
n-Propyl benzene	ND	0.50	1	07/17/2018 03:01
Styrene	ND	0.50	1	07/17/2018 03:01
1,1,1,2-Tetrachloroethane	ND	0.50	1	07/17/2018 03:01
1,1,2,2-Tetrachloroethane	ND	0.50	1	07/17/2018 03:01
Tetrachloroethene	**4.9**	0.50	1	07/17/2018 03:01
Toluene	ND	0.50	1	07/17/2018 03:01
1,2,3-Trichlorobenzene	ND	0.50	1	07/17/2018 03:01
1,2,4-Trichlorobenzene	ND	0.50	1	07/17/2018 03:01
1,1,1-Trichloroethane	ND	0.50	1	07/17/2018 03:01
1,1,2-Trichloroethane	ND	0.50	1	07/17/2018 03:01
Trichloroethene	ND	0.50	1	07/17/2018 03:01
Trichlorofluoromethane	ND	0.50	1	07/17/2018 03:01
1,2,3-Trichloropropane	ND	0.50	1	07/17/2018 03:01
1,2,4-Trimethylbenzene	ND	0.50	1	07/17/2018 03:01
1,3,5-Trimethylbenzene	ND	0.50	1	07/17/2018 03:01
Vinyl Chloride	ND	0.50	1	07/17/2018 03:01
Xylenes, Total	ND	0.50	1	07/17/2018 03:01

(Cont.)

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1807562
Date Received:	7/12/18 14:40	**Extraction Method:**	SW5030B
Date Prepared:	7/17/18	**Analytical Method:**	SW8260B
Project:	2165.002; Livermore Downtown	**Unit:**	µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
MW-4	**1807562-001A**	**Water**	**07/11/2018 17:30**	**GC10 07161830.D**	**161566**

Analytes	Result	RL	DF	Date Analyzed
Surrogates	**REC (%)**	**Limits**		
Dibromofluoromethane	104	78-134		07/17/2018 03:01
Toluene-d8	115	82-120		07/17/2018 03:01
4-BFB	92	69-131		07/17/2018 03:01

Analyst(s): TK

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1807562
Date Prepared:	7/16/18	**BatchID:**	161566
Date Analyzed:	7/16/18	**Extraction Method:**	SW5030B
Instrument:	GC10	**Analytical Method:**	SW8260B
Matrix:	Water	**Unit:**	µg/L
Project:	2165.002; Livermore Downtown	**Sample ID:**	MB/LCS/LCSD-161566

QC Summary Report for SW8260B

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
Acetone	ND	10	-	-	-
tert-Amyl methyl ether (TAME)	ND	0.50	-	-	-
Benzene	ND	0.50	-	-	-
Bromobenzene	ND	0.50	-	-	-
Bromochloromethane	ND	0.50	-	-	-
Bromodichloromethane	ND	0.50	-	-	-
Bromoform	ND	0.50	-	-	-
Bromomethane	ND	0.50	-	-	-
2-Butanone (MEK)	ND	2.0	-	-	-
t-Butyl alcohol (TBA)	ND	2.0	-	-	-
n-Butyl benzene	ND	0.50	-	-	-
sec-Butyl benzene	ND	0.50	-	-	-
tert-Butyl benzene	ND	0.50	-	-	-
Carbon Disulfide	ND	0.50	-	-	-
Carbon Tetrachloride	ND	0.50	-	-	-
Chlorobenzene	ND	0.50	-	-	-
Chloroethane	ND	0.50	-	-	-
Chloroform	ND	0.50	-	-	-
Chloromethane	ND	0.50	-	-	-
2-Chlorotoluene	ND	0.50	-	-	-
4-Chlorotoluene	ND	0.50	-	-	-
Dibromochloromethane	ND	0.50	-	-	-
1,2-Dibromo-3-chloropropane	ND	0.20	-	-	-
1,2-Dibromoethane (EDB)	ND	0.50	-	-	-
Dibromomethane	ND	0.50	-	-	-
1,2-Dichlorobenzene	ND	0.50	-	-	-
1,3-Dichlorobenzene	ND	0.50	-	-	-
1,4-Dichlorobenzene	ND	0.50	-	-	-
Dichlorodifluoromethane	ND	0.50	-	-	-
1,1-Dichloroethane	ND	0.50	-	-	-
1,2-Dichloroethane (1,2-DCA)	ND	0.50	-	-	-
1,1-Dichloroethene	ND	0.50	-	-	-
cis-1,2-Dichloroethene	ND	0.50	-	-	-
trans-1,2-Dichloroethene	ND	0.50	-	-	-
1,2-Dichloropropane	ND	0.50	-	-	-
1,3-Dichloropropane	ND	0.50	-	-	-
2,2-Dichloropropane	ND	0.50	-	-	-
1,1-Dichloropropene	ND	0.50	-	-	-

(Cont.)

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1807562
Date Prepared:	7/16/18	**BatchID:**	161566
Date Analyzed:	7/16/18	**Extraction Method:**	SW5030B
Instrument:	GC10	**Analytical Method:**	SW8260B
Matrix:	Water	**Unit:**	µg/L
Project:	2165.002; Livermore Downtown	**Sample ID:**	MB/LCS/LCSD-161566

QC Summary Report for SW8260B

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
cis-1,3-Dichloropropene	ND	0.50	-	-	-
trans-1,3-Dichloropropene	ND	0.50	-	-	-
Diisopropyl ether (DIPE)	ND	0.50	-	-	-
Ethylbenzene	ND	0.50	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	0.50	-	-	-
Freon 113	ND	0.50	-	-	-
Hexachlorobutadiene	ND	0.50	-	-	-
Hexachloroethane	ND	0.50	-	-	-
2-Hexanone	ND	0.50	-	-	-
Isopropylbenzene	ND	0.50	-	-	-
4-Isopropyl toluene	ND	0.50	-	-	-
Methyl-t-butyl ether (MTBE)	ND	0.50	-	-	-
Methylene chloride	ND	0.50	-	-	-
4-Methyl-2-pentanone (MIBK)	ND	0.50	-	-	-
Naphthalene	ND	0.50	-	-	-
n-Propyl benzene	ND	0.50	-	-	-
Styrene	ND	0.50	-	-	-
1,1,1,2-Tetrachloroethane	ND	0.50	-	-	-
1,1,2,2-Tetrachloroethane	ND	0.50	-	-	-
Tetrachloroethene	ND	0.50	-	-	-
Toluene	ND	0.50	-	-	-
1,2,3-Trichlorobenzene	ND	0.50	-	-	-
1,2,4-Trichlorobenzene	ND	0.50	-	-	-
1,1,1-Trichloroethane	ND	0.50	-	-	-
1,1,2-Trichloroethane	ND	0.50	-	-	-
Trichloroethene	ND	0.50	-	-	-
Trichlorofluoromethane	ND	0.50	-	-	-
1,2,3-Trichloropropane	ND	0.50	-	-	-
1,2,4-Trimethylbenzene	ND	0.50	-	-	-
1,3,5-Trimethylbenzene	ND	0.50	-	-	-
Vinyl Chloride	ND	0.50	-	-	-
Xylenes, Total	ND	0.50	-	-	-
Surrogate Recovery					
Dibromofluoromethane	24.4		25	97	91-133
Toluene-d8	28.9		25	116	87-127
4-BFB	2.16		2.5	86	66-140

(Cont.)

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http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1807562
Date Prepared:	7/16/18	**BatchID:**	161566
Date Analyzed:	7/16/18	**Extraction Method:**	SW5030B
Instrument:	GC10	**Analytical Method:**	SW8260B
Matrix:	Water	**Unit:**	µg/L
Project:	2165.002; Livermore Downtown	**Sample ID:**	MB/LCS/LCSD-161566

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Acetone	142	151	200	71	75	47-122	6.29	20
tert-Amyl methyl ether (TAME)	8.20	8.64	10	82	86	62-121	5.12	20
Benzene	9.45	9.93	10	95	99	74-121	4.94	20
Bromobenzene	9.27	9.68	10	93	97	63-127	4.36	20
Bromochloromethane	9.29	9.77	10	93	98	70-126	5.05	20
Bromodichloromethane	8.61	9.04	10	86	90	66-127	4.88	20
Bromoform	8.22	8.78	10	82	88	60-119	6.66	20
Bromomethane	11.5	11.9	10	115	119	32-155	3.31	20
2-Butanone (MEK)	27.9	29.8	40	70	74	51-117	6.40	20
t-Butyl alcohol (TBA)	25.4	28.8	40	64	72	41-122	12.5	20
n-Butyl benzene	10.4	11.2	10	104	112	73-137	7.53	20
sec-Butyl benzene	10.2	10.6	10	102	106	71-137	4.38	20
tert-Butyl benzene	8.06	9.15	10	81	92	61-136	12.7	20
Carbon Disulfide	9.08	9.58	10	91	96	61-139	5.34	20
Carbon Tetrachloride	9.45	9.99	10	94	100	69-137	5.60	20
Chlorobenzene	9.64	10.0	10	96	100	71-122	3.69	20
Chloroethane	10.3	10.5	10	103	105	54-132	2.23	20
Chloroform	9.45	9.86	10	94	99	73-122	4.28	20
Chloromethane	10.0	10.3	10	100	103	48-136	2.48	20
2-Chlorotoluene	10.1	10.4	10	101	105	65-134	3.04	20
4-Chlorotoluene	9.51	9.72	10	95	97	65-130	2.26	20
Dibromochloromethane	8.14	8.72	10	81	87	65-121	6.83	20
1,2-Dibromo-3-chloropropane	2.02	2.42	4	50	60	41-132	17.9	20
1,2-Dibromoethane (EDB)	7.90	8.38	10	79	84	67-125	5.92	20
Dibromomethane	8.34	8.75	10	83	87	68-121	4.78	20
1,2-Dichlorobenzene	9.62	10.0	10	96	101	69-128	4.45	20
1,3-Dichlorobenzene	10.5	11.0	10	105	110	71-131	5.23	20
1,4-Dichlorobenzene	9.72	10.1	10	97	101	70-128	4.05	20
Dichlorodifluoromethane	11.2	11.5	10	112	115	21-158	2.84	20
1,1-Dichloroethane	9.65	10.1	10	97	101	73-123	4.61	20
1,2-Dichloroethane (1,2-DCA)	8.98	9.43	10	90	94	61-127	4.86	20
1,1-Dichloroethene	9.24	9.83	10	92	98	68-130	6.19	20
cis-1,2-Dichloroethene	9.38	9.88	10	94	99	72-123	5.16	20
trans-1,2-Dichloroethene	9.74	10.3	10	97	103	64-138	5.13	20
1,2-Dichloropropane	9.15	9.54	10	92	95	71-121	4.18	20
1,3-Dichloropropane	8.15	8.62	10	81	86	69-120	5.57	20
2,2-Dichloropropane	9.49	9.92	10	95	99	64-142	4.45	20
1,1-Dichloropropene	9.15	9.63	10	91	96	70-130	5.12	20

(Cont.)

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http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1807562
Date Prepared:	7/16/18	**BatchID:**	161566
Date Analyzed:	7/16/18	**Extraction Method:**	SW5030B
Instrument:	GC10	**Analytical Method:**	SW8260B
Matrix:	Water	**Unit:**	µg/L
Project:	2165.002; Livermore Downtown	**Sample ID:**	MB/LCS/LCSD-161566

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
cis-1,3-Dichloropropene	8.58	9.03	10	86	90	58-136	5.13	20
trans-1,3-Dichloropropene	8.54	9.16	10	85	92	66-119	7.01	20
Diisopropyl ether (DIPE)	9.21	9.57	10	92	96	66-123	3.83	20
Ethylbenzene	9.99	10.2	10	100	102	71-125	1.97	20
Ethyl tert-butyl ether (ETBE)	9.00	9.44	10	90	94	67-122	4.76	20
Freon 113	9.22	9.75	10	92	97	68-132	5.58	20
Hexachlorobutadiene	8.83	10.1	10	88	101	56-155	13.1	20
Hexachloroethane	9.01	9.65	10	90	96	61-129	6.88	20
2-Hexanone	5.82	6.28	10	58	63	51-115	7.57	20
Isopropylbenzene	10.4	10.3	10	104	103	66-134	0.945	20
4-Isopropyl toluene	10.2	10.8	10	102	108	70-136	5.36	20
Methyl-t-butyl ether (MTBE)	8.40	8.85	10	84	88	64-118	5.22	20
Methylene chloride	8.13	8.75	10	81	87	62-121	7.31	20
4-Methyl-2-pentanone (MIBK)	6.14	6.58	10	61	66	51-115	6.95	20
Naphthalene	6.77	7.80	10	68	78	55-137	14.2	20
n-Propyl benzene	10.0	10.5	10	100	105	63-140	4.50	20
Styrene	9.66	9.39	10	97	94	62-133	2.80	20
1,1,1,2-Tetrachloroethane	9.16	9.62	10	92	96	69-128	4.90	20
1,1,2,2-Tetrachloroethane	6.76	7.54	10	68	75	60-118	10.9	20
Tetrachloroethene	9.32	10.1	10	93	101	63-136	7.70	20
Toluene	8.85	9.30	10	89	93	67-124	4.99	20
1,2,3-Trichlorobenzene	7.35	8.37	10	73	84	57-145	13.0	20
1,2,4-Trichlorobenzene	8.08	9.40	10	81	94	60-144	15.1	20
1,1,1-Trichloroethane	9.28	9.78	10	93	98	70-133	5.22	20
1,1,2-Trichloroethane	7.85	8.43	10	78	84	65-125	7.14	20
Trichloroethene	9.28	9.78	10	93	98	67-133	5.21	20
Trichlorofluoromethane	9.30	9.80	10	93	98	59-145	5.28	20
1,2,3-Trichloropropane	7.25	8.15	10	73	81	65-115	11.6	20
1,2,4-Trimethylbenzene	10.1	10.6	10	101	106	67-136	5.00	20
1,3,5-Trimethylbenzene	10.0	10.5	10	100	105	68-135	5.10	20
Vinyl Chloride	10.5	11.2	10	105	112	53-146	6.89	20
Xylenes, Total	30.3	29.4	30	101	98	68-128	2.96	20
Surrogate Recovery								
Dibromofluoromethane	25.5	25.4	25	102	101	91-133	0.467	20
Toluene-d8	28.8	29.3	25	115	117	87-127	1.76	20
4-BFB	2.49	2.45	2.5	100	98	66-140	1.94	20

McCampbell Analytical, Inc.
1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 1807562 **ClientCode: PEO**

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ EQuIS ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag
☐ Detection Summary ☐ Dry-Weight

Report to:
Morgan Gillies
Pangea Environmental Svcs., Inc.
1710 Franklin Street, Ste. 200
Oakland, CA 94612
(510) 836-3700 FAX: (510) 836-3709

Email: mgillies@pangeaenv.com
cc/3rd Party:
PO:
Project: 2165.002; Livermore Downtown

Bill to:
Bob Clark-Riddell
Pangea Environmental Svcs., Inc.
1710 Franklin Street, Ste. 200
Oakland, CA 94612

Requested TAT: 5 days;

Date Received: **07/12/2018**
Date Logged: **07/12/2018**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
1807562-001	MW-4	Water	7/11/2018 17:30	☐	A											

Test Legend:

1	8260B_W	2		3		4	
5		6		7		8	
9		10		11		12	

Prepared by: Lilly Ortiz

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

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WORK ORDER SUMMARY

Client Name: PANGEA ENVIRONMENTAL SVCS., INC. **Project:** 2165.002; Livermore Downtown **Work Order:** 1807562
Client Contact: Morgan Gillies **QC Level:** LEVEL 2
Contact's Email: mgillies@pangeaenv.com **Comments:** **Date Logged:** 7/12/2018

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ Fax ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1807562-001A	MW-4	Water	SW8260B (VOCs)	4	VOA w/ HCl	☐	7/11/2018 17:30	5 days	Trace	☐	
1807562-002A	MW-4-75	Soil		1	Acetate Liner	☐	7/11/2018 12:00			☑	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

1075102

McCAMPBELL ANALYTICAL, INC.

1534 Willow Pass Road
Pittsburg, CA 94565
Website: www.mccampbell.com Email: main@mccampbell.com
Telephone: (925) 252-9262 Fax: (925) 252-9269

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ 5 DAY

EDF Required? Coelt (Normal) No Write On (DW) No

Report To: Morgan Gillies Bill To: Pangea

Company: Pangea Environmental Services, Inc.

1710 Franklin Street, Suite 200, Oakland, CA 94612

E-Mail: mgillies@pangeaenv.com

Tele: (510) 836-3700 Fax: (510) 836-3709

Project #: 2165.002 Project Name: Livermore Downtown

Project Location: 20 S Livermore Ave, Livermore

Sampler Signature: MB

SAMPLE ID	LOCATION (Field Point Name)	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED ICE	METHOD PRESERVED HCL	METHOD PRESERVED HNO_3	METHOD PRESERVED Other
(+) MW-4	MW-4	7/11	1730	4	V	X					X	X		
MW-4-75	MW-4	7/11	1200	1	A		X				X			

Analysis Request

VOCs by EPA Method 8260	TPH as Diesel (8015) w/ Silica Gel Cleanup	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010 / 8021	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8081	EPA 608 / 8082 PCB's ONLY	EPA 8140 / 8141	EPA 8150 / 8151	EPA 524.2 / 624 / 8260	EPA 525 / 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals (6010 / 6020)	LUFT 5 Metals (6010 / 6020)	Lead (200.8 / 200.9 / 6010)
X															

Other

Comments: Filter Samples for Metals analysis: Yes / No

HOLD

Relinquished By:	Date:	Time:	Received By:
MB	7/12/18	1150	LAP 7.12.18 1150
LAP	7.12.18	1440	Lilly Ortiz 7/12/18 1440

ICE/t° 2.3°C

GOOD CONDITION_____

HEAD SPACE ABSENT_____

DECHLORINATED IN LAB_____

APPROPRIATE CONTAINERS_____

PRESERVED IN LAB_____

COMMENTS:

VOAS O&G METALS OTHER

PRESERVATION_____ pH<2_____

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Sample Receipt Checklist

Client Name:	**Pangea Environmental Svcs., Inc.**	Date and Time Received:	**7/12/2018 14:40**
Project:	**2165.002; Livermore Downtown**	Date Logged:	**7/12/2018**
		Received by:	Lilly Ortiz
WorkOrder №:	**1807562** Matrix: Soil/Water	Logged by:	Lilly Ortiz
Carrier:	Lorenzo Perez (MAI Courier)		

Chain of Custody (COC) Information

Chain of custody present?	Yes	☑	No	☐	
Chain of custody signed when relinquished and received?	Yes	☑	No	☐	
Chain of custody agrees with sample labels?	Yes	☑	No	☐	
Sample IDs noted by Client on COC?	Yes	☑	No	☐	
Date and Time of collection noted by Client on COC?	Yes	☑	No	☐	
Sampler's name noted on COC?	Yes	☑	No	☐	
COC agrees with Quote?	Yes	☐	No	☐	NA ☑

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes	☐	No	☐	NA ☑
Shipping container/cooler in good condition?	Yes	☑	No	☐	
Samples in proper containers/bottles?	Yes	☑	No	☐	
Sample containers intact?	Yes	☑	No	☐	
Sufficient sample volume for indicated test?	Yes	☑	No	☐	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes	☑	No	☐	NA ☐
Samples Received on Ice?	Yes	☑	No	☐	
(Ice Type: WET ICE)					
Sample/Temp Blank temperature	Temp: 2.3°C				NA ☐
Water - VOA vials have zero headspace / no bubbles?	Yes	☑	No	☐	NA ☐
Sample labels checked for correct preservation?	Yes	☑	No	☐	
pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)?	Yes	☐	No	☐	NA ☑
UCMR Samples:					
pH tested and acceptable upon receipt (200.8: ≤2; 525.3: ≤4; 530: ≤7; 541: <3; 544: <6.5 & 7.5)?	Yes	☐	No	☐	NA ☑
Free Chlorine tested and acceptable upon receipt (<0.1mg/L)?	Yes	☐	No	☐	NA ☑

Comments:



ENTHALPY

ANALYTICAL

Enthalpy Analytical

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 304956
ANALYTICAL REPORT

Pangea Environmental	Project : STANDARD
1710 Franklin Street	Location : Livermore CORE
Oakland, CA 94612	Level : II

Sample ID	Lab ID
HP-1-MF	304956-001

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 which applies to this PDF file as well as any associated electronic data deliverable files. The results contained in this report meet all requirements of NELAP and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 11/13/2018

Patrick McCarthy
Project Manager
patrick.mccarthy@enthalpy.com
(510) 204-2236 ext 13115

CA ELAP# 2896, NELAP# 4044-001

ENTHALPY ANALYTICAL

CASE NARRATIVE

Laboratory number:	**304956**
Client:	**Pangea Environmental**
Location:	**Livermore CORE**
Request Date:	**11/12/18**
Samples Received:	**11/12/18**

This data package contains sample and QC results for one water sample, requested for the above referenced project on 11/12/18. The sample was received cold and intact.

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

CHAIN OF CUSTODY

ENTHALPY ANALYTICAL
Formerly Curtis & Tompkins Labs
2323 Fifth Street
Berkeley, CA 94710
Phone (510) 486-0900
Fax (510) 486-0532

Chain of Custody # _____

C&T LOGIN # 304956

Project No: 2165.002.215
Project Name: Livermore CORE
Project P. O. No:
EDD Format: Report Level ☒ II ☐ III ☐ IV
Turnaround Time: ☒ RUSH ☐ Standard

Sampler: E. Lervaag
Report To: morgan Gillies
Company: Pangea Env. Svs.
Telephone: 510-836-3700
Email: mgillies@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	VOC by 8260
	HP-1-MF	11.12.18	1335	X				3	X					X

Notes:
Geotracker EDF req.

SAMPLE RECEIPT
☐ Intact
☒ Cold
☐ On Ice
☐ Ambient

RELINQUISHED BY:
E. Lervaag DATE: 11.12.18 TIME: 1500
Matt Bogue DATE: 11/12/18 TIME: 1655
DATE: TIME:

RECEIVED BY:
Matt Bogue DATE: 11/12/18 TIME: 1500
Trey Bass DATE: 11/12/18 TIME: 1655
DATE: TIME:

SAMPLE RECEIPT CHECKLIST

Section 1: Login # 304956 Client: Pangea Environmental

Date Received: 11/12/18 Project: _____

ENTHALPY ANALYTICAL

Section 2: Samples received in a cooler? ☐ Yes, how many? _____ ☒ No (skip Section 3 below)

If no cooler Sample Temp (°C): 7.4 using IR Gun # ☐ A, or ☒ B

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

If in cooler: Date Opened 11/12/18 By (print) D.O (sign) _____

Shipping info (if applicable) _____

Are custody seals present? ☒ No, or ☐ Yes. If yes, where? ☐ on cooler, ☐ on samples, ☐ on package

☐ Date: _____ How many _____ ☐ Signature, ☐ Initials, ☐ None

Were custody seals intact upon arrival? ☐ Yes ☐ No ☒ N/A

Section 3: ***Important*: Notify PM if temperature exceeds 6°C or arrive frozen.**

Packing in cooler: (if other, describe) _____

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

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

Type of ice used: ☒ Wet, ☐ Blue/Gel, ☐ None Temperature blank(s) included? ☐ Yes, ☐ No

Temperature measured using ☐ Thermometer ID: _____, or IR Gun # ☐ A ☐ B

Cooler Temp (°C): #1: _____, #2: _____, #3: _____, #4: _____, #5: _____, #6: _____, #7: _____

Section 4:	YES	NO	N/A
Were custody papers dry, filled out properly, and the project identifiable	X		
Were Method 5035 sampling containers present?		X	
If YES, what time were they transferred to freezer?			
Did all bottles arrive unbroken/unopened?	X		
Are there any missing / extra samples?		X	
Are samples in the appropriate containers for indicated tests?	X		
Are sample labels present, in good condition and complete?	X		
Does the container count match the COC?	X		
Do the sample labels agree with custody papers?	X		
Was sufficient amount of sample sent for tests requested?	X		
Did you change the hold time in LIMS for unpreserved VOAs?			X
Did you change the hold time in LIMS for preserved terracores?			X
Are bubbles > 6mm absent in VOA samples?	X		
Was the client contacted concerning this sample delivery?		X	
If YES, who was called? By Date:			

Section 5:	YES	NO	N/A
Are the samples appropriately preserved? (If N/A, skip the rest of section 5)			X
Did you check preservatives for all bottles for each sample?			
Did you document your preservative check?			

pH strip lot# _____, pH strip lot# _____, pH strip lot# _____

Preservative added:

☐ H2SO4 lot# _____ added to samples _____ on/at _____

☐ HCL lot# _____ added to samples _____ on/at _____

☐ HNO3 lot# _____ added to samples _____ on/at _____

☐ NaOH lot# _____ added to samples _____ on/at _____

Section 6:

Explanations/Comments: _____

Date Logged in 11/12/18 **By (print)** DO **(sign)** _____

Date Labeled 11/12/18 **By (print)** DO **(sign)** _____

ENTHALPY ANALYTICAL

Detections Summary for 304956

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

Client : Pangea Environmental
Project : STANDARD
Location : Livermore CORE

Client Sample ID : HP-1-MF Laboratory Sample ID : 304956-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Chloroform	0.6		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
Toluene	5.1		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
Tetrachloroethene	16		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B

ENTHALPY ANALYTICAL

Purgeable Organics by GC/MS

Lab #:	304956	Location:	Livermore CORE
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Field ID:	HP-1-MF	Batch#:	265380
Lab ID:	304956-001	Sampled:	11/12/18
Matrix:	Water	Received:	11/12/18
Units:	ug/L	Analyzed:	11/13/18
Diln Fac:	1.000		

Analyte	Result	RL
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	0.6	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	5.1	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	16	0.5

ND= Not Detected
RL= Reporting Limit

ENTHALPY ANALYTICAL

Purgeable Organics by GC/MS

Lab #:	304956	Location:	Livermore CORE
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Field ID:	HP-1-MF	Batch#:	265380
Lab ID:	304956-001	Sampled:	11/12/18
Matrix:	Water	Received:	11/12/18
Units:	ug/L	Analyzed:	11/13/18
Diln Fac:	1.000		

Analyte	Result	RL
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
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	94	80-120
1,2-Dichloroethane-d4	102	80-135
Toluene-d8	97	80-120
Bromofluorobenzene	96	80-120

ND= Not Detected
RL= Reporting Limit

ENTHALPY ANALYTICAL

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	304956	Location:	Livermore CORE
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	265380
Units:	ug/L	Analyzed:	11/12/18
Diln Fac:	1.000		

Type: BS Lab ID: QC955215

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	15.00	14.92	99	70-132
Benzene	15.00	14.33	96	77-124
Trichloroethene	15.00	13.46	90	75-121
Toluene	15.00	14.27	95	78-121
Chlorobenzene	15.00	14.67	98	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	87	80-120
1,2-Dichloroethane-d4	98	80-135
Toluene-d8	97	80-120
Bromofluorobenzene	96	80-120

Type: BSD Lab ID: QC955216

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	15.00	14.65	98	70-132	2	22
Benzene	15.00	14.06	94	77-124	2	20
Trichloroethene	15.00	13.29	89	75-121	1	20
Toluene	15.00	14.03	94	78-121	2	20
Chlorobenzene	15.00	14.60	97	80-120	1	20

Surrogate	%REC	Limits
Dibromofluoromethane	87	80-120
1,2-Dichloroethane-d4	98	80-135
Toluene-d8	97	80-120
Bromofluorobenzene	94	80-120

RPD= Relative Percent Difference

ENTHALPY ANALYTICAL

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	304956	Location:	Livermore CORE
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC955217	Batch#:	265380
Matrix:	Water	Analyzed:	11/12/18
Units:	ug/L		

Analyte	Result	RL
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

ND= Not Detected
RL= Reporting Limit

ENTHALPY ANALYTICAL

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	304956	Location:	Livermore CORE
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC955217	Batch#:	265380
Matrix:	Water	Analyzed:	11/12/18
Units:	ug/L		

Analyte	Result	RL
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
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	98	80-135
Toluene-d8	97	80-120
Bromofluorobenzene	96	80-120

ND= Not Detected
RL= Reporting Limit

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Analytical Report

WorkOrder: 1811509

Report Created for: Pangea Environmental Svcs., Inc.

1710 Franklin Street, Ste. 200
Oakland, CA 94612

Project Contact: Morgan Gillies
Project P.O.:
Project: 2165.002.215; Livermore Core

Project Received: 11/13/2018

Analytical Report reviewed & approved for release on 11/14/2018 by:

Yen Cao

Project Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.

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Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
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Glossary of Terms & Qualifier Definitions

Client: Pangea Environmental Svcs., Inc.
Project: 2165.002.215; Livermore Core
WorkOrder: 1811509

Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ERS	External reference sample. Second source calibration verification.
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1811509
Date Received:	11/13/18 15:00	**Extraction Method:**	SW5030B
Date Prepared:	11/14/18	**Analytical Method:**	SW8260B
Project:	2165.002.215; Livermore Core	**Unit:**	µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
HP-2-MF	**1811509-001A**	**Water**	**11/13/2018 13:30**	**GC16 11131829.D**	**168397**

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	10	1	11/14/2018 02:28
tert-Amyl methyl ether (TAME)	ND	0.50	1	11/14/2018 02:28
Benzene	ND	0.50	1	11/14/2018 02:28
Bromobenzene	ND	0.50	1	11/14/2018 02:28
Bromochloromethane	ND	0.50	1	11/14/2018 02:28
Bromodichloromethane	ND	0.50	1	11/14/2018 02:28
Bromoform	ND	0.50	1	11/14/2018 02:28
Bromomethane	ND	0.50	1	11/14/2018 02:28
2-Butanone (MEK)	ND	2.0	1	11/14/2018 02:28
t-Butyl alcohol (TBA)	ND	2.0	1	11/14/2018 02:28
n-Butyl benzene	ND	0.50	1	11/14/2018 02:28
sec-Butyl benzene	ND	0.50	1	11/14/2018 02:28
tert-Butyl benzene	ND	0.50	1	11/14/2018 02:28
Carbon Disulfide	ND	0.50	1	11/14/2018 02:28
Carbon Tetrachloride	ND	0.50	1	11/14/2018 02:28
Chlorobenzene	ND	0.50	1	11/14/2018 02:28
Chloroethane	ND	0.50	1	11/14/2018 02:28
Chloroform	**0.77**	0.50	1	11/14/2018 02:28
Chloromethane	ND	0.50	1	11/14/2018 02:28
2-Chlorotoluene	ND	0.50	1	11/14/2018 02:28
4-Chlorotoluene	ND	0.50	1	11/14/2018 02:28
Dibromochloromethane	ND	0.50	1	11/14/2018 02:28
1,2-Dibromo-3-chloropropane	ND	0.20	1	11/14/2018 02:28
1,2-Dibromoethane (EDB)	ND	0.50	1	11/14/2018 02:28
Dibromomethane	ND	0.50	1	11/14/2018 02:28
1,2-Dichlorobenzene	ND	0.50	1	11/14/2018 02:28
1,3-Dichlorobenzene	ND	0.50	1	11/14/2018 02:28
1,4-Dichlorobenzene	ND	0.50	1	11/14/2018 02:28
Dichlorodifluoromethane	ND	0.50	1	11/14/2018 02:28
1,1-Dichloroethane	ND	0.50	1	11/14/2018 02:28
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	11/14/2018 02:28
1,1-Dichloroethene	ND	0.50	1	11/14/2018 02:28
cis-1,2-Dichloroethene	ND	0.50	1	11/14/2018 02:28
trans-1,2-Dichloroethene	ND	0.50	1	11/14/2018 02:28
1,2-Dichloropropane	ND	0.50	1	11/14/2018 02:28
1,3-Dichloropropane	ND	0.50	1	11/14/2018 02:28
2,2-Dichloropropane	ND	0.50	1	11/14/2018 02:28

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1811509
Date Received:	11/13/18 15:00	**Extraction Method:**	SW5030B
Date Prepared:	11/14/18	**Analytical Method:**	SW8260B
Project:	2165.002.215; Livermore Core	**Unit:**	µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
HP-2-MF	1811509-001A	Water	11/13/2018 13:30	GC16 11131829.D	168397

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.50	1	11/14/2018 02:28
cis-1,3-Dichloropropene	ND	0.50	1	11/14/2018 02:28
trans-1,3-Dichloropropene	ND	0.50	1	11/14/2018 02:28
Diisopropyl ether (DIPE)	ND	0.50	1	11/14/2018 02:28
Ethylbenzene	ND	0.50	1	11/14/2018 02:28
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	11/14/2018 02:28
Freon 113	ND	0.50	1	11/14/2018 02:28
Hexachlorobutadiene	ND	0.50	1	11/14/2018 02:28
Hexachloroethane	ND	0.50	1	11/14/2018 02:28
2-Hexanone	ND	0.50	1	11/14/2018 02:28
Isopropylbenzene	ND	0.50	1	11/14/2018 02:28
4-Isopropyl toluene	ND	0.50	1	11/14/2018 02:28
Methyl-t-butyl ether (MTBE)	ND	0.50	1	11/14/2018 02:28
Methylene chloride	ND	2.0	1	11/14/2018 02:28
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	11/14/2018 02:28
Naphthalene	ND	0.50	1	11/14/2018 02:28
n-Propyl benzene	ND	0.50	1	11/14/2018 02:28
Styrene	ND	0.50	1	11/14/2018 02:28
1,1,1,2-Tetrachloroethane	ND	0.50	1	11/14/2018 02:28
1,1,2,2-Tetrachloroethane	ND	0.50	1	11/14/2018 02:28
Tetrachloroethene	**4.6**	0.50	1	11/14/2018 02:28
Toluene	**0.85**	0.50	1	11/14/2018 02:28
1,2,3-Trichlorobenzene	ND	0.50	1	11/14/2018 02:28
1,2,4-Trichlorobenzene	ND	0.50	1	11/14/2018 02:28
1,1,1-Trichloroethane	ND	0.50	1	11/14/2018 02:28
1,1,2-Trichloroethane	ND	0.50	1	11/14/2018 02:28
Trichloroethene	ND	0.50	1	11/14/2018 02:28
Trichlorofluoromethane	ND	0.50	1	11/14/2018 02:28
1,2,3-Trichloropropane	ND	0.50	1	11/14/2018 02:28
1,2,4-Trimethylbenzene	ND	0.50	1	11/14/2018 02:28
1,3,5-Trimethylbenzene	ND	0.50	1	11/14/2018 02:28
Vinyl Chloride	ND	0.50	1	11/14/2018 02:28
m,p-Xylene	ND	0.50	1	11/14/2018 02:28
o-Xylene	ND	0.50	1	11/14/2018 02:28
Xylenes, Total	ND	0.50	1	11/14/2018 02:28

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1811509
Date Received:	11/13/18 15:00	**Extraction Method:**	SW5030B
Date Prepared:	11/14/18	**Analytical Method:**	SW8260B
Project:	2165.002.215; Livermore Core	**Unit:**	µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
HP-2-MF	**1811509-001A**	**Water**	**11/13/2018 13:30**	**GC16 11131829.D**	**168397**

Analytes	Result	RL	DF	Date Analyzed
Surrogates	**REC (%)**	**Limits**		
Dibromofluoromethane	92	81-144		11/14/2018 02:28
Toluene-d8	90	85-135		11/14/2018 02:28
4-BFB	75	63-145		11/14/2018 02:28

Analyst(s): AK

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1811509
Date Received:	11/13/18 15:00	**Extraction Method:**	SW5030B
Date Prepared:	11/14/18	**Analytical Method:**	SW8260B
Project:	2165.002.215; Livermore Core	**Unit:**	µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
HP-3-MF	**1811509-002A**	**Water**	**11/13/2018 13:50**	**GC16 11131830.D**	**168397**

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	10	1	11/14/2018 03:08
tert-Amyl methyl ether (TAME)	ND	0.50	1	11/14/2018 03:08
Benzene	ND	0.50	1	11/14/2018 03:08
Bromobenzene	ND	0.50	1	11/14/2018 03:08
Bromochloromethane	ND	0.50	1	11/14/2018 03:08
Bromodichloromethane	ND	0.50	1	11/14/2018 03:08
Bromoform	ND	0.50	1	11/14/2018 03:08
Bromomethane	ND	0.50	1	11/14/2018 03:08
2-Butanone (MEK)	ND	2.0	1	11/14/2018 03:08
t-Butyl alcohol (TBA)	ND	2.0	1	11/14/2018 03:08
n-Butyl benzene	ND	0.50	1	11/14/2018 03:08
sec-Butyl benzene	ND	0.50	1	11/14/2018 03:08
tert-Butyl benzene	ND	0.50	1	11/14/2018 03:08
Carbon Disulfide	ND	0.50	1	11/14/2018 03:08
Carbon Tetrachloride	ND	0.50	1	11/14/2018 03:08
Chlorobenzene	ND	0.50	1	11/14/2018 03:08
Chloroethane	ND	0.50	1	11/14/2018 03:08
Chloroform	**0.72**	0.50	1	11/14/2018 03:08
Chloromethane	ND	0.50	1	11/14/2018 03:08
2-Chlorotoluene	ND	0.50	1	11/14/2018 03:08
4-Chlorotoluene	ND	0.50	1	11/14/2018 03:08
Dibromochloromethane	ND	0.50	1	11/14/2018 03:08
1,2-Dibromo-3-chloropropane	ND	0.20	1	11/14/2018 03:08
1,2-Dibromoethane (EDB)	ND	0.50	1	11/14/2018 03:08
Dibromomethane	ND	0.50	1	11/14/2018 03:08
1,2-Dichlorobenzene	ND	0.50	1	11/14/2018 03:08
1,3-Dichlorobenzene	ND	0.50	1	11/14/2018 03:08
1,4-Dichlorobenzene	ND	0.50	1	11/14/2018 03:08
Dichlorodifluoromethane	ND	0.50	1	11/14/2018 03:08
1,1-Dichloroethane	ND	0.50	1	11/14/2018 03:08
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	11/14/2018 03:08
1,1-Dichloroethene	ND	0.50	1	11/14/2018 03:08
cis-1,2-Dichloroethene	ND	0.50	1	11/14/2018 03:08
trans-1,2-Dichloroethene	ND	0.50	1	11/14/2018 03:08
1,2-Dichloropropane	ND	0.50	1	11/14/2018 03:08
1,3-Dichloropropane	ND	0.50	1	11/14/2018 03:08
2,2-Dichloropropane	ND	0.50	1	11/14/2018 03:08

(Cont.)

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1811509
Date Received:	11/13/18 15:00	**Extraction Method:**	SW5030B
Date Prepared:	11/14/18	**Analytical Method:**	SW8260B
Project:	2165.002.215; Livermore Core	**Unit:**	µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
HP-3-MF	**1811509-002A**	**Water**	**11/13/2018 13:50**	**GC16 11131830.D**	**168397**

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.50	1	11/14/2018 03:08
cis-1,3-Dichloropropene	ND	0.50	1	11/14/2018 03:08
trans-1,3-Dichloropropene	ND	0.50	1	11/14/2018 03:08
Diisopropyl ether (DIPE)	ND	0.50	1	11/14/2018 03:08
Ethylbenzene	ND	0.50	1	11/14/2018 03:08
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	11/14/2018 03:08
Freon 113	ND	0.50	1	11/14/2018 03:08
Hexachlorobutadiene	ND	0.50	1	11/14/2018 03:08
Hexachloroethane	ND	0.50	1	11/14/2018 03:08
2-Hexanone	ND	0.50	1	11/14/2018 03:08
Isopropylbenzene	ND	0.50	1	11/14/2018 03:08
4-Isopropyl toluene	ND	0.50	1	11/14/2018 03:08
Methyl-t-butyl ether (MTBE)	ND	0.50	1	11/14/2018 03:08
Methylene chloride	ND	2.0	1	11/14/2018 03:08
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	11/14/2018 03:08
Naphthalene	ND	0.50	1	11/14/2018 03:08
n-Propyl benzene	ND	0.50	1	11/14/2018 03:08
Styrene	ND	0.50	1	11/14/2018 03:08
1,1,1,2-Tetrachloroethane	ND	0.50	1	11/14/2018 03:08
1,1,2,2-Tetrachloroethane	ND	0.50	1	11/14/2018 03:08
Tetrachloroethene	**10**	0.50	1	11/14/2018 03:08
Toluene	**0.68**	0.50	1	11/14/2018 03:08
1,2,3-Trichlorobenzene	ND	0.50	1	11/14/2018 03:08
1,2,4-Trichlorobenzene	ND	0.50	1	11/14/2018 03:08
1,1,1-Trichloroethane	ND	0.50	1	11/14/2018 03:08
1,1,2-Trichloroethane	ND	0.50	1	11/14/2018 03:08
Trichloroethene	ND	0.50	1	11/14/2018 03:08
Trichlorofluoromethane	ND	0.50	1	11/14/2018 03:08
1,2,3-Trichloropropane	ND	0.50	1	11/14/2018 03:08
1,2,4-Trimethylbenzene	ND	0.50	1	11/14/2018 03:08
1,3,5-Trimethylbenzene	ND	0.50	1	11/14/2018 03:08
Vinyl Chloride	ND	0.50	1	11/14/2018 03:08
m,p-Xylene	ND	0.50	1	11/14/2018 03:08
o-Xylene	ND	0.50	1	11/14/2018 03:08
Xylenes, Total	ND	0.50	1	11/14/2018 03:08

(Cont.)

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1811509
Date Received:	11/13/18 15:00	**Extraction Method:**	SW5030B
Date Prepared:	11/14/18	**Analytical Method:**	SW8260B
Project:	2165.002.215; Livermore Core	**Unit:**	µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
HP-3-MF	**1811509-002A**	**Water**	**11/13/2018 13:50**	**GC16 11131830.D**	**168397**

Analytes	Result	RL	DF	Date Analyzed
Surrogates	**REC (%)**	**Limits**		
Dibromofluoromethane	92	81-144		11/14/2018 03:08
Toluene-d8	93	85-135		11/14/2018 03:08
4-BFB	76	63-145		11/14/2018 03:08

Analyst(s): AK

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1811509
Date Prepared:	11/13/18 - 11/14/18	**BatchID:**	168397
Date Analyzed:	11/13/18 - 11/14/18	**Extraction Method:**	SW5030B
Instrument:	GC16	**Analytical Method:**	SW8260B
Matrix:	Water	**Unit:**	µg/L
Project:	2165.002.215; Livermore Core	**Sample ID:**	MB/LCS/LCSD-168397

QC Summary Report for SW8260B

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
Acetone	ND	10	-	-	-
tert-Amyl methyl ether (TAME)	ND	0.50	-	-	-
Benzene	ND	0.50	-	-	-
Bromobenzene	ND	0.50	-	-	-
Bromochloromethane	ND	0.50	-	-	-
Bromodichloromethane	ND	0.50	-	-	-
Bromoform	ND	0.50	-	-	-
Bromomethane	ND	0.50	-	-	-
2-Butanone (MEK)	ND	2.0	-	-	-
t-Butyl alcohol (TBA)	ND	2.0	-	-	-
n-Butyl benzene	ND	0.50	-	-	-
sec-Butyl benzene	ND	0.50	-	-	-
tert-Butyl benzene	ND	0.50	-	-	-
Carbon Disulfide	ND	0.50	-	-	-
Carbon Tetrachloride	ND	0.50	-	-	-
Chlorobenzene	ND	0.50	-	-	-
Chloroethane	ND	0.50	-	-	-
Chloroform	ND	0.50	-	-	-
Chloromethane	ND	0.50	-	-	-
2-Chlorotoluene	ND	0.50	-	-	-
4-Chlorotoluene	ND	0.50	-	-	-
Dibromochloromethane	ND	0.50	-	-	-
1,2-Dibromo-3-chloropropane	ND	0.20	-	-	-
1,2-Dibromoethane (EDB)	ND	0.50	-	-	-
Dibromomethane	ND	0.50	-	-	-
1,2-Dichlorobenzene	ND	0.50	-	-	-
1,3-Dichlorobenzene	ND	0.50	-	-	-
1,4-Dichlorobenzene	ND	0.50	-	-	-
Dichlorodifluoromethane	ND	0.50	-	-	-
1,1-Dichloroethane	ND	0.50	-	-	-
1,2-Dichloroethane (1,2-DCA)	ND	0.50	-	-	-
1,1-Dichloroethene	ND	0.50	-	-	-
cis-1,2-Dichloroethene	ND	0.50	-	-	-
trans-1,2-Dichloroethene	ND	0.50	-	-	-
1,2-Dichloropropane	ND	0.50	-	-	-
1,3-Dichloropropane	ND	0.50	-	-	-
2,2-Dichloropropane	ND	0.50	-	-	-
1,1-Dichloropropene	ND	0.50	-	-	-

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1811509
Date Prepared:	11/13/18 - 11/14/18	**BatchID:**	168397
Date Analyzed:	11/13/18 - 11/14/18	**Extraction Method:**	SW5030B
Instrument:	GC16	**Analytical Method:**	SW8260B
Matrix:	Water	**Unit:**	µg/L
Project:	2165.002.215; Livermore Core	**Sample ID:**	MB/LCS/LCSD-168397

QC Summary Report for SW8260B

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
cis-1,3-Dichloropropene	ND	0.50	-	-	-
trans-1,3-Dichloropropene	ND	0.50	-	-	-
Diisopropyl ether (DIPE)	ND	0.50	-	-	-
Ethylbenzene	ND	0.50	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	0.50	-	-	-
Freon 113	ND	0.50	-	-	-
Hexachlorobutadiene	ND	0.50	-	-	-
Hexachloroethane	ND	0.50	-	-	-
2-Hexanone	ND	0.50	-	-	-
Isopropylbenzene	ND	0.50	-	-	-
4-Isopropyl toluene	ND	0.50	-	-	-
Methyl-t-butyl ether (MTBE)	ND	0.50	-	-	-
Methylene chloride	ND	2.0	-	-	-
4-Methyl-2-pentanone (MIBK)	ND	0.50	-	-	-
Naphthalene	ND	0.50	-	-	-
n-Propyl benzene	ND	0.50	-	-	-
Styrene	ND	0.50	-	-	-
1,1,1,2-Tetrachloroethane	ND	0.50	-	-	-
1,1,2,2-Tetrachloroethane	ND	0.50	-	-	-
Tetrachloroethene	ND	0.50	-	-	-
Toluene	ND	0.50	-	-	-
1,2,3-Trichlorobenzene	ND	0.50	-	-	-
1,2,4-Trichlorobenzene	ND	0.50	-	-	-
1,1,1-Trichloroethane	ND	0.50	-	-	-
1,1,2-Trichloroethane	ND	0.50	-	-	-
Trichloroethene	ND	0.50	-	-	-
Trichlorofluoromethane	ND	0.50	-	-	-
1,2,3-Trichloropropane	ND	0.50	-	-	-
1,2,4-Trimethylbenzene	ND	0.50	-	-	-
1,3,5-Trimethylbenzene	ND	0.50	-	-	-
Vinyl Chloride	ND	0.50	-	-	-
m,p-Xylene	ND	0.50	-	-	-
o-Xylene	ND	0.50	-	-	-
Xylenes, Total	ND	0.50	-	-	-

(Cont.)

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1811509
Date Prepared:	11/13/18 - 11/14/18	**BatchID:**	168397
Date Analyzed:	11/13/18 - 11/14/18	**Extraction Method:**	SW5030B
Instrument:	GC16	**Analytical Method:**	SW8260B
Matrix:	Water	**Unit:**	µg/L
Project:	2165.002.215; Livermore Core	**Sample ID:**	MB/LCS/LCSD-168397

QC Summary Report for SW8260B

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
Surrogate Recovery					
Dibromofluoromethane	23		25	90	82-142
Toluene-d8	23		25	93	85-137
4-BFB	1.9		2.5	77	66-144

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1811509
Date Prepared:	11/13/18 - 11/14/18	**BatchID:**	168397
Date Analyzed:	11/13/18 - 11/14/18	**Extraction Method:**	SW5030B
Instrument:	GC16	**Analytical Method:**	SW8260B
Matrix:	Water	**Unit:**	µg/L
Project:	2165.002.215; Livermore Core	**Sample ID:**	MB/LCS/LCSD-168397

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Acetone	150	160	200	74	79	46-128	7.19	20
tert-Amyl methyl ether (TAME)	8.0	8.5	10	80	85	65-118	5.68	20
Benzene	9.0	9.1	10	90	91	71-120	1.96	20
Bromobenzene	8.4	8.7	10	84	87	67-121	3.75	20
Bromochloromethane	8.5	8.8	10	85	88	71-127	4.26	20
Bromodichloromethane	8.6	8.9	10	86	89	67-120	3.73	20
Bromoform	7.6	8.1	10	76	81	59-121	6.42	20
Bromomethane	12	12	10	121	122	44-175	0.568	20
2-Butanone (MEK)	31	33	40	76	84	50-121	9.02	20
t-Butyl alcohol (TBA)	27	29	40	67	72	47-123	7.65	20
n-Butyl benzene	9.5	9.6	10	95	96	71-128	1.37	20
sec-Butyl benzene	9.9	9.6	10	99	96	75-123	2.67	20
tert-Butyl benzene	9.0	8.9	10	90	89	70-121	1.36	20
Carbon Disulfide	9.2	9.4	10	92	94	75-121	2.49	20
Carbon Tetrachloride	8.9	9.2	10	89	92	73-117	3.06	20
Chlorobenzene	8.7	8.9	10	87	89	73-119	2.07	20
Chloroethane	12	12	10	117	118	60-144	1.10	20
Chloroform	8.8	9.1	10	88	91	72-120	2.67	20
Chloromethane	11	11	10	111	112	28-145	0.854	20
2-Chlorotoluene	9.6	9.7	10	96	97	76-121	1.18	20
4-Chlorotoluene	8.8	8.9	10	88	89	72-119	1.36	20
Dibromochloromethane	8.2	8.7	10	82	87	66-122	6.04	20
1,2-Dibromo-3-chloropropane	3.0	3.3	4	75	84	50-123	10.5	20
1,2-Dibromoethane (EDB)	7.9	8.4	10	79	84	68-117	5.80	20
Dibromomethane	8.0	8.4	10	80	84	67-121	4.74	20
1,2-Dichlorobenzene	8.4	8.7	10	84	87	70-121	3.25	20
1,3-Dichlorobenzene	9.4	9.6	10	94	96	69-125	1.97	20
1,4-Dichlorobenzene	8.5	8.8	10	85	88	67-123	2.81	20
Dichlorodifluoromethane	10	9.9	10	101	99	19-147	1.97	20
1,1-Dichloroethane	8.9	9.1	10	89	91	72-121	2.57	20
1,2-Dichloroethane (1,2-DCA)	8.0	8.4	10	80	84	64-120	4.92	20
1,1-Dichloroethene	8.9	9.1	10	89	91	76-123	2.44	20
cis-1,2-Dichloroethene	8.8	8.9	10	88	89	71-124	1.67	20
trans-1,2-Dichloroethene	8.8	9.0	10	88	90	74-124	2.19	20
1,2-Dichloropropane	8.9	9.0	10	89	90	70-120	1.96	20
1,3-Dichloropropane	8.1	8.5	10	81	85	66-119	4.51	20
2,2-Dichloropropane	8.5	8.7	10	85	87	67-126	1.95	20
1,1-Dichloropropene	9.0	9.2	10	90	92	73-120	1.96	20

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1811509
Date Prepared:	11/13/18 - 11/14/18	**BatchID:**	168397
Date Analyzed:	11/13/18 - 11/14/18	**Extraction Method:**	SW5030B
Instrument:	GC16	**Analytical Method:**	SW8260B
Matrix:	Water	**Unit:**	µg/L
Project:	2165.002.215; Livermore Core	**Sample ID:**	MB/LCS/LCSD-168397

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
cis-1,3-Dichloropropene	8.6	8.9	10	86	89	69-121	3.76	20
trans-1,3-Dichloropropene	8.7	9.1	10	87	91	70-121	4.71	20
Diisopropyl ether (DIPE)	9.0	9.2	10	90	92	68-123	2.86	20
Ethylbenzene	9.0	9.0	10	90	90	75-116	0	20
Ethyl tert-butyl ether (ETBE)	8.6	9.0	10	86	90	67-120	4.68	20
Freon 113	9.0	9.3	10	90	93	75-117	2.68	20
Hexachlorobutadiene	8.6	9.0	10	86	90	66-127	4.07	20
Hexachloroethane	9.5	9.7	10	95	97	69-127	2.29	20
2-Hexanone	7.6	8.4	10	76	84	50-116	9.95	20
Isopropylbenzene	9.5	9.1	10	95	91	70-127	3.51	20
4-Isopropyl toluene	9.2	9.3	10	92	93	71-124	0.886	20
Methyl-t-butyl ether (MTBE)	7.8	8.4	10	78	84	64-121	7.05	20
Methylene chloride	8.2	8.4	10	82	84	66-115	2.25	20
4-Methyl-2-pentanone (MIBK)	7.4	8.2	10	74	82	50-119	10.4	20
Naphthalene	7.6	8.3	10	76	83	63-121	8.96	20
n-Propyl benzene	9.6	9.5	10	96	95	74-122	1.09	20
Styrene	8.4	8.3	10	84	83	69-118	1.08	20
1,1,1,2-Tetrachloroethane	8.4	8.7	10	84	87	71-120	3.59	20
1,1,2,2-Tetrachloroethane	7.9	8.6	10	79	86	58-123	8.89	20
Tetrachloroethene	8.5	8.7	10	85	87	72-118	3.21	20
Toluene	8.7	8.9	10	87	89	73-111	2.38	20
1,2,3-Trichlorobenzene	7.7	8.3	10	77	83	63-125	7.70	20
1,2,4-Trichlorobenzene	7.8	8.4	10	78	84	66-128	6.34	20
1,1,1-Trichloroethane	8.6	8.9	10	86	89	72-118	2.97	20
1,1,2-Trichloroethane	8.0	8.5	10	80	85	66-118	6.12	20
Trichloroethene	8.6	8.7	10	86	87	71-121	1.67	20
Trichlorofluoromethane	8.5	8.8	10	85	88	59-125	3.47	20
1,2,3-Trichloropropane	7.8	8.5	10	78	85	62-120	9.57	20
1,2,4-Trimethylbenzene	9.0	9.4	10	90	94	73-120	4.32	20
1,3,5-Trimethylbenzene	9.1	9.5	10	91	95	67-123	3.96	20
Vinyl Chloride	11	11	10	107	107	60-138	0	20
m,p-Xylene	18	18	20	91	89	74-118	1.85	20
o-Xylene	9.3	9.2	10	93	92	73-119	1.08	20
Xylenes, Total	27	27	30	92	90	74-118	1.59	20

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1811509
Date Prepared:	11/13/18 - 11/14/18	**BatchID:**	168397
Date Analyzed:	11/13/18 - 11/14/18	**Extraction Method:**	SW5030B
Instrument:	GC16	**Analytical Method:**	SW8260B
Matrix:	Water	**Unit:**	µg/L
Project:	2165.002.215; Livermore Core	**Sample ID:**	MB/LCS/LCSD-168397

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Surrogate Recovery								
Dibromofluoromethane	23	23	25	90	92	82-142	2.30	20
Toluene-d8	23	23	25	92	93	85-137	0.723	20
4-BFB	2.0	2.0	2.5	78	80	66-144	2.69	20

McCampbell Analytical, Inc.
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(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 1811509 **ClientCode: PEO**

☐ WaterTrax ☐ WriteOn ☑ EDF ☐ Excel ▣ EQuIS ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag
▣ Detection Summary ▣ Dry-Weight

Report to:
Morgan Gillies
Pangea Environmental Svcs., Inc.
1710 Franklin Street, Ste. 200
Oakland, CA 94612
(510) 836-3700 FAX: (510) 836-3709

Email: mgillies@pangeaenv.com
cc/3rd Party:
PO:
Project: 2165.002.215; Livermore Core

Bill to:
Bob Clark-Riddell
Pangea Environmental Svcs., Inc.
1710 Franklin Street, Ste. 200
Oakland, CA 94612

Requested TAT: **1 day;**

Date Received: **11/13/2018**
Date Logged: **11/13/2018**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
1811509-001	HP-2-MF	Water	11/13/2018 13:30	☐	A	A										
1811509-002	HP-3-MF	Water	11/13/2018 13:50	☐	A											

Test Legend:

1	8260B_W	2	PREDF REPORT	3		4	
5		6		7		8	
9		10		11		12	

Prepared by: Lilly Ortiz

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

WORK ORDER SUMMARY

Client Name: PANGEA ENVIRONMENTAL SVCS., INC. **Project:** 2165.002.215; Livermore Core **Work Order:** 1811509

Client Contact: Morgan Gillies **QC Level:** LEVEL 2

Contact's Email: mgillies@pangeaenv.com **Comments** **Date Logged:** 11/13/2018

☐ WaterTrax ☐ WriteOn ☑ EDF ☐ Excel ☐ Fax ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1811509-001A	HP-2-MF	Water	SW8260B (VOCs)	3	VOA w/ HCl	☐	11/13/2018 13:30	1 day	Trace	☐	
1811509-002A	HP-3-MF	Water	SW8260B (VOCs)	3	VOA w/ HCl	☐	11/13/2018 13:50	1 day	Trace	☐	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

General COC

RUSH

MAI Work Order # 1811509

McCAMPBELL ANALYTICAL, INC.

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CHAIN OF CUSTODY RECORD

Turn Around Time:	1 Day Rush	X	2 Day Rush		3 Day Rush		STD		Quote #						
J-Flag / MDL		ESL		Cleanup Approved				Bottle Order #							
Delivery Format:	PDF		GeoTracker EDF	X	EDD		Write On (DW)		EQuIS						

Report To: Morgan Gillies Bill To: Pangea
Company: Pangea Env. Svs.
Email: mgillies@pangeaenv.com
Alt Email: Tele:
Project Name: Livermore CORE Project #: 2165.002.215
Project Location: Multi-Family PO #
Sampler Signature:

Analysis Requested

	SAMPLE ID Location / Field Point	Sampling Date	Sampling Time	#Containers	Matrix	Preservative	BTEX & TPH as Gas (8021/ 8015) MTBE	TPH as Diesel (8015) + Motor Oil Without Silica Gel	TPH as Diesel (8015) + Motor Oil With Silica Gel	Total Oil & Grease (1664 / 9071) Without Silica Gel	Total Petroleum Hydrocarbons - Oil & Grease (1664 / 9071) With Silica Gel	Total Petroleum Hydrocarbons (418.1) With Silica Gel	EPA 505/ 608 / 8081 (Cl Pesticides)	EPA 608 / 8082 PCB's ; Aroclors only	EPA 524.2 / 624 / 8260 (VOCs)	EPA 525.2 / 625 / 8270 (SVOCs)	EPA 8270 SIM / 8310 (PAHs / PNAs)	CAM 17 Metals (200.8 / 6020)*	Metals (200.8 / 6020)	Baylands Requirements	Lab to filter sample for dissolved metals analysis				
(+)	HP-2-MF	11.13.18	1330	3	GW	HCl									X										
(+)	HP-3-MF	11.13.18	1350	3	GW	HCl									X										

MAI clients MUST disclose any dangerous chemicals known to be present in their submitted samples in concentrations that may cause immediate harm or serious future health endangerment as a result of brief, gloved, open air, sample handling by MAI staff. Non-disclosure incurs an immediate $250 surcharge and the client is subject to full legal liability for harm suffered. Thank you for your understanding and for allowing us to work safely.

* If metals are requested for water samples and the water type (Matrix) is not specified on the chain of custody, MAI will default to metals by E200.8.

Please provide an adequate volume of sample. If the volume is not sufficient for a MS/MSD a LCS/LCSD will be prepared in its place and noted in the report.

Comments / Instructions

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
	11.13.18	1500		11/13/18	1500

Matrix Code: DW=Drinking Water, GW=Ground Water, WW=Waste Water, SW=Seawater, S=Soil, SL=Sludge, A=Air, WP=Wipe, O=Other

Preservative Code: 1=4°C 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=ZnOAc/NaOH 7=None

Temp 7.6 °C not Initials LO

Page 1 of 1

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Sample Receipt Checklist

Client Name:	**Pangea Environmental Svcs., Inc.**	Date and Time Received:	**11/13/2018 15:00**
Project:	**2165.002.215; Livermore Core**	Date Logged:	**11/13/2018**
		Received by:	Lilly Ortiz
WorkOrder №:	**1811509** Matrix: Water	Logged by:	Lilly Ortiz
Carrier:	Client Drop-In		

Chain of Custody (COC) Information

Chain of custody present?	Yes	☑	No	☐		
Chain of custody signed when relinquished and received?	Yes	☑	No	☐		
Chain of custody agrees with sample labels?	Yes	☑	No	☐		
Sample IDs noted by Client on COC?	Yes	☑	No	☐		
Date and Time of collection noted by Client on COC?	Yes	☑	No	☐		
Sampler's name noted on COC?	Yes	☑	No	☐		
COC agrees with Quote?	Yes	☐	No	☐	NA	☑

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes	☐	No	☐	NA	☑
Shipping container/cooler in good condition?	Yes	☑	No	☐		
Samples in proper containers/bottles?	Yes	☑	No	☐		
Sample containers intact?	Yes	☑	No	☐		
Sufficient sample volume for indicated test?	Yes	☑	No	☐		

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes	☑	No	☐	NA	☐
Samples Received on Ice?	Yes	☑	No	☐		
(Ice Type: WET ICE)						
Sample/Temp Blank temperature	Temp: 7.6°C				NA	☐
Water - VOA vials have zero headspace / no bubbles?	Yes	☑	No	☐	NA	☐
Sample labels checked for correct preservation?	Yes	☑	No	☐		
pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)?	Yes	☐	No	☐	NA	☑
UCMR Samples:						
pH tested and acceptable upon receipt (200.8: ≤2; 525.3: ≤4; 530: ≤7; 541: <3; 544: <6.5 & 7.5)?	Yes	☐	No	☐	NA	☑
Free Chlorine tested and acceptable upon receipt (<0.1mg/L)?	Yes	☐	No	☐	NA	☑

Comments:

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

July 31, 2018

Pangea Environmental Serv - Oakland, CA

Sample Delivery Group:	L1012954
Samples Received:	07/27/2018
Project Number:	IH1-180725
Description:	Downtown Livermore Core
Site:	20 S. L ST LIVERMORE CA
Report To:	Morgan Gillies 1710 Franklin Street Suite 200 Oakland, CA 94612

Entire Report Reviewed By:

Brian Ford
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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MW-3 L1012954-01 GW

Collected by	Collected date/time	Received date/time
IH	07/26/18 08:35	07/27/18 15:25

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1144978	1	07/30/18 12:25	07/30/18 12:25	PP

MW-2 L1012954-02 GW

Collected by	Collected date/time	Received date/time
IH	07/26/18 09:56	07/27/18 15:25

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1144978	1	07/30/18 12:50	07/30/18 12:50	PP

MW-4 L1012954-03 GW

Collected by	Collected date/time	Received date/time
IH	07/26/18 10:30	07/27/18 15:25

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1144978	1	07/30/18 13:15	07/30/18 13:15	PP

MW-1 L1012954-04 GW

Collected by	Collected date/time	Received date/time
IH	07/26/18 10:50	07/27/18 15:25

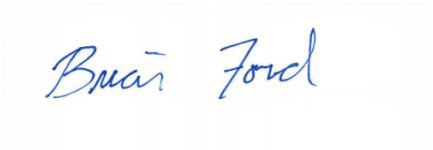
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1144978	1	07/30/18 14:15	07/30/18 14:15	PP

TB-1 L1012954-05 GW

Collected by	Collected date/time	Received date/time
IH	07/26/18 00:00	07/27/18 15:25

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1144978	1	07/30/18 12:00	07/30/18 12:00	PP

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Brian Ford
Project Manager

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Acetone	3.99	J	3.45	50.0	1	07/30/2018 12:25	WG1144978
Acrolein	U		2.28	50.0	1	07/30/2018 12:25	WG1144978
Acrylonitrile	U		1.20	10.0	1	07/30/2018 12:25	WG1144978
Benzene	U		0.102	1.00	1	07/30/2018 12:25	WG1144978
Bromobenzene	U		0.0947	1.00	1	07/30/2018 12:25	WG1144978
Bromodichloromethane	U		0.0920	1.00	1	07/30/2018 12:25	WG1144978
Bromoform	U		0.129	1.00	1	07/30/2018 12:25	WG1144978
Bromomethane	U	J3	0.472	20.0	1	07/30/2018 12:25	WG1144978
n-Butylbenzene	U		0.133	1.00	1	07/30/2018 12:25	WG1144978
sec-Butylbenzene	U		0.128	1.00	1	07/30/2018 12:25	WG1144978
tert-Butylbenzene	0.389	J	0.193	1.00	1	07/30/2018 12:25	WG1144978
Carbon Tetrachloride	U		0.0916	1.00	1	07/30/2018 12:25	WG1144978
Chlorobenzene	U		0.104	1.00	1	07/30/2018 12:25	WG1144978
Chlorodibromomethane	U		0.0882	1.00	1	07/30/2018 12:25	WG1144978
Chloroethane	U		0.152	5.00	1	07/30/2018 12:25	WG1144978
Chloroform	U		0.103	5.00	1	07/30/2018 12:25	WG1144978
Chloromethane	U		0.101	2.50	1	07/30/2018 12:25	WG1144978
2-Chlorotoluene	U		0.141	1.00	1	07/30/2018 12:25	WG1144978
4-Chlorotoluene	U		0.128	1.00	1	07/30/2018 12:25	WG1144978
1,2-Dibromoethane	U		0.114	1.00	1	07/30/2018 12:25	WG1144978
1,2-Dibromo-3-Chloropropane	U		0.452	5.00	1	07/30/2018 12:25	WG1144978
Dibromomethane	U		0.151	1.00	1	07/30/2018 12:25	WG1144978
1,2-Dichlorobenzene	0.255	J	0.126	1.00	1	07/30/2018 12:25	WG1144978
1,3-Dichlorobenzene	U		0.136	1.00	1	07/30/2018 12:25	WG1144978
1,4-Dichlorobenzene	U		0.154	1.00	1	07/30/2018 12:25	WG1144978
Dichlorodifluoromethane	U	J3	0.0998	5.00	1	07/30/2018 12:25	WG1144978
1,1-Dichloroethane	U		0.110	1.00	1	07/30/2018 12:25	WG1144978
1,2-Dichloroethane	U		0.218	1.00	1	07/30/2018 12:25	WG1144978
1,1-Dichloroethene	U		0.108	1.00	1	07/30/2018 12:25	WG1144978
Cis-1,2-Dichloroethene	1.02		0.114	1.00	1	07/30/2018 12:25	WG1144978
trans-1,2-Dichloroethene	2.33		0.104	1.00	1	07/30/2018 12:25	WG1144978
1,2-Dichloropropane	U		0.0975	1.00	1	07/30/2018 12:25	WG1144978
1,3-Dichloropropane	U		0.0984	1.00	1	07/30/2018 12:25	WG1144978
2,2-Dichloropropane	U		0.252	2.00	1	07/30/2018 12:25	WG1144978
1,1-Dichloropropene	U		0.118	1.00	1	07/30/2018 12:25	WG1144978
Cis-1,3-Dichloropropene	U		0.130	1.00	1	07/30/2018 12:25	WG1144978
trans-1,3-Dichloropropene	U		0.0841	1.00	1	07/30/2018 12:25	WG1144978
Di-isopropyl ether	U		0.122	1.00	1	07/30/2018 12:25	WG1144978
Ethylbenzene	U		0.0955	1.00	1	07/30/2018 12:25	WG1144978
Hexachloro-1,3-butadiene	U		0.234	1.00	1	07/30/2018 12:25	WG1144978
Isopropylbenzene	U		0.0841	1.00	1	07/30/2018 12:25	WG1144978
p-Isopropyltoluene	U		0.126	1.00	1	07/30/2018 12:25	WG1144978
2-Butanone (MEK)	U		1.28	10.0	1	07/30/2018 12:25	WG1144978
Methylene Chloride	U		0.113	5.00	1	07/30/2018 12:25	WG1144978
4-Methyl-2-pentanone (MIBK)	U		0.537	10.0	1	07/30/2018 12:25	WG1144978
Methyl tert-butyl ether	U		0.105	1.00	1	07/30/2018 12:25	WG1144978
Naphthalene	0.202	B J	0.0975	5.00	1	07/30/2018 12:25	WG1144978
n-Propylbenzene	U		0.159	1.00	1	07/30/2018 12:25	WG1144978
Styrene	U		0.0763	1.00	1	07/30/2018 12:25	WG1144978
1,1,1,2-Tetrachloroethane	U		0.0913	1.00	1	07/30/2018 12:25	WG1144978
1,1,2,2-Tetrachloroethane	U		0.0971	1.00	1	07/30/2018 12:25	WG1144978
1,1,2-Trichlorotrifluoroethane	U		0.0948	1.00	1	07/30/2018 12:25	WG1144978
Tetrachloroethene	0.303	J	0.157	1.00	1	07/30/2018 12:25	WG1144978
Toluene	U		0.104	1.00	1	07/30/2018 12:25	WG1144978
1,2,3-Trichlorobenzene	U		0.162	1.00	1	07/30/2018 12:25	WG1144978
1,2,4-Trichlorobenzene	U		0.182	1.00	1	07/30/2018 12:25	WG1144978

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
1,2,4-Trimethylbenzene	U		0.0984	1.00	1	07/30/2018 12:25	WG1144978
1,3,5-Trimethylbenzene	U		0.109	1.00	1	07/30/2018 12:25	WG1144978
1,1,1-Trichloroethane	U		0.0892	1.00	1	07/30/2018 12:25	WG1144978
1,1,2-Trichloroethane	U		0.0109	1.00	1	07/30/2018 12:25	WG1144978
Trichloroethene	0.391	J	0.101	1.00	1	07/30/2018 12:25	WG1144978
Trichlorofluoromethane	U		0.140	5.00	1	07/30/2018 12:25	WG1144978
1,2,3-Trichloropropane	U		0.165	2.50	1	07/30/2018 12:25	WG1144978
Vinyl Chloride	4.14	J3 J6	0.129	1.00	1	07/30/2018 12:25	WG1144978
Xylenes, Total	U		0.288	3.00	1	07/30/2018 12:25	WG1144978
(S) 1,2-Dichloroethane-d4	*99.3*			*80.0-125*		*07/30/2018 12:25*	WG1144978
(S) 4-Bromofluorobenzene	*95.2*			*75.0-120*		*07/30/2018 12:25*	WG1144978
(S) Toluene-d8	*97.1*			*80.0-120*		*07/30/2018 12:25*	WG1144978

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Acetone	4.20	J	3.45	50.0	1	07/30/2018 12:50	WG1144978
Acrolein	U		2.28	50.0	1	07/30/2018 12:50	WG1144978
Acrylonitrile	U		1.20	10.0	1	07/30/2018 12:50	WG1144978
Benzene	U		0.102	1.00	1	07/30/2018 12:50	WG1144978
Bromobenzene	U		0.0947	1.00	1	07/30/2018 12:50	WG1144978
Bromodichloromethane	U		0.0920	1.00	1	07/30/2018 12:50	WG1144978
Bromoform	U		0.129	1.00	1	07/30/2018 12:50	WG1144978
Bromomethane	U		0.472	20.0	1	07/30/2018 12:50	WG1144978
n-Butylbenzene	U		0.133	1.00	1	07/30/2018 12:50	WG1144978
sec-Butylbenzene	U		0.128	1.00	1	07/30/2018 12:50	WG1144978
tert-Butylbenzene	U		0.193	1.00	1	07/30/2018 12:50	WG1144978
Carbon Tetrachloride	U		0.0916	1.00	1	07/30/2018 12:50	WG1144978
Chlorobenzene	U		0.104	1.00	1	07/30/2018 12:50	WG1144978
Chlorodibromomethane	U		0.0882	1.00	1	07/30/2018 12:50	WG1144978
Chloroethane	U		0.152	5.00	1	07/30/2018 12:50	WG1144978
Chloroform	U		0.103	5.00	1	07/30/2018 12:50	WG1144978
Chloromethane	U		0.101	2.50	1	07/30/2018 12:50	WG1144978
2-Chlorotoluene	U		0.141	1.00	1	07/30/2018 12:50	WG1144978
4-Chlorotoluene	U		0.128	1.00	1	07/30/2018 12:50	WG1144978
1,2-Dibromoethane	U		0.114	1.00	1	07/30/2018 12:50	WG1144978
1,2-Dibromo-3-Chloropropane	U		0.452	5.00	1	07/30/2018 12:50	WG1144978
Dibromomethane	U		0.151	1.00	1	07/30/2018 12:50	WG1144978
1,2-Dichlorobenzene	U		0.126	1.00	1	07/30/2018 12:50	WG1144978
1,3-Dichlorobenzene	U		0.136	1.00	1	07/30/2018 12:50	WG1144978
1,4-Dichlorobenzene	U		0.154	1.00	1	07/30/2018 12:50	WG1144978
Dichlorodifluoromethane	U		0.0998	5.00	1	07/30/2018 12:50	WG1144978
1,1-Dichloroethane	U		0.110	1.00	1	07/30/2018 12:50	WG1144978
1,2-Dichloroethane	U		0.218	1.00	1	07/30/2018 12:50	WG1144978
1,1-Dichloroethene	U		0.108	1.00	1	07/30/2018 12:50	WG1144978
Cis-1,2-Dichloroethene	1.29		0.114	1.00	1	07/30/2018 12:50	WG1144978
trans-1,2-Dichloroethene	1.67		0.104	1.00	1	07/30/2018 12:50	WG1144978
1,2-Dichloropropane	U		0.0975	1.00	1	07/30/2018 12:50	WG1144978
1,3-Dichloropropane	U		0.0984	1.00	1	07/30/2018 12:50	WG1144978
2,2-Dichloropropane	U		0.252	2.00	1	07/30/2018 12:50	WG1144978
1,1-Dichloropropene	U		0.118	1.00	1	07/30/2018 12:50	WG1144978
Cis-1,3-Dichloropropene	U		0.130	1.00	1	07/30/2018 12:50	WG1144978
trans-1,3-Dichloropropene	U		0.0841	1.00	1	07/30/2018 12:50	WG1144978
Di-isopropyl ether	U		0.122	1.00	1	07/30/2018 12:50	WG1144978
Ethylbenzene	U		0.0955	1.00	1	07/30/2018 12:50	WG1144978
Hexachloro-1,3-butadiene	U		0.234	1.00	1	07/30/2018 12:50	WG1144978
Isopropylbenzene	U		0.0841	1.00	1	07/30/2018 12:50	WG1144978
p-Isopropyltoluene	U		0.126	1.00	1	07/30/2018 12:50	WG1144978
2-Butanone (MEK)	U		1.28	10.0	1	07/30/2018 12:50	WG1144978
Methylene Chloride	U		0.113	5.00	1	07/30/2018 12:50	WG1144978
4-Methyl-2-pentanone (MIBK)	U		0.537	10.0	1	07/30/2018 12:50	WG1144978
Methyl tert-butyl ether	U		0.105	1.00	1	07/30/2018 12:50	WG1144978
Naphthalene	0.126	B J	0.0975	5.00	1	07/30/2018 12:50	WG1144978
n-Propylbenzene	U		0.159	1.00	1	07/30/2018 12:50	WG1144978
Styrene	U		0.0763	1.00	1	07/30/2018 12:50	WG1144978
1,1,1,2-Tetrachloroethane	U		0.0913	1.00	1	07/30/2018 12:50	WG1144978
1,1,2,2-Tetrachloroethane	U		0.0971	1.00	1	07/30/2018 12:50	WG1144978
1,1,2-Trichlorotrifluoroethane	U		0.0948	1.00	1	07/30/2018 12:50	WG1144978
Tetrachloroethene	U		0.157	1.00	1	07/30/2018 12:50	WG1144978
Toluene	U		0.104	1.00	1	07/30/2018 12:50	WG1144978
1,2,3-Trichlorobenzene	U		0.162	1.00	1	07/30/2018 12:50	WG1144978
1,2,4-Trichlorobenzene	U		0.182	1.00	1	07/30/2018 12:50	WG1144978

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
1,2,4-Trimethylbenzene	U		0.0984	1.00	1	07/30/2018 12:50	WG1144978
1,3,5-Trimethylbenzene	U		0.109	1.00	1	07/30/2018 12:50	WG1144978
1,1,1-Trichloroethane	U		0.0892	1.00	1	07/30/2018 12:50	WG1144978
1,1,2-Trichloroethane	U		0.0109	1.00	1	07/30/2018 12:50	WG1144978
Trichloroethene	0.920	J	0.101	1.00	1	07/30/2018 12:50	WG1144978
Trichlorofluoromethane	U		0.140	5.00	1	07/30/2018 12:50	WG1144978
1,2,3-Trichloropropane	U		0.165	2.50	1	07/30/2018 12:50	WG1144978
Vinyl Chloride	U		0.129	1.00	1	07/30/2018 12:50	WG1144978
Xylenes, Total	U		0.288	3.00	1	07/30/2018 12:50	WG1144978
(S) 1,2-Dichloroethane-d4	*101*			*80.0-125*		*07/30/2018 12:50*	WG1144978
(S) 4-Bromofluorobenzene	*87.8*			*75.0-120*		*07/30/2018 12:50*	WG1144978
(S) Toluene-d8	*98.5*			*80.0-120*		*07/30/2018 12:50*	WG1144978

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Acetone	U		3.45	50.0	1	07/30/2018 13:15	WG1144978
Acrolein	U		2.28	50.0	1	07/30/2018 13:15	WG1144978
Acrylonitrile	U		1.20	10.0	1	07/30/2018 13:15	WG1144978
Benzene	U		0.102	1.00	1	07/30/2018 13:15	WG1144978
Bromobenzene	U		0.0947	1.00	1	07/30/2018 13:15	WG1144978
Bromodichloromethane	U		0.0920	1.00	1	07/30/2018 13:15	WG1144978
Bromoform	U		0.129	1.00	1	07/30/2018 13:15	WG1144978
Bromomethane	U		0.472	20.0	1	07/30/2018 13:15	WG1144978
n-Butylbenzene	U		0.133	1.00	1	07/30/2018 13:15	WG1144978
sec-Butylbenzene	U		0.128	1.00	1	07/30/2018 13:15	WG1144978
tert-Butylbenzene	U		0.193	1.00	1	07/30/2018 13:15	WG1144978
Carbon Tetrachloride	U		0.0916	1.00	1	07/30/2018 13:15	WG1144978
Chlorobenzene	U		0.104	1.00	1	07/30/2018 13:15	WG1144978
Chlorodibromomethane	U		0.0882	1.00	1	07/30/2018 13:15	WG1144978
Chloroethane	U		0.152	5.00	1	07/30/2018 13:15	WG1144978
Chloroform	0.708	J	0.103	5.00	1	07/30/2018 13:15	WG1144978
Chloromethane	U		0.101	2.50	1	07/30/2018 13:15	WG1144978
2-Chlorotoluene	U		0.141	1.00	1	07/30/2018 13:15	WG1144978
4-Chlorotoluene	U		0.128	1.00	1	07/30/2018 13:15	WG1144978
1,2-Dibromoethane	U		0.114	1.00	1	07/30/2018 13:15	WG1144978
1,2-Dibromo-3-Chloropropane	U		0.452	5.00	1	07/30/2018 13:15	WG1144978
Dibromomethane	U		0.151	1.00	1	07/30/2018 13:15	WG1144978
1,2-Dichlorobenzene	U		0.126	1.00	1	07/30/2018 13:15	WG1144978
1,3-Dichlorobenzene	U		0.136	1.00	1	07/30/2018 13:15	WG1144978
1,4-Dichlorobenzene	U		0.154	1.00	1	07/30/2018 13:15	WG1144978
Dichlorodifluoromethane	U		0.0998	5.00	1	07/30/2018 13:15	WG1144978
1,1-Dichloroethane	U		0.110	1.00	1	07/30/2018 13:15	WG1144978
1,2-Dichloroethane	U		0.218	1.00	1	07/30/2018 13:15	WG1144978
1,1-Dichloroethene	U		0.108	1.00	1	07/30/2018 13:15	WG1144978
Cis-1,2-Dichloroethene	U		0.114	1.00	1	07/30/2018 13:15	WG1144978
trans-1,2-Dichloroethene	U		0.104	1.00	1	07/30/2018 13:15	WG1144978
1,2-Dichloropropane	U		0.0975	1.00	1	07/30/2018 13:15	WG1144978
1,3-Dichloropropane	U		0.0984	1.00	1	07/30/2018 13:15	WG1144978
2,2-Dichloropropane	U		0.252	2.00	1	07/30/2018 13:15	WG1144978
1,1-Dichloropropene	U		0.118	1.00	1	07/30/2018 13:15	WG1144978
Cis-1,3-Dichloropropene	U		0.130	1.00	1	07/30/2018 13:15	WG1144978
trans-1,3-Dichloropropene	U		0.0841	1.00	1	07/30/2018 13:15	WG1144978
Di-isopropyl ether	U		0.122	1.00	1	07/30/2018 13:15	WG1144978
Ethylbenzene	U		0.0955	1.00	1	07/30/2018 13:15	WG1144978
Hexachloro-1,3-butadiene	U		0.234	1.00	1	07/30/2018 13:15	WG1144978
Isopropylbenzene	U		0.0841	1.00	1	07/30/2018 13:15	WG1144978
p-Isopropyltoluene	U		0.126	1.00	1	07/30/2018 13:15	WG1144978
2-Butanone (MEK)	U		1.28	10.0	1	07/30/2018 13:15	WG1144978
Methylene Chloride	U		0.113	5.00	1	07/30/2018 13:15	WG1144978
4-Methyl-2-pentanone (MIBK)	U		0.537	10.0	1	07/30/2018 13:15	WG1144978
Methyl tert-butyl ether	U		0.105	1.00	1	07/30/2018 13:15	WG1144978
Naphthalene	0.117	B J	0.0975	5.00	1	07/30/2018 13:15	WG1144978
n-Propylbenzene	U		0.159	1.00	1	07/30/2018 13:15	WG1144978
Styrene	U		0.0763	1.00	1	07/30/2018 13:15	WG1144978
1,1,1,2-Tetrachloroethane	U		0.0913	1.00	1	07/30/2018 13:15	WG1144978
1,1,2,2-Tetrachloroethane	U		0.0971	1.00	1	07/30/2018 13:15	WG1144978
1,1,2-Trichlorotrifluoroethane	U		0.0948	1.00	1	07/30/2018 13:15	WG1144978
Tetrachloroethene	10.2		0.157	1.00	1	07/30/2018 13:15	WG1144978
Toluene	U		0.104	1.00	1	07/30/2018 13:15	WG1144978
1,2,3-Trichlorobenzene	U		0.162	1.00	1	07/30/2018 13:15	WG1144978
1,2,4-Trichlorobenzene	U		0.182	1.00	1	07/30/2018 13:15	WG1144978

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
1,2,4-Trimethylbenzene	U		0.0984	1.00	1	07/30/2018 13:15	WG1144978
1,3,5-Trimethylbenzene	U		0.109	1.00	1	07/30/2018 13:15	WG1144978
1,1,1-Trichloroethane	U		0.0892	1.00	1	07/30/2018 13:15	WG1144978
1,1,2-Trichloroethane	U		0.0109	1.00	1	07/30/2018 13:15	WG1144978
Trichloroethene	0.138	J	0.101	1.00	1	07/30/2018 13:15	WG1144978
Trichlorofluoromethane	U		0.140	5.00	1	07/30/2018 13:15	WG1144978
1,2,3-Trichloropropane	U		0.165	2.50	1	07/30/2018 13:15	WG1144978
Vinyl Chloride	U		0.129	1.00	1	07/30/2018 13:15	WG1144978
Xylenes, Total	U		0.288	3.00	1	07/30/2018 13:15	WG1144978
(S) 1,2-Dichloroethane-d4	*99.0*			*80.0-125*		*07/30/2018 13:15*	WG1144978
(S) 4-Bromofluorobenzene	*89.3*			*75.0-120*		*07/30/2018 13:15*	WG1144978
(S) Toluene-d8	*97.5*			*80.0-120*		*07/30/2018 13:15*	WG1144978

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Acetone	27.8	J	3.45	50.0	1	07/30/2018 14:15	WG1144978
Acrolein	U		2.28	50.0	1	07/30/2018 14:15	WG1144978
Acrylonitrile	U		1.20	10.0	1	07/30/2018 14:15	WG1144978
Benzene	0.613	J	0.102	1.00	1	07/30/2018 14:15	WG1144978
Bromobenzene	U		0.0947	1.00	1	07/30/2018 14:15	WG1144978
Bromodichloromethane	U		0.0920	1.00	1	07/30/2018 14:15	WG1144978
Bromoform	U		0.129	1.00	1	07/30/2018 14:15	WG1144978
Bromomethane	U		0.472	20.0	1	07/30/2018 14:15	WG1144978
n-Butylbenzene	U		0.133	1.00	1	07/30/2018 14:15	WG1144978
sec-Butylbenzene	U		0.128	1.00	1	07/30/2018 14:15	WG1144978
tert-Butylbenzene	U		0.193	1.00	1	07/30/2018 14:15	WG1144978
Carbon Tetrachloride	U		0.0916	1.00	1	07/30/2018 14:15	WG1144978
Chlorobenzene	U		0.104	1.00	1	07/30/2018 14:15	WG1144978
Chlorodibromomethane	U		0.0882	1.00	1	07/30/2018 14:15	WG1144978
Chloroethane	U		0.152	5.00	1	07/30/2018 14:15	WG1144978
Chloroform	U		0.103	5.00	1	07/30/2018 14:15	WG1144978
Chloromethane	1.12	J	0.101	2.50	1	07/30/2018 14:15	WG1144978
2-Chlorotoluene	U		0.141	1.00	1	07/30/2018 14:15	WG1144978
4-Chlorotoluene	U		0.128	1.00	1	07/30/2018 14:15	WG1144978
1,2-Dibromoethane	U		0.114	1.00	1	07/30/2018 14:15	WG1144978
1,2-Dibromo-3-Chloropropane	U		0.452	5.00	1	07/30/2018 14:15	WG1144978
Dibromomethane	U		0.151	1.00	1	07/30/2018 14:15	WG1144978
1,2-Dichlorobenzene	U		0.126	1.00	1	07/30/2018 14:15	WG1144978
1,3-Dichlorobenzene	U		0.136	1.00	1	07/30/2018 14:15	WG1144978
1,4-Dichlorobenzene	U		0.154	1.00	1	07/30/2018 14:15	WG1144978
Dichlorodifluoromethane	U		0.0998	5.00	1	07/30/2018 14:15	WG1144978
1,1-Dichloroethane	U		0.110	1.00	1	07/30/2018 14:15	WG1144978
1,2-Dichloroethane	U		0.218	1.00	1	07/30/2018 14:15	WG1144978
1,1-Dichloroethene	U		0.108	1.00	1	07/30/2018 14:15	WG1144978
Cis-1,2-Dichloroethene	U		0.114	1.00	1	07/30/2018 14:15	WG1144978
trans-1,2-Dichloroethene	U		0.104	1.00	1	07/30/2018 14:15	WG1144978
1,2-Dichloropropane	U		0.0975	1.00	1	07/30/2018 14:15	WG1144978
1,3-Dichloropropane	U		0.0984	1.00	1	07/30/2018 14:15	WG1144978
2,2-Dichloropropane	U		0.252	2.00	1	07/30/2018 14:15	WG1144978
1,1-Dichloropropene	U		0.118	1.00	1	07/30/2018 14:15	WG1144978
Cis-1,3-Dichloropropene	U		0.130	1.00	1	07/30/2018 14:15	WG1144978
trans-1,3-Dichloropropene	U		0.0841	1.00	1	07/30/2018 14:15	WG1144978
Di-isopropyl ether	U		0.122	1.00	1	07/30/2018 14:15	WG1144978
Ethylbenzene	U		0.0955	1.00	1	07/30/2018 14:15	WG1144978
Hexachloro-1,3-butadiene	U		0.234	1.00	1	07/30/2018 14:15	WG1144978
Isopropylbenzene	U		0.0841	1.00	1	07/30/2018 14:15	WG1144978
p-Isopropyltoluene	U		0.126	1.00	1	07/30/2018 14:15	WG1144978
2-Butanone (MEK)	U		1.28	10.0	1	07/30/2018 14:15	WG1144978
Methylene Chloride	U		0.113	5.00	1	07/30/2018 14:15	WG1144978
4-Methyl-2-pentanone (MIBK)	U		0.537	10.0	1	07/30/2018 14:15	WG1144978
Methyl tert-butyl ether	U		0.105	1.00	1	07/30/2018 14:15	WG1144978
Naphthalene	0.146	B J	0.0975	5.00	1	07/30/2018 14:15	WG1144978
n-Propylbenzene	U		0.159	1.00	1	07/30/2018 14:15	WG1144978
Styrene	U		0.0763	1.00	1	07/30/2018 14:15	WG1144978
1,1,1,2-Tetrachloroethane	U		0.0913	1.00	1	07/30/2018 14:15	WG1144978
1,1,2,2-Tetrachloroethane	U		0.0971	1.00	1	07/30/2018 14:15	WG1144978
1,1,2-Trichlorotrifluoroethane	U		0.0948	1.00	1	07/30/2018 14:15	WG1144978
Tetrachloroethene	3.05		0.157	1.00	1	07/30/2018 14:15	WG1144978
Toluene	0.409	J	0.104	1.00	1	07/30/2018 14:15	WG1144978
1,2,3-Trichlorobenzene	U		0.162	1.00	1	07/30/2018 14:15	WG1144978
1,2,4-Trichlorobenzene	U		0.182	1.00	1	07/30/2018 14:15	WG1144978

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
1,2,4-Trimethylbenzene	U		0.0984	1.00	1	07/30/2018 14:15	WG1144978
1,3,5-Trimethylbenzene	U		0.109	1.00	1	07/30/2018 14:15	WG1144978
1,1,1-Trichloroethane	U		0.0892	1.00	1	07/30/2018 14:15	WG1144978
1,1,2-Trichloroethane	U		0.0109	1.00	1	07/30/2018 14:15	WG1144978
Trichloroethene	U		0.101	1.00	1	07/30/2018 14:15	WG1144978
Trichlorofluoromethane	U		0.140	5.00	1	07/30/2018 14:15	WG1144978
1,2,3-Trichloropropane	U		0.165	2.50	1	07/30/2018 14:15	WG1144978
Vinyl Chloride	U		0.129	1.00	1	07/30/2018 14:15	WG1144978
Xylenes, Total	0.307	J	0.288	3.00	1	07/30/2018 14:15	WG1144978
(S) 1,2-Dichloroethane-d4	*98.5*			*80.0-125*		*07/30/2018 14:15*	WG1144978
(S) 4-Bromofluorobenzene	*87.4*			*75.0-120*		*07/30/2018 14:15*	WG1144978
(S) Toluene-d8	*95.4*			*80.0-120*		*07/30/2018 14:15*	WG1144978

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Acetone	U		3.45	50.0	1	07/30/2018 12:00	WG1144978
Acrolein	U		2.28	50.0	1	07/30/2018 12:00	WG1144978
Acrylonitrile	U		1.20	10.0	1	07/30/2018 12:00	WG1144978
Benzene	U		0.102	1.00	1	07/30/2018 12:00	WG1144978
Bromobenzene	U		0.0947	1.00	1	07/30/2018 12:00	WG1144978
Bromodichloromethane	U		0.0920	1.00	1	07/30/2018 12:00	WG1144978
Bromoform	U		0.129	1.00	1	07/30/2018 12:00	WG1144978
Bromomethane	U		0.472	20.0	1	07/30/2018 12:00	WG1144978
n-Butylbenzene	U		0.133	1.00	1	07/30/2018 12:00	WG1144978
sec-Butylbenzene	U		0.128	1.00	1	07/30/2018 12:00	WG1144978
tert-Butylbenzene	U		0.193	1.00	1	07/30/2018 12:00	WG1144978
Carbon Tetrachloride	U		0.0916	1.00	1	07/30/2018 12:00	WG1144978
Chlorobenzene	U		0.104	1.00	1	07/30/2018 12:00	WG1144978
Chlorodibromomethane	U		0.0882	1.00	1	07/30/2018 12:00	WG1144978
Chloroethane	U		0.152	5.00	1	07/30/2018 12:00	WG1144978
Chloroform	U		0.103	5.00	1	07/30/2018 12:00	WG1144978
Chloromethane	U		0.101	2.50	1	07/30/2018 12:00	WG1144978
2-Chlorotoluene	U		0.141	1.00	1	07/30/2018 12:00	WG1144978
4-Chlorotoluene	U		0.128	1.00	1	07/30/2018 12:00	WG1144978
1,2-Dibromoethane	U		0.114	1.00	1	07/30/2018 12:00	WG1144978
1,2-Dibromo-3-Chloropropane	U		0.452	5.00	1	07/30/2018 12:00	WG1144978
Dibromomethane	U		0.151	1.00	1	07/30/2018 12:00	WG1144978
1,2-Dichlorobenzene	U		0.126	1.00	1	07/30/2018 12:00	WG1144978
1,3-Dichlorobenzene	U		0.136	1.00	1	07/30/2018 12:00	WG1144978
1,4-Dichlorobenzene	U		0.154	1.00	1	07/30/2018 12:00	WG1144978
Dichlorodifluoromethane	U		0.0998	5.00	1	07/30/2018 12:00	WG1144978
1,1-Dichloroethane	U		0.110	1.00	1	07/30/2018 12:00	WG1144978
1,2-Dichloroethane	U		0.218	1.00	1	07/30/2018 12:00	WG1144978
1,1-Dichloroethene	U		0.108	1.00	1	07/30/2018 12:00	WG1144978
Cis-1,2-Dichloroethene	U		0.114	1.00	1	07/30/2018 12:00	WG1144978
trans-1,2-Dichloroethene	U		0.104	1.00	1	07/30/2018 12:00	WG1144978
1,2-Dichloropropane	U		0.0975	1.00	1	07/30/2018 12:00	WG1144978
1,3-Dichloropropane	U		0.0984	1.00	1	07/30/2018 12:00	WG1144978
2,2-Dichloropropane	U		0.252	2.00	1	07/30/2018 12:00	WG1144978
1,1-Dichloropropene	U		0.118	1.00	1	07/30/2018 12:00	WG1144978
Cis-1,3-Dichloropropene	U		0.130	1.00	1	07/30/2018 12:00	WG1144978
trans-1,3-Dichloropropene	U		0.0841	1.00	1	07/30/2018 12:00	WG1144978
Di-isopropyl ether	U		0.122	1.00	1	07/30/2018 12:00	WG1144978
Ethylbenzene	U		0.0955	1.00	1	07/30/2018 12:00	WG1144978
Hexachloro-1,3-butadiene	U		0.234	1.00	1	07/30/2018 12:00	WG1144978
Isopropylbenzene	U		0.0841	1.00	1	07/30/2018 12:00	WG1144978
p-Isopropyltoluene	U		0.126	1.00	1	07/30/2018 12:00	WG1144978
2-Butanone (MEK)	U		1.28	10.0	1	07/30/2018 12:00	WG1144978
Methylene Chloride	U		0.113	5.00	1	07/30/2018 12:00	WG1144978
4-Methyl-2-pentanone (MIBK)	U		0.537	10.0	1	07/30/2018 12:00	WG1144978
Methyl tert-butyl ether	U		0.105	1.00	1	07/30/2018 12:00	WG1144978
Naphthalene	0.228	B J	0.0975	5.00	1	07/30/2018 12:00	WG1144978
n-Propylbenzene	U		0.159	1.00	1	07/30/2018 12:00	WG1144978
Styrene	U		0.0763	1.00	1	07/30/2018 12:00	WG1144978
1,1,1,2-Tetrachloroethane	U		0.0913	1.00	1	07/30/2018 12:00	WG1144978
1,1,2,2-Tetrachloroethane	U		0.0971	1.00	1	07/30/2018 12:00	WG1144978
1,1,2-Trichlorotrifluoroethane	U		0.0948	1.00	1	07/30/2018 12:00	WG1144978
Tetrachloroethene	U		0.157	1.00	1	07/30/2018 12:00	WG1144978
Toluene	U		0.104	1.00	1	07/30/2018 12:00	WG1144978
1,2,3-Trichlorobenzene	U		0.162	1.00	1	07/30/2018 12:00	WG1144978
1,2,4-Trichlorobenzene	U		0.182	1.00	1	07/30/2018 12:00	WG1144978

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
1,2,4-Trimethylbenzene	U		0.0984	1.00	1	07/30/2018 12:00	WG1144978
1,3,5-Trimethylbenzene	U		0.109	1.00	1	07/30/2018 12:00	WG1144978
1,1,1-Trichloroethane	U		0.0892	1.00	1	07/30/2018 12:00	WG1144978
1,1,2-Trichloroethane	U		0.0109	1.00	1	07/30/2018 12:00	WG1144978
Trichloroethene	U		0.101	1.00	1	07/30/2018 12:00	WG1144978
Trichlorofluoromethane	U		0.140	5.00	1	07/30/2018 12:00	WG1144978
1,2,3-Trichloropropane	U		0.165	2.50	1	07/30/2018 12:00	WG1144978
Vinyl Chloride	U		0.129	1.00	1	07/30/2018 12:00	WG1144978
Xylenes, Total	U		0.288	3.00	1	07/30/2018 12:00	WG1144978
(S) 1,2-Dichloroethane-d4	*96.4*			*80.0-125*		*07/30/2018 12:00*	WG1144978
(S) 4-Bromofluorobenzene	*88.6*			*75.0-120*		*07/30/2018 12:00*	WG1144978
(S) Toluene-d8	*97.2*			*80.0-120*		*07/30/2018 12:00*	WG1144978

Method Blank (MB)

(MB) R3329621-6 07/30/18 11:35

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
1,1,1,2-Tetrachloroethane	U		0.0913	1.00
1,1,1-Trichloroethane	U		0.0892	1.00
1,1,2,2-Tetrachloroethane	U		0.0971	1.00
1,1,2-Trichloroethane	U		0.0109	1.00
1,1,2-Trichlorotrifluoroethane	U		0.0948	1.00
1,1-Dichloroethane	U		0.110	1.00
1,1-Dichloroethene	U		0.108	1.00
1,1-Dichloropropene	U		0.118	1.00
1,2,3-Trichlorobenzene	0.195	J	0.162	1.00
1,2,3-Trichloropropane	U		0.165	2.50
1,2,4-Trichlorobenzene	U		0.182	1.00
1,2,4-Trimethylbenzene	U		0.0984	1.00
1,2-Dibromo-3-Chloropropane	U		0.452	5.00
1,2-Dibromoethane	U		0.114	1.00
1,2-Dichlorobenzene	U		0.126	1.00
1,2-Dichloroethane	U		0.218	1.00
1,2-Dichloropropane	U		0.0975	1.00
1,3,5-Trimethylbenzene	U		0.109	1.00
1,3-Dichlorobenzene	U		0.136	1.00
1,3-Dichloropropane	U		0.0984	1.00
1,4-Dichlorobenzene	U		0.154	1.00
2,2-Dichloropropane	U		0.252	2.00
2-Butanone (MEK)	U		1.28	10.0
2-Chlorotoluene	U		0.141	1.00
4-Chlorotoluene	U		0.128	1.00
4-Methyl-2-pentanone (MIBK)	U		0.537	10.0
Acetone	U		3.45	50.0
Acrolein	U		2.28	50.0
Acrylonitrile	U		1.20	10.0
Benzene	U		0.102	1.00
Bromobenzene	U		0.0947	1.00
Bromodichloromethane	U		0.0920	1.00
Bromoform	U		0.129	1.00
Bromomethane	U		0.472	20.0
Carbon Tetrachloride	U		0.0916	1.00
Chlorobenzene	U		0.104	1.00
Chloroethane	U		0.152	5.00
Chloroform	U		0.103	5.00
Chloromethane	U		0.101	2.50
Cis-1,2-Dichloroethene	U		0.114	1.00

Method Blank (MB)

(MB) R3329621-6 07/30/18 11:35

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Cis-1,3-Dichloropropene	U		0.130	1.00
Chlorodibromomethane	U		0.0882	1.00
Dibromomethane	U		0.151	1.00
Dichlorodifluoromethane	U		0.0998	5.00
Di-isopropyl ether	U		0.122	1.00
Ethylbenzene	U		0.0955	1.00
Hexachloro-1,3-butadiene	U		0.234	1.00
Isopropylbenzene	U		0.0841	1.00
Methylene Chloride	U		0.113	5.00
Methyl tert-butyl ether	U		0.105	1.00
Naphthalene	0.339	J	0.0975	5.00
n-Butylbenzene	U		0.133	1.00
n-Propylbenzene	U		0.159	1.00
p-Isopropyltoluene	U		0.126	1.00
sec-Butylbenzene	U		0.128	1.00
Styrene	U		0.0763	1.00
tert-Butylbenzene	U		0.193	1.00
Tetrachloroethene	U		0.157	1.00
Toluene	U		0.104	1.00
trans-1,2-Dichloroethene	U		0.104	1.00
trans-1,3-Dichloropropene	U		0.0841	1.00
Trichloroethene	U		0.101	1.00
Trichlorofluoromethane	U		0.140	5.00
Vinyl Chloride	U		0.129	1.00
Xylenes, Total	U		0.288	3.00
(S) 1,2-Dichloroethane-d4	*99.0*			*80.0-125*
(S) 4-Bromofluorobenzene	*89.9*			*75.0-120*
(S) Toluene-d8	*98.4*			*80.0-120*

Laboratory Control Sample (LCS)

(LCS) R3329621-1 07/30/18 09:30

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,1,1,2-Tetrachloroethane	40.0	42.4	106	80.0-120	
1,1,1-Trichloroethane	40.0	42.9	107	80.0-125	
1,1,2,2-Tetrachloroethane	40.0	40.0	100	79.0-121	
1,1,2-Trichloroethane	40.0	39.2	98.1	78.0-121	
1,1,2-Trichlorotrifluoroethane	40.0	39.0	97.6	77.0-122	

Laboratory Control Sample (LCS)

(LCS) R3329621-1 07/30/18 09:30

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,1-Dichloroethane	40.0	39.6	99.0	78.0-124	
1,1-Dichloroethene	40.0	39.3	98.4	78.0-121	
1,1-Dichloropropene	40.0	39.4	98.5	80.0-125	
1,2,3-Trichlorobenzene	40.0	41.8	104	61.0-129	
1,2,3-Trichloropropane	40.0	41.4	103	77.0-120	
1,2,4-Trichlorobenzene	40.0	41.6	104	70.0-122	
1,2,4-Trimethylbenzene	40.0	42.4	106	77.0-128	
1,2-Dibromo-3-Chloropropane	100	114	114	67.0-135	
1,2-Dibromoethane	40.0	42.4	106	78.0-121	
1,2-Dichlorobenzene	40.0	40.8	102	80.0-120	
1,2-Dichloroethane	40.0	42.1	105	72.0-126	
1,2-Dichloropropane	40.0	37.9	94.7	79.0-123	
1,3,5-Trimethylbenzene	40.0	42.4	106	80.0-124	
1,3-Dichlorobenzene	40.0	42.1	105	80.0-120	
1,3-Dichloropropane	40.0	40.5	101	78.0-122	
1,4-Dichlorobenzene	40.0	40.1	100	80.0-120	
2,2-Dichloropropane	40.0	45.1	113	72.0-130	
2-Butanone (MEK)	200	202	101	64.0-142	
2-Chlorotoluene	40.0	42.1	105	80.0-121	
4-Chlorotoluene	40.0	42.3	106	80.0-121	
4-Methyl-2-pentanone (MIBK)	200	217	108	68.0-137	
Acetone	200	217	108	56.0-140	
Acrolein	400	386	96.4	42.0-160	
Acrylonitrile	400	404	101	65.0-137	
Benzene	40.0	39.4	98.4	79.0-120	
Bromobenzene	40.0	41.1	103	80.0-120	
Bromodichloromethane	40.0	40.3	101	80.0-125	
Bromoform	40.0	45.1	113	74.0-129	
Bromomethane	40.0	44.8	112	25.0-160	
Carbon Tetrachloride	40.0	43.7	109	78.0-131	
Chlorobenzene	40.0	39.9	99.7	80.0-120	
Chloroethane	40.0	43.9	110	55.0-143	
Chloroform	40.0	40.5	101	80.0-122	
Chloromethane	40.0	41.9	105	57.0-130	
Cis-1,2-Dichloroethene	40.0	40.0	99.9	80.0-120	
Cis-1,3-Dichloropropene	40.0	42.6	106	80.0-123	
Chlorodibromomethane	40.0	44.4	111	80.0-123	
Dibromomethane	40.0	41.0	102	77.0-122	
Dichlorodifluoromethane	40.0	44.3	111	49.0-146	
Di-isopropyl ether	40.0	40.2	101	79.0-126	

Laboratory Control Sample (LCS)

(LCS) R3329621-1 07/30/18 09:30

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Ethylbenzene	40.0	40.6	101	80.0-120	
Hexachloro-1,3-butadiene	40.0	40.4	101	61.0-137	
Isopropylbenzene	40.0	41.5	104	80.0-123	
Methylene Chloride	40.0	37.5	93.7	78.0-120	
Methyl tert-butyl ether	40.0	41.9	105	77.0-121	
Naphthalene	40.0	42.5	106	62.0-130	
n-Butylbenzene	40.0	40.7	102	78.0-126	
n-Propylbenzene	40.0	40.8	102	80.0-121	
p-Isopropyltoluene	40.0	40.7	102	79.0-127	
sec-Butylbenzene	40.0	42.1	105	80.0-126	
Styrene	40.0	42.1	105	80.0-123	
tert-Butylbenzene	40.0	40.5	101	79.0-129	
Tetrachloroethene	40.0	40.9	102	78.0-122	
Toluene	40.0	40.0	100	80.0-121	
trans-1,2-Dichloroethene	40.0	40.8	102	80.0-121	
trans-1,3-Dichloropropene	40.0	46.4	116	78.0-125	
Trichloroethene	40.0	38.9	97.2	78.0-121	
Trichlorofluoromethane	40.0	43.7	109	65.0-135	
Vinyl Chloride	40.0	43.1	108	72.0-124	
Xylenes, Total	120	121	101	80.0-121	
(S) 1,2-Dichloroethane-d4			*97.1*	*80.0-125*	
(S) 4-Bromofluorobenzene			*95.2*	*75.0-120*	
(S) Toluene-d8			*98.1*	*80.0-120*	

L1012954-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1012954-01 07/30/18 12:25 • (MS) R3329621-4 07/30/18 10:20 • (MSD) R3329621-5 07/30/18 10:45

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,1,1,2-Tetrachloroethane	40.0	U	42.2	41.9	106	105	1	75.0-125			0.852	30
1,1,1-Trichloroethane	40.0	U	43.1	41.4	108	104	1	75.0-125			3.95	30
1,1,2,2-Tetrachloroethane	40.0	U	39.4	39.7	98.5	99.2	1	75.0-125			0.656	30
1,1,2-Trichloroethane	40.0	U	39.7	39.4	99.2	98.4	1	75.0-125			0.811	30
1,1,2-Trichlorotrifluoroethane	40.0	U	39.8	38.4	99.6	96.1	1	75.0-125			3.53	30
1,1-Dichloroethane	40.0	U	40.6	38.8	101	97.0	1	75.0-125			4.46	30
1,1-Dichloroethene	40.0	U	40.4	39.0	101	97.5	1	69.0-136			3.39	30
1,1-Dichloropropene	40.0	U	40.6	38.9	101	97.4	1	75.0-125			4.10	30
1,2,3-Trichlorobenzene	40.0	U	40.4	40.5	101	101	1	51.0-132			0.116	30
1,2,3-Trichloropropane	40.0	U	41.9	40.4	105	101	1	75.0-125			3.57	30

L1012954-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1012954-01 07/30/18 12:25 • (MS) R3329621-4 07/30/18 10:20 • (MSD) R3329621-5 07/30/18 10:45

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,2,4-Trichlorobenzene	40.0	U	40.4	40.9	101	102	1	55.0-125			1.43	30
1,2,4-Trimethylbenzene	40.0	U	43.3	41.8	108	104	1	71.0-125			3.63	30
1,2-Dibromo-3-Chloropropane	100	U	109	111	109	111	1	69.0-130			2.08	30
1,2-Dibromoethane	40.0	U	42.2	41.5	106	104	1	75.0-125			1.79	30
1,2-Dichlorobenzene	40.0	0.255	40.6	41.1	101	102	1	75.0-125			1.18	30
1,2-Dichloroethane	40.0	U	41.9	40.5	105	101	1	75.0-125			3.26	30
1,2-Dichloropropane	40.0	U	38.5	37.7	96.1	94.2	1	75.0-125			2.00	30
1,3,5-Trimethylbenzene	40.0	U	43.3	41.8	108	104	1	70.0-125			3.68	30
1,3-Dichlorobenzene	40.0	U	42.8	41.2	107	103	1	70.0-125			3.77	30
1,3-Dichloropropane	40.0	U	40.5	39.7	101	99.2	1	75.0-125			2.01	30
1,4-Dichlorobenzene	40.0	U	39.9	39.6	99.7	99.1	1	73.0-125			0.657	30
2,2-Dichloropropane	40.0	U	44.5	43.9	111	110	1	74.0-125			1.45	30
2-Butanone (MEK)	200	U	194	194	96.9	97.2	1	63.0-141			0.283	30
2-Chlorotoluene	40.0	U	43.0	41.3	107	103	1	73.0-125			3.90	30
4-Chlorotoluene	40.0	U	43.1	41.5	108	104	1	73.0-125			3.83	30
4-Methyl-2-pentanone (MIBK)	200	U	211	212	106	106	1	66.0-138			0.431	30
Acetone	200	3.99	207	206	102	101	1	61.0-133			0.648	30
Acrolein	400	U	332	334	83.1	83.5	1	30.0-150			0.512	30
Acrylonitrile	400	U	397	399	99.3	99.8	1	74.0-131			0.467	30
Benzene	40.0	U	39.9	38.7	99.7	96.8	1	75.0-125			2.95	30
Bromobenzene	40.0	U	41.6	40.6	104	101	1	75.0-125			2.57	30
Bromodichloromethane	40.0	U	40.6	39.2	102	98.1	1	72.0-132			3.51	30
Bromoform	40.0	U	43.8	43.6	110	109	1	75.0-125			0.566	30
Bromomethane	40.0	U	24.4	44.0	60.9	110	1	30.0-150		J3	57.6	30
Carbon Tetrachloride	40.0	U	44.4	41.8	111	105	1	75.0-127			5.97	30
Chlorobenzene	40.0	U	40.4	39.5	101	98.7	1	75.0-125			2.22	30
Chloroethane	40.0	U	42.3	42.7	106	107	1	75.0-125			1.01	30
Chloroform	40.0	U	41.9	40.0	105	99.9	1	75.0-125			4.75	30
Chloromethane	40.0	U	41.8	41.1	104	103	1	54.0-125			1.78	30
Cis-1,2-Dichloroethene	40.0	1.02	41.9	40.0	102	97.4	1	75.0-125			4.83	30
Cis-1,3-Dichloropropene	40.0	U	42.4	41.5	106	104	1	75.0-125			2.00	30
Chlorodibromomethane	40.0	U	44.8	43.7	112	109	1	64.0-150			2.51	30
Dibromomethane	40.0	U	40.8	40.1	102	100	1	75.0-125			1.74	30
Dichlorodifluoromethane	40.0	U	18.9	42.9	47.2	107	1	44.0-144		J3	77.6	30
Di-isopropyl ether	40.0	U	40.4	39.4	101	98.5	1	75.0-125			2.38	30
Ethylbenzene	40.0	U	41.4	40.0	104	100	1	75.0-125			3.40	30
Hexachloro-1,3-butadiene	40.0	U	40.2	39.4	100	98.6	1	30.0-150			1.83	30
Isopropylbenzene	40.0	U	42.5	41.1	106	103	1	72.0-125			3.38	30
Methylene Chloride	40.0	U	37.7	37.1	94.3	92.7	1	75.0-125			1.71	30
Methyl tert-butyl ether	40.0	U	42.3	41.5	106	104	1	75.0-125			1.96	30

L1012954-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1012954-01 07/30/18 12:25 • (MS) R3329621-4 07/30/18 10:20 • (MSD) R3329621-5 07/30/18 10:45

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Naphthalene	40.0	0.202	40.4	41.6	101	104	1	61.0-132			2.90	30
n-Butylbenzene	40.0	U	40.7	40.2	102	101	1	53.0-129			1.10	30
n-Propylbenzene	40.0	U	41.1	40.2	103	101	1	70.0-125			2.24	30
p-Isopropyltoluene	40.0	U	40.4	40.5	101	101	1	61.0-125			0.0564	30
sec-Butylbenzene	40.0	U	43.1	41.3	108	103	1	61.0-125			4.10	30
Styrene	40.0	U	42.5	41.4	106	103	1	75.0-125			2.72	30
tert-Butylbenzene	40.0	0.389	41.6	39.8	103	98.5	1	66.0-125			4.54	30
Tetrachloroethene	40.0	0.303	42.1	40.1	104	99.6	1	68.0-126			4.77	30
Toluene	40.0	U	40.5	39.3	101	98.3	1	75.0-125			2.93	30
trans-1,2-Dichloroethene	40.0	2.33	43.9	41.8	104	98.8	1	73.0-127			4.71	30
trans-1,3-Dichloropropene	40.0	U	45.3	43.9	113	110	1	75.0-128			3.25	30
Trichloroethene	40.0	0.391	40.4	38.5	100	95.4	1	71.0-125			4.73	30
Trichlorofluoromethane	40.0	U	43.6	41.9	109	105	1	70.0-125			3.80	30
Vinyl Chloride	40.0	4.14	25.1	45.9	52.5	105	1	72.0-129	J6	J3	58.6	30
Xylenes, Total	120	U	123	120	103	100	1	75.0-125			2.47	30
(S) 1,2-Dichloroethane-d4					*99.4*	*96.3*		*80.0-125*				
(S) 4-Bromofluorobenzene					*96.3*	*95.5*		*75.0-120*				
(S) Toluene-d8					*98.0*	*96.9*		*80.0-120*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

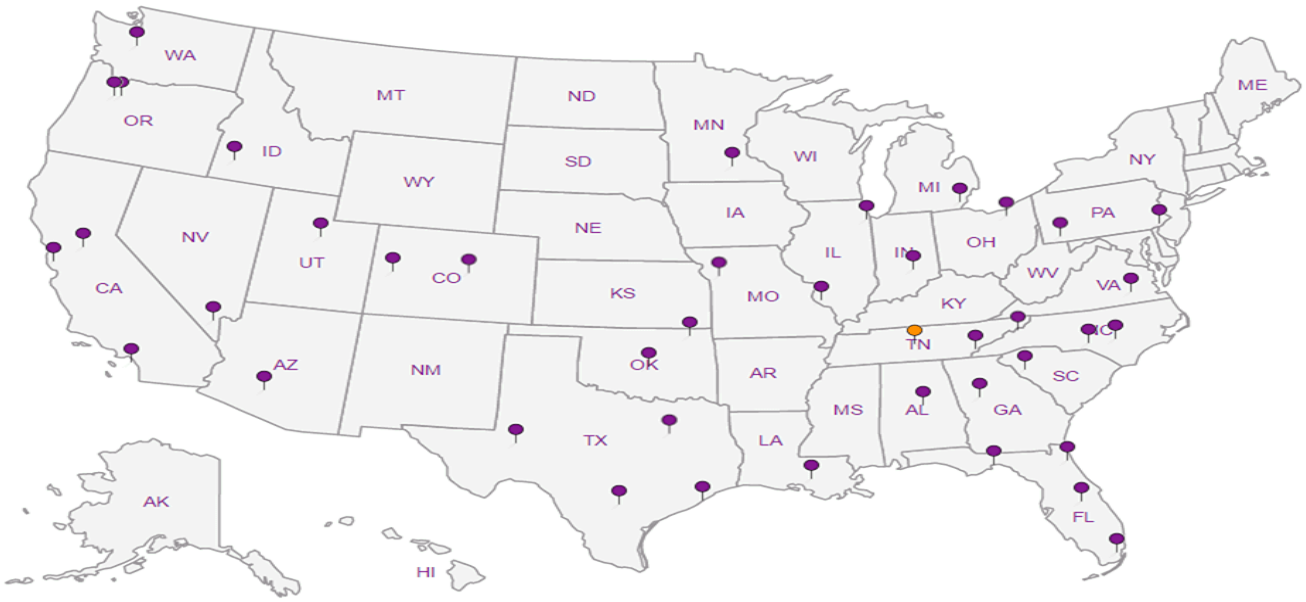
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Confluence Environmental, Inc.
3308 El Camino Ave, Suite 300 #148
Sacramento, CA 95821
916-760-7641 - main
916-473-8617 - fax
www.confluence-env.com

Chain of Custody

Project Name: Downtown Livermore Core

Job Number: IH1-180725

TAT: (STANDARD) 5 DAY 2 DAY 24 HOUR OTHER:

L1012954

Lab: ESC	Site Address: 20 South L St, Livermore CA	Confluence PM: Jason Brown
Address: 12065 Lebanon Road | Mt. Juliet, TN 37122	California Global ID No.:	Phone / Fax: 916-760-7641 / 916-473-8617
Contact: Brian Ford	Include EDF w/ Report: Yes No	Confluence Log Code: CESC
Phone/ Fax: 615.773.9772	Consultant / PM: Pangea / Morgan Gillies	Report to: Morgan Gillies / Jake Wilson
	Phone / Fax: (510) 836-3700	Invoice to: Pangea

	Sample ID	Time	Date	Matrix: Soil/Solid	Matrix: Water/Liquid	Matrix: Air	Laboratory No	No. of Containers	Preservative: Unpreserved	Preservative: H_2SO_4	Preservative: HNO_3	Preservative: HCl	Preservative: NaOH	Requested Analysis: VOCs 8260	Notes and Comments
	MW-3	0835	7/26/18		X			3				3		X	-01
	MW-2	0956	7/26/18		X			3				3		X	-02
	MW-4	1030	7/26/18		X			3				3		X	-03
	MW-1	1050	7/26/18		X			3				3		X	-04
	TB-1	—	7/26/18		X			1				1		X	-05

Sampler's Name: Ian Hultquist	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Confluence Environmental	[signature] / CEI	7/26/18	1525	[signature]	072718	1525
Shipment Date:						
Shipment Method:						

Special Instructions:

Cooler Receipt Form

Client:	Pangea	SDG#	402984
Cooler Received/Opened On:	7/27/18	Temperature:	8.4
Received By:	E Gaddess		
Signature:			

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?			X
COC Signed / Accurate?		X	
Bottles arrive intact?		X	
Correct bottles used?		X	
Sufficient volume sent?		X	
If Applicable			
VOA Zero headspace?		X	
Preservation Correct / Checked?			X

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

December 06, 2018

Pangea Environmental Serv - Oakland, CA

Sample Delivery Group:	L1048117
Samples Received:	11/29/2018
Project Number:	2165.002.215
Description:	Livermore MultiFamily

Report To:

Morgan Gillies
1710 Franklin Street
Suite 200
Oakland, CA 94612

Entire Report Reviewed By:

Brian Ford

Brian Ford
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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SGMF-1-5 L1048117-01 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	11/27/18 11:52	11/29/18 09:25

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1204642	1	12/03/18 16:21	12/03/18 16:21	MBF

SGMF-2-5 L1048117-02 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	11/27/18 13:15	11/29/18 09:25

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1204642	1	12/03/18 17:12	12/03/18 17:12	MBF

SGMF-2-15 L1048117-03 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	11/27/18 13:42	11/29/18 09:25

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1204642	1	12/03/18 18:00	12/03/18 18:00	MBF
Volatile Organic Compounds (MS) by Method TO-15	WG1205170	20	12/04/18 17:51	12/04/18 17:51	MBF

SGMF-2-25 L1048117-04 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	11/27/18 15:23	11/29/18 09:25

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1204642	1	12/03/18 18:49	12/03/18 18:49	MBF
Volatile Organic Compounds (MS) by Method TO-15	WG1205170	25	12/04/18 18:32	12/04/18 18:32	MBF

SGMF-3-15 L1048117-05 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	11/28/18 09:46	11/29/18 09:25

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1204642	1	12/03/18 19:39	12/03/18 19:39	MBF
Volatile Organic Compounds (MS) by Method TO-15	WG1205170	25	12/04/18 19:13	12/04/18 19:13	MBF

SGMF-3-25 L1048117-06 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	11/28/18 10:07	11/29/18 09:25

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1204642	1	12/03/18 20:32	12/03/18 20:32	MBF
Volatile Organic Compounds (MS) by Method TO-15	WG1205170	25	12/04/18 19:55	12/04/18 19:55	MBF

SGMF-4-5 L1048117-07 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	11/28/18 11:02	11/29/18 09:25

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1204642	1	12/03/18 21:21	12/03/18 21:21	MBF
Volatile Organic Compounds (MS) by Method TO-15	WG1205170	10	12/04/18 20:36	12/04/18 20:36	MBF

SGMF-4-15 L1048117-08 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	11/28/18 11:29	11/29/18 09:25

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1204642	1	12/03/18 22:16	12/03/18 22:16	MBF
Volatile Organic Compounds (MS) by Method TO-15	WG1205170	25	12/04/18 21:18	12/04/18 21:18	MBF

SHROUD L1048117-09 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	11/28/18 11:29	11/29/18 09:25

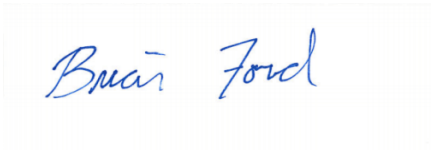
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1205832	2500	12/05/18 12:05	12/05/18 12:05	MBF

SGMF-4-25 L1048117-10 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	11/28/18 11:59	11/29/18 09:25

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1204642	1	12/03/18 23:06	12/03/18 23:06	MBF
Volatile Organic Compounds (MS) by Method TO-15	WG1205170	25	12/04/18 21:59	12/04/18 21:59	MBF

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Brian Ford
Project Manager

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	4.34	10.3		1	WG1204642
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1204642
Benzene	71-43-2	78.10	0.200	0.639	ND	ND		1	WG1204642
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1204642
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1204642
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1204642
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1204642
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1204642
Carbon disulfide	75-15-0	76.10	0.200	0.622	2.84	8.85		1	WG1204642
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1204642
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1204642
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1204642
Chloroform	67-66-3	119	0.200	0.973	0.909	4.43		1	WG1204642
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1204642
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1204642
Cyclohexane	110-82-7	84.20	0.200	0.689	ND	ND		1	WG1204642
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1204642
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1204642
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1204642
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1204642
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1204642
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1204642
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1204642
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1204642
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1204642
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1204642
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1204642
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1204642
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1204642
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1204642
Ethanol	64-17-5	46.10	0.630	1.19	3.50	6.59		1	WG1204642
Ethylbenzene	100-41-4	106	0.200	0.867	0.503	2.18		1	WG1204642
4-Ethyltoluene	622-96-8	120	0.200	0.982	1.33	6.51		1	WG1204642
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.264	1.49		1	WG1204642
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.297	1.47		1	WG1204642
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1204642
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1204642
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1204642
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1204642
n-Hexane	110-54-3	86.20	0.200	0.705	ND	ND		1	WG1204642
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1204642
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.209	0.727		1	WG1204642
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1204642
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	1.31	3.88		1	WG1204642
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1204642
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1204642
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1204642
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1204642
2-Propanol	67-63-0	60.10	1.25	3.07	2.89	7.11		1	WG1204642
Propene	115-07-1	42.10	0.400	0.689	ND	ND		1	WG1204642
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1204642
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1204642
Tetrachloroethylene	127-18-4	166	0.200	1.36	8.33	56.5		1	WG1204642
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1204642
Toluene	108-88-3	92.10	0.200	0.753	0.363	1.37		1	WG1204642
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1204642

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1204642
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1204642
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1204642
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	2.27	11.2		1	WG1204642
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	0.288	1.41		1	WG1204642
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG1204642
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1204642
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1204642
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1204642
m&p-Xylene	1330-20-7	106	0.400	1.73	1.82	7.88		1	WG1204642
o-Xylene	95-47-6	106	0.200	0.867	1.52	6.57		1	WG1204642
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	ND	ND		1	WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*94.4*				WG1204642

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	2.62	6.22		1	WG1204642
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1204642
Benzene	71-43-2	78.10	0.200	0.639	ND	ND		1	WG1204642
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1204642
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1204642
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1204642
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1204642
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1204642
Carbon disulfide	75-15-0	76.10	0.200	0.622	0.955	2.97		1	WG1204642
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1204642
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1204642
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1204642
Chloroform	67-66-3	119	0.200	0.973	0.580	2.82		1	WG1204642
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1204642
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1204642
Cyclohexane	110-82-7	84.20	0.200	0.689	ND	ND		1	WG1204642
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1204642
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1204642
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1204642
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1204642
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1204642
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1204642
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1204642
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1204642
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1204642
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1204642
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1204642
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1204642
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1204642
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1204642
Ethanol	64-17-5	46.10	0.630	1.19	0.969	1.83		1	WG1204642
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG1204642
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1204642
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.316	1.77		1	WG1204642
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.497	2.46		1	WG1204642
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1204642
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1204642
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1204642
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1204642
n-Hexane	110-54-3	86.20	0.200	0.705	ND	ND		1	WG1204642
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1204642
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG1204642
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1204642
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG1204642
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1204642
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1204642
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1204642
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1204642
2-Propanol	67-63-0	60.10	1.25	3.07	15.8	38.9		1	WG1204642
Propene	115-07-1	42.10	0.400	0.689	0.475	0.818		1	WG1204642
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1204642
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1204642
Tetrachloroethylene	127-18-4	166	0.200	1.36	16.0	108		1	WG1204642
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1204642
Toluene	108-88-3	92.10	0.200	0.753	ND	ND		1	WG1204642
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1204642

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	0.271	1.47		1	WG1204642
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1204642
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1204642
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	ND	ND		1	WG1204642
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1204642
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG1204642
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1204642
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1204642
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1204642
m&p-Xylene	1330-20-7	106	0.400	1.73	ND	ND		1	WG1204642
o-Xylene	95-47-6	106	0.200	0.867	ND	ND		1	WG1204642
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	ND	ND		1	WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*99.1*				WG1204642

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	4.37	10.4		1	WG1204642
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1204642
Benzene	71-43-2	78.10	0.200	0.639	0.600	1.92		1	WG1204642
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1204642
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1204642
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1204642
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1204642
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1204642
Carbon disulfide	75-15-0	76.10	0.200	0.622	16.7	52.1		1	WG1204642
Carbon tetrachloride	56-23-5	154	0.200	1.26	0.843	5.31		1	WG1204642
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1204642
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1204642
Chloroform	67-66-3	119	0.200	0.973	1.79	8.70		1	WG1204642
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1204642
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1204642
Cyclohexane	110-82-7	84.20	0.200	0.689	0.362	1.25		1	WG1204642
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1204642
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1204642
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1204642
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1204642
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1204642
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1204642
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1204642
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1204642
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1204642
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1204642
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1204642
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1204642
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1204642
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1204642
Ethanol	64-17-5	46.10	0.630	1.19	2.50	4.71		1	WG1204642
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG1204642
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1204642
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.513	2.88		1	WG1204642
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.724	3.58		1	WG1204642
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1204642
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1204642
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1204642
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1204642
n-Hexane	110-54-3	86.20	0.200	0.705	ND	ND		1	WG1204642
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1204642
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.208	0.722		1	WG1204642
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1204642
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG1204642
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1204642
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1204642
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1204642
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1204642
2-Propanol	67-63-0	60.10	1.25	3.07	ND	ND		1	WG1204642
Propene	115-07-1	42.10	0.400	0.689	10.9	18.8		1	WG1204642
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1204642
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1204642
Tetrachloroethylene	127-18-4	166	4.00	27.2	119	809		20	WG1205170
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1204642
Toluene	108-88-3	92.10	0.200	0.753	0.544	2.05		1	WG1204642
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1204642

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	0.934	5.08		1	WG1204642
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1204642
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1204642
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	ND	ND		1	WG1204642
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1204642
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG1204642
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1204642
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1204642
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1204642
m&p-Xylene	1330-20-7	106	0.400	1.73	ND	ND		1	WG1204642
o-Xylene	95-47-6	106	0.200	0.867	ND	ND		1	WG1204642
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	232	960		1	WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*93.5*				WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*72.3*				WG1205170

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	7.84	18.6		1	WG1204642
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1204642
Benzene	71-43-2	78.10	0.200	0.639	18.1	57.7		1	WG1204642
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1204642
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1204642
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1204642
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1204642
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1204642
Carbon disulfide	75-15-0	76.10	5.00	15.6	40.6	126		25	WG1205170
Carbon tetrachloride	56-23-5	154	0.200	1.26	1.17	7.39		1	WG1204642
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1204642
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1204642
Chloroform	67-66-3	119	0.200	0.973	5.57	27.1		1	WG1204642
Chloromethane	74-87-3	50.50	0.200	0.413	0.631	1.30		1	WG1204642
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1204642
Cyclohexane	110-82-7	84.20	0.200	0.689	44.4	153		1	WG1204642
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1204642
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1204642
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1204642
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1204642
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1204642
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1204642
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1204642
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1204642
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1204642
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1204642
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1204642
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1204642
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1204642
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1204642
Ethanol	64-17-5	46.10	0.630	1.19	4.81	9.06		1	WG1204642
Ethylbenzene	100-41-4	106	0.200	0.867	0.253	1.10		1	WG1204642
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1204642
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.527	2.96		1	WG1204642
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.657	3.25		1	WG1204642
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1204642
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1204642
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1204642
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1204642
n-Hexane	110-54-3	86.20	0.200	0.705	2.65	9.34		1	WG1204642
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1204642
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.695	2.41		1	WG1204642
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1204642
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	1.38	4.08		1	WG1204642
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1204642
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1204642
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1204642
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1204642
2-Propanol	67-63-0	60.10	1.25	3.07	3.35	8.23		1	WG1204642
Propene	115-07-1	42.10	10.0	17.2	228	392		25	WG1205170
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1204642
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1204642
Tetrachloroethylene	127-18-4	166	5.00	33.9	272	1850		25	WG1205170
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1204642
Toluene	108-88-3	92.10	0.200	0.753	2.74	10.3		1	WG1204642
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1204642

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	1.20	6.50		1	WG1204642
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1204642
Trichloroethylene	79-01-6	131	0.200	1.07	0.722	3.87		1	WG1204642
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.216	1.06		1	WG1204642
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1204642
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	15.1	70.3		1	WG1204642
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1204642
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1204642
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1204642
m&p-Xylene	1330-20-7	106	0.400	1.73	0.511	2.21		1	WG1204642
o-Xylene	95-47-6	106	0.200	0.867	ND	ND		1	WG1204642
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	937	3870		1	WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*103*				WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*72.6*				WG1205170

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	3.91	9.28		1	WG1204642
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1204642
Benzene	71-43-2	78.10	0.200	0.639	0.654	2.09		1	WG1204642
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1204642
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1204642
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1204642
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1204642
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1204642
Carbon disulfide	75-15-0	76.10	0.200	0.622	6.55	20.4		1	WG1204642
Carbon tetrachloride	56-23-5	154	0.200	1.26	0.238	1.50		1	WG1204642
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1204642
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1204642
Chloroform	67-66-3	119	0.200	0.973	0.506	2.46		1	WG1204642
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1204642
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1204642
Cyclohexane	110-82-7	84.20	0.200	0.689	0.267	0.919		1	WG1204642
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1204642
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1204642
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1204642
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1204642
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1204642
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1204642
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1204642
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1204642
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1204642
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1204642
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1204642
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1204642
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1204642
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1204642
Ethanol	64-17-5	46.10	0.630	1.19	3.31	6.23		1	WG1204642
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG1204642
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1204642
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.446	2.51		1	WG1204642
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.349	1.73		1	WG1204642
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1204642
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1204642
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1204642
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1204642
n-Hexane	110-54-3	86.20	0.200	0.705	0.252	0.888		1	WG1204642
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1204642
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.318	1.10		1	WG1204642
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1204642
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG1204642
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1204642
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1204642
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1204642
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1204642
2-Propanol	67-63-0	60.10	1.25	3.07	11.7	28.7		1	WG1204642
Propene	115-07-1	42.10	0.400	0.689	3.99	6.86		1	WG1204642
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1204642
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1204642
Tetrachloroethylene	127-18-4	166	5.00	33.9	274	1860		25	WG1205170
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1204642
Toluene	108-88-3	92.10	0.200	0.753	1.52	5.74		1	WG1204642
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1204642

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	0.559	3.04		1	WG1204642
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1204642
Trichloroethylene	79-01-6	131	0.200	1.07	0.261	1.40		1	WG1204642
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	ND	ND		1	WG1204642
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1204642
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG1204642
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1204642
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1204642
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1204642
m&p-Xylene	1330-20-7	106	0.400	1.73	ND	ND		1	WG1204642
o-Xylene	95-47-6	106	0.200	0.867	0.697	3.02		1	WG1204642
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	516	2130		1	WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*97.4*				WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*71.4*				WG1205170

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	3.75	8.90		1	WG1204642
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1204642
Benzene	71-43-2	78.10	0.200	0.639	1.55	4.97		1	WG1204642
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1204642
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1204642
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1204642
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1204642
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1204642
Carbon disulfide	75-15-0	76.10	0.200	0.622	10.8	33.7		1	WG1204642
Carbon tetrachloride	56-23-5	154	0.200	1.26	0.856	5.39		1	WG1204642
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1204642
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1204642
Chloroform	67-66-3	119	0.200	0.973	0.319	1.55		1	WG1204642
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1204642
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1204642
Cyclohexane	110-82-7	84.20	0.200	0.689	0.827	2.85		1	WG1204642
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1204642
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1204642
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1204642
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1204642
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1204642
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1204642
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1204642
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1204642
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1204642
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1204642
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1204642
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1204642
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1204642
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1204642
Ethanol	64-17-5	46.10	0.630	1.19	1.46	2.74		1	WG1204642
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG1204642
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1204642
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.504	2.83		1	WG1204642
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.341	1.69		1	WG1204642
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1204642
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1204642
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1204642
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1204642
n-Hexane	110-54-3	86.20	0.200	0.705	ND	ND		1	WG1204642
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1204642
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.250	0.867		1	WG1204642
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1204642
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	1.41	4.16		1	WG1204642
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1204642
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1204642
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1204642
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1204642
2-Propanol	67-63-0	60.10	1.25	3.07	1.98	4.86		1	WG1204642
Propene	115-07-1	42.10	10.0	17.2	49.1	84.6		25	WG1205170
Styrene	100-42-5	104	0.200	0.851	0.290	1.23		1	WG1204642
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1204642
Tetrachloroethylene	127-18-4	166	5.00	33.9	787	5340		25	WG1205170
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1204642
Toluene	108-88-3	92.10	0.200	0.753	0.249	0.937		1	WG1204642
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1204642

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	0.570	3.10		1	WG1204642
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1204642
Trichloroethylene	79-01-6	131	0.200	1.07	1.34	7.16		1	WG1204642
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	ND	ND		1	WG1204642
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1204642
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG1204642
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1204642
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1204642
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1204642
m&p-Xylene	1330-20-7	106	0.400	1.73	ND	ND		1	WG1204642
o-Xylene	95-47-6	106	0.200	0.867	ND	ND		1	WG1204642
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	891	3680		1	WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*95.8*				WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*69.7*				WG1205170

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	2.90	6.90		1	WG1204642
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1204642
Benzene	71-43-2	78.10	0.200	0.639	0.270	0.863		1	WG1204642
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1204642
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1204642
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1204642
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1204642
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1204642
Carbon disulfide	75-15-0	76.10	0.200	0.622	3.18	9.90		1	WG1204642
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1204642
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1204642
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1204642
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1204642
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1204642
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1204642
Cyclohexane	110-82-7	84.20	0.200	0.689	ND	ND		1	WG1204642
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1204642
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1204642
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1204642
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1204642
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1204642
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1204642
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1204642
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1204642
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1204642
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1204642
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1204642
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1204642
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1204642
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1204642
Ethanol	64-17-5	46.10	0.630	1.19	5.65	10.7		1	WG1204642
Ethylbenzene	100-41-4	106	0.200	0.867	0.966	4.19		1	WG1204642
4-Ethyltoluene	622-96-8	120	0.200	0.982	0.719	3.53		1	WG1204642
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.256	1.44		1	WG1204642
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.288	1.42		1	WG1204642
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1204642
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1204642
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1204642
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1204642
n-Hexane	110-54-3	86.20	0.200	0.705	0.455	1.60		1	WG1204642
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1204642
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.704	2.45		1	WG1204642
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1204642
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	2.01	5.94		1	WG1204642
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1204642
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1204642
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1204642
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1204642
2-Propanol	67-63-0	60.10	1.25	3.07	5.88	14.5		1	WG1204642
Propene	115-07-1	42.10	0.400	0.689	1.11	1.92		1	WG1204642
Styrene	100-42-5	104	0.200	0.851	0.366	1.56		1	WG1204642
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1204642
Tetrachloroethylene	127-18-4	166	2.00	13.6	57.1	387		10	WG1205170
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1204642
Toluene	108-88-3	92.10	0.200	0.753	0.555	2.09		1	WG1204642
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1204642

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1204642
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1204642
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1204642
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	1.37	6.74		1	WG1204642
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	0.308	1.51		1	WG1204642
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG1204642
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1204642
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1204642
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1204642
m&p-Xylene	1330-20-7	106	0.400	1.73	3.57	15.5		1	WG1204642
o-Xylene	95-47-6	106	0.200	0.867	1.28	5.53		1	WG1204642
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	148	611		1	WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*93.9*				WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*74.6*				WG1205170

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	9.12	21.7		1	WG1204642
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1204642
Benzene	71-43-2	78.10	0.200	0.639	1.11	3.55		1	WG1204642
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1204642
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1204642
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1204642
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1204642
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1204642
Carbon disulfide	75-15-0	76.10	0.200	0.622	9.91	30.9		1	WG1204642
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1204642
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1204642
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1204642
Chloroform	67-66-3	119	0.200	0.973	1.01	4.92		1	WG1204642
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1204642
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1204642
Cyclohexane	110-82-7	84.20	0.200	0.689	0.249	0.857		1	WG1204642
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1204642
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1204642
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1204642
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1204642
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1204642
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1204642
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1204642
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1204642
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1204642
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1204642
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1204642
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1204642
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1204642
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1204642
Ethanol	64-17-5	46.10	0.630	1.19	5.51	10.4		1	WG1204642
Ethylbenzene	100-41-4	106	0.200	0.867	2.44	10.6		1	WG1204642
4-Ethyltoluene	622-96-8	120	0.200	0.982	2.81	13.8		1	WG1204642
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.293	1.65		1	WG1204642
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.258	1.28		1	WG1204642
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1204642
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1204642
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1204642
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1204642
n-Hexane	110-54-3	86.20	0.200	0.705	0.472	1.67		1	WG1204642
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1204642
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.204	0.707		1	WG1204642
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1204642
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	2.81	8.28		1	WG1204642
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1204642
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1204642
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1204642
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1204642
2-Propanol	67-63-0	60.10	1.25	3.07	39.1	96.1		1	WG1204642
Propene	115-07-1	42.10	0.400	0.689	3.06	5.26		1	WG1204642
Styrene	100-42-5	104	0.200	0.851	0.955	4.06		1	WG1204642
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1204642
Tetrachloroethylene	127-18-4	166	5.00	33.9	158	1070		25	WG1205170
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1204642
Toluene	108-88-3	92.10	0.200	0.753	4.14	15.6		1	WG1204642
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1204642

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	0.528	2.87		1	WG1204642
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1204642
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1204642
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	3.11	15.3		1	WG1204642
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	0.821	4.03		1	WG1204642
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	0.244	1.14		1	WG1204642
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1204642
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1204642
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1204642
m&p-Xylene	1330-20-7	106	0.400	1.73	8.67	37.6		1	WG1204642
o-Xylene	95-47-6	106	0.200	0.867	3.42	14.8		1	WG1204642
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	372	1540		1	WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*95.2*				WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*73.1*				WG1205170

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
2-Propanol	67-63-0	60.10	3120	7670	60900	150000		2500	WG1205832
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*64.2*				WG1205832

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	3.89	9.24		1	WG1204642
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1204642
Benzene	71-43-2	78.10	0.200	0.639	4.42	14.1		1	WG1204642
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1204642
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1204642
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1204642
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1204642
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1204642
Carbon disulfide	75-15-0	76.10	5.00	15.6	101	314		25	WG1205170
Carbon tetrachloride	56-23-5	154	0.200	1.26	0.278	1.75		1	WG1204642
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1204642
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1204642
Chloroform	67-66-3	119	0.200	0.973	9.26	45.1		1	WG1204642
Chloromethane	74-87-3	50.50	0.200	0.413	0.277	0.571		1	WG1204642
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1204642
Cyclohexane	110-82-7	84.20	0.200	0.689	6.45	22.2		1	WG1204642
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1204642
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1204642
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1204642
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1204642
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1204642
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1204642
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1204642
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1204642
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1204642
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	0.209	0.826		1	WG1204642
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1204642
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1204642
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1204642
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1204642
Ethanol	64-17-5	46.10	0.630	1.19	2.83	5.33		1	WG1204642
Ethylbenzene	100-41-4	106	0.200	0.867	5.09	22.1		1	WG1204642
4-Ethyltoluene	622-96-8	120	0.200	0.982	1.15	5.66		1	WG1204642
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.323	1.82		1	WG1204642
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.239	1.18		1	WG1204642
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1204642
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1204642
Heptane	142-82-5	100	0.200	0.818	1.03	4.21		1	WG1204642
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1204642
n-Hexane	110-54-3	86.20	0.200	0.705	4.09	14.4		1	WG1204642
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1204642
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.307	1.06		1	WG1204642
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1204642
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG1204642
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1204642
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1204642
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1204642
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1204642
2-Propanol	67-63-0	60.10	1.25	3.07	3.20	7.87		1	WG1204642
Propene	115-07-1	42.10	10.0	17.2	55.1	94.9		25	WG1205170
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1204642
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1204642
Tetrachloroethylene	127-18-4	166	5.00	33.9	489	3320		25	WG1205170
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1204642
Toluene	108-88-3	92.10	0.200	0.753	27.1	102		1	WG1204642
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1204642

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	0.492	2.68		1	WG1204642
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1204642
Trichloroethylene	79-01-6	131	0.200	1.07	2.24	12.0		1	WG1204642
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	1.84	9.02		1	WG1204642
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	1.19	5.86		1	WG1204642
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	4.45	20.8		1	WG1204642
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1204642
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1204642
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1204642
m&p-Xylene	1330-20-7	106	0.400	1.73	13.3	57.9		1	WG1204642
o-Xylene	95-47-6	106	0.200	0.867	3.94	17.1		1	WG1204642
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	987	4080		1	WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*103*				WG1204642
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*79.4*				WG1205170

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3365121-3 12/03/18 10:24

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Acetone	U		0.0569	1.25
Allyl Chloride	U		0.0546	0.200
Benzene	U		0.0460	0.200
Benzyl Chloride	U		0.0598	0.200
Bromodichloromethane	U		0.0436	0.200
Bromoform	U		0.0786	0.600
Bromomethane	U		0.0609	0.200
1,3-Butadiene	U		0.0563	2.00
Carbon disulfide	U		0.0544	0.200
Carbon tetrachloride	U		0.0585	0.200
Chlorobenzene	U		0.0601	0.200
Chloroethane	U		0.0489	0.200
Chloroform	U		0.0574	0.200
Chloromethane	U		0.0544	0.200
2-Chlorotoluene	U		0.0605	0.200
Cyclohexane	U		0.0534	0.200
Dibromochloromethane	U		0.0494	0.200
1,2-Dibromoethane	U		0.0185	0.200
1,2-Dichlorobenzene	U		0.0603	0.200
1,3-Dichlorobenzene	U		0.0597	0.200
1,4-Dichlorobenzene	U		0.0557	0.200
1,2-Dichloroethane	U		0.0616	0.200
1,1-Dichloroethane	U		0.0514	0.200
1,1-Dichloroethene	U		0.0490	0.200
cis-1,2-Dichloroethene	U		0.0389	0.200
trans-1,2-Dichloroethene	U		0.0464	0.200
1,2-Dichloropropane	U		0.0599	0.200
cis-1,3-Dichloropropene	U		0.0588	0.200
trans-1,3-Dichloropropene	U		0.0435	0.200
1,4-Dioxane	U		0.0554	0.200
Ethylbenzene	U		0.0506	0.200
4-Ethyltoluene	U		0.0666	0.200
Trichlorofluoromethane	U		0.0673	0.200
Dichlorodifluoromethane	U		0.0601	0.200
1,1,2-Trichlorotrifluoroethane	U		0.0687	0.200
1,2-Dichlorotetrafluoroethane	U		0.0458	0.200
Heptane	U		0.0626	0.200
Hexachloro-1,3-butadiene	U		0.0656	0.630
n-Hexane	U		0.0457	0.200
Isopropylbenzene	U		0.0563	0.200

Method Blank (MB)

(MB) R3365121-3 12/03/18 10:24

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Methylene Chloride	U		0.0465	0.200
Methyl Butyl Ketone	U		0.0682	1.25
2-Butanone (MEK)	U		0.0493	1.25
4-Methyl-2-pentanone (MIBK)	U		0.0650	1.25
Methyl Methacrylate	U		0.0773	0.200
MTBE	U		0.0505	0.200
Naphthalene	U		0.154	0.630
2-Propanol	U		0.0882	1.25
Propene	U		0.0932	0.400
Styrene	U		0.0465	0.200
1,1,2,2-Tetrachloroethane	U		0.0576	0.200
Tetrachloroethylene	U		0.0497	0.200
Tetrahydrofuran	U		0.0508	0.200
Toluene	U		0.0499	0.200
1,2,4-Trichlorobenzene	U		0.148	0.630
1,1,1-Trichloroethane	U		0.0665	0.200
1,1,2-Trichloroethane	U		0.0287	0.200
Trichloroethylene	U		0.0545	0.200
1,2,4-Trimethylbenzene	U		0.0483	0.200
1,3,5-Trimethylbenzene	U		0.0631	0.200
2,2,4-Trimethylpentane	U		0.0456	0.200
Vinyl chloride	U		0.0457	0.200
Vinyl Bromide	U		0.0727	0.200
Vinyl acetate	U		0.0639	0.200
m&p-Xylene	U		0.0946	0.400
o-Xylene	U		0.0633	0.200
Ethanol	U		0.0832	0.630
TPH (GC/MS) Low Fraction	11.1	J	6.91	50.0
(S) 1,4-Bromofluorobenzene	*94.8*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3365121-1 12/03/18 08:55 • (LCSD) R3365121-2 12/03/18 09:37

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	4.26	4.35	114	116	55.0-148			1.95	25
Propene	3.75	4.00	3.99	107	106	64.0-144			0.0465	25
Dichlorodifluoromethane	3.75	3.94	3.97	105	106	64.0-139			0.796	25
1,2-Dichlorotetrafluoroethane	3.75	4.17	4.27	111	114	70.0-130			2.31	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3365121-1 12/03/18 08:55 • (LCSD) R3365121-2 12/03/18 09:37

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloromethane	3.75	3.99	4.11	106	110	70.0-130			2.88	25
Vinyl chloride	3.75	4.04	4.08	108	109	70.0-130			0.973	25
1,3-Butadiene	3.75	4.18	4.01	112	107	70.0-130			4.17	25
Bromomethane	3.75	4.22	4.29	113	114	70.0-130			1.47	25
Chloroethane	3.75	4.24	4.12	113	110	70.0-130			2.79	25
Trichlorofluoromethane	3.75	4.01	4.06	107	108	70.0-130			1.23	25
1,1,2-Trichlorotrifluoroethane	3.75	3.96	4.06	106	108	70.0-130			2.36	25
1,1-Dichloroethene	3.75	3.96	4.00	105	107	70.0-130			0.992	25
1,1-Dichloroethane	3.75	3.96	4.05	106	108	70.0-130			2.12	25
Acetone	3.75	4.08	4.16	109	111	70.0-130			1.94	25
2-Propanol	3.75	4.09	4.16	109	111	70.0-139			1.68	25
Carbon disulfide	3.75	3.92	4.02	105	107	70.0-130			2.38	25
Methylene Chloride	3.75	3.73	3.78	99.5	101	70.0-130			1.16	25
MTBE	3.75	3.98	4.06	106	108	70.0-130			2.11	25
trans-1,2-Dichloroethene	3.75	3.95	4.02	105	107	70.0-130			1.77	25
n-Hexane	3.75	4.14	4.12	110	110	70.0-130			0.509	25
Vinyl acetate	3.75	4.14	4.24	110	113	70.0-130			2.27	25
Methyl Ethyl Ketone	3.75	4.03	4.14	108	110	70.0-130			2.60	25
cis-1,2-Dichloroethene	3.75	4.00	4.00	107	107	70.0-130			0.135	25
Chloroform	3.75	3.95	3.97	105	106	70.0-130			0.466	25
Cyclohexane	3.75	4.06	4.18	108	111	70.0-130			3.05	25
1,1,1-Trichloroethane	3.75	3.96	4.02	105	107	70.0-130			1.62	25
Carbon tetrachloride	3.75	3.90	3.94	104	105	70.0-130			1.09	25
Benzene	3.75	4.16	4.01	111	107	70.0-130			3.74	25
1,2-Dichloroethane	3.75	3.99	3.89	106	104	70.0-130			2.58	25
Heptane	3.75	4.38	4.16	117	111	70.0-130			5.09	25
Trichloroethylene	3.75	3.98	3.96	106	105	70.0-130			0.730	25
1,2-Dichloropropane	3.75	3.94	3.97	105	106	70.0-130			0.771	25
1,4-Dioxane	3.75	4.10	4.08	109	109	70.0-140			0.454	25
Bromodichloromethane	3.75	3.96	3.97	106	106	70.0-130			0.0788	25
cis-1,3-Dichloropropene	3.75	4.04	4.03	108	107	70.0-130			0.263	25
4-Methyl-2-pentanone (MIBK)	3.75	4.08	3.93	109	105	70.0-139			3.87	25
Toluene	3.75	4.12	3.92	110	104	70.0-130			4.96	25
trans-1,3-Dichloropropene	3.75	4.07	3.85	109	103	70.0-130			5.56	25
1,1,2-Trichloroethane	3.75	4.08	3.88	109	104	70.0-130			4.97	25
Tetrachloroethylene	3.75	4.14	4.02	110	107	70.0-130			2.70	25
Methyl Butyl Ketone	3.75	4.25	4.04	113	108	70.0-149			5.04	25
Dibromochloromethane	3.75	4.09	3.91	109	104	70.0-130			4.50	25
1,2-Dibromoethane	3.75	4.13	3.93	110	105	70.0-130			5.01	25
Chlorobenzene	3.75	4.14	4.00	110	107	70.0-130			3.49	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3365121-1 12/03/18 08:55 • (LCSD) R3365121-2 12/03/18 09:37

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethylbenzene	3.75	4.16	4.13	111	110	70.0-130			0.763	25
m&p-Xylene	7.50	8.41	8.32	112	111	70.0-130			1.11	25
o-Xylene	3.75	4.20	4.15	112	111	70.0-130			1.02	25
Styrene	3.75	4.32	4.28	115	114	70.0-130			0.845	25
Bromoform	3.75	4.27	4.17	114	111	70.0-130			2.33	25
1,1,2,2-Tetrachloroethane	3.75	4.08	3.97	109	106	70.0-130			2.54	25
4-Ethyltoluene	3.75	4.19	4.11	112	110	70.0-130			1.80	25
1,3,5-Trimethylbenzene	3.75	4.17	4.05	111	108	70.0-130			2.81	25
1,2,4-Trimethylbenzene	3.75	4.29	4.09	114	109	70.0-130			4.70	25
1,3-Dichlorobenzene	3.75	4.26	4.11	114	110	70.0-130			3.46	25
1,4-Dichlorobenzene	3.75	4.25	4.11	113	109	70.0-130			3.38	25
Benzyl Chloride	3.75	4.38	4.15	117	111	70.0-152			5.37	25
1,2-Dichlorobenzene	3.75	4.22	4.07	113	109	70.0-130			3.71	25
1,2,4-Trichlorobenzene	3.75	4.54	4.40	121	117	70.0-160			3.13	25
Hexachloro-1,3-butadiene	3.75	4.20	4.03	112	107	70.0-151			4.13	25
Naphthalene	3.75	4.91	4.70	131	125	70.0-159			4.23	25
TPH (GC/MS) Low Fraction	203	216	216	107	107	70.0-130			0.0988	25
Allyl Chloride	3.75	4.12	4.07	110	108	70.0-130			1.18	25
2-Chlorotoluene	3.75	4.27	4.20	114	112	70.0-130			1.65	25
Methyl Methacrylate	3.75	4.09	4.09	109	109	70.0-130			0.159	25
Tetrahydrofuran	3.75	4.02	4.05	107	108	70.0-137			0.815	25
2,2,4-Trimethylpentane	3.75	4.19	4.24	112	113	70.0-130			1.17	25
Vinyl Bromide	3.75	4.18	4.30	111	115	70.0-130			2.84	25
Isopropylbenzene	3.75	4.19	4.11	112	110	70.0-130			2.09	25
(S) 1,4-Bromofluorobenzene				*99.3*	*97.5*	*60.0-140*				

Method Blank (MB)

(MB) R3365167-3 12/04/18 10:56

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Carbon disulfide	U		0.0544	0.200
Propene	U		0.0932	0.400
Tetrachloroethylene	U		0.0497	0.200
(S) 1,4-Bromofluorobenzene	*76.0*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3365167-1 12/04/18 09:27 • (LCSD) R3365167-2 12/04/18 10:11

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Propene	3.75	3.67	3.73	97.8	99.4	64.0-144			1.58	25
Carbon disulfide	3.75	3.64	3.70	97.1	98.6	70.0-130			1.48	25
Tetrachloroethylene	3.75	4.30	4.36	115	116	70.0-130			1.40	25
(S) 1,4-Bromofluorobenzene				*94.8*	*96.1*	*60.0-140*				

Method Blank (MB)

(MB) R3365659-2 12/05/18 10:18

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
2-Propanol	U		0.0882	1.25
(S) 1,4-Bromofluorobenzene	*70.9*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3365659-1 12/05/18 09:33 • (LCSD) R3365659-3 12/05/18 11:02

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
2-Propanol	3.75	4.15	4.10	111	109	70.0-139			1.20	25
(S) 1,4-Bromofluorobenzene				*93.5*	*93.3*	*60.0-140*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

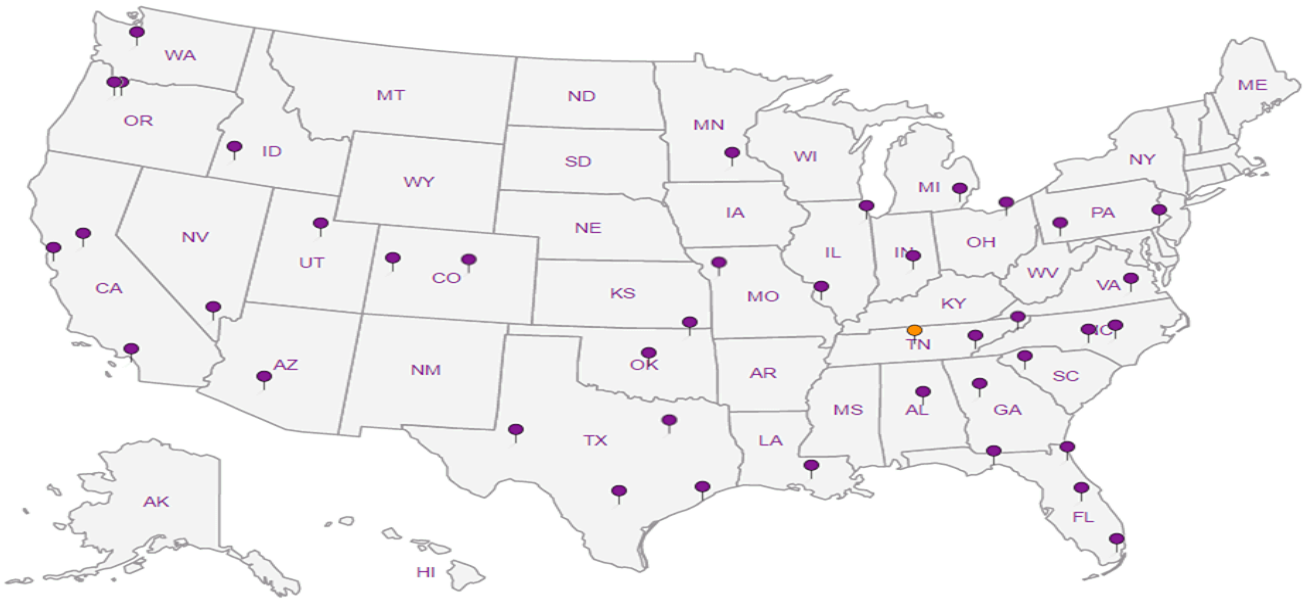
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Company Name/Address:
Pangea Env. Svs
1710 Franklin St
Oakland, CA 94612

Billing Information:
Pangea

Report to: morgan Gillies

Email To: mgillies@pangeaenv.com

Project Description: Livermore-Multi Family

City/State Collected: Livermore, CA

Phone: 510-836-
Fax: 3700

Client Project # 2165.022.215

Lab Project #

Collected by (print): E. Lervaag

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed: STANDARD TAT

Email? ___No X Yes
FAX? ___No ___Yes

Canister Pressure/Vacuum

Analysis: TO-15 (WI IPA leak check) | IPA leak check only

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 104817

M210

Acctnum:
Template: T141422
Prelogin:
TSR:
PB:
Shipped Via:

Sample ID	Sample Description	Can #	Date	Time	Initial	Final	TO-15 (WI IPA leak check)	IPA leak check only	Rem./Contaminant	Sample # (lab only)
	SGMF-1-5	8148	11.27.18	1152	30	5	X			01
	SGMF-2-5	8266	|	1315	30	5	X			02
	SGMF-2-15	8240	|	1342	29	5	X			03
	SGMF-2-25	8158	|	1523	30	5	X			04
	SGMF-3-15	8134	11.28.17	0946	30	5	X			05
	SGMF-3-25	8146	|	1007	29	5	X			06
	SGMF-4-5	8119	|	1102	29	5	X			07
	SGMF-4-15	8238	|	1129	29	5	X	X		08
	shroud	8258	|	1129	30	5		X		09
	SGMF-4-25	8121	|	1159	30	5	X			10

Remarks: 4510166224972398

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11.28.18	1530	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ____
Temp: Amb °C Bottles Received: 12 X 10
Date: 11/29/18 Time: 0925

Hold #
Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client:	Pansvon	SDG#	608/1048117
Cooler Received/Opened On: 11/ 29 /18		Temperature:	Amb
Received By: Eric Struck			
Signature:			

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	✓		
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			

ANALYTICAL REPORT

July 05, 2018

Pangea Environmental Serv - Oakland, CA

Sample Delivery Group:	L1004982
Samples Received:	06/27/2018
Project Number:	
Description:	Livermore

Report To: Morgan Gillies
1710 Franklin Street
Suite 200
Oakland, CA 94612

Entire Report Reviewed By:

Brian Ford
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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SG-4-5 L1004982-01 Air

			Collected by	Collected date/time	Received date/time
			E. Lervaag	06/22/18 17:14	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1131153	1	06/28/18 17:44	06/28/18 17:44	AMC

SG-4-20 L1004982-02 Air

			Collected by	Collected date/time	Received date/time
			E. Lervaag	06/22/18 19:16	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1131153	1	06/28/18 18:36	06/28/18 18:36	AMC

SG-5-5 L1004982-03 Air

			Collected by	Collected date/time	Received date/time
			E. Lervaag	06/21/18 10:30	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1131153	1	06/28/18 19:33	06/28/18 19:33	AMC

SG-6-5 L1004982-04 Air

			Collected by	Collected date/time	Received date/time
			E. Lervaag	06/21/18 11:56	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1131153	1	06/28/18 20:32	06/28/18 20:32	AMC

SG-7-5 L1004982-05 Air

			Collected by	Collected date/time	Received date/time
			E. Lervaag	06/21/18 11:28	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1131153	1	06/28/18 21:30	06/28/18 21:30	AMC

SG-8-5 L1004982-06 Air

			Collected by	Collected date/time	Received date/time
			E. Lervaag	06/21/18 16:17	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1131153	1	06/28/18 22:37	06/28/18 22:37	AMC
Volatile Organic Compounds (MS) by Method TO-15	WG1131716	25	06/29/18 14:52	06/29/18 14:52	AMC

SG-9-5 L1004982-07 Air

			Collected by	Collected date/time	Received date/time
			E. Lervaag	06/22/18 11:00	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1131153	1	06/28/18 23:50	06/28/18 23:50	AMC

SG-10-5 L1004982-08 Air

			Collected by	Collected date/time	Received date/time
			E. Lervaag	06/22/18 15:48	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1131153	1	06/29/18 00:43	06/29/18 00:43	AMC

SG-11-5 L1004982-09 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	06/22/18 15:14	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1131153	1	06/29/18 01:43	06/29/18 01:43	AMC
Volatile Organic Compounds (MS) by Method TO-15	WG1133311	40	07/03/18 12:23	07/03/18 12:23	AMC

SG-12-5 L1004982-10 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	06/22/18 10:49	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1131153	1	06/29/18 02:43	06/29/18 02:43	AMC

SG-13-5 L1004982-11 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	06/22/18 11:43	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1131153	1	06/29/18 03:34	06/29/18 03:34	AMC

SG-13-5 REP L1004982-12 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	06/22/18 11:50	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1132888	2	07/02/18 15:39	07/02/18 15:39	MBF

SG-14-5 L1004982-13 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	06/22/18 11:16	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1132227	2	06/30/18 16:38	06/30/18 16:38	MBF

SG-15-10 L1004982-14 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	06/22/18 10:18	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1131819	1	06/29/18 20:30	06/29/18 20:30	AMC
Volatile Organic Compounds (MS) by Method TO-15	WG1132227	25	06/30/18 17:26	06/30/18 17:26	MBF

SG-17-10 L1004982-15 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	06/22/18 09:40	06/27/18 08:45

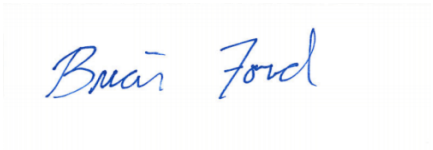
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1131819	1	06/29/18 21:34	06/29/18 21:34	AMC

SHROUD L1004982-16 Air

Collected by	Collected date/time	Received date/time
E. Lervaag	06/22/18 00:00	06/27/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG1132225	4000	06/30/18 22:07	06/30/18 22:07	MBF

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Brian Ford
Technical Service Representative

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	35.9	85.3		1	WG1131153
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1131153
Benzene	71-43-2	78.10	0.200	0.639	0.312	0.997		1	WG1131153
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1131153
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1131153
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1131153
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1131153
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1131153
Carbon disulfide	75-15-0	76.10	0.200	0.622	8.22	25.6		1	WG1131153
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1131153
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1131153
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1131153
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1131153
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1131153
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1131153
Cyclohexane	110-82-7	84.20	0.200	0.689	0.309	1.06		1	WG1131153
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1131153
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1131153
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1131153
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1131153
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1131153
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1131153
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1131153
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1131153
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1131153
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1131153
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1131153
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1131153
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1131153
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1131153
Ethanol	64-17-5	46.10	0.630	1.19	3.39	6.40		1	WG1131153
Ethylbenzene	100-41-4	106	0.200	0.867	0.542	2.35		1	WG1131153
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1131153
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.372	2.09		1	WG1131153
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.372	1.84		1	WG1131153
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1131153
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1131153
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1131153
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1131153
n-Hexane	110-54-3	86.20	0.200	0.705	0.261	0.922		1	WG1131153
Isopropylbenzene	98-82-8	120.20	0.200	0.983	0.369	1.81		1	WG1131153
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG1131153
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1131153
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	1.81	5.35		1	WG1131153
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1131153
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1131153
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1131153
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1131153
2-Propanol	67-63-0	60.10	1.25	3.07	2.05	5.04		1	WG1131153
Propene	115-07-1	42.10	0.400	0.689	ND	ND		1	WG1131153
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1131153
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1131153
Tetrachloroethylene	127-18-4	166	0.200	1.36	45.6	309		1	WG1131153
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	0.343	1.01		1	WG1131153
Toluene	108-88-3	92.10	0.200	0.753	1.78	6.70		1	WG1131153
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1131153
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1131153
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1131153
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	1.15	5.66		1	WG1131153
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	0.268	1.32		1	WG1131153
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	0.573	2.68		1	WG1131153
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1131153
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1131153
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1131153
m&p-Xylene	1330-20-7	106	0.400	1.73	2.04	8.82		1	WG1131153
o-Xylene	95-47-6	106	0.200	0.867	0.883	3.83		1	WG1131153
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	133	551		1	WG1131153
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*107*				WG1131153

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	20.1	47.8		1	WG1131153
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1131153
Benzene	71-43-2	78.10	0.200	0.639	0.846	2.70		1	WG1131153
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1131153
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1131153
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1131153
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1131153
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1131153
Carbon disulfide	75-15-0	76.10	0.200	0.622	1.87	5.83		1	WG1131153
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1131153
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1131153
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1131153
Chloroform	67-66-3	119	0.200	0.973	0.474	2.30		1	WG1131153
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1131153
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1131153
Cyclohexane	110-82-7	84.20	0.200	0.689	5.00	17.2		1	WG1131153
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1131153
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1131153
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1131153
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1131153
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1131153
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1131153
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1131153
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1131153
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1131153
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1131153
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1131153
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1131153
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1131153
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1131153
Ethanol	64-17-5	46.10	0.630	1.19	3.31	6.24		1	WG1131153
Ethylbenzene	100-41-4	106	0.200	0.867	0.220	0.954		1	WG1131153
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1131153
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.581	3.26		1	WG1131153
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.375	1.85		1	WG1131153
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1131153
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1131153
Heptane	142-82-5	100	0.200	0.818	0.478	1.96		1	WG1131153
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1131153
n-Hexane	110-54-3	86.20	0.200	0.705	1.06	3.75		1	WG1131153
Isopropylbenzene	98-82-8	120.20	0.200	0.983	9.53	46.9		1	WG1131153
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG1131153
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1131153
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	2.10	6.20		1	WG1131153
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1131153
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1131153
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1131153
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1131153
2-Propanol	67-63-0	60.10	1.25	3.07	ND	ND		1	WG1131153
Propene	115-07-1	42.10	0.400	0.689	13.1	22.6		1	WG1131153
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1131153
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1131153
Tetrachloroethylene	127-18-4	166	0.200	1.36	61.8	420	E	1	WG1131153
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	0.324	0.956		1	WG1131153
Toluene	108-88-3	92.10	0.200	0.753	1.24	4.65		1	WG1131153
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1131153
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1131153
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1131153
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.427	2.09		1	WG1131153
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1131153
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	0.301	1.41		1	WG1131153
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1131153
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1131153
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1131153
m&p-Xylene	1330-20-7	106	0.400	1.73	0.779	3.38		1	WG1131153
o-Xylene	95-47-6	106	0.200	0.867	0.368	1.60		1	WG1131153
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	461	1900		1	WG1131153
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*105*				WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	27.5	65.4		1	WG1131153
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1131153
Benzene	71-43-2	78.10	0.200	0.639	0.211	0.676		1	WG1131153
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1131153
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1131153
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1131153
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1131153
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1131153
Carbon disulfide	75-15-0	76.10	0.200	0.622	1.67	5.20		1	WG1131153
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1131153
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1131153
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1131153
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1131153
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1131153
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1131153
Cyclohexane	110-82-7	84.20	0.200	0.689	ND	ND		1	WG1131153
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1131153
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1131153
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1131153
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1131153
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1131153
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1131153
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1131153
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1131153
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1131153
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1131153
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1131153
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1131153
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1131153
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1131153
Ethanol	64-17-5	46.10	0.630	1.19	4.39	8.27		1	WG1131153
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG1131153
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1131153
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.817	4.59		1	WG1131153
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.465	2.30		1	WG1131153
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1131153
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1131153
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1131153
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1131153
n-Hexane	110-54-3	86.20	0.200	0.705	ND	ND		1	WG1131153
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1131153
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG1131153
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1131153
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG1131153
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1131153
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1131153
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1131153
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1131153
2-Propanol	67-63-0	60.10	1.25	3.07	1.91	4.70		1	WG1131153
Propene	115-07-1	42.10	0.400	0.689	0.853	1.47		1	WG1131153
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1131153
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1131153
Tetrachloroethylene	127-18-4	166	0.200	1.36	5.09	34.6		1	WG1131153
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	0.267	0.788		1	WG1131153
Toluene	108-88-3	92.10	0.200	0.753	0.426	1.61		1	WG1131153
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1131153
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1131153
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1131153
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	ND	ND		1	WG1131153
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1131153
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG1131153
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1131153
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1131153
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1131153
m&p-Xylene	1330-20-7	106	0.400	1.73	0.413	1.79		1	WG1131153
o-Xylene	95-47-6	106	0.200	0.867	0.208	0.902		1	WG1131153
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	124	512		1	WG1131153
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*99.6*				WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	31.9	75.8		1	WG1131153
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1131153
Benzene	71-43-2	78.10	0.200	0.639	ND	ND		1	WG1131153
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1131153
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1131153
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1131153
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1131153
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1131153
Carbon disulfide	75-15-0	76.10	0.200	0.622	1.21	3.76		1	WG1131153
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1131153
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1131153
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1131153
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1131153
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1131153
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1131153
Cyclohexane	110-82-7	84.20	0.200	0.689	ND	ND		1	WG1131153
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1131153
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1131153
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1131153
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1131153
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1131153
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1131153
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1131153
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1131153
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1131153
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1131153
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1131153
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1131153
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1131153
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1131153
Ethanol	64-17-5	46.10	0.630	1.19	4.95	9.34		1	WG1131153
Ethylbenzene	100-41-4	106	0.200	0.867	0.293	1.27		1	WG1131153
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1131153
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.317	1.78		1	WG1131153
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.412	2.04		1	WG1131153
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1131153
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1131153
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1131153
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1131153
n-Hexane	110-54-3	86.20	0.200	0.705	0.267	0.942		1	WG1131153
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1131153
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG1131153
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1131153
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG1131153
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1131153
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1131153
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1131153
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1131153
2-Propanol	67-63-0	60.10	1.25	3.07	98.5	242	E	1	WG1131153
Propene	115-07-1	42.10	0.400	0.689	1.71	2.94		1	WG1131153
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1131153
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1131153
Tetrachloroethylene	127-18-4	166	0.200	1.36	24.8	168		1	WG1131153
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1131153
Toluene	108-88-3	92.10	0.200	0.753	0.854	3.22		1	WG1131153
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1131153
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1131153
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1131153
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	ND	ND		1	WG1131153
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1131153
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG1131153
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1131153
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1131153
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1131153
m&p-Xylene	1330-20-7	106	0.400	1.73	0.672	2.91		1	WG1131153
o-Xylene	95-47-6	106	0.200	0.867	0.310	1.35		1	WG1131153
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	79.6	329	B	1	WG1131153
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*97.4*				WG1131153

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	12.4	29.5		1	WG1131153
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1131153
Benzene	71-43-2	78.10	0.200	0.639	0.716	2.29		1	WG1131153
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1131153
Bromodichloromethane	75-27-4	164	0.200	1.34	0.205	1.38		1	WG1131153
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1131153
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1131153
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1131153
Carbon disulfide	75-15-0	76.10	0.200	0.622	19.5	60.8		1	WG1131153
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1131153
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1131153
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1131153
Chloroform	67-66-3	119	0.200	0.973	0.413	2.01		1	WG1131153
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1131153
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1131153
Cyclohexane	110-82-7	84.20	0.200	0.689	1.04	3.58		1	WG1131153
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1131153
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1131153
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1131153
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1131153
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1131153
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1131153
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1131153
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1131153
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1131153
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1131153
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1131153
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1131153
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1131153
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1131153
Ethanol	64-17-5	46.10	0.630	1.19	4.20	7.92		1	WG1131153
Ethylbenzene	100-41-4	106	0.200	0.867	1.97	8.53		1	WG1131153
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1131153
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.590	3.32		1	WG1131153
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.433	2.14		1	WG1131153
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1131153
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1131153
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1131153
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1131153
n-Hexane	110-54-3	86.20	0.200	0.705	0.361	1.27		1	WG1131153
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1131153
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.251	0.870		1	WG1131153
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1131153
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	1.26	3.71		1	WG1131153
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1131153
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1131153
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1131153
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1131153
2-Propanol	67-63-0	60.10	1.25	3.07	1.69	4.16		1	WG1131153
Propene	115-07-1	42.10	0.400	0.689	2.05	3.52		1	WG1131153
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1131153
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1131153
Tetrachloroethylene	127-18-4	166	0.200	1.36	10.8	73.2		1	WG1131153
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	0.320	0.945		1	WG1131153
Toluene	108-88-3	92.10	0.200	0.753	24.1	90.9		1	WG1131153
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	0.783	4.26		1	WG1131153
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1131153
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1131153
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.287	1.41		1	WG1131153
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1131153
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	1.81	8.46		1	WG1131153
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1131153
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1131153
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1131153
m&p-Xylene	1330-20-7	106	0.400	1.73	6.63	28.8		1	WG1131153
o-Xylene	95-47-6	106	0.200	0.867	2.19	9.47		1	WG1131153
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	177	731		1	WG1131153
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*101*				WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	49.3	117		1	WG1131153
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1131153
Benzene	71-43-2	78.10	0.200	0.639	0.732	2.34		1	WG1131153
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1131153
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1131153
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1131153
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1131153
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1131153
Carbon disulfide	75-15-0	76.10	0.200	0.622	10.6	33.1		1	WG1131153
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1131153
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1131153
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1131153
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1131153
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1131153
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1131153
Cyclohexane	110-82-7	84.20	0.200	0.689	0.408	1.40		1	WG1131153
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1131153
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1131153
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1131153
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1131153
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1131153
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1131153
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1131153
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1131153
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1131153
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1131153
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1131153
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1131153
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1131153
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1131153
Ethanol	64-17-5	46.10	0.630	1.19	4.61	8.69		1	WG1131153
Ethylbenzene	100-41-4	106	0.200	0.867	3.82	16.6		1	WG1131153
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1131153
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	1.32	7.40		1	WG1131153
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.421	2.08		1	WG1131153
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1131153
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1131153
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1131153
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1131153
n-Hexane	110-54-3	86.20	0.200	0.705	0.619	2.18		1	WG1131153
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1131153
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.274	0.952		1	WG1131153
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1131153
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	1.66	4.88		1	WG1131153
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1131153
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1131153
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1131153
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1131153
2-Propanol	67-63-0	60.10	1.25	3.07	6.84	16.8		1	WG1131153
Propene	115-07-1	42.10	0.400	0.689	5.06	8.71		1	WG1131153
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1131153
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1131153
Tetrachloroethylene	127-18-4	166	5.00	33.9	509	3460		25	WG1131716
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	0.311	0.916		1	WG1131153
Toluene	108-88-3	92.10	0.200	0.753	30.8	116		1	WG1131153
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1131153
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1131153
Trichloroethylene	79-01-6	131	0.200	1.07	0.549	2.94		1	WG1131153
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.407	2.00		1	WG1131153
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1131153
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	5.67	26.5		1	WG1131153
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1131153
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1131153
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1131153
m&p-Xylene	1330-20-7	106	0.400	1.73	12.1	52.5		1	WG1131153
o-Xylene	95-47-6	106	0.200	0.867	3.73	16.2		1	WG1131153
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	601	2480		1	WG1131153
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*102*				WG1131153
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*95.5*				WG1131716

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	57.7	137	E	1	WG1131153
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1131153
Benzene	71-43-2	78.10	0.200	0.639	0.497	1.59		1	WG1131153
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1131153
Bromodichloromethane	75-27-4	164	0.200	1.34	0.285	1.91		1	WG1131153
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1131153
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1131153
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1131153
Carbon disulfide	75-15-0	76.10	0.200	0.622	21.7	67.7		1	WG1131153
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1131153
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1131153
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1131153
Chloroform	67-66-3	119	0.200	0.973	0.818	3.98		1	WG1131153
Chloromethane	74-87-3	50.50	0.200	0.413	0.237	0.489		1	WG1131153
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1131153
Cyclohexane	110-82-7	84.20	0.200	0.689	0.406	1.40		1	WG1131153
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1131153
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1131153
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1131153
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1131153
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1131153
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1131153
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1131153
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1131153
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1131153
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1131153
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1131153
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1131153
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1131153
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1131153
Ethanol	64-17-5	46.10	0.630	1.19	7.21	13.6		1	WG1131153
Ethylbenzene	100-41-4	106	0.200	0.867	0.918	3.98		1	WG1131153
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1131153
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.913	5.13		1	WG1131153
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.381	1.88		1	WG1131153
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1131153
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1131153
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1131153
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1131153
n-Hexane	110-54-3	86.20	0.200	0.705	0.380	1.34		1	WG1131153
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1131153
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.219	0.759		1	WG1131153
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1131153
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG1131153
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1131153
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1131153
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1131153
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1131153
2-Propanol	67-63-0	60.10	1.25	3.07	11.8	28.9		1	WG1131153
Propene	115-07-1	42.10	0.400	0.689	2.84	4.89		1	WG1131153
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1131153
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1131153
Tetrachloroethylene	127-18-4	166	0.200	1.36	50.0	340		1	WG1131153
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	0.328	0.967		1	WG1131153
Toluene	108-88-3	92.10	0.200	0.753	4.67	17.6		1	WG1131153
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1131153

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1131153
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1131153
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1131153
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.818	4.02		1	WG1131153
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1131153
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	0.490	2.29		1	WG1131153
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1131153
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1131153
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1131153
m&p-Xylene	1330-20-7	106	0.400	1.73	2.07	8.97		1	WG1131153
o-Xylene	95-47-6	106	0.200	0.867	1.14	4.93		1	WG1131153
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	209	865		1	WG1131153
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*102*				WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	8.62	20.5		1	WG1131153
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1131153
Benzene	71-43-2	78.10	0.200	0.639	ND	ND		1	WG1131153
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1131153
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1131153
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1131153
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1131153
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1131153
Carbon disulfide	75-15-0	76.10	0.200	0.622	6.28	19.5		1	WG1131153
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1131153
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1131153
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1131153
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1131153
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1131153
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1131153
Cyclohexane	110-82-7	84.20	0.200	0.689	0.218	0.751		1	WG1131153
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1131153
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1131153
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1131153
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1131153
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1131153
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1131153
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1131153
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1131153
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1131153
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1131153
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1131153
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1131153
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1131153
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1131153
Ethanol	64-17-5	46.10	0.630	1.19	2.88	5.42		1	WG1131153
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG1131153
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1131153
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.549	3.08		1	WG1131153
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.342	1.69		1	WG1131153
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1131153
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1131153
Heptane	142-82-5	100	0.200	0.818	0.219	0.895		1	WG1131153
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1131153
n-Hexane	110-54-3	86.20	0.200	0.705	0.362	1.28		1	WG1131153
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1131153
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG1131153
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1131153
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG1131153
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1131153
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1131153
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1131153
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1131153
2-Propanol	67-63-0	60.10	1.25	3.07	ND	ND		1	WG1131153
Propene	115-07-1	42.10	0.400	0.689	1.85	3.18		1	WG1131153
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1131153
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1131153
Tetrachloroethylene	127-18-4	166	0.200	1.36	2.12	14.4		1	WG1131153
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1131153
Toluene	108-88-3	92.10	0.200	0.753	0.784	2.95		1	WG1131153
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1131153
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1131153
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1131153
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.329	1.61		1	WG1131153
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1131153
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG1131153
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1131153
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1131153
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1131153
m&p-Xylene	1330-20-7	106	0.400	1.73	0.623	2.70		1	WG1131153
o-Xylene	95-47-6	106	0.200	0.867	0.377	1.63		1	WG1131153
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	61.8	255	B	1	WG1131153
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*100*				WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	30.2	71.8		1	WG1131153
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1131153
Benzene	71-43-2	78.10	0.200	0.639	0.370	1.18		1	WG1131153
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1131153
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1131153
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1131153
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1131153
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1131153
Carbon disulfide	75-15-0	76.10	0.200	0.622	3.72	11.6		1	WG1131153
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1131153
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1131153
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1131153
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1131153
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1131153
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1131153
Cyclohexane	110-82-7	84.20	0.200	0.689	ND	ND		1	WG1131153
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1131153
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1131153
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1131153
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1131153
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1131153
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1131153
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1131153
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1131153
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1131153
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1131153
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1131153
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1131153
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1131153
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1131153
Ethanol	64-17-5	46.10	0.630	1.19	3.74	7.05		1	WG1131153
Ethylbenzene	100-41-4	106	0.200	0.867	1.64	7.10		1	WG1131153
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1131153
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.585	3.29		1	WG1131153
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.394	1.95		1	WG1131153
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1131153
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1131153
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1131153
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1131153
n-Hexane	110-54-3	86.20	0.200	0.705	0.238	0.839		1	WG1131153
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1131153
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.534	1.85		1	WG1131153
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1131153
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG1131153
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1131153
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1131153
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1131153
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1131153
2-Propanol	67-63-0	60.10	1.25	3.07	22.1	54.4		1	WG1131153
Propene	115-07-1	42.10	0.400	0.689	2.12	3.66		1	WG1131153
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1131153
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1131153
Tetrachloroethylene	127-18-4	166	8.00	54.3	250	1700		40	WG1133311
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1131153
Toluene	108-88-3	92.10	0.200	0.753	4.31	16.2		1	WG1131153
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1131153
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1131153
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1131153
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	ND	ND		1	WG1131153
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1131153
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	2.04	9.53		1	WG1131153
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1131153
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1131153
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1131153
m&p-Xylene	1330-20-7	106	0.400	1.73	4.75	20.6		1	WG1131153
o-Xylene	95-47-6	106	0.200	0.867	1.63	7.06		1	WG1131153
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	526	2170		1	WG1131153
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*98.5*				WG1131153
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*93.5*				WG1133311

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	11.0	26.1		1	WG1131153
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1131153
Benzene	71-43-2	78.10	0.200	0.639	0.837	2.67		1	WG1131153
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1131153
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1131153
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1131153
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1131153
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1131153
Carbon disulfide	75-15-0	76.10	0.200	0.622	2.28	7.09		1	WG1131153
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1131153
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1131153
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1131153
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1131153
Chloromethane	74-87-3	50.50	0.200	0.413	0.288	0.595		1	WG1131153
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1131153
Cyclohexane	110-82-7	84.20	0.200	0.689	ND	ND		1	WG1131153
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1131153
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1131153
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1131153
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1131153
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1131153
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1131153
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1131153
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1131153
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1131153
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1131153
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1131153
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1131153
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1131153
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1131153
Ethanol	64-17-5	46.10	0.630	1.19	1.71	3.23		1	WG1131153
Ethylbenzene	100-41-4	106	0.200	0.867	0.850	3.68		1	WG1131153
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1131153
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.281	1.58		1	WG1131153
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.365	1.80		1	WG1131153
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1131153
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1131153
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1131153
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1131153
n-Hexane	110-54-3	86.20	0.200	0.705	0.243	0.856		1	WG1131153
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1131153
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG1131153
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1131153
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG1131153
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1131153
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1131153
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1131153
Naphthalene	91-20-3	128	0.630	3.30	0.706	3.69		1	WG1131153
2-Propanol	67-63-0	60.10	1.25	3.07	ND	ND		1	WG1131153
Propene	115-07-1	42.10	0.400	0.689	0.723	1.24		1	WG1131153
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1131153
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1131153
Tetrachloroethylene	127-18-4	166	0.200	1.36	0.779	5.29		1	WG1131153
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1131153
Toluene	108-88-3	92.10	0.200	0.753	32.1	121		1	WG1131153
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1131153
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1131153
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1131153
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.884	4.34		1	WG1131153
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1131153
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	11.3	52.8		1	WG1131153
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1131153
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1131153
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1131153
m&p-Xylene	1330-20-7	106	0.400	1.73	2.65	11.5		1	WG1131153
o-Xylene	95-47-6	106	0.200	0.867	0.765	3.31		1	WG1131153
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	97.4	402	B	1	WG1131153
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*97.7*				WG1131153

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	16.8	40.0		1	WG1131153
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1131153
Benzene	71-43-2	78.10	0.200	0.639	0.306	0.976		1	WG1131153
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1131153
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1131153
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1131153
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1131153
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1131153
Carbon disulfide	75-15-0	76.10	0.200	0.622	4.31	13.4		1	WG1131153
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1131153
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1131153
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1131153
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1131153
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1131153
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1131153
Cyclohexane	110-82-7	84.20	0.200	0.689	ND	ND		1	WG1131153
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1131153
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1131153
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1131153
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1131153
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1131153
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1131153
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1131153
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1131153
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1131153
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1131153
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1131153
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1131153
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1131153
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1131153
Ethanol	64-17-5	46.10	0.630	1.19	2.12	4.00		1	WG1131153
Ethylbenzene	100-41-4	106	0.200	0.867	1.72	7.45		1	WG1131153
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1131153
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.332	1.86		1	WG1131153
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.289	1.43		1	WG1131153
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1131153
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1131153
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1131153
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1131153
n-Hexane	110-54-3	86.20	0.200	0.705	0.260	0.916		1	WG1131153
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1131153
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.327	1.14		1	WG1131153
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1131153
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG1131153
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1131153
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1131153
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1131153
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1131153
2-Propanol	67-63-0	60.10	1.25	3.07	8.79	21.6		1	WG1131153
Propene	115-07-1	42.10	0.400	0.689	ND	ND		1	WG1131153
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1131153
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1131153
Tetrachloroethylene	127-18-4	166	0.200	1.36	5.89	40.0		1	WG1131153
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1131153
Toluene	108-88-3	92.10	0.200	0.753	21.8	82.1		1	WG1131153
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1131153

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1131153
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1131153
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1131153
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.336	1.65		1	WG1131153
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1131153
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	2.29	10.7		1	WG1131153
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1131153
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1131153
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1131153
m&p-Xylene	1330-20-7	106	0.400	1.73	5.43	23.6		1	WG1131153
o-Xylene	95-47-6	106	0.200	0.867	1.78	7.72		1	WG1131153
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	108	444	B	1	WG1131153
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*99.0*				WG1131153

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	2.50	5.94	11.2	26.6		2	WG1132888
Allyl chloride	107-05-1	76.53	0.400	1.25	ND	ND		2	WG1132888
Benzene	71-43-2	78.10	0.400	1.28	ND	ND		2	WG1132888
Benzyl Chloride	100-44-7	127	0.400	2.08	ND	ND		2	WG1132888
Bromodichloromethane	75-27-4	164	0.400	2.68	ND	ND		2	WG1132888
Bromoform	75-25-2	253	1.20	12.4	ND	ND		2	WG1132888
Bromomethane	74-83-9	94.90	0.400	1.55	ND	ND		2	WG1132888
1,3-Butadiene	106-99-0	54.10	4.00	8.85	ND	ND		2	WG1132888
Carbon disulfide	75-15-0	76.10	0.400	1.24	2.43	7.56		2	WG1132888
Carbon tetrachloride	56-23-5	154	0.400	2.52	ND	ND		2	WG1132888
Chlorobenzene	108-90-7	113	0.400	1.85	ND	ND		2	WG1132888
Chloroethane	75-00-3	64.50	0.400	1.06	ND	ND		2	WG1132888
Chloroform	67-66-3	119	0.400	1.95	ND	ND		2	WG1132888
Chloromethane	74-87-3	50.50	0.400	0.826	ND	ND		2	WG1132888
2-Chlorotoluene	95-49-8	126	0.400	2.06	ND	ND		2	WG1132888
Cyclohexane	110-82-7	84.20	0.400	1.38	ND	ND		2	WG1132888
Dibromochloromethane	124-48-1	208	0.400	3.40	ND	ND		2	WG1132888
1,2-Dibromoethane	106-93-4	188	0.400	3.08	ND	ND		2	WG1132888
1,2-Dichlorobenzene	95-50-1	147	0.400	2.40	ND	ND		2	WG1132888
1,3-Dichlorobenzene	541-73-1	147	0.400	2.40	ND	ND		2	WG1132888
1,4-Dichlorobenzene	106-46-7	147	0.400	2.40	ND	ND		2	WG1132888
1,2-Dichloroethane	107-06-2	99	0.400	1.62	ND	ND		2	WG1132888
1,1-Dichloroethane	75-34-3	98	0.400	1.60	ND	ND		2	WG1132888
1,1-Dichloroethene	75-35-4	96.90	0.400	1.59	ND	ND		2	WG1132888
cis-1,2-Dichloroethene	156-59-2	96.90	0.400	1.59	ND	ND		2	WG1132888
trans-1,2-Dichloroethene	156-60-5	96.90	0.400	1.59	ND	ND		2	WG1132888
1,2-Dichloropropane	78-87-5	113	0.400	1.85	ND	ND		2	WG1132888
cis-1,3-Dichloropropene	10061-01-5	111	0.400	1.82	ND	ND		2	WG1132888
trans-1,3-Dichloropropene	10061-02-6	111	0.400	1.82	ND	ND		2	WG1132888
1,4-Dioxane	123-91-1	88.10	0.400	1.44	ND	ND		2	WG1132888
Ethanol	64-17-5	46.10	1.26	2.38	3.05	5.75		2	WG1132888
Ethylbenzene	100-41-4	106	0.400	1.73	1.11	4.79		2	WG1132888
4-Ethyltoluene	622-96-8	120	0.400	1.96	ND	ND		2	WG1132888
Trichlorofluoromethane	75-69-4	137.40	0.400	2.25	ND	ND		2	WG1132888
Dichlorodifluoromethane	75-71-8	120.92	0.400	1.98	ND	ND		2	WG1132888
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.400	3.07	ND	ND		2	WG1132888
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.400	2.80	ND	ND		2	WG1132888
Heptane	142-82-5	100	0.400	1.64	ND	ND		2	WG1132888
Hexachloro-1,3-butadiene	87-68-3	261	1.26	13.5	ND	ND		2	WG1132888
n-Hexane	110-54-3	86.20	0.400	1.41	0.484	1.71		2	WG1132888
Isopropylbenzene	98-82-8	120.20	0.400	1.97	ND	ND		2	WG1132888
Methylene Chloride	75-09-2	84.90	0.400	1.39	0.952	3.30		2	WG1132888
Methyl Butyl Ketone	591-78-6	100	2.50	10.2	ND	ND		2	WG1132888
2-Butanone (MEK)	78-93-3	72.10	2.50	7.37	ND	ND		2	WG1132888
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	2.50	10.2	ND	ND		2	WG1132888
Methyl methacrylate	80-62-6	100.12	0.400	1.64	ND	ND		2	WG1132888
MTBE	1634-04-4	88.10	0.400	1.44	ND	ND		2	WG1132888
Naphthalene	91-20-3	128	1.26	6.60	ND	ND		2	WG1132888
2-Propanol	67-63-0	60.10	2.50	6.15	4.53	11.1		2	WG1132888
Propene	115-07-1	42.10	0.800	1.38	0.939	1.62		2	WG1132888
Styrene	100-42-5	104	0.400	1.70	ND	ND		2	WG1132888
1,1,2,2-Tetrachloroethane	79-34-5	168	0.400	2.75	ND	ND		2	WG1132888
Tetrachloroethylene	127-18-4	166	0.400	2.72	6.81	46.2		2	WG1132888
Tetrahydrofuran	109-99-9	72.10	0.400	1.18	ND	ND		2	WG1132888
Toluene	108-88-3	92.10	0.400	1.51	13.2	49.7		2	WG1132888
1,2,4-Trichlorobenzene	120-82-1	181	1.26	9.33	ND	ND		2	WG1132888

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.400	2.18	ND	ND		2	WG1132888
1,1,2-Trichloroethane	79-00-5	133	0.400	2.18	ND	ND		2	WG1132888
Trichloroethylene	79-01-6	131	0.400	2.14	ND	ND		2	WG1132888
1,2,4-Trimethylbenzene	95-63-6	120	0.400	1.96	ND	ND		2	WG1132888
1,3,5-Trimethylbenzene	108-67-8	120	0.400	1.96	ND	ND		2	WG1132888
2,2,4-Trimethylpentane	540-84-1	114.22	0.400	1.87	1.47	6.88		2	WG1132888
Vinyl chloride	75-01-4	62.50	0.400	1.02	ND	ND		2	WG1132888
Vinyl Bromide	593-60-2	106.95	0.400	1.75	ND	ND		2	WG1132888
Vinyl acetate	108-05-4	86.10	0.400	1.41	ND	ND		2	WG1132888
m&p-Xylene	1330-20-7	106	0.800	3.47	3.64	15.8		2	WG1132888
o-Xylene	95-47-6	106	0.400	1.73	1.18	5.13		2	WG1132888
TPH (GC/MS) Low Fraction	8006-61-9	101	100	413	ND	ND		2	WG1132888
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*102*				WG1132888

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	2.50	5.94	20.6	49.0		2	WG1132227
Allyl chloride	107-05-1	76.53	0.400	1.25	ND	ND		2	WG1132227
Benzene	71-43-2	78.10	0.400	1.28	ND	ND		2	WG1132227
Benzyl Chloride	100-44-7	127	0.400	2.08	ND	ND		2	WG1132227
Bromodichloromethane	75-27-4	164	0.400	2.68	ND	ND		2	WG1132227
Bromoform	75-25-2	253	1.20	12.4	ND	ND		2	WG1132227
Bromomethane	74-83-9	94.90	0.400	1.55	ND	ND		2	WG1132227
1,3-Butadiene	106-99-0	54.10	4.00	8.85	ND	ND		2	WG1132227
Carbon disulfide	75-15-0	76.10	0.400	1.24	ND	ND		2	WG1132227
Carbon tetrachloride	56-23-5	154	0.400	2.52	ND	ND		2	WG1132227
Chlorobenzene	108-90-7	113	0.400	1.85	ND	ND		2	WG1132227
Chloroethane	75-00-3	64.50	0.400	1.06	ND	ND		2	WG1132227
Chloroform	67-66-3	119	0.400	1.95	ND	ND		2	WG1132227
Chloromethane	74-87-3	50.50	0.400	0.826	ND	ND		2	WG1132227
2-Chlorotoluene	95-49-8	126	0.400	2.06	ND	ND		2	WG1132227
Cyclohexane	110-82-7	84.20	0.400	1.38	ND	ND		2	WG1132227
Dibromochloromethane	124-48-1	208	0.400	3.40	ND	ND		2	WG1132227
1,2-Dibromoethane	106-93-4	188	0.400	3.08	ND	ND		2	WG1132227
1,2-Dichlorobenzene	95-50-1	147	0.400	2.40	ND	ND		2	WG1132227
1,3-Dichlorobenzene	541-73-1	147	0.400	2.40	ND	ND		2	WG1132227
1,4-Dichlorobenzene	106-46-7	147	0.400	2.40	ND	ND		2	WG1132227
1,2-Dichloroethane	107-06-2	99	0.400	1.62	ND	ND		2	WG1132227
1,1-Dichloroethane	75-34-3	98	0.400	1.60	ND	ND		2	WG1132227
1,1-Dichloroethene	75-35-4	96.90	0.400	1.59	ND	ND		2	WG1132227
cis-1,2-Dichloroethene	156-59-2	96.90	0.400	1.59	ND	ND		2	WG1132227
trans-1,2-Dichloroethene	156-60-5	96.90	0.400	1.59	ND	ND		2	WG1132227
1,2-Dichloropropane	78-87-5	113	0.400	1.85	ND	ND		2	WG1132227
cis-1,3-Dichloropropene	10061-01-5	111	0.400	1.82	ND	ND		2	WG1132227
trans-1,3-Dichloropropene	10061-02-6	111	0.400	1.82	ND	ND		2	WG1132227
1,4-Dioxane	123-91-1	88.10	0.400	1.44	ND	ND		2	WG1132227
Ethanol	64-17-5	46.10	1.26	2.38	1.56	2.94		2	WG1132227
Ethylbenzene	100-41-4	106	0.400	1.73	0.421	1.83		2	WG1132227
4-Ethyltoluene	622-96-8	120	0.400	1.96	ND	ND		2	WG1132227
Trichlorofluoromethane	75-69-4	137.40	0.400	2.25	ND	ND		2	WG1132227
Dichlorodifluoromethane	75-71-8	120.92	0.400	1.98	ND	ND		2	WG1132227
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.400	3.07	ND	ND		2	WG1132227
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.400	2.80	ND	ND		2	WG1132227
Heptane	142-82-5	100	0.400	1.64	ND	ND		2	WG1132227
Hexachloro-1,3-butadiene	87-68-3	261	1.26	13.5	ND	ND		2	WG1132227
n-Hexane	110-54-3	86.20	0.400	1.41	ND	ND		2	WG1132227
Isopropylbenzene	98-82-8	120.20	0.400	1.97	ND	ND		2	WG1132227
Methylene Chloride	75-09-2	84.90	0.400	1.39	ND	ND		2	WG1132227
Methyl Butyl Ketone	591-78-6	100	2.50	10.2	ND	ND		2	WG1132227
2-Butanone (MEK)	78-93-3	72.10	2.50	7.37	ND	ND		2	WG1132227
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	2.50	10.2	ND	ND		2	WG1132227
Methyl methacrylate	80-62-6	100.12	0.400	1.64	ND	ND		2	WG1132227
MTBE	1634-04-4	88.10	0.400	1.44	ND	ND		2	WG1132227
Naphthalene	91-20-3	128	1.26	6.60	ND	ND		2	WG1132227
2-Propanol	67-63-0	60.10	2.50	6.15	47.4	117		2	WG1132227
Propene	115-07-1	42.10	0.800	1.38	ND	ND		2	WG1132227
Styrene	100-42-5	104	0.400	1.70	ND	ND		2	WG1132227
1,1,2,2-Tetrachloroethane	79-34-5	168	0.400	2.75	ND	ND		2	WG1132227
Tetrachloroethylene	127-18-4	166	0.400	2.72	1.55	10.6		2	WG1132227
Tetrahydrofuran	109-99-9	72.10	0.400	1.18	1.78	5.26		2	WG1132227
Toluene	108-88-3	92.10	0.400	1.51	1.65	6.22		2	WG1132227
1,2,4-Trichlorobenzene	120-82-1	181	1.26	9.33	ND	ND		2	WG1132227

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.400	2.18	ND	ND		2	WG1132227
1,1,2-Trichloroethane	79-00-5	133	0.400	2.18	ND	ND		2	WG1132227
Trichloroethylene	79-01-6	131	0.400	2.14	ND	ND		2	WG1132227
1,2,4-Trimethylbenzene	95-63-6	120	0.400	1.96	ND	ND		2	WG1132227
1,3,5-Trimethylbenzene	108-67-8	120	0.400	1.96	ND	ND		2	WG1132227
2,2,4-Trimethylpentane	540-84-1	114.22	0.400	1.87	ND	ND		2	WG1132227
Vinyl chloride	75-01-4	62.50	0.400	1.02	ND	ND		2	WG1132227
Vinyl Bromide	593-60-2	106.95	0.400	1.75	ND	ND		2	WG1132227
Vinyl acetate	108-05-4	86.10	0.400	1.41	ND	ND		2	WG1132227
m&p-Xylene	1330-20-7	106	0.800	3.47	1.20	5.21		2	WG1132227
o-Xylene	95-47-6	106	0.400	1.73	0.572	2.48		2	WG1132227
TPH (GC/MS) Low Fraction	8006-61-9	101	100	413	ND	ND		2	WG1132227
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*94.6*				WG1132227

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	26.4	62.6		1	WG1131819
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1131819
Benzene	71-43-2	78.10	0.200	0.639	7.89	25.2		1	WG1131819
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1131819
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1131819
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1131819
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1131819
1,3-Butadiene	106-99-0	54.10	2.00	4.43	7.41	16.4		1	WG1131819
Carbon disulfide	75-15-0	76.10	5.00	15.6	43.8	136		25	WG1132227
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1131819
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1131819
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1131819
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1131819
Chloromethane	74-87-3	50.50	0.200	0.413	0.386	0.797		1	WG1131819
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1131819
Cyclohexane	110-82-7	84.20	0.200	0.689	26.7	91.9		1	WG1131819
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1131819
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1131819
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1131819
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1131819
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1131819
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1131819
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1131819
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1131819
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1131819
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1131819
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1131819
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1131819
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1131819
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1131819
Ethanol	64-17-5	46.10	0.630	1.19	1.67	3.15		1	WG1131819
Ethylbenzene	100-41-4	106	0.200	0.867	2.01	8.73		1	WG1131819
4-Ethyltoluene	622-96-8	120	0.200	0.982	0.774	3.80		1	WG1131819
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.285	1.60		1	WG1131819
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.295	1.46		1	WG1131819
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1131819
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1131819
Heptane	142-82-5	100	0.200	0.818	5.78	23.6		1	WG1131819
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1131819
n-Hexane	110-54-3	86.20	0.200	0.705	8.11	28.6		1	WG1131819
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1131819
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG1131819
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1131819
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	5.72	16.9		1	WG1131819
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	1.29	5.30		1	WG1131819
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1131819
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1131819
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1131819
2-Propanol	67-63-0	60.10	1.25	3.07	ND	ND		1	WG1131819
Propene	115-07-1	42.10	10.0	17.2	16.4	28.3		25	WG1132227
Styrene	100-42-5	104	0.200	0.851	0.256	1.09		1	WG1131819
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1131819
Tetrachloroethylene	127-18-4	166	0.200	1.36	0.278	1.89		1	WG1131819
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1131819
Toluene	108-88-3	92.10	0.200	0.753	24.3	91.4		1	WG1131819
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1131819

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1131819
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1131819
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1131819
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.816	4.01		1	WG1131819
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	0.379	1.86		1	WG1131819
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	4.33	20.2		1	WG1131819
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1131819
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1131819
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1131819
m&p-Xylene	1330-20-7	106	0.400	1.73	5.99	26.0		1	WG1131819
o-Xylene	95-47-6	106	0.200	0.867	2.03	8.81		1	WG1131819
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	499	2060		1	WG1131819
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*95.6*				WG1131819
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*92.3*				WG1132227

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	1.65	3.91		1	WG1131819
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1131819
Benzene	71-43-2	78.10	0.200	0.639	0.330	1.05		1	WG1131819
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1131819
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1131819
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1131819
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1131819
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1131819
Carbon disulfide	75-15-0	76.10	0.200	0.622	1.84	5.74		1	WG1131819
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1131819
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1131819
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1131819
Chloroform	67-66-3	119	0.200	0.973	2.61	12.7		1	WG1131819
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1131819
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1131819
Cyclohexane	110-82-7	84.20	0.200	0.689	0.481	1.66		1	WG1131819
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1131819
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1131819
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1131819
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1131819
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1131819
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1131819
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1131819
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1131819
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1131819
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1131819
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1131819
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1131819
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1131819
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1131819
Ethanol	64-17-5	46.10	0.630	1.19	ND	ND		1	WG1131819
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG1131819
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG1131819
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.235	1.32		1	WG1131819
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.288	1.43		1	WG1131819
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1131819
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1131819
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG1131819
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1131819
n-Hexane	110-54-3	86.20	0.200	0.705	0.441	1.55		1	WG1131819
Isopropylbenzene	98-82-8	120.20	0.200	0.983	0.255	1.25		1	WG1131819
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG1131819
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1131819
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG1131819
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1131819
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1131819
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1131819
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1131819
2-Propanol	67-63-0	60.10	1.25	3.07	ND	ND		1	WG1131819
Propene	115-07-1	42.10	0.400	0.689	9.91	17.1		1	WG1131819
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1131819
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1131819
Tetrachloroethylene	127-18-4	166	0.200	1.36	ND	ND		1	WG1131819
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1131819
Toluene	108-88-3	92.10	0.200	0.753	1.07	4.04		1	WG1131819
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1131819

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1131819
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1131819
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1131819
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	ND	ND		1	WG1131819
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1131819
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	0.286	1.34		1	WG1131819
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1131819
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1131819
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1131819
m&p-Xylene	1330-20-7	106	0.400	1.73	ND	ND		1	WG1131819
o-Xylene	95-47-6	106	0.200	0.867	ND	ND		1	WG1131819
TPH (GC/MS) Low Fraction	8006-61-9	101	50.0	207	68.9	285		1	WG1131819
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*97.5*				WG1131819

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
2-Propanol	67-63-0	60.10	5000	12300	89200	219000		4000	WG1132225
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*94.7*				WG1132225

Method Blank (MB)

(MB) R3321663-3 06/28/18 10:17

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Acetone	0.0619	J	0.0569	1.25
Allyl Chloride	U		0.0546	0.200
Benzene	U		0.0460	0.200
Benzyl Chloride	U		0.0598	0.200
Bromodichloromethane	U		0.0436	0.200
Bromoform	U		0.0786	0.600
Bromomethane	U		0.0609	0.200
1,3-Butadiene	U		0.0563	2.00
Carbon disulfide	U		0.0544	0.200
Carbon tetrachloride	U		0.0585	0.200
Chlorobenzene	U		0.0601	0.200
Chloroethane	U		0.0489	0.200
Chloroform	U		0.0574	0.200
Chloromethane	U		0.0544	0.200
2-Chlorotoluene	U		0.0605	0.200
Cyclohexane	U		0.0534	0.200
Dibromochloromethane	U		0.0494	0.200
1,2-Dibromoethane	U		0.0185	0.200
1,2-Dichlorobenzene	U		0.0603	0.200
1,3-Dichlorobenzene	U		0.0597	0.200
1,4-Dichlorobenzene	U		0.0557	0.200
1,2-Dichloroethane	U		0.0616	0.200
1,1-Dichloroethane	U		0.0514	0.200
1,1-Dichloroethene	U		0.0490	0.200
cis-1,2-Dichloroethene	U		0.0389	0.200
trans-1,2-Dichloroethene	U		0.0464	0.200
1,2-Dichloropropane	U		0.0599	0.200
cis-1,3-Dichloropropene	U		0.0588	0.200
trans-1,3-Dichloropropene	U		0.0435	0.200
1,4-Dioxane	U		0.0554	0.200
Ethylbenzene	U		0.0506	0.200
4-Ethyltoluene	U		0.0666	0.200
Trichlorofluoromethane	U		0.0673	0.200
Dichlorodifluoromethane	U		0.0601	0.200
1,1,2-Trichlorotrifluoroethane	U		0.0687	0.200
1,2-Dichlorotetrafluoroethane	U		0.0458	0.200
Heptane	U		0.0626	0.200
Hexachloro-1,3-butadiene	U		0.0656	0.630
n-Hexane	U		0.0457	0.200
Isopropylbenzene	U		0.0563	0.200

Method Blank (MB)

(MB) R3321663-3 06/28/18 10:17

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Methylene Chloride	U		0.0465	0.200
Methyl Butyl Ketone	U		0.0682	1.25
2-Butanone (MEK)	U		0.0493	1.25
4-Methyl-2-pentanone (MIBK)	U		0.0650	1.25
Methyl Methacrylate	U		0.0773	0.200
MTBE	U		0.0505	0.200
Naphthalene	U		0.154	0.630
2-Propanol	U		0.0882	1.25
Propene	U		0.0932	0.400
Styrene	U		0.0465	0.200
1,1,2,2-Tetrachloroethane	U		0.0576	0.200
Tetrachloroethylene	U		0.0497	0.200
Tetrahydrofuran	U		0.0508	0.200
Toluene	U		0.0499	0.200
1,2,4-Trichlorobenzene	U		0.148	0.630
1,1,1-Trichloroethane	U		0.0665	0.200
1,1,2-Trichloroethane	U		0.0287	0.200
Trichloroethylene	U		0.0545	0.200
1,2,4-Trimethylbenzene	U		0.0483	0.200
1,3,5-Trimethylbenzene	U		0.0631	0.200
2,2,4-Trimethylpentane	U		0.0456	0.200
Vinyl chloride	U		0.0457	0.200
Vinyl Bromide	U		0.0727	0.200
Vinyl acetate	U		0.0639	0.200
m&p-Xylene	U		0.0946	0.400
o-Xylene	U		0.0633	0.200
Ethanol	U		0.0832	0.630
(S) 1,4-Bromofluorobenzene	*96.3*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3321663-1 06/28/18 08:54 • (LCSD) R3321663-2 06/28/18 09:35

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	3.79	3.82	101	102	52.0-158			0.873	25
Propene	3.75	3.77	3.61	100	96.2	54.0-155			4.26	25
Dichlorodifluoromethane	3.75	4.09	3.96	109	106	69.0-143			3.21	25
1,2-Dichlorotetrafluoroethane	3.75	3.98	3.85	106	103	70.0-130			3.31	25
Chloromethane	3.75	3.94	3.81	105	102	70.0-130			3.24	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3321663-1 06/28/18 08:54 • (LCSD) R3321663-2 06/28/18 09:35

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Vinyl chloride	3.75	3.87	3.53	103	94.0	70.0-130			9.40	25
1,3-Butadiene	3.75	3.71	3.36	99.1	89.5	70.0-130			10.1	25
Bromomethane	3.75	3.66	3.37	97.5	89.9	70.0-130			8.12	25
Chloroethane	3.75	3.55	3.27	94.8	87.1	70.0-130			8.48	25
Trichlorofluoromethane	3.75	3.73	3.73	99.5	99.5	70.0-130			0.0176	25
1,1,2-Trichlorotrifluoroethane	3.75	4.07	3.99	109	106	70.0-130			2.20	25
1,1-Dichloroethene	3.75	3.97	3.88	106	103	70.0-130			2.33	25
1,1-Dichloroethane	3.75	3.88	3.91	103	104	70.0-130			0.847	25
Acetone	3.75	3.82	3.86	102	103	70.0-130			1.17	25
2-Propanol	3.75	3.88	3.89	103	104	66.0-150			0.248	25
Carbon disulfide	3.75	3.93	3.87	105	103	70.0-130			1.69	25
Methylene Chloride	3.75	3.67	3.70	98.0	98.6	70.0-130			0.578	25
MTBE	3.75	3.89	3.87	104	103	70.0-130			0.361	25
trans-1,2-Dichloroethene	3.75	3.93	3.93	105	105	70.0-130			0.148	25
n-Hexane	3.75	3.85	3.87	103	103	70.0-130			0.350	25
Vinyl acetate	3.75	3.95	3.98	105	106	70.0-130			0.974	25
Methyl Ethyl Ketone	3.75	3.89	3.84	104	102	70.0-130			1.26	25
cis-1,2-Dichloroethene	3.75	4.00	4.01	107	107	70.0-130			0.0810	25
Chloroform	3.75	3.93	3.91	105	104	70.0-130			0.515	25
Cyclohexane	3.75	3.93	3.91	105	104	70.0-130			0.549	25
1,1,1-Trichloroethane	3.75	3.98	4.01	106	107	70.0-130			0.741	25
Carbon tetrachloride	3.75	4.16	4.20	111	112	70.0-130			0.786	25
Benzene	3.75	3.91	3.85	104	103	70.0-130			1.66	25
1,2-Dichloroethane	3.75	3.96	3.94	106	105	70.0-130			0.428	25
Heptane	3.75	3.95	3.91	105	104	70.0-130			1.02	25
Trichloroethylene	3.75	3.98	3.94	106	105	70.0-130			1.04	25
1,2-Dichloropropane	3.75	3.87	3.87	103	103	70.0-130			0.127	25
1,4-Dioxane	3.75	3.97	4.02	106	107	70.0-152			1.05	25
Bromodichloromethane	3.75	3.92	3.95	105	105	70.0-130			0.559	25
cis-1,3-Dichloropropene	3.75	4.03	3.97	108	106	70.0-130			1.58	25
4-Methyl-2-pentanone (MIBK)	3.75	3.92	3.93	104	105	70.0-142			0.243	25
Toluene	3.75	3.99	4.03	106	108	70.0-130			0.991	25
trans-1,3-Dichloropropene	3.75	3.99	4.02	106	107	70.0-130			0.657	25
1,1,2-Trichloroethane	3.75	3.99	3.98	106	106	70.0-130			0.162	25
Tetrachloroethylene	3.75	4.34	4.39	116	117	70.0-130			0.995	25
Methyl Butyl Ketone	3.75	3.99	4.06	106	108	70.0-150			1.72	25
Dibromochloromethane	3.75	4.13	4.22	110	112	70.0-130			1.98	25
1,2-Dibromoethane	3.75	4.06	4.10	108	109	70.0-130			0.931	25
Chlorobenzene	3.75	4.01	4.10	107	109	70.0-130			2.26	25
Ethylbenzene	3.75	4.02	4.06	107	108	70.0-130			0.962	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3321663-1 06/28/18 08:54 • (LCSD) R3321663-2 06/28/18 09:35

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
m&p-Xylene	7.50	8.24	8.33	110	111	70.0-130			1.04	25
o-Xylene	3.75	3.98	4.02	106	107	70.0-130			0.949	25
Styrene	3.75	4.06	4.13	108	110	70.0-130			1.61	25
Bromoform	3.75	4.47	4.54	119	121	70.0-130			1.52	25
1,1,2,2-Tetrachloroethane	3.75	3.79	3.86	101	103	70.0-130			1.93	25
4-Ethyltoluene	3.75	3.95	4.09	105	109	70.0-130			3.33	25
1,3,5-Trimethylbenzene	3.75	4.01	4.02	107	107	70.0-130			0.364	25
1,2,4-Trimethylbenzene	3.75	3.91	4.01	104	107	70.0-130			2.48	25
1,3-Dichlorobenzene	3.75	4.02	4.10	107	109	70.0-130			1.91	25
1,4-Dichlorobenzene	3.75	4.22	4.29	112	115	70.0-130			1.84	25
Benzyl Chloride	3.75	4.07	4.16	109	111	70.0-144			2.21	25
1,2-Dichlorobenzene	3.75	3.95	4.00	105	107	70.0-130			1.15	25
1,2,4-Trichlorobenzene	3.75	4.20	4.16	112	111	70.0-155			1.06	25
Hexachloro-1,3-butadiene	3.75	4.32	4.26	115	114	70.0-145			1.27	25
Naphthalene	3.75	3.99	3.90	106	104	70.0-155			2.35	25
Allyl Chloride	3.75	3.98	3.98	106	106	70.0-130			0.182	25
2-Chlorotoluene	3.75	4.07	4.10	108	109	70.0-130			0.752	25
Methyl Methacrylate	3.75	3.88	3.94	104	105	70.0-130			1.39	25
Tetrahydrofuran	3.75	3.79	3.75	101	100	70.0-140			1.09	25
2,2,4-Trimethylpentane	3.75	3.95	4.00	105	107	70.0-130			1.14	25
Vinyl Bromide	3.75	3.66	3.69	97.7	98.5	70.0-130			0.787	25
Isopropylbenzene	3.75	4.07	4.13	109	110	70.0-130			1.30	25
(S) 1,4-Bromofluorobenzene				*98.4*	*99.2*	*60.0-140*				

Method Blank (MB)

(MB) R3321986-3 06/29/18 10:34

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Tetrachloroethylene	U		0.0497	0.200
(S) 1,4-Bromofluorobenzene	*93.7*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3321986-1 06/29/18 09:06 • (LCSD) R3321986-2 06/29/18 09:49

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Tetrachloroethylene	3.75	4.19	4.24	112	113	70.0-130			1.02	25
(S) 1,4-Bromofluorobenzene				*102*	*102*	*60.0-140*				

Method Blank (MB)

(MB) R3322123-2 06/29/18 11:15

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Acetone	U		0.0569	1.25
Allyl Chloride	U		0.0546	0.200
Benzene	U		0.0460	0.200
Benzyl Chloride	U		0.0598	0.200
Bromodichloromethane	U		0.0436	0.200
Bromoform	U		0.0786	0.600
Bromomethane	U		0.0609	0.200
1,3-Butadiene	U		0.0563	2.00
Carbon disulfide	U		0.0544	0.200
Carbon tetrachloride	U		0.0585	0.200
Chlorobenzene	U		0.0601	0.200
Chloroethane	U		0.0489	0.200
Chloroform	U		0.0574	0.200
Chloromethane	U		0.0544	0.200
2-Chlorotoluene	U		0.0605	0.200
Cyclohexane	U		0.0534	0.200
Dibromochloromethane	U		0.0494	0.200
1,2-Dibromoethane	U		0.0185	0.200
1,2-Dichlorobenzene	U		0.0603	0.200
1,3-Dichlorobenzene	U		0.0597	0.200
1,4-Dichlorobenzene	U		0.0557	0.200
1,2-Dichloroethane	U		0.0616	0.200
1,1-Dichloroethane	U		0.0514	0.200
1,1-Dichloroethene	U		0.0490	0.200
cis-1,2-Dichloroethene	U		0.0389	0.200
trans-1,2-Dichloroethene	U		0.0464	0.200
1,2-Dichloropropane	U		0.0599	0.200
cis-1,3-Dichloropropene	U		0.0588	0.200
trans-1,3-Dichloropropene	U		0.0435	0.200
1,4-Dioxane	U		0.0554	0.200
Ethylbenzene	U		0.0506	0.200
4-Ethyltoluene	U		0.0666	0.200
Trichlorofluoromethane	U		0.0673	0.200
Dichlorodifluoromethane	U		0.0601	0.200
1,1,2-Trichlorotrifluoroethane	U		0.0687	0.200
1,2-Dichlorotetrafluoroethane	U		0.0458	0.200
Heptane	U		0.0626	0.200
Hexachloro-1,3-butadiene	0.0981	J	0.0656	0.630
n-Hexane	U		0.0457	0.200
Isopropylbenzene	U		0.0563	0.200

Method Blank (MB)

(MB) R3322123-2 06/29/18 11:15

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Methylene Chloride	U		0.0465	0.200
Methyl Butyl Ketone	U		0.0682	1.25
2-Butanone (MEK)	U		0.0493	1.25
4-Methyl-2-pentanone (MIBK)	U		0.0650	1.25
Methyl Methacrylate	U		0.0773	0.200
MTBE	U		0.0505	0.200
Naphthalene	0.209	J	0.154	0.630
2-Propanol	U		0.0882	1.25
Propene	U		0.0932	0.400
Styrene	U		0.0465	0.200
1,1,2,2-Tetrachloroethane	U		0.0576	0.200
Tetrachloroethylene	U		0.0497	0.200
Tetrahydrofuran	U		0.0508	0.200
Toluene	U		0.0499	0.200
1,2,4-Trichlorobenzene	U		0.148	0.630
1,1,1-Trichloroethane	U		0.0665	0.200
1,1,2-Trichloroethane	U		0.0287	0.200
Trichloroethylene	U		0.0545	0.200
1,2,4-Trimethylbenzene	U		0.0483	0.200
1,3,5-Trimethylbenzene	U		0.0631	0.200
2,2,4-Trimethylpentane	U		0.0456	0.200
Vinyl chloride	U		0.0457	0.200
Vinyl Bromide	U		0.0727	0.200
Vinyl acetate	U		0.0639	0.200
m&p-Xylene	U		0.0946	0.400
o-Xylene	U		0.0633	0.200
Ethanol	U		0.0832	0.630
TPH (GC/MS) Low Fraction	U		6.91	50.0
(S) 1,4-Bromofluorobenzene	*92.7*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3322123-1 06/29/18 10:31 • (LCSD) R3322123-3 06/29/18 12:03

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	3.36	3.46	89.5	92.2	52.0-158			2.91	25
Propene	3.75	3.21	3.25	85.7	86.7	54.0-155			1.16	25
Dichlorodifluoromethane	3.75	2.69	2.68	71.6	71.4	69.0-143			0.376	25
1,2-Dichlorotetrafluoroethane	3.75	3.48	3.50	92.7	93.3	70.0-130			0.670	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3322123-1 06/29/18 10:31 • (LCSD) R3322123-3 06/29/18 12:03

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloromethane	3.75	3.28	3.30	87.6	88.0	70.0-130			0.473	25
Vinyl chloride	3.75	3.46	3.45	92.4	92.1	70.0-130			0.278	25
1,3-Butadiene	3.75	3.30	3.31	87.9	88.2	70.0-130			0.335	25
Bromomethane	3.75	3.64	3.67	97.2	97.8	70.0-130			0.699	25
Chloroethane	3.75	3.52	3.54	94.0	94.5	70.0-130			0.546	25
Trichlorofluoromethane	3.75	3.60	3.65	95.9	97.4	70.0-130			1.48	25
1,1,2-Trichlorotrifluoroethane	3.75	3.73	3.73	99.4	99.5	70.0-130			0.103	25
1,1-Dichloroethene	3.75	3.45	3.46	92.0	92.2	70.0-130			0.224	25
1,1-Dichloroethane	3.75	3.52	3.55	93.8	94.6	70.0-130			0.864	25
Acetone	3.75	3.31	3.30	88.3	88.1	70.0-130			0.262	25
2-Propanol	3.75	3.48	3.50	92.9	93.3	66.0-150			0.452	25
Carbon disulfide	3.75	3.66	3.68	97.5	98.2	70.0-130			0.704	25
Methylene Chloride	3.75	3.28	3.31	87.5	88.3	70.0-130			0.906	25
MTBE	3.75	3.55	3.60	94.7	96.1	70.0-130			1.46	25
trans-1,2-Dichloroethene	3.75	3.64	3.70	96.9	98.5	70.0-130			1.64	25
n-Hexane	3.75	3.49	3.50	93.0	93.2	70.0-130			0.276	25
Vinyl acetate	3.75	3.55	3.55	94.6	94.7	70.0-130			0.0361	25
Methyl Ethyl Ketone	3.75	3.67	3.69	97.8	98.5	70.0-130			0.739	25
cis-1,2-Dichloroethene	3.75	3.69	3.69	98.4	98.4	70.0-130			0.00881	25
Chloroform	3.75	3.58	3.61	95.3	96.3	70.0-130			0.977	25
Cyclohexane	3.75	3.67	3.69	97.7	98.4	70.0-130			0.633	25
1,1,1-Trichloroethane	3.75	3.59	3.59	95.7	95.8	70.0-130			0.0720	25
Carbon tetrachloride	3.75	3.66	3.66	97.5	97.6	70.0-130			0.0425	25
Benzene	3.75	3.65	3.61	97.4	96.3	70.0-130			1.18	25
1,2-Dichloroethane	3.75	3.40	3.35	90.7	89.3	70.0-130			1.50	25
Heptane	3.75	3.35	3.32	89.2	88.6	70.0-130			0.674	25
Trichloroethylene	3.75	3.65	3.67	97.4	97.8	70.0-130			0.384	25
1,2-Dichloropropane	3.75	3.58	3.53	95.4	94.0	70.0-130			1.44	25
1,4-Dioxane	3.75	4.06	3.97	108	106	70.0-152			2.23	25
Bromodichloromethane	3.75	3.64	3.61	97.2	96.3	70.0-130			0.942	25
cis-1,3-Dichloropropene	3.75	3.76	3.69	100	98.3	70.0-130			1.89	25
4-Methyl-2-pentanone (MIBK)	3.75	3.52	3.47	93.9	92.6	70.0-142			1.44	25
Toluene	3.75	3.74	3.68	99.7	98.1	70.0-130			1.65	25
trans-1,3-Dichloropropene	3.75	3.67	3.64	97.9	97.1	70.0-130			0.876	25
1,1,2-Trichloroethane	3.75	3.72	3.69	99.3	98.3	70.0-130			1.07	25
Tetrachloroethylene	3.75	3.85	3.79	103	101	70.0-130			1.55	25
Methyl Butyl Ketone	3.75	3.71	3.67	99.0	97.9	70.0-150			1.16	25
Dibromochloromethane	3.75	3.83	3.77	102	101	70.0-130			1.60	25
1,2-Dibromoethane	3.75	3.80	3.75	101	99.9	70.0-130			1.31	25
Chlorobenzene	3.75	3.65	3.59	97.2	95.8	70.0-130			1.52	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3322123-1 06/29/18 10:31 • (LCSD) R3322123-3 06/29/18 12:03

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethylbenzene	3.75	3.78	3.72	101	99.3	70.0-130			1.43	25
m&p-Xylene	7.50	7.34	7.21	97.8	96.1	70.0-130			1.78	25
o-Xylene	3.75	3.76	3.72	100	99.2	70.0-130			0.972	25
Styrene	3.75	3.92	3.83	104	102	70.0-130			2.31	25
Bromoform	3.75	3.99	3.91	106	104	70.0-130			1.92	25
1,1,2,2-Tetrachloroethane	3.75	3.74	3.65	99.7	97.3	70.0-130			2.39	25
4-Ethyltoluene	3.75	3.85	3.77	103	101	70.0-130			1.93	25
1,3,5-Trimethylbenzene	3.75	3.76	3.51	100	93.6	70.0-130			6.86	25
1,2,4-Trimethylbenzene	3.75	3.77	3.67	100	97.9	70.0-130			2.57	25
1,3-Dichlorobenzene	3.75	3.91	3.78	104	101	70.0-130			3.40	25
1,4-Dichlorobenzene	3.75	3.95	3.80	105	101	70.0-130			3.72	25
Benzyl Chloride	3.75	3.95	3.75	105	99.9	70.0-144			5.16	25
1,2-Dichlorobenzene	3.75	3.84	3.68	102	98.3	70.0-130			4.17	25
1,2,4-Trichlorobenzene	3.75	4.79	4.27	128	114	70.0-155			11.6	25
Hexachloro-1,3-butadiene	3.75	3.67	3.55	98.0	94.6	70.0-145			3.53	25
Naphthalene	3.75	4.62	4.09	123	109	70.0-155			12.2	25
TPH (GC/MS) Low Fraction	176	174	173	99.0	98.0	70.0-130			0.979	25
Allyl Chloride	3.75	3.35	3.37	89.3	89.9	70.0-130			0.714	25
2-Chlorotoluene	3.75	3.70	3.62	98.8	96.6	70.0-130			2.27	25
Methyl Methacrylate	3.75	3.76	3.71	100	98.8	70.0-130			1.36	25
Tetrahydrofuran	3.75	3.35	3.36	89.3	89.6	70.0-140			0.313	25
2,2,4-Trimethylpentane	3.75	3.49	3.50	93.0	93.3	70.0-130			0.291	25
Vinyl Bromide	3.75	3.86	3.85	103	103	70.0-130			0.316	25
Isopropylbenzene	3.75	3.82	3.74	102	99.8	70.0-130			1.90	25
(S) 1,4-Bromofluorobenzene				*98.7*	*98.7*	*60.0-140*				

Method Blank (MB)

(MB) R3322470-3 06/30/18 10:08

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
2-Propanol	U		0.0882	1.25
(S) 1,4-Bromofluorobenzene	*94.5*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3322470-1 06/30/18 08:39 • (LCSD) R3322470-2 06/30/18 09:22

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
2-Propanol	3.75	4.03	4.23	107	113	66.0-150			4.77	25
(S) 1,4-Bromofluorobenzene				*103*	*101*	*60.0-140*				

Method Blank (MB)

(MB) R3322462-3 06/30/18 10:40

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Acetone	U		0.0569	1.25
Allyl Chloride	U		0.0546	0.200
Benzene	U		0.0460	0.200
Benzyl Chloride	U		0.0598	0.200
Bromodichloromethane	U		0.0436	0.200
Bromoform	U		0.0786	0.600
Bromomethane	U		0.0609	0.200
1,3-Butadiene	U		0.0563	2.00
Carbon disulfide	U		0.0544	0.200
Carbon tetrachloride	U		0.0585	0.200
Chlorobenzene	U		0.0601	0.200
Chloroethane	U		0.0489	0.200
Chloroform	U		0.0574	0.200
Chloromethane	U		0.0544	0.200
2-Chlorotoluene	U		0.0605	0.200
Cyclohexane	U		0.0534	0.200
Dibromochloromethane	U		0.0494	0.200
1,2-Dibromoethane	U		0.0185	0.200
1,2-Dichlorobenzene	U		0.0603	0.200
1,3-Dichlorobenzene	U		0.0597	0.200
1,4-Dichlorobenzene	U		0.0557	0.200
1,2-Dichloroethane	U		0.0616	0.200
1,1-Dichloroethane	U		0.0514	0.200
1,1-Dichloroethene	U		0.0490	0.200
cis-1,2-Dichloroethene	U		0.0389	0.200
trans-1,2-Dichloroethene	U		0.0464	0.200
1,2-Dichloropropane	U		0.0599	0.200
cis-1,3-Dichloropropene	U		0.0588	0.200
trans-1,3-Dichloropropene	U		0.0435	0.200
1,4-Dioxane	U		0.0554	0.200
Ethylbenzene	U		0.0506	0.200
4-Ethyltoluene	U		0.0666	0.200
Trichlorofluoromethane	U		0.0673	0.200
Dichlorodifluoromethane	U		0.0601	0.200
1,1,2-Trichlorotrifluoroethane	U		0.0687	0.200
1,2-Dichlorotetrafluoroethane	U		0.0458	0.200
Heptane	U		0.0626	0.200
Hexachloro-1,3-butadiene	0.0891	J	0.0656	0.630
n-Hexane	U		0.0457	0.200
Isopropylbenzene	U		0.0563	0.200

Method Blank (MB)

(MB) R3322462-3 06/30/18 10:40

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Methylene Chloride	U		0.0465	0.200
Methyl Butyl Ketone	U		0.0682	1.25
2-Butanone (MEK)	U		0.0493	1.25
4-Methyl-2-pentanone (MIBK)	U		0.0650	1.25
Methyl Methacrylate	U		0.0773	0.200
MTBE	U		0.0505	0.200
Naphthalene	0.183	J	0.154	0.630
2-Propanol	U		0.0882	1.25
Propene	U		0.0932	0.400
Styrene	U		0.0465	0.200
1,1,2,2-Tetrachloroethane	U		0.0576	0.200
Tetrachloroethylene	U		0.0497	0.200
Tetrahydrofuran	U		0.0508	0.200
Toluene	U		0.0499	0.200
1,2,4-Trichlorobenzene	U		0.148	0.630
1,1,1-Trichloroethane	U		0.0665	0.200
1,1,2-Trichloroethane	U		0.0287	0.200
Trichloroethylene	U		0.0545	0.200
1,2,4-Trimethylbenzene	U		0.0483	0.200
1,3,5-Trimethylbenzene	U		0.0631	0.200
2,2,4-Trimethylpentane	U		0.0456	0.200
Vinyl chloride	U		0.0457	0.200
Vinyl Bromide	U		0.0727	0.200
Vinyl acetate	U		0.0639	0.200
m&p-Xylene	U		0.0946	0.400
o-Xylene	U		0.0633	0.200
Ethanol	U		0.0832	0.630
TPH (GC/MS) Low Fraction	U		6.91	50.0
(S) 1,4-Bromofluorobenzene	*93.8*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3322462-1 06/30/18 09:00 • (LCSD) R3322462-2 06/30/18 09:50

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	4.02	3.89	107	104	52.0-158			3.26	25
Propene	3.75	4.14	4.07	110	109	54.0-155			1.66	25
Dichlorodifluoromethane	3.75	3.07	3.02	81.9	80.5	69.0-143			1.74	25
1,2-Dichlorotetrafluoroethane	3.75	3.79	3.73	101	99.3	70.0-130			1.62	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3322462-1 06/30/18 09:00 • (LCSD) R3322462-2 06/30/18 09:50

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloromethane	3.75	4.13	4.03	110	107	70.0-130			2.47	25
Vinyl chloride	3.75	3.99	3.96	106	106	70.0-130			0.649	25
1,3-Butadiene	3.75	4.32	4.22	115	113	70.0-130			2.31	25
Bromomethane	3.75	3.89	3.86	104	103	70.0-130			0.763	25
Chloroethane	3.75	4.13	4.05	110	108	70.0-130			1.92	25
Trichlorofluoromethane	3.75	3.90	3.83	104	102	70.0-130			1.87	25
1,1,2-Trichlorotrifluoroethane	3.75	3.87	3.81	103	101	70.0-130			1.65	25
1,1-Dichloroethene	3.75	3.97	3.93	106	105	70.0-130			1.08	25
1,1-Dichloroethane	3.75	4.02	3.94	107	105	70.0-130			1.95	25
Acetone	3.75	4.16	4.05	111	108	70.0-130			2.66	25
2-Propanol	3.75	3.99	3.96	106	106	66.0-150			0.867	25
Carbon disulfide	3.75	3.96	3.91	106	104	70.0-130			1.33	25
Methylene Chloride	3.75	4.07	3.96	108	106	70.0-130			2.63	25
MTBE	3.75	3.87	3.85	103	103	70.0-130			0.584	25
trans-1,2-Dichloroethene	3.75	3.90	3.87	104	103	70.0-130			0.717	25
n-Hexane	3.75	4.06	4.04	108	108	70.0-130			0.396	25
Vinyl acetate	3.75	4.31	4.23	115	113	70.0-130			1.77	25
Methyl Ethyl Ketone	3.75	4.03	3.99	108	106	70.0-130			1.02	25
cis-1,2-Dichloroethene	3.75	4.23	4.16	113	111	70.0-130			1.80	25
Chloroform	3.75	3.95	3.90	105	104	70.0-130			1.35	25
Cyclohexane	3.75	3.87	3.87	103	103	70.0-130			0.00739	25
1,1,1-Trichloroethane	3.75	3.88	3.87	104	103	70.0-130			0.409	25
Carbon tetrachloride	3.75	3.84	3.81	102	102	70.0-130			0.896	25
Benzene	3.75	4.04	3.98	108	106	70.0-130			1.44	25
1,2-Dichloroethane	3.75	4.09	3.98	109	106	70.0-130			2.61	25
Heptane	3.75	4.28	4.19	114	112	70.0-130			2.11	25
Trichloroethylene	3.75	3.87	3.81	103	102	70.0-130			1.45	25
1,2-Dichloropropane	3.75	4.03	3.98	108	106	70.0-130			1.26	25
1,4-Dioxane	3.75	4.17	4.15	111	111	70.0-152			0.442	25
Bromodichloromethane	3.75	4.05	3.99	108	106	70.0-130			1.44	25
cis-1,3-Dichloropropene	3.75	3.92	3.86	105	103	70.0-130			1.43	25
4-Methyl-2-pentanone (MIBK)	3.75	4.42	4.34	118	116	70.0-142			1.82	25
Toluene	3.75	4.02	3.99	107	107	70.0-130			0.638	25
trans-1,3-Dichloropropene	3.75	3.88	3.87	103	103	70.0-130			0.181	25
1,1,2-Trichloroethane	3.75	3.93	3.93	105	105	70.0-130			0.101	25
Tetrachloroethylene	3.75	3.75	3.75	100	100	70.0-130			0.104	25
Methyl Butyl Ketone	3.75	4.61	4.51	123	120	70.0-150			2.25	25
Dibromochloromethane	3.75	3.95	3.89	105	104	70.0-130			1.35	25
1,2-Dibromoethane	3.75	4.00	3.94	107	105	70.0-130			1.41	25
Chlorobenzene	3.75	3.99	3.95	107	105	70.0-130			1.01	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3322462-1 06/30/18 09:00 • (LCSD) R3322462-2 06/30/18 09:50

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethylbenzene	3.75	4.01	3.99	107	106	70.0-130			0.535	25
m&p-Xylene	7.50	7.89	7.82	105	104	70.0-130			0.925	25
o-Xylene	3.75	3.98	3.97	106	106	70.0-130			0.0760	25
Styrene	3.75	4.09	4.07	109	109	70.0-130			0.416	25
Bromoform	3.75	3.93	3.88	105	103	70.0-130			1.33	25
1,1,2,2-Tetrachloroethane	3.75	4.01	3.98	107	106	70.0-130			0.772	25
4-Ethyltoluene	3.75	3.97	3.96	106	106	70.0-130			0.270	25
1,3,5-Trimethylbenzene	3.75	3.55	3.84	94.7	102	70.0-130			7.90	25
1,2,4-Trimethylbenzene	3.75	3.85	3.84	103	102	70.0-130			0.265	25
1,3-Dichlorobenzene	3.75	3.88	3.85	103	103	70.0-130			0.885	25
1,4-Dichlorobenzene	3.75	3.92	3.89	105	104	70.0-130			0.862	25
Benzyl Chloride	3.75	3.83	3.80	102	101	70.0-144			0.965	25
1,2-Dichlorobenzene	3.75	3.76	3.72	100	99.1	70.0-130			1.00	25
1,2,4-Trichlorobenzene	3.75	4.05	4.01	108	107	70.0-155			0.940	25
Hexachloro-1,3-butadiene	3.75	3.50	3.43	93.3	91.4	70.0-145			2.03	25
Naphthalene	3.75	3.85	3.81	103	102	70.0-155			1.05	25
TPH (GC/MS) Low Fraction	176	188	186	107	105	70.0-130			1.01	25
Allyl Chloride	3.75	4.17	4.07	111	109	70.0-130			2.39	25
2-Chlorotoluene	3.75	3.95	3.93	105	105	70.0-130			0.558	25
Methyl Methacrylate	3.75	4.20	4.07	112	108	70.0-130			3.17	25
Tetrahydrofuran	3.75	4.29	4.21	114	112	70.0-140			1.85	25
2,2,4-Trimethylpentane	3.75	4.10	4.04	109	108	70.0-130			1.44	25
Vinyl Bromide	3.75	3.77	3.84	100	102	70.0-130			1.86	25
Isopropylbenzene	3.75	3.93	3.91	105	104	70.0-130			0.493	25
(S) 1,4-Bromofluorobenzene				*99.3*	*101*	*60.0-140*				

Method Blank (MB)

(MB) R3322618-3 07/02/18 10:13

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Acetone	U		0.0569	1.25
Allyl Chloride	U		0.0546	0.200
Benzene	U		0.0460	0.200
Benzyl Chloride	U		0.0598	0.200
Bromodichloromethane	U		0.0436	0.200
Bromoform	U		0.0786	0.600
Bromomethane	U		0.0609	0.200
1,3-Butadiene	U		0.0563	2.00
Carbon disulfide	U		0.0544	0.200
Carbon tetrachloride	U		0.0585	0.200
Chlorobenzene	U		0.0601	0.200
Chloroethane	U		0.0489	0.200
Chloroform	U		0.0574	0.200
Chloromethane	U		0.0544	0.200
2-Chlorotoluene	U		0.0605	0.200
Cyclohexane	U		0.0534	0.200
Dibromochloromethane	U		0.0494	0.200
1,2-Dibromoethane	U		0.0185	0.200
1,2-Dichlorobenzene	U		0.0603	0.200
1,3-Dichlorobenzene	U		0.0597	0.200
1,4-Dichlorobenzene	U		0.0557	0.200
1,2-Dichloroethane	U		0.0616	0.200
1,1-Dichloroethane	U		0.0514	0.200
1,1-Dichloroethene	U		0.0490	0.200
cis-1,2-Dichloroethene	U		0.0389	0.200
trans-1,2-Dichloroethene	U		0.0464	0.200
1,2-Dichloropropane	U		0.0599	0.200
cis-1,3-Dichloropropene	U		0.0588	0.200
trans-1,3-Dichloropropene	U		0.0435	0.200
1,4-Dioxane	U		0.0554	0.200
Ethylbenzene	U		0.0506	0.200
4-Ethyltoluene	U		0.0666	0.200
Trichlorofluoromethane	U		0.0673	0.200
Dichlorodifluoromethane	U		0.0601	0.200
1,1,2-Trichlorotrifluoroethane	U		0.0687	0.200
1,2-Dichlorotetrafluoroethane	U		0.0458	0.200
Heptane	U		0.0626	0.200
Hexachloro-1,3-butadiene	U		0.0656	0.630
n-Hexane	U		0.0457	0.200
Isopropylbenzene	U		0.0563	0.200

Method Blank (MB)

(MB) R3322618-3 07/02/18 10:13

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Methylene Chloride	U		0.0465	0.200
Methyl Butyl Ketone	U		0.0682	1.25
2-Butanone (MEK)	U		0.0493	1.25
4-Methyl-2-pentanone (MIBK)	U		0.0650	1.25
Methyl Methacrylate	U		0.0773	0.200
MTBE	U		0.0505	0.200
Naphthalene	U		0.154	0.630
2-Propanol	0.0938	J	0.0882	1.25
Propene	U		0.0932	0.400
Styrene	U		0.0465	0.200
1,1,2,2-Tetrachloroethane	U		0.0576	0.200
Tetrachloroethylene	U		0.0497	0.200
Tetrahydrofuran	U		0.0508	0.200
Toluene	U		0.0499	0.200
1,2,4-Trichlorobenzene	U		0.148	0.630
1,1,1-Trichloroethane	U		0.0665	0.200
1,1,2-Trichloroethane	U		0.0287	0.200
Trichloroethylene	U		0.0545	0.200
1,2,4-Trimethylbenzene	U		0.0483	0.200
1,3,5-Trimethylbenzene	U		0.0631	0.200
2,2,4-Trimethylpentane	U		0.0456	0.200
Vinyl chloride	U		0.0457	0.200
Vinyl Bromide	U		0.0727	0.200
Vinyl acetate	U		0.0639	0.200
m&p-Xylene	U		0.0946	0.400
o-Xylene	U		0.0633	0.200
Ethanol	U		0.0832	0.630
TPH (GC/MS) Low Fraction	10.0	J	6.91	50.0
(S) 1,4-Bromofluorobenzene	*96.7*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3322618-1 07/02/18 08:51 • (LCSD) R3322618-2 07/02/18 09:31

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	3.65	3.98	97.4	106	52.0-158			8.67	25
Propene	3.75	4.12	4.08	110	109	54.0-155			1.09	25
Dichlorodifluoromethane	3.75	4.15	4.16	111	111	69.0-143			0.355	25
1,2-Dichlorotetrafluoroethane	3.75	4.31	4.32	115	115	70.0-130			0.374	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3322618-1 07/02/18 08:51 • (LCSD) R3322618-2 07/02/18 09:31

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloromethane	3.75	4.36	4.31	116	115	70.0-130			1.08	25
Vinyl chloride	3.75	4.30	4.31	115	115	70.0-130			0.221	25
1,3-Butadiene	3.75	4.19	4.10	112	109	70.0-130			2.14	25
Bromomethane	3.75	4.22	4.16	113	111	70.0-130			1.46	25
Chloroethane	3.75	4.18	4.17	112	111	70.0-130			0.299	25
Trichlorofluoromethane	3.75	4.09	4.12	109	110	70.0-130			0.657	25
1,1,2-Trichlorotrifluoroethane	3.75	4.24	4.24	113	113	70.0-130			0.0273	25
1,1-Dichloroethene	3.75	4.24	4.23	113	113	70.0-130			0.281	25
1,1-Dichloroethane	3.75	4.22	4.22	113	113	70.0-130			0.0227	25
Acetone	3.75	4.16	4.21	111	112	70.0-130			1.26	25
2-Propanol	3.75	4.04	4.01	108	107	66.0-150			0.889	25
Carbon disulfide	3.75	4.28	4.25	114	113	70.0-130			0.586	25
Methylene Chloride	3.75	4.03	4.04	108	108	70.0-130			0.131	25
MTBE	3.75	4.08	4.09	109	109	70.0-130			0.204	25
trans-1,2-Dichloroethene	3.75	4.23	4.21	113	112	70.0-130			0.363	25
n-Hexane	3.75	4.15	4.21	111	112	70.0-130			1.27	25
Vinyl acetate	3.75	4.19	4.19	112	112	70.0-130			0.00921	25
Methyl Ethyl Ketone	3.75	4.11	4.09	110	109	70.0-130			0.449	25
cis-1,2-Dichloroethene	3.75	4.23	4.22	113	113	70.0-130			0.129	25
Chloroform	3.75	4.12	4.16	110	111	70.0-130			0.810	25
Cyclohexane	3.75	4.18	4.19	111	112	70.0-130			0.297	25
1,1,1-Trichloroethane	3.75	4.14	4.16	110	111	70.0-130			0.437	25
Carbon tetrachloride	3.75	4.24	4.26	113	114	70.0-130			0.563	25
Benzene	3.75	4.16	4.18	111	111	70.0-130			0.397	25
1,2-Dichloroethane	3.75	4.15	4.11	111	110	70.0-130			0.865	25
Heptane	3.75	4.20	4.09	112	109	70.0-130			2.72	25
Trichloroethylene	3.75	4.13	4.13	110	110	70.0-130			0.0235	25
1,2-Dichloropropane	3.75	4.22	4.20	112	112	70.0-130			0.483	25
1,4-Dioxane	3.75	4.08	4.00	109	107	70.0-152			1.98	25
Bromodichloromethane	3.75	4.21	4.19	112	112	70.0-130			0.534	25
cis-1,3-Dichloropropene	3.75	4.20	4.25	112	113	70.0-130			1.15	25
4-Methyl-2-pentanone (MIBK)	3.75	4.21	4.21	112	112	70.0-142			0.0488	25
Toluene	3.75	4.27	4.26	114	114	70.0-130			0.0713	25
trans-1,3-Dichloropropene	3.75	4.22	4.22	113	113	70.0-130			0.107	25
1,1,2-Trichloroethane	3.75	4.21	4.22	112	113	70.0-130			0.172	25
Tetrachloroethylene	3.75	4.25	4.32	113	115	70.0-130			1.53	25
Methyl Butyl Ketone	3.75	4.23	4.21	113	112	70.0-150			0.487	25
Dibromochloromethane	3.75	4.22	4.26	113	113	70.0-130			0.784	25
1,2-Dibromoethane	3.75	4.23	4.31	113	115	70.0-130			1.80	25
Chlorobenzene	3.75	4.22	4.26	113	114	70.0-130			0.934	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3322618-1 07/02/18 08:51 • (LCSD) R3322618-2 07/02/18 09:31

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethylbenzene	3.75	4.33	4.28	116	114	70.0-130			1.21	25
m&p-Xylene	7.50	8.82	8.73	118	116	70.0-130			0.974	25
o-Xylene	3.75	4.23	4.20	113	112	70.0-130			0.750	25
Styrene	3.75	4.30	4.31	115	115	70.0-130			0.203	25
Bromoform	3.75	4.42	4.41	118	118	70.0-130			0.287	25
1,1,2,2-Tetrachloroethane	3.75	4.15	4.10	111	109	70.0-130			1.32	25
4-Ethyltoluene	3.75	4.23	4.20	113	112	70.0-130			0.826	25
1,3,5-Trimethylbenzene	3.75	4.22	4.20	113	112	70.0-130			0.589	25
1,2,4-Trimethylbenzene	3.75	4.11	4.09	110	109	70.0-130			0.629	25
1,3-Dichlorobenzene	3.75	4.21	4.16	112	111	70.0-130			1.11	25
1,4-Dichlorobenzene	3.75	4.44	4.42	118	118	70.0-130			0.541	25
Benzyl Chloride	3.75	4.23	4.20	113	112	70.0-144			0.769	25
1,2-Dichlorobenzene	3.75	4.12	4.12	110	110	70.0-130			0.154	25
1,2,4-Trichlorobenzene	3.75	4.30	4.32	115	115	70.0-155			0.411	25
Hexachloro-1,3-butadiene	3.75	4.30	4.33	115	115	70.0-145			0.656	25
Naphthalene	3.75	4.05	4.09	108	109	70.0-155			1.04	25
TPH (GC/MS) Low Fraction	176	193	192	109	109	70.0-130			0.353	25
Allyl Chloride	3.75	4.23	4.19	113	112	70.0-130			1.03	25
2-Chlorotoluene	3.75	4.28	4.27	114	114	70.0-130			0.293	25
Methyl Methacrylate	3.75	4.07	4.13	109	110	70.0-130			1.56	25
Tetrahydrofuran	3.75	4.00	3.97	107	106	70.0-140			0.816	25
2,2,4-Trimethylpentane	3.75	4.28	4.26	114	114	70.0-130			0.497	25
Vinyl Bromide	3.75	4.11	4.13	110	110	70.0-130			0.415	25
Isopropylbenzene	3.75	4.30	4.28	115	114	70.0-130			0.459	25
(S) 1,4-Bromofluorobenzene				*99.9*	*98.4*	*60.0-140*				

Method Blank (MB)

(MB) R3323076-2 07/03/18 09:10

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Tetrachloroethylene	U		0.0497	0.200
(S) 1,4-Bromofluorobenzene	*98.5*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3323076-1 07/03/18 08:25 • (LCSD) R3323076-3 07/03/18 10:39

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Tetrachloroethylene	3.75	4.31	4.30	115	115	70.0-130			0.366	25
(S) 1,4-Bromofluorobenzene				*103*	*104*	*60.0-140*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

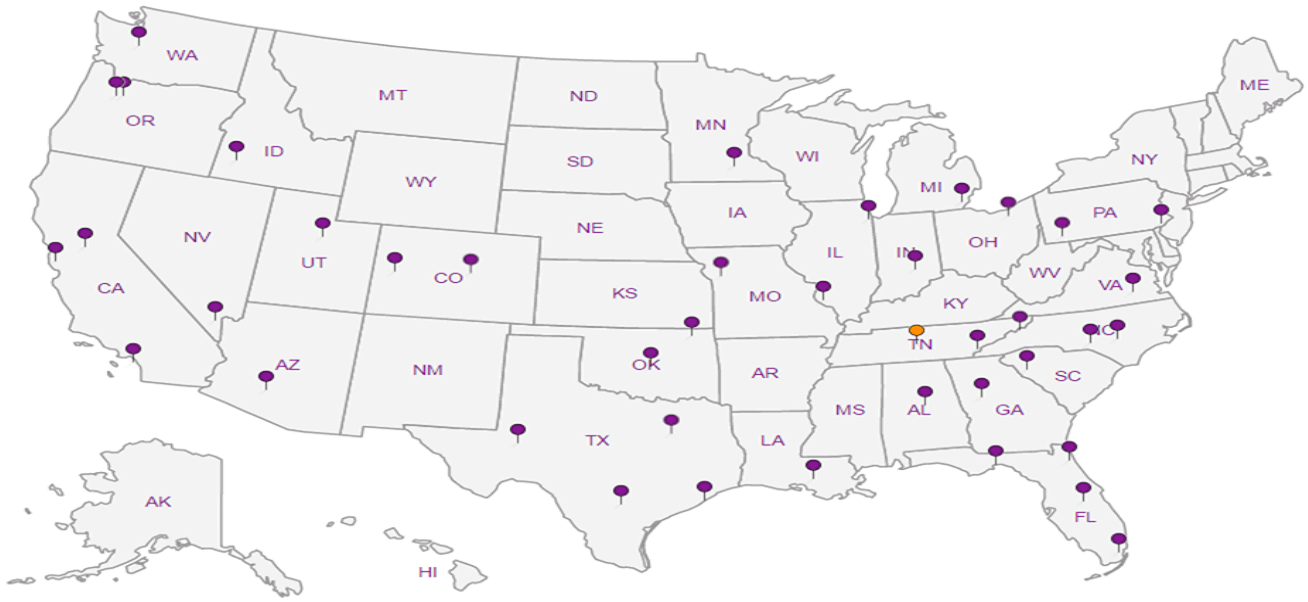
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



Pangea Environmental Serv - Oakland, CA

1710 Franklin Street

Billing Information:
Jake Wilson
1710 Franklin St., Ste. 200
Oakland, CA 94612

Pres Chk

Report to: morgan Gillies
Email To: mgillies@pangeaenv.com

Project Description: Livermore
City/State Collected: Livermore CA

Phone: 510-836-3700
Fax:
Client Project #
Lab Project # PANENVOCA-LIVERMORE

Collected by (print): E. Lervaag
Site/Facility ID #
P.O. #

Collected by (signature):
Immediately Packed on Ice N ___ NA
Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day
Date Results Needed
Quote #

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	IPA only Summa	TO-15 (with IPA) Summa	Sample # (lab only)
~~SG-4-5~~		Air		~~6.22.18~~	1714			X	~~8094~~
		Air		6.22.18	1714			X	8094 -01
SG-4-5		Air		6.22.18	1916			X	8219 -02
SG-4-20		Air		6.21.18	1030			X	8102 -03
SG-5-5		Air		"	1156			X	8228 -04
SG-6-5		Air		"	1128			X	8213 -05
SG-7-5		Air		"	1617			X	8256 -06
SG-8-5		Air		6.22.18	1100			X	8207 -07
SG-9-5		Air		"	1548			X	8156 -08
SG-10-5		Air		"	1514			X	8230 -09
SG-11-5									

Chain of Custody Page 1 of 2

ESC LABORATORY SCIENCES
a subsidiary of Pace Analytical
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1004982
Table M222
Acctnum: PANENVOCA
Template: T137269
Prelogin: P658587
TSR: 110 - Brian Ford
PB: BF 6/13/18
Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other

Remarks:

pH ___ Temp ___
Flow ___ Other ___

Samples returned via:
__ UPS __ FedEx __ Courier __ ____

Tracking # 4930 3427 5830, 5841

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	6.22.18	1800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / (No) HCL / MeoH TBR
Temp: Amb. °C Bottles Received: 17
Date: 6/27/18 Time: 0845

If preservation required by Login: Date/Time

Hold:

Condition: (NCF) / OK

Pangea Environmental Serv - Oakland, CA

1710 Franklin Street

Billing Information:
Jake Wilson
1710 Franklin St., Ste. 200
Oakland, CA 94612

Pres Chk

Report to: Morgan Gillies

Email To: mgillies@pangeaenv.com

Project Description: Livermore

City/State Collected: Livermore CA

Phone: 510-836-3700

Client Project #

Lab Project # **PANENVOCA-LIVERMORE**

Fax:

Collected by (print): E. Lervaag

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N NA

Rush? (Lab MUST Be Notified)
___ Same Day X Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Sample ID	CAN # Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	IPA only Summa	TO-15 (with IPA) Summa
SG-12-5	8086	Air		6.22.18	1049	1		X
SG-13-5	8864	Air			1143	1		X
SG-13-5 REP	8138	Air			1150	1		X
SG-14-5	8250	Air			1116	1		X
SG-15-10	8170	Air			1018	1		X
SG-17-10	8181	Air			0940	1	X	
Shroud	8192	Air				1		
		Air						
		Air						
		Air						

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

ESC LABORATORY SCIENCES
a subsidiary of Pace Analytical
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1004982

Table #

Acctnum: **PANENVOCA**
Template: **T137269**
Prelogin: **P658587**
TSR: **110 - Brian Ford**
PB: BF 6/13/18

Shipped Via: **FedEX Ground**

Remarks	Sample # (lab only)
	-10
	-11
	-12
	-13
	-14
	-15
	-16

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Trip Blank Received: Yes (No)
HCL / MeoH
TBR

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	6.22.18	1800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Temp: Amb °C Bottles Received: 17

Date: 6/27/18 Time: 0845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK TO

ESC Lab Sciences
Non-Conformance Form

Login #: L1004982	Client: PANENVOCA	Date: 6/27/18	Evaluated by: Troy Dunlap

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time		Login Clarification Needed		**If Broken Container:**
	Improper temperature		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
	Improper preservation		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Courie
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container	X	Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: No analysis marked for sample SHROUD.

Client informed by:		Call		Email X		Voice Mail		Date:06/27/18	Time:1800
TSR Initials:bjf		Client Contact: Morgan Gillies							

Login Instructions:

Log SG-17-10 for TO-15 (VOCs w/ IPA)

Log Shroud for TO-15BTEXMGRO (IPA only)

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ENTHALPY

ANALYTICAL

Enthalpy Analytical

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 305045
ANALYTICAL REPORT

Pangea Environmental	Project : STANDARD
1710 Franklin Street	Location : Livermore Core
Oakland, CA 94612	Level : II

Sample ID	Lab ID
SGMF-2-23	305045-001

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 which applies to this PDF file as well as any associated electronic data deliverable files. The results contained in this report meet all requirements of NELAP and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 11/19/2018

Patrick McCarthy
Project Manager
patrick.mccarthy@enthalpy.com
(510) 204-2236 ext 13115

CA ELAP# 2896, NELAP# 4044-001

ENTHALPY ANALYTICAL

CASE NARRATIVE

Laboratory number:	**305045**
Client:	**Pangea Environmental**
Location:	**Livermore Core**
Request Date:	**11/14/18**
Samples Received:	**11/14/18**

This data package contains sample and QC results for one soil sample, requested for the above referenced project on 11/14/18. The sample was received cold and intact.

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

Matrix spikes were not performed for this analysis in batch 265494 due to insufficient sample amount. No other analytical problems were encountered.

CHAIN OF CUSTODY

ENTHALPY ANALYTICAL
Formerly Curtis & Tompkins Labs
2323 Fifth Street
Berkeley, CA 94710
Phone (510) 486-0900
Fax (510) 486-0532

Chain of Custody #

C&T LOGIN # 305045

Project No: 2165.002.215
Project Name: Livermore CORE
Project P. O. No: Multi-Family
EDD Format: Report Level ☒ II ☐ III ☐ IV
Turnaround Time: ☐ RUSH ☒ Standard

Sampler: E. Lervaag
Report To: Morgan Gillies
Company: Pangea Env. Svs.
Telephone: 510-836-3700
Email: mgillies@pangeaenv.com

Lab No.	Sample ID.	SAMPLING		MATRIX				# of Containers	CHEMICAL PRESERVATIVE					ANALYTICAL REQUEST
		Date Collected	Time Collected	Water	Solid				HCl	H2SO4	HNO3	MeOH	None	VOC by 8260
	SGMF-2-23	11.14.18			X			3				X	X	X

Notes:

SAMPLE RECEIPT
☐ Intact
☐ Cold
☐ On Ice
☐ Ambient

RELINQUISHED BY:
11.14.18 DATE: 1215 TIME:
11/14/18 DATE: 1700 TIME:
DATE: TIME:

RECEIVED BY:
11/14/18 DATE: 1215 TIME:
11/14/18 DATE: 1700 TIME:
DATE: TIME:

SAMPLE RECEIPT CHECKLIST

Section 1: Login # 365045 Client: Ramge2

Date Received: 11/14/16 Project: _____

Section 2: Samples received in a cooler? ☑ Yes, how many? ___ ☐ No (skip Section 3 below)

If no cooler Sample Temp (°C): _____ using IR Gun # ☐ A, or ☐ B

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

If in cooler: Date Opened 11/14/16 By (print) AZ (sign) _____

Shipping info (if applicable) _____

Are custody seals present? ☑ No, or ☐ Yes. If yes, where? ☐ on cooler, ☐ on samples, ☐ on package

☐ Date: _____ How many _____ ☐ Signature, ☐ Initials, ☐ None

Were custody seals intact upon arrival? ☐ Yes ☐ No ☑ N/A

Section 3: ***Important*: Notify PM if temperature exceeds 6°C or arrive frozen.**

Packing in cooler: (if other, describe) _____

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

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

Type of ice used: ☑ Wet, ☑ Blue/Gel, ☐ None Temperature blank(s) included? ☐ Yes, ☑ No

Temperature measured using ☐ Thermometer ID: _____, or IR Gun # ☐ A ☑ B

Cooler Temp (°C): #1: 3.7, #2: _____, #3: _____, #4: _____, #5: _____, #6: _____, #7: _____

Section 4:	YES	NO	N/A
Were custody papers dry, filled out properly, and the project identifiable	—		
Were Method 5035 sampling containers present?	—		
If YES, what time were they transferred to freezer? 11/14/16 1710			
Did all bottles arrive unbroken/unopened?	—		
Are there any missing / extra samples?		—	
Are samples in the appropriate containers for indicated tests?	—		
Are sample labels present, in good condition and complete?	—		
Does the container count match the COC?	—		
Do the sample labels agree with custody papers?	—		
Was sufficient amount of sample sent for tests requested?	—		
Did you change the hold time in LIMS for unpreserved VOAs?	AZ		—
Did you change the hold time in LIMS for preserved terracores?	—		
Are bubbles > 6mm absent in VOA samples?			—
Was the client contacted concerning this sample delivery?		—	
If YES, who was called? _____ By _____ Date: _____			

Section 5:	YES	NO	N/A
Are the samples appropriately preserved? (if N/A, skip the rest of section 5)			—
Did you check preservatives for all bottles for each sample?			
Did you document your preservative check?			

pH strip lot# _____, pH strip lot# _____, pH strip lot# _____

Preservative added:

☐ H2SO4 lot# _____ added to samples _____ on/at _____

☐ HCL lot# _____ added to samples _____ on/at _____

☐ HNO3 lot# _____ added to samples _____ on/at _____

☐ NaOH lot# _____ added to samples _____ on/at _____

Section 6:

Explanations/Comments: _____

Date Logged in 11/14/16 **By (print)** AZ **(sign)** AZ

Date Labeled 11/14/16 **By (print)** AZ **(sign)** _____

ENTHALPY ANALYTICAL

Detections Summary for 305045

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

Client : Pangea Environmental
Project : STANDARD
Location : Livermore Core

Client Sample ID : SGMF-2-23 Laboratory Sample ID : 305045-001

No Detections

ENTHALPY ANALYTICAL

Purgeable Organics by GC/MS

Lab #:	305045	Location:	Livermore Core
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	STANDARD	Analysis:	EPA 8260B
Field ID:	SGMF-2-23	Diln Fac:	0.7669
Lab ID:	305045-001	Batch#:	265494
Matrix:	Soil	Sampled:	11/14/18
Units:	ug/Kg	Received:	11/14/18
Basis:	as received	Analyzed:	11/15/18

Analyte	Result	RL
Freon 12	ND	7.7
Chloromethane	ND	7.7
Vinyl Chloride	ND	7.7
Bromomethane	ND	7.7
Chloroethane	ND	7.7
Trichlorofluoromethane	ND	3.8
Acetone	ND	15
Freon 113	ND	3.8
1,1-Dichloroethene	ND	3.8
Methylene Chloride	ND	15
Carbon Disulfide	ND	3.8
MTBE	ND	3.8
trans-1,2-Dichloroethene	ND	3.8
Vinyl Acetate	ND	38
1,1-Dichloroethane	ND	3.8
2-Butanone	ND	7.7
cis-1,2-Dichloroethene	ND	3.8
2,2-Dichloropropane	ND	3.8
Chloroform	ND	3.8
Bromochloromethane	ND	3.8
1,1,1-Trichloroethane	ND	3.8
1,1-Dichloropropene	ND	3.8
Carbon Tetrachloride	ND	3.8
1,2-Dichloroethane	ND	3.8
Benzene	ND	3.8
Trichloroethene	ND	3.8
1,2-Dichloropropane	ND	3.8
Bromodichloromethane	ND	3.8
Dibromomethane	ND	3.8
4-Methyl-2-Pentanone	ND	7.7
cis-1,3-Dichloropropene	ND	3.8
Toluene	ND	3.8
trans-1,3-Dichloropropene	ND	3.8
1,1,2-Trichloroethane	ND	3.8
2-Hexanone	ND	7.7
1,3-Dichloropropane	ND	3.8
Tetrachloroethene	ND	3.8

ND= Not Detected
RL= Reporting Limit

ENTHALPY ANALYTICAL

Purgeable Organics by GC/MS

Lab #:	305045	Location:	Livermore Core
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	STANDARD	Analysis:	EPA 8260B
Field ID:	SGMF-2-23	Diln Fac:	0.7669
Lab ID:	305045-001	Batch#:	265494
Matrix:	Soil	Sampled:	11/14/18
Units:	ug/Kg	Received:	11/14/18
Basis:	as received	Analyzed:	11/15/18

Analyte	Result	RL
Dibromochloromethane	ND	3.8
1,2-Dibromoethane	ND	3.8
Chlorobenzene	ND	3.8
1,1,1,2-Tetrachloroethane	ND	3.8
Ethylbenzene	ND	3.8
m,p-Xylenes	ND	3.8
o-Xylene	ND	3.8
Styrene	ND	3.8
Bromoform	ND	3.8
Isopropylbenzene	ND	3.8
1,1,2,2-Tetrachloroethane	ND	3.8
1,2,3-Trichloropropane	ND	3.8
Propylbenzene	ND	3.8
Bromobenzene	ND	3.8
1,3,5-Trimethylbenzene	ND	3.8
2-Chlorotoluene	ND	3.8
4-Chlorotoluene	ND	3.8
tert-Butylbenzene	ND	3.8
1,2,4-Trimethylbenzene	ND	3.8
sec-Butylbenzene	ND	3.8
para-Isopropyl Toluene	ND	3.8
1,3-Dichlorobenzene	ND	3.8
1,4-Dichlorobenzene	ND	3.8
n-Butylbenzene	ND	3.8
1,2-Dichlorobenzene	ND	3.8
1,2-Dibromo-3-Chloropropane	ND	3.8
1,2,4-Trichlorobenzene	ND	3.8
Hexachlorobutadiene	ND	3.8
Naphthalene	ND	3.8
1,2,3-Trichlorobenzene	ND	3.8

Surrogate	%REC	Limits
Dibromofluoromethane	98	79-127
1,2-Dichloroethane-d4	110	73-139
Toluene-d8	96	80-120
Bromofluorobenzene	93	80-127

ND= Not Detected
RL= Reporting Limit

ENTHALPY ANALYTICAL

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	305045	Location:	Livermore Core
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	STANDARD	Analysis:	EPA 8260B
Matrix:	Soil	Batch#:	265494
Units:	ug/Kg	Analyzed:	11/15/18
Diln Fac:	1.000		

Type: BS Lab ID: QC955702

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	25.00	20.87	83	68-140
Benzene	25.00	24.57	98	74-123
Trichloroethene	25.00	24.64	99	72-125
Toluene	25.00	25.65	103	73-121
Chlorobenzene	25.00	26.25	105	76-123

Surrogate	%REC	Limits
Dibromofluoromethane	96	79-127
1,2-Dichloroethane-d4	97	73-139
Toluene-d8	97	80-120
Bromofluorobenzene	90	80-127

Type: BSD Lab ID: QC955703

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	25.00	20.59	82	68-140	1	25
Benzene	25.00	24.28	97	74-123	1	22
Trichloroethene	25.00	23.89	96	72-125	3	23
Toluene	25.00	25.55	102	73-121	0	22
Chlorobenzene	25.00	26.18	105	76-123	0	20

Surrogate	%REC	Limits
Dibromofluoromethane	96	79-127
1,2-Dichloroethane-d4	99	73-139
Toluene-d8	98	80-120
Bromofluorobenzene	92	80-127

RPD= Relative Percent Difference

ENTHALPY ANALYTICAL

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	305045	Location:	Livermore Core
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	STANDARD	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC955704	Batch#:	265494
Matrix:	Soil	Analyzed:	11/15/18
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

ENTHALPY ANALYTICAL

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	305045	Location:	Livermore Core
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	STANDARD	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC955704	Batch#:	265494
Matrix:	Soil	Analyzed:	11/15/18
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	98	79-127
1,2-Dichloroethane-d4	102	73-139
Toluene-d8	96	80-120
Bromofluorobenzene	93	80-127

ND= Not Detected
RL= Reporting Limit

McCampbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 1806A92

Report Created for: Pangea Environmental Svcs., Inc.

1710 Franklin Street, Ste. 200
Oakland, CA 94612

Project Contact: Morgan Gillies
Project P.O.:
Project: 2165.002; Livermore Downtown

Project Received: 06/21/2018

Analytical Report reviewed & approved for release on 06/27/2018 by:

Christine Askari
Project Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.

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Glossary of Terms & Qualifier Definitions

Client: Pangea Environmental Svcs., Inc.
Project: 2165.002; Livermore Downtown
WorkOrder: 1806A92

Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ERS	External reference sample. Second source calibration verification.
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

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Glossary of Terms & Qualifier Definitions

Client: Pangea Environmental Svcs., Inc.
Project: 2165.002; Livermore Downtown
WorkOrder: 1806A92

Analytical Qualifiers

d6	One to a few isolated non-target peaks present in the TPH(g) chromatogram
d7	Strongly aged gasoline or diesel range compounds are significant in the TPH(g) chromatogram
e7	Oil range compounds are significant

Quality Control Qualifiers

F10	MS/MSD outside control limits. Physical or chemical interferences exist due to sample matrix.
F13	Indigenous sample results too high for a representative matrix spike analysis.

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW3050B
Date Prepared:	6/21/18	**Analytical Method:**	SW6020
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-4-3	1806A92-001A	Soil	06/20/2018 11:30	ICP-MS3 064SMPL.D	160333

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.50	1	06/22/2018 14:28
Arsenic	**4.0**	0.50	1	06/22/2018 14:28
Barium	**150**	5.0	1	06/22/2018 14:28
Beryllium	ND	0.50	1	06/22/2018 14:28
Cadmium	ND	0.25	1	06/22/2018 14:28
Chromium	**54**	0.50	1	06/22/2018 14:28
Cobalt	**14**	0.50	1	06/22/2018 14:28
Copper	**23**	0.50	1	06/22/2018 14:28
Lead	**7.1**	0.50	1	06/22/2018 14:28
Mercury	**0.072**	0.050	1	06/22/2018 14:28
Molybdenum	ND	0.50	1	06/22/2018 14:28
Nickel	**140**	0.50	1	06/22/2018 14:28
Selenium	ND	0.50	1	06/22/2018 14:28
Silver	ND	0.50	1	06/22/2018 14:28
Thallium	ND	0.50	1	06/22/2018 14:28
Vanadium	**20**	0.50	1	06/22/2018 14:28
Zinc	**47**	5.0	1	06/22/2018 14:28

Surrogates	REC (%)	Limits	
Terbium	112	70-130	06/22/2018 14:28

Analyst(s): JC

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW3050B
Date Prepared:	6/21/18	**Analytical Method:**	SW6020
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-4-6	1806A92-002A	Soil	06/20/2018 11:40	ICP-MS2 166SMPL.D	160333

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.50	1	06/26/2018 01:44
Arsenic	**3.3**	0.50	1	06/26/2018 01:44
Barium	**110**	5.0	1	06/26/2018 01:44
Beryllium	ND	0.50	1	06/26/2018 01:44
Cadmium	ND	0.25	1	06/26/2018 01:44
Chromium	**50**	0.50	1	06/26/2018 01:44
Cobalt	**11**	0.50	1	06/26/2018 01:44
Copper	**24**	0.50	1	06/26/2018 01:44
Lead	**4.7**	0.50	1	06/26/2018 01:44
Mercury	ND	0.050	1	06/26/2018 01:44
Molybdenum	ND	0.50	1	06/26/2018 01:44
Nickel	**110**	0.50	1	06/26/2018 01:44
Selenium	ND	0.50	1	06/26/2018 01:44
Silver	ND	0.50	1	06/26/2018 01:44
Thallium	ND	0.50	1	06/26/2018 01:44
Vanadium	**23**	0.50	1	06/26/2018 01:44
Zinc	**42**	5.0	1	06/26/2018 01:44

Surrogates	REC (%)	Limits	
Terbium	102	70-130	06/26/2018 01:44

Analyst(s): ND

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW3050B
Date Prepared:	6/21/18	**Analytical Method:**	SW6020
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-4-12	1806A92-003A	Soil	06/20/2018 11:55	ICP-MS1 031SMPL.D	160362

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.50	1	06/22/2018 11:04
Arsenic	**4.3**	0.50	1	06/22/2018 11:04
Barium	**110**	5.0	1	06/22/2018 11:04
Beryllium	ND	0.50	1	06/22/2018 11:04
Cadmium	ND	0.25	1	06/22/2018 11:04
Chromium	**48**	0.50	1	06/22/2018 11:04
Cobalt	**10**	0.50	1	06/22/2018 11:04
Copper	**23**	0.50	1	06/22/2018 11:04
Lead	**5.3**	0.50	1	06/22/2018 11:04
Mercury	ND	0.050	1	06/22/2018 11:04
Molybdenum	ND	0.50	1	06/22/2018 11:04
Nickel	**120**	0.50	1	06/22/2018 11:04
Selenium	ND	0.50	1	06/22/2018 11:04
Silver	ND	0.50	1	06/22/2018 11:04
Thallium	ND	0.50	1	06/22/2018 11:04
Vanadium	**23**	0.50	1	06/22/2018 11:04
Zinc	**42**	5.0	1	06/22/2018 11:04

Surrogates	REC (%)	Limits	
Terbium	96	70-130	06/22/2018 11:04

Analyst(s): ND

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW3050B
Date Prepared:	6/21/18	**Analytical Method:**	SW6020
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-15-3	1806A92-004A	Soil	06/20/2018 10:35	ICP-MS2 167SMPL.D	160362

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.50	1	06/26/2018 01:50
Arsenic	**3.2**	0.50	1	06/26/2018 01:50
Barium	**140**	5.0	1	06/26/2018 01:50
Beryllium	ND	0.50	1	06/26/2018 01:50
Cadmium	ND	0.25	1	06/26/2018 01:50
Chromium	**73**	0.50	1	06/26/2018 01:50
Cobalt	**21**	0.50	1	06/26/2018 01:50
Copper	**19**	0.50	1	06/26/2018 01:50
Lead	**4.9**	0.50	1	06/26/2018 01:50
Mercury	ND	0.050	1	06/26/2018 01:50
Molybdenum	**0.50**	0.50	1	06/26/2018 01:50
Nickel	**350**	0.50	1	06/26/2018 01:50
Selenium	ND	0.50	1	06/26/2018 01:50
Silver	ND	0.50	1	06/26/2018 01:50
Thallium	ND	0.50	1	06/26/2018 01:50
Vanadium	**19**	0.50	1	06/26/2018 01:50
Zinc	**36**	5.0	1	06/26/2018 01:50

Surrogates	REC (%)	Limits	
Terbium	104	70-130	06/26/2018 01:50

Analyst(s): ND

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW3050B
Date Prepared:	6/21/18	**Analytical Method:**	SW6020
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-15-6	1806A92-005A	Soil	06/20/2018 10:45	ICP-MS2 168SMPL.D	160362

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.50	1	06/26/2018 01:56
Arsenic	**3.4**	0.50	1	06/26/2018 01:56
Barium	**64**	5.0	1	06/26/2018 01:56
Beryllium	ND	0.50	1	06/26/2018 01:56
Cadmium	ND	0.25	1	06/26/2018 01:56
Chromium	**81**	0.50	1	06/26/2018 01:56
Cobalt	**22**	0.50	1	06/26/2018 01:56
Copper	**17**	0.50	1	06/26/2018 01:56
Lead	**4.0**	0.50	1	06/26/2018 01:56
Mercury	ND	0.050	1	06/26/2018 01:56
Molybdenum	ND	0.50	1	06/26/2018 01:56
Nickel	**420**	0.50	1	06/26/2018 01:56
Selenium	ND	0.50	1	06/26/2018 01:56
Silver	ND	0.50	1	06/26/2018 01:56
Thallium	ND	0.50	1	06/26/2018 01:56
Vanadium	**18**	0.50	1	06/26/2018 01:56
Zinc	**36**	5.0	1	06/26/2018 01:56

Surrogates	REC (%)	Limits	
Terbium	99	70-130	06/26/2018 01:56

Analyst(s): ND

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW3050B
Date Prepared:	6/21/18	**Analytical Method:**	SW6020
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-15-10	1806A92-006A	Soil	06/20/2018 10:55	ICP-MS2 060SMPL.D	160362

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.50	1	06/22/2018 14:22
Arsenic	**3.9**	0.50	1	06/22/2018 14:22
Barium	**100**	5.0	1	06/22/2018 14:22
Beryllium	ND	0.50	1	06/22/2018 14:22
Cadmium	ND	0.25	1	06/22/2018 14:22
Chromium	**47**	0.50	1	06/22/2018 14:22
Cobalt	**11**	0.50	1	06/22/2018 14:22
Copper	**29**	0.50	1	06/22/2018 14:22
Lead	**4.7**	0.50	1	06/22/2018 14:22
Mercury	**0.30**	0.050	1	06/22/2018 14:22
Molybdenum	**0.53**	0.50	1	06/22/2018 14:22
Nickel	**140**	0.50	1	06/22/2018 14:22
Selenium	ND	0.50	1	06/22/2018 14:22
Silver	ND	0.50	1	06/22/2018 14:22
Thallium	ND	0.50	1	06/22/2018 14:22
Vanadium	**19**	0.50	1	06/22/2018 14:22
Zinc	**36**	5.0	1	06/22/2018 14:22

Surrogates	REC (%)	Limits	
Terbium	114	70-130	06/22/2018 14:22

Analyst(s): MIG

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW3050B
Date Prepared:	6/21/18	**Analytical Method:**	SW6020
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-17-3	1806A92-007A	Soil	06/20/2018 09:40	ICP-MS2 061SMPL.D	160362

Analytes	Result	RL	DF	Date Analyzed
Antimony	**0.94**	0.50	1	06/22/2018 14:29
Arsenic	**8.5**	0.50	1	06/22/2018 14:29
Barium	**220**	5.0	1	06/22/2018 14:29
Beryllium	ND	0.50	1	06/22/2018 14:29
Cadmium	ND	0.25	1	06/22/2018 14:29
Chromium	**60**	0.50	1	06/22/2018 14:29
Cobalt	**15**	0.50	1	06/22/2018 14:29
Copper	**30**	0.50	1	06/22/2018 14:29
Lead	**19**	0.50	1	06/22/2018 14:29
Mercury	ND	0.050	1	06/22/2018 14:29
Molybdenum	ND	0.50	1	06/22/2018 14:29
Nickel	**150**	0.50	1	06/22/2018 14:29
Selenium	ND	0.50	1	06/22/2018 14:29
Silver	ND	0.50	1	06/22/2018 14:29
Thallium	ND	0.50	1	06/22/2018 14:29
Vanadium	**31**	0.50	1	06/22/2018 14:29
Zinc	**52**	5.0	1	06/22/2018 14:29

Surrogates	REC (%)	Limits	
Terbium	117	70-130	06/22/2018 14:29

Analyst(s): MIG

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW3050B
Date Prepared:	6/21/18	**Analytical Method:**	SW6020
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-17-6	1806A92-008A	Soil	06/20/2018 09:55	ICP-MS2 062SMPL.D	160362

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.50	1	06/22/2018 14:35
Arsenic	**3.5**	0.50	1	06/22/2018 14:35
Barium	**120**	5.0	1	06/22/2018 14:35
Beryllium	ND	0.50	1	06/22/2018 14:35
Cadmium	ND	0.25	1	06/22/2018 14:35
Chromium	**64**	0.50	1	06/22/2018 14:35
Cobalt	**19**	0.50	1	06/22/2018 14:35
Copper	**19**	0.50	1	06/22/2018 14:35
Lead	**3.8**	0.50	1	06/22/2018 14:35
Mercury	**0.050**	0.050	1	06/22/2018 14:35
Molybdenum	**0.66**	0.50	1	06/22/2018 14:35
Nickel	**280**	0.50	1	06/22/2018 14:35
Selenium	ND	0.50	1	06/22/2018 14:35
Silver	ND	0.50	1	06/22/2018 14:35
Thallium	ND	0.50	1	06/22/2018 14:35
Vanadium	**20**	0.50	1	06/22/2018 14:35
Zinc	**40**	5.0	1	06/22/2018 14:35

Surrogates	REC (%)	Limits	
Terbium	129	70-130	06/22/2018 14:35

Analyst(s): MIG

(Cont.)

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW3050B
Date Prepared:	6/21/18	**Analytical Method:**	SW6020
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-17-10	1806A92-009A	Soil	06/20/2018 10:15	ICP-MS2 063SMPL.D	160362

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.50	1	06/22/2018 14:41
Arsenic	**3.2**	0.50	1	06/22/2018 14:41
Barium	**78**	5.0	1	06/22/2018 14:41
Beryllium	ND	0.50	1	06/22/2018 14:41
Cadmium	ND	0.25	1	06/22/2018 14:41
Chromium	**34**	0.50	1	06/22/2018 14:41
Cobalt	**8.2**	0.50	1	06/22/2018 14:41
Copper	**19**	0.50	1	06/22/2018 14:41
Lead	**5.4**	0.50	1	06/22/2018 14:41
Mercury	ND	0.050	1	06/22/2018 14:41
Molybdenum	**0.63**	0.50	1	06/22/2018 14:41
Nickel	**88**	0.50	1	06/22/2018 14:41
Selenium	ND	0.50	1	06/22/2018 14:41
Silver	ND	0.50	1	06/22/2018 14:41
Thallium	ND	0.50	1	06/22/2018 14:41
Vanadium	**19**	0.50	1	06/22/2018 14:41
Zinc	**39**	5.0	1	06/22/2018 14:41

Surrogates	REC (%)	Limits	
Terbium	113	70-130	06/22/2018 14:41

Analyst(s): MIG

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW5030B
Date Prepared:	6/21/18	**Analytical Method:**	SW8021B/8015Bm
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-4-3	**1806A92-001A**	**Soil**	**06/20/2018 11:30**	**GC7 06221819.D**	**160304**

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	1.0	1	06/22/2018 20:22
MTBE	---	0.050	1	06/22/2018 20:22
Benzene	---	0.0050	1	06/22/2018 20:22
Toluene	---	0.0050	1	06/22/2018 20:22
Ethylbenzene	---	0.0050	1	06/22/2018 20:22
Xylenes	---	0.0050	1	06/22/2018 20:22

Surrogates	REC (%)	Limits	
2-Fluorotoluene	82	62-126	06/22/2018 20:22

Analyst(s): HD

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-4-6	**1806A92-002A**	**Soil**	**06/20/2018 11:40**	**GC7 06221827.D**	**160304**

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	1.0	1	06/23/2018 00:22
MTBE	---	0.050	1	06/23/2018 00:22
Benzene	---	0.0050	1	06/23/2018 00:22
Toluene	---	0.0050	1	06/23/2018 00:22
Ethylbenzene	---	0.0050	1	06/23/2018 00:22
Xylenes	---	0.0050	1	06/23/2018 00:22

Surrogates	REC (%)	Limits	
2-Fluorotoluene	83	62-126	06/23/2018 00:22

Analyst(s): HD

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW5030B
Date Prepared:	6/21/18	**Analytical Method:**	SW8021B/8015Bm
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-4-12	**1806A92-003A**	**Soil**	**06/20/2018 11:55**	**GC7 06221828.D**	**160304**

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	1.0	1	06/23/2018 00:52
MTBE	---	0.050	1	06/23/2018 00:52
Benzene	---	0.0050	1	06/23/2018 00:52
Toluene	---	0.0050	1	06/23/2018 00:52
Ethylbenzene	---	0.0050	1	06/23/2018 00:52
Xylenes	---	0.0050	1	06/23/2018 00:52

Surrogates	REC (%)	Limits	
2-Fluorotoluene	83	62-126	06/23/2018 00:52

Analyst(s): HD

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-15-3	**1806A92-004A**	**Soil**	**06/20/2018 10:35**	**GC7 06221829.D**	**160304**

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	1.0	1	06/23/2018 01:22
MTBE	---	0.050	1	06/23/2018 01:22
Benzene	---	0.0050	1	06/23/2018 01:22
Toluene	---	0.0050	1	06/23/2018 01:22
Ethylbenzene	---	0.0050	1	06/23/2018 01:22
Xylenes	---	0.0050	1	06/23/2018 01:22

Surrogates	REC (%)	Limits	
2-Fluorotoluene	83	62-126	06/23/2018 01:22

Analyst(s): HD

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW5030B
Date Prepared:	6/21/18	**Analytical Method:**	SW8021B/8015Bm
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-15-6	**1806A92-005A**	**Soil**	**06/20/2018 10:45**	**GC19 06211825.D**	**160361**

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	1.0	1	06/22/2018 01:27
MTBE	---	0.050	1	06/22/2018 01:27
Benzene	---	0.0050	1	06/22/2018 01:27
Toluene	---	0.0050	1	06/22/2018 01:27
Ethylbenzene	---	0.0050	1	06/22/2018 01:27
Xylenes	---	0.0050	1	06/22/2018 01:27

Surrogates	REC (%)	Limits	
2-Fluorotoluene	96	62-126	06/22/2018 01:27

Analyst(s): IA

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-15-10	**1806A92-006A**	**Soil**	**06/20/2018 10:55**	**GC7 06221830.D**	**160361**

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	1.0	1	06/23/2018 01:52
MTBE	---	0.050	1	06/23/2018 01:52
Benzene	---	0.0050	1	06/23/2018 01:52
Toluene	---	0.0050	1	06/23/2018 01:52
Ethylbenzene	---	0.0050	1	06/23/2018 01:52
Xylenes	---	0.0050	1	06/23/2018 01:52

Surrogates	REC (%)	Limits	
2-Fluorotoluene	84	62-126	06/23/2018 01:52

Analyst(s): HD

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW5030B
Date Prepared:	6/21/18	**Analytical Method:**	SW8021B/8015Bm
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-17-3	**1806A92-007A**	**Soil**	**06/20/2018 09:40**	**GC7 06221821.D**	**160361**

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	**1.8**	1.0	1	06/22/2018 21:22
MTBE	---	0.050	1	06/22/2018 21:22
Benzene	---	0.0050	1	06/22/2018 21:22
Toluene	---	0.0050	1	06/22/2018 21:22
Ethylbenzene	---	0.0050	1	06/22/2018 21:22
Xylenes	---	0.0050	1	06/22/2018 21:22

Surrogates	REC (%)	Limits	
2-Fluorotoluene	78	62-126	06/22/2018 21:22

Analyst(s): HD Analytical Comments: d6,d7

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-17-6	**1806A92-008A**	**Soil**	**06/20/2018 09:55**	**GC7 06221836.D**	**160361**

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	1.0	1	06/23/2018 04:52
MTBE	---	0.050	1	06/23/2018 04:52
Benzene	---	0.0050	1	06/23/2018 04:52
Toluene	---	0.0050	1	06/23/2018 04:52
Ethylbenzene	---	0.0050	1	06/23/2018 04:52
Xylenes	---	0.0050	1	06/23/2018 04:52

Surrogates	REC (%)	Limits	
2-Fluorotoluene	77	62-126	06/23/2018 04:52

Analyst(s): HD

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW5030B
Date Prepared:	6/21/18	**Analytical Method:**	SW8021B/8015Bm
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-17-10	**1806A92-009A**	**Soil**	**06/20/2018 10:15**	**GC7 06221838.D**	**160361**

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	1.0	1	06/23/2018 05:51
MTBE	---	0.050	1	06/23/2018 05:51
Benzene	---	0.0050	1	06/23/2018 05:51
Toluene	---	0.0050	1	06/23/2018 05:51
Ethylbenzene	---	0.0050	1	06/23/2018 05:51
Xylenes	---	0.0050	1	06/23/2018 05:51

Surrogates	REC (%)	Limits	
2-Fluorotoluene	75	62-126	06/23/2018 05:51

Analyst(s): HD

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW3550B
Date Prepared:	6/21/18	**Analytical Method:**	SW8015B
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

Total Extractable Petroleum Hydrocarbons w/out SG Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-4-3	1806A92-001A	Soil	06/20/2018 11:30	GC39A 06241834.D	160360

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	1.0	1	06/25/2018 00:45
TPH-Motor Oil (C18-C36)	ND	5.0	1	06/25/2018 00:45

Surrogates	REC (%)	Limits	
C9	88	74-123	06/25/2018 00:45

Analyst(s): JIS

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-4-6	1806A92-002A	Soil	06/20/2018 11:40	GC6B 06261833.D	160360

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	1.0	1	06/26/2018 21:49
TPH-Motor Oil (C18-C36)	ND	5.0	1	06/26/2018 21:49

Surrogates	REC (%)	Limits	
C9	90	74-123	06/26/2018 21:49

Analyst(s): JIS

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-4-12	1806A92-003A	Soil	06/20/2018 11:55	GC39A 06241856.D	160360

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	1.0	1	06/25/2018 07:52
TPH-Motor Oil (C18-C36)	ND	5.0	1	06/25/2018 07:52

Surrogates	REC (%)	Limits	
C9	97	74-123	06/25/2018 07:52

Analyst(s): JIS

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW3550B
Date Prepared:	6/21/18	**Analytical Method:**	SW8015B
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

Total Extractable Petroleum Hydrocarbons w/out SG Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-15-3	1806A92-004A	Soil	06/20/2018 10:35	GC6B 06261845.D	160360

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	1.0	1	06/27/2018 01:43
TPH-Motor Oil (C18-C36)	**20**	5.0	1	06/27/2018 01:43

Surrogates	REC (%)	Limits	
C9	90	74-123	06/27/2018 01:43

Analyst(s): JIS Analytical Comments: e7

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-15-6	1806A92-005A	Soil	06/20/2018 10:45	GC39A 06241830.D	160360

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	1.0	1	06/24/2018 23:27
TPH-Motor Oil (C18-C36)	ND	5.0	1	06/24/2018 23:27

Surrogates	REC (%)	Limits	
C9	88	74-123	06/24/2018 23:27

Analyst(s): JIS

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-15-10	1806A92-006A	Soil	06/20/2018 10:55	GC39B 06261815.D	160360

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	1.0	1	06/26/2018 15:54
TPH-Motor Oil (C18-C36)	ND	5.0	1	06/26/2018 15:54

Surrogates	REC (%)	Limits	
C9	94	74-123	06/26/2018 15:54

Analyst(s): JIS

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Analytical Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Received:	6/21/18 14:45	**Extraction Method:**	SW3550B
Date Prepared:	6/21/18	**Analytical Method:**	SW8015B
Project:	2165.002; Livermore Downtown	**Unit:**	mg/Kg

Total Extractable Petroleum Hydrocarbons w/out SG Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-17-3	1806A92-007A	Soil	06/20/2018 09:40	GC39A 06241848.D	160360

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	1.0	1	06/25/2018 05:17
TPH-Motor Oil (C18-C36)	ND	5.0	1	06/25/2018 05:17

Surrogates	REC (%)	Limits	
C9	88	74-123	06/25/2018 05:17

Analyst(s): JIS

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-17-6	1806A92-008A	Soil	06/20/2018 09:55	GC39A 06241852.D	160360

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	1.0	1	06/25/2018 06:34
TPH-Motor Oil (C18-C36)	ND	5.0	1	06/25/2018 06:34

Surrogates	REC (%)	Limits	
C9	88	74-123	06/25/2018 06:34

Analyst(s): JIS

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG-17-10	1806A92-009A	Soil	06/20/2018 10:15	GC39B 06261845.D	160360

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	1.0	1	06/27/2018 01:36
TPH-Motor Oil (C18-C36)	ND	5.0	1	06/27/2018 01:36

Surrogates	REC (%)	Limits	
C9	94	74-123	06/27/2018 01:36

Analyst(s): JIS

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Prepared:	6/21/18	**BatchID:**	160333
Date Analyzed:	6/22/18	**Extraction Method:**	SW3050B
Instrument:	ICP-MS1, ICP-MS3	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/Kg
Project:	2165.002; Livermore Downtown	**Sample ID:**	MB/LCS-160333 1806A52-011AMS/MSD

QC Summary Report for Metals

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Antimony	ND	49.6	0.50	50	-	99	75-125
Arsenic	ND	46.6	0.50	50	-	93	75-125
Barium	ND	473	5.0	500	-	95	75-125
Beryllium	ND	42.5	0.50	50	-	85	75-125
Cadmium	ND	44.2	0.25	50	-	88	75-125
Chromium	ND	46.6	0.50	50	-	93	75-125
Cobalt	ND	44.3	0.50	50	-	89	75-125
Copper	ND	46.4	0.50	50	-	93	75-125
Lead	ND	46.3	0.50	50	-	93	75-125
Mercury	ND	1.18	0.050	1.25	-	94	75-125
Molybdenum	ND	46.8	0.50	50	-	94	75-125
Nickel	ND	47.2	0.50	50	-	94	75-125
Selenium	ND	45.6	0.50	50	-	91	75-125
Silver	ND	46.3	0.50	50	-	93	75-125
Thallium	ND	43.1	0.50	50	-	86	75-125
Vanadium	ND	46.6	0.50	50	-	93	75-125
Zinc	ND	458	5.0	500	-	92	75-125
Surrogate Recovery							
Terbium	487	490		500	97	98	70-130

(Cont.)

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Prepared:	6/21/18	**BatchID:**	160333
Date Analyzed:	6/22/18	**Extraction Method:**	SW3050B
Instrument:	ICP-MS1, ICP-MS3	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/Kg
Project:	2165.002; Livermore Downtown	**Sample ID:**	MB/LCS-160333 1806A52-011AMS/MSD

QC Summary Report for Metals

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Antimony	49.0	48.3	50	ND	97	96	75-125	1.25	20
Arsenic	54.9	54.4	50	6.026	98	97	75-125	0.988	20
Barium	630	620	500	87.53	109	107	75-125	1.57	20
Beryllium	49.8	49.2	50	ND	99	97	75-125	1.29	20
Cadmium	48.3	48.1	50	ND	97	96	75-125	0.581	20
Chromium	287	293	50	186.0	202,F10	214,F10	75-125	2.14	20
Cobalt	69.0	69.8	50	18.65	101	102	75-125	1.12	20
Copper	82.5	87.5	50	30.50	104	114	75-125	5.87	20
Lead	56.3	58.5	50	7.679	97	102	75-125	3.90	20
Mercury	1.27	1.25	1.25	0.07440	96	94	75-125	1.75	20
Molybdenum	48.6	48.4	50	1.298	95	94	75-125	0.351	20
Nickel	393	403	50	242.8	301,F13	320,F13	75-125	2.41	20
Selenium	49.3	48.7	50	ND	98	97	75-125	1.20	20
Silver	47.8	47.7	50	ND	95	95	75-125	0	20
Thallium	47.8	46.9	50	ND	96	94	75-125	1.90	20
Vanadium	105	106	50	62.71	84	87	75-125	1.42	20
Zinc	546	556	500	63.43	96	98	75-125	1.87	20
Surrogate Recovery									
Terbium	542	541	500		108	108	70-130	0	20

Analyte	DLT Result	DLTRef Val	%D	%D Limit
Antimony	ND<2.5	ND	-	-
Arsenic	5.50	6.026	8.73	-
Barium	74.0	87.53	15.5	-
Beryllium	ND<2.5	ND	-	-
Cadmium	ND<1.2	ND	-	-
Chromium	166	186.0	10.8	20
Cobalt	17.2	18.65	7.77	20
Copper	25.7	30.50	15.7	20
Lead	6.50	7.679	15.4	-
Mercury	ND<0.25	0.07440	-	-
Molybdenum	ND<2.5	1.298	-	-
Nickel	207	242.8	14.7	20
Selenium	ND<2.5	ND	-	-

(Cont.)

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Prepared:	6/21/18	**BatchID:**	160333
Date Analyzed:	6/22/18	**Extraction Method:**	SW3050B
Instrument:	ICP-MS1, ICP-MS3	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/Kg
Project:	2165.002; Livermore Downtown	**Sample ID:**	MB/LCS-160333 1806A52-011AMS/MSD

QC Summary Report for Metals

Analyte	DLT Result	DLTRef Val	%D	%D Limit
Silver	ND<2.5	ND	-	-
Thallium	ND<2.5	ND	-	-
Vanadium	56.2	62.71	10.4	20
Zinc	55.3	63.43	12.8	-

%D Control Limit applied to analytes with concentrations greater than 25 times the reporting limits.

(Cont.)

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Prepared:	6/21/18	**BatchID:**	160362
Date Analyzed:	6/22/18	**Extraction Method:**	SW3050B
Instrument:	ICP-MS1, ICP-MS2	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/Kg
Project:	2165.002; Livermore Downtown	**Sample ID:**	MB/LCS-160362 1806A92-003AMS/MSD

QC Summary Report for Metals

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Antimony	ND	48.8	0.50	50	-	98	75-125
Arsenic	ND	45.9	0.50	50	-	92	75-125
Barium	ND	473	5.0	500	-	95	75-125
Beryllium	ND	41.6	0.50	50	-	83	75-125
Cadmium	ND	43.9	0.25	50	-	88	75-125
Chromium	ND	45.6	0.50	50	-	91	75-125
Cobalt	ND	43.6	0.50	50	-	87	75-125
Copper	ND	45.7	0.50	50	-	91	75-125
Lead	ND	46.5	0.50	50	-	93	75-125
Mercury	ND	1.15	0.050	1.25	-	92	75-125
Molybdenum	ND	45.6	0.50	50	-	91	75-125
Nickel	ND	46.5	0.50	50	-	93	75-125
Selenium	ND	45.3	0.50	50	-	91	75-125
Silver	ND	45.9	0.50	50	-	92	75-125
Thallium	ND	43.0	0.50	50	-	86	75-125
Vanadium	ND	45.4	0.50	50	-	91	75-125
Zinc	ND	458	5.0	500	-	92	75-125
Surrogate Recovery							
Terbium	501	490		500	100	98	70-130

(Cont.)

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Prepared:	6/21/18	**BatchID:**	160362
Date Analyzed:	6/22/18	**Extraction Method:**	SW3050B
Instrument:	ICP-MS1, ICP-MS2	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/Kg
Project:	2165.002; Livermore Downtown	**Sample ID:**	MB/LCS-160362 1806A92-003AMS/MSD

QC Summary Report for Metals

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Antimony	49.1	51.0	50	ND	98	101	75-125	3.66	20
Arsenic	53.9	54.0	50	4.290	99	99	75-125	0	20
Barium	625	642	500	111.7	103	106	75-125	2.73	20
Beryllium	40.9	42.0	50	ND	81	84	75-125	2.65	20
Cadmium	47.4	48.4	50	ND	95	97	75-125	2.05	20
Chromium	99.8	99.5	50	48.45	103	102	75-125	0.311	20
Cobalt	58.2	59.8	50	10.01	96	100	75-125	2.66	20
Copper	74.0	76.4	50	22.79	102	107	75-125	3.10	20
Lead	53.2	55.0	50	5.287	96	99	75-125	3.23	20
Mercury	1.22	1.27	1.25	ND	95	98	75-125	3.45	20
Molybdenum	47.9	48.8	50	ND	95	97	75-125	1.84	20
Nickel	188	192	50	119.6	137,F10	145,F10	75-125	1.89	20
Selenium	48.4	48.1	50	ND	97	96	75-125	0.601	20
Silver	47.6	49.0	50	ND	95	98	75-125	3.04	20
Thallium	44.8	46.7	50	ND	90	93	75-125	4.24	20
Vanadium	69.9	70.4	50	22.57	95	96	75-125	0.599	20
Zinc	546	554	500	42.47	101	102	75-125	1.45	20
Surrogate Recovery									
Terbium	554	574	500		111	115	70-130	3.67	20

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Prepared:	6/20/18	**BatchID:**	160304
Date Analyzed:	6/21/18	**Extraction Method:**	SW5030B
Instrument:	GC7	**Analytical Method:**	SW8021B/8015Bm
Matrix:	Soil	**Unit:**	mg/Kg
Project:	2165.002; Livermore Downtown	**Sample ID:**	MB/LCS/LCSD-160304

QC Summary Report for SW8021B/8015Bm

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
TPH(g) (C6-C12)	ND	1.0	-	-	-
MTBE	ND	0.050	-	-	-
Benzene	ND	0.0050	-	-	-
Toluene	ND	0.0050	-	-	-
Ethylbenzene	ND	0.0050	-	-	-
Xylenes	ND	0.0050	-	-	-
Surrogate Recovery					
2-Fluorotoluene	0.114		0.10	114	75-134

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH(btex)	0.600	0.603	0.60	100	101	82-118	0.495	20
MTBE	0.106	0.105	0.10	106	105	61-119	0.969	20
Benzene	0.112	0.111	0.10	112	111	77-128	0.791	20
Toluene	0.100	0.100	0.10	101	100	74-132	0.440	20
Ethylbenzene	0.104	0.104	0.10	104	104	84-127	0	20
Xylenes	0.310	0.312	0.30	103	104	86-129	0.558	20
Surrogate Recovery								
2-Fluorotoluene	0.0917	0.0910	0.10	92	91	75-134	0.686	20

(Cont.)

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Prepared:	6/21/18	**BatchID:**	160361
Date Analyzed:	6/22/18	**Extraction Method:**	SW5030B
Instrument:	GC7	**Analytical Method:**	SW8021B/8015Bm
Matrix:	Soil	**Unit:**	mg/Kg
Project:	2165.002; Livermore Downtown	**Sample ID:**	MB/LCS/LCSD-160361 1806A92-005AMS/MSD

QC Summary Report for SW8021B/8015Bm

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
TPH(g) (C6-C12)	ND	1.0	-	-	-
MTBE	ND	0.050	-	-	-
Benzene	ND	0.0050	-	-	-
Toluene	ND	0.0050	-	-	-
Ethylbenzene	ND	0.0050	-	-	-
Xylenes	ND	0.0050	-	-	-
Surrogate Recovery					
2-Fluorotoluene	0.102		0.10	102	75-134

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH(btex)	0.590	0.614	0.60	98	102	82-118	3.93	20
MTBE	0.104	0.0996	0.10	104	100	61-119	4.09	20
Benzene	0.112	0.104	0.10	112	104	77-128	7.62	20
Toluene	0.0980	0.0929	0.10	98	93	74-132	5.44	20
Ethylbenzene	0.100	0.0980	0.10	101	98	84-127	2.57	20
Xylenes	0.295	0.291	0.30	98	97	86-129	1.33	20
Surrogate Recovery								
2-Fluorotoluene	0.0868	0.0848	0.10	87	85	75-134	2.31	20

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH(btex)	0.608	0.603	0.60	ND	101	101	58-129	0	20
MTBE	0.0956	0.0947	0.10	ND	96	95	47-118	0.936	20
Benzene	0.0938	0.0940	0.10	ND	94	94	55-129	0	20
Toluene	0.0880	0.0893	0.10	ND	87	88	56-130	1.48	20
Ethylbenzene	0.0926	0.0908	0.10	ND	93	91	63-129	1.99	20
Xylenes	0.279	0.273	0.30	ND	93	91	64-131	2.27	20
Surrogate Recovery									
2-Fluorotoluene	0.0806	0.0786	0.10		81	79	62-126	2.57	20

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Quality Control Report

Client:	Pangea Environmental Svcs., Inc.	**WorkOrder:**	1806A92
Date Prepared:	6/21/18	**BatchID:**	160360
Date Analyzed:	6/25/18	**Extraction Method:**	SW3550B
Instrument:	GC11A	**Analytical Method:**	SW8015B
Matrix:	Soil	**Unit:**	mg/Kg
Project:	2165.002; Livermore Downtown	**Sample ID:**	MB/LCS/LCSD-160360

QC Report for SW8015B w/out SG Clean-Up

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
TPH-Diesel (C10-C23)	ND	1.0	-	-	-
TPH-Motor Oil (C18-C36)	ND	5.0	-	-	-
Surrogate Recovery					
C9	23.4		25	94	72-122

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH-Diesel (C10-C23)	38.2	38.8	40	95	97	75-128	1.45	30
Surrogate Recovery								
C9	22.0	21.2	25	88	85	72-122	3.44	30

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CHAIN-OF-CUSTODY RECORD

WorkOrder: 1806A92 **ClientCode: PEO**

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ EQuIS ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag
☐ Detection Summary ☐ Dry-Weight

Report to:
Morgan Gillies
Pangea Environmental Svcs., Inc.
1710 Franklin Street, Ste. 200
Oakland, CA 94612
(510) 836-3700 FAX: (510) 836-3709

Email: mgillies@pangeaenv.com
cc/3rd Party:
PO:
Project: 2165.002; Livermore Downtown

Bill to:
Bob Clark-Riddell
Pangea Environmental Svcs., Inc.
1710 Franklin Street, Ste. 200
Oakland, CA 94612

Requested TAT: **5 days;**

Date Received: **06/21/2018**
Date Logged: **06/21/2018**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
1806A92-001	SG-4-3	Soil	6/20/2018 11:30	☐	A	A	A									
1806A92-002	SG-4-6	Soil	6/20/2018 11:40	☐	A	A	A									
1806A92-003	SG-4-12	Soil	6/20/2018 11:55	☐	A	A	A									
1806A92-004	SG-15-3	Soil	6/20/2018 10:35	☐	A	A	A									
1806A92-005	SG-15-6	Soil	6/20/2018 10:45	☐	A	A	A									
1806A92-006	SG-15-10	Soil	6/20/2018 10:55	☐	A	A	A									
1806A92-007	SG-17-3	Soil	6/20/2018 09:40	☐	A	A	A									
1806A92-008	SG-17-6	Soil	6/20/2018 09:55	☐	A	A	A									
1806A92-009	SG-17-10	Soil	6/20/2018 10:15	☐	A	A	A									

Test Legend:

1	CAM17MS_TTLC_S	2	G-MBTEX_S	3	TPH(DMO)_S	4	
5		6		7		8	
9		10		11		12	

Prepared by: Tina Perez

The following SampIDs: 001A, 002A, 003A, 004A, 005A, 006A, 007A, 008A, 009A contain testgroup Multi Range_S.

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

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WORK ORDER SUMMARY

Client Name: PANGEA ENVIRONMENTAL SVCS., INC. **Project:** 2165.002; Livermore Downtown **Work Order:** 1806A92
Client Contact: Morgan Gillies **QC Level:** LEVEL 2
Contact's Email: mgillies@pangeaenv.com **Comments:** **Date Logged:** 6/21/2018

☐WaterTrax ☐WriteOn ☐EDF ☐Excel ☐Fax ☑Email ☐HardCopy ☐ThirdParty ☐J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1806A92-001A	SG-4-3	Soil	Multi-Range TPH(g,d,mo)	1	Stainless Steel tube 2"x6"	☐	6/20/2018 11:30	5 days		☐	
			SW6020 (CAM 17)			☐		5 days		☐	
1806A92-002A	SG-4-6	Soil	Multi-Range TPH(g,d,mo)	1	Acetate Liner	☐	6/20/2018 11:40	5 days		☐	
			SW6020 (CAM 17)			☐		5 days		☐	
1806A92-003A	SG-4-12	Soil	Multi-Range TPH(g,d,mo)	1	Acetate Liner	☐	6/20/2018 11:55	5 days		☐	
			SW6020 (CAM 17)			☐		5 days		☐	
1806A92-004A	SG-15-3	Soil	Multi-Range TPH(g,d,mo)	1	Acetate Liner	☐	6/20/2018 10:35	5 days		☐	
			SW6020 (CAM 17)			☐		5 days		☐	
1806A92-005A	SG-15-6	Soil	Multi-Range TPH(g,d,mo)	1	Acetate Liner	☐	6/20/2018 10:45	5 days		☐	
			SW6020 (CAM 17)			☐		5 days		☐	
1806A92-006A	SG-15-10	Soil	Multi-Range TPH(g,d,mo)	1	Acetate Liner	☐	6/20/2018 10:55	5 days		☐	
			SW6020 (CAM 17)			☐		5 days		☐	
1806A92-007A	SG-17-3	Soil	Multi-Range TPH(g,d,mo)	1	Stainless Steel tube 2"x6"	☐	6/20/2018 9:40	5 days		☐	
			SW6020 (CAM 17)			☐		5 days		☐	
1806A92-008A	SG-17-6	Soil	Multi-Range TPH(g,d,mo)	1	Acetate Liner	☐	6/20/2018 9:55	5 days		☐	
			SW6020 (CAM 17)			☐		5 days		☐	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

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WORK ORDER SUMMARY

Client Name: PANGEA ENVIRONMENTAL SVCS., INC. **Project:** 2165.002; Livermore Downtown **Work Order:** 1806A92
Client Contact: Morgan Gillies **QC Level:** LEVEL 2
Contact's Email: mgillies@pangeaenv.com **Comments:** **Date Logged:** 6/21/2018

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ Fax ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1806A92-009A	SG-17-10	Soil	Multi-Range TPH(g,d,mo)	1	Acetate Liner	☐	6/20/2018 10:15	5 days		☐	
			SW6020 (CAM 17)			☐		5 days		☐	
1806A92-010A	SG-12-4.5	Soil		1	Acetate Liner	☐	6/20/2018 8:00			☑	
1806A92-011A	SG-10-2.5	Soil		1	Stainless Steel tube 2"x6"	☐	6/19/2018 15:00			☑	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

1806A92

McCAMPBELL ANALYTICAL, INC.

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Telephone: (925) 252-9262 Fax: (925) 252-9269

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ 5 DAY
EDF Required? Coelt (Normal) No Write On (DW) No

Report To: Morgan Gillies Bill To: Pangea
Company: Pangea Environmental Services, Inc.
1710 Franklin Street, Suite 200, Oakland, CA 94612
E-Mail: mgillies@pangeaenv.com
Tele: (510) 836-3700 Fax: (510) 836-3709
Project #: 2165.002 Project Name: Livermore Downtown
Project Location: Railroad and S Livermore Ave, Livermore
Sampler Signature:

SAMPLE ID	LOCATION (Field Point Name)	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED ICE	METHOD PRESERVED HCL	METHOD PRESERVED HNO_3	METHOD PRESERVED Other	BTEX & TPH as Gas (602/8020 + 8015)/MTBE	TPH as Diesel (8015) w/ Silica Gel Cleanup	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010 / 8021	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8081	EPA 608 / 8082 PCB's ONLY	EPA 8140 / 8141	EPA 8150 / 8151	EPA 524.2 / 624 / 8260	EPA 525 / 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals (6010 / 6020)	LUFT 5 Metals (6010 / 6020)	Lead (200.8 / 200.9 / 6010)	Other	Other	Other	Comments
SG-4-3		6.20.18	1130	1			X				X																X				X	TPH full scan	
SG-4-6			1140	1			X				X																X				X	Hold	
SG-4-12			1155	1			X				X																X				X		
SG-15-3		6.20.18	1035	1			X				X																X				X		
SG-15-6			1045	1			X				X																X				X		
SG-15-10			1055	1			X				X																X				X		
SG-17-3			0940	1			X				X																X				X		
SG-17-6			0955	1			X				X																X				X		
SG-17-10		6.20.18	1015	1			X				X																X				X		
SG-12-4.5		6.20.18	0800	1			X				X																					X	
SG-10-2.5		6.19.18	1500	1			X				X																					X	

Relinquished By:	Date:	Time:	Received By:
	6/21/18	1445	6/21/18 14:45
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

ICE/t° 6.2 Wet
GOOD CONDITION
HEAD SPACE ABSENT
DECHLORINATED IN LAB
APPROPRIATE CONTAINERS
PRESERVED IN LAB

VOAS O&G METALS OTHER
PRESERVATION pH<2

COMMENTS:

Filter Samples for Metals analysis: Yes / No

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Sample Receipt Checklist

Client Name:	**Pangea Environmental Svcs., Inc.**	Date and Time Received:	**6/21/2018 14:45**
Project:	**2165.002; Livermore Downtown**	Date Logged:	**6/21/2018**
		Received by:	Tina Perez
WorkOrder №:	**1806A92** Matrix: Soil	Logged by:	Tina Perez
Carrier:	Client Drop-In		

Chain of Custody (COC) Information

Chain of custody present?	Yes	☑	No	☐		
Chain of custody signed when relinquished and received?	Yes	☑	No	☐		
Chain of custody agrees with sample labels?	Yes	☑	No	☐		
Sample IDs noted by Client on COC?	Yes	☑	No	☐		
Date and Time of collection noted by Client on COC?	Yes	☑	No	☐		
Sampler's name noted on COC?	Yes	☑	No	☐		
COC agrees with Quote?	Yes	☐	No	☐	NA	☑

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes	☐	No	☐	NA	☑
Shipping container/cooler in good condition?	Yes	☑	No	☐		
Samples in proper containers/bottles?	Yes	☑	No	☐		
Sample containers intact?	Yes	☑	No	☐		
Sufficient sample volume for indicated test?	Yes	☑	No	☐		

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes	☑	No	☐	NA	☐
Samples Received on Ice?	Yes	☑	No	☐		
(Ice Type: WET ICE)						
Sample/Temp Blank temperature	Temp: 6.2°C				NA	☐
Water - VOA vials have zero headspace / no bubbles?	Yes	☐	No	☐	NA	☑
Sample labels checked for correct preservation?	Yes	☑	No	☐		
pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)?	Yes	☐	No	☐	NA	☑
UCMR Samples:						
pH tested and acceptable upon receipt (200.8: ≤2; 525.3: ≤4; 530: ≤7; 541: <3; 544: <6.5 & 7.5)?	Yes	☐	No	☐	NA	☑
Free Chlorine tested and acceptable upon receipt (<0.1mg/L)?	Yes	☐	No	☐	NA	☑

Comments:

Appendix F

Waste Manifests

Adelanto, CA Soil Recycling Facility	Soil Safe (Formerly TPST) SOIL DATA AND CERTIFCATION SHEET	DATE:

Generator (propery owner):

City of Livermore
Attn: Joel Waxdeck
1052 S Livermore Ave.
Livermore, CA 94550

Consultant/Engineering Firm:

Belshire Environmental Services, Inc.
25971 Towne Centre Dr
Foothill Ranch CA 92610
Tel: (949) 460-5200
Fax: (949) 460-5210

- [X] **Invoice BESI**
- [ ] **Invoice Generator**
- [ ] **Invoice Consultant**

Testing Laboratory:
McCampbell Analytical, Inc.

Sampling Procedures:
Soil Borings

Site History: Please list SITE NAME ADDRESS (including zip code), describe contamination type, contamination source, how contamination was stored, and past activities at site.-Attach additional documents)

Site Name & Address:
20 South L Street
20 SOUTH L STREET
LIVERMORE, CA 94550

BESI: 296370
Site No: 20SOUTHL
Site Contact: Morgan Gillies
Consultant: Pangea Environmental Services
Contact Morgan Gillies

- [X] **NON-HAZ**
- [ ] **HAZ**

ESTIMATED QUANTITY
____ Tons
16 Drums

Source of contamination (ust, ast, etc...): UST
(please list gas, diesel, combo, waste oil, etc...) Gasoline

Please check appropate box below and attach all required analytical reports. Unless otherwise noted, composite samples should be collected with the following frequency: 1sample for 100 cubic yards or less ; 3 samples for 500 cu yds or less ; 5 samples for 1000 cu yds 1 additional sample for each additional 500cu yds greater than 1000 cu yds

- [X] I/we certify that the soil referenced herein is contaminated soley by Virgin petroleum products from leaking underground storage tank(s).

Attached is analytical data from state certified lab for the following

1) Total Petroleum Hydrocarbons (TPH, EPA 8015 Modified)

2) Benzene/Toluene/Ethylbenzene/xylene (BTEX, EPA 8020)

- [ ] I/We certified that some or all of the contaminants in the soil referenced herein is waste oil, or some other non-virgin petroleum product, or virgin petroleum product from something other than a leaking underground storage tank.
Attached is analytical data from a state certified lab for the following:

1) Total metals concentration for a thru q below (TTLC test)

a) Antimony	g)Cobalt	m) Selenium
b) Arsenic	h)Copper	n) Silver
c) Barium	I) Lead	o) Thalium
d) Berylium	j) Mercury	p) Vanadium
e) Cadmium	k) Molybdenum	q) Zinc
f) Chromium	l) Nickel	

Note: If any item a thru q is greater than 10 times its Soluble Threshold Limit concentration (STLC) the soluble metal concentration must be determined by the Waste Extraction Test procedure.

2) TPH by:
EPA 418.1 or
EPA 8015 modified

3) BTEX/VOC by:
EPA 8020 EPA 8010
or EPA 8260(combines above)

4) PCB'S(waste oil only)
5) Additional analytical data as required.

No soils referenced herein may be delivered until the forgoing certificate is received and approved by the facility, and they issues manifests and assigns an approval number. If any soils delivered to the facility are found to be "Hazardous Waste" pursuant to federal or state regulations, the client shall be solely responsible for their removal. If the client fails to remove such soils, the facility, acting as client's agent, may arrange for such removal at client's expense. This is a complete and accurate description of the soil referenced herein; no deliberate or willful omissions have been made and all known or suspected hazards have been disclosed herein. I/We certify that the soil is not "hazardous" as defined by U.S. Department of Transportation (DOT), U.S. Environmental Protection Agency (EPA), State or local regulations. I/We further certify that the soils referenced herein contain no free liquids. All analysis reports attached.

Generator's Authorized Signatory: _____ **Date:** _____

Print Name: _____ **Title:** _____

Environmental Firm Signatory: [signature] **Date:** 7/16/18

Print Name: Morgan Gillies **Title:** Project Manager

Manifest

SOIL SAFE OF CA – TPST
Non-Hazardous Soils

↓ Manifest # ↓

Date of Shipment:	Responsible for Payment:	Transport Truck #:	Facility #:	Approval Number:	Load #
/ /			A07	49118	001

Generator and/or Consultant

Generator's Name and Billing Address:	Generator's Phone #:	
CITY OF LIVERMORE ATTN: JOEL WAXDECK 1052 S LIVERMORE AVE. LIVERMORE, CA 94550	925-580-8276	
	Person to Contact:	
	FAX#:	Customer Account Number

Consultant's Name and Billing Address:	Consultant's Phone #:	
	Person to Contact:	
	FAX#:	Customer Account Number

Generation Site (Transport from): *(name & address)*	Site Phone #:	
20 SOUTH L STREET 20 SOUTH L STREET LIVERMORE, CA 94550	Person to Contact:	
	FAX#:	

Designated Facility (Transport to): *(name & address)*	Facility Phone #:	
SOIL SAFE 12328 HIBISCUS AVENUE ADELANTO, CA 92301	(800) 862-8001	
	Person to Contact: JOE PROVANSAL	
	FAX#: (760) 246-8004	

Transporter Name and Mailing Address:	Transporter's Phone #:	CAR000183913
BELSHIRE 25971 TOWNE CENTRE DRIVE FOOTHILL RANCH, CA 92610 BESI: 206370	949-460-5200	
	Person to Contact: LARRY MOOTHART	450647
	FAX#: 949-460-5210	Customer Account Number

Description of Soil	Moisture Content	Contaminated by:	Approx. Qty:	Description of Delivery	Gross Weight	Tare Weight	Net Weight
Sand ☐ Organic ☐ Clay ☐ Other ☐	0 - 10% ☐ 10 - 20% ☐ 20% - over ☐	Gas ☐ Diesel ☐ Other ☐	15 DM	Soil	45100	37100	8000
Sand ☐ Organic ☐ Clay ☐ Other ☐	0 - 10% ☐ 10 - 20% ☐ 20% - over ☐	Gas ☐ Diesel ☐ Other ☐					40

List any exception to items listed above: Scale Ticket # 145325

Generator's and/or consultant's certification: I/We certify that the soil referenced herein is taken entirely from those soils descried in the Soil Data Sheet completed and certified by me/us for the Generation Site shown above and nothing has been added or done to such soil that would alter it in any way.

Print or Type Name: Generator ☐ Consultant ☐	Signature and date:	Month	Day	Year
Larry Moothart of BESI on behalf of generator		7	10	18

Transporter

Transporter's certification: I/We acknowledge receipt of the soil referenced above and certify that such soil is being delivered in exactly the same condition as when received. I/We further certify that the soil is being directly transported from the Generation Site to the Designated Facility without off-loading, adding to, subtracting from or in any way delaying delivery to such site.

Print or Type Name:	Signature and date:	Month	Day	Year
Larry Moothart		7	10	18

Recycling Facility

Discrepancies:

Recycling Facility certifies the receipt of the soil covered by this manifest except as noted above:

Print or Type Name:	Signature and date:
J. PROVANSAL	8-15-18

Please print or type.

TRANSPORTER COPY

20SOUTHL/1872800

NO. 744685

NON-HAZARDOUS WASTE DATA FORM

BESI # 298060

GENERATOR

Generator's Name and Mailing Address
CITY OF LIVERMORE
ATTN: JOEL WAYDECK
1052 S LIVERMORE AVE.
LIVERMORE, CA 94550

Generator's Site Address (if different than mailing address)
LIVERMORE DOWNTOWN CORE
20 SOUTH L STREET
LIVERMORE, CA 94550

Generator's Phone: 925-580-8270

Container type removed from site:
☒ Drums ☐ Vacuum Truck ☐ Roll-off Truck ☐ Dump Truck
☐ Other

Quantity 5

Container type transported to receiving facility:
☐ Drums ☒ Vacuum Truck ☐ Roll-off Truck ☐ Dump Truck
☐ Other

Quantity 1 Volume 258 gallons

WASTE DESCRIPTION NON-HAZARDOUS WATER

GENERATING PROCESS WELL PURGING / DECON WATER

COMPONENTS OF WASTE	PPM	%
1. WATER		99-100%
2. TPH		<1%
3.		
4.		

Waste Profile

PROPERTIES: pH 7-10 ☐ SOLID ☒ LIQUID ☐ SLUDGE ☐ SLURRY ☐ OTHER

HANDLING INSTRUCTIONS: WEAR ALL APPROPRIATE PERSONAL PROTECTIVE CLOTHING.

Generator Printed/Typed Name: Larry Moothart of BESI on behalf of generator | Signature | Month 09 | Day 20 | Year 18

The Generator certifies that the waste as described is 100% non-hazardous

TRANSPORTER

Transporter 1 Company Name: BELSHIRE | Phone# 949-460-5200

Transporter 1 Printed/Typed Name: Ronreen | Signature | Month 09 | Day 20 | Year 18

Transporter Acknowledgment of Receipt of Materials

Transporter 2 Company Name: NIETO & SONS TRUCKING, INC. | Phone# 714-990-6865

Transporter 2 Printed/Typed Name: Hugo Canal | Signature | Month 10 | Day 4 | Year 18

Transporter Acknowledgment of Receipt of Materials

RECEIVING FACILITY

Designated Facility Name and Site Address
DEMENNO KERDOON
2000 N. ALAMEDA ST.
COMPTON, CA 90222

Phone# 310-537-7100

Printed/Typed Name: Jacob E. Maldonado | Signature | Month 10 | Day 04 | Year 18

Designated Facility Owner or Operator: Certification of receipt of materials covered by this data form.

20SOUTHL
1904146

NO. 742767

NON-HAZARDOUS WASTE DATA FORM

BESI # 296370

GENERATOR

Generator's Name and Mailing Address
CITY OF LIVERMORE
ATTN: JOEL WAXDECK
1052 S LIVERMORE AVE.
LIVERMORE, CA 94550

Generator's Site Address (if different than mailing address)
20 SOUTH L STREET
20 SOUTH L STREET
LIVERMORE, CA 94550

Generator's Phone: 925-580-6276

Container type removed from site:
☒ Drums ☐ Vacuum Truck ☐ Roll-off Truck ☐ Dump Truck
☐ Other _____
Quantity 3

Container type transported to receiving facility:
☐ Drums ☒ Vacuum Truck ☐ Roll-off Truck ☐ Dump Truck
☐ Other _____
Quantity 1 Volume 136 gallons

WASTE DESCRIPTION NON-HAZARDOUS WATER
GENERATING PROCESS WELL PURGING / DECON WATER

COMPONENTS OF WASTE	PPM	%	COMPONENTS OF WASTE	PPM	%
1. WATER		99-100%	3.		
2. TPH		<1%	4.		

Waste Profile _____ PROPERTIES: pH 7-10 ☐ SOLID ☒ LIQUID ☐ SLUDGE ☐ SLURRY ☐ OTHER _____

HANDLING INSTRUCTIONS: WEAR ALL APPROPRIATE PERSONAL PROTECTIVE CLOTHING.

Generator Printed/Typed Name: Larry Mathart of BESI on behalf of generator
Signature: [signature]
Month 7 Day 17 Year 18

The Generator certifies that the waste as described is 100% non-hazardous

TRANSPORTER

Transporter 1 Company Name: BELSHIRE
Phone#: 949-460-5200

Transporter 1 Printed/Typed Name: Larry Mathart
Signature: [signature]
Month 7 Day 17 Year 18

Transporter Acknowledgment of Receipt of Materials

Transporter 2 Company Name: NIETO & SONS TRUCKING, INC.
Phone#: 714-990-6855

Transporter 2 Printed/Typed Name: Tony Ramirez
Signature: [signature]
Month 07 Day 31 Year 18

Transporter Acknowledgment of Receipt of Materials

RECEIVING FACILITY

Designated Facility Name and Site Address
DEMENNO KERDOON
2000 N. ALAMEDA ST.
COMPTON, CA 90222

Phone#: 310-537-7100

Printed/Typed Name: SOPHAL P. SVAY
Signature: [signature]
Month 07 Day 31 Year 18

Designated Facility Owner or Operator: Certification of receipt of materials covered by this data form.

20 South L
1862113

NO. 743321

NON-HAZARDOUS WASTE DATA FORM

BEST # 296370

GENERATOR

Generator's Name and Mailing Address
CITY OF LIVERMORE
ATTN: JOEL WAXDECK
1052 S LIVERMORE AVE.
LIVERMORE, CA 94550

Generator's Site Address (if different than mailing address)
20 SOUTH L STREET
20 SOUTH L STREET
LIVERMORE, CA 94550

Generator's Phone: 925-960-8270

Container type removed from site:
XX ☐ Drums ☐ Vacuum Truck ☐ Roll-off Truck ☐ Dump Truck
☐ Other _____
Quantity 1

Container type transported to receiving facility:
☐ Drums XX ☑ Vacuum Truck ☐ Roll-off Truck ☐ Dump Truck
☐ Other _____
Quantity 1 Volume 40 gallons

WASTE DESCRIPTION NON-HAZARDOUS WATER
GENERATING PROCESS WELL PURGING / DECON WATER

COMPONENTS OF WASTE	PPM	%	COMPONENTS OF WASTE	PPM	%
1. WATER		99-100%	3.		
2. TPH		<1%	4.		

Waste Profile _____ PROPERTIES: pH 7-10 ☐ SOLID XX ☑ LIQUID ☐ SLUDGE ☐ SLURRY ☐ OTHER _____

HANDLING INSTRUCTIONS: WEAR ALL APPROPRIATE PERSONAL PROTECTIVE CLOTHING.

Generator Printed/Typed Name: Larry Moothart of BESI on behalf of generator | Signature | Month 7 | Day 17 | Year 18

The Generator certifies that the waste as described is 100% non-hazardous

TRANSPORTER

Transporter 1 Company Name: BELSHIRE | Phone#: 949-460-5200

Transporter 1 Printed/Typed Name: LARRY MOOTHART | Signature | Month 7 | Day 17 | Year 18

Transporter Acknowledgment of Receipt of Materials

Transporter 2 Company Name: NIETO & SONS TRUCKING, INC. | Phone#: 714-990-6855

Transporter 2 Printed/Typed Name: IMDeanal | Signature | Month 9 | Day 16 | Year 18

Transporter Acknowledgment of Receipt of Materials

RECEIVING FACILITY

Designated Facility Name and Site Address
DEMENNO KERDOON
2000 N. ALAMEDA ST.
COMPTON, CA 90222

Phone#: 310-537-7100

Printed/Typed Name: Rudy Smith | Signature | Month 08 | Day 18 | Year 18

Designated Facility Owner or Operator: certification of receipt of materials covered by this data form.

20 SOUTH L
187358