

By Alameda County Environmental Health 1:45 pm, Oct 03, 2016

# **PERJURY STATEMENT**

Subject: Fuel Lake Case No. Ro0002981 and Geotracker Clobal ID T1000000416, Red Hanger Cleaners, 6335-6339 College Ave., Oakland, CA 94618

"I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge."

**Ted Cleveland** 

Vice President – Eastern Region EFI Global, Inc.

# P&D ENVIRONMENTAL, INC.

55 Santa Clara Ave, Suite 240 Oakland, CA 94610 (510) 658-6916

September 30, 2016 Report 0461.R6

Mr. Gary Bates EFI Global, Inc. 11000 Richmond Avenue, Suite 250 Houston, TX 77042

SUBJECT: SOIL VAPOR EXTRACTION REMEDIATION PROGRESS REPORT

Spills Leaks, Investigation and Cleanup Leak Case No RO0002981

Geotracker Global ID T10000000416

Red Hanger Kleaners 6239 College Avenue Oakland, California

Dear Mr. Bates:

P&D Environmental, Inc. (P&D) has prepared this soil vapor extraction remediation progress report documenting the following subject site activities:

- Cleaning of the first floor space in June and the first week of July 2016 preparation for indoor air sampling.
- Indoor air sampling, which was performed during a 24-hour period on July 13 and 14, 2016.
- Collection of soil gas samples from all of the soil gas wells at the subject site on August 10 and 11, 2016.
- Continued operation and monitoring of the Soil Vapor Extraction (SVE) system at the site.
- Evaluation of a natural gas leak at the adjacent property to the northeast of the subject site at 6241-6247 College Avenue.

This work was performed on behalf of the property owner Ronald Elvidge and EFI Global, Inc. (EFI). The objective of the work was to evaluate indoor air and soil gas Tetrachloroethene (PCE) concentrations following the June 10, 2016 startup of the SVE system in accordance with recommendations set forth in P&D's Site Investigation and Soil Vapor Extraction Report dated July 11, 2016 (document 0461.R5) and in accordance with verbal communications with the Alameda County Department of Environmental Health (ACDEH). The ACDEH approved the scope of work in a letter dated July 14, 2016.

The indoor air samples were collected during SVE system operation following completion of removal of drums of investigation-derived waste and cleaning of the first floor space at the site. Following collection of the indoor air samples on July 14, 2016 the SVE system was temporarily shut off on July 26, 2016 in preparation for soil gas sample collection. Following completion of soil gas sample collection on August 11, 2016, the SVE system was re-started on August 11, 2016.

A Site Location Map is attached as Figure 1, Site Plans showing the locations of Indoor and Ambient Air Sample Collection Locations on the first, second and third floors of the building are attached as Figure 2, Figure 3, and Figure 4, respectively, Site Plans showing December 2, 2015 PCE concentrations in shallow soil gas and in deep soil gas, are attached as Figure 5 and Figure 6, respectively, and Site Plans showing August 10, 2016 and August 11, 2016 PCE concentrations in shallow soil gas and in deep soil gas, are attached as Figure 7 and Figure 8, respectively. All work was performed under the direct supervision of a California professional geologist.

### **BACKGROUND**

A detailed discussion of the historical site use as a drycleaner from 1987 to 2015 (approximately 28 years) and of all known historical subsurface investigations is provided in P&D's Soil Gas Investigation Work Plan dated October 16, 2015 (document 0461.W1). The work plan includes all known available soil, groundwater, soil gas, and indoor air sample results (through October 13, 2015) for the subject site and also discusses the available known historical dry cleaner operations from 1953 to 1987 (approximately 34 years) at the nearby former Kay's Cleaners located at 6251-6255 College Avenue. Review of the available data shows that trichloroethene (TCE) has not been detected in any soil, groundwater, or soil gas samples. Documentation of the evaluation and mitigation of indoor air quality at the subject site (including post-mitigation air sample results for samples collected on October 21, 2015) are provided in P&D's November 3, 2015 Indoor Air Investigation Report (document 0461.R2). The report concluded that indoor air mitigation measures had successfully mitigated indoor air PCE and TCE concentrations to below commercial trigger and Environmental Screening Level concentrations for common areas and tenant spaces.

Documentation of the evaluation and mitigation of indoor air quality at the subject site (including post-mitigation air sample results for samples collected on October 21, 2015) is provided in P&D's November 3, 2015 Indoor Air Investigation Report (document 0461.R2). The report concluded that indoor air mitigation measures had successfully mitigated indoor air PCE and TCE concentrations to below commercial trigger and Environmental Screening Level concentrations for common areas and tenant spaces.

Documentation of a sub-slab depressurization feasibility test that was performed on November 16, 2015 in the former Red Hanger Kleaners dry cleaner store at the subject site is provided in P&D's December 14, 2015 Sub-Slab Depressurization Feasibility Test Report (document 0461.R4). During the sub-slab depressurization feasibility test a vacuum of between 12 and 13 inches of water column (in. WC) was applied under the building slab and the highest recorded vacuum at soil gas well SG9-17 (located within the footprint of the subject site former dry cleaner store) was approximately 0.1 in. WC, and the highest recorded vacuum at soil gas well SG10-7 (located within the footprint of the subject site former dry cleaner store) was approximately 0.09 in. WC. The information obtained during the feasibility test demonstrated that although a sub-slab grade beam appeared to function as a barrier to the eastward migration of PCE vapors beneath the floor

slab, vacuum was readily observed at all observation locations beneath the floor slab. The readily observed vacuum is attributed to the uniform presence of approximately 8 to 9.5 inches of coarse-grained material consisting primarily of gravel located beneath the floor slab.

Documentation of soil gas well installation during November 2015 and associated soil gas sample collection on December 2, 2015 at the subject site is provided in P&D's January 21, 2016 Soil Gas Investigation Report (document 0461.R3). The sample results for shallow (approximately 7 foot depth) and deeper (approximately 17 foot depth) soil gas samples collected on December 2, 2015 are shown as Figures 5 and 6 attached with this Report. A detailed discussion of the site geology and hydrogeology based upon available historical boring logs, in addition to a summary of the depth to groundwater during historical site investigations is provided in the P&D January 21, 2016 report.

Documentation of drilling and collection of groundwater samples from boreholes B9 through B14, installation of two additional onsite soil gas wells designated as SG4-17 and SG11-17, installation of eight SVE wells designated as SVE1 through SVE8, installation of one additional sub-slab extraction location inside the building designated as SSE5, SVE feasibility testing using existing soil gas wells and Vapor Pins at the site, SVE system installation, SVE system start up on June 10, 2016, and initial SVE system monitoring is provided in P&D's Site Investigation and Soil Vapor Extraction Report dated July 11, 2016 (document 0461.R5).

### FIELD ACTIVITIES

Field activities were performed on the following dates:

- Cleaning of first floor space in June and the first week of July, 2016.
- Indoor and ambient air sampling was performed, at locations shown on Figures 2 through 4, during a 24-hour period on July 13 and 14, 2016.
- Collection of soil gas samples from all of the soil gas wells at the subject site on August 10 and 11, 2016.
- Monitoring of the SVE system on July 19, 2016, August 16, 2016, and August 24, 2016.

Each of these activities is discussed in further detail below.

# Cleaning of First Floor Space Prior to Indoor Air Sample Collection

Following removal of the drummed investigation-derived waste from the first floor space on June 16, 2016 (documentation of drum removal and disposal is provided in P&D's July 11, 2016 Site Investigation and Soil Vapor Extraction Report), all overhead ducting and hanging lights were removed from the first floor tenant space. The bottom of the ventilation duct to the roof was sealed near the ceiling of the first floor tenant space using sheet metal with sheet metal

screws and caulked with a polyurethane caulk. A leaf blower was used to remove lint and accumulated dust from the walls and horizontal surfaces. The floor was subsequently swept, and the walls, horizontal surfaces, and floor were damp mopped with water to remove dust, with the damp mopping completed by July 8, 2016. On July 11 and 12, 2016 (the two days prior to indoor air sampling) a blower was installed at the back door of the first floor tenant space and the front doors were opened to allow ventilation of the space.

# **Indoor and Ambient Air Sampling**

From July 13 to July 14, 2014 indoor and ambient (outdoor) air samples were collected during a period of approximately 24 hours using SIM-certified 6-liter Summa canisters, SIM-certified 24-hour flow controllers, SIM-certified sampling canes, and a SIM-certified duplicate tee. The Summa canister inlets were at a height of approximately five feet above the ground surface. The indoor air samples were collected at locations where indoor air samples have been historically collected in the subject site building on the first floor (IA1, IA2), on the second floor in the hallway adjacent to the elevator (IA4), on the third floor in the men's bathroom (IA5), and in the elevator pit (sample designation Elevator Pit). A duplicate indoor air sample designated as IA5 DUP was collected at location IA5. One ambient air sample was collected at location and BG-2 Ambient where ambient air samples have historically been collected during indoor air evaluation at the site. Following completion of sample collection the Summa canisters were placed into boxes pending delivery to the laboratory via courier. Chain of custody procedures were observed for all sample handling.

The locations of the ambient and indoor air sample collection locations are shown on Figures 2 through 4, and measurements of Summa canister initial and final vacuums, and beginning and ending sample collection times were recorded on an Air Sampling Data Sheet that is provided in Appendix A of this report.

# Soil Gas Well Sample Collection

On August 10 and 11, 2016 soil gas samples were collected from all of the soil gas wells at the site, including the two soil gas wells SG4-17 and SG11-17 that were installed on March 28, 2016 but were not sampled at the time of installation because of elevated groundwater levels. The locations of soil gas wells SG1-7, SG2-7, SG2-17, SG3-17, SG4-7, SG4-17, SG5-7, SG5-17, SG6-7, SG6-17, SG7-7, SG7-17, SG8-7, SG9-17, SG10-7, and SG11-17 are shown in Figures 5 through 8. All of the soil gas wells were sampled in the following manner.

A soil gas sampling manifold with a 1-liter Summa canister as the sampling canister for each sampling location (see Figure 9) was assembled in a shroud consisting of a 35-gallon Rubbermaid bin that had been modified by cutting viewing ports into the sides of the shroud and covering the viewing ports with transparent polycarbonate sheets. A hole measuring approximately two inches

square in the bottom of the shroud allowed the shroud to cover the soil gas well while still allowing access to the sampling location through the bottom of the shroud. At the time that the sampling manifold was assembled, the vacuum for the sample canister was verified with a vacuum gauge and recorded.

Prior to sampling each soil gas well, a 10 minute shut-in test of the sampling manifold was performed by closing the valve located between the filter and the pressure gauge, opening the purge canister valve, and recording the manifold system vacuum (see Figure 9). No purge testing for purge volume determination was performed based on the large volume of the soil gas well sand packs. Following successful verification of the manifold shut-in test, the tubing volume plus 200 cubic centimeters was extracted prior to sample collection at each sample collection location. The purge time was calculated for each sample collection location using a nominal flow rate provided by the flow controller of 150 cubic centimeters per minute. Copies of the purge volume calculation sheets are attached with this report as Appendix B.

Following completion of purging and prior to sampling, a lid was placed onto the shroud and a tracer gas 1,1-Difluoroethane (DFA) was sprayed into the shroud interior for one second through a tube connected to a hole in the side of the shroud. Gloves in the lid of the shroud were used to open the sample canister valve. The pressure gage on the inlet side of the flow controller (see Figure 9) was monitored during sample collection to verify that the vacuum applied to the soil gas well did not exceed 100 in. WC. Once the vacuum for the sample canister valve had decreased to 5 inches of mercury, the gloves in the lid of the bin were used to close the sample canister valve. Duplicate soil gas samples were collected into Summa canisters at locations SG4-7 and SG9-17 using a stainless steel sampling tee for the Summa canisters using methods described above. Following the completion of sample collection the soil gas Summa canister samples were stored in a box and promptly shipped to the laboratory for extraction and analysis.

During Summa canister sample collection an air sample was collected from the shroud atmosphere to quantify the shroud tracer gas concentration while the soil gas sample was being collected. The shroud atmosphere sample was collected into a Tedlar bag that was placed into a vacuum chamber with the Tedlar bag inlet connected to a new piece of polyethylene tubing that was inserted into the shroud atmosphere through a hole in the side of the shroud. The shroud Tedlar bag samples were stored in a cooler to prevent exposure to light or crushing and promptly shipped to the laboratory for extraction and analysis. Chain of custody procedures were observed for all sample handling.

New polyethylene tubing and clean, unused vacuum gages and stainless steel sampling manifolds were used at each sample collection location. Measurements of vacuums, purging and equilibration time intervals, and PID readings were recorded on Soil Gas Sampling Data Sheets that are attached with this report as Appendix B.

# **SVE System Operation and Monitoring**

The site SVE system consists of a positive displacement blower with a variable frequency drive (VFD), a moisture separator (knockout tank), and two 2,000-pound vessels containing granular activated carbon (GAC). The system was installed at the site between May 23 and June 10, 2016 and was started on June 10, 2016. The system was plumbed with 4-inch diameter Schedule 40 PVC pipe to allow vapors extracted from SVE wells SVE1 through SVE8 and sub-slab extraction location SSE5 to be pulled sequentially through the moisture separator tank (referred to in the field notes as the knock out (KO) tank), the first carbon vessel (designated as air abatement device A1) and the second carbon vessel (designated as air abatement device A2) before being pulled into the blower and then discharged through a stack to the atmosphere at a height of three feet above the roof line. The SVE blower and associated control equipment was enclosed in a trailer. The piping from all of the extraction locations was plumbed to a manifold located adjacent to the trailer. The extraction locations consist of SVE wells SVE1 through SVE8 and sub-slab extraction location SSE5. A Process and Flow Diagram showing the SVE system components is attached with this report as Figure C1 in Appendix C and a Facility Layout diagram showing the locations of the SVE system components and piping at the site is attached with this report as Figure C2 in Appendix C.

Documentation of SVE system installation, start up, and initial system monitoring is provided in P&D's July 11, 2016 Site Investigation and Soil Vapor Extraction Report (document 0461.R5). P&D is currently required by BAAQMD permit conditions to monitor the SVE system on a monthly basis. Due to the renovation of the first floor space for a new tenant, the piping at sub-slab extraction locations SSE1 through SSE4 were removed on August 26, 2016 and the holes in the floor slab at these locations were filled with cement.

The SVE system was started on June 10, 2016 and was continuously operated until July 26, 2016 when the system was temporarily shut down in preparation for soil gas well sample collection. Soil gas well soil gas samples were collected on August 10 and 11, 2016 and the SVE system was restarted on August 11, 2016 after completion of soil gas sample collection.

Following the SVE system startup on June 10, 2016, the SVE system has operated continuously since June 20, 2016 at 56 Hz with all SVE well valves and the SSE5 valve completely open with the following exceptions:

- The SVE system was temporarily shut down on July 26, 2016 in preparation for soil gas well sample collection and was restarted on August 11, 2016.
- When the SVE system was restarted on August 11, 2016 the SSE5 valve remained temporarily closed until the valve was opened on August 19, 2016. The SSE5 valve was temporarily closed for evaluation of sub-slab vacuum in the absence of vacuum applied at SSE5.

• The valve for SSE5 was temporarily closed on August 26, 26 for removal of SSE1 through SSE4, and was subsequently reopened on September 2, 2016.

Subsequent to the last SVE system monitoring episode on June 24, 2016 that is documented in P&D's July 11, 2016 Site Investigation and Soil Vapor Extraction Report, the SVE system was monitored on July 19, August 16, and August 24, 2016. The system air flow rate and temperature were measured using a TSI Velocicalc Model 9535 digital hot wire anemometer at the inlet to the first carbon vessel (A1). System vacuum was measured at each of the following locations:

- Wellheads of SVE1 through SVE8,
- Sub-slab extraction location SSE5,
- Vapor Pins VP1 through VP8,
- Inlet to the first carbon vessel (A1),
- Inlet to the second carbon vessel (A2),
- Outlet to the second carbon vessel,
- The SVE piping manifold for air flow from SVE wells SVE2, SVE3, and SVE8 were monitored on July 19, 2016 and August 24, 2016 but not on August 16, 2016,
- The soil gas wells and Vapor Pins were monitored on August 16, 2016 and August 24, 2016 but not on July 19, 2016,
- Sub-slab extraction locations SSE1 through SSE4 (originally installed for the sub-slab depressurization feasibility test) were monitored on August 16, 2016 and August 24, 2016 but not on July 19, 2016.

Air quality was also periodically evaluated with a PID and oxygen meter by using an air pump to pull air from the location being evaluated into a 1-gallon container on a continuous basis. The PID was equipped with a 10.6 eV bulb and was calibrated with a 100 parts per million (ppm) isobutylene standard prior to the beginning of use.

Monitoring was performed with the following equipment:

- Air flow and temperature were monitored with a hot wire anemometer TSI Velocicalc Model 9545.
- Vacuum was monitored at extraction and monitoring locations with digital monometers as follows:
  - o Dwyer Model 476A-0 with range of -20 to +20 +/-0.3 in. WC,
  - $\circ$  Dwyer Model 475-3-FM with range of 0 to -200 +/- 1.0 in. WC), and
- Air quality was monitored using the following instruments:
  - o Thermo Environmental Instruments PID Model 580B equipped with a 10.6 eV bulb (organic vapors),
  - o RKI Instruments Model Eagle (oxygen).

The SVE system air flow rate, temperature, and vacuum measurements were recorded on SVE System Air Flow and Temperature Monitoring Data Sheets; vacuum readings from all of the SVE wells, soil gas wells, Vapor Pins, the inlet to the moisture separator, inlet to the first carbon vessel (A1), inlet to the second carbon vessel (A2), and outlet from the second carbon vessel were recorded on SVE Well Monitoring Field Sheets. Vacuum readings were recorded in in. WC, PID readings in ppm, oxygen readings in percent, and methane readings in ppm. The SVE system monitoring data field forms for on July 19, August 16, and August 24, 2016 are provided in Appendix C.

Review of Appendix C shows that the system operated with a total system flow of approximately 450 cfm and all SVE system air quality evaluations with the PID have shown 0.0 ppm. The wellhead vacuums were as follows:

- Approximately 18 in. WC was observed in wells SVE1 through SVE8 on July 19, 2016.
- Approximately 25 in. WC was observed in wells SVE1 through SVE8 on August 16, 2016.
- Approximately 15 in. WC was observed in wells SVE1 through SVE8 on August 24, 2016.

### Natural Gas Leak Evaluation

On July 15, 2016 P&D personnel met with a Pacific Gas & Electric inspector to evaluate a suspected natural gas leak associated with reported natural gas odors at the adjacent property located to the northeast of the subject site at 6241-6247 College Avenue (see Figures 5 through 8). Although the PG&E inspector did not identify a natural gas leak, methane detected at SVE extraction locations and in the SVE system is interpreted to originate from a natural gas leak at the adjacent property at 6241-6247 College Avenue.

### <u>WEATHER</u>

Weather data, including precipitation and barometric pressure for July 1, 2016 through August 31, 2016 are provided in Appendix D. The range of dates for weather encompasses the dates of indoor and ambient air sample collection on July 13 and 14, 2016 and the dates of soil gas sample collection on August 10 and 11, 2016. Review of the data in Appendix D shows that the only precipitation that occurred was 0.01 inches on August 5, 2016.

The weather station is located on the north side of Prince Street immediately east of the intersection of Prince Street and College Avenue in Berkeley at an elevation of 253 feet above sea level, approximately 0.4 miles to the north-northeast of the subject site. The subject site is located at an elevation of approximately 210 feet above sea level. An internet link to the weather station information is provided in Appendix D.

The weather station used to obtain weather information for previous P&D investigation reports that was located on the north side of Forest Avenue and west of the intersection of Piedmont Avenue

and Forest Avenue in Berkeley approximately 0.8 miles to the north-northeast of the subject site stopped reporting on July 21, 2016.

### LABORATORY ANALYSIS

All of the air and soil gas samples were analyzed at Eurofins/ Air Toxics Ltd. of Folsom, California. All of the samples were analyzed for Volatile Organic Compounds (VOCs) using EPA Method TO-15.

The indoor and ambient air sample results are summarized in Table 1, the soil gas sample results are summarized in Table 2A, and the soil gas shroud sample results are summarized in Table 2B. The 2016 sample results are hi-lited yellow in Tables 2A and 2B to differentiate the results from the 2015 sample results. The percent shroud information reported in Table 2A is the ratio of the detected tracer gas concentration in the soil gas sample to the corresponding shroud air tracer gas concentration, expressed as a percentage. Copies of the laboratory analytical reports and chain of custody documentation are attached with this report as Appendix E.

# RISK AND HAZARD ANALYSIS

The only complete pathway for contaminant exposure at the subject site is considered to be potential vapor intrusion from soil gas to indoor air. A parking lot is located immediately to the south of the subject site, and College Avenue is located immediately to the east of the subject site. The structures that are located immediately adjacent to the subject site to the north, northeast, and west are identified as follows (see Figures 5 through 8):

- To the north: 309 63rd Street commercial storage on the ground floor and residential apartments above the ground floor.
- To the northeast: 6251 top 6255 College Avenue commercial stores on the ground floor and residential apartments above the ground floor.
- To the northeast: 6241 top 6247 College Avenue commercial stores on the ground floor and commercial use above the ground floor.
- To the west: 323 63rd Street residential two story buildings. Based on the number of visible electrical meters each building appears to consist of a 4-plex. A crawl space was observed at each building.

Risk analysis is the evaluation of the predicted increased incidence of cancer resulting from exposure to Chemicals of Potential Concern (COPCs), and is reported for each COPC as the incremental carcinogenic risk. Hazard analysis is the evaluation of the predicted increased non-cancer adverse health effects resulting from exposure to COPCs, and is reported for each COPC as the hazard quotient. In addition, cumulative incremental carcinogenic risk (the total of the risks posed by all of the COPCs in a sample when all of the individual COPC risks are added together)

and hazard indices (the total of the hazards posed by all of the COPCs in a sample when all of the individual COPC hazards are added together) were also calculated for all detected compounds for each sample.

The cumulative incremental risk is calculated as the increased number of cases of cancer that might develop in a population of one million people in addition to the background risk of Americans developing cancer. According to the American Cancer Society the background risk for an American eventually developing cancer during their life time is one chance in two (also expressed as 500,000 per million, or expressed as 5E-01). In determining what is an acceptable level of risk, the Department of Toxic Substances Control (DTSC) has determined that lifetime incremental cumulative cancer risks posed by a site should not exceed 1 per million without further evaluation. The DTSC recommends that activities to reduce exposure to COPCs be evaluated when the cumulative risk exceeds 100 per million. The DTSC also recommends that further action be evaluated when the hazard quotient exceeds 1. These recommendations are based on conservative (erring on the side of caution) assumptions in determining actions associated with calculated risk or hazard.

The Interim Final December 2013 San Francisco Bay Regional Water Quality Control Board (RWQCB) User's Guide: Derivation and Application of Environmental Screening Levels (the User's Guide) recommends using methods for calculation of risk and hazard associated with potential vapor intrusion identified in various DTSC guidance documents. The incremental carcinogenic risk and hazard quotient were calculated for each detected compound for each of the soil gas samples using the DTSC Human and Ecological Risk Office (HERO) California-specific screening-level spreadsheet version of the Johnson & Ettinger soil gas vapor intrusion model. The DTSC most recently updated the screening-level vapor intrusion model spreadsheet in December 2014.

The Inhalation Unit Risk factor (IUR) value used for risk calculation and the Reference Concentration (RfC) values used for hazard calculation were obtained from the most recent version of the DTSC HERO Vapor Intrusion Screening Model for Soil Gas VLOOKUP Table (last updated December 2014). These values are consistent with the values provided in the most recent version of the DTSC HERO Human Health Risk Assessment Note Number 3 dated June 2016. DTSC RfC values were converted from milligrams per cubic meter ( $mg/m^3$ ) to micrograms per cubic meter ( $\mu g/m^3$ ) for hazard calculation. The 2013 RWQCB User's Guide Table J-2 PCE RfC value of 270  $\mu g/m^3$  was superseded for risk calculation by the 2014 DTSC PCE RfC value of 35  $\mu g/m^3$ .

Default exposure parameter values provided in the December 2014 DTSC HERO vapor intrusion screening model for soil gas for a residential land use scenario were used for evaluation of the soil gas sample results at locations SG1, SG2, SG3, SG4 and SG5 as follows:

• averaging time for carcinogens of 70 years,

- averaging time for non-carcinogens of 26 years,
- exposure duration for 26 years,
- exposure frequency of 350 days per year,
- exposure time of 24 hours per day, and
- air exchange rate of 0.5 per hour.

Default exposure parameter values provided in the December 2014 DTSC HERO Vapor Intrusion Screening Model for Soil Gas for a commercial land use scenario were used for evaluation of the soil gas sample results at locations SG6, SG7, SG8, SG9, SG10 and SG11 as follows:

- averaging time for carcinogens of 70 years,
- averaging time for non-carcinogens of 25 years,
- exposure duration for 25 years,
- exposure frequency of 250 days per year,
- exposure time of 8 hours per day, and
- air exchange rate of 1.0 per hour.

The soil gas sample depth used for risk and hazard calculation was 6.0 feet (182.88 centimeters) for the 7-foot deep soil gas wells and 16.0 feet (487.68 centimeters) for the 17-foot deep soil gas wells based on the depth of the soil gas well filter in the center of the sand filter pack. The soil type used was silt (SI), and the default value of 5 liters per minute was used for the average vapor flow rate into a building with a footprint measuring 10 meter by 10 meter building (100 square meters).

In addition, the cumulative incremental carcinogenic risk (the total of the risks posed by all of the COPCs in a sample when all of the individual COPC risks are added together) and hazard indices (the total of the hazards posed by all of the COPCs in a sample when all of the individual COPC hazards are added together) were calculated for all detected compounds for each sample.

The August 10 and 11, 2016 soil gas sample incremental risk and hazard quotient calculation results are provided in Table 3A. The soil gas sample incremental risk and hazard quotient calculation results for each of the December 2, 2015 and the August 10 and 11, 2016 sampling events are summarized in Table 3B. The 2016 sample results are hi-lited yellow in Table 3B to differentiate the 2016 results from the 2015 results. The vapor intrusion model spreadsheet input sheets which include a calculation results summary for each calculation are attached with this report as Appendix F.

Soil gas model sensitivity analysis of the soil gas model was performed using PCE for a total of ten scenarios, including an evaluation of the DTSC HERO vapor intrusion screening model for soil gas spreadsheet default values for a residential exposure scenario with a soil type of silty (SI) and a soil gas sampling depth of 5.0 feet (152 cm). A summary of soil gas model sensitivity analysis is provided in Table 4, and the sensitivity analysis vapor intrusion model spreadsheet input sheets

which include a results summary for each calculation are attached with this report as Appendix G. Calculation of risk and hazard for PCE and TCE in indoor air was not performed because none of the detected concentrations exceeded their respective RWQCB February 2016 (Revision 3) Table IA-1 Indoor Air direct exposure human health screening levels for a commercial land use scenario. Calculation of risk and hazard for carbon tetrachloride and chloroform in indoor air was not performed because these compounds are presently not considered to be related to historical operations at the former Red Hanger Kleaners.

# **DISCUSSION**

Each of indoor and ambient air, soil gas, SVE system operation, and risk and hazard are discussed below.

### Indoor and Ambient Air

Review of Table 1 shows that PCE and TCE were not detected in the ambient air sample and were not detected in any of the air samples at concentrations exceeding their respective RWQCB February 2016 (Revision 3) Table IA-1 Indoor Air direct exposure human health screening levels for a commercial land use scenario. Additionally, the detected PCE concentration in the elevator pit sample was less than 1 ug/m³, which is lower than the PCE air concentrations historically detected in the elevator pit of 43 and 44 ug/m³. Carbon tetrachloride and chloroform were detected in the ambient air sample, and were detected in almost all of the indoor air samples at concentrations exceeding the RWQCB February 2016 (Revision 3) Table IA-1 Indoor Air direct exposure human health screening levels for a commercial land use scenario, with the concentrations being generally consistent with historically detected concentrations.

To date, TCE and carbon tetrachloride have not been detected in any soil gas samples, and chloroform has only been detected in soil gas samples at a depth of 17 feet at two locations. Although chloroform has historically been used for cleaning in the dry cleaning industry, it is unknown if chloroform was historically used at the subject site. Chloroform is also commonly associated with municipal water supplies. Similarly, although carbon tetrachloride has historically been used for cleaning in the dry cleaning industry, it is unknown if carbon tetrachloride was used at the subject site. Carbon tetrachloride is also commonly associated with refrigeration and fire suppression systems.

# Soil Gas

Review of the Table 2A Percent Shroud column shows that the tracer gas concentrations detected in the soil gas samples are less than 5 percent of the associated shroud atmosphere tracer gas concentrations (see Table 2B), indicating that atmospheric dilution of the samples during sample collection is not a concern, with the exception of sample SG5-17 where the sample tracer gas

concentration was 6.5 percent. Although the SG11-17 soil gas sample tracer gas concentration was 4.9 percent (less than 5 percent), based on the tracer gas concentration detected in samples SG5-17 and SG11-17 these samples are not considered to be a valid samples, with soil gas concentrations anticipated to be higher than identified by the laboratory based on atmospheric dilution of the samples.

Comparison of the August 2016 soil gas sample results with the December 2015 results in Table 2A shows that the PCE soil gas concentrations in 2016 are all lower than the corresponding 2015 sample results for all soil gas wells.

Review of shallow and deep soil gas concentrations in December 2015 shown in Figures 5 and 6, respectively shows that the highest concentrations of PCE soil gas were consistently detected in the vicinity of the sanitary sewer pipe immediately to the north of the former Red Hanger Kleaners store, with the highest PCE shallow soil gas concentration detected immediately to the south of the sanitary sewer cleanout and the highest deep soil gas concentrations detected adjacent to and immediately downgradient of the sanitary sewer cleanout. Review of shallow and deep soil gas concentrations in August 2016 shown in Figures 7 and 8, respectively shows a similar distribution of PCE in soil gas as observed in December 2015.

Benzene is not a decomposition product of PCE. The source of the historically detected benzene in soil gas is presently unknown. Review of Table 1A shows that benzene was only detected in deep soil gas samples with the exception of sample SG8-7, where benzene was detected at a concentration below the RWQCB December 2013 Table E-2 residential exposure scenario ESL. The widespread presence of benzene in deep soil gas at the subject site suggests that the benzene originates from an offsite upgradient source. The former fuel underground storage tank pit of a former fuel release site is located directly upgradient of the subject site at 6201 Claremont Avenue, approximately 80 feet to the east of the subject site.

# **SVE System Operation**

The SVE system was started on June 10, 2016 and has operated continuously since then with the exception of July 26, 2016 to August 11, 2016 when the system was temporarily shut down for soil gas well sample collection. Following abatement of system noise on June 21, 2016 all of the valves for extraction locations SVE1 through SVE8 and SSE5 have remained fully open with operation of the SVE system at 56 Hz with the exception of the valve for SSE5 being closed during the following dates.

 When the SVE system was restarted on August 11, 2016 the SSE5 valve remained temporarily closed until the valve was opened on August 19, 2016. The SSE5 valve was temporarily closed for evaluation of sub-slab vacuum in the absence of vacuum applied at SSE5.

• The valve for SSE5 was temporarily closed on August 26, 26 for removal of SSE1 through SSE4, and was subsequently reopened on September 2, 2016.

SVE system monitoring on July 19, August 16 and August 24, 2016 shows that the system operated with a total system flow of approximately 450 cfm and all SVE system air quality evaluations with the PID have shown 0.0 ppm. The wellhead vacuums were as follows:

- Approximately 18 in. WC was observed in wells SVE1 through SVE8 on July 19, 2016 (SSE5 valve open).
- Approximately 25 in. WC was observed in wells SVE1 through SVE8 on August 16, 2016 (SSE5 valve closed).
- Approximately 15 in. WC was observed in wells SVE1 through SVE8 on August 24, 2016 (SSE5 valve open).

Operation of the SVE system with the SSE5 valve closed resulted in negligible vacuum measured beneath the building floor slab. Based on the absence of vacuum beneath the floor slab with the SSE5 valve closed, it was decided to operate the SVE system with the SSE5 valve open.

# Risk and Hazard Evaluation

The only complete pathway for contaminant exposure at the subject site is considered to be potential vapor intrusion from soil gas to indoor air. A residential exposure scenario was used for evaluation of the soil gas sample results at locations SG1, SG2, SG3, SG4 and SG5, and a commercial exposure scenario was used for evaluation of the soil gas sample results at locations SG6, SG7, SG8, SG9, SG10 and SG11 using the DTSC HERO California-specific screening-level spreadsheet version of the Johnson & Ettinger soil gas vapor intrusion model.

Comparison of the risk and hazard identified for soil gas samples collected in 2015 and 2016 (see Table 3B) shows that the calculated risk and hazard for the 2016 samples is substantially reduced for all of the 2016 samples. Review of the soil gas model sensitivity analysis in Table 4 shows that the model is not very sensitive to changes in temperature, is moderately sensitive to changes in soil type, and is sensitive to changes in average vapor flow rate into building (Qsoil), sample depth, and COPC concentration.

Calculation of risk and hazard for PCE and TCE in indoor air was not performed because none of the detected concentrations exceeded their respective RWQCB February 2016 (Revision 3) Table IA-1 Indoor Air direct exposure human health screening levels for a commercial land use scenario. Calculation of risk and hazard for carbon tetrachloride and chloroform in indoor air was not performed because these compounds are presently not considered to be related to historical operations at the former Red Hanger Kleaners.

### **DISTRIBUTION**

Copies of this report should be uploaded to the county ftp site and to GeoTracker.

# **LIMITATIONS**

This report was prepared solely for the use of Ron Elvidge and EFI Global, Inc. The content and conclusions provided by P&D in this assessment are based on information collected during our investigation, which may include, but not be limited to, visual site inspections; interviews with the site owner, regulatory agencies and other pertinent individuals; review of available public documents; subsurface exploration and our professional judgment based on said information at the time of preparation of this document. Any subsurface sample results and observations presented herein are considered to be representative of the area of investigation; however, geological conditions may vary between borings and may not necessarily apply to the general site as a whole. If future subsurface or other conditions are revealed which vary from these findings, the newly revealed conditions must be evaluated and may invalidate the findings of this report.

This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information contained herein is brought to the attention of the appropriate regulatory agencies, where required by law. Additionally, it is the sole responsibility of the owner to properly dispose of any hazardous materials or hazardous wastes left onsite, in accordance with existing laws and regulations.

This report has been prepared in accordance with generally accepted practices using standards of care and diligence normally practiced by recognized consulting firms performing services of a similar nature. P&D is not responsible for the accuracy or completeness of information provided by other individuals or entities which is used in this report. This report presents our professional judgment based upon data and findings identified in this report and interpretation of such data based upon our experience and background, and no warranty, either express or implied, is made. The conclusions presented are based upon the current regulatory climate and may require revision if future regulatory changes occur.

Should you have any questions, please do not hesitate to contact us at (510) 658-6916.

Sincerely,

P&D Environmental, Inc.

Paul H. King

California Professional Geologist #5901

Expires: 12/31/17

### Attachments:

Table 1 - Summary of Indoor and Ambient Air Sample Laboratory Analytical Results

Table 2A - Summary of Soil Gas Sample Analytical Results

Table 2B - Summary of Soil Gas Shroud Sample Laboratory Analytical Results - Difluoroethane

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Table 3A - 8/10/16 and 8/11/16 Soil Gas Risk and Hazard Calculation Results

Table 3B - 12/2/15, 8/10/16 and 8/11/16 Soil Gas Risk and Hazard Calculation Summary

Table 4 - Summary of Soil Gas Model Sensitivity Analysis

Figure 1 - Site Location Map

Figure 2 - Site Plan Showing Air Sample Collection Locations - First Floor

Figure 3 - Site Plan Showing Air Sample Collection Locations - Second Floor

Figure 4 - Site Plan Showing Air Sample Collection Locations - Third Floor

Figure 5 - Site Plan Showing 12/2/15 PCE Concentrations in Shallow Soil Gas

Figure 6 - Site Plan Showing 12/2/15 PCE Concentrations in Deep Soil Gas

Figure 7 - Site Plan Showing 8/10/16 and 8/11/16 PCE Concentrations in Shallow Soil Gas

Figure 8 - Site Plan Showing 8/10/16 and 8/11/16 PCE Concentrations in Deep Soil Gas

Figure 9 - Typical Soil Gas Sampling Manifold

Appendix A - Air Sampling Data Sheet

Appendix B - Purge Volume Calculations and Soil Gas Sampling Data Sheets

Appendix C - SVE System Monitoring Data

Appendix D - Weather Information

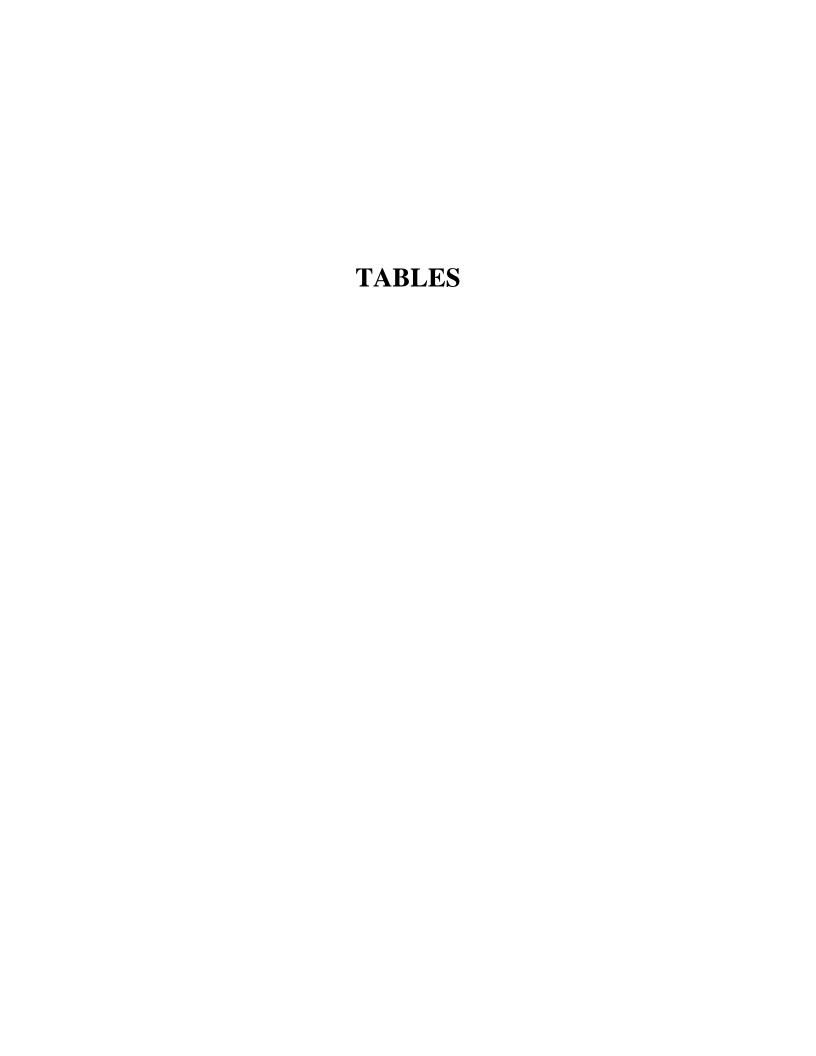
Appendix E - Laboratory Analytical Reports and Chain of Custody Documentation

Appendix F - DTSC December 2014 Vapor Intrusion Risk and Hazard Calculation Work Sheets

Appendix G - Soil Gas Model Sensitivity Analysis Risk and Hazard Calculation Work Sheets

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Table 1

Summary of Indoor and Ambient Air Sample Laboratory Analytical Results

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Sample Location/ID	Sample Date	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	Carbon Tetrachloride	Chloroform	Chloromethane	Dichlorodifluoromethane (Freon 12)	1,2-DCA	PCE	TCE	cis-1,2-DCE tra	ans-1,2-DCE	Vinyl Chloride
IA-1	5/29/2015	0.62	1.6	0.31	0.87	0.29	0.50	0.32	1.3	2.5	ND<0.13	3.5	ND<0.17	ND<0.12	ND<0.63	ND<0.040
IA1	7/14/2016	0.32	1.1	0.15	0.44	0.16	0.49	0.66	1.4	2.9	ND<0.13	1.1	0.99	ND<0.13	ND<0.63	ND<0.041
IA-2	5/29/2015	0.61	1.7	0.37	1.2	0.46	0.54	0.34	1.2	2.6	ND<0.13	3.3	ND<0.17	ND<0.12	ND<0.62	ND<0.040
IA2 (1st Floor)	8/6/2015	0.38	1.2	0.22	0.67	0.23	0.54, a	0.28	0.89	2.1	ND<0.13	4.2	0.40	ND<0.13	ND<0.64	ND<0.041
IA2	7/14/2016	0.32	1.1	0.15	0.46	0.16	0.50	0.63	1.1	2.8	ND<0.14	1.3	0.97	ND<0.13	ND<0.67	ND<0.043
IA-4*	5/29/2015	0.43	1.9	0.30	0.87	0.34	0.51	3.3	1.6	2.7	0.25	4.0	8.8	ND<0.13	ND<0.63	ND<0.041
IA4 (2nd Floor)	8/6/2015	0.42	2.4	0.41	1.0	0.46	0.52, a	5.4	1.0	2.2	0.24	3.6	8.1	ND<0.12	ND<0.63	ND<0.040
IA4 (Hallway)	8/13/2015	0.28	1.6	6.8	6.0	1.7	0.41	3.8	0.82	1.7	0.32	3.7	5.6	ND<0.10	ND<0.53	ND<0.034
IA4 (Hallway)	9/4/2015	0.432	3.19	1.24	2.07	0.765	0.634	4.17	1.12	2.82	0.365	7.15	8.09	ND<0.0397	ND<0.0396	ND<0.0256
IA4 Hallway	10/13/2015	ND<0.28	0.52	ND<0.15	0.33	ND<0.15	ND<0.22	0.70	1.1	2.4	ND<0.27	0.24	0.34	ND<0.14	ND<0.69	ND<0.045
IA4	7/14/2016	ND<0.27	0.44	ND<0.14	ND<0.29	ND<0.14	0.46	2.6	1.2	2.8	0.17	ND<0.23	1.7	ND<0.13	ND<0.67	ND<0.043
IA-5*	5/29/2015	0.40	1.6	0.25	0.74	0.35	0.48	3.2	1.5	2.8	0.14	4.1	6.6	ND<0.12	ND<0.63	ND<0.040
IA5 Men's Room (3rd Floor)	8/6/2015	0.43	2.6	0.47	1.1	0.42	0.42, a	6.6	1.1	2.1	0.20	4.7	6.5	ND<0.13	ND<0.63	ND<0.041
IA5 (Men's Room)	8/13/2015	0.44	2.7	4.1	3.9	1.1	0.69	7.6	1.4	2.3	0.25	5.5	8.1	ND<0.13	ND<0.66	ND<0.042
IA5 Men's Room (3rd Floor)	9/4/2015	0.462	2.88	0.871	1.64	0.568	0.542	6.72	1.15	2.60	0.234	8.01	8.98	ND<0.0397	ND<0.0396	ND<0.0256
IA5 Men's Room (3rd Floor)	10/13/2015	0.32	1.1	0.24	0.67	0.26	ND<0.22	2.0	1.2	2.3	ND<0.14	0.80	0.27	ND<0.14	ND<0.69	ND<0.045
IA5 Men's Room (3rd Floor)	10/21/2015	0.32	1.0	0.23	0.57	0.24	ND<0.22	1.8	1.0	2.2	ND<0.14	0.88	0.33	ND<0.14	ND<0.70	ND<0.045

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Table 1

Summary of Indoor and Ambient Air Sample Laboratory Analytical Results

Sample Location/ID	Sample Date	Benzene	Toluene	Ethylbenzene			Carbon	Chloroform	Chloromethane	Dichlorodifluoromethane	1,2-DCA	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	
IA5	7/14/2016	ND<0.27	1.2	ND<0.15	ND<0.29	ND<0.15	Tetrachloride 0.28	6.9	1.2	(Freon 12) 2.9	0.14	0.51	1.6	ND<0.13	ND<0.67	Chloride ND<0.043
INS	7/14/2010	110 < 0.27	1.2	110 < 0.13	110 (0.2)	110 < 0.15	0.20	0.7	1.2	2.7	0.14	0.51	1.0	110 < 0.15	11D <0.07	110 <0.043
IA5-DUP	7/14/2016	ND<0.27	0.67	ND<0.15	ND<0.30	ND<0.15	0.34	6.7	1.2	2.7	ND<0.14	0.49	1.6	ND<0.14	ND<0.68	ND<0.044
Elevator Pit	8/6/2015	0.50	1.4	0.24	0.79	0.29	0.55, a	0.98	0.89	2.0	ND<0.11	43	1.3	ND<0.11	ND<0.55	ND<0.036
Elevator Pit	10/21/2015	1.2	3.7	0.68	2.3	0.86	0.44	2.4	3.1	2.2	ND<0.13	44	3.4	ND<0.13	ND<0.64	ND<0.041
							77.1									
Elevator Pit	7/14/2016	0.31	1.1	0.15	0.46	0.16	0.50	2.1	1.1	2.8	ND<0.12	0.82	2.5	ND<0.11	ND<0.57	ND<0.036
200	# 100 100 4 #	0.55		0.04	0.00	0.10	0.54	NTD 0.45		2.5	NID 0 40		NTD 0.45	NTD 0.42	NTD 0 40	NTD 0.040
BG-2	5/29/2015	0.66	1.4	0.26	0.99	0.43	0.51	ND<0.15	1.3	2.5	ND<0.13	ND<0.21	ND<0.17	ND<0.12	ND<0.62	ND<0.040
BG-2 Ambient	8/6/2015	0.30	1.5	0.19	0.59	0.22	0.48, a	ND<0.15	0.91	2.3	ND<0.12	ND<0.21	ND<0.17	ND<0.12	ND<0.61	ND<0.040
BG-2 Ambient	8/13/2015	ND<0.25	0.68	0.14	0.37	0.21	0.60	ND<0.15	1.1	2.5	ND<0.13	ND<0.21	ND<0.17	ND<0.12	ND<0.62	ND<0.040
DCO A 11	0/4/2015	0.210	1.74	0.220	0.848	0.210	0.653	NID 0 0 400	1.22	2.01	0.0506	0.212	NID 0.0525	NID 0.0207	NID 0.020 C	NTD 0.0256
BG2 Ambient	9/4/2015	0.319	1.54	0.229	0.848	0.319	0.053	ND<0.0488	1.22	2.91	0.0596	0.213	ND<0.0537	ND<0.0397	ND<0.0396	ND<0.0256
BG2 Ambient	10/13/2015	0.98	3.0	0.59	2.0	0.72	0.39	0.27	1.1	2.3	ND<0.12	ND<0.20	ND<0.16	ND<0.12	ND<0.59	ND<0.038
BG2 Ambient	10/21/2015	0.77	2.1	0.42	1.4	0.51	0.36	0.22	1.1	2.3	ND<0.13	ND<0.21	ND<0.17	ND<0.12	ND<0.62	ND<0.040
BG2 Ambient	7/14/2016	0.30	1.0	0.14	0.43	0.15	0.53	0.17	1.2	2.8	ND <0.12	ND<0.21	ND<0.16	ND<0.12	ND<0.60	ND<0.039
BO2 Ambient	//14/2010	0.30	1.0	0.14	0.43	0.13	0.33	0.17	1.2	2.0	ND<0.12	ND<0.21	ND<0.10	ND<0.12	ND<0.00	ND<0.039
ESL		0.42	1,300	4.9	440 Co	mbined	0.29	0.53	390	No Value	0.47	2.1	3.0	35	350	0.16
NOTES:																
1,2-DCA = 1,2-Dichloroethane																
PCE = Tetrachloroethene																
TCE = Trichloroethene																
cis-1,2-DCE = cis-1,2-Dichloroe																
trans-1,2-DCE = trans-1,2-Dichl	oroethene															
ND = Not Detected.																
a = Laboratory note: Estimated v																
* = Results reported in revised la																
ESL = Environmental Screening			y Regional	Water Quality C	Control Board,	Jpdated Februa	ary 2016 (Revisio	on 3), from Tab	le IA-1 - Indoor Ai	r Direct Exposure Human Hea	Ith Screenii	ng Levels. (	Commercial/I	ndustrial Land	Use.	
Results in BOLD exceed their																
Results and ESLs in micrograms	per cubic meter	r (ug/m̃), unl	less otherw	ise noted.												

Sample ID	Sample	Sand Pack	Probe Depth	Benzene	Toluene	Ethyl-	m,p-Xylenes	mmary of Soil Ga o-Xylenes	PCE	TCE	cis-1.2-DCF	trans-1,2-DCE	Vinyl	Other VOCs by EPA TO-15	1,1-Difluoroethane	Percent
Sample 1D	Date	Interval (Feet bgs)	(Feet bgs)	Benzene	Tolucie	benzene	m,p-Ayienes	0-Ayiches	TCE	ICE	CIS-1,2-DCE	trans-1,2-DCE	Chloride	Ollici Voes by Er A 10-15	1,1-Billuoroctilane	Shroud
SG1-7	12/2/2015	5.0 to 7.0	6.0	10	11	ND<10	ND<10	ND<10	5,800	ND<13	ND<9.6	ND<9.6	ND<6.2	ND, except	1,800	0
561 /	12/2/2010	5.0 to 7.0	0.0	10		112 (10	112 (10	112 (10	24000	110 (10	112 ()10	112 ().0	110 (0.2	Carbon Disulfide = 54	1,000	0
SG1-7	8/10/2016	5.0 to 7.0	6.0	ND<39	ND<46	ND<53	ND<53	ND<53	1,000	ND<65	ND<48	ND<48	ND<31	All ND	140	0
SG2-7	12/2/2015	5.0 to 7.0	6.0	ND<81	ND<95	ND<110	ND<110	ND<110	59,000	ND<140	ND<100	ND<100	ND<65	All ND	3,100	0
SG2-7	8/10/2016	5.0 to 7.0	6.0	ND<41	ND<48	ND<55	ND<55	ND<55	15,000	ND<68	ND<50	ND<50	ND<32	All ND	4,200	0
SG2-17	12/2/2015	15.0 to 17.0	16.0	ND<480	ND<570	ND<660	ND<660	ND<660	120,000	ND<810	ND<600	ND<600	ND<380	All ND	4,200	0
SG2-17	8/10/2016	15.0 to 17.0	16.0	ND<41	ND<48	ND<55	ND<55	ND<55	39,000	ND<68	ND<50	ND<50	ND<32	ND, except	480	0
														Chloroform = <b>74</b> , Tetrahydrofuran = <b>59</b>		
SG3-17	12/2/2015	15.0 to 17.0	16.0	130	ND<90	ND<100	ND<100	ND<100	62,000	ND<130	ND<95	ND<95	ND<61	ND, except	520	0
														Cyclohexane = 110		
SG3-17	8/10/2016	15.0 to 17.0	16.0	ND<39	ND<46	ND<52	ND<52	ND<52	10,000	ND<65	ND<48	ND<48	ND<31	All ND	ND<130	0
SG4-7	12/2/2015	5.0 to 7.0	6.0	ND<15	ND<18	ND<20	ND<20	ND<20	3,700	ND<25	ND<18	ND<18	ND<12	All ND	100,000, a	2.5
SG4-7	8/10/2016	5.0 to 7.0	6.0	ND<39	ND<46	ND<53	ND<53	ND<53	ND<82	ND<65	ND<48	ND<48	ND<31	All ND	1,700	0
SG4-7 DUP	12/2/2015	5.0 to 7.0	6.0	ND<7.4	ND<8.8	ND<10	ND<10	ND<10	3,700	ND<12	ND<9.2	ND<9.2	ND<5.9	All ND	6,400, a	0
SG4-7 DUP	8/10/2016	5.0 to 7.0	6.0	ND<39	ND<46	ND<54	ND<54	ND<54	83	ND<66	ND<49	ND<49	ND<32	All ND	44,000, a	0
SG4-17	8/10/2016	15.0 to 17.0	16.0	ND<38	ND<45	ND<52	ND<52	ND<52	9,800	ND<64	ND<48	ND<48	ND<31	All ND	180	0
SG5-7	12/2/2015	5.0 to 7.0	6.0	ND<38	ND<45	ND<52	ND<52	ND<52	23,000	ND<64	ND<48	ND<48	ND<31	All ND	600	0
SG5-7	8/10/2016	5.0 to 7.0	6.0	ND<37	ND<44	ND<50	ND<50	ND<50	<u>5,500</u>	ND<62	ND<46	ND<46	ND<30	All ND	3,200	0
SG5-17	12/2/2015	15.0 to 17.0	16.0	56	54	ND<26	ND<26	ND<26	15,000	ND<32	ND<24	ND<24	ND<15	ND, except	570	0
														Carbon Disulfide = 140		
SG5-17	8/10/2016	15.0 to 17.0	16.0	ND<990	ND<1,200	ND<1,300	ND<1,300	ND<1,300	2,400	ND<1,700	ND<1,200	ND<1,200	ND<790	All ND	840,000, a	6.5
SG6-7	12/2/2015	5.0 to 7.0	6.0	ND<220	ND<260	ND<310	ND<310	ND<310	61,000	ND<380	ND<280	ND<280	ND<180	All ND	2,000	0
SG6-7	8/10/2016	5.0 to 7.0	6.0	ND<41	ND<49	ND<56	ND<56	ND<56	8,400	ND<69	ND<51	ND<51	ND<33	All ND	660	0
SG6-17	12/2/2015	15.0 to 17.0	16.0	140	170	ND<90	ND<90	ND<90	41,000	ND<110	ND<82	ND<82	ND<53	ND, except	540	0
														Hexane = 89		
SG6-17	8/10/2016	15.0 to 17.0	16.0	ND<41	ND<49	ND<56	ND<56	ND<56	<u>8,600</u>	ND<69	ND<51	ND<51	ND<33	All ND	300	0
SG7-7	12/2/2015	5.0 to 7.0	6.0	ND<14	ND<16	ND<18	ND<18	ND<18	7,000	ND<23	ND<17	ND<17	ND<11	All ND	1,500	0
SG7-7	8/10/2016	5.0 to 7.0	6.0	ND<38	ND<45	ND<52	ND<52	ND<52	ND<81	ND<64	ND<47	ND<47	ND<30	ND, except	260	0
			4 - 0				1 May 1 - 0							Tetrahydrofuran = 70		
SG7-17	12/2/2015	15.0 to 17.0	16.0	ND<120	ND<140	ND<160	ND<160	ND<160	37,000	ND<200	ND<140	ND<140	ND<94	All ND	ND<400	0
SG7-17	8/10/2016	15.0 to 17.0	16.0	ND<39	ND<46	ND<53	ND<53	ND<53	<u>5,700</u>	ND<66	ND<48	ND<48	ND<31	All ND	ND<130	0
SG8-7	12/2/2015	5.0 to 7.0	6.0	13	ND<4.5	ND<5.2	ND<5.2	ND<5.2	850	ND<6.4	ND<4.7	ND<4.7	ND<3.0	All ND	210	0
SG8-7	8/10/2016	5.0 to 7.0	6.0	ND<36	ND<42	ND<49	ND<49	ND<49	110	ND<60	ND<45	ND<45	ND<29	All ND	330	0
SG9-17	12/2/2015	15.0 to 17.0	16.0	42	30	ND<18	ND<18	ND<18	4,000	ND<23	ND<17	ND<17	ND<11	ND, except Chloroform = 46,	66,000, a	0
														Carbon Disulfide = 170,		
														Hexane = 29		
SG9-17	8/11/2016	15.0 to 17.0	16.0	ND<40	ND<47	75	370	110	860	ND<67	ND<50	ND<50	ND<32	All ND	41,000, a	0
SG9-17 DUP	12/2/2015	15.0 to 17.0	16.0	44	34	ND<21	ND<21	ND<21	4,600	ND<26	ND<18	ND<18	ND<12	ND, except	9,200, a	0
														Chloroform = 54, Carbon Disulfide = 190,		
														Hexane = 39	+	
SG9-17 DUP	8/11/2016	15.0 to 17.0	16.0	ND<40	ND<47	56	370	92	930	ND<68	ND<50	ND<50	ND<32	All ND	8,600, a	0
SG10-7	12/2/2015	5.0 to 7.0	6.0	ND<72	ND<85	ND<98	ND<98	ND<98	1,100	ND<120	ND<90	ND<90	ND<58	All ND	680,000, a	8.7
SG10-7	8/11/2016	5.0 to 7.0	6.0	ND<42	ND<50	ND<57	ND<57	ND<57	ND<90	ND<71	ND<52	ND<52	ND<34	All ND	320	0
SG11-17	8/10/2016	15.0 to 17.0	16.0	ND<750	ND<1,200	ND<1,000	ND<1,000	ND<1,000	34,000	ND<1,200	ND<930	ND<930	ND<600	All ND	470,000	4.9
											<u> </u>					

Report 0461.R6 Table 2A
Summary of Soil Gas Sample Analytical Results

							Bui	initially of bon ou	s Sample Analytic	ui recounts						
Sample ID	Sample Date	Sand Pack Interval (Feet bgs)	Probe Depth (Feet bgs)	Benzene	Toluene	Ethyl- benzene	m,p-Xylenes	o-Xylenes	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	Other VOCs by EPA TO-15	1,1-Difluoroethane	Percent Shroud
ESL <sup>1</sup>				48	160,000	560	Combined	l = 52,000	240	240	4,200	42,000	4.7	Chloroform = 61,	No Value	No Value
														$Carbon\ Disulfide = No\ Value,$		
														Cyclohexane = No Value,		
														$Hexane = No\ Value,$		
														$Tetrahydrofuran = No\ Value,$		
ESL <sup>2</sup>				420	1,300,000	4,900	Combined	= 440,000	2,100	3,000	35,000	350,000	160	Chloroform = 530,	No Value	No Value
														Carbon Disulfide = No Value,		
														Cyclohexane = No Value,		
														$Hexane = No\ Value,$		
														$Tetrahydrofuran = No\ Value,$		
Notes:																
Feet bgs = Feet Below	Ground Sur	face														
PCE = Tetrachloroeth		racc.	+													
TCE = Trichloroether																
cis-1.2-TCE = cis-1.2	-Dichloroethe	ene.														
trans-1,2-TCE = trans	-1,2-Dichloro	ethene.														
DFA = 1,1-Difluoroet	thane. (tracer	gas)														
ND = Not Detected.																
a = Laboratory Note:	exceeds instru	ument calibratio	on range.													
Percent Shroud = The	ratio of trace	r gas concentra	tion detected in th	ne soil gas sam	ple to the tracer	gas concentra	tion detected in the	e shroud air samp	e, expressed as a	percentage.						
ESL <sup>1</sup> = Environmenta	1 Screening L	evel, by San Fr	ancisco Bay – Re	gional Water (	Quality Control I	Board, update	d February 2016 (	Revision 3), from	Table SG-1 - Sul	oslab/Soil Gas	Vapor Intrusion	Human Health Sc	reening Level	s. Residential Land Use.		
ESL1 = Environmenta	1 Screening L	evel, by San Fr	ancisco Bay - Re	gional Water (	Quality Control I	Board, update	d February 2016 (	Revision 3), from	Table SG-1 - Sul	oslab/Soil Gas	Vapor Intrusion	Human Health Sc	reening Level	s. Commercial/Industrial Land Use.		
Values in bold excee	d their respe	ctive ESL <sup>1</sup> valu	ies.			_										
Underlined values exc	ceed their resp	pective ESL <sup>2</sup> val	ues.													
Results in micrograms	s per cubic m	eter (µg/m3), u	nless otherwise in	ndicated												

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Sample ID	Sample Date	DFA,#									
SG1-7	8/10/2016	9,000,000									
SG2-7	8/10/2016	6,400,000									
SG2-17	8/10/2016	16,000,000									
SG3-17	8/10/2016	31,000,000									
SG4-7	8/10/2016	18,000,000									
SG4-17	8/10/2016	16,000,000									
SG5-7	8/10/2016	9,400,000									
SG5-17	8/10/2016	13,000,000									
SG6-7	8/10/2016	7,700,000									
SG6-17	8/10/2016	9,700,000									
SG7-7	8/10/2016	7,700,000									
SG7-17	8/10/2016	12,000,000									
SG8-7	8/10/2016	7,600,000									
SG9-17	8/11/2016	6,500,000									
SG10-7	8/11/2016	7,700,000									
SG11-17	8/10/2016	9,600,000									
Notes:											
ND = Not Detected.											
	# = 1,1-Difluoroethane (DFA) used as leak detection compound										
for TO-15 analysis.											
Results in micrograms per cubic meter (µg/m³),											
unless otherwise indicate	ed.										

		8/10/16 ar	nd 8/11/16 Soil Gas R				<del></del>
				Incremental	Hazard		
				risk from	quotient		
				vapor	from vapor		
Commis				intrusion to	intrusion to		
Sample		Land	Componentian	indoor air,	indoor air,		
Location		Land	Concentration	carcinogen	noncarcinogen	Nompa	
and Depth (Feet)	Chemical	Use	$(\mu g/m^3)$	(unitless)	(unitless)	NOTES	CAS#
			Samples Collected	August 10 and 11, 20	16		
			Samples Collected A	August 10 and 11, 20	16		
<u>SG1-7</u>	PCE	RESIDENTIAL	1,000	1.3E-06	1.7E-02		127184
6.0							
			TOTALS	1.3E-06	1.7E-02		
~~-							
<u>SG2-7</u>	PCE	RESIDENTIAL	15,000	2.0E-05	2.6E-01		127184
6.0			TOTAL C	2.05.05	2 (F 01		
			TOTALS	2.0E-05	2.6E-01		
SG2-17	PCE	RESIDENTIAL	39,000	2.2E-05	2.9E-01		127184
16.0	Chloroform	KEDIDENTIAL	74	2.4E-07	2.8E-04		67663
10.0	Tetrahydrofuran		59	NA	1.3E-05		109999
	- camparorum		3,	11/1	2.51.00		10,,,,,
			TOTALS	2.2E-05	2.9E-01		+
			1011110				
		H					
SG3-17	PCE	RESIDENTIAL	10,000	5.7E-06	7.4E-02		127184
16.0			Í				
			TOTALS	5.7E-06	7.4E-02		
SG4-7 DUP	PCE	RESIDENTIAL	83	1.1E-07	1.4E-03		127184
6.0							
			TOTALS	1.1E-07	1.4E-03		
SG4-17	PCE	RESIDENTIAL	9,800	5.5E-06	7.2E-02		127184
16.0							
			TOTALS	5.5E-06	7.2E-02		
005.7	DCE	DECIDENTIAL	5.500	7.25.06	0.50.02		127104
<u>SG5-7</u>	PCE	RESIDENTIAL	5,500	7.3E-06	9.5E-02		127184
6.0			TOTALS	7.3E-06	9.5E-02		
			TOTALS	7.3E-00	9.5E-02		_
							_
SG5-17	PCE	RESIDENTIAL	2,400	1.4E-06	1.8E-02		127184
16.0	102	TELOID EL TITLE	2,400	11.12.00	1.02.02		12,101
10.0			TOTALS	1.4E-06	1.8E-02		_
			TOTALS	1112 00	1102.02		_
SG6-7	PCE	Commercial	8,400	1.3E-06	1.7E-02		127184
6.0			,				
			TOTALS	1.3E-06	1.7E-02		
SG6-17	PCE	Commercial	8,600	5.6E-07	7.6E-03		127184
16.0							
			TOTALS	5.6E-07	7.6E-03		
96	m · 1 1 *	g ::			0.07.6		
<u>SG7-7</u>	Tetrahydrofuran	Commercial	70	NA	3.9E-06		109999
6.0			TOTAL	0.077.00	2.017.04		
			TOTALS	0.0E+00	3.9E-06		-
SG7-17	PCE	Commercial	5,700	3.7E-07	5.0E-03		127184
16.0	I CE	Commercial	3,700	3.1E-01	3.0E-03		12/104
10.0			TOTALS	3.7E-07	5.0E-03		-
			IJIALS	3.72.07	5.01.05		_
							-
SG8-7	PCE	Commercial	110	1.7E-08	2.3E-04		127184
6.0				11-11-11	1.2.2.		1.22
			TOTALS	1.7E-08	2.3E-04		
		H					
		1.1			1	L	

Report 0461.R6 Table 3A 8/10/16 and 8/11/16 Soil Gas Risk and Hazard Calculation Results

	,	8/10/10 a	ind 8/11/16 Soil Gas Ri				
				Incremental	Hazard		
				risk from	quotient		
				vapor	from vapor		
				intrusion to	intrusion to		
Sample				indoor air,	indoor air,		
Location		Land	Concentration	carcinogen	noncarcinogen		
and Depth (Feet)	Chemical	Use	$(\mu g/m^3)$	(unitless)	(unitless)	NOTES	CAS#
			Samples Collected A	August 10 and 11, 201	.6		1
SG9-17	Ethylbenzene	Commercial	75	2.7E-09	3.0E-06		100414
16.0	m,p-Xylene		370	NA	1.5E-04	used p-Xylene CAS number	106423
	o-Xylene		110	NA	4.4E-05		95476
	PCE		860	5.6E-08	7.6E-04		127184
			TOTALS	5.9E-08	9.6E-04		
			TOTALS	3.5E-00	9.0E-04		
SG9-17 DUP	Ethylbenzene	Commercial	56	2.0E-09	2.2E-06		100414
16.0	m,p-Xylene		370	NA	1.5E-04	used p-Xylene CAS number	106423
	o-Xylene		92	NA	3.7E-05	1 2	95476
	PCE		930	6.0E-08	8.2E-04		127184
			TOTALS	6.2E-08	1.0E-03		
			TOTALS	0.215-00	1.012-03		
SG11-17	PCE	Commercial	34,000	2.2E-06	3.0E-02		127184
16.0							
			TOTALS	2.2E-06	3.0E-02		
IOTES							
CE = Tetrachloroeth							1
	SG2-7, SG4-7, and SG5						
						commercial exposure with a	
						lt values were used for a	
						SG9-17 spreadsheet default values	
ere used for a comm	nercial exposure with a v	adose zone soil type SI	, and a sample depth of	f 16.0 feet (487.68 cr	n).		

### 12/2/15, 8/10/16 and 8/11/16 Soil Gas Risk and Hazard Calculation Results Summary

i .		1		12/2/15, 5/10/10 &	nd 8/11/16 Soil Gas Risk and Haza	uncummon Nes	•
		<del>                                     </del>	Color-1-4-3	Color-1-4-3	Color-4-4		Recommendations Based on
	Comple	<del>                                     </del>	Calculated Cumulative Incremental	Calculated Cumulative Incremental	Calculated Cumulative Incremental	Calculated	DTSC-Recommended Guidance for Action or Response
Soil Gas Sample	Sample Collection	Land	Carcinogenic	Carcinogenic Risk	Carcinogenic Risk	Hazard	(Minimum of Two Adequately-Spaced (With Respect
Designation	Date	Use	Risk	Alternate Description	Alternate Description	Index	To Time) Soil Gas Sampling Events Needed)
Designation	Date	Cac	Hor	Atternate Description	Anternate Description	muca	10 Time) Son Gas Samping Decits (ected)
SG1-7	8/10/2016	Residential	1.30E-06	0.0000013	1.3 in a million	0.017	Evaluate need for action- risk greater than 1 in a million.
SG1-7	12/2/2015	Residential	7.80E-06	0.0000078	7.8 in a million	0.1	Evaluate need for action- risk greater than 1 in a million.
5017	12/2/2013	reordenda	7.002 00	0.0000070	7.0 III ti IIIIIIOII	0.1	Diameter need 151 dection 1 to a greater than 1 in a minion
SG2-7	8/10/2016	Residential	2.00E-05	0.000020	20 in a million	0.26	Evaluate need for action- risk greater than 1 in a million.
SG2-7	12/2/2015	Residential	7.80E-05	0.0000780	78 in a million	1	Evaluate need for action- risk greater than 1 in a million and hazard greater than 1.
SG2-17	8/10/2016	Residential	2.20E-05	0.000022	22 in a million	0.29	Evaluate need for action- risk greater than 1 in a million.
SG2-17	12/2/2015	Residential	6.80E-05	0.0000680	68 in a million	0.89	Evaluate need for action- risk greater than 1 in a million.
SG3-17	8/10/2016	Residential	5.70E-06	0.000057	5.7 in a million	0.074	Evaluate need for action- risk greater than 1 in a million.
SG3-17	12/2/2015	Residential	3.60E-05	0.0000360	36 in a million	0.48	Evaluate need for action- risk greater than 1 in a million.
SG4-7	8/10/2016	Residential	0.00E+00	0.00	0 in a million	0.00	No further action.
SG4-7	12/2/2015	Residential	4.90E-06	0.0000049	4.9 in a million	0.064	Evaluate need for action- risk greater than 1 in a million.
CC4 7 DID	0/10/2016	D 11 11	1 105 07	0.00000011	0.11.	0.0014	N. C. a. a.
SG4-7 DUP SG4-7 DUP	8/10/2016 12/2/2015	Residential Residential	1.10E-07 4.90E-06	0.0000011 0.0000049	0.11 in a million 4.9 in a million	0.0014 0.064	No further action.
3G4-/ DUP	12/2/2015	Kesidential	4.90E-06	0.000049	4.9 in a million	0.064	Evaluate need for action- risk greater than 1 in a million.
SG4-17	8/10/2016	Residential	5.50E-06	0.0000055	5.5 in a million	0.072	Evaluate need for action- risk greater than 1 in a million.
304-17	8/10/2010	Residential	J.JUE-00	0.0000033	5.5 iii a iiiiiiioii	0.072	Evaluate need for action- risk greater than 1 in a minion.
SG5-7	8/10/2016	Residential	7.30E-06	0.0000073	7.3 in a million	0.095	Evaluate need for action- risk greater than 1 in a million.
SG5-7	12/2/2015	Residential	3.10E-05	0.000073	31 in a million	0.4	Evaluate need for action-risk greater than 1 in a million.
5057	12/2/2013	reordenda	3.102 03	0.0000310	31 m u mmon	0.1	Endure need to detain 1 mg greater than 1 mg minion.
SG5-17	8/10/2016	Residential	1.40E-06	0.000014	1.4 in a million	0.018	Evaluate need for action- risk greater than 1 in a million.
SG5-17	12/2/2015	Residential	8.80E-06	0.0000088	8.8 in a million	0.12	Evaluate need for action- risk greater than 1 in a million.
SG6-7	8/10/2016	Commercial	1.30E-06	0.0000013	1.3 in a million	0.017	Evaluate need for action- risk greater than 1 in a million.
SG6-7	12/2/2015	Commercial	9.30E-06	0.0000093	9.3 in a million	0.13	Evaluate need for action- risk greater than 1 in a million.
SG6-17	8/10/2016	Commercial	5.60E-07	0.00000056	0.56 in a million	0.0076	No further action.
SG6-17	12/2/2015	Commercial	2.80E-06	0.0000028	2.8 in a million	0.038	Evaluate need for action- risk greater than 1 in a million.
SG7-7	8/10/2016	Commercial	0.00E+00	0.00	0 in a million	0.00	No further action.
SG7-7	12/2/2015	Commercial	1.10E-06	0.0000011	1.1 in a million	0.014	Evaluate need for action- risk greater than 1 in a million.
0.05 45	0.40.004.4		9 507 05	0.000000	0.05	0.00#	
SG7-17	8/10/2016	Commercial	3.70E-07 2.40E-06	0.0000037 0.000024	0.37 in a million	0.005 0.033	No further action.
SG7-17	12/2/2015	Commercial	2.40E-06	0.0000024	2.4 in a million	0.033	Evaluate need for action- risk greater than 1 in a million.
SG8-7	8/10/2016	Commercial	1.70E-08	0.00000017	0.017 in a million	0.00023	No further action.
SG8-7	12/2/2015	Commercial	1.40E-07	0.00000017	0.14 in a million	0.0023	No further action.
500-7	12/2/2013	Commercial	1.402-07	0.0000001	0.14 iii a iiiiiioii	0.0025	TWO TARREST BELLOTS.
SG9-17	8/11/2016	Commercial	5.90E-08	0.000000059	0.059 in a million	0.00096	No further action.
SG9-17	12/2/2015	Commercial	3.00E-07	0.0000003	0.30 in a million	0.0042	No further action.
SG9-17 DUP	8/11/2016	Commercial	6.20E-08	0.00000062	0.062 in a million	0.00100	No further action.
SG9-17 DUP	12/2/2015	Commercial	3.40E-07	0.0000003	0.34 in a million	0.0048	No further action.
SG10-7	8/11/2016	Commercial	0.00E+00	0.00	0 in a million	0.00	No further action.
SG10-7	12/2/2015	Commercial	1.70E-07	0.00000017	0.17 in a million	0.0023	No further action.
SG11-17	8/10/2016	Commercial	2.20E-06	0.0000022	2.2 in a million	0.003	Evaluate need for action- risk greater than 1 in a million.
							<u> </u>
NY .		-					
Notes: RISK MANAGEMENT MA	ATDIV FOR T	A DOD INTERIOR	OM.				
				Activities			
Risk	<u>Hazard</u>	-	Response	Activities			
Less than 1 in a million	x ≤ 1.0	<del>                                     </del>	No Further Action	None			
Less man 1 m à million	A <u>&gt; 1.0</u>		110 I di dici Acubii	TORC			
1 to 100 in a million	x ≥ 1.0	<b> </b>	Evaluate Need	Possible Actions			
1 to 100 iii a iiiiiioii	<u>~ _ 1.0</u>		for Action	o Additional Data Collection			
				o Monitoring			
				o Additional Risk Characterization	on		
				o Mitigation			
				o Source Remediation			
More than 100 in a million			Response	o Vapor Intrusion Mitigation			
			Action Needed	o Source Remediation			

Table 4 Summary of Soil Gas Model Sensitivity Analysis

DTSC V			el (December 2		
DISC V	ipor mirasion	Joh Gas Mod	CI (December 2	Incremental	Hazard
				risk from	quotient
				vapor	from vapor
				intrusion to	intrusion to
				indoor air,	indoor air,
		Concentration	Sample Result	carcinogen	noncarcinogen
Chemical		(ug/m <sup>3</sup> )	Location	(unitless)	(unitless)
Scenario 1		hest Concentrat	ion with Residen	tial Model Def	<b>Sault Values Except for</b>
	Soil Type = SI.				
PCE		120,000	SG2-17	1.8E-04	2.4E+00
g . a	0 11		•		
	= Scenario 1 va		age soil tempera		
PCE		120,000	SG2-17	1.8E-04	2.4E+00
Scanaria 2	= Scenario 1 val	luge except soil 4	yna is CI		
PCE	- Scenario i Val	120,000	SG2-17	1.4E-04	1.9E+00
ICL		120,000	502-17	1.4L-04	1.7L±00
Scenario 4	= Scenario 1 val	lues except soil 1	vne is S.		
PCE	Section 1 va	120,000	SG2-17	2.6E-04	3.4E+00
		.,			
Scenario 5	= Scenario 1 val	lues except Q <sub>soil</sub>	1 Liter per minu	ite.	
PCE		120,000	SG2-17	8.4E-05	1.1E+00
Scenario 6	= Scenario 1 va	lues except Q <sub>soil</sub>	100 Liters per m	inute.	
PCE		120,000	SG2-17	2.6E-04	3.4E+00
Scenario 7	= Scenario 1 va	lues except soil g	gas sampling dep	th is 182.88 cn	n (6.0 ft).
PCE		120,000	SG2-17	1.6E-04	2.1E+00
	= Scenario 1 val		gas sampling dep		
PCE		120,000	SG2-17	6.8E-05	8.9E-01
G . A	g	l A POP	1 1:	12.000 / 2	
	= Scenario I va		concentration =		
PCE		12,000	None	1.8E-05	2.4E-01
Scanaria 1	0 – Sconorio 1 v	luce except DC	E concentration	_ 1 200 000 na	/m3
PCE	U – SCEHALIU I V	12,000,000	None	2.6E-03	3.4E+01
LCE		12,000,000	None	2.0E-03	J. <del>1</del> LT01
Notes					
	achloroethene.				

# **FIGURES**

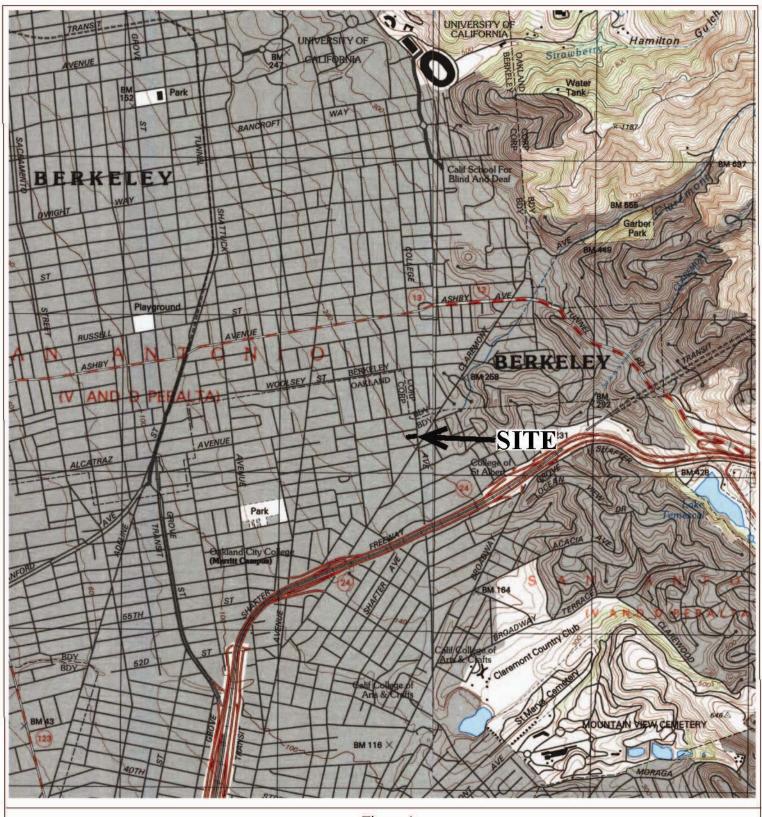
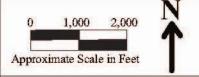


Figure 1 Site Location Map Red Hanger Kleaners 6239 College Avenue Oakland, California

Base Map From: U.S. Geologic Survey 7.5 Minute Quadrangles Oakland East, and Oakland West, both maps edited 1996.

P&D Environmental, Inc. 55 Santa Clara Avenue, Suite 240 Oakland CA 94610



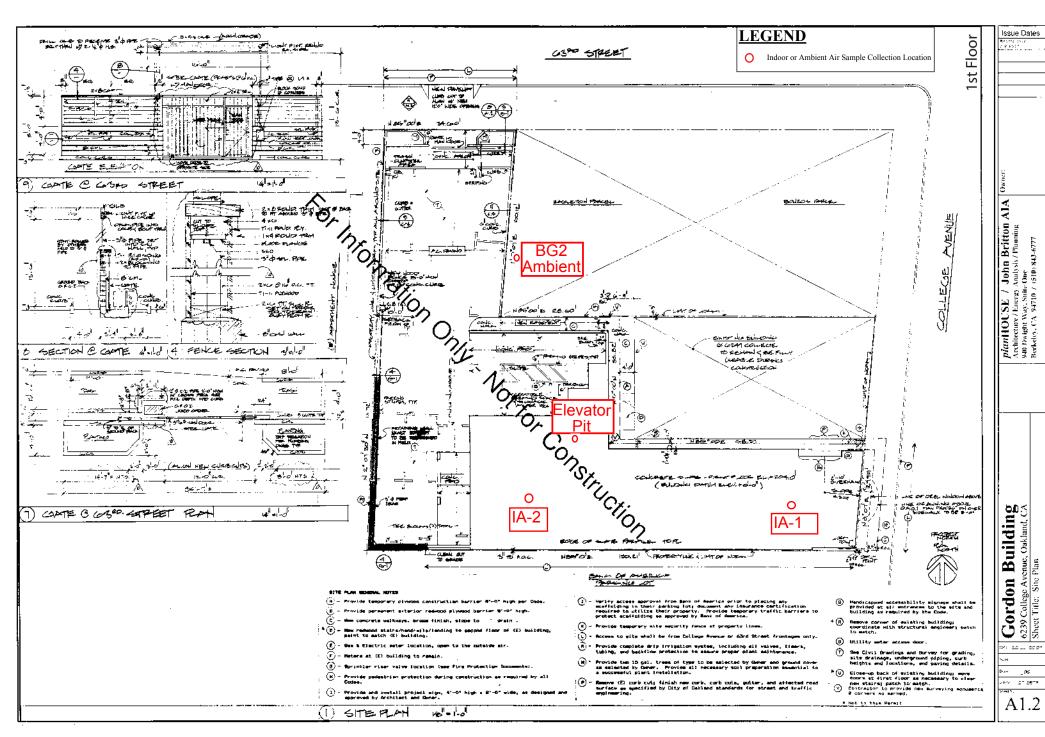


Figure 2
Site Plan Showing Air Sample Collection Locations - First Floor

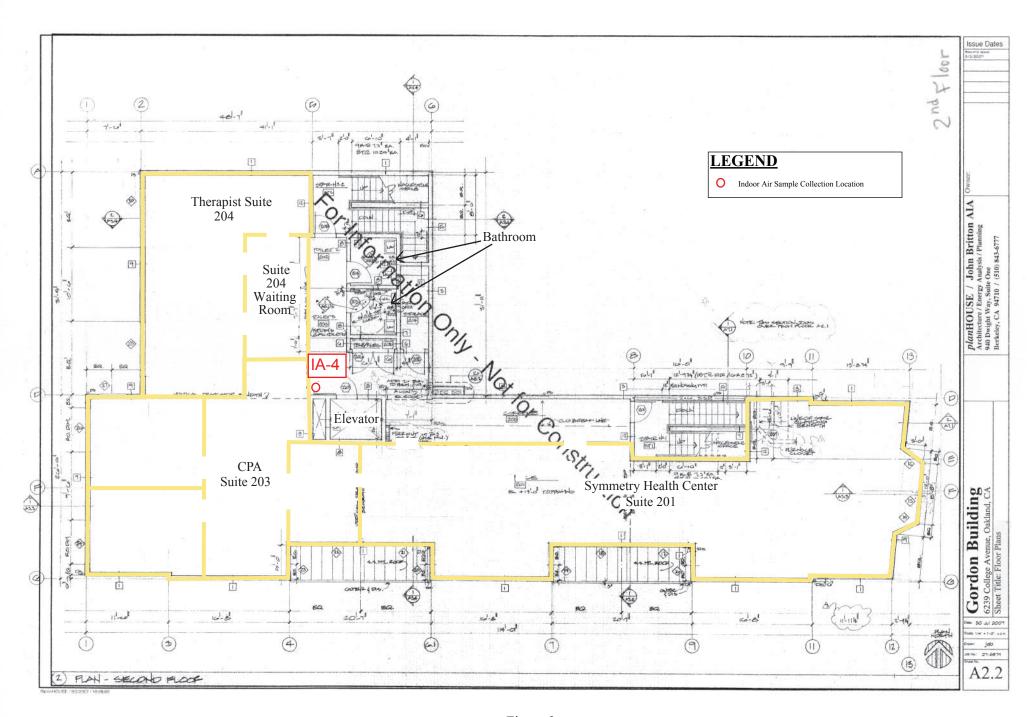


Figure 3
Site Plan Showing Air Sample Collection Locations - Second Floor

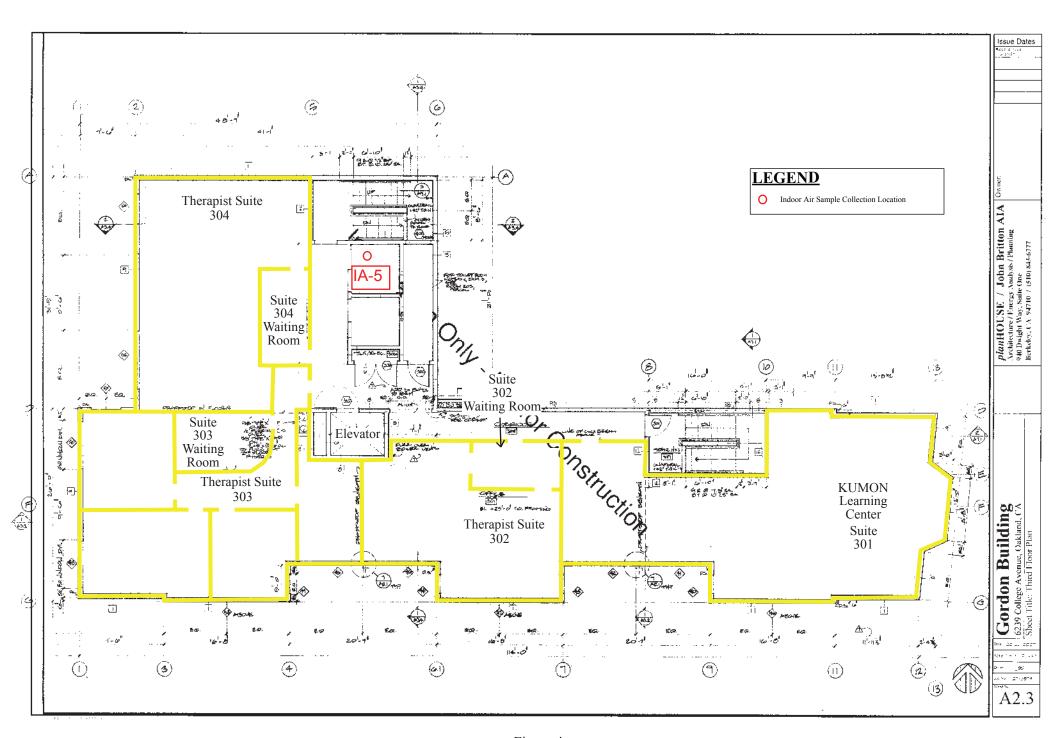
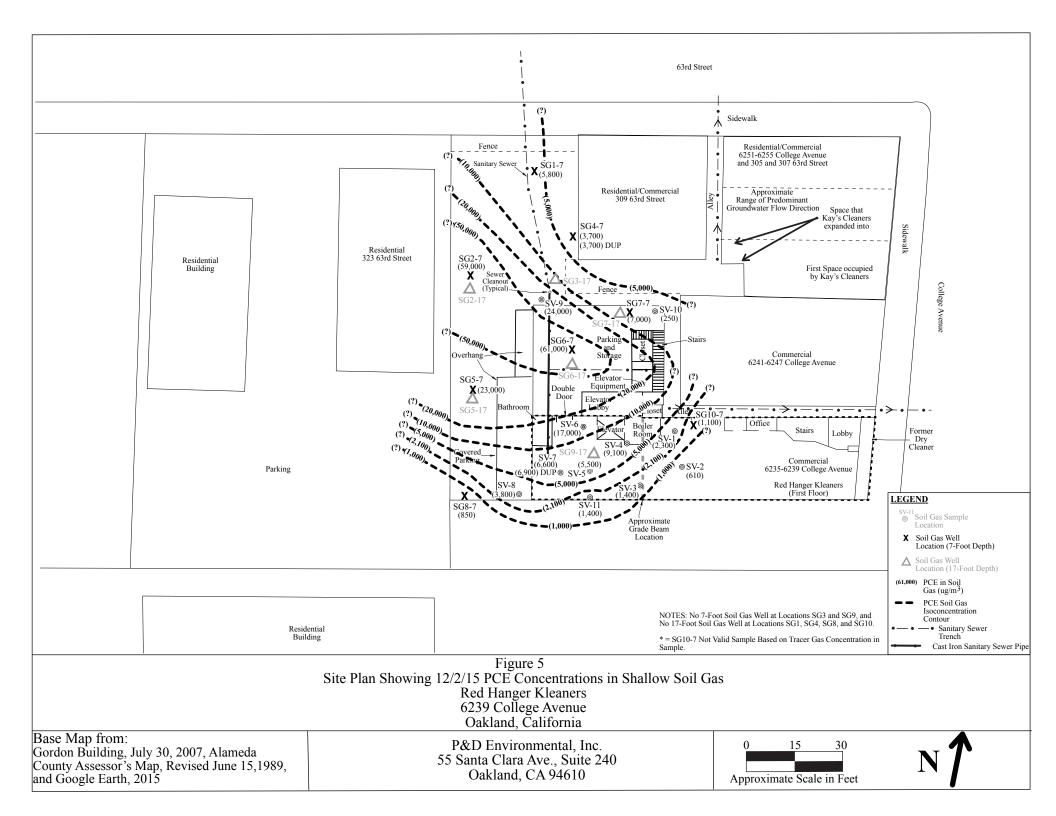
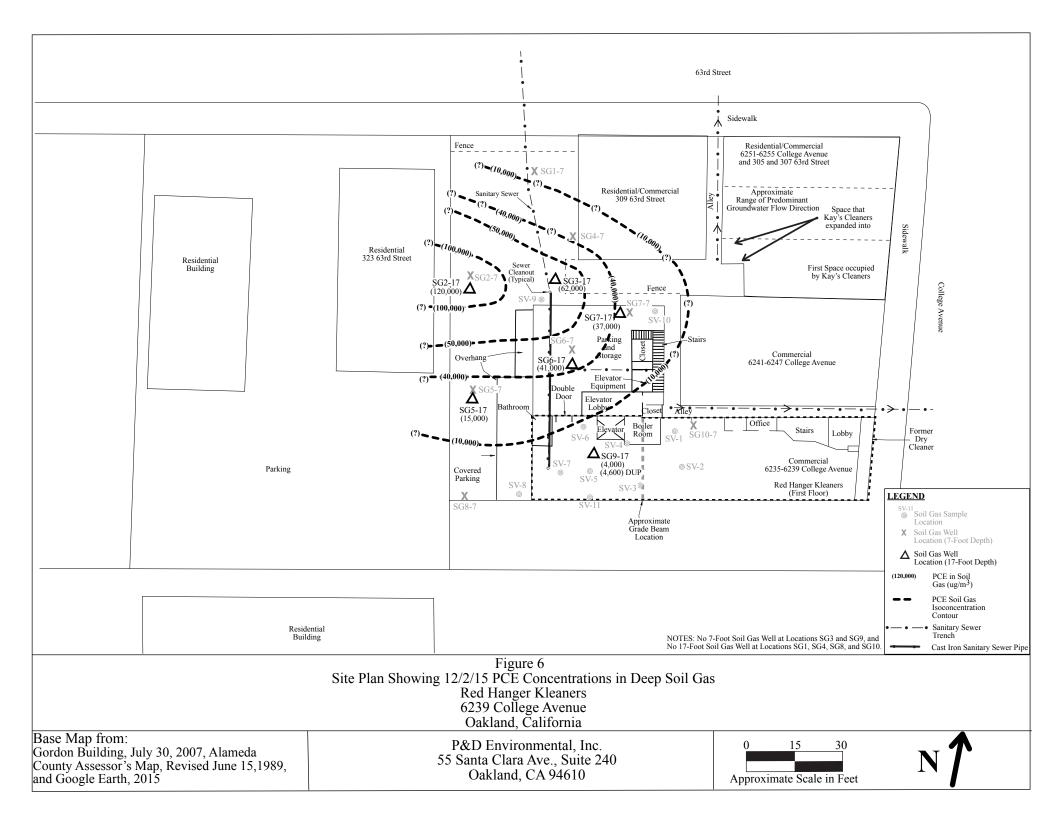
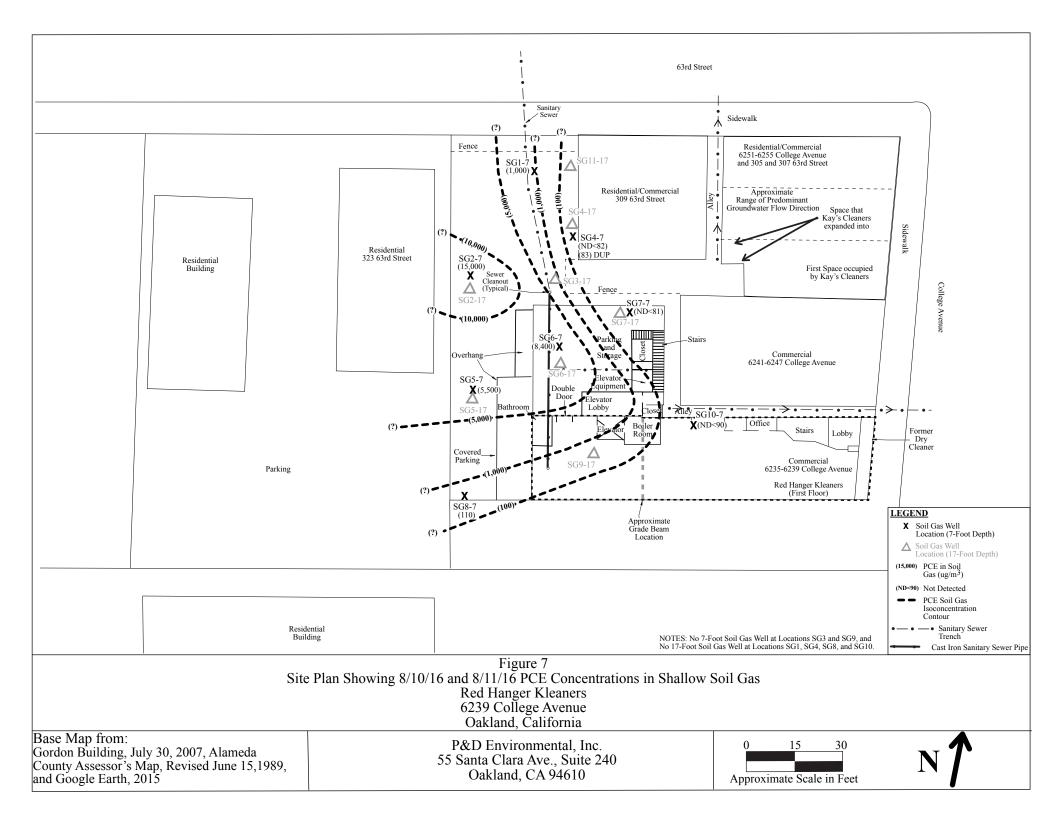


Figure 4
Site Plan Showing Air Sample Collection Locations - Third Floor







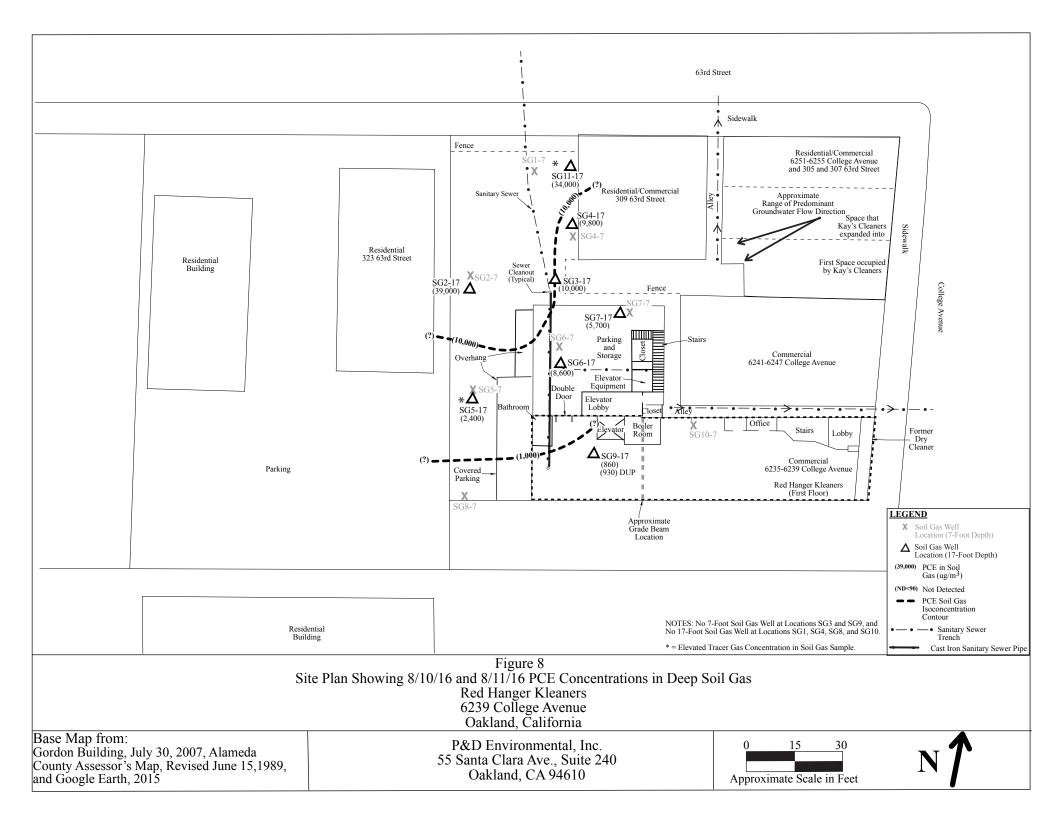




Figure 9
Typical Soil Gas Sampling Manifold
Red Hanger Kleaners
6239 College Avenue
Oakland, California

P&D Environmental, Inc. 55 Santa Clara Ave., Suite 240 Oakland, CA 94610

## **APPENDIX A**

**Air Sampling Data Sheet** 

AIR SAMPLIN	IG DATA SHE	FT RED L	MICERK	TEANER	9		
Address	6239	COLLEGE	AUE, OAK	AUD CA	7.		
Job #	0461						
Date Nam	7/13/1 e hup	6 AND 7/1	4/16				
Sampler Nam	MLE	25		+			
					7/13/16	7/14/16	
			b	Sample		/	
0 1		01 1 0	F	Canister Initial	Begin sample	End sample	
Sample Location		Start pump flow rate (cc/min)	End pump flow rate (cc/min) and	Vacuum Check (In. Hg)	collection vacuum (In. Hg)	collection vacuum (In.	
Designation	Canister#	and time	time	and time	and time	Hg) and time	NOTES
ELEVATER		flow	flow	vac -30	vac - 30	vac - 3 5	
	12004	time	time	time 0 550	time/61122	vac - 3.5 time06544	7
PIT		une	une	unie 330	unie griese	une of the	, —
1	-111			-20	20	vac - 8	
IA1	5666	flow	flow	vac -30	vac - 30		
		time	time	time0612	time 62534	time063310	3
IAZ	00316	flow	flow	vac = 30	vac -30	vac -6	
		time	time	time 0614	time062621	time06330	5
			192				
TA4	36044	flow	flow	vac - 30	vac -30	vac =6	
401	26011	time	time	time0628	time063505	time06350	A.
		une	unic	unite of occ	WIND 3503	and 655	7
TAF	1602			30	20		
IA5	1000	flow	flow	vac = 30	vac - 30	vac -6	
		time	time	time/630	time 63705	time 63805	
				-			
IA5	00343	flow	flow	vac = 30	vac -30	vac ~8	
DUP		time	time	time 632	time 63705	time06380	2
BG2	35143	flow	flow	vac - 30	vac -30	vac -8	
AMBIENT	- 310	time	time	time0602	time060912		1
run DIENL		unic	uille	unie bost	and the state of the	unig/el > 1	•
	-	-	_				
		flow	flow	vac	vac	vac	
		time	time	time	time	time	
		flow	flow	vac	vac	vac	
		time	time	time	time	time	
		flow	flow	vac	vac	vac	
		time	time	time	time	time	
		31110		anno		unio	
	+	flour	flour	una .	1000		
	-	flow	flow	vac	vac	vac	
		time	time	time	time	time	
			27				
	1	flow	flow	vac	vac	vac	
		time	time	time	time	time	
				119			
		flow	flow	vac	vac	vac	
		time	time	time	time	time	
						2	
NOTES ;	Sheet	LE: 6-4	ITER SULL	era with			
	100	211					
		277	W COULRO	CERTIFIE	30		
		TW	Certifo				
			-				

## **APPENDIX B**

**Purge Volume Calculations and Soil Gas Sampling Data Sheets** 

8.0 feet tubing, 24 inch sand interval, 6 inch hydrated bentonite interval above sand

#### Soil Gas Purge Volume Calculations

One Purge Volume is calculated as the volume of the tubing interior plus 200 cubic centimeters.

The tubing interior volume is calculated as follows:

V tubing = pi x (r x r) x h, where pi = 3.14, r = 0.187 in/2, and h = 8 ft.

V tubing = 3.14 x ( 0.0935 x 0.0935) x ( 8 ft. x 12 in./ft) = 2.64 cubic inches.

The sand interval volume is calculated as follows:

V sand interval = pi x (r x r) x h x porosity, where pi = 3.14, r = 0 in./2, h =  $\frac{24}{10}$  in., and porosity =  $\frac{0.35}{10}$ 

V sand interval =  $3.14 \times (0.00 \times 0.00) \times 24 \times 0.35$  0.00 cubic inches.

The total volume for one purge volume is V tubing + V sand interval, where

V total = 2.64 cubic inches + 0.00 cubic inches = 2.64 cubic inches.

To convert to cubic centimeters:

V total = 2.64 cubic inches x 16.39 cubic centimeters/cubic inches = 43.2 cubic centimeters.

The total tubing volume to be purged is 1 purge volumes.

V purge total = 43.2 cubic centimeters x 1 43 cubic centimeters x 1

V TOTAL = 43 + default 200 cubic centimeters 200 = 243

The flow controller has a nominal flow rate of cubic centimeters per minute.

The purge time is calculated as follows:

T purge = 243 cubic centimeters/ 150 cubic centimeters per minute = 1.62 minutes.

Converting the purge time to seconds, 1.62 minutes x 60seconds/ minute = 97 seconds.

Notes:

Yellow hi-lite indicates data entry required.

Blue hi-lite indicates values are calculated or automatically updated.

Sand interval is 2 ft from 5 to 7 ft bgs, filter is at center of sand pack, 2 ft tubing stickup above grade, 6 ft + 2 ft = 8 ft tubing, is hydrated, cement seal above bentonite.

18.0 feet tubing, 24 inch sand interval, 6 inch hydrated bentonite interval above sand

#### Soil Gas Purge Volume Calculations

One Purge Volume is calculated as the volume of the tubing interior plus 200 cubic centimeters.

The tubing interior volume is calculated as follows:

V tubing = pi x (r x r) x h, where pi = 3.14, r = 0.187 in/2, and h = 18 ft.

V tubing = 3.14 x ( 0.0935 x 0.0935) x ( 18 ft. x 12 in./ft) = 5.93 cubic inches.

The sand interval volume is calculated as follows:

V sand interval = pi x (r x r) x h x porosity, where pi = 3.14, r =  $\frac{0}{100}$  in./2, h =  $\frac{24}{100}$  in., and porosity =  $\frac{0.35}{100}$ 

V sand interval =  $3.14 \times (0.00 \times 0.00) \times 24 \times 0.35$  0.00 cubic inches.

The total volume for one purge volume is V tubing + V sand interval, where

V total = 5.93 cubic inches + 0.00 cubic inches = 5.93 cubic inches.

To convert to cubic centimeters:

V total = 5.93 cubic inches x 16.39 cubic centimeters/cubic inches = 97.2 cubic centimeters.

The total tubing volume to be purged is 1 purge volumes.

V purge total = 97.2 cubic centimeters x 1 97 cubic centimeters x cubic centimeters.

V TOTAL = 97 + default 200 cubic centimeters 200 = 297

The flow controller has a nominal flow rate of cubic centimeters per minute.

The purge time is calculated as follows:

T purge = 297 cubic centimeters/ 150 cubic centimeters per minute = 1.98 minutes.

Converting the purge time to seconds, 1.98 minutes x 60seconds/ minute = 119 seconds.

#### Notes:

Yellow hi-lite indicates data entry required.

Blue hi-lite indicates values are calculated or automatically updated.

Sand interval is 2 ft from 15 to 17 ft bgs, filter is at center of sand pack, 2 ft tubing stickup above grade, 16 ft + 2 ft = 18 ft tubing, 0.5 ft of bentonite above sand is hydrated, cement seal above bentonite.

p. 1 0/12 SOIL GAS SAMPLING DATA SHEET AUE. OAKLAND CA Address 4239 College Job # Probe M O PRT Sampler Name O Temp Dnilling Company O Perma o Temp Well e Permanent Well Vapor Pin Begin End sample PID value in sample ADDITIONAL Teflon tube Canister Initial Start leak End leak Start of collection Time leak check tracer gas vacuum (In. vacuum (In. Vacuum chack check Soil Gas End PURGE Installation Check (In. Ha) vacuum (In. vacuum (In. vacuum (In. Hg) Start PURGE injection Hg) and Hg) and sample Location Depth Designation (Ft.) Completed Canister # and time Hg) and time Hg) and time and time 111915 vac - 29 ppm 0 SG\-7 vac - 29 vac - 26 vac - 26 vac =5 time 254 60 time 30108 time 303 PFA 1255 time 25040 time 25137 time 255 time0941 time 1235 time | 245 vac - 30 vac - 5 ppm 0.9 vac -26 vac = 30 SG2-7 1025 vac - 26 time0745 time 0800 time 0805 00 time 080657 time 0819 time 0818 00 time 0838 DFA 0819 time@150 vac - 28 vac - 5 ppm 3,3 time 85152 time 859 time 85830 time 9035 time 9035 DFA 0 8 59 vac - 28 vac - 26 SG 2-17 16 3043 vac- 26 time 6 8 3 0 time0835 time0845 time 31796 vac - 29 vac - 26 vac - 26 vac= 39 vac = 5 ppm 0.1 SG3-17 16 time 95640 time 95758 time 1003 time 100 22 time 1005 time 1011 DFA 1003 time 0920 time 0930 time 0940 time 37656 vac - 27.5 vac - 26 SG4-7 vac -27 vac-5 ppm 0 vac - 26 time 1049 Cotime 10503 7 time 1056 time 10550 Otime 1108 B Stime 1110 DFA 1056 time0925 time1030 time 1040 33639 vac-27 vac - 37 vac - 5 ppm SG4-7 vac-26 vac = 34 time/04900 time/05037 time/05500 time/05500 time/1083/5time DUP time 4 28 time 030 vac - 29 vac - 5 ppm 0 vac = 29.5 vac = 26 SG4-17 16 8003 vac - 26 time//3240 time//3358 time//38 time//3700 time//4524 time//47 D FA 1138 time0932 time1/10 time! 1 20 37424 vac - 37.5 vac - 26 time! 405 time! 410 vac 26 vac time 1420 time SG 5-7 time) 51800 time (51958 time) 530 time) 527 0 time) 5547 a time (550 DEA 1530) vac -29 SG5-17 16 11430 vac 29,5 vac 26 vac 26 35673 SG 6-7 vac = 29 vac - 5 ppm 0 time 72700 time 7283 7 time 1734 time 173300 time 7411 atime 1743 DFA 1734 time 1710 time 1720 time 1/35 37355 time (65600 time 6575 8 time 703 time 7030 time 7090 time 7010 time 7030 time 7090 time 7010 tim vac -26 vac -26 SG6-17 16 DFA 1703 time/640 time/650 time 1 70 1 00 time 1 70 23 7 time 80 55 time 80 50 time 80 20 6 time 8 1 4 DFA 80 5 vac - 25 vac - 26 vac - 26 vac time | 17.55 time 30832 SG7 -- 7 vac 29 vac 5 ppm © 37840 vac-39 vac-36 vac 36 vac time 540 time 810 time 820 time SG 7-17 time 1 839 Ottime 1830 5 time 1833 time 1833 Ottime 1841 Warme 1842 DEA 1833

p. 292

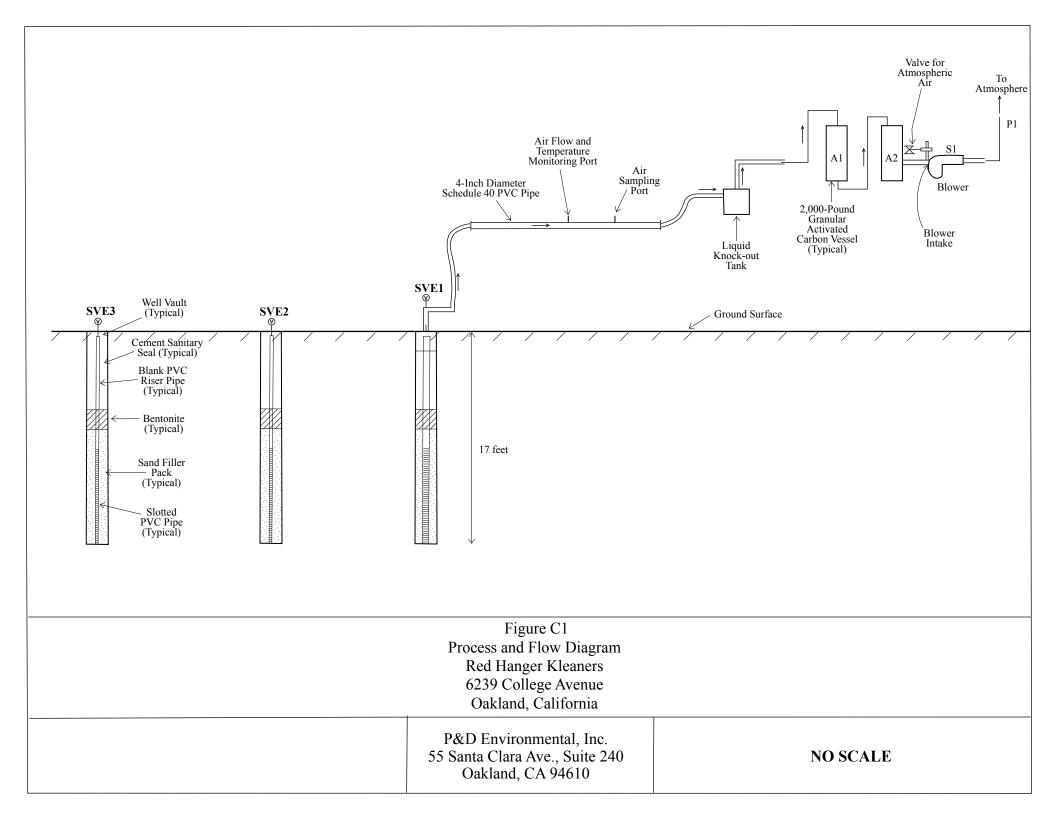
1	SOIL GAS SA	AMPLING DA	TA SHEET	The same of the same												
	Address	6239	collec	E AVE.,OA 8/11/16	KLAND, CA											
	Job#	0461			Probe Method (ch	neck one)										
	Date	8-10-	-16 AND	8/11/16	o PRT											
	Sampler Nam	ne MLB	2		o Temp Well								-			
	Drilling Comp	any VIR	1 Ex		T CHINGHOIL VIC	ell .			-		-	-	+		-	
					o Vapor Pin	+		+	-			+	+	+	-	
	Soil Gas Location Designation	Probe Depth (Ft.)	Time Probe Installation Completed	Canister # 37823	Sample Canister Initial Vacuum Check (In. Hg) and time	Start leak check vacuum (In. Hg) and time vac = 1600 time 1550	End leak check vacuum (In. Hg) and time	ADDITIONAL leak check vacuum (In. Hg) and time	Start PURGE	time	Start of tracer gas injection time	Begin sample collection vacuum (In. Hg) and time	End sample collection vacuum (In. Hg) and time	PID value in Teflon tube after sample collection	NOTES	
	Designation SG 8-7	6		37823	vac - 25 time 1530	vac- 26	vac - 26	vac		time (6193		vac-35	vac -5	ppm O		
	000	100	-	2,00	1520	ICEA	U-16 00	time	11119	1/192	7. 3/90	1491	1/2/	25 1628	DEA	1/47
					time 100	time ( 5 50	time (CC)	time	time 6 ( &c	O timel 6113	I manage	rimer Chief t	Crime/6/62	June 1	arge	10012
16	SG9-17	1/		37728	vac - 29	vac -35	vac -25	vac		1 c N		vac - 39	vac - >	ppm 🛆		
	- 1	100		37728	time IAAL	time 1010	time (020	time	time! OHH /	00 time10455	Stime 553	timet A 63	etime 1 095	3 time 110	DFA	1/152
					1005	3010		Line	anno: 5-1-16	130	000	1000	1000		17	100
,		16		2	11.00		-					200				
16	SG - 17	16		11438	vac - 28.5	vac -25	vac - 2.5	vac	177			vac28	vac - 5	ppm	-	
William !	TUP		The second	100,000,000	time 1000	time 010	time LOSO	time	time 0440	10 time 10455	Ztime	time 0520	time   025	time		
									1							
1,1	SCIA 7	1		35633	was - 2/3	was = 35	vac # 35	vac				vac = 3/2	vac er a	nom 🔿		
16	30 0- 1	6		0000	vac lace	vac - 25 time 1100	valu 3		1.200-	time   [213]	- 1155	vac 30	11000	9 1125	DEA	1170
C.					time(USC)	time I LOO	time 1110	time	time ( 300	time 1 at 3	1 time((2)	time ( +7	e amelia 3	time[[3]	DIA	1193
	1-	a Carrier						SCALE I		11-61-11-11-11-11-11-11-11-11-11-11-11-1						
	SG11-17	1 16		31767	vac -29	vac = 36	vac -26	vac				vac - 29	vac 5	ppm 3.2		
	-11	10			time (193/	time ( ) 50	time acco	time	time / 2 / 7/4	0 time 12 185	8 time ( ) 21	time/ 2 3 2 d	Clime 12312	Atime / 222	DEA	1221
					and / Sta			Line	and 541 76	111000100	and and	and a sea	-	June 2 2	and the	
											-				-	
	SG				vac	vac	vac	vac				vac	vac	ppm		
					time	time	time	time	time	time	time	time	time	time		
	SG				1.00	vac	vac	vac				vac	vac	ppm		
	36				vac			-					1			
			1		time	time	time	time	time	time	time	time	time	time		
												45			/	
	SG				vac	vac	vac	vac				vac	vac	ppm		
	-				time	time	time	time	time	time	time	time	time	time		
	-	-			une	une	anie	une	une	unio	unie	une	unio	unio		
											-		-			
	SG				vac	vac	vac	vac				vac	vac	ppm		
					time	time	time	time	time	time	time	time	time	time		
	SG						vac					Lune	vac	ppm		
	36				vac	vac	-	vac				vac		1.0		
					time	time	time	time	time	time	time	time	time	time		
			1 23													
	SG				vac	vac	vac	vac				vac	vac	ppm		
	-				time	time	time	time	time	time	time	time	time	time		
					unte	une	unte	unte	urile	ume	ane	une	une	une		
															-	
	SG				vac	vac	vac	vac				vac	vac	ppm		
					time	time	time	time	time	time	time	time	time	time		
										1000000						
	CC		+	1		1000	1	luna .					1100	nnm .		
	SG				vac	vac	vac	vac				vac	vac	ppm		
					time	time	time	time	time	time	time	time	time	time		

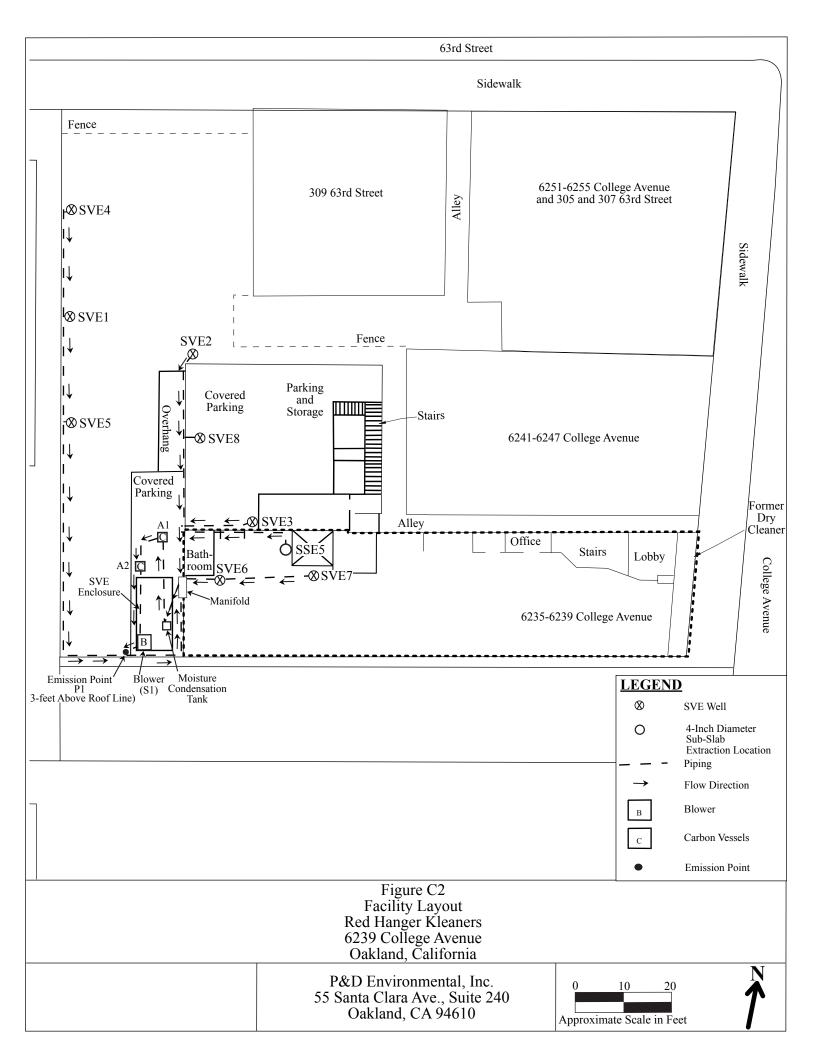
#### **APPENDIX C**

### SVE SYSTEM MONITORING, WELL MONITORING, AND AIR QUALITY DATA

- FIGURE C1 PROCESS AND FLOW DIAGRAM
- FIGURE C2 FACILITY LAYOUT
- SVE SYSTEM AIR FLOW AND TEMPERATURE MONITORING DATA SHEETS (3 pp)
- SVE WELL MONITORING FIELD SHEETS (3 pp)
- SVE SYSTEM AIR QUALITY MONITORING DATA SHEETS (3 pp)

## FIGURES C1 AND C2





## **JULY 19, 2016**

# SVE SYSTEM AIR FLOW AND TEMPERATURE MONITORING DATA SHEETS

#### SVE SYSTEM AIR FLOW AND TEMPERATURE MONITORING DATA SHEET

Date	1/9/16						Page	of _	1	
Site	Red Hanger Klean	ers, 6239 College	Ave, Oakl	and (Job # 04	61)					
AUADAL PARA	city Meter Model #	TSI-954			Time					
	f Field Person	JHM	•							
Blower Speed (Hz)	Monitored Location	Monitoring Date & Time	Vacuum (In WC)	Monitored Pipe Diameter (inches)	Air Flow (cfm)	Air Flow (fpm)	Temp (F)	Relative Humidity (Percent)	Dew Point (F)	Wet Bulb Temp (F)
56,0	SVEI	1/19/16 2107	-1834	4	18,99	218	68.8	55.1	51.9	58,6
0010	SYEZ	1109	- 17,94	4	23,63	271	68.7	55.8	1.55	58,5
	SVE3	uei	-17,93	4	23,01	264	67.2	58.2	51,8	57.9
	SVE4	1113	-18.38	4	26,50	327	68,0	56.0	51.9	58.5
	SVE 4			4						58.5
	SVES		-18:34		69,24	173	68,1	56.7	52.1	
	SVEG	1117	-18,65	4	44.17	506	67,3	57.9	51.9	58,0
	SUF7		-18.44	4	30,00	345	66.5	60,2	52,2	58.0
	SVEB	1125	-17.90	4	44.16	506	68.8	55.4	5211	58,7
	SSE5	1121	-18.U	4	147,23	1687	69,5	54.8	51.9	58,5
	SVF 2,3,8	1123	-17,99	4	101.22	1160	68.7	56.8	52,3	38,6
	3.4 10.0			1	101,00	Truc		56.0	2012	20,4
	INLET TO AI	1130		4	453,21	5193	69.4	59.7	53.5	59.8
	MACE! IC PA!	1150		- 1	100101	0.10	Serie 1	01.	0.5(5	31.0
					-					
					-					27
						1,200				
					-					
									-	

## **SVE WELL MONITORING FIELD SHEETS**

ate 119116					Page	of
ite	`	Red Hanger Kleaners, 6239 (	ollege Ave, Oakland (Job			
nitials of Field F		JHM				
			Monitored Location	Vacuum (inches of		
Monitoring	Date/Time	Wells Extracting	Th		PID (ppm)	Comments
19/16	1045 1046		SVEI	-18.36		
	1046		SUFZ	-17.94		
	1000		VIE3	S 17 98		
	1052		SUEA	-:0 28		
			SVEI SVEZ SVE3 SVE4 SVES	10/30		
	1053		SVES	-16/54		
	1055		SUEG	-18.45 -18.44 -17.90		
	1055		SUE7	-18.44		
	1057		SVES	-17,90		
	1056		SSE5	-18,11		
	10			1		
						**

## SVE SYSTEM AIR QUALITY MONITORING DATA SHEETS

#### SVE SYSTEM AIR QUALITY MONITORING DATA SHEET

Date 7/	9/16			Page	of	
Date //	Red Hanger Kleaners, 6239 (	College Ave. Oakland (Joh #	0461)	1 age	01	
Initials of Field	Person JHM	onege Ave, Oakianu (Jub#	0401)			
Zarenais of Field	A PIOON					
Blower Speed			Vacuum (In		Oxygen	
(Hz)	Monitored Location	Monitoring Date & Time	WC)	PID (ppm)	(Percent)	CH4 (ppm)
56.0	OUTLET TO AZ		-56.3	0.0	20.9	25
	INLET TO AZ	1150	-48,3	0,0	20,9	15
	INLET TO AL		-36,4	0,0	20,9	10
	INCEL TO AL	1,40	2014		011	,0
19						
	× pri					
1						
	E.					
			F " T A			
						1/4
			Lance State of the			
				- E		

## **AUGUST 16, 2016**

# SVE SYSTEM AIR FLOW AND TEMPERATURE MONITORING DATA SHEETS

#### SVE SYSTEM AIR FLOW AND TEMPERATURE MONITORING DATA SHEET

Date	8/16/16						Page	of _	1	
Site	Red Hanger Klean			and (Job # 04	61)					
Air Veloc	city Meter Model #	TSI- 95	45							
Initials of	f Field Person	JHM								
Blower Speed (Hz)	Monitored Location	Monitoring Date & Time	Vacuum (In WC)	Monitored Pipe Diameter (inches)	Air Flow	Air Flow (fpm)	Temp (F)	Relative Humidity (Percent)	Dew Point (F)	Wet Bulb Temp (F)
56,0	BLOWER	8/16/16 0941				F-18-1-				
		/ 1								
	SVE	16/16 0943	-75,0	411	13.02	149	65.8	6bile	52.2	57.8
	SVEZ	09.47	1.25-	40	35,60	408	65,4	62,3	51,7	57.2
	SVE3		-26,0	41	36,46	418	66,1	66.9	53,4	57.8
	SUE9	0951	-24,9	411	39,87	457	64.9	64.8	52.9	57.8
	SVES	0953	-24.8	4"	112.30	1287	64,2	Wei3	52.9	57.4
	SVE6		-26.6	4"	60.68	695	63,1	70.0	53,8	57.4
	SVE7	0955	-26,5	44	43.87	503	62.6	71.6	53,3	57.2
	SVER	1000	-25,9	41	60,34	691	GAA	67,7	52,9	57. Ce
		el i				- 1	- 1-1			0116
	WLET TO AL	9/16/K 1009	_	4"	441.47	5059	W13	67,7	53.3	97,8
		LOSED			1.1				0.0	0.70
		0		- 1						
					_					
									77-1-17	
							11-200			
	7									

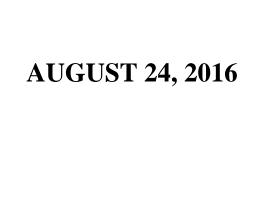
## **SVE WELL MONITORING FIELD SHEETS**

Date Ofthe The	Red Hanger Kleaners, 6239 C	College Ave, Oakland (Job	# 0461)	Page	of
nitials of Field Person	JHM	onege it e, outside (see			
Monitoring Date/Time	Wells Extracting	Monitored Location ID	Vacuum (inches of water)	PID (ppm)	Comments
8/16/16: 0800		SVEI			
1280		SVEZ	= 26.1		
0825		SV E3	-26,0	No.	
0823		SUEA	-74.9 -74.8		
0824		SVE5	-24,8		
0825		SUES SUES SUEG	-26.6		V
0825		SUF7	-26.5		
9290		SVF8	-26.6 -26.5 -25,9		
0837		591-7.	-0.11		
0843		562-7	- 0.57		
0846		592-17	-0,93		
0901	1 2 5 5	553-17	-2.64		
0903		36A-7	0,00		
0906		364-17	-0,67	17	
0850		595-7	-0,67		
0853		56547	+0.15		
0916		566-7	-286		
0918	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	896-17	-2.16 -0.46		
1190		567-7	-0,40		
0914		597-17	-1.46		
0857		568-7			Tall 1 Tall
		599-17	0,00 =2.85		
0923 0926		3910.7	-0.16		
6840		5911-17	0.00		
092	8	SSEI	-0.10		
0929		53E3	0,00		
0928	3	SSFZ	0.00		
0929	and the second	55£4	6,00	8	SES CLOSED
0936		UP1 VP2	0,00		
0937	The state of the s	UP3	0,00		
0937		VP4	0,00		40
0938		VP5	0,00		
0938 0938		VPG	0.00		
0938		NPS	0.00		
Ref					

## SVE SYSTEM AIR QUALITY MONITORING DATA SHEETS

#### SVE SYSTEM AIR QUALITY MONITORING DATA SHEET

Date 8/16	UC.				Page	of	
Site	Red Hanger Kleaners, 6239	College Ave,	Oakland (Job #	# 0461)			
nitials of Field	Person JHM						
					40		
Blower Speed				Vacuum (In		Oxygen	
<u>(Hz)</u>	Monitored Location	Monitoring	Date & Time	WC)	PID (ppm)	(Percent)	CH4 (ppm)
56.0	BLOWER						
	TUBING TO APM	8/16/16	169	-	0,0	20,9	0
	CODING TO MIT	110/16	1601		*		
							16-
	OUTLET TO AZ		1021	-63.5 -55.16 -41.1	0,0	2019	\$25
	WET TO AZ		1023	-55,6	0,0	2019	15 5
	INLET TO AI		1036	-141	0,0	2019	5
	INCE TO A		10 00	1 111		-	
		-		-		+	
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			7.5		-	+	
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		1					



# SVE SYSTEM AIR FLOW AND TEMPERATURE MONITORING DATA SHEETS

## SVE SYSTEM AIR FLOW AND TEMPERATURE MONITORING DATA SHEET

Date Site	8/24/16						Page	of		
	Red Hanger Klea	ners, 6239 College	Ave, Oak	land (Job # 0	461)		- "ge	01		_
Air Velo	city Meter Model #	TSI- 95	45							
Initials o	of Field Person	JHM								
Blower Speed (Hz)	Monitored Location	Monitoring Date & Time	Vacuum (In WC)	Monitored Pipe Diameter (inches)	Air Flow	Air Flow	Temp (F)	Relative Humidity		Wet Bulb
56,0	BLOWER				101111	(триг)	(1)	(Percent)	Point (F)	Temp (F)
	2NES	0910	-6.5 -15,2	4"	16.75	192	63.8		52,2	56.8
	SVF3	0921	-15.2	4"	20,59	236e	6518		52.3	56.4
	SVEA	0926	-15.5		73,59		1:50	70.2	52.3	563
	SVES			-	25.42		62,4	69,2	52.1	563
		0930	-15.5	7	82,23		61,6	71.2	52.2	5610
	SVE6	0934 -	- 1519	An.	41,33	474	61,6	72.5	52.8	56,4
	SUE7	0937	-15.7	4"	31,90	366 0	e2,6		and the same of th	56.4
	SVES.	0940	-13.2	4"	35,46		63,9			56.9
	SVE2,3, 8	0942.	-1513	4"	107:46				52,6	57,6
	SSES	0943	-15.3	4"	14294					
					170.11	1620	2010	64.1	53,0	57.6
	IN OF TO AI	0945		4"	463,51	5311	63,4	69.4	52.9	57,4
										2

## **SVE WELL MONITORING FIELD SHEETS**

ate 0/24	116				Page	of	
te itials of Field Per	rson	Red Hanger Kleaners, 6239 (	College Ave, Oakland (Job	# 0461)			
/ Monitoring I		Wells Extracting	Monitored Location ID	Vacuum (inches of water)	PID (ppm)		Comments
K4/16	0753		SVEL	-15,5			
1,41.	0754		SUEZ	~ 1502			
	0755		SVE3	-15.2			
	0756		SVEA	-15.5			
	0756		SVES	-15.5			
	0759		SVE6	-15.9			
	0759			-15.7			
	0880		SVE8	-15,2			
	0800			-15.3			
	our		3.70	1 3			
	0806		591-7	0.00			
	0813		562-7	-0,47			
	0814			-0.84			
			592-17	-1.62			
	0818		593-17 594-7	0.00			
	0014		2971	-0.49			
	0824		SG4-17				
	0827		5G5-7	-0.21			
	0830		SG5-17	0,60			
	0836		566-7	-1.51			
	0888		396-17				
	0841		5G7-7	-0,36			
	0845		567-17	-0.98			
	0832		5687	0.00			
	0846		359-17	~1.83			
	0848		SG10-7	-0,16			
	0809		5611-17	-0.28			94
	0854		SSEI	-1.21			
	9855		SJES	20.62			
	0855		SSE3	-0.23			
	0856		53£4	=0,16			
	0902		SSE5	-45.5			
	0,00	<del> </del>					
	0858		UPI	-0,13			
	0858		SAN	-0,10			
			VP3	-0.16e			
	0859		VP4	-0,82			
	0900		VP5	-0.78			
	0900	1	NLO.	-1,74			
	0901		UPG UP8				
	0901		olo	-0,15			

## SVE SYSTEM AIR QUALITY MONITORING DATA SHEETS

#### SVE SYSTEM AIR QUALITY MONITORING DATA SHEET

Date 8/24 Site Initials of Field	Red Hanger Kleaners, 6239	College Ave, Oakland (Job #	0461)	Page		
nitials of Fiel	d Person					
Blower Speed		M. I. D. O.T.	Vacuum (In		Oxygen (Paraget)	CU4 (nnm)
(Hz)	Monitored Location	Monitoring Date & Time	WC)	PID (ppm)	(Percent)	CH4 (ppm)
56,0	BLOWER	,				
	TUBING TO ATM	Phalie 0953		0.0	20.9	0
	COINE DAIN	10 016 0 100			1	1
	CUTLEY TO AZ	0954		0,0	20,9	15
	INLET TO AZ	0956	-96.1	0.0	20.9	6
	MACCI TO AC	0958 -	2/1/1	0.0	20.9	0
	INLET TO AL	0730	3717	0.0	20.1	1
						<del> </del>
					2 2	
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## APPENDIX D

**Weather Information** 

Кероп	0461.R6			T		ı	T		T				T	1		1
h					1	ID KOADE	DI/E 44#b:-	/4 -1 - 4 - /-	-00400704	/-00400004	/					
https://www.v	vunaergrou	na.com/pers	sonal-weatr	ner-station/c	asnboard :	ID=KCABE	KKE41#nis	story/tdata/s	520160701/	/e20160831	mcustom					
	About T	his Weat	ther Stati	ion												
		r Station			1											
		Name: El		DEIXIXE												
		/ Longit		7 0 5 1 1 1 0	" \\\ 122 '	0 15 15 11										
	Elevation		uue. N 3/	31 10	, VV 122	15 5										
	City: Be															
	State: C															
		re: AcuRit		ather Cen	ter											
	Softwar	e: Acu-Lir	nk.com													
Weather																
July 1, 20	016 - Au	gust 31,	2016													
2016	Temperat	uro		Dew Point		,	Humidity	-	,	Speed	-		Pressure		<u> </u>	Precip.
2010	remperat	uic		Dew Folli			Tiumuity			Speed			riessuie			Accum.
Jul	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Gust	High	Avg	Low	Sum
1	75.7 °F	59.8 °F	50.5 °F	55.7 °F	51.5 °F	47.7 °F	92 %	76 %	50 %	7 mph	1 mph	0 mph	<b>29.68</b> in	<b>29.62</b> in	<b>29.57</b> in	<b>0</b> in
2	73.9 °F	59.7 °F	50.7 °F	56.2 °F	52.5 °F	48.1 °F	94 %	79 % 80 %	<b>54</b> %	7 mph	1 mph	0 mph	29.74 in	29.69 in	29.64 in	0 in
4	73.2 °F 71.1 °F	59.6 °F 60.4 °F	53.2 °F 54.3 °F	56.2 °F 57 °F	53.1 °F 53.9 °F	50.9 °F 51.9 °F	93 % 92 %	80 % 80 %	54 % 60 %	4 mph 5 mph	1 mph 1 mph	0 mph 0 mph	29.81 in 29.81 in	29.77 in 29.77 in	29.73 in 29.73 in	0 in 0 in
5	71.1 °F 75.2 °F	59.6 °F	55 °F	57 °F 55.4 °F	53.9 °F	49.9 °F	92 % 89 %	78 %	49 %	4 mph	0 mph	0 mph	29.81 in 29.79 in	29.77 in 29.75 in	29.73 in 29.7 in	<b>0</b> in
6	76.5 °F	60.2 °F	53.6 °F	55.2 °F	52.1 °F	49.7 °F	87 %	76 %	47 %	4 mph	0 mph	0 mph	29.78 in	29.74 in	29.71 in	<b>0</b> in
7	75.9 °F	60.3 °F	54 °F	57.2 °F	53 °F	50.8 °F	90 %	78 %	51 %	3 mph	0 mph	0 mph	29.78 in	<b>29.75</b> in	29.72 in	<b>0</b> in
8	81.7 °F	<b>62.7</b> °F	<b>54.5</b> °F	58.9 °F	54.9 °F	51.8 °F	93 %	78 %	44 %	6 mph	0 mph	0 mph	<b>29.8</b> in	<b>29.77</b> in	<b>29.74</b> in	<b>0</b> in
9	<b>83.3</b> °F	<b>65.7</b> °F	<b>52.2</b> °F	<b>63.3</b> °F	<b>57.1</b> °F	<b>48.8</b> °F	91 %	76 %	46 %	3 mph	0 mph	0 mph	<b>29.87</b> in	<b>29.83</b> in	<b>29.78</b> in	<b>0</b> in
10	89.2 °F	66.3 °F	49.6 °F	<b>57.5</b> °F	51.3 °F	47.1 °F	95 %	64 %	32 %	3 mph	0 mph	0 mph	<b>29.86</b> in	<b>29.78</b> in	<b>29.7</b> in	<b>0</b> in
11	85.3 °F	66 °F	52 °F	58.8 °F	53.9 °F	48.9 °F	91 %	68 %	40 %	7 mph	0 mph	0 mph	<b>29.73</b> in	<b>29.68</b> in	29.63 in	<b>0</b> in
12 13	85.8 °F 87.6 °F	64.3 °F 65.5 °F	54.9 °F 50.7 °F	57.1 °F 60.9 °F	53.4 °F 54.2 °F	51.4 °F 48.4 °F	89 % 93 %	71 % 70 %	37 % 38 %	3 mph 4 mph	0 mph 0 mph	0 mph 0 mph	29.76 in 29.77 in	29.72 in 29.73 in	29.67 in 29.69 in	<b>0</b> in <b>0</b> in
14	79.3 °F	62.1 °F	51.4 °F	58.7 °F	53.6 °F	48 °F	95 %	76 %	48 %	6 mph	0 mph	0 mph	29.77 in	29.73 in	29.69 in	<b>0</b> in
15	77.5 °F	61.7 °F	49.3 °F	58 °F	53.9 °F	46.7 °F	96 %	77 %	50 %	6 mph	1 mph	0 mph	29.72 in	29.67 in	29.63 in	<b>0</b> in
16	76.5 °F	61.7 °F	55.8 °F	58.1 °F	54.3 °F	51.8 °F	90 %	78 %	51 %	7 mph	1 mph	0 mph	<b>29.69</b> in	<b>29.66</b> in	29.63 in	<b>0</b> in
17	<b>77.2</b> °F	<b>60.2</b> °F	<b>54.7</b> °F	57.2 °F	53.2 °F	51.4 °F	89 %	79 %	48 %	3 mph	0 mph	0 mph	<b>29.75</b> in	<b>29.69</b> in	<b>29.63</b> in	<b>0</b> in
18	<b>76.5</b> °F	60.9 °F	54.9 °F	58.2 °F	54.2 °F	<b>52</b> °F	90 %	80 %	52 %	4 mph	0 mph	0 mph	<b>29.86</b> in	<b>29.81</b> in	<b>29.75</b> in	<b>0</b> in
19	<b>78.6</b> °F	<b>58.1</b> °F	<b>54.3</b> °F	<b>54.8</b> °F	<b>52.2</b> °F	<b>50.5</b> °F	89 %	82 %	44 %	2 mph	0 mph	0 mph	<b>29.88</b> in	<b>29.83</b> in	<b>29.77</b> in	<b>0</b> in
20	<b>81</b> °F	<b>72.6</b> °F	55.9 °F	57.9 °F	<b>56.1</b> °F	<b>52.1</b> °F	87 %	58 %	45 %	5 mph	1 mph	0 mph	<b>29.83</b> in	<b>29.79</b> in	<b>29.75</b> in	<b>0</b> in
21	77.2 °F	64.3 °F	55.2 °F	57.9 °F	54.3 °F	51.1 °F	88 %	72 %	50 %	3 mph	0 mph	0 mph	<b>30.11</b> in	<b>29.95</b> in	<b>29.79</b> in	<b>0</b> in
22	80.6 °F	64.2 °F	51.3 °F	59.4 °F	54.5 °F	48.6 °F	95 %	73 %	47 %	3 mph	0 mph	0 mph	30.13 in	30.07 in	30.01 in	0 in
23 24	84.6 °F 78.6 °F	65.8 °F 62.1 °F	50.7 °F 51.8 °F	59.3 °F 58.2 °F	54.2 °F 53.6 °F	48.2 °F 49.5 °F	92 % 92 %	69 % 76 %	37 % 49 %	4 mph 5 mph	0 mph 0 mph	0 mph 0 mph	30 in 29.92 in	29.92 in 29.87 in	29.84 in 29.82 in	0 in 0 in
25	82.4 °F	63.9 °F	54.7 °F	58.9 °F	54.5 °F	50.9 °F	90 %	74 %	45 %	4 mph	0 mph	0 mph	29.95 in	29.92 in	29.89 in	<b>0</b> in
26	89.6 °F	65.9 °F	50.2 °F	61.7 °F	53.7 °F	48 °F	96 %	70 %	29 %	4 mph	0 mph	0 mph	<b>29.92</b> in	<b>29.88</b> in	29.83 in	<b>0</b> in
27	81.5 °F	63.2 °F	53.4 °F	59.3 °F	54.5 °F	51.2 °F	93 %	76 %	46 %	5 mph	0 mph	0 mph	<b>29.93</b> in	<b>29.89</b> in	<b>29.84</b> in	<b>0</b> in
28	<b>76.5</b> °F	61.4 °F	52.9 °F	58.3 °F	<b>53.6</b> °F	<b>50.9</b> °F	94 %	77 %	53 %	5 mph	0 mph	0 mph	<b>29.94</b> in	<b>29.9</b> in	<b>29.85</b> in	<b>0</b> in
29	<b>78.6</b> °F	<b>63.6</b> °F	<b>54.3</b> °F	57.9 °F	<b>54.7</b> °F	<b>51.7</b> °F	91 %	75 %	49 %	4 mph	0 mph	0 mph	<b>29.89</b> in	<b>29.84</b> in	<b>29.79</b> in	<b>0</b> in
30	<b>72</b> °F	61.1 °F	<b>54.5</b> °F	58.3 °F	<b>54.7</b> °F	<b>52.5</b> °F	93 %	80 %	60 %	4 mph	0 mph	0 mph	<b>29.87</b> in	<b>29.83</b> in	<b>29.79</b> in	<b>0</b> in
31	68.9 °F	63.2 °F	<b>55</b> °F	<b>58.4</b> °F	<b>56.4</b> °F	<b>52.3</b> °F	92 %	79 %	69 %	5 mph	1 mph	0 mph	<b>29.95</b> in	<b>29.9</b> in	<b>29.85</b> in	0 in
2016	Tammarat			Daw Bain			Humidity			Cnood			Pressure			Precip. Accum.
	Temperat High	Avg	Low	Dew Point		Low	High	Avg	Low	Speed High	Avg	Gust	High	Avg	Low	Sum
Aug 1	71.6 °F	64.7 °F	57 °F	High 57.3 °F	Avg 55.5 °F	52.5 °F	87 %	73 %	60 %	5 mph	1 mph	0 mph	30.02 in	<b>29.97</b> in	29.92 in	0 in
2	71.6 °F 72.1 °F	64.7 °F	54 °F	57.3 °F	54.3 °F	51.1 °F	91 %	73 % 80 %	61 %	2 mph	0 mph	0 mph	30.02 in 30.05 in	29.97 in 30 in	29.92 in 29.95 in	0 in
3	72.1 7 72 °F	59.8 °F	49.1 °F	58.4 °F	53.3 °F	46.9 °F	95 %	80 %	61 %	2 mph	0 mph	0 mph	30.03 in	29.96 in	29.92 in	<b>0</b> in
4	63.1 °F	<b>57.8</b> °F	<b>54.7</b> °F	<b>55.3</b> °F	<b>52.6</b> °F	<b>50.9</b> °F	89 %	83 %	74 %	3 mph	0 mph	0 mph	<b>29.98</b> in	<b>29.94</b> in	<b>29.9</b> in	<b>0</b> in
5	69.1 °F	<b>59.2</b> °F	<b>55.6</b> °F	<b>56.4</b> °F	<b>53.7</b> °F	51.5 °F	92 %	83 %	64 %	3 mph	0 mph	0 mph	<b>29.95</b> in	<b>29.92</b> in	<b>29.88</b> in	<b>0.01</b> in
6	<b>69.4</b> °F	<b>59</b> °F	<b>54.1</b> °F	<b>56</b> °F	<b>52.7</b> °F	51.4 °F	91 %	80 %	60 %	3 mph	0 mph	0 mph	<b>29.92</b> in	<b>29.89</b> in	<b>29.85</b> in	<b>0</b> in
7	84.4 °F	62.9 °F	55.6 °F	58.1 °F	53.4 °F	50.8 °F	89 %	73 %	40 %	3 mph	0 mph	0 mph	29.93 in	29.88 in	29.83 in	<b>0</b> in
8	87.3 °F	65.1 °F	55.8 °F	59.5 °F	55 °F	52 °F	88 %	73 %	39 %	3 mph	0 mph	0 mph	29.87 in	29.72 in	29.56 in	0 in
9 10	80.4 °F 78.1 °F	64 °F 62.3 °F	54.5 °F 53.1 °F	59.9 °F 58.9 °F	55 °F 54.5 °F	50.8 °F 50.2 °F	89 % 93 %	74 % 78 %	48 % 51 %	2 mph 4 mph	0 mph 0 mph	0 mph 0 mph	<b>29.86</b> in <b>29.69</b> in	29.72 in 29.64 in	<b>29.57</b> in <b>29.58</b> in	<b>0</b> in <b>0</b> in
11	76.8 °F	64.3 °F	55.4 °F	59.2 °F	55.7 °F	50.2 °F	91 %	75 %	54 %	5 mph	0 mph	0 mph	29.69 in	29.74 in	29.68 in	<b>0</b> in
13	83.3 °F	81.4 °F	77.7 °F	60.6 °F	59.9 °F	59.5 °F	54 %	48 %	45 %	1 mph	0 mph	0 mph	29.74 in	29.73 in	29.72 in	<b>0</b> in
14	81.5 °F	76.2 °F	65.1 °F	59.9 °F	58.2 °F	56.2 °F	73 %	54 %	48 %	1 mph	0 mph	0 mph	<b>29.7</b> in	<b>29.67</b> in	29.65 in	<b>0</b> in
15	75.9 °F	75.9 °F	75.9 °F	58 °F	58 °F	58 °F	54 %	54 %	54 %	1 mph	1 mph	0 mph	<b>29.71</b> in	<b>29.71</b> in	<b>29.71</b> in	<b>0</b> in
17	<b>77.5</b> °F	<b>66.6</b> °F	<b>57.6</b> °F	<b>59.6</b> °F	<b>56.6</b> °F	<b>54.4</b> °F	89 %	72 %	53 %	4 mph	0 mph	0 mph	<b>29.88</b> in	<b>29.74</b> in	<b>29.59</b> in	<b>0</b> in
18	<b>76.1</b> °F	<b>62.1</b> °F	<b>56.5</b> °F	<b>60.2</b> °F	<b>55.9</b> °F	53.9 °F	93 %	81 %	56 %	5 mph	0 mph	0 mph	<b>29.9</b> in	<b>29.74</b> in	<b>29.59</b> in	<b>0</b> in
19	75.4 °F	62.3 °F	57.2 °F	58.8 °F	55.5 °F	53.7 °F	89 %	79 %	56 %	4 mph	0 mph	0 mph	<b>29.96</b> in	29.92 in	<b>29.87</b> in	<b>0</b> in
20	78.1 °F	63.1 °F	56.8 °F	60.1 °F	55.5 °F	53.2 °F	88 %	77 %	53 %	2 mph	0 mph	0 mph	29.99 in	29.94 in	29.9 in	0 in
21 22	77.7 °F 78.3 °F	63.6 °F 62.9 °F	57.4 °F 56.5 °F	58.9 °F 58.9 °F	55.2 °F 55.2 °F	53.2 °F 52.9 °F	86 % 90 %	75 % 77 %	51 % 51 %	3 mph 2 mph	0 mph	0 mph	<b>29.96</b> in <b>30</b> in	29.93 in 29.96 in	29.91 in 29.92 in	<b>0</b> in <b>0</b> in
23	78.3 °F	62.9 °F	57.9 °F	59.2 °F	55.5 °F	53.4 °F	90 % 86 %	77 %	51 % 52 %	3 mph	0 mph	0 mph 0 mph	30.09 in	29.96 in	29.92 in 29.83 in	0 in
24	81.5 °F	62.4 °F	56.7 °F	58.7 °F	54.8 °F	52.6 °F	87 %	78 %	46 %	5 mph	0 mph	0 mph	29.87 in	29.8 in	29.73 in	<b>0</b> in
25	76.6 °F	61.3 °F	54.9 °F	59.1 °F	54.6 °F	51.4 °F	89 %	80 %	54 %	2 mph	0 mph	0 mph	29.74 in	29.68 in	29.63 in	<b>0</b> in
26	<b>77</b> °F	64.4 °F	<b>59.2</b> °F	<b>60.2</b> °F	<b>56.4</b> °F	<b>53.9</b> °F	86 %	76 %	53 %	3 mph	0 mph	0 mph	<b>29.73</b> in	<b>29.68</b> in	<b>29.64</b> in	<b>0</b> in
27	<b>74.7</b> °F	<b>63.8</b> °F	59.5 °F	<b>58.9</b> °F	<b>55.5</b> °F	<b>53.9</b> °F	82 %	75 %	56 %	3 mph	0 mph	0 mph	<b>29.78</b> in	<b>29.74</b> in	<b>29.71</b> in	<b>0</b> in
28	<b>80.6</b> °F	65.1 °F	55.8 °F	<b>58.2</b> °F	<b>54.9</b> °F	<b>52.1</b> °F	88 %	71 %	45 %	2 mph	0 mph	0 mph	<b>29.85</b> in	<b>29.82</b> in	<b>29.78</b> in	<b>0</b> in
29	86.9 °F	65.2 °F	55.2 °F	60.4 °F	55.3 °F	51.4 °F	88 %	73 %	41 %	3 mph	0 mph	0 mph	<b>29.87</b> in	<b>29.81</b> in	<b>29.74</b> in	<b>0</b> in
30	88.3 °F	67.9 °F	57.6 °F	61.2 °F	57.2 °F	54.4 °F	90 %	71 %	40 %	2 mph	0 mph	0 mph	29.77 in	29.7 in	29.64 in	0 in
31	<b>83.3</b> °F	<b>65.6</b> °F	55 °F	59.9 °F	<b>56.6</b> °F	<b>52.1</b> °F	93 %	75 %	44 %	4 mph	0 mph	0 mph	<b>29.72</b> in	<b>29.68</b> in	<b>29.65</b> in	<b>0</b> in

### **APPENDIX E**

## **Laboratory Analytical Reports and Chain of Custody Documentation**

### **Air Samples**

• Air Toxics Workorder # 1607236 - July 14, 2016 Indoor and Ambient Air Samples

### Soil Gas and Shroud Air Samples

- Air Toxics Workorder # 1608198 August 10 and 11, 2016 Soil Gas Samples
- Air Toxics Workorder # 1608178 August 10 and 11, 2016 Shroud Air Samples



7/21/2016 Mr. Paul King P & D Environmental 55 Santa Clara Suite 240 Oakland CA 94610

Project Name: Red Hanger Kleaners

Project #: 0461

Workorder #: 1607236

Dear Mr. Paul King

The following report includes the data for the above referenced project for sample(s) received on 7/14/2016 at Air Toxics Ltd.

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

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

Regards,

Kyle Vagadori

**Project Manager** 

Kya Vych



#### **WORK ORDER #: 1607236**

Work Order Summary

CLIENT: Mr. Paul King BILL TO: Mr. Paul King

P & D Environmental
P & D Environmental
P & D Environmental
Suite 240
P & D Environmental
Stanta Clara
Suite 240
Suite 240

Oakland, CA 94610 Oakland, CA 94610

PHONE: 510-658-6916 P.O. #

FAX: 510-834-0772 PROJECT # 0461 Red Hanger Kleaners

**DATE RECEIVED:** 07/14/2016 **CONTACT:** Kyle Vagadori 07/20/2016

FRACTION #	NAME	<u>TEST</u>	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	ELEVATOR PIT	Modified TO-15 SIM	1.8 "Hg	5.1 psi
02A	IA1	Modified TO-15 SIM	4.7 "Hg	5.1 psi
03A	IA2	Modified TO-15 SIM	6.1 "Hg	5.2 psi
04A	IA4	Modified TO-15 SIM	6.1 "Hg	4.9 psi
05A	IA5	Modified TO-15 SIM	5.9 "Hg	5.2 psi
06A	IA5-DUP	Modified TO-15 SIM	6.5 "Hg	5 psi
07A	BG2-AMBIENT	Modified TO-15 SIM	3.5 "Hg	5 psi
08A	Lab Blank	Modified TO-15 SIM	NA	NA
09A	CCV	Modified TO-15 SIM	NA	NA
10A	LCS	Modified TO-15 SIM	NA	NA
10AA	LCSD	Modified TO-15 SIM	NA	NA

	Meide Rayes	
CERTIFIED BY:	0 00	DATE: 07/21/16

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-15-9, UT NELAP CA0093332015-6, VA NELAP - 8113, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2015, Expiration date: 10/17/2016.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, Inc.



#### LABORATORY NARRATIVE Modified TO-15 SIM P & D Environmental Workorder# 1607236

Seven 6 Liter Summa Canister (SIM Certified) samples were received on July 14, 2016. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the SIM acquisition mode.

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

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

Requirement	TO-15	ATL Modifications
ICAL %RSD acceptance criteria	<pre><!--=30% RSD with 2 compounds allowed out to < 40% RSD</pre--></pre>	Project specific; default criteria is =30% RSD with 10% of compounds allowed out to < 40% RSD</td
Daily Calibration	+- 30% Difference	Project specific; default criteria is = 30% Difference with 10% of compounds allowed out up to </=40%.; flag and narrate outliers</td
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

#### **Receiving Notes**

The Summa canister for sample BG2-AMBIENT was leaking upon arrival. The client was notified and the analysis proceeded. Reported analyte concentrations are considered to be estimated.

#### **Analytical Notes**

There were no analytical discrepancies.

#### **Definition of Data Qualifying Flags**

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

- B Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
  - J Estimated value.
  - E Exceeds instrument calibration range.
  - S Saturated peak.
  - Q Exceeds quality control limits.
- U Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.



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

File extensions may have been used on the data analysis sheets and indicates as follows:

- a-File was requantified
- b-File was quantified by a second column and detector
- r1-File was requantified for the purpose of reissue



# **Summary of Detected Compounds MODIFIED EPA METHOD TO-15 GC/MS SIM**

**Client Sample ID: ELEVATOR PIT** 

Lab ID#: 1607236-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.029	0.57	0.14	2.8
Chloromethane	0.072	0.56	0.15	1.1
Chloroform	0.029	0.43	0.14	2.1
Carbon Tetrachloride	0.029	0.080	0.18	0.50
Benzene	0.072	0.098	0.23	0.31
Trichloroethene	0.029	0.47	0.15	2.5
Toluene	0.029	0.30	0.11	1.1
Tetrachloroethene	0.029	0.12	0.19	0.82
Ethyl Benzene	0.029	0.034	0.12	0.15
m,p-Xylene	0.057	0.10	0.25	0.46
o-Xylene	0.029	0.036	0.12	0.16

Client Sample ID: IA1

Lab ID#: 1607236-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.032	0.58	0.16	2.9
Chloromethane	0.080	0.67	0.16	1.4
Chloroform	0.032	0.14	0.16	0.66
Carbon Tetrachloride	0.032	0.078	0.20	0.49
Benzene	0.080	0.10	0.26	0.32
Trichloroethene	0.032	0.18	0.17	0.99
Toluene	0.032	0.29	0.12	1.1
Tetrachloroethene	0.032	0.16	0.22	1.1
Ethyl Benzene	0.032	0.034	0.14	0.15
m,p-Xylene	0.064	0.10	0.28	0.44
o-Xylene	0.032	0.037	0.14	0.16

**Client Sample ID: IA2** 

Lab ID#: 1607236-03A

	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	0.034	0.56	0.17	2.8



# **Summary of Detected Compounds MODIFIED EPA METHOD TO-15 GC/MS SIM**

**Client Sample ID: IA2** 

Lab ID#: 1607236-03A				
Chloromethane	0.085	0.54	0.18	1.1
Chloroform	0.034	0.13	0.17	0.63
Carbon Tetrachloride	0.034	0.080	0.21	0.50
Benzene	0.085	0.10	0.27	0.32
Trichloroethene	0.034	0.18	0.18	0.97
Toluene	0.034	0.30	0.13	1.1
Tetrachloroethene	0.034	0.18	0.23	1.3
Ethyl Benzene	0.034	0.034	0.15	0.15
m,p-Xylene	0.068	0.10	0.30	0.46
o-Xylene	0.034	0.037	0.15	0.16

Client Sample ID: IA4 Lab ID#: 1607236-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	(ug/m3)	Amount (ug/m3)
Freon 12	0.034	0.56	0.17	2.8
Chloromethane	0.084	0.56	0.17	1.2
Chloroform	0.034	0.54	0.16	2.6
Carbon Tetrachloride	0.034	0.074	0.21	0.46
1,2-Dichloroethane	0.034	0.043	0.14	0.17
Trichloroethene	0.034	0.32	0.18	1.7
Toluene	0.034	0.12	0.13	0.44

Client Sample ID: IA5 Lab ID#: 1607236-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.034	0.58	0.17	2.9
Chloromethane	0.084	0.61	0.17	1.2
Chloroform	0.034	1.4	0.16	6.9
Carbon Tetrachloride	0.034	0.045	0.21	0.28
1,2-Dichloroethane	0.034	0.034	0.14	0.14
Trichloroethene	0.034	0.30	0.18	1.6
Toluene	0.034	0.31	0.13	1.2



# **Summary of Detected Compounds MODIFIED EPA METHOD TO-15 GC/MS SIM**

**Client Sample ID: IA5** 

Lab ID#: 1607236-05A

Tetrachloroethene 0.034 0.075 0.23 0.51

**Client Sample ID: IA5-DUP** 

Lab ID#: 1607236-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.034	0.55	0.17	2.7
Chloromethane	0.086	0.57	0.18	1.2
Chloroform	0.034	1.4	0.17	6.7
Carbon Tetrachloride	0.034	0.053	0.22	0.34
Trichloroethene	0.034	0.29	0.18	1.6
Toluene	0.034	0.18	0.13	0.67
Tetrachloroethene	0.034	0.072	0.23	0.49

**Client Sample ID: BG2-AMBIENT** 

Lab ID#: 1607236-07A

Compound	Rpt. Limit (ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	0.030	0.58	0.15	2.8
Chloromethane	0.076	0.58	0.16	1.2
Chloroform	0.030	0.036	0.15	0.17
Carbon Tetrachloride	0.030	0.084	0.19	0.53
Benzene	0.076	0.093	0.24	0.30
Toluene	0.030	0.26	0.11	1.0
Ethyl Benzene	0.030	0.033	0.13	0.14
m,p-Xylene	0.061	0.099	0.26	0.43
o-Xylene	0.030	0.034	0.13	0.15



# Client Sample ID: ELEVATOR PIT Lab ID#: 1607236-01A

## MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	20071514sim	Date of Collection: 7/14/16 6:54:00 AM
Dil. Factor:	1.43	Date of Analysis: 7/15/16 04:40 PM

Dil. i dotor.	1.43	Date	OI Allalysis. 1115	10 07.70 [ 10]
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.029	0.57	0.14	2.8
Freon 114	0.029	Not Detected	0.20	Not Detected
Chloromethane	0.072	0.56	0.15	1.1
Vinyl Chloride	0.014	Not Detected	0.036	Not Detected
Chloroethane	0.072	Not Detected	0.19	Not Detected
1,1-Dichloroethene	0.014	Not Detected	0.057	Not Detected
trans-1,2-Dichloroethene	0.14	Not Detected	0.57	Not Detected
Methyl tert-butyl ether	0.14	Not Detected	0.52	Not Detected
1,1-Dichloroethane	0.029	Not Detected	0.12	Not Detected
cis-1,2-Dichloroethene	0.029	Not Detected	0.11	Not Detected
Chloroform	0.029	0.43	0.14	2.1
1,1,1-Trichloroethane	0.029	Not Detected	0.16	Not Detected
Carbon Tetrachloride	0.029	0.080	0.18	0.50
Benzene	0.072	0.098	0.23	0.31
1,2-Dichloroethane	0.029	Not Detected	0.12	Not Detected
Trichloroethene	0.029	0.47	0.15	2.5
Toluene	0.029	0.30	0.11	1.1
1,1,2-Trichloroethane	0.029	Not Detected	0.16	Not Detected
Tetrachloroethene	0.029	0.12	0.19	0.82
1,2-Dibromoethane (EDB)	0.029	Not Detected	0.22	Not Detected
Ethyl Benzene	0.029	0.034	0.12	0.15
m,p-Xylene	0.057	0.10	0.25	0.46
o-Xylene	0.029	0.036	0.12	0.16
1,1,2,2-Tetrachloroethane	0.029	Not Detected	0.20	Not Detected
1,4-Dichlorobenzene	0.029	Not Detected	0.17	Not Detected

		wetnoa	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	120	70-130	
Toluene-d8	101	70-130	
4-Bromofluorobenzene	95	70-130	



## Client Sample ID: IA1 Lab ID#: 1607236-02A

## MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	20071517sim	Date of Collection: 7/14/16 6:32:00 AM
Dil. Factor:	1.60	Date of Analysis: 7/15/16 06:54 PM

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Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.032	0.58	0.16	2.9
Freon 114	0.032	Not Detected	0.22	Not Detected
Chloromethane	0.080	0.67	0.16	1.4
Vinyl Chloride	0.016	Not Detected	0.041	Not Detected
Chloroethane	0.080	Not Detected	0.21	Not Detected
1,1-Dichloroethene	0.016	Not Detected	0.063	Not Detected
trans-1,2-Dichloroethene	0.16	Not Detected	0.63	Not Detected
Methyl tert-butyl ether	0.16	Not Detected	0.58	Not Detected
1,1-Dichloroethane	0.032	Not Detected	0.13	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.13	Not Detected
Chloroform	0.032	0.14	0.16	0.66
1,1,1-Trichloroethane	0.032	Not Detected	0.17	Not Detected
Carbon Tetrachloride	0.032	0.078	0.20	0.49
Benzene	0.080	0.10	0.26	0.32
1,2-Dichloroethane	0.032	Not Detected	0.13	Not Detected
Trichloroethene	0.032	0.18	0.17	0.99
Toluene	0.032	0.29	0.12	1.1
1,1,2-Trichloroethane	0.032	Not Detected	0.17	Not Detected
Tetrachloroethene	0.032	0.16	0.22	1.1
1,2-Dibromoethane (EDB)	0.032	Not Detected	0.24	Not Detected
Ethyl Benzene	0.032	0.034	0.14	0.15
m,p-Xylene	0.064	0.10	0.28	0.44
o-Xylene	0.032	0.037	0.14	0.16
1,1,2,2-Tetrachloroethane	0.032	Not Detected	0.22	Not Detected
1,4-Dichlorobenzene	0.032	Not Detected	0.19	Not Detected

		wethod	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	121	70-130	
Toluene-d8	102	70-130	
4-Bromofluorobenzene	99	70-130	



## Client Sample ID: IA2 Lab ID#: 1607236-03A

## **MODIFIED EPA METHOD TO-15 GC/MS SIM**

File Name:	20071516sim	Date of Collection: 7/14/16 6:33:00 AM
Dil. Factor:	1.70	Date of Analysis: 7/15/16 06:14 PM

Dil. I dotor.	1.70	Date	OI Allalysis. 1115	7 10 00.17 1 W
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.034	0.56	0.17	2.8
Freon 114	0.034	Not Detected	0.24	Not Detected
Chloromethane	0.085	0.54	0.18	1.1
Vinyl Chloride	0.017	Not Detected	0.043	Not Detected
Chloroethane	0.085	Not Detected	0.22	Not Detected
1,1-Dichloroethene	0.017	Not Detected	0.067	Not Detected
trans-1,2-Dichloroethene	0.17	Not Detected	0.67	Not Detected
Methyl tert-butyl ether	0.17	Not Detected	0.61	Not Detected
1,1-Dichloroethane	0.034	Not Detected	0.14	Not Detected
cis-1,2-Dichloroethene	0.034	Not Detected	0.13	Not Detected
Chloroform	0.034	0.13	0.17	0.63
1,1,1-Trichloroethane	0.034	Not Detected	0.18	Not Detected
Carbon Tetrachloride	0.034	0.080	0.21	0.50
Benzene	0.085	0.10	0.27	0.32
1,2-Dichloroethane	0.034	Not Detected	0.14	Not Detected
Trichloroethene	0.034	0.18	0.18	0.97
Toluene	0.034	0.30	0.13	1.1
1,1,2-Trichloroethane	0.034	Not Detected	0.18	Not Detected
Tetrachloroethene	0.034	0.18	0.23	1.3
1,2-Dibromoethane (EDB)	0.034	Not Detected	0.26	Not Detected
Ethyl Benzene	0.034	0.034	0.15	0.15
m,p-Xylene	0.068	0.10	0.30	0.46
o-Xylene	0.034	0.037	0.15	0.16
1,1,2,2-Tetrachloroethane	0.034	Not Detected	0.23	Not Detected
1,4-Dichlorobenzene	0.034	Not Detected	0.20	Not Detected

		wethod	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	118	70-130	
Toluene-d8	101	70-130	
4-Bromofluorobenzene	97	70-130	



## Client Sample ID: IA4 Lab ID#: 1607236-04A

## MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	20071518sim	Date of Collection: 7/14/16 6:35:00 AM
Dil. Factor:	1.68	Date of Analysis: 7/15/16 07:33 PM

	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	0.034	0.56	0.17	2.8
Freon 114	0.034	Not Detected	0.23	Not Detected
Chloromethane	0.084	0.56	0.17	1.2
Vinyl Chloride	0.017	Not Detected	0.043	Not Detected
Chloroethane	0.084	Not Detected	0.22	Not Detected
1,1-Dichloroethene	0.017	Not Detected	0.067	Not Detected
trans-1,2-Dichloroethene	0.17	Not Detected	0.67	Not Detected
Methyl tert-butyl ether	0.17	Not Detected	0.60	Not Detected
1,1-Dichloroethane	0.034	Not Detected	0.14	Not Detected
cis-1,2-Dichloroethene	0.034	Not Detected	0.13	Not Detected
Chloroform	0.034	0.54	0.16	2.6
1,1,1-Trichloroethane	0.034	Not Detected	0.18	Not Detected
Carbon Tetrachloride	0.034	0.074	0.21	0.46
Benzene	0.084	Not Detected	0.27	Not Detected
1,2-Dichloroethane	0.034	0.043	0.14	0.17
Trichloroethene	0.034	0.32	0.18	1.7
Toluene	0.034	0.12	0.13	0.44
1,1,2-Trichloroethane	0.034	Not Detected	0.18	Not Detected
Tetrachloroethene	0.034	Not Detected	0.23	Not Detected
1,2-Dibromoethane (EDB)	0.034	Not Detected	0.26	Not Detected
Ethyl Benzene	0.034	Not Detected	0.14	Not Detected
m,p-Xylene	0.067	Not Detected	0.29	Not Detected
o-Xylene	0.034	Not Detected	0.14	Not Detected
1,1,2,2-Tetrachloroethane	0.034	Not Detected	0.23	Not Detected
1,4-Dichlorobenzene	0.034	Not Detected	0.20	Not Detected

		wethod	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	118	70-130	
Toluene-d8	101	70-130	
4-Bromofluorobenzene	94	70-130	



## Client Sample ID: IA5 Lab ID#: 1607236-05A

## **MODIFIED EPA METHOD TO-15 GC/MS SIM**

File Name:	20071519sim	Date of Collection: 7/14/16 6:38:00 AM
Dil. Factor:	1.69	Date of Analysis: 7/15/16 08:23 PM

DII. Factor.	1.09	Date	OI Alialysis. 1115	10 00.23 PW
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.034	0.58	0.17	2.9
Freon 114	0.034	Not Detected	0.24	Not Detected
Chloromethane	0.084	0.61	0.17	1.2
Vinyl Chloride	0.017	Not Detected	0.043	Not Detected
Chloroethane	0.084	Not Detected	0.22	Not Detected
1,1-Dichloroethene	0.017	Not Detected	0.067	Not Detected
trans-1,2-Dichloroethene	0.17	Not Detected	0.67	Not Detected
Methyl tert-butyl ether	0.17	Not Detected	0.61	Not Detected
1,1-Dichloroethane	0.034	Not Detected	0.14	Not Detected
cis-1,2-Dichloroethene	0.034	Not Detected	0.13	Not Detected
Chloroform	0.034	1.4	0.16	6.9
1,1,1-Trichloroethane	0.034	Not Detected	0.18	Not Detected
Carbon Tetrachloride	0.034	0.045	0.21	0.28
Benzene	0.084	Not Detected	0.27	Not Detected
1,2-Dichloroethane	0.034	0.034	0.14	0.14
Trichloroethene	0.034	0.30	0.18	1.6
Toluene	0.034	0.31	0.13	1.2
1,1,2-Trichloroethane	0.034	Not Detected	0.18	Not Detected
Tetrachloroethene	0.034	0.075	0.23	0.51
1,2-Dibromoethane (EDB)	0.034	Not Detected	0.26	Not Detected
Ethyl Benzene	0.034	Not Detected	0.15	Not Detected
m,p-Xylene	0.068	Not Detected	0.29	Not Detected
o-Xylene	0.034	Not Detected	0.15	Not Detected
1,1,2,2-Tetrachloroethane	0.034	Not Detected	0.23	Not Detected
1,4-Dichlorobenzene	0.034	Not Detected	0.20	Not Detected

		wethod	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	120	70-130	
Toluene-d8	102	70-130	
4-Bromofluorobenzene	96	70-130	



## Client Sample ID: IA5-DUP Lab ID#: 1607236-06A

## MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	20071520sim	Date of Collection: 7/14/16 6:38:00 AM
Dil. Factor:	1.71	Date of Analysis: 7/15/16 09:01 PM

	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	0.034	0.55	0.17	2.7
Freon 114	0.034	Not Detected	0.24	Not Detected
Chloromethane	0.086	0.57	0.18	1.2
Vinyl Chloride	0.017	Not Detected	0.044	Not Detected
Chloroethane	0.086	Not Detected	0.22	Not Detected
1,1-Dichloroethene	0.017	Not Detected	0.068	Not Detected
trans-1,2-Dichloroethene	0.17	Not Detected	0.68	Not Detected
Methyl tert-butyl ether	0.17	Not Detected	0.62	Not Detected
1,1-Dichloroethane	0.034	Not Detected	0.14	Not Detected
cis-1,2-Dichloroethene	0.034	Not Detected	0.14	Not Detected
Chloroform	0.034	1.4	0.17	6.7
1,1,1-Trichloroethane	0.034	Not Detected	0.19	Not Detected
Carbon Tetrachloride	0.034	0.053	0.22	0.34
Benzene	0.086	Not Detected	0.27	Not Detected
1,2-Dichloroethane	0.034	Not Detected	0.14	Not Detected
Trichloroethene	0.034	0.29	0.18	1.6
Toluene	0.034	0.18	0.13	0.67
1,1,2-Trichloroethane	0.034	Not Detected	0.19	Not Detected
Tetrachloroethene	0.034	0.072	0.23	0.49
1,2-Dibromoethane (EDB)	0.034	Not Detected	0.26	Not Detected
Ethyl Benzene	0.034	Not Detected	0.15	Not Detected
m,p-Xylene	0.068	Not Detected	0.30	Not Detected
o-Xylene	0.034	Not Detected	0.15	Not Detected
1,1,2,2-Tetrachloroethane	0.034	Not Detected	0.23	Not Detected
1,4-Dichlorobenzene	0.034	Not Detected	0.20	Not Detected

		wethod	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	118	70-130	
Toluene-d8	102	70-130	
4-Bromofluorobenzene	98	70-130	



## Client Sample ID: BG2-AMBIENT Lab ID#: 1607236-07A

## MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	20071521sim	Date of Collection: 7/14/16 6:57:00 AM
Dil. Factor:	1.52	Date of Analysis: 7/15/16 09:50 PM

Dil. i actor.	1.32	Date	OI Allalysis. 1115	10 03.30 F W
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.030	0.58	0.15	2.8
Freon 114	0.030	Not Detected	0.21	Not Detected
Chloromethane	0.076	0.58	0.16	1.2
Vinyl Chloride	0.015	Not Detected	0.039	Not Detected
Chloroethane	0.076	Not Detected	0.20	Not Detected
1,1-Dichloroethene	0.015	Not Detected	0.060	Not Detected
trans-1,2-Dichloroethene	0.15	Not Detected	0.60	Not Detected
Methyl tert-butyl ether	0.15	Not Detected	0.55	Not Detected
1,1-Dichloroethane	0.030	Not Detected	0.12	Not Detected
cis-1,2-Dichloroethene	0.030	Not Detected	0.12	Not Detected
Chloroform	0.030	0.036	0.15	0.17
1,1,1-Trichloroethane	0.030	Not Detected	0.16	Not Detected
Carbon Tetrachloride	0.030	0.084	0.19	0.53
Benzene	0.076	0.093	0.24	0.30
1,2-Dichloroethane	0.030	Not Detected	0.12	Not Detected
Trichloroethene	0.030	Not Detected	0.16	Not Detected
Toluene	0.030	0.26	0.11	1.0
1,1,2-Trichloroethane	0.030	Not Detected	0.16	Not Detected
Tetrachloroethene	0.030	Not Detected	0.21	Not Detected
1,2-Dibromoethane (EDB)	0.030	Not Detected	0.23	Not Detected
Ethyl Benzene	0.030	0.033	0.13	0.14
m,p-Xylene	0.061	0.099	0.26	0.43
o-Xylene	0.030	0.034	0.13	0.15
1,1,2,2-Tetrachloroethane	0.030	Not Detected	0.21	Not Detected
1,4-Dichlorobenzene	0.030	Not Detected	0.18	Not Detected

		Wethod	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	123	70-130	
Toluene-d8	98	70-130	
4-Bromofluorobenzene	96	70-130	



## Client Sample ID: Lab Blank Lab ID#: 1607236-08A

## **MODIFIED EPA METHOD TO-15 GC/MS SIM**

<u>-</u>		
Dil. Factor:	1.00	Date of Analysis: 7/15/16 12:10 PM
File Name:	20071508sim	Date of Collection: NA

	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	0.020	Not Detected	0.099	Not Detected
Freon 114	0.020	Not Detected	0.14	Not Detected
Chloromethane	0.050	Not Detected	0.10	Not Detected
Vinyl Chloride	0.010	Not Detected	0.026	Not Detected
Chloroethane	0.050	Not Detected	0.13	Not Detected
1,1-Dichloroethene	0.010	Not Detected	0.040	Not Detected
trans-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
Methyl tert-butyl ether	0.10	Not Detected	0.36	Not Detected
1,1-Dichloroethane	0.020	Not Detected	0.081	Not Detected
cis-1,2-Dichloroethene	0.020	Not Detected	0.079	Not Detected
Chloroform	0.020	Not Detected	0.098	Not Detected
1,1,1-Trichloroethane	0.020	Not Detected	0.11	Not Detected
Carbon Tetrachloride	0.020	Not Detected	0.12	Not Detected
Benzene	0.050	Not Detected	0.16	Not Detected
1,2-Dichloroethane	0.020	Not Detected	0.081	Not Detected
Trichloroethene	0.020	Not Detected	0.11	Not Detected
Toluene	0.020	Not Detected	0.075	Not Detected
1,1,2-Trichloroethane	0.020	Not Detected	0.11	Not Detected
Tetrachloroethene	0.020	Not Detected	0.14	Not Detected
1,2-Dibromoethane (EDB)	0.020	Not Detected	0.15	Not Detected
Ethyl Benzene	0.020	Not Detected	0.087	Not Detected
m,p-Xylene	0.040	Not Detected	0.17	Not Detected
o-Xylene	0.020	Not Detected	0.087	Not Detected
1,1,2,2-Tetrachloroethane	0.020	Not Detected	0.14	Not Detected
1,4-Dichlorobenzene	0.020	Not Detected	0.12	Not Detected

		Wethod	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	112	70-130	
Toluene-d8	99	70-130	
4-Bromofluorobenzene	96	70-130	



## Client Sample ID: CCV Lab ID#: 1607236-09A

## MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name: 20071504sim Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 7/15/16 08:36 AM

Compound	%Recovery	
Freon 12	104	
Freon 114	99	
Chloromethane	94	
Vinyl Chloride	97	
Chloroethane	104	
1,1-Dichloroethene	90	
trans-1,2-Dichloroethene	94	
Methyl tert-butyl ether	100	
1,1-Dichloroethane	100	
cis-1,2-Dichloroethene	96	
Chloroform	101	
1,1,1-Trichloroethane	103	
Carbon Tetrachloride	136	
Benzene	88	
1,2-Dichloroethane	110	
Trichloroethene	98	
Toluene	105	
1,1,2-Trichloroethane	105	
Tetrachloroethene	96	
1,2-Dibromoethane (EDB)	109	
Ethyl Benzene	108	
m,p-Xylene	108	
o-Xylene	108	
1,1,2,2-Tetrachloroethane	112	
1,4-Dichlorobenzene	88	

		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	106	70-130



## Client Sample ID: LCS Lab ID#: 1607236-10A

## MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name: 20071505sim Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 7/15/16 09:23 AM

Compound	%Recovery	Method Limits
	•	
Freon 12	109	70-130
Freon 114	106	70-130
Chloromethane	96	70-130
Vinyl Chloride	103	70-130
Chloroethane	113	70-130
1,1-Dichloroethene	94	70-130
trans-1,2-Dichloroethene	84	70-130
Methyl tert-butyl ether	100	70-130
1,1-Dichloroethane	100	70-130
cis-1,2-Dichloroethene	107	70-130
Chloroform	103	70-130
1,1,1-Trichloroethane	106	70-130
Carbon Tetrachloride	130	60-140
Benzene	90	70-130
1,2-Dichloroethane	109	70-130
Trichloroethene	100	70-130
Toluene	106	70-130
1,1,2-Trichloroethane	108	70-130
Tetrachloroethene	99	70-130
1,2-Dibromoethane (EDB)	111	70-130
Ethyl Benzene	110	70-130
m,p-Xylene	108	70-130
o-Xylene	110	70-130
1,1,2,2-Tetrachloroethane	113	70-130
1,4-Dichlorobenzene	87	70-130

<i>,</i>		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	106	70-130



## Client Sample ID: LCSD Lab ID#: 1607236-10AA

## MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name: 20071506sim Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 7/15/16 10:09 AM

Compound	%Recovery	Method Limits
	•	
Freon 12	108	70-130
Freon 114	105	70-130
Chloromethane	96	70-130
Vinyl Chloride	102	70-130
Chloroethane	113	70-130
1,1-Dichloroethene	94	70-130
trans-1,2-Dichloroethene	100	70-130
Methyl tert-butyl ether	101	70-130
1,1-Dichloroethane	100	70-130
cis-1,2-Dichloroethene	95	70-130
Chloroform	103	70-130
1,1,1-Trichloroethane	106	70-130
Carbon Tetrachloride	131	60-140
Benzene	89	70-130
1,2-Dichloroethane	109	70-130
Trichloroethene	100	70-130
Toluene	107	70-130
1,1,2-Trichloroethane	106	70-130
Tetrachloroethene	98	70-130
1,2-Dibromoethane (EDB)	110	70-130
Ethyl Benzene	110	70-130
m,p-Xylene	109	70-130
o-Xylene	110	70-130
1,1,2,2-Tetrachloroethane	111	70-130
1,4-Dichlorobenzene	88	70-130

<i>,</i>		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	107	70-130

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CHAIN OF CUSTODY RECORD PAGE 2 OF 2 P&D ENVIRONMENTAL, INC. 55 Santa Clara Ave., Suite 240 Oakland, CA 94610 (510) 658-6916 PROJECT NAME: PROJECT NUMBER: NUMBER OF CONTAINERS ANALYSISIES); RED HANGER KLEANERS 0461 6239 COLLEGE AUE. OAKLAND, CA PRESERVATIVE SAMPLED BY: (PRINTED & SIGNATURE) MICHAEL BASS-DESCHENES TIME TYPE SAMPLE NUMBER DATE . SAMPLE LOCATION REMARKS FURZ SUMMAN IAS-DUP 7/13/16 063705AIR OWA 7/14/16 063800 -30 -8 00343 NONE WEEK TAT DG2-AUBIECT 7/13/16 060162 OTA 7/14/16 065711 ii -30 -8 35143 ii ΙĹ NECEIVE Y Y: SIGNATURE) RELINQUISHED BY: (SIGNATURE) DATE TIME Total No. of Samples (This Shipment) LABORATORY: 7-1-1-16 Whithad Jan-Werell 1114 Total No. of Containers (This Shipment) EUROFINS/AIRTOXICS LTD. RELINQUISHED BY: (SIGNATURE) DATE TIME RECEIVED BY: (SIGNATURE) LABORATORY CONTACT: LABORATORY PHONE NUMBER: 1916 605-3339 RELINQUISHED BY: (SIGNATURE) RECEIVED FOR LABORATORY BY: (SIGNATURE) DATE TIME SAMPLE ANALYSIS REQUEST SHEET (X) NO 1607236 ATTACHED: ( )YES Results and billing to: 6-LITER SLIVER REMARKS: FLOW CONTROLLER 24-hour (SIM CERTIFIED) Custody Seal Intact? P&D Environmental, Inc. lab@pdenviro.com EATL Courier



8/18/2016 Mr. Paul King P & D Environmental 55 Santa Clara Suite 240 Oakland CA 94610

Project Name: RED HANGER KLEANERS 6239 COLLEGE AVE.

Project #: 0461

Workorder #: 1608198

Dear Mr. Paul King

The following report includes the data for the above referenced project for sample(s) received on 8/11/2016 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 (5&20 ppbv) are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

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

Regards,

Kelly Buettner

**Project Manager** 

Welly Butte



#### WORK ORDER #: 1608198

Work Order Summary

CLIENT: Mr. Paul King BILL TO: Mr. Paul King

P & D Environmental
P & D Environmental
P & D Environmental
Source 240
P & D Environmental
Source 240
Suite 240

DECEIDE

TOTAL A T

Oakland, CA 94610 Oakland, CA 94610

PHONE: 510-658-6916 P.O. #

FAX: 510-834-0772 PROJECT # 0461 RED HANGER KLEANERS 6239

**DATE RECEIVED:** 08/11/2016 **CONTACT:** COLLEGE AVE. Kelly Buettner 08/18/2016

			RECEIPT	FINAL
FRACTION #	<b>NAME</b>	<u>TEST</u>	VAC./PRES.	<b>PRESSURE</b>
01A	SG1-7	Modified TO-15 (5&20 ppbv	5.1 "Hg	14.9 psi
02A	SG2-7	Modified TO-15 (5&20 ppbv	5.9 "Hg	15.4 psi
03A	SG2-17	Modified TO-15 (5&20 ppbv	5.1 "Hg	14.8 psi
04A	SG3-17	Modified TO-15 (5&20 ppbv	5.7 "Hg	15 psi
05A	SG4-7	Modified TO-15 (5&20 ppbv	5.1 "Hg	14.9 psi
06A	SG4-7-DUP	Modified TO-15 (5&20 ppbv	5.3 "Hg	15.2 psi
07A	SG4-17	Modified TO-15 (5&20 ppbv	4.7 "Hg	15.1 psi
08A	SG5-7	Modified TO-15 (5&20 ppbv	3.7 "Hg	15.1 psi
09A	SG5-17	Modified TO-15 (5&20 ppbv	5.7 "Hg	14.9 psi
10A	SG6-7	Modified TO-15 (5&20 ppbv	6.7 "Hg	14.8 psi
11A	SG6-17	Modified TO-15 (5&20 ppbv	6.7 "Hg	14.8 psi
12A	SG7-7	Modified TO-15 (5&20 ppbv	4.5 "Hg	15.1 psi
13A	SG7-17	Modified TO-15 (5&20 ppbv	5.3 "Hg	14.8 psi
14A	SG8-7	Modified TO-15 (5&20 ppbv	3.3 "Hg	14.7 psi
15A	SG9-17	Modified TO-15 (5&20 ppbv	5.9 "Hg	14.8 psi
16A	SG9-17 DUP	Modified TO-15 (5&20 ppbv	5.9 "Hg	15 psi
17A	SG10-7	Modified TO-15 (5&20 ppbv	7.3 "Hg	14.7 psi
18A	SG11-17	Modified TO-15 (5&20 ppbv	4.1 "Hg	15 psi
19A	Lab Blank	Modified TO-15 (5&20 ppbv	NA	NA
20A	CCV	Modified TO-15 (5&20 ppbv	NA	NA
21A	LCS	Modified TO-15 (5&20 ppbv	NA	NA
21AA	LCSD	Modified TO-15 (5&20 ppbv	NA	NA

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CERTIFIED BY:	0 00	DATE: $\frac{08/18/16}{}$
CERTIFIED DIT	_	5.112.

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-15-9, UT NELAP CA0093332015-6, VA NELAP - 8113, WA NELAP - C935 Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program) Accreditation number: CA300005, Effective date: 10/18/2015, Expiration date: 10/17/2016. Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

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#### LABORATORY NARRATIVE EPA Method TO-15 Soil Gas P & D Environmental Workorder# 1608198

Eighteen 1 Liter Summa Canister samples were received on August 11, 2016. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating up to 50 mLs of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

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

#### **Receiving Notes**

The Chain of Custody (COC) information for sample SG4-7-DUP did not match the entry on the sample tag with regard to sample identification. The information on the COC was used to process and report the sample.

## **Analytical Notes**

Dilution was performed on samples SG5-17 and SG11-17 due to the presence of high level target species.

The reported CCV for each daily batch may be derived from more than one analytical file due to the client's request for non-standard compounds.

Non-standard compounds may have different acceptance criteria than the standard TO-14A/TO-15 compound list as per contract or verbal agreement.

All Quality Control Limit exceedances and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

#### **Definition of Data Qualifying Flags**

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

- B Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
  - J Estimated value.
  - E Exceeds instrument calibration range.
  - S Saturated peak.
  - Q Exceeds quality control limits.
  - U Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See



data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue



Client Sample ID: SG1-7 Lab ID#: 1608198-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)	
Tetrachloroethene	12	150	82	1000	_
1,1-Difluoroethane	49	52	130	140	

**Client Sample ID: SG2-7** 

Lab ID#: 1608198-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	13	2200	86	15000
1,1-Difluoroethane	51	1600	140	4200

Client Sample ID: SG2-17

Lab ID#: 1608198-03A

Compound	Rpt. Limit (ppbv)	(ppbv)	(ug/m3)	Amount (ug/m3)
Tetrahydrofuran	12	20	36	59
Chloroform	12	15	59	74
Tetrachloroethene	12	5700	82	39000
1,1-Difluoroethane	48	180	130	480

**Client Sample ID: SG3-17** 

Lab ID#: 1608198-04A

	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Tetrachloroethene	12	1500	84	10000

**Client Sample ID: SG4-7** 

Lab ID#: 1608198-05A

	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	49	620	130	1700



**Client Sample ID: SG4-7-DUP** 

Lab ID#: 1608198-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)	
Tetrachloroethene	12	12	84	83	
1,1-Difluoroethane	49	16000 E	130	44000 E	

**Client Sample ID: SG4-17** 

Lab ID#: 1608198-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)	
Tetrachloroethene	12	1400	81	9800	
1,1-Difluoroethane	48	65	130	180	

**Client Sample ID: SG5-7** 

Lab ID#: 1608198-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	12	820	78	5500
1,1-Difluoroethane	46	1200	120	3200

**Client Sample ID: SG5-17** 

Lab ID#: 1608198-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	310	360	2100	2400
1,1-Difluoroethane	1200	310000 E	3400	840000 E

**Client Sample ID: SG6-7** 

Lab ID#: 1608198-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	13	1200	88	8400
1,1-Difluoroethane	52	240	140	660



Client Sample ID: SG6-17 Lab ID#: 1608198-11A

	Rpt. Limit	Amount	Rpt. Limit	Amount		
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)		
Tetrachloroethene	13	1300	88	8600		
1,1-Difluoroethane	52	110	140	300		

Client Sample ID: SG7-7

Lab ID#: 1608198-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)	
Tetrahydrofuran	12	24	35	70	
1,1-Difluoroethane	48	96	130	260	

**Client Sample ID: SG7-17** 

Lab ID#: 1608198-13A

Compound	Rpt. Limit (ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Tetrachloroethene	12	840	83	5700

Client Sample ID: SG8-7

Lab ID#: 1608198-14A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)	
Tetrachloroethene	11	16	76	110	
1,1-Difluoroethane	45	120	120	330	

**Client Sample ID: SG9-17** 

Lab ID#: 1608198-15A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	12	130	85	860
Ethyl Benzene	12	17	54	75
m,p-Xylene	12	86	54	370
o-Xylene	12	26	54	110
1,1-Difluoroethane	50	15000 E	140	41000 E



Client Sample ID: SG9-17 DUP

Lab ID#: 1608198-16A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)	
Tetrachloroethene	13	140	85	930	
Ethyl Benzene	13	13	55	56	
m,p-Xylene	13	86	55	370	
o-Xylene	13	21	55	92	
1,1-Difluoroethane	50	3200 E	140	8600 E	

Client Sample ID: SG10-7

Lab ID#: 1608198-17A

	Rpt. Limit	Amount	Rpt. Limit	Amount	
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)	
1.1-Difluoroethane	53	120	140	320	

**Client Sample ID: SG11-17** 

Lab ID#: 1608198-18A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	230	5000	1600	34000
1,1-Difluoroethane	940	170000	2500	470000



## Client Sample ID: SG1-7 Lab ID#: 1608198-01A

## **EPA METHOD TO-15 GC/MS**

File Name: Dil. Factor:	j081607 2.43		of Collection: 8/1 of Analysis: 8/16	
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	12	Not Detected	60	Not Detected
Freon 114	12	Not Detected	85	Not Detected
Chloromethane	49	Not Detected	100	Not Detected
Vinyl Chloride	12	Not Detected	31	Not Detected
1,3-Butadiene	12	Not Detected	27	Not Detected
Bromomethane	49	Not Detected	190	Not Detected
Chloroethane	49	Not Detected	130	Not Detected
Freon 11	12	Not Detected	68	Not Detected
Ethanol	49	Not Detected	92	Not Detected
Freon 113	12	Not Detected	93	Not Detected
1,1-Dichloroethene	12	Not Detected	48	Not Detected
Acetone	49	Not Detected	120	Not Detecte
2-Propanol	49	Not Detected	120	Not Detecte
Carbon Disulfide	49	Not Detected	150	Not Detecte
3-Chloropropene	49	Not Detected	150	Not Detecte
Methylene Chloride	49	Not Detected	170	Not Detecte
Methyl tert-butyl ether	12	Not Detected	44	Not Detecte
trans-1,2-Dichloroethene	12	Not Detected	48	Not Detecte
Hexane	12	Not Detected	43	Not Detecte
1,1-Dichloroethane	12	Not Detected	49	Not Detecte
2-Butanone (Methyl Ethyl Ketone)	49	Not Detected	140	Not Detecte
	12	Not Detected	48	Not Detecte
cis-1,2-Dichloroethene	12	Not Detected	36	Not Detecte
Tetrahydrofuran Chloroform	12	Not Detected	59	Not Detecte
1,1,1-Trichloroethane	12	Not Detected	66	Not Detecte
	12			
Cyclohexane		Not Detected Not Detected	42	Not Detecte
Carbon Tetrachloride	12		76	Not Detecte
2,2,4-Trimethylpentane	12	Not Detected	57	Not Detecte
Benzene	12	Not Detected	39	Not Detecte
1,2-Dichloroethane	12	Not Detected	49	Not Detecte
Heptane	12	Not Detected	50	Not Detecte
Trichloroethene	12	Not Detected	65	Not Detecte
1,2-Dichloropropane	12	Not Detected	56	Not Detected
1,4-Dioxane	49	Not Detected	180	Not Detecte
Bromodichloromethane	12	Not Detected	81	Not Detected
cis-1,3-Dichloropropene	12	Not Detected	55	Not Detected
4-Methyl-2-pentanone	12	Not Detected	50	Not Detected
Toluene	12	Not Detected	46	Not Detected
trans-1,3-Dichloropropene	12	Not Detected	55	Not Detected
1,1,2-Trichloroethane	12	Not Detected	66	Not Detected
Tetrachloroethene	12	150	82	1000
2-Hexanone	49	Not Detected	200	Not Detected



## Client Sample ID: SG1-7 Lab ID#: 1608198-01A

## **EPA METHOD TO-15 GC/MS**

File Name:	j081607	Date of Collection: 8/10/16 1:01:00 PM
Dil. Factor:	2.43	Date of Analysis: 8/16/16 02:33 PM

Dii. 1 40001.	2.73	Date	Of Allalysis. Of to	10 02.33 1 10
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	12	Not Detected	100	Not Detected
1,2-Dibromoethane (EDB)	12	Not Detected	93	Not Detected
Chlorobenzene	12	Not Detected	56	Not Detected
Ethyl Benzene	12	Not Detected	53	Not Detected
m,p-Xylene	12	Not Detected	53	Not Detected
o-Xylene	12	Not Detected	53	Not Detected
Styrene	12	Not Detected	52	Not Detected
Bromoform	12	Not Detected	120	Not Detected
Cumene	12	Not Detected	60	Not Detected
1,1,2,2-Tetrachloroethane	12	Not Detected	83	Not Detected
Propylbenzene	12	Not Detected	60	Not Detected
4-Ethyltoluene	12	Not Detected	60	Not Detected
1,3,5-Trimethylbenzene	12	Not Detected	60	Not Detected
1,2,4-Trimethylbenzene	12	Not Detected	60	Not Detected
1,3-Dichlorobenzene	12	Not Detected	73	Not Detected
1,4-Dichlorobenzene	12	Not Detected	73	Not Detected
alpha-Chlorotoluene	12	Not Detected	63	Not Detected
1,2-Dichlorobenzene	12	Not Detected	73	Not Detected
1,2,4-Trichlorobenzene	49	Not Detected	360	Not Detected
Hexachlorobutadiene	49	Not Detected	520	Not Detected
1,1-Difluoroethane	49	52	130	140

## **Container Type: 1 Liter Summa Canister**

		Wethod
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	91	70-130



## Client Sample ID: SG2-7 Lab ID#: 1608198-02A

## **EPA METHOD TO-15 GC/MS**

File Name: Dil. Factor:	j081608 2.55		of Collection: 8/1 of Analysis: 8/16	
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	13	Not Detected	63	Not Detected
Freon 114	13	Not Detected	89	Not Detected
Chloromethane	51	Not Detected	100	Not Detected
Vinyl Chloride	13	Not Detected	32	Not Detected
1,3-Butadiene	13	Not Detected	28	Not Detected
Bromomethane	51	Not Detected	200	Not Detected
Chloroethane	51	Not Detected	130	Not Detected
Freon 11	13	Not Detected	72	Not Detected
Ethanol	51	Not Detected	96	Not Detected
Freon 113	13	Not Detected	98	Not Detected
1,1-Dichloroethene	13	Not Detected	50	Not Detected
Acetone	51	Not Detected	120	Not Detected
2-Propanol	51	Not Detected	120	Not Detected
Carbon Disulfide	51	Not Detected	160	Not Detected
3-Chloropropene	51	Not Detected	160	Not Detected
Methylene Chloride	51	Not Detected	180	Not Detected
Methyl tert-butyl ether	13	Not Detected	46	Not Detected
trans-1,2-Dichloroethene	13	Not Detected	50	Not Detected
Hexane	13	Not Detected	45	Not Detected
1,1-Dichloroethane	13	Not Detected	52	Not Detected
2-Butanone (Methyl Ethyl Ketone)	51	Not Detected	150	Not Detected
cis-1,2-Dichloroethene	13	Not Detected	50	Not Detected
Tetrahydrofuran	13	Not Detected	38	Not Detected
Chloroform	13	Not Detected	62	Not Detected
1,1,1-Trichloroethane	13	Not Detected	70	Not Detected
Cyclohexane	13	Not Detected	44	Not Detected
Carbon Tetrachloride	13	Not Detected	80	Not Detected
2,2,4-Trimethylpentane	13	Not Detected	60	Not Detected
Benzene	13	Not Detected	41	Not Detected
1,2-Dichloroethane	13	Not Detected	52	Not Detected
<u>'</u>	13	Not Detected	52	Not Detected
Heptane Trichlereathana	13		68	Not Detected
Trichloroethene		Not Detected		
1,2-Dichloropropane	13 51	Not Detected Not Detected	59 180	Not Detected Not Detected
1,4-Dioxane	13	Not Detected	85	
Bromodichloromethane				Not Detected
cis-1,3-Dichloropropene	13	Not Detected	58	Not Detected
4-Methyl-2-pentanone	13	Not Detected	52	Not Detected
Toluene	13	Not Detected	48	Not Detected
trans-1,3-Dichloropropene	13	Not Detected	58 70	Not Detected
1,1,2-Trichloroethane	13	Not Detected	70	Not Detected
Tetrachloroethene	13	2200	86	15000
2-Hexanone	51	Not Detected	210	Not Detected



## Client Sample ID: SG2-7 Lab ID#: 1608198-02A

## **EPA METHOD TO-15 GC/MS**

File Name:	j081608	Date of Collection: 8/10/16 8:26:00 AM
Dil. Factor:	2.55	Date of Analysis: 8/16/16 02:56 PM

= ::: : *:*:*::	2.00		or randing of or or or	10 02100 1 111
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	13	Not Detected	110	Not Detected
1,2-Dibromoethane (EDB)	13	Not Detected	98	Not Detected
Chlorobenzene	13	Not Detected	59	Not Detected
Ethyl Benzene	13	Not Detected	55	Not Detected
m,p-Xylene	13	Not Detected	55	Not Detected
o-Xylene	13	Not Detected	55	Not Detected
Styrene	13	Not Detected	54	Not Detected
Bromoform	13	Not Detected	130	Not Detected
Cumene	13	Not Detected	63	Not Detected
1,1,2,2-Tetrachloroethane	13	Not Detected	88	Not Detected
Propylbenzene	13	Not Detected	63	Not Detected
4-Ethyltoluene	13	Not Detected	63	Not Detected
1,3,5-Trimethylbenzene	13	Not Detected	63	Not Detected
1,2,4-Trimethylbenzene	13	Not Detected	63	Not Detected
1,3-Dichlorobenzene	13	Not Detected	77	Not Detected
1,4-Dichlorobenzene	13	Not Detected	77	Not Detected
alpha-Chlorotoluene	13	Not Detected	66	Not Detected
1,2-Dichlorobenzene	13	Not Detected	77	Not Detected
1,2,4-Trichlorobenzene	51	Not Detected	380	Not Detected
Hexachlorobutadiene	51	Not Detected	540	Not Detected
1,1-Difluoroethane	51	1600	140	4200

## **Container Type: 1 Liter Summa Canister**

21		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	92	70-130



## Client Sample ID: SG2-17 Lab ID#: 1608198-03A

## **EPA METHOD TO-15 GC/MS**

File Name: Dil. Factor:	j081609 2.42		of Collection: 8/1 of Analysis: 8/16/	
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	12	Not Detected	60	Not Detected
Freon 114	12	Not Detected	84	Not Detected
Chloromethane	48	Not Detected	100	Not Detected
Vinyl Chloride	12	Not Detected	31	Not Detected
1,3-Butadiene	12	Not Detected	27	Not Detected
Bromomethane	48	Not Detected	190	Not Detected
Chloroethane	48	Not Detected	130	Not Detected
Freon 11	12	Not Detected	68	Not Detected
Ethanol	48	Not Detected	91	Not Detected
Freon 113	12	Not Detected	93	Not Detected
1,1-Dichloroethene	12	Not Detected	48	Not Detected
Acetone	48	Not Detected	110	Not Detected
2-Propanol	48	Not Detected	120	Not Detected
Carbon Disulfide	48	Not Detected	150	Not Detected
3-Chloropropene	48	Not Detected	150	Not Detected
Methylene Chloride	48	Not Detected	170	Not Detected
Methyl tert-butyl ether	12	Not Detected	44	Not Detected
trans-1,2-Dichloroethene	12	Not Detected	48	Not Detected
Hexane	12	Not Detected	43	Not Detected
1,1-Dichloroethane	12	Not Detected	49	Not Detected
2-Butanone (Methyl Ethyl Ketone)	48	Not Detected	140	Not Detected
cis-1,2-Dichloroethene	12	Not Detected	48	Not Detected
Tetrahydrofuran	12	20	36	59
Chloroform	12	15	59	74
1,1,1-Trichloroethane	12	Not Detected	66	Not Detected
Cyclohexane	12	Not Detected	42	Not Detected
Carbon Tetrachloride	12	Not Detected	76	Not Detected
2,2,4-Trimethylpentane	12	Not Detected	56	Not Detected
Benzene	12	Not Detected	39	Not Detected
1,2-Dichloroethane	12	Not Detected	49	Not Detected
Heptane	12	Not Detected	50	Not Detected
Trichloroethene	12	Not Detected	65	Not Detected
1,2-Dichloropropane	12	Not Detected	56	Not Detected
1,4-Dioxane	48	Not Detected	170	Not Detected
Bromodichloromethane	12	Not Detected	81	Not Detected
cis-1,3-Dichloropropene	12	Not Detected	55	Not Detected
4-Methyl-2-pentanone	12	Not Detected	50	Not Detected
Toluene	12	Not Detected	46	Not Detected
trans-1,3-Dichloropropene	12	Not Detected	55	Not Detected
1,1,2-Trichloroethane	12	Not Detected	66	Not Detected
Tetrachloroethene	12	5700	82	39000
2-Hexanone	48	Not Detected	200	Not Detected



## Client Sample ID: SG2-17 Lab ID#: 1608198-03A

## **EPA METHOD TO-15 GC/MS**

File Name:	j081609	Date of Collection: 8/10/16 9:03:00 AM
Dil. Factor:	2.42	Date of Analysis: 8/16/16 03:20 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	12	Not Detected	100	Not Detected
1,2-Dibromoethane (EDB)	12	Not Detected	93	Not Detected
Chlorobenzene	12	Not Detected	56	Not Detected
Ethyl Benzene	12	Not Detected	52	Not Detected
m,p-Xylene	12	Not Detected	52	Not Detected
o-Xylene	12	Not Detected	52	Not Detected
Styrene	12	Not Detected	52	Not Detected
Bromoform	12	Not Detected	120	Not Detected
Cumene	12	Not Detected	59	Not Detected
1,1,2,2-Tetrachloroethane	12	Not Detected	83	Not Detected
Propylbenzene	12	Not Detected	59	Not Detected
4-Ethyltoluene	12	Not Detected	59	Not Detected
1,3,5-Trimethylbenzene	12	Not Detected	59	Not Detected
1,2,4-Trimethylbenzene	12	Not Detected	59	Not Detected
1,3-Dichlorobenzene	12	Not Detected	73	Not Detected
1,4-Dichlorobenzene	12	Not Detected	73	Not Detected
alpha-Chlorotoluene	12	Not Detected	63	Not Detected
1,2-Dichlorobenzene	12	Not Detected	73	Not Detected
1,2,4-Trichlorobenzene	48	Not Detected	360	Not Detected
Hexachlorobutadiene	48	Not Detected	520	Not Detected
1,1-Difluoroethane	48	180	130	480

## Container Type: 1 Liter Summa Canister

		Method Limits	
Surrogates	%Recovery		
1,2-Dichloroethane-d4	102	70-130	
Toluene-d8	98	70-130	
4-Bromofluorobenzene	93	70-130	



## Client Sample ID: SG3-17 Lab ID#: 1608198-04A

## EPA METHOD TO-15 GC/MS

File Name: Dil. Factor:	j081610 Date of Collection: 8/10/16 10 2.49 Date of Analysis: 8/16/16 03:4			
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	12	Not Detected	62	Not Detected
Freon 114	12	Not Detected	87	Not Detected
Chloromethane	50	Not Detected	100	Not Detected
Vinyl Chloride	12	Not Detected	32	Not Detected
1,3-Butadiene	12	Not Detected	28	Not Detected
Bromomethane	50	Not Detected	190	Not Detected
Chloroethane	50	Not Detected	130	Not Detected
Freon 11	12	Not Detected	70	Not Detected
Ethanol	50	Not Detected	94	Not Detected
Freon 113	12	Not Detected	95	Not Detected
1,1-Dichloroethene	12	Not Detected	49	Not Detected
Acetone	50	Not Detected	120	Not Detected
2-Propanol	50	Not Detected	120	Not Detected
Carbon Disulfide	50	Not Detected	160	Not Detected
3-Chloropropene	50	Not Detected	160	Not Detected
Methylene Chloride	50	Not Detected	170	Not Detected
Methyl tert-butyl ether	12	Not Detected	45	Not Detected
trans-1,2-Dichloroethene	12	Not Detected	49	Not Detected
Hexane	12	Not Detected	44	Not Detected
1,1-Dichloroethane	12	Not Detected	50	Not Detected
2-Butanone (Methyl Ethyl Ketone)	50	Not Detected	150	Not Detected
cis-1,2-Dichloroethene	12	Not Detected	49	Not Detected
Tetrahydrofuran	12	Not Detected	37	Not Detected
Chloroform	12	Not Detected	61	Not Detected
1,1,1-Trichloroethane	12	Not Detected	68	Not Detected
Cyclohexane	12	Not Detected	43	Not Detected
Carbon Tetrachloride	12	Not Detected	78	Not Detected
2,2,4-Trimethylpentane	12	Not Detected	58	Not Detected
Benzene	12	Not Detected	40	Not Detected
1,2-Dichloroethane	12	Not Detected	50	Not Detected
Heptane	12	Not Detected	51	Not Detected
Trichloroethene	12	Not Detected	67	Not Detected
1,2-Dichloropropane	12	Not Detected	58	Not Detected
1,4-Dioxane	50	Not Detected	180	Not Detected
Bromodichloromethane	12	Not Detected	83	Not Detected
cis-1,3-Dichloropropene	12	Not Detected	56	Not Detected
4-Methyl-2-pentanone	12	Not Detected	51	Not Detected
Toluene	12	Not Detected	47	Not Detected
trans-1,3-Dichloropropene	12	Not Detected	56	Not Detected
1,1,2-Trichloroethane	12	Not Detected	68	Not Detected
Tetrachloroethene	12	1500	84	10000
2-Hexanone	50	Not Detected	200	Not Detected
Z-1 IEXALIULE	30	NOT DETECTED	200	INOL DELECTED



## Client Sample ID: SG3-17 Lab ID#: 1608198-04A

## **EPA METHOD TO-15 GC/MS**

File Name:	j081610	Date of Collection: 8/10/16 10:10:00 AM
Dil. Factor:	2.49	Date of Analysis: 8/16/16 03:45 PM

· · · · · · · · · · · · · · · · · · ·				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	12	Not Detected	110	Not Detected
1,2-Dibromoethane (EDB)	12	Not Detected	96	Not Detected
Chlorobenzene	12	Not Detected	57	Not Detected
Ethyl Benzene	12	Not Detected	54	Not Detected
m,p-Xylene	12	Not Detected	54	Not Detected
o-Xylene	12	Not Detected	54	Not Detected
Styrene	12	Not Detected	53	Not Detected
Bromoform	12	Not Detected	130	Not Detected
Cumene	12	Not Detected	61	Not Detected
1,1,2,2-Tetrachloroethane	12	Not Detected	85	Not Detected
Propylbenzene	12	Not Detected	61	Not Detected
4-Ethyltoluene	12	Not Detected	61	Not Detected
1,3,5-Trimethylbenzene	12	Not Detected	61	Not Detected
1,2,4-Trimethylbenzene	12	Not Detected	61	Not Detected
1,3-Dichlorobenzene	12	Not Detected	75	Not Detected
1,4-Dichlorobenzene	12	Not Detected	75	Not Detected
alpha-Chlorotoluene	12	Not Detected	64	Not Detected
1,2-Dichlorobenzene	12	Not Detected	75	Not Detected
1,2,4-Trichlorobenzene	50	Not Detected	370	Not Detected
Hexachlorobutadiene	50	Not Detected	530	Not Detected
1,1-Difluoroethane	50	Not Detected	130	Not Detected

## Container Type: 1 Liter Summa Canister

		Metnod Limits	
Surrogates	%Recovery		
1,2-Dichloroethane-d4	107	70-130	
Toluene-d8	99	70-130	
4-Bromofluorobenzene	92	70-130	



## Client Sample ID: SG4-7 Lab ID#: 1608198-05A

File Name:	i081611	Date of Collection: 8/10/16 11:08:00 AM
Dil. Factor:	2.43	Date of Analysis: 8/16/16 04:09 PM

Dil. Factor:	2.43 Date of Analysis: 8/16/16 04:09 PM			
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	12	Not Detected	60	Not Detected
Freon 114	12	Not Detected	85	Not Detected
Chloromethane	49	Not Detected	100	Not Detected
Vinyl Chloride	12	Not Detected	31	Not Detected
1,3-Butadiene	12	Not Detected	27	Not Detected
Bromomethane	49	Not Detected	190	Not Detected
Chloroethane	49	Not Detected	130	Not Detected
Freon 11	12	Not Detected	68	Not Detected
Ethanol	49	Not Detected	92	Not Detected
Freon 113	12	Not Detected	93	Not Detected
1,1-Dichloroethene	12	Not Detected	48	Not Detected
Acetone	49	Not Detected	120	Not Detected
2-Propanol	49	Not Detected	120	Not Detected
Carbon Disulfide	49	Not Detected	150	Not Detected
3-Chloropropene	49	Not Detected	150	Not Detected
Methylene Chloride	49	Not Detected	170	Not Detected
Methyl tert-butyl ether	12	Not Detected	44	Not Detected
trans-1,2-Dichloroethene	12	Not Detected	48	Not Detected
Hexane	12	Not Detected	43	Not Detected
1,1-Dichloroethane	12	Not Detected	49	Not Detected
2-Butanone (Methyl Ethyl Ketone)	49	Not Detected	140	Not Detected
cis-1,2-Dichloroethene	12	Not Detected	48	Not Detected
Tetrahydrofuran	12	Not Detected	36	Not Detected
Chloroform	12	Not Detected	59	Not Detected
1,1,1-Trichloroethane	12	Not Detected	66	Not Detected
Cyclohexane	12	Not Detected	42	Not Detected
Carbon Tetrachloride	12	Not Detected	76	Not Detected
2,2,4-Trimethylpentane	12	Not Detected	57	Not Detected
Benzene	12	Not Detected	39	Not Detected
1,2-Dichloroethane	12	Not Detected	49	Not Detected
Heptane	12	Not Detected	50	Not Detected
Trichloroethene	12	Not Detected	65	Not Detected
1,2-Dichloropropane	12	Not Detected	56	Not Detected
1,4-Dioxane	49	Not Detected	180	Not Detected
Bromodichloromethane	12	Not Detected	81	Not Detected
cis-1,3-Dichloropropene	12	Not Detected	55	Not Detected
4-Methyl-2-pentanone	12	Not Detected	50	Not Detected
Toluene	12	Not Detected	46	Not Detected
trans-1,3-Dichloropropene	12	Not Detected	55	Not Detected
1,1,2-Trichloroethane	12	Not Detected	66	Not Detected
Tetrachloroethene	12	Not Detected	82	Not Detected
2-Hexanone	49	Not Detected	200	Not Detected



## Client Sample ID: SG4-7 Lab ID#: 1608198-05A

EPA METHOD TO-15 GC/MS

 File Name:
 j081611
 Date of Collection: 8/10/16 11:08:00 AM

 Dil. Factor:
 2.43
 Date of Analysis: 8/16/16 04:09 PM

DII. Factor.	2.43	Date of Analysis: 6/16/16 04:09 PM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	12	Not Detected	100	Not Detected
1,2-Dibromoethane (EDB)	12	Not Detected	93	Not Detected
Chlorobenzene	12	Not Detected	56	Not Detected
Ethyl Benzene	12	Not Detected	53	Not Detected
m,p-Xylene	12	Not Detected	53	Not Detected
o-Xylene	12	Not Detected	53	Not Detected
Styrene	12	Not Detected	52	Not Detected
Bromoform	12	Not Detected	120	Not Detected
Cumene	12	Not Detected	60	Not Detected
1,1,2,2-Tetrachloroethane	12	Not Detected	83	Not Detected
Propylbenzene	12	Not Detected	60	Not Detected
4-Ethyltoluene	12	Not Detected	60	Not Detected
1,3,5-Trimethylbenzene	12	Not Detected	60	Not Detected
1,2,4-Trimethylbenzene	12	Not Detected	60	Not Detected
1,3-Dichlorobenzene	12	Not Detected	73	Not Detected
1,4-Dichlorobenzene	12	Not Detected	73	Not Detected
alpha-Chlorotoluene	12	Not Detected	63	Not Detected
1,2-Dichlorobenzene	12	Not Detected	73	Not Detected
1,2,4-Trichlorobenzene	49	Not Detected	360	Not Detected
Hexachlorobutadiene	49	Not Detected	520	Not Detected
1,1-Difluoroethane	49	620	130	1700

•		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	104	70-130	
Toluene-d8	98	70-130	
4-Bromofluorobenzene	93	70-130	



## Client Sample ID: SG4-7-DUP Lab ID#: 1608198-06A

File Name: Dil. Factor:	j081612 2.47	Date of Collection: 8/10/16 11:08:00 AM Date of Analysis: 8/16/16 04:33 PM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	12	Not Detected	61	Not Detected
Freon 114	12	Not Detected	86	Not Detected
Chloromethane	49	Not Detected	100	Not Detected
Vinyl Chloride	12	Not Detected	32	Not Detected
1,3-Butadiene	12	Not Detected	27	Not Detected
Bromomethane	49	Not Detected	190	Not Detected
Chloroethane	49	Not Detected	130	Not Detected
Freon 11	12	Not Detected	69	Not Detected
Ethanol	49	Not Detected	93	Not Detected
Freon 113	12	Not Detected	95	Not Detected
1,1-Dichloroethene	12	Not Detected	49	Not Detected
Acetone	49	Not Detected	120	Not Detected
2-Propanol	49	Not Detected	120	Not Detected
Carbon Disulfide	49	Not Detected	150	Not Detected
3-Chloropropene	49	Not Detected	150	Not Detected
Methylene Chloride	49	Not Detected	170	Not Detected
Methyl tert-butyl ether	12	Not Detected	44	Not Detected
trans-1,2-Dichloroethene	12	Not Detected	49	Not Detected
Hexane	12	Not Detected	44	Not Detected
1,1-Dichloroethane	12	Not Detected	50	Not Detected
2-Butanone (Methyl Ethyl Ketone)	49	Not Detected	140	Not Detected
cis-1,2-Dichloroethene	12	Not Detected	49	Not Detected
Tetrahydrofuran	12	Not Detected	36	Not Detected
Chloroform	12	Not Detected	60	Not Detected
1,1,1-Trichloroethane	12	Not Detected	67	Not Detected
Cyclohexane	12	Not Detected	42	Not Detected
Carbon Tetrachloride	12	Not Detected	78	Not Detected
2,2,4-Trimethylpentane	12	Not Detected	58	Not Detected
Benzene	12	Not Detected	39	Not Detected
1,2-Dichloroethane	12	Not Detected	50	Not Detected
	12	Not Detected	51	Not Detected
Heptane	12		66	
Trichloroethene		Not Detected Not Detected	57	Not Detected
1,2-Dichloropropane	12			Not Detected
1,4-Dioxane	49	Not Detected	180	Not Detected
Bromodichloromethane	12	Not Detected	83	Not Detected
cis-1,3-Dichloropropene	12	Not Detected	56	Not Detected
4-Methyl-2-pentanone	12	Not Detected	50	Not Detected
Toluene	12	Not Detected	46	Not Detected
trans-1,3-Dichloropropene	12	Not Detected	56	Not Detected
1,1,2-Trichloroethane	12	Not Detected	67	Not Detected
Tetrachloroethene	12	12	84	83
2-Hexanone	49	Not Detected	200	Not Detected



## Client Sample ID: SG4-7-DUP Lab ID#: 1608198-06A

#### **EPA METHOD TO-15 GC/MS**

File Name: j081612 Date of Collection: 8/10/16 11:08:00 AM Dil. Factor: 2.47 Date of Analysis: 8/16/16 04:33 PM

2	<b>4</b> 171	Date of Analysis: 6/16/16 04:00 1 iii		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	12	Not Detected	100	Not Detected
1,2-Dibromoethane (EDB)	12	Not Detected	95	Not Detected
Chlorobenzene	12	Not Detected	57	Not Detected
Ethyl Benzene	12	Not Detected	54	Not Detected
m,p-Xylene	12	Not Detected	54	Not Detected
o-Xylene	12	Not Detected	54	Not Detected
Styrene	12	Not Detected	53	Not Detected
Bromoform	12	Not Detected	130	Not Detected
Cumene	12	Not Detected	61	Not Detected
1,1,2,2-Tetrachloroethane	12	Not Detected	85	Not Detected
Propylbenzene	12	Not Detected	61	Not Detected
4-Ethyltoluene	12	Not Detected	61	Not Detected
1,3,5-Trimethylbenzene	12	Not Detected	61	Not Detected
1,2,4-Trimethylbenzene	12	Not Detected	61	Not Detected
1,3-Dichlorobenzene	12	Not Detected	74	Not Detected
1,4-Dichlorobenzene	12	Not Detected	74	Not Detected
alpha-Chlorotoluene	12	Not Detected	64	Not Detected
1,2-Dichlorobenzene	12	Not Detected	74	Not Detected
1,2,4-Trichlorobenzene	49	Not Detected	370	Not Detected
Hexachlorobutadiene	49	Not Detected	530	Not Detected
1.1-Difluoroethane	49	16000 E	130	44000 E

E = Exceeds instrument calibration range.

Surrogates	%Recovery	Method Limits
Surrogates	/orecovery	Lillits
1,2-Dichloroethane-d4	111	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	92	70-130



Tetrachloroethene

2-Hexanone

## Client Sample ID: SG4-17 Lab ID#: 1608198-07A

### **EPA METHOD TO-15 GC/MS**

File Name: Dil. Factor:	j081613 2.40	Date of Collection: 8/10/16 11:45:00 AM Date of Analysis: 8/16/16 04:57 PM		
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	12	Not Detected	59	Not Detected
Freon 114	12	Not Detected	84	Not Detected
Chloromethane	48	Not Detected	99	Not Detected
Vinyl Chloride	12	Not Detected	31	Not Detected
1,3-Butadiene	12	Not Detected	26	Not Detected
Bromomethane	48	Not Detected	190	Not Detected
Chloroethane	48	Not Detected	130	Not Detected
Freon 11	12	Not Detected	67	Not Detected
Ethanol	48	Not Detected	90	Not Detected
Freon 113	12	Not Detected	92	Not Detected
1,1-Dichloroethene	12	Not Detected	48	Not Detected
Acetone	48	Not Detected	110	Not Detected
2-Propanol	48	Not Detected	120	Not Detected
Carbon Disulfide	48	Not Detected	150	Not Detected
3-Chloropropene	48	Not Detected	150	Not Detected
Methylene Chloride	48	Not Detected	170	Not Detected
Methyl tert-butyl ether	12	Not Detected	43	Not Detected
trans-1,2-Dichloroethene	12	Not Detected	48	Not Detected
Hexane	12	Not Detected	42	Not Detected
1,1-Dichloroethane	12	Not Detected	48	Not Detected
2-Butanone (Methyl Ethyl Ketone)	48	Not Detected	140	Not Detected
cis-1,2-Dichloroethene	12	Not Detected	48	Not Detected
Tetrahydrofuran	12	Not Detected	35	Not Detected
Chloroform	12	Not Detected	58	Not Detected
1,1,1-Trichloroethane	12	Not Detected	65	Not Detected
Cyclohexane	12	Not Detected	41	Not Detected
Carbon Tetrachloride	12	Not Detected	76	Not Detected
2,2,4-Trimethylpentane	12	Not Detected	56	Not Detected
Benzene	12	Not Detected	38	Not Detected
1,2-Dichloroethane	12	Not Detected	48	Not Detected
Heptane	12	Not Detected	49	Not Detected
Trichloroethene	12	Not Detected	64	Not Detected
1,2-Dichloropropane	12	Not Detected	55	Not Detected
1,4-Dioxane	48	Not Detected	170	Not Detected
Bromodichloromethane	12	Not Detected	80	Not Detected
cis-1,3-Dichloropropene	12	Not Detected	54	Not Detected
4-Methyl-2-pentanone	12	Not Detected	49	Not Detected
Toluene	12	Not Detected	45	Not Detected
trans-1,3-Dichloropropene	12	Not Detected	54	Not Detected
1,1,2-Trichloroethane	12	Not Detected	65	Not Detected

1400

Not Detected

9800

Not Detected

81

200

12

48



## Client Sample ID: SG4-17 Lab ID#: 1608198-07A

### **EPA METHOD TO-15 GC/MS**

File Name:	j081613	Date of Collection: 8/10/16 11:45:00 AM
Dil. Factor:	2.40	Date of Analysis: 8/16/16 04:57 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	12	Not Detected	100	Not Detected
1,2-Dibromoethane (EDB)	12	Not Detected	92	Not Detected
Chlorobenzene	12	Not Detected	55	Not Detected
Ethyl Benzene	12	Not Detected	52	Not Detected
m,p-Xylene	12	Not Detected	52	Not Detected
o-Xylene	12	Not Detected	52	Not Detected
Styrene	12	Not Detected	51	Not Detected
Bromoform	12	Not Detected	120	Not Detected
Cumene	12	Not Detected	59	Not Detected
1,1,2,2-Tetrachloroethane	12	Not Detected	82	Not Detected
Propylbenzene	12	Not Detected	59	Not Detected
4-Ethyltoluene	12	Not Detected	59	Not Detected
1,3,5-Trimethylbenzene	12	Not Detected	59	Not Detected
1,2,4-Trimethylbenzene	12	Not Detected	59	Not Detected
1,3-Dichlorobenzene	12	Not Detected	72	Not Detected
1,4-Dichlorobenzene	12	Not Detected	72	Not Detected
alpha-Chlorotoluene	12	Not Detected	62	Not Detected
1,2-Dichlorobenzene	12	Not Detected	72	Not Detected
1,2,4-Trichlorobenzene	48	Not Detected	360	Not Detected
Hexachlorobutadiene	48	Not Detected	510	Not Detected
1,1-Difluoroethane	48	65	130	180

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	105	70-130	
Toluene-d8	98	70-130	
4-Bromofluorobenzene	95	70-130	



## Client Sample ID: SG5-7 Lab ID#: 1608198-08A

File Name:	j081614	Dat	te of Collection: 8/10	)/16 2:54:00 PM
Dil. Factor:	2.31	Date of Analysis: 8/16/16 05:21 PM		
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(nnhy)	(nnhy)	(ua/m2)	/ua/m2\

	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	12	Not Detected	57	Not Detected
Freon 114	12	Not Detected	81	Not Detected
Chloromethane	46	Not Detected	95	Not Detected
Vinyl Chloride	12	Not Detected	30	Not Detected
1,3-Butadiene	12	Not Detected	26	Not Detected
Bromomethane	46	Not Detected	180	Not Detected
Chloroethane	46	Not Detected	120	Not Detected
Freon 11	12	Not Detected	65	Not Detected
Ethanol	46	Not Detected	87	Not Detected
Freon 113	12	Not Detected	88	Not Detected
1,1-Dichloroethene	12	Not Detected	46	Not Detected
Acetone	46	Not Detected	110	Not Detected
2-Propanol	46	Not Detected	110	Not Detected
Carbon Disulfide	46	Not Detected	140	Not Detected
3-Chloropropene	46	Not Detected	140	Not Detected
Methylene Chloride	46	Not Detected	160	Not Detected
Methyl tert-butyl ether	12	Not Detected	42	Not Detected
trans-1,2-Dichloroethene	12	Not Detected	46	Not Detected
Hexane	12	Not Detected	41	Not Detected
1,1-Dichloroethane	12	Not Detected	47	Not Detected
2-Butanone (Methyl Ethyl Ketone)	46	Not Detected	140	Not Detected
cis-1,2-Dichloroethene	12	Not Detected	46	Not Detected
Tetrahydrofuran	12	Not Detected	34	Not Detected
Chloroform	12	Not Detected	56	Not Detected
1,1,1-Trichloroethane	12	Not Detected	63	Not Detected
Cyclohexane	12	Not Detected	40	Not Detected
Carbon Tetrachloride	12	Not Detected	73	Not Detected
2,2,4-Trimethylpentane	12	Not Detected	54	Not Detected
Benzene	12	Not Detected	37	Not Detected
1,2-Dichloroethane	12	Not Detected	47	Not Detected
Heptane	12	Not Detected	47	Not Detected
Trichloroethene	12	Not Detected	62	Not Detected
1,2-Dichloropropane	12	Not Detected	53	Not Detected
1,4-Dioxane	46	Not Detected	170	Not Detected
Bromodichloromethane	12	Not Detected	77	Not Detected
cis-1,3-Dichloropropene	12	Not Detected	52	Not Detected
4-Methyl-2-pentanone	12	Not Detected	47	Not Detected
Toluene	12	Not Detected	44	Not Detected
trans-1,3-Dichloropropene	12	Not Detected	52	Not Detected
1,1,2-Trichloroethane	12	Not Detected	63	Not Detected
Tetrachloroethene	12	820	78	5500
2-Hexanone	46	Not Detected	190	Not Detected



### Client Sample ID: SG5-7 Lab ID#: 1608198-08A EPA METHOD TO-15 GC/MS

File Name: j081614 Date of Collection: 8/10/16 2:54:00 PM
Dil. Factor: 2.31 Date of Analysis: 8/16/16 05:21 PM

חום. ו מכנסו	2.31	Date of Analysis. 6/10/10 03.21 i		10 03.21 FW
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	12	Not Detected	98	Not Detected
1,2-Dibromoethane (EDB)	12	Not Detected	89	Not Detected
Chlorobenzene	12	Not Detected	53	Not Detected
Ethyl Benzene	12	Not Detected	50	Not Detected
m,p-Xylene	12	Not Detected	50	Not Detected
o-Xylene	12	Not Detected	50	Not Detected
Styrene	12	Not Detected	49	Not Detected
Bromoform	12	Not Detected	120	Not Detected
Cumene	12	Not Detected	57	Not Detected
1,1,2,2-Tetrachloroethane	12	Not Detected	79	Not Detected
Propylbenzene	12	Not Detected	57	Not Detected
4-Ethyltoluene	12	Not Detected	57	Not Detected
1,3,5-Trimethylbenzene	12	Not Detected	57	Not Detected
1,2,4-Trimethylbenzene	12	Not Detected	57	Not Detected
1,3-Dichlorobenzene	12	Not Detected	69	Not Detected
1,4-Dichlorobenzene	12	Not Detected	69	Not Detected
alpha-Chlorotoluene	12	Not Detected	60	Not Detected
1,2-Dichlorobenzene	12	Not Detected	69	Not Detected
1,2,4-Trichlorobenzene	46	Not Detected	340	Not Detected
Hexachlorobutadiene	46	Not Detected	490	Not Detected
1,1-Difluoroethane	46	1200	120	3200

		wethod	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	106	70-130	
Toluene-d8	97	70-130	
4-Bromofluorobenzene	94	70-130	



File Name:

1,4-Dioxane

Toluene

Bromodichloromethane

cis-1,3-Dichloropropene

trans-1,3-Dichloropropene

4-Methyl-2-pentanone

1,1,2-Trichloroethane

Tetrachloroethene

2-Hexanone

### Client Sample ID: SG5-17 Lab ID#: 1608198-09A

#### **EPA METHOD TO-15 GC/MS**

Date of Collection: 8/10/16 3:54:00 PM

j081624

Dil. Factor:	62.1	Date of Analysis: 8/16/16 11:35 PM		/16 11:35 PM
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	310	Not Detected	1500	Not Detected
Freon 114	310	Not Detected	2200	Not Detected
Chloromethane	1200	Not Detected	2600	Not Detected
Vinyl Chloride	310	Not Detected	790	Not Detected
1,3-Butadiene	310	Not Detected	690	Not Detected
Bromomethane	1200	Not Detected	4800	Not Detected
Chloroethane	1200	Not Detected	3300	Not Detected
Freon 11	310	Not Detected	1700	Not Detected
Ethanol	1200	Not Detected	2300	Not Detected
Freon 113	310	Not Detected	2400	Not Detected
1,1-Dichloroethene	310	Not Detected	1200	Not Detected
Acetone	1200	Not Detected	3000	Not Detected
2-Propanol	1200	Not Detected	3000	Not Detected
Carbon Disulfide	1200	Not Detected	3900	Not Detected
3-Chloropropene	1200	Not Detected	3900	Not Detected
Methylene Chloride	1200	Not Detected	4300	Not Detected
Methyl tert-butyl ether	310	Not Detected	1100	Not Detected
trans-1,2-Dichloroethene	310	Not Detected	1200	Not Detected
Hexane	310	Not Detected	1100	Not Detected
1,1-Dichloroethane	310	Not Detected	1200	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1200	Not Detected	3700	Not Detected
cis-1,2-Dichloroethene	310	Not Detected	1200	Not Detected
Tetrahydrofuran	310	Not Detected	920	Not Detected
Chloroform	310	Not Detected	1500	Not Detected
1,1,1-Trichloroethane	310	Not Detected	1700	Not Detected
Cyclohexane	310	Not Detected	1100	Not Detected
Carbon Tetrachloride	310	Not Detected	2000	Not Detected
2,2,4-Trimethylpentane	310	Not Detected	1400	Not Detected
Benzene	310	Not Detected	990	Not Detected
1,2-Dichloroethane	310	Not Detected	1200	Not Detected
Heptane	310	Not Detected	1300	Not Detected
Trichloroethene	310	Not Detected	1700	Not Detected
1,2-Dichloropropane	310	Not Detected	1400	Not Detected
• •				

Not Detected

360

Not Detected

4500

2100

1400

1300

1200

1400

1700

2100

5100

Not Detected Not Detected

Not Detected

Not Detected

Not Detected Not Detected

Not Detected

2400

Not Detected

1200

310

310

310

310

310

310

310

1200



### Client Sample ID: SG5-17 Lab ID#: 1608198-09A

### **EPA METHOD TO-15 GC/MS**

File Name:	j081624	Date of Collection: 8/10/16 3:54:00 PM
Dil. Factor:	62.1	Date of Analysis: 8/16/16 11:35 PM

	V#	Date of Amaryolo: 6/16/10 11:00 1 III		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	310	Not Detected	2600	Not Detected
1,2-Dibromoethane (EDB)	310	Not Detected	2400	Not Detected
Chlorobenzene	310	Not Detected	1400	Not Detected
Ethyl Benzene	310	Not Detected	1300	Not Detected
m,p-Xylene	310	Not Detected	1300	Not Detected
o-Xylene	310	Not Detected	1300	Not Detected
Styrene	310	Not Detected	1300	Not Detected
Bromoform	310	Not Detected	3200	Not Detected
Cumene	310	Not Detected	1500	Not Detected
1,1,2,2-Tetrachloroethane	310	Not Detected	2100	Not Detected
Propylbenzene	310	Not Detected	1500	Not Detected
4-Ethyltoluene	310	Not Detected	1500	Not Detected
1,3,5-Trimethylbenzene	310	Not Detected	1500	Not Detected
1,2,4-Trimethylbenzene	310	Not Detected	1500	Not Detected
1,3-Dichlorobenzene	310	Not Detected	1900	Not Detected
1,4-Dichlorobenzene	310	Not Detected	1900	Not Detected
alpha-Chlorotoluene	310	Not Detected	1600	Not Detected
1,2-Dichlorobenzene	310	Not Detected	1900	Not Detected
1,2,4-Trichlorobenzene	1200	Not Detected	9200	Not Detected
Hexachlorobutadiene	1200	Not Detected	13000	Not Detected
1,1-Difluoroethane	1200	310000 E	3400	840000 E

E = Exceeds instrument calibration range.

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	107	70-130	
Toluene-d8	102	70-130	
4-Bromofluorobenzene	95	70-130	



### Client Sample ID: SG6-7 Lab ID#: 1608198-10A EPA METHOD TO-15 GC/MS

File Name: Dil. Factor:	j081615 2.58	Date of Collection: 8/10/16 5:41:00 PM Date of Analysis: 8/16/16 07:31 PM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	13	Not Detected	64	Not Detected

	(11 /	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		· · · ·
Freon 12	13	Not Detected	64	Not Detected
Freon 114	13	Not Detected	90	Not Detected
Chloromethane	52	Not Detected	110	Not Detected
Vinyl Chloride	13	Not Detected	33	Not Detected
1,3-Butadiene	13	Not Detected	28	Not Detected
Bromomethane	52	Not Detected	200	Not Detected
Chloroethane	52	Not Detected	140	Not Detected
Freon 11	13	Not Detected	72	Not Detected
Ethanol	52	Not Detected	97	Not Detected
Freon 113	13	Not Detected	99	Not Detected
1,1-Dichloroethene	13	Not Detected	51	Not Detected
Acetone	52	Not Detected	120	Not Detected
2-Propanol	52	Not Detected	130	Not Detected
Carbon Disulfide	52	Not Detected	160	Not Detected
3-Chloropropene	52	Not Detected	160	Not Detected
Methylene Chloride	52	Not Detected	180	Not Detected
Methyl tert-butyl ether	13	Not Detected	46	Not Detected
trans-1,2-Dichloroethene	13	Not Detected	51	Not Detected
Hexane	13	Not Detected	45	Not Detected
1,1-Dichloroethane	13	Not Detected	52	Not Detected
2-Butanone (Methyl Ethyl Ketone)	52	Not Detected	150	Not Detected
cis-1,2-Dichloroethene	13	Not Detected	51	Not Detected
Tetrahydrofuran	13	Not Detected	38	Not Detected
Chloroform	13	Not Detected	63	Not Detected
1,1,1-Trichloroethane	13	Not Detected	70	Not Detected
Cyclohexane	13	Not Detected	44	Not Detected
Carbon Tetrachloride	13	Not Detected	81	Not Detected
2,2,4-Trimethylpentane	13	Not Detected	60	Not Detected
Benzene	13	Not Detected	41	Not Detected
1,2-Dichloroethane	13	Not Detected	52	Not Detected
Heptane	13	Not Detected	53	Not Detected
Trichloroethene	13	Not Detected	69	Not Detected
1,2-Dichloropropane	13	Not Detected	60	Not Detected
1,4-Dioxane	52	Not Detected	180	Not Detected
Bromodichloromethane	13	Not Detected	86	Not Detected
cis-1,3-Dichloropropene	13	Not Detected	58	Not Detected
4-Methyl-2-pentanone	13	Not Detected	53	Not Detected
Toluene	13	Not Detected	49	Not Detected
trans-1,3-Dichloropropene	13	Not Detected	58	Not Detected
1,1,2-Trichloroethane	13	Not Detected	70	Not Detected
Tetrachloroethene	13	1200	88	8400
2-Hexanone	52	Not Detected	210	Not Detected
	<b>3-</b>		=.•	



# Client Sample ID: SG6-7 Lab ID#: 1608198-10A

### **EPA METHOD TO-15 GC/MS**

File Name:	j081615	Date of Collection: 8/10/16 5:41:00 PM
Dil. Factor:	2.58	Date of Analysis: 8/16/16 07:31 PM

=		Date of Atlanyolo: 0, 10, 10 07:01 1 III		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	13	Not Detected	110	Not Detected
1,2-Dibromoethane (EDB)	13	Not Detected	99	Not Detected
Chlorobenzene	13	Not Detected	59	Not Detected
Ethyl Benzene	13	Not Detected	56	Not Detected
m,p-Xylene	13	Not Detected	56	Not Detected
o-Xylene	13	Not Detected	56	Not Detected
Styrene	13	Not Detected	55	Not Detected
Bromoform	13	Not Detected	130	Not Detected
Cumene	13	Not Detected	63	Not Detected
1,1,2,2-Tetrachloroethane	13	Not Detected	88	Not Detected
Propylbenzene	13	Not Detected	63	Not Detected
4-Ethyltoluene	13	Not Detected	63	Not Detected
1,3,5-Trimethylbenzene	13	Not Detected	63	Not Detected
1,2,4-Trimethylbenzene	13	Not Detected	63	Not Detected
1,3-Dichlorobenzene	13	Not Detected	78	Not Detected
1,4-Dichlorobenzene	13	Not Detected	78	Not Detected
alpha-Chlorotoluene	13	Not Detected	67	Not Detected
1,2-Dichlorobenzene	13	Not Detected	78	Not Detected
1,2,4-Trichlorobenzene	52	Not Detected	380	Not Detected
Hexachlorobutadiene	52	Not Detected	550	Not Detected
1,1-Difluoroethane	52	240	140	660

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	105	70-130	
Toluene-d8	100	70-130	
4-Bromofluorobenzene	95	70-130	



## Client Sample ID: SG6-17 Lab ID#: 1608198-11A

File Name: Dil. Factor:	j081616 2.58	Date of Collection: 8/10/16 5:09:0 Date of Analysis: 8/16/16 07:54 Pl		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	13	Not Detected	64	Not Detected
Freon 114	13	Not Detected	90	Not Detected
Chloromethane	52	Not Detected	110	Not Detected
Vinyl Chloride	13	Not Detected	33	Not Detected
1,3-Butadiene	13	Not Detected	28	Not Detected
Bromomethane	52	Not Detected	200	Not Detected
Chloroethane	52	Not Detected	140	Not Detected
Freon 11	13	Not Detected	72	Not Detected
Ethanol	52	Not Detected	97	Not Detected
Freon 113	13	Not Detected	99	Not Detected
1,1-Dichloroethene	13	Not Detected	51	Not Detected
Acetone	52	Not Detected	120	Not Detected
2-Propanol	52	Not Detected	130	Not Detected
Carbon Disulfide	52	Not Detected	160	Not Detected
3-Chloropropene	52	Not Detected	160	Not Detected
Methylene Chloride	52	Not Detected	180	Not Detected
Methyl tert-butyl ether	13	Not Detected	46	Not Detected
trans-1,2-Dichloroethene	13	Not Detected	51	Not Detected
Hexane	13	Not Detected	45	Not Detected
1,1-Dichloroethane	13	Not Detected	52	Not Detected
2-Butanone (Methyl Ethyl Ketone)	52	Not Detected	150	Not Detected
cis-1,2-Dichloroethene	13	Not Detected	51	Not Detected
Tetrahydrofuran	13	Not Detected	38	Not Detected
Chloroform	13	Not Detected	63	Not Detected
1,1,1-Trichloroethane	13	Not Detected	70	Not Detected
Cyclohexane	13	Not Detected	44	Not Detected
Carbon Tetrachloride	13	Not Detected	81	Not Detected
2,2,4-Trimethylpentane	13	Not Detected	60	Not Detected
Benzene	13	Not Detected	41	Not Detected
1,2-Dichloroethane	13	Not Detected	52	Not Detected
	13	Not Detected	53	Not Detected
Heptane	13		53 69	
Trichloroethene		Not Detected		Not Detected
1,2-Dichloropropane	13 52	Not Detected	60 180	Not Detected
1,4-Dioxane	52	Not Detected	180 86	Not Detected
Bromodichloromethane	13	Not Detected	86	Not Detected
cis-1,3-Dichloropropene	13	Not Detected	58	Not Detected
4-Methyl-2-pentanone	13	Not Detected	53	Not Detected
Toluene	13	Not Detected	49	Not Detected
trans-1,3-Dichloropropene	13	Not Detected	58	Not Detected
1,1,2-Trichloroethane	13	Not Detected	70	Not Detected
Tetrachloroethene	13	1300	88	8600
2-Hexanone	52	Not Detected	210	Not Detected



## Client Sample ID: SG6-17 Lab ID#: 1608198-11A

### EPA METHOD TO-15 GC/MS

File Name:	j081616	Date of Collection: 8/10/16 5:09:00 PM
Dil. Factor:	2.58	Date of Analysis: 8/16/16 07:54 PM

Dili. I dotor.	2.30	Date of Allarysis. Of for 10 of 154 i W		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	13	Not Detected	110	Not Detected
1,2-Dibromoethane (EDB)	13	Not Detected	99	Not Detected
Chlorobenzene	13	Not Detected	59	Not Detected
Ethyl Benzene	13	Not Detected	56	Not Detected
m,p-Xylene	13	Not Detected	56	Not Detected
o-Xylene	13	Not Detected	56	Not Detected
Styrene	13	Not Detected	55	Not Detected
Bromoform	13	Not Detected	130	Not Detected
Cumene	13	Not Detected	63	Not Detected
1,1,2,2-Tetrachloroethane	13	Not Detected	88	Not Detected
Propylbenzene	13	Not Detected	63	Not Detected
4-Ethyltoluene	13	Not Detected	63	Not Detected
1,3,5-Trimethylbenzene	13	Not Detected	63	Not Detected
1,2,4-Trimethylbenzene	13	Not Detected	63	Not Detected
1,3-Dichlorobenzene	13	Not Detected	78	Not Detected
1,4-Dichlorobenzene	13	Not Detected	78	Not Detected
alpha-Chlorotoluene	13	Not Detected	67	Not Detected
1,2-Dichlorobenzene	13	Not Detected	78	Not Detected
1,2,4-Trichlorobenzene	52	Not Detected	380	Not Detected
Hexachlorobutadiene	52	Not Detected	550	Not Detected
1,1-Difluoroethane	52	110	140	300

		Wethod	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	106	70-130	
Toluene-d8	96	70-130	
4-Bromofluorobenzene	93	70-130	



## Client Sample ID: SG7-7 Lab ID#: 1608198-12A

File Name:	j081617	Date of Collection: 8/10/16 6:12:00 PM
Dil. Factor:	2.38	Date of Analysis: 8/16/16 08:19 PM

Dil. Factor:	2.38	Date of Analysis: 8/16/16 08:19 P		
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	12	Not Detected	59	Not Detected
Freon 114	12	Not Detected	83	Not Detected
Chloromethane	48	Not Detected	98	Not Detected
Vinyl Chloride	12	Not Detected	30	Not Detected
1,3-Butadiene	12	Not Detected	26	Not Detected
Bromomethane	48	Not Detected	180	Not Detected
Chloroethane	48	Not Detected	120	Not Detected
Freon 11	12	Not Detected	67	Not Detected
Ethanol	48	Not Detected	90	Not Detected
Freon 113	12	Not Detected	91	Not Detected
1,1-Dichloroethene	12	Not Detected	47	Not Detected
Acetone	48	Not Detected	110	Not Detected
2-Propanol	48	Not Detected	120	Not Detected
Carbon Disulfide	48	Not Detected	150	Not Detected
3-Chloropropene	48	Not Detected	150	Not Detected
Methylene Chloride	48	Not Detected	160	Not Detected
Methyl tert-butyl ether	12	Not Detected	43	Not Detected
trans-1,2-Dichloroethene	12	Not Detected	47	Not Detected
Hexane	12	Not Detected	42	Not Detected
1,1-Dichloroethane	12	Not Detected	48	Not Detected
2-Butanone (Methyl Ethyl Ketone)	48	Not Detected	140	Not Detected
cis-1,2-Dichloroethene	12	Not Detected	47	Not Detected
Tetrahydrofuran	12	24	35	70
Chloroform	12	Not Detected	58	Not Detected
1,1,1-Trichloroethane	12	Not Detected	65	Not Detected
Cyclohexane	12	Not Detected	41	Not Detected
Carbon Tetrachloride	12	Not Detected	75	Not Detected
2,2,4-Trimethylpentane	12	Not Detected	56	Not Detected
Benzene	12	Not Detected	38	Not Detected
1,2-Dichloroethane	12	Not Detected	48	Not Detected
Heptane	12	Not Detected	49	Not Detected
Trichloroethene	12	Not Detected	64	Not Detected
1,2-Dichloropropane	12	Not Detected	55	Not Detected
1,4-Dioxane	48	Not Detected	170	Not Detected
Bromodichloromethane	12	Not Detected	80	Not Detected
cis-1,3-Dichloropropene	12	Not Detected	54	Not Detected
4-Methyl-2-pentanone	12	Not Detected	49	Not Detected
Toluene	12	Not Detected	45	Not Detected
trans-1,3-Dichloropropene	12	Not Detected	54	Not Detected
1,1,2-Trichloroethane	12	Not Detected	65	Not Detected
Tetrachloroethene	12	Not Detected	81	Not Detected
2-Hexanone	48	Not Detected	190	Not Detected



# Client Sample ID: SG7-7 Lab ID#: 1608198-12A

### **EPA METHOD TO-15 GC/MS**

File Name:	j081617	Date of Collection: 8/10/16 6:12:00 PM
Dil. Factor:	2.38	Date of Analysis: 8/16/16 08:19 PM

Dili. I dotor.	2.30	Date of Analysis. 0/10/10 00:13 i iii		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	12	Not Detected	100	Not Detected
1,2-Dibromoethane (EDB)	12	Not Detected	91	Not Detected
Chlorobenzene	12	Not Detected	55	Not Detected
Ethyl Benzene	12	Not Detected	52	Not Detected
m,p-Xylene	12	Not Detected	52	Not Detected
o-Xylene	12	Not Detected	52	Not Detected
Styrene	12	Not Detected	51	Not Detected
Bromoform	12	Not Detected	120	Not Detected
Cumene	12	Not Detected	58	Not Detected
1,1,2,2-Tetrachloroethane	12	Not Detected	82	Not Detected
Propylbenzene	12	Not Detected	58	Not Detected
4-Ethyltoluene	12	Not Detected	58	Not Detected
1,3,5-Trimethylbenzene	12	Not Detected	58	Not Detected
1,2,4-Trimethylbenzene	12	Not Detected	58	Not Detected
1,3-Dichlorobenzene	12	Not Detected	72	Not Detected
1,4-Dichlorobenzene	12	Not Detected	72	Not Detected
alpha-Chlorotoluene	12	Not Detected	62	Not Detected
1,2-Dichlorobenzene	12	Not Detected	72	Not Detected
1,2,4-Trichlorobenzene	48	Not Detected	350	Not Detected
Hexachlorobutadiene	48	Not Detected	510	Not Detected
1,1-Difluoroethane	48	96	130	260

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	108	70-130	
Toluene-d8	98	70-130	
4-Bromofluorobenzene	90	70-130	



## Client Sample ID: SG7-17 Lab ID#: 1608198-13A

Compound         Rpt. Limit (ppbv)         Amount (upfm3)         Rpt. Limit (upfm3)         Amount (upfm3)           Freon 12         12         Not Detected         60         Not Detected Freon 114         12         Not Detected         85         Not Detected Remain (upfm3)           Chloromethane         49         Not Detected         100         Not Detected Remain (upfm3)         31         Not Detected Remain (upfm3)         32         Not Detected Remain (upfm3)	File Name: Dil. Factor:	j081618 2.44		of Collection: 8/1 of Analysis: 8/16	
Freon 114         12         Not Detected         85         Not Detected           Chloromethane         49         Not Detected         100         Not Detected           Unyl Chloride         12         Not Detected         31         Not Detected           1,3-Butadiene         12         Not Detected         27         Not Detected           Chloromethane         49         Not Detected         190         Not Detected           Chloromethane         49         Not Detected         130         Not Detected           Freon 11         12         Not Detected         92         Not Detected           Freon 113         12         Not Detected         92         Not Detected           1,1-Dichloroethene         12         Not Detected         49         Not Detected           1,1-Dichloroethene         12         Not Detected         48         Not Detected           2,Propanol         49         Not Detected         120         Not Detected           Carbon Disulfide         49         Not Detected         150         Not Detected           Carbon Disulfide         49         Not Detected         150         Not Detected           Methylene Chloride         49         Not Detecte	Compound	=		-	
Chloromethane         49         Not Detected         31         Not Detected           Vinyl Chloride         12         Not Detected         31         Not Detected           1.3-Butadiene         12         Not Detected         27         Not Detected           Bromomethane         49         Not Detected         190         Not Detected           Chloroethane         49         Not Detected         130         Not Detected           Freon 11         12         Not Detected         68         Not Detected           Ethanol         49         Not Detected         92         Not Detected           Freon 113         12         Not Detected         92         Not Detected           1.1-Dichloroethene         12         Not Detected         48         Not Detected           Acetone         49         Not Detected         120         Not Detected           2-Propanol         49         Not Detected         120         Not Detected           2-Propanol         49         Not Detected         150         Not Detected           3-Chioropropene         49         Not Detected         150         Not Detected           Methylerbutyl ether         12         Not Detected         1	Freon 12	12	Not Detected	60	Not Detected
Vinyl Chloride         12         Not Detected         31         Not Detected           1,3-Butadiene         12         Not Detected         27         Not Detected           Bromomethane         49         Not Detected         190         Not Detected           Chloroethane         49         Not Detected         130         Not Detected           Freon 11         12         Not Detected         68         Not Detected           Ethanol         49         Not Detected         92         Not Detected           Freon 113         12         Not Detected         49         Not Detected           1,1-Dichloroethene         12         Not Detected         48         Not Detected           Acetone         49         Not Detected         120         Not Detected           2-Propanol         49         Not Detected         120         Not Detected           2-Propanol         49         Not Detected         150         Not Detected           2-Propanol         49         Not Detected         150         Not Detected           2-Propanol         49         Not Detected         150         Not Detected           2-Chloropropopene         49         Not Detected         150	Freon 114	12	Not Detected	85	Not Detected
1,3-Butadiene         12         Not Detected         27         Not Detected Bromomethane         49         Not Detected         190         Not Detected Chloroethane         49         Not Detected         190         Not Detected Freon 11         12         Not Detected         130         Not Detected Freon 11         12         Not Detected         68         Not Detected Freon 113         12         Not Detected         92         Not Detected Treon 113         12         Not Detected         48         Not Detected Acetone         12         Not Detected         48         Not Detected Acetone         49         Not Detected 120         Not Detected Acetone         49         Not Detected 120         Not Detected 2-Propanol         49         Not Detected 120         Not Detected 2-Propanol         49         Not Detected 150         Not Detected 3-Chloropropene         49         Not Detected 150         Not Detected 170         Not Detected 170         Not Detected 150         Not Detected 170	Chloromethane	49	Not Detected	100	Not Detected
Bromomethane	Vinyl Chloride	12	Not Detected	31	Not Detected
Chloroethane         49         Not Detected         130         Not Detected Freon 11         12         Not Detected         68         Not Detected Ethanol         49         Not Detected         92         Not Detected Freon 113         12         Not Detected         94         Not Detected Freon 113         12         Not Detected         94         Not Detected Freon 113         12         Not Detected         49         Not Detected Freon 113         12         Not Detected         48         Not Detected Freon 113         12         Not Detected         120         Not Detected Freon 113         12         Not Detected Freon 113         12         Not Detected Freon 113         12         Not Detected Freon 114         12         Not Detected Freon 120         Not Detected Freon 120         12         Not Detected Freon 120	1,3-Butadiene	12	Not Detected	27	Not Detected
Freon 11         12         Not Detected         68         Not Detected Ethanol         49         Not Detected         92         Not Detected Freon 113         12         Not Detected         94         Not Detected         1,1-Dichloroethene         12         Not Detected         48         Not Detected Acetone         49         Not Detected         48         Not Detected Acetone         49         Not Detected         120         Not Detected Acetone         120 <td< td=""><td>Bromomethane</td><td>49</td><td>Not Detected</td><td>190</td><td>Not Detected</td></td<>	Bromomethane	49	Not Detected	190	Not Detected
Ethanol         49         Not Detected         92         Not Detected Freon 113         12         Not Detected         94         Not Detected Picon 113         Not Detected         94         Not Detected         48         Not Detected Ace Not Detected         49         Not Detected Ace Not Detected         120         Not Detected Ace Not Detected         120         Not Detected Ace Not Detected         120         Not Detected Ace Not Detected         150         Not Detected Ace	Chloroethane	49	Not Detected	130	Not Detected
Freon 113         12         Not Detected         94         Not Detected           1,1-Dichloroethene         12         Not Detected         48         Not Detected           Acetone         49         Not Detected         120         Not Detected           2-Propanol         49         Not Detected         120         Not Detected           Garbon Disulfide         49         Not Detected         150         Not Detected           3-Chloropropene         49         Not Detected         150         Not Detected           Methylene Chloride         49         Not Detected         170         Not Detected           Methylene Chloride         49         Not Detected         44         Not Detected           Methyl tert-butyl ether         12         Not Detected         44         Not Detected           Hexane         12         Not Detected         48         Not Detected           Hexane         12         Not Detected         43         Not Detected           Hexane         12         Not Detected         49         Not Detected           Hexane         12         Not Detected         48         Not Detected           Gis-1,2-Dichloroethene         12         Not Detected	Freon 11	12	Not Detected	68	Not Detected
1,1-Dichloroethene         12         Not Detected         48         Not Detected           Acetone         49         Not Detected         120         Not Detected           2-Propanol         49         Not Detected         120         Not Detected           Carbon Disulfide         49         Not Detected         150         Not Detected           3-Chloropropene         49         Not Detected         150         Not Detected           Methyl tert-butyl ether         12         Not Detected         44         Not Detected           Methyl tert-butyl ether         12         Not Detected         44         Not Detected           Hexane         12         Not Detected         48         Not Detected           Hexane         12         Not Detected         48         Not Detected           1,1-Dichloroethene         12         Not Detected         49         Not Detected           2-Butanone (Methyl Ethyl Ketone)         49         Not Detected         140         Not Detected           15-1,2-Dichloroethene         12         Not Detected         48         Not Detected           15-2-Dichloroethene         12         Not Detected         36         Not Detected           15-2-Dichloroethane <td>Ethanol</td> <td>49</td> <td>Not Detected</td> <td>92</td> <td>Not Detected</td>	Ethanol	49	Not Detected	92	Not Detected
Acetone 49 Not Detected 120 Not Detected 2-Propanol 49 Not Detected 120 Not Detected Carbon Disulfide 49 Not Detected 150 Not Detected 3-Chloropropene 49 Not Detected 150 Not Detected Methylene Chloride 49 Not Detected 150 Not Detected Methyl tert-butyl ether 12 Not Detected 44 Not Detected 140 Not Detected 140 Not Detected 141 Not Detected 141 Not Detected 142 Not Detected 143 Not Detected 143 Not Detected 144	Freon 113	12	Not Detected	94	Not Detected
Acetone         49         Not Detected         120         Not Detected           2-Propanol         49         Not Detected         120         Not Detected           3-Chloropropene         49         Not Detected         150         Not Detected           3-Chloropropene         49         Not Detected         150         Not Detected           Methyl tert-butyl ether         12         Not Detected         170         Not Detected           Methyl tert-butyl ether         12         Not Detected         44         Not Detected           Hexane         12         Not Detected         48         Not Detected           Hexane         12         Not Detected         48         Not Detected           Hexane         12         Not Detected         43         Not Detected           1,1-Dichloroethane         12         Not Detected         49         Not Detected           2-Butanone (Methyl Ethyl Ketone)         49         Not Detected         48         Not Detected           2-Butanone (Methyl Ethyl Ketone)         49         Not Detected         40         Not Detected           2-Butanone (Methyl Ethyl Ketone)         12         Not Detected         40         Not Detected           2-Butanone (	1,1-Dichloroethene	12	Not Detected	48	Not Detected
2-Propanol 49 Not Detected 120 Not Detected Carbon Disulficie 49 Not Detected 150 Not Detected 3-Chloropropene 49 Not Detected 150 Not Detected Methylene Chloride 49 Not Detected 170 Not Detected Methylene Chloride 49 Not Detected 170 Not Detected Methylene Chloride 49 Not Detected 44 Not Detected Methylene Chloride 12 Not Detected 44 Not Detected trans-1,2-Dichloroethene 12 Not Detected 48 Not Detected 48 Not Detected 48 Not Detected 49 Not Detected 49 Not Detected 49 Not Detected 4,1-Dichloroethane 12 Not Detected 49 Not Detected 4,1-Dichloroethane 12 Not Detected 49 Not Detected 6,1-Dichloroethane 12 Not Detected 49 Not Detected 6,1-Dichloroethane 12 Not Detected 48 Not Detected 6,1-Dichloroethane 12 Not Detected 48 Not Detected 6,1-Dichloroethane 12 Not Detected 48 Not Detected 6,1-Dichloroethane 12 Not Detected 60 Not Detected 6,1-Dichloroethane 12 Not Detected 77 Not Detected 6,1-Dichloroethane 12 Not Detected 77 Not Detected 6,1-Dichloroethane 12 Not Detected 57 Not Detected 6,1-Dichloroethane 12 Not Detected 57 Not Detected 6,1-Dichloroethane 12 Not Detected 49 Not Detected 1,2-Dichloroethane 12 Not Detected 49 Not Detected 1,2-Dichloropropane 12 Not Detected 50 Not Detected 7,2-Dichloropropane 12 Not Detected 50 Not Detected 1,2-Dichloropropane 12 Not Detected 55 Not Detected 6,1-Dichloropropane 12 Not Detected 55 Not Detected 6,1-Dichloroprop	•		Not Detected		Not Detected
Carbon Disulfide 3-Chloropropene 49 Not Detected 150 Not Detected 3-Chloropropene 49 Not Detected 150 Not Detected Methylene Chloride 49 Not Detected 170 Not Detected Methylene Chloride 49 Not Detected 170 Not Detected trans-1,2-Dichloroethene 12 Not Detected 44 Not Detected trans-1,2-Dichloroethene 12 Not Detected 48 Not Detected 1,1-Dichloroethene 12 Not Detected 49 Not Detected 1,1-Dichloroethane 12 Not Detected 49 Not Detected 1,1-Dichloroethane 12 Not Detected 49 Not Detected 2-Butanone (Methyl Ethyl Ketone) 49 Not Detected 48 Not Detected 2-Butanone (Methyl Ethyl Ketone) 49 Not Detected 48 Not Detected 2-Entrahydrofuran 12 Not Detected 48 Not Detected 2-Entrahydrofuran 12 Not Detected 60 Not Detected 2-Entrahydrofuran 12 Not Detected 65 Not Detected 2-Entrahydrofuran 12 Not Detected 42 Not Detected 2-Entrahydrofuran 12 Not Detected 42 Not Detected 2-Entrahydrofuran 12 Not Detected 57 Not Detected 2-Entrahydrofuran 12 Not Detected 57 Not Detected 4-Entrahydrofuran 12 Not Detected 49 Not Detected 4-Entrahydrofuran 12 Not Detected 49 Not Detected 4-Entrahydrofuran 12 Not Detected 50 Not Detected 1-Entrahydrofuran 12 Not Detected 56 Not Detected 1-Entrahydrofuran 12 Not Detected 56 Not Detected 1-Entrahydrofuran 12 Not Detected 55 Not Detected 1-Entrahydrofuran 12 Not Detected 55 Not Detected 51-Li-Entrahydrofuran 570 Not Detect	2-Propanol	49	Not Detected	120	Not Detected
Methylene Chloride 49 Not Detected 170 Not Detected Methyl tert-butyl ether 12 Not Detected 44 Not Detected trans-1,2-Dichloroethene 12 Not Detected 48 Not Detected Hexane 12 Not Detected 49 Not Detected 47,1-Dichloroethane 12 Not Detected 49 Not Detected 48 Not Detected 49 Not Detected 48 Not Detected 49 Not Detecte	· · · · · · · · · · · · · · · · · · ·	49	Not Detected	150	Not Detected
Methylene Chloride49Not Detected170Not DetectedMethyl tert-butyl ether12Not Detected44Not Detectedtrans-1,2-Dichloroethene12Not Detected48Not DetectedHexane12Not Detected43Not Detected1,1-Dichloroethane12Not Detected49Not Detected2-Butanone (Methyl Ethyl Ketone)49Not Detected140Not Detected2-Butanone (Methyl Ethyl Ketone)49Not Detected140Not Detected2-Butanone (Methyl Ethyl Ketone)49Not Detected48Not Detected2-Butanone (Methyl Ethyl Ketone)49Not Detected48Not Detected2-Butanone (Methyl Ethyl Ketone)49Not Detected48Not Detected2-Butanone (Methyl Ethyl Ketone)49Not Detected36Not DetectedChloroform12Not Detected36Not DetectedChloroform12Not Detected60Not DetectedChloroform12Not Detected60Not DetectedCyclohexane12Not Detected77Not DetectedCyclohexane12Not Detected39Not DetectedBenzene12Not Detected39Not Detected1,2-Dichloroethane12Not Detected49Not DetectedHeptane12Not Detected50Not Detected1,2-Dichloropropane12Not Detected66Not Detected1,2	3-Chloropropene	49		150	Not Detected
Methyl tert-butyl ether12Not Detected44Not Detectedtrans-1,2-Dichloroethene12Not Detected48Not DetectedHexane12Not Detected43Not Detected1,1-Dichloroethane12Not Detected49Not Detected2-Butanone (Methyl Ethyl Ketone)49Not Detected140Not Detected2-Butanone (Methyl Ethyl Ketone)49Not Detected140Not Detected2-Butanone (Methyl Ethyl Ketone)49Not Detected48Not Detected2-Butanone (Methyl Ethyl Ketone)12Not Detected36Not Detected2-Butanone (Methyl Ethyl Ketone)12Not Detected60Not Detected2-Dichloroform12Not Detected40Not Detected2-Not Detected46Not Detected42Not Detected2-Quid-Trinchloroethane12Not Detected49Not Detected1,2-Dichloropropane12Not Detected50Not Detected1,2-Dichloropropane12Not Detected56Not Detected2-Poichloropropane12Not Detected55Not Detected2-Poichloropropene12Not Detected55Not Detected3-Poichloropropene		49	Not Detected	170	Not Detected
trans-1,2-Dichloroethene 12 Not Detected 48 Not Detected Hexane 12 Not Detected 43 Not Detected 1,1-Dichloroethane 12 Not Detected 49 Not Detected 2-Butanone (Methyl Ethyl Ketone) 49 Not Detected 49 Not Detected cis-1,2-Dichloroethene 12 Not Detected 48 Not Detected cis-1,2-Dichloroethene 12 Not Detected 36 Not Detected 60 Not Detected 61,1,1-Trichloroethane 12 Not Detected 60 Not Detected 1,1,1-Trichloroethane 12 Not Detected 66 Not Detected 1,1,1-Trichloroethane 12 Not Detected 66 Not Detected 67 Not Detected 67 Not Detected 68 Not Detected 69 Not Detected 70 Not De		12	Not Detected	44	Not Detected
Hexane         12         Not Detected         43         Not Detected           1,1-Dichloroethane         12         Not Detected         49         Not Detected           2-Butanone (Methyl Ethyl Ketone)         49         Not Detected         140         Not Detected           cis-1,2-Dichloroethene         12         Not Detected         48         Not Detected           cis-1,2-Dichloroethene         12         Not Detected         36         Not Detected           Chloroform         12         Not Detected         60         Not Detected           1,1,1-Trichloroethane         12         Not Detected         66         Not Detected           1,2,1-Trimethyloroethane         12         Not Detected         77         Not Detected           Cyclohexane         12         Not Detected         77         Not Detected           Cyclohexane         12         Not Detected         37         Not Detected           Cyclohexane         12         Not Detected         37         Not Detected           Cyclohexane         12         Not Detected         39         Not Detected           Ly-Dichloroethane         12         Not Detected         49         Not Detected           Ly-Dichloroethane		12	Not Detected	48	
2-Butanone (Methyl Ethyl Ketone) 49 Not Detected cis-1,2-Dichloroethene 12 Not Detected 48 Not Detected Tetrahydrofuran 12 Not Detected 36 Not Detected Chloroform 12 Not Detected 60 Not Detected 1,1,1-Trichloroethane 12 Not Detected 66 Not Detected Cyclohexane 12 Not Detected 42 Not Detected Carbon Tetrachloride 12 Not Detected 77 Not Detected 2,2,4-Trimethylpentane 12 Not Detected 57 Not Detected 1,2-Dichloroethane 12 Not Detected 49 Not Detected 1,2-Dichloropropane 12 Not Detected 49 Not Detected 1,2-Dichloropropane 12 Not Detected 50 Not Detected 1,2-Dichloromethane 12 Not Detected 50 Not Detected 1,2-Dichloropropane 12 Not Detected 56 Not Detected 1,2-Dichloromethane 12 Not Detected 56 Not Detected 1,3-Dichloromethane 12 Not Detected 55 Not Detected 55 Not Detected 56 Not Detected 57 Not Detected 57 Not Detected 58 Not Detected 59 Not Detected 50 Not Detected 50 Not Detected 51 Not Detected 55 Not Detected 55 Not Detected 55 Not Detected 55 Not Detected 56 Not Detected 57 Not Detected 57 Not Detected 58 Not Detected 58 Not Detected 59 Not Detected 59 Not Detected 50 Not Detected 50 Not Detected 50 Not Detected 50 Not Detected 55 Not Detected 55 Not Detected 56 Not Detected 57 Not Detected 55 Not Detected 56 Not Detected 57 Not Detected 57 Not Detected 58 Not Detected 59 Not Detected 59 Not Detected 50 Not Detected 55 Not Detected 56 Not Detected 57 Not Detected 57 Not Detected 55 Not Detected 56 Not Detected 57 Not Detected 57 Not Detected 55 Not Detected 56 Not Detected 57 Not Detected 57 Not Detected 57		12	Not Detected	43	Not Detected
2-Butanone (Methyl Ethyl Ketone) 49 Not Detected cis-1,2-Dichloroethene 12 Not Detected 48 Not Detected Tetrahydrofuran 12 Not Detected 36 Not Detected Chloroform 12 Not Detected 60 Not Detected 1,1,1-Trichloroethane 12 Not Detected 66 Not Detected Cyclohexane 12 Not Detected 42 Not Detected Carbon Tetrachloride 12 Not Detected 77 Not Detected 2,2,4-Trimethylpentane 12 Not Detected 57 Not Detected 88 Not Detected 1,2-Dichloroethane 12 Not Detected 49 Not Detected 1,2-Dichloroethane 11 Not Detected 49 Not Detected 1,2-Dichloropropane 11 Not Detected 1,2-Dichloropropane 12 Not Detected 13 Not Detected 14 Not Detected 14 Not Detected 15 Not Detected 16 Not Detected 16 Not Detected 17 Not Detected 18 Not Detected	1,1-Dichloroethane	12	Not Detected	49	Not Detected
cis-1,2-Dichloroethene12Not Detected48Not DetectedTetrahydrofuran12Not Detected36Not DetectedChloroform12Not Detected60Not Detected1,1,1-Trichloroethane12Not Detected66Not DetectedCyclohexane12Not Detected42Not DetectedCarbon Tetrachloride12Not Detected77Not Detected2,2,4-Trimethylpentane12Not Detected57Not DetectedBenzene12Not Detected39Not Detected1,2-Dichloroethane12Not Detected49Not Detected1,2-Dichloroethane12Not Detected50Not DetectedHeptane12Not Detected50Not Detected1,2-Dichloropropane12Not Detected66Not Detected1,2-Dichloropropane12Not Detected180Not Detected1,4-Dioxane49Not Detected180Not DetectedBromodichloromethane12Not Detected55Not Detectedcis-1,3-Dichloropropene12Not Detected50Not DetectedToluene12Not Detected55Not DetectedToluene12Not Detected55Not DetectedToluene12Not Detected55Not DetectedToluene12Not Detected55Not DetectedToluene12Not Detected55Not DetectedToluene<		49	Not Detected	140	Not Detected
Tetrahydrofuran 12 Not Detected 36 Not Detected Chloroform 12 Not Detected 60 Not Detected 1,1,1-Trichloroethane 12 Not Detected 66 Not Detected 1,1,1-Trichloroethane 12 Not Detected 66 Not Detected 2,2,4-Trimethylpentane 12 Not Detected 77 Not Detected 2,2,4-Trimethylpentane 12 Not Detected 57 Not Detected 8enzene 12 Not Detected 39 Not Detected 1,2-Dichloroethane 12 Not Detected 39 Not Detected 1,2-Dichloroethane 12 Not Detected 49 Not Detected 1,2-Dichloroethane 12 Not Detected 50 Not Detected 1,2-Dichloropropane 12 Not Detected 50 Not Detected 1,2-Dichloropropane 12 Not Detected 56 Not Detected 1,4-Dioxane 49 Not Detected 56 Not Detected 1,4-Dioxane 49 Not Detected 82 Not Detected 1,3-Dichloropropane 12 Not Detected 82 Not Detected 65-1,3-Dichloropropane 12 Not Detected 55 Not Detected 64-Methyl-2-pentanone 12 Not Detected 50 Not Detected 10luene 12 Not Detected 55 Not Detected 11,2-Trichloroethane 12 Not Detected 66 Not Detected 11,2-Trichloroethane 12 Not Detected 1		12	Not Detected	48	Not Detected
Chloroform12Not Detected60Not Detected1,1,1-Trichloroethane12Not Detected66Not DetectedCyclohexane12Not Detected42Not DetectedCarbon Tetrachloride12Not Detected77Not Detected2,2,4-Trimethylpentane12Not Detected57Not DetectedBenzene12Not Detected39Not Detected1,2-Dichloroethane12Not Detected49Not Detected1,2-Dichloroethane12Not Detected50Not DetectedTrichloroethene12Not Detected66Not Detected1,2-Dichloropropane12Not Detected56Not Detected1,2-Dichloropropane12Not Detected56Not Detected1,4-Dioxane49Not Detected180Not Detected1,4-Dioxane49Not Detected82Not Detected1,3-Dichloropropene12Not Detected55Not Detected2,3-Dichloropropene12Not Detected50Not Detected3-Dichloropropene12Not Detected46Not Detected4-Methyl-2-pentanone12Not Detected55Not DetectedToluene12Not Detected55Not Detected1,2-Trichloroethane12Not Detected55Not Detected1,2-Trichloroethane12Not Detected66Not Detected1,2-Trichloroethane12Not Detected66		12	Not Detected	36	Not Detected
1,1,1-Trichloroethane12Not Detected66Not DetectedCyclohexane12Not Detected42Not DetectedCarbon Tetrachloride12Not Detected77Not Detected2,2,4-Trimethylpentane12Not Detected57Not DetectedBenzene12Not Detected39Not Detected1,2-Dichloroethane12Not Detected49Not DetectedHeptane12Not Detected50Not DetectedTrichloroethene12Not Detected66Not Detected1,2-Dichloropropane12Not Detected56Not Detected1,4-Dioxane49Not Detected180Not DetectedBromodichloromethane12Not Detected82Not Detectedcis-1,3-Dichloropropene12Not Detected55Not Detected4-Methyl-2-pentanone12Not Detected50Not DetectedToluene12Not Detected46Not DetectedToluene12Not Detected55Not DetectedToluene12Not Detect		12	Not Detected	60	Not Detected
Cyclohexane 12 Not Detected 42 Not Detected Carbon Tetrachloride 12 Not Detected 77 Not Detected 2,2,4-Trimethylpentane 12 Not Detected 57 Not Detected 8enzene 12 Not Detected 39 Not Detected 1,2-Dichloroethane 12 Not Detected 49 Not Detected 1,2-Dichloroethane 12 Not Detected 50 Not Detected 49 Heptane 12 Not Detected 50 Not Detected 50 Not Detected 1,2-Dichloropropane 12 Not Detected 56 Not Detected 1,2-Dichloropropane 12 Not Detected 56 Not Detected 1,4-Dioxane 49 Not Detected 56 Not Detected 1,4-Dioxane 49 Not Detected 82 Not Detected 85 Not Detected 1,4-Dioxane 12 Not Detected 82 Not Detected 155 Not Detected 155 Not Detected 156 Not Detected 156 Not Detected 157.3-Dichloropropene 12 Not Detected 55 Not Detected 156 Not Detected 157.3-Dichloropropene 157 Not Detected 157 Not Detected 158 Not Detected 159 Not Detected 159 Not Detected 159 Not Detected 150 N		12	Not Detected	66	Not Detected
Carbon Tetrachloride12Not Detected77Not Detected2,2,4-Trimethylpentane12Not Detected57Not DetectedBenzene12Not Detected39Not Detected1,2-Dichloroethane12Not Detected49Not DetectedHeptane12Not Detected50Not DetectedTrichloroethene12Not Detected66Not Detected1,2-Dichloropropane12Not Detected56Not Detected1,4-Dioxane49Not Detected180Not DetectedBromodichloromethane12Not Detected82Not Detectedcis-1,3-Dichloropropene12Not Detected55Not Detected4-Methyl-2-pentanone12Not Detected50Not DetectedToluene12Not Detected46Not DetectedToluene12Not Detected55Not DetectedToluene12Not Detected55Not DetectedToluene12Not Detected55Not DetectedToluene12Not Detected55Not DetectedToluene12Not Detected55Not DetectedToluene12Not Detected55Not DetectedToluene12Not Detected66Not DetectedToluene12Not Detected66Not DetectedToluene12Not Detected66Not DetectedToluene12Not Detected66		12	Not Detected	42	Not Detected
2,2,4-Trimethylpentane12Not Detected57Not DetectedBenzene12Not Detected39Not Detected1,2-Dichloroethane12Not Detected49Not DetectedHeptane12Not Detected50Not DetectedTrichloroethene12Not Detected66Not Detected1,2-Dichloropropane12Not Detected56Not Detected1,4-Dioxane49Not Detected180Not DetectedBromodichloromethane12Not Detected82Not Detectedcis-1,3-Dichloropropene12Not Detected55Not Detected4-Methyl-2-pentanone12Not Detected50Not DetectedToluene12Not Detected46Not Detectedtrans-1,3-Dichloropropene12Not Detected55Not Detected1,1,2-Trichloroethane12Not Detected55Not DetectedTetrachloroethene12Not Detected66Not Detected	•	12	Not Detected	77	Not Detected
Benzene12Not Detected39Not Detected1,2-Dichloroethane12Not Detected49Not DetectedHeptane12Not Detected50Not DetectedTrichloroethene12Not Detected66Not Detected1,2-Dichloropropane12Not Detected56Not Detected1,4-Dioxane49Not Detected180Not DetectedBromodichloromethane12Not Detected82Not Detectedcis-1,3-Dichloropropene12Not Detected55Not Detected4-Methyl-2-pentanone12Not Detected50Not DetectedToluene12Not Detected46Not DetectedToluene12Not Detected55Not Detected1,1,2-Trichloroethane12Not Detected55Not DetectedTetrachloroethene12Not Detected66Not DetectedTetrachloroethene12840835700		12		57	Not Detected
1,2-Dichloroethane12Not Detected49Not DetectedHeptane12Not Detected50Not DetectedTrichloroethene12Not Detected66Not Detected1,2-Dichloropropane12Not Detected56Not Detected1,4-Dioxane49Not Detected180Not DetectedBromodichloromethane12Not Detected82Not Detectedcis-1,3-Dichloropropene12Not Detected55Not Detected4-Methyl-2-pentanone12Not Detected50Not DetectedToluene12Not Detected46Not Detectedtrans-1,3-Dichloropropene12Not Detected55Not Detected1,1,2-Trichloroethane12Not Detected66Not DetectedTetrachloroethene12840835700		12	Not Detected	39	Not Detected
Trichloroethene 12 Not Detected 66 Not Detected 1,2-Dichloropropane 12 Not Detected 56 Not Detected 1,4-Dioxane 49 Not Detected 180 Not Detected Bromodichloromethane 12 Not Detected 82 Not Detected cis-1,3-Dichloropropene 12 Not Detected 55 Not Detected 4-Methyl-2-pentanone 12 Not Detected 50 Not Detected Toluene 12 Not Detected 46 Not Detected trans-1,3-Dichloropropene 12 Not Detected 46 Not Detected 1,1,2-Trichloroethane 12 Not Detected 55 Not Detected 1,1,2-Trichloroethane 12 Not Detected 66 Not Detected 1,1,2-Trichloroethane 12 Not Detected 55 Not Detected 55 Not Detected 55 Not Detected 1,1,2-Trichloroethane 12 Not Detected 55 Not Detected 55 Not Detected 55 Not Detected 1,1,2-Trichloroethane 12 Not Detected 55		12	Not Detected	49	Not Detected
Trichloroethene 12 Not Detected 66 Not Detected 1,2-Dichloropropane 12 Not Detected 56 Not Detected 1,4-Dioxane 49 Not Detected 180 Not Detected Bromodichloromethane 12 Not Detected 82 Not Detected cis-1,3-Dichloropropene 12 Not Detected 55 Not Detected 4-Methyl-2-pentanone 12 Not Detected 50 Not Detected Toluene 12 Not Detected 46 Not Detected trans-1,3-Dichloropropene 12 Not Detected 46 Not Detected 1,1,2-Trichloroethane 12 Not Detected 55 Not Detected 1,1,2-Trichloroethane 12 Not Detected 66 Not Detected 1,1,2-Trichloroethane 12 Not Detected 66 Not Detected 1,1,2-Trichloroethane 12 Not Detected 570 Not Detected 570 Not Detected 1,1,2-Trichloroethane 12 Not Detected 55 Not Detected 1,1,2-Trichloroethane 12 Not Detected 55 Not Detected 5,1,2-Trichloroethane 12 Not Detected 5,1,2-Trichloroethane 12 Not Detected 5,1,2-Trichloroethane 1,2 Not Detected 5,2 Not Detected		12	Not Detected	50	Not Detected
1,2-Dichloropropane12Not Detected56Not Detected1,4-Dioxane49Not Detected180Not DetectedBromodichloromethane12Not Detected82Not Detectedcis-1,3-Dichloropropene12Not Detected55Not Detected4-Methyl-2-pentanone12Not Detected50Not DetectedToluene12Not Detected46Not Detectedtrans-1,3-Dichloropropene12Not Detected55Not Detected1,1,2-Trichloroethane12Not Detected66Not DetectedTetrachloroethene12840835700	-		Not Detected	66	Not Detected
1,4-Dioxane49Not Detected180Not DetectedBromodichloromethane12Not Detected82Not Detectedcis-1,3-Dichloropropene12Not Detected55Not Detected4-Methyl-2-pentanone12Not Detected50Not DetectedToluene12Not Detected46Not Detectedtrans-1,3-Dichloropropene12Not Detected55Not Detected1,1,2-Trichloroethane12Not Detected66Not DetectedTetrachloroethene12840835700					
Bromodichloromethane12Not Detected82Not Detectedcis-1,3-Dichloropropene12Not Detected55Not Detected4-Methyl-2-pentanone12Not Detected50Not DetectedToluene12Not Detected46Not Detectedtrans-1,3-Dichloropropene12Not Detected55Not Detected1,1,2-Trichloroethane12Not Detected66Not DetectedTetrachloroethene12840835700					
cis-1,3-Dichloropropene 12 Not Detected 55 Not Detected 4-Methyl-2-pentanone 12 Not Detected 50 Not Detected Toluene 12 Not Detected 46 Not Detected trans-1,3-Dichloropropene 12 Not Detected 55 Not Detected 1,1,2-Trichloroethane 12 Not Detected 66 Not Detected Tetrachloroethene 12 Not Detected 83 5700			Not Detected		
4-Methyl-2-pentanone12Not Detected50Not DetectedToluene12Not Detected46Not Detectedtrans-1,3-Dichloropropene12Not Detected55Not Detected1,1,2-Trichloroethane12Not Detected66Not DetectedTetrachloroethene12840835700		12	Not Detected	55	Not Detected
Toluene12Not Detected46Not Detectedtrans-1,3-Dichloropropene12Not Detected55Not Detected1,1,2-Trichloroethane12Not Detected66Not DetectedTetrachloroethene12840835700					
trans-1,3-Dichloropropene 12 Not Detected 55 Not Detected 1,1,2-Trichloroethane 12 Not Detected 66 Not Detected Tetrachloroethene 12 840 83 5700					
1,1,2-Trichloroethane12Not Detected66Not DetectedTetrachloroethene12840835700					
Tetrachloroethene 12 840 83 5700					
A LIDAGIDID IQ NOLDOLOGO ACO NOLDOLOGO	2-Hexanone	49	Not Detected	200	Not Detected



## Client Sample ID: SG7-17 Lab ID#: 1608198-13A

#### **EPA METHOD TO-15 GC/MS**

File Name:	j081618	Date of Collection: 8/10/16 6:41:00 PM
Dil. Factor:	2.44	Date of Analysis: 8/16/16 08:44 PM

Dii: 1 doloi:	2.77	Date of Analysis. 0/10/10 00:44 1 W		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	12	Not Detected	100	Not Detected
1,2-Dibromoethane (EDB)	12	Not Detected	94	Not Detected
Chlorobenzene	12	Not Detected	56	Not Detected
Ethyl Benzene	12	Not Detected	53	Not Detected
m,p-Xylene	12	Not Detected	53	Not Detected
o-Xylene	12	Not Detected	53	Not Detected
Styrene	12	Not Detected	52	Not Detected
Bromoform	12	Not Detected	130	Not Detected
Cumene	12	Not Detected	60	Not Detected
1,1,2,2-Tetrachloroethane	12	Not Detected	84	Not Detected
Propylbenzene	12	Not Detected	60	Not Detected
4-Ethyltoluene	12	Not Detected	60	Not Detected
1,3,5-Trimethylbenzene	12	Not Detected	60	Not Detected
1,2,4-Trimethylbenzene	12	Not Detected	60	Not Detected
1,3-Dichlorobenzene	12	Not Detected	73	Not Detected
1,4-Dichlorobenzene	12	Not Detected	73	Not Detected
alpha-Chlorotoluene	12	Not Detected	63	Not Detected
1,2-Dichlorobenzene	12	Not Detected	73	Not Detected
1,2,4-Trichlorobenzene	49	Not Detected	360	Not Detected
Hexachlorobutadiene	49	Not Detected	520	Not Detected
1,1-Difluoroethane	49	Not Detected	130	Not Detected

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	108	70-130	
Toluene-d8	98	70-130	
4-Bromofluorobenzene	93	70-130	



# Client Sample ID: SG8-7 Lab ID#: 1608198-14A

File Name: Dil. Factor:	j081619 2.25	Date of Collection: 8/10/16 4:26:00 PN Date of Analysis: 8/16/16 09:09 PM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	11	Not Detected	56	Not Detected
Freon 114	11	Not Detected	79	Not Detected
Chloromethane	45	Not Detected	93	Not Detected
Vinyl Chloride	11	Not Detected	29	Not Detected
1,3-Butadiene	11	Not Detected	25	Not Detected
Bromomethane	45	Not Detected	170	Not Detected
Chloroethane	45	Not Detected	120	Not Detected
Freon 11	11	Not Detected	63	Not Detected
Ethanol	45	Not Detected	85	Not Detected
Freon 113	11	Not Detected	86	Not Detected
1,1-Dichloroethene	11	Not Detected	45	Not Detected
Acetone	45	Not Detected	110	Not Detected
2-Propanol	45	Not Detected	110	Not Detected
Carbon Disulfide	45	Not Detected	140	Not Detected
3-Chloropropene	45	Not Detected	140	Not Detected
Methylene Chloride	45	Not Detected	160	Not Detected
Methyl tert-butyl ether	11	Not Detected	40	Not Detected
trans-1,2-Dichloroethene	11	Not Detected	45	Not Detected
Hexane	11	Not Detected	40	Not Detected
1,1-Dichloroethane	11	Not Detected	46	Not Detected
2-Butanone (Methyl Ethyl Ketone)	45	Not Detected	130	Not Detected
cis-1,2-Dichloroethene	11	Not Detected	45	Not Detected
Tetrahydrofuran	11	Not Detected	33	Not Detected
Chloroform	11	Not Detected	55	Not Detected
1,1,1-Trichloroethane	11	Not Detected	61	Not Detected
Cyclohexane	11	Not Detected	39	Not Detected
Carbon Tetrachloride	11	Not Detected	71	Not Detected
2,2,4-Trimethylpentane	11	Not Detected	52	Not Detected
Benzene	11	Not Detected	36	Not Detected
1,2-Dichloroethane	11	Not Detected	46	Not Detected
Heptane	11	Not Detected	46	Not Detected
Trichloroethene	11	Not Detected	60	Not Detected
1,2-Dichloropropane	11	Not Detected	52	Not Detected
1,4-Dioxane	45	Not Detected	160	Not Detected
Bromodichloromethane	11	Not Detected	75	Not Detected
cis-1,3-Dichloropropene	11	Not Detected	51	Not Detected
4-Methyl-2-pentanone	11	Not Detected	46	Not Detected
Toluene	11	Not Detected	42	Not Detected
trans-1,3-Dichloropropene	11	Not Detected	51	Not Detected
1,1,2-Trichloroethane	11	Not Detected	61	Not Detected
Tetrachloroethene	11	16	76	110
2-Hexanone	45	Not Detected	180	Not Detected



# Client Sample ID: SG8-7 Lab ID#: 1608198-14A

### **EPA METHOD TO-15 GC/MS**

File Name:	j081619	Date of Collection: 8/10/16 4:26:00 PM
Dil. Factor:	2.25	Date of Analysis: 8/16/16 09:09 PM

	2.20		or randing of or or or	10 00100 1 111
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	11	Not Detected	96	Not Detected
1,2-Dibromoethane (EDB)	11	Not Detected	86	Not Detected
Chlorobenzene	11	Not Detected	52	Not Detected
Ethyl Benzene	11	Not Detected	49	Not Detected
m,p-Xylene	11	Not Detected	49	Not Detected
o-Xylene	11	Not Detected	49	Not Detected
Styrene	11	Not Detected	48	Not Detected
Bromoform	11	Not Detected	120	Not Detected
Cumene	11	Not Detected	55	Not Detected
1,1,2,2-Tetrachloroethane	11	Not Detected	77	Not Detected
Propylbenzene	11	Not Detected	55	Not Detected
4-Ethyltoluene	11	Not Detected	55	Not Detected
1,3,5-Trimethylbenzene	11	Not Detected	55	Not Detected
1,2,4-Trimethylbenzene	11	Not Detected	55	Not Detected
1,3-Dichlorobenzene	11	Not Detected	68	Not Detected
1,4-Dichlorobenzene	11	Not Detected	68	Not Detected
alpha-Chlorotoluene	11	Not Detected	58	Not Detected
1,2-Dichlorobenzene	11	Not Detected	68	Not Detected
1,2,4-Trichlorobenzene	45	Not Detected	330	Not Detected
Hexachlorobutadiene	45	Not Detected	480	Not Detected
1,1-Difluoroethane	45	120	120	330

••		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	89	70-130



## Client Sample ID: SG9-17 Lab ID#: 1608198-15A

File Name: Dil. Factor:	j081620 2.50	Date of Collection: 8/11/16 11:08:00 AM Date of Analysis: 8/16/16 09:34 PM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	12	Not Detected	62	Not Detected
Freon 114	12	Not Detected	87	Not Detected
Chloromethane	50	Not Detected	100	Not Detected
Vinyl Chloride	12	Not Detected	32	Not Detected
1,3-Butadiene	12	Not Detected	28	Not Detected
Bromomethane	50	Not Detected	190	Not Detected
Chloroethane	50	Not Detected	130	Not Detected
Freon 11	12	Not Detected	70	Not Detected
Ethanol	50	Not Detected	94	Not Detected
Freon 113	12	Not Detected	96	Not Detected
1,1-Dichloroethene	12	Not Detected	50	Not Detected
Acetone	50	Not Detected	120	Not Detected
2-Propanol	50	Not Detected	120	Not Detected
Carbon Disulfide	50	Not Detected	160	Not Detected
3-Chloropropene	50	Not Detected	160	Not Detected
Methylene Chloride	50	Not Detected	170	Not Detected
Methyl tert-butyl ether	12	Not Detected	45	Not Detected
trans-1,2-Dichloroethene	12	Not Detected	50	Not Detected
Hexane	12	Not Detected	44	Not Detected
1,1-Dichloroethane	12	Not Detected	50	Not Detected
2-Butanone (Methyl Ethyl Ketone)	50	Not Detected	150	Not Detected
cis-1,2-Dichloroethene	12	Not Detected	50	Not Detected
Tetrahydrofuran	12	Not Detected	37	Not Detected
Chloroform	12	Not Detected	61	Not Detected
1,1,1-Trichloroethane	12	Not Detected	68	Not Detected
Cyclohexane	12	Not Detected	43	Not Detected
Carbon Tetrachloride	12	Not Detected	79	Not Detected
2,2,4-Trimethylpentane	12	Not Detected	58	Not Detected
Benzene	12	Not Detected	40	Not Detected
1,2-Dichloroethane	12	Not Detected	50	Not Detected
·	12	Not Detected	51	Not Detected
Heptane				
Trichloroethene	12	Not Detected	67	Not Detected
1,2-Dichloropropane	12 50	Not Detected	58 180	Not Detected
1,4-Dioxane	50	Not Detected	180	Not Detected
Bromodichloromethane	12	Not Detected	84	Not Detected
cis-1,3-Dichloropropene	12	Not Detected	57	Not Detected
4-Methyl-2-pentanone	12	Not Detected	51	Not Detected
Toluene	12	Not Detected	47	Not Detected
trans-1,3-Dichloropropene	12	Not Detected	57	Not Detected
1,1,2-Trichloroethane	12	Not Detected	68	Not Detected
Tetrachloroethene	12	130	85	860
2-Hexanone	50	Not Detected	200	Not Detected



### Client Sample ID: SG9-17 Lab ID#: 1608198-15A

#### **EPA METHOD TO-15 GC/MS**

File Name: j081620 Date of Collection: 8/11/16 11:08:00 AM
Dil. Factor: 2.50 Date of Analysis: 8/16/16 09:34 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	12	Not Detected	110	Not Detected
1,2-Dibromoethane (EDB)	12	Not Detected	96	Not Detected
Chlorobenzene	12	Not Detected	58	Not Detected
Ethyl Benzene	12	17	54	75
m,p-Xylene	12	86	54	370
o-Xylene	12	26	54	110
Styrene	12	Not Detected	53	Not Detected
Bromoform	12	Not Detected	130	Not Detected
Cumene	12	Not Detected	61	Not Detected
1,1,2,2-Tetrachloroethane	12	Not Detected	86	Not Detected
Propylbenzene	12	Not Detected	61	Not Detected
4-Ethyltoluene	12	Not Detected	61	Not Detected
1,3,5-Trimethylbenzene	12	Not Detected	61	Not Detected
1,2,4-Trimethylbenzene	12	Not Detected	61	Not Detected
1,3-Dichlorobenzene	12	Not Detected	75	Not Detected
1,4-Dichlorobenzene	12	Not Detected	75	Not Detected
alpha-Chlorotoluene	12	Not Detected	65	Not Detected
1,2-Dichlorobenzene	12	Not Detected	75	Not Detected
1,2,4-Trichlorobenzene	50	Not Detected	370	Not Detected
Hexachlorobutadiene	50	Not Detected	530	Not Detected
1,1-Difluoroethane	50	15000 E	140	41000 E

E = Exceeds instrument calibration range.

	-/-	Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	96	70-130



## Client Sample ID: SG9-17 DUP Lab ID#: 1608198-16A

File Name:	j081621 2.52		e of Collection: 8/11 e of Analysis: 8/16/1	
J.III I dotori	Rpt. Limit	Amount	Rpt. Limit	Amount

D.II. 1 401011	2.02	Date	of Allalysis. Of to	710 03.00 1 111
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	13	Not Detected	62	Not Detected
Freon 114	13	Not Detected	88	Not Detected
Chloromethane	50	Not Detected	100	Not Detected
Vinyl Chloride	13	Not Detected	32	Not Detected
1,3-Butadiene	13	Not Detected	28	Not Detected
Bromomethane	50	Not Detected	200	Not Detected
Chloroethane	50	Not Detected	130	Not Detected
Freon 11	13	Not Detected	71	Not Detected
Ethanol	50	Not Detected	95	Not Detected
Freon 113	13	Not Detected	96	Not Detected
1,1-Dichloroethene	13	Not Detected	50	Not Detected
Acetone	50	Not Detected	120	Not Detected
2-Propanol	50	Not Detected	120	Not Detected
Carbon Disulfide	50	Not Detected	160	Not Detected
3-Chloropropene	50	Not Detected	160	Not Detected
Methylene Chloride	50	Not Detected	180	Not Detected
Methyl tert-butyl ether	13	Not Detected	45	Not Detected
trans-1,2-Dichloroethene	13	Not Detected	50	Not Detected
Hexane	13	Not Detected	44	Not Detected
1,1-Dichloroethane	13	Not Detected	51	Not Detected
2-Butanone (Methyl Ethyl Ketone)	50	Not Detected	150	Not Detected
cis-1,2-Dichloroethene	13	Not Detected	50	Not Detected
Tetrahydrofuran	13	Not Detected	37	Not Detected
Chloroform	13	Not Detected	62	Not Detected
1,1,1-Trichloroethane	13	Not Detected	69	Not Detected
Cyclohexane	13	Not Detected	43	Not Detected
Carbon Tetrachloride	13	Not Detected	79	Not Detected
2,2,4-Trimethylpentane	13	Not Detected	59	Not Detected
Benzene	13	Not Detected	40	Not Detected
1,2-Dichloroethane	13	Not Detected	51	Not Detected
Heptane	13	Not Detected	52	Not Detected
Trichloroethene	13	Not Detected	68	Not Detected
1,2-Dichloropropane	13	Not Detected	58	Not Detected
1,4-Dioxane	50	Not Detected	180	Not Detected
Bromodichloromethane	13	Not Detected	84	Not Detected
cis-1,3-Dichloropropene	13	Not Detected	57	Not Detected
4-Methyl-2-pentanone	13	Not Detected	52	Not Detected
Toluene	13	Not Detected	47	Not Detected
trans-1,3-Dichloropropene	13	Not Detected	57	Not Detected
1,1,2-Trichloroethane	13	Not Detected	69	Not Detected
Tetrachloroethene	13	140	85	930
2-Hexanone	50	Not Detected	210	Not Detected



### Client Sample ID: SG9-17 DUP Lab ID#: 1608198-16A

#### **EPA METHOD TO-15 GC/MS**

File Name: j081621 Date of Collection: 8/11/16 11:08:00 AM
Dil. Factor: 2.52 Date of Analysis: 8/16/16 09:58 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	13	Not Detected	110	Not Detected
1,2-Dibromoethane (EDB)	13	Not Detected	97	Not Detected
Chlorobenzene	13	Not Detected	58	Not Detected
Ethyl Benzene	13	13	55	56
m,p-Xylene	13	86	55	370
o-Xylene	13	21	55	92
Styrene	13	Not Detected	54	Not Detected
Bromoform	13	Not Detected	130	Not Detected
Cumene	13	Not Detected	62	Not Detected
1,1,2,2-Tetrachloroethane	13	Not Detected	86	Not Detected
Propylbenzene	13	Not Detected	62	Not Detected
4-Ethyltoluene	13	Not Detected	62	Not Detected
1,3,5-Trimethylbenzene	13	Not Detected	62	Not Detected
1,2,4-Trimethylbenzene	13	Not Detected	62	Not Detected
1,3-Dichlorobenzene	13	Not Detected	76	Not Detected
1,4-Dichlorobenzene	13	Not Detected	76	Not Detected
alpha-Chlorotoluene	13	Not Detected	65	Not Detected
1,2-Dichlorobenzene	13	Not Detected	76	Not Detected
1,2,4-Trichlorobenzene	50	Not Detected	370	Not Detected
Hexachlorobutadiene	50	Not Detected	540	Not Detected
1,1-Difluoroethane	50	3200 E	140	8600 E

E = Exceeds instrument calibration range.

		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	93	70-130



## Client Sample ID: SG10-7 Lab ID#: 1608198-17A

File Name:	j081622	Date of Collection: 8/11/16 11:29:00 AM			
Dil. Factor:	2.64	Date of Analysis: 8/16/16 10:23 PM			
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)	

	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	13	Not Detected	65	Not Detected
Freon 114	13	Not Detected	92	Not Detected
Chloromethane	53	Not Detected	110	Not Detected
Vinyl Chloride	13	Not Detected	34	Not Detected
1,3-Butadiene	13	Not Detected	29	Not Detected
Bromomethane	53	Not Detected	200	Not Detected
Chloroethane	53	Not Detected	140	Not Detected
Freon 11	13	Not Detected	74	Not Detected
Ethanol	53	Not Detected	99	Not Detected
Freon 113	13	Not Detected	100	Not Detected
1,1-Dichloroethene	13	Not Detected	52	Not Detected
Acetone	53	Not Detected	120	Not Detected
2-Propanol	53	Not Detected	130	Not Detected
Carbon Disulfide	53	Not Detected	160	Not Detected
3-Chloropropene	53	Not Detected	160	Not Detected
Methylene Chloride	53	Not Detected	180	Not Detected
Methyl tert-butyl ether	13	Not Detected	48	Not Detected
trans-1,2-Dichloroethene	13	Not Detected	52	Not Detected
Hexane	13	Not Detected	46	Not Detected
1,1-Dichloroethane	13	Not Detected	53	Not Detected
2-Butanone (Methyl Ethyl Ketone)	53	Not Detected	160	Not Detected
cis-1,2-Dichloroethene	13	Not Detected	52	Not Detected
Tetrahydrofuran	13	Not Detected	39	Not Detected
Chloroform	13	Not Detected	64	Not Detected
1,1,1-Trichloroethane	13	Not Detected	72	Not Detected
Cyclohexane	13	Not Detected	45	Not Detected
Carbon Tetrachloride	13	Not Detected	83	Not Detected
2,2,4-Trimethylpentane	13	Not Detected	62	Not Detected
Benzene	13	Not Detected	42	Not Detected
1,2-Dichloroethane	13	Not Detected	53	Not Detected
Heptane	13	Not Detected	54	Not Detected
Trichloroethene	13	Not Detected	71	Not Detected
1,2-Dichloropropane	13	Not Detected	61	Not Detected
1,4-Dioxane	53	Not Detected	190	Not Detected
Bromodichloromethane	13	Not Detected	88	Not Detected
cis-1,3-Dichloropropene	13	Not Detected	60	Not Detected
4-Methyl-2-pentanone	13	Not Detected	54	Not Detected
Toluene	13	Not Detected	50	Not Detected
trans-1,3-Dichloropropene	13	Not Detected	60	Not Detected
1,1,2-Trichloroethane	13	Not Detected	72	Not Detected
Tetrachloroethene	13	Not Detected	90	Not Detected
2-Hexanone	53	Not Detected	220	Not Detected



## Client Sample ID: SG10-7 Lab ID#: 1608198-17A

### **EPA METHOD TO-15 GC/MS**

File Name:	j081622	Date of Collection: 8/11/16 11:29:00 AM
Dil. Factor:	2.64	Date of Analysis: 8/16/16 10:23 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	13	Not Detected	110	Not Detected
1,2-Dibromoethane (EDB)	13	Not Detected	100	Not Detected
Chlorobenzene	13	Not Detected	61	Not Detected
Ethyl Benzene	13	Not Detected	57	Not Detected
m,p-Xylene	13	Not Detected	57	Not Detected
o-Xylene	13	Not Detected	57	Not Detected
Styrene	13	Not Detected	56	Not Detected
Bromoform	13	Not Detected	140	Not Detected
Cumene	13	Not Detected	65	Not Detected
1,1,2,2-Tetrachloroethane	13	Not Detected	91	Not Detected
Propylbenzene	13	Not Detected	65	Not Detected
4-Ethyltoluene	13	Not Detected	65	Not Detected
1,3,5-Trimethylbenzene	13	Not Detected	65	Not Detected
1,2,4-Trimethylbenzene	13	Not Detected	65	Not Detected
1,3-Dichlorobenzene	13	Not Detected	79	Not Detected
1,4-Dichlorobenzene	13	Not Detected	79	Not Detected
alpha-Chlorotoluene	13	Not Detected	68	Not Detected
1,2-Dichlorobenzene	13	Not Detected	79	Not Detected
1,2,4-Trichlorobenzene	53	Not Detected	390	Not Detected
Hexachlorobutadiene	53	Not Detected	560	Not Detected
1,1-Difluoroethane	53	120	140	320

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	106	70-130	
Toluene-d8	101	70-130	
4-Bromofluorobenzene	92	70-130	



2-Hexanone

## Client Sample ID: SG11-17 Lab ID#: 1608198-18A

### **EPA METHOD TO-15 GC/MS**

File Name: Dil. Factor:	j081623 46.8		of Collection: 8/1 of Analysis: 8/16	
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	230	Not Detected	1200	Not Detected
Freon 114	230	Not Detected	1600	Not Detected
Chloromethane	940	Not Detected	1900	Not Detected
Vinyl Chloride	230	Not Detected	600	Not Detected
1,3-Butadiene	230	Not Detected	520	Not Detected
Bromomethane	940	Not Detected	3600	Not Detected
Chloroethane	940	Not Detected	2500	Not Detected
Freon 11	230	Not Detected	1300	Not Detected
Ethanol	940	Not Detected	1800	Not Detected
Freon 113	230	Not Detected	1800	Not Detected
1,1-Dichloroethene	230	Not Detected	930	Not Detected
Acetone	940	Not Detected	2200	Not Detected
2-Propanol	940	Not Detected	2300	Not Detected
Carbon Disulfide	940	Not Detected	2900	Not Detected
3-Chloropropene	940	Not Detected	2900	Not Detected
Methylene Chloride	940	Not Detected	3200	Not Detected
Methyl tert-butyl ether	230	Not Detected	840	Not Detected
trans-1,2-Dichloroethene	230	Not Detected	930	Not Detected
Hexane	230	Not Detected	820	Not Detected
1,1-Dichloroethane	230	Not Detected	950	Not Detected
2-Butanone (Methyl Ethyl Ketone)	940	Not Detected	2800	Not Detected
cis-1,2-Dichloroethene	230	Not Detected	930	Not Detected
Tetrahydrofuran	230	Not Detected	690	Not Detected
Chloroform	230	Not Detected	1100	Not Detected
1,1,1-Trichloroethane	230	Not Detected	1300	Not Detected
Cyclohexane	230	Not Detected	800	Not Detected
Carbon Tetrachloride	230	Not Detected	1500	Not Detected
2,2,4-Trimethylpentane	230	Not Detected	1100	Not Detected
Benzene	230	Not Detected	750	Not Detected
1,2-Dichloroethane	230	Not Detected	950	Not Detected
Heptane	230	Not Detected	960	Not Detected
Trichloroethene	230	Not Detected	1200	Not Detected
1,2-Dichloropropane	230	Not Detected	1100	Not Detected
1,4-Dioxane	940	Not Detected	3400	Not Detected
Bromodichloromethane	230	Not Detected	1600	Not Detected
cis-1,3-Dichloropropene	230	Not Detected	1100	Not Detected
4-Methyl-2-pentanone	230	Not Detected	960	Not Detected
Toluene	230	Not Detected	880	Not Detected
trans-1,3-Dichloropropene	230	Not Detected	1100	Not Detected
1,1,2-Trichloroethane	230	Not Detected	1300	Not Detected
Tetrachloroethene	230	5000	1600	34000
	200	3000	1000	<del>5-000</del>

Not Detected

3800

Not Detected

940



## Client Sample ID: SG11-17 Lab ID#: 1608198-18A

### **EPA METHOD TO-15 GC/MS**

File Name	1004000	Data of Oalland's a 0/40/40 40 04 00 DM
File Name:	j081623	Date of Collection: 8/10/16 12:31:00 PM
Dil. Factor:	46.8	Date of Analysis: 8/16/16 11:00 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	230	Not Detected	2000	Not Detected
1,2-Dibromoethane (EDB)	230	Not Detected	1800	Not Detected
Chlorobenzene	230	Not Detected	1100	Not Detected
Ethyl Benzene	230	Not Detected	1000	Not Detected
m,p-Xylene	230	Not Detected	1000	Not Detected
o-Xylene	230	Not Detected	1000	Not Detected
Styrene	230	Not Detected	1000	Not Detected
Bromoform	230	Not Detected	2400	Not Detected
Cumene	230	Not Detected	1200	Not Detected
1,1,2,2-Tetrachloroethane	230	Not Detected	1600	Not Detected
Propylbenzene	230	Not Detected	1200	Not Detected
4-Ethyltoluene	230	Not Detected	1200	Not Detected
1,3,5-Trimethylbenzene	230	Not Detected	1200	Not Detected
1,2,4-Trimethylbenzene	230	Not Detected	1200	Not Detected
1,3-Dichlorobenzene	230	Not Detected	1400	Not Detected
1,4-Dichlorobenzene	230	Not Detected	1400	Not Detected
alpha-Chlorotoluene	230	Not Detected	1200	Not Detected
1,2-Dichlorobenzene	230	Not Detected	1400	Not Detected
1,2,4-Trichlorobenzene	940	Not Detected	6900	Not Detected
Hexachlorobutadiene	940	Not Detected	10000	Not Detected
1,1-Difluoroethane	940	170000	2500	470000

		wetnoa	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	109	70-130	
Toluene-d8	99	70-130	
4-Bromofluorobenzene	92	70-130	



## Client Sample ID: Lab Blank Lab ID#: 1608198-19A

File Name: j081606 Dil. Factor: 1.00		Date of Collection: NA Date of Analysis: 8/16/16 01:58 PM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	5.0	Not Detected	25	Not Detected
Freon 114	5.0	Not Detected	35	Not Detected
Chloromethane	20	Not Detected	41	Not Detected
Vinyl Chloride	5.0	Not Detected	13	Not Detected
1,3-Butadiene	5.0	Not Detected	11	Not Detected
Bromomethane	20	Not Detected	78	Not Detected
Chloroethane	20	Not Detected	53	Not Detected
Freon 11	5.0	Not Detected	28	Not Detected
Ethanol	20	Not Detected	38	Not Detected
Freon 113	5.0	Not Detected	38	Not Detected
1,1-Dichloroethene	5.0	Not Detected	20	Not Detected
Acetone	20	Not Detected	48	Not Detected
2-Propanol	20	Not Detected	49	Not Detected
Carbon Disulfide	20	Not Detected	62	Not Detected
3-Chloropropene	20	Not Detected	63	Not Detected
Methylene Chloride	20	Not Detected	69	Not Detected
Methyl tert-butyl ether	5.0	Not Detected	18	Not Detected
trans-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
Hexane	5.0	Not Detected	18	Not Detected
1,1-Dichloroethane	5.0	Not Detected	20	Not Detected
2-Butanone (Methyl Ethyl Ketone)	20	Not Detected	59	Not Detected
cis-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
Tetrahydrofuran	5.0	Not Detected	15	Not Detected
Chloroform	5.0	Not Detected	24	Not Detected
1,1,1-Trichloroethane	5.0	Not Detected	27	Not Detected
Cyclohexane	5.0	Not Detected	17	Not Detected
Carbon Tetrachloride	5.0	Not Detected	31	Not Detected
2,2,4-Trimethylpentane	5.0	Not Detected	23	Not Detected
Benzene	5.0	Not Detected	16	Not Detected
1,2-Dichloroethane	5.0	Not Detected	20	Not Detected
Heptane	5.0	Not Detected	20	Not Detected
Trichloroethene	5.0	Not Detected	27	Not Detected
1,2-Dichloropropane	5.0	Not Detected	23	Not Detected
1,4-Dioxane	20	Not Detected	72	Not Detected
Bromodichloromethane	5.0	Not Detected	34	Not Detected
cis-1,3-Dichloropropene	5.0	Not Detected	23	Not Detected
4-Methyl-2-pentanone	5.0	Not Detected	20	Not Detected
Toluene	5.0	Not Detected	19	Not Detected
trans-1,3-Dichloropropene	5.0	Not Detected	23	Not Detected
1,1,2-Trichloroethane	5.0	Not Detected	27	Not Detected
Tetrachloroethene	5.0	Not Detected	34	Not Detected
2-Hexanone	20	Not Detected	82	Not Detected



# Client Sample ID: Lab Blank Lab ID#: 1608198-19A

### **EPA METHOD TO-15 GC/MS**

File Name:	j081606	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 8/16/16 01:58 PM

	1100	But of Amaryolo: Of 10/10 01:00 1 m		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	5.0	Not Detected	42	Not Detected
1,2-Dibromoethane (EDB)	5.0	Not Detected	38	Not Detected
Chlorobenzene	5.0	Not Detected	23	Not Detected
Ethyl Benzene	5.0	Not Detected	22	Not Detected
m,p-Xylene	5.0	Not Detected	22	Not Detected
o-Xylene	5.0	Not Detected	22	Not Detected
Styrene	5.0	Not Detected	21	Not Detected
Bromoform	5.0	Not Detected	52	Not Detected
Cumene	5.0	Not Detected	24	Not Detected
1,1,2,2-Tetrachloroethane	5.0	Not Detected	34	Not Detected
Propylbenzene	5.0	Not Detected	24	Not Detected
4-Ethyltoluene	5.0	Not Detected	24	Not Detected
1,3,5-Trimethylbenzene	5.0	Not Detected	24	Not Detected
1,2,4-Trimethylbenzene	5.0	Not Detected	24	Not Detected
1,3-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,4-Dichlorobenzene	5.0	Not Detected	30	Not Detected
alpha-Chlorotoluene	5.0	Not Detected	26	Not Detected
1,2-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,2,4-Trichlorobenzene	20	Not Detected	150	Not Detected
Hexachlorobutadiene	20	Not Detected	210	Not Detected
1,1-Difluoroethane	20	Not Detected	54	Not Detected

### Container Type: NA - Not Applicable

		Method Limits
Surrogates	%Recovery	
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	94	70-130



## Client Sample ID: CCV Lab ID#: 1608198-20A

### **EPA METHOD TO-15 GC/MS**

File Name: j081602 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 8/16/16 11:38 AM

Compound	%Recovery
Freon 12	108
Freon 114	95
Chloromethane	115
Vinyl Chloride	101
1,3-Butadiene	108
Bromomethane	100
Chloroethane	101
Freon 11	105
Ethanol	117
Freon 113	92
1,1-Dichloroethene	109
Acetone	116
2-Propanol	116
Carbon Disulfide	102
3-Chloropropene	88
Methylene Chloride	138 Q
Methyl tert-butyl ether	103
trans-1,2-Dichloroethene	96
Hexane	98
1,1-Dichloroethane	118
2-Butanone (Methyl Ethyl Ketone)	100
cis-1,2-Dichloroethene	115
Tetrahydrofuran	110
Chloroform	109
1,1,1-Trichloroethane	109
Cyclohexane	103
Carbon Tetrachloride	107
2,2,4-Trimethylpentane	104
Benzene	114
1,2-Dichloroethane	108
Heptane	98
Trichloroethene	111
1,2-Dichloropropane	106
1,4-Dioxane	102
Bromodichloromethane	104
cis-1,3-Dichloropropene	96
4-Methyl-2-pentanone	92
Toluene	102
trans-1,3-Dichloropropene	97
1,1,2-Trichloroethane	99
Tetrachloroethene	100
2-Hexanone	106



## Client Sample ID: CCV Lab ID#: 1608198-20A

#### **EPA METHOD TO-15 GC/MS**

File Name: j081602 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 8/16/16 11:38 AM

Compound	%Recovery	
Dibromochloromethane	96	
1,2-Dibromoethane (EDB)	99	
Chlorobenzene	92	
Ethyl Benzene	94	
m,p-Xylene	94	
o-Xylene	95	
Styrene	97	
Bromoform	88	
Cumene	95	
1,1,2,2-Tetrachloroethane	100	
Propylbenzene	98	
4-Ethyltoluene	93	
1,3,5-Trimethylbenzene	98	
1,2,4-Trimethylbenzene	92	
1,3-Dichlorobenzene	95	
1,4-Dichlorobenzene	94	
alpha-Chlorotoluene	92	
1,2-Dichlorobenzene	94	
1,2,4-Trichlorobenzene	79	
Hexachlorobutadiene	70	
1,1-Difluoroethane	65	

### Q = Exceeds Quality Control limits.

**Container Type: NA - Not Applicable** 

Surrogates		Method	
	%Recovery	Limits	
1,2-Dichloroethane-d4	104	70-130	
Toluene-d8	99	70-130	
4-Bromofluorobenzene	97	70-130	



# Client Sample ID: LCS Lab ID#: 1608198-21A

### **EPA METHOD TO-15 GC/MS**

File Name: j081603 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 8/16/16 12:01 PM

		Method
Compound	%Recovery	Limits
Freon 12	111	70-130
Freon 114	102	70-130
Chloromethane	114	70-130
Vinyl Chloride	98	70-130
1,3-Butadiene	103	70-130
Bromomethane	100	70-130
Chloroethane	102	70-130
Freon 11	109	70-130
Ethanol	122	70-130
Freon 113	91	70-130
1,1-Dichloroethene	106	70-130
Acetone	113	70-130
2-Propanol	123	70-130
Carbon Disulfide	91	70-130
3-Chloropropene	89	70-130
Methylene Chloride	140 Q	70-130
Methyl tert-butyl ether	101	70-130
trans-1,2-Dichloroethene	97	70-130
Hexane	97	70-130
1,1-Dichloroethane	117	70-130
2-Butanone (Methyl Ethyl Ketone)	98	70-130
cis-1,2-Dichloroethene	113	70-130
Tetrahydrofuran	113	70-130
Chloroform	110	70-130
1,1,1-Trichloroethane	109	70-130
Cyclohexane	104	70-130
Carbon Tetrachloride	106	70-130
2,2,4-Trimethylpentane	103	70-130
Benzene	115	70-130
1,2-Dichloroethane	108	70-130
Heptane	95	70-130
Trichloroethene	109	70-130
1,2-Dichloropropane	108	70-130
1,4-Dioxane	99	70-130
Bromodichloromethane	110	70-130
cis-1,3-Dichloropropene	88	70-130
4-Methyl-2-pentanone	90	70-130
Toluene	101	70-130
trans-1,3-Dichloropropene	99	70-130
1,1,2-Trichloroethane	102	70-130
Tetrachloroethene	102	70-130
2-Hexanone	109	70-130



### Client Sample ID: LCS Lab ID#: 1608198-21A

#### **EPA METHOD TO-15 GC/MS**

File Name: j081603 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 8/16/16 12:01 PM

		Method
Compound	%Recovery	Limits
Dibromochloromethane	98	70-130
1,2-Dibromoethane (EDB)	103	70-130
Chlorobenzene	93	70-130
Ethyl Benzene	97	70-130
m,p-Xylene	93	70-130
o-Xylene	98	70-130
Styrene	101	70-130
Bromoform	91	70-130
Cumene	95	70-130
1,1,2,2-Tetrachloroethane	104	70-130
Propylbenzene	102	70-130
4-Ethyltoluene	95	70-130
1,3,5-Trimethylbenzene	100	70-130
1,2,4-Trimethylbenzene	94	70-130
1,3-Dichlorobenzene	97	70-130
1,4-Dichlorobenzene	96	70-130
alpha-Chlorotoluene	100	70-130
1,2-Dichlorobenzene	98	70-130
1,2,4-Trichlorobenzene	84	70-130
Hexachlorobutadiene	73	70-130
1,1-Difluoroethane	Not Spiked	

### Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates		Method	
	%Recovery	Limits	
1,2-Dichloroethane-d4	101	70-130	
Toluene-d8	100	70-130	
4-Bromofluorobenzene	95	70-130	



# Client Sample ID: LCSD Lab ID#: 1608198-21AA

### **EPA METHOD TO-15 GC/MS**

File Name: j081604 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 8/16/16 12:24 PM

		Method
Compound	%Recovery	Limits
Freon 12	116	70-130
Freon 114	106	70-130
Chloromethane	118	70-130
Vinyl Chloride	102	70-130
1,3-Butadiene	111	70-130
Bromomethane	109	70-130
Chloroethane	107	70-130
Freon 11	114	70-130
Ethanol	136 Q	70-130
Freon 113	98	70-130
1,1-Dichloroethene	113	70-130
Acetone	120	70-130
2-Propanol	126	70-130
Carbon Disulfide	94	70-130
3-Chloropropene	92	70-130
Methylene Chloride	146 Q	70-130
Methyl tert-butyl ether	108	70-130
trans-1,2-Dichloroethene	102	70-130
Hexane	102	70-130
1,1-Dichloroethane	120	70-130
2-Butanone (Methyl Ethyl Ketone)	104	70-130
cis-1,2-Dichloroethene	116	70-130
Tetrahydrofuran	120	70-130
Chloroform	113	70-130
1,1,1-Trichloroethane	115	70-130
Cyclohexane	106	70-130
Carbon Tetrachloride	116	70-130
2,2,4-Trimethylpentane	108	70-130
Benzene	110	70-130
1,2-Dichloroethane	109	70-130
Heptane	97	70-130
Trichloroethene	108	70-130
1,2-Dichloropropane	105	70-130
1,4-Dioxane	99	70-130
Bromodichloromethane	109	70-130
cis-1,3-Dichloropropene	91	70-130
4-Methyl-2-pentanone	92	70-130
Toluene	104	70-130
trans-1,3-Dichloropropene	97	70-130
1,1,2-Trichloroethane	100	70-130
Tetrachloroethene	103	70-130
2-Hexanone	109	70-130



# Client Sample ID: LCSD Lab ID#: 1608198-21AA

#### **EPA METHOD TO-15 GC/MS**

File Name: j081604 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 8/16/16 12:24 PM

		Method
Compound	%Recovery	Limits
Dibromochloromethane	99	70-130
1,2-Dibromoethane (EDB)	104	70-130
Chlorobenzene	95	70-130
Ethyl Benzene	99	70-130
m,p-Xylene	95	70-130
o-Xylene	100	70-130
Styrene	100	70-130
Bromoform	90	70-130
Cumene	96	70-130
1,1,2,2-Tetrachloroethane	105	70-130
Propylbenzene	102	70-130
4-Ethyltoluene	106	70-130
1,3,5-Trimethylbenzene	97	70-130
1,2,4-Trimethylbenzene	96	70-130
1,3-Dichlorobenzene	98	70-130
1,4-Dichlorobenzene	95	70-130
alpha-Chlorotoluene	101	70-130
1,2-Dichlorobenzene	98	70-130
1,2,4-Trichlorobenzene	97	70-130
Hexachlorobutadiene	84	70-130
1,1-Difluoroethane	Not Spiked	

Q = Exceeds Quality Control limits.

**Container Type: NA - Not Applicable** 

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	109	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	95	70-130

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F	Results and billing to: P&D Environmental, Inc. lab@pdenviro.com					REMARKS: 1- LITER SUMMA 1608198							198						



8/16/2016 Mr. Paul King P & D Environmental 55 Santa Clara Suite 240 Oakland CA 94610

Project Name: Red Hangar Kleaners SVE

Project #: 0461

Workorder #: 1608178

Dear Mr. Paul King

The following report includes the data for the above referenced project for sample(s) received on 8/11/2016 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 (5&20 ppbv) are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

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

Regards,

Kelly Buettner

**Project Manager** 

Kelly Butte



#### **WORK ORDER #: 1608178**

Work Order Summary

CLIENT: Mr. Paul King BILL TO: Mr. Paul King

P & D Environmental
55 Santa Clara
Suite 240

P & D Environmental
55 Santa Clara
Suite 240

Suite 240

Oakland, CA 94610 Oakland, CA 94610

PHONE: 510-658-6916 P.O. #

FAX: 510-834-0772 PROJECT # 0461 Red Hangar Kleaners SVE

**DATE RECEIVED:** 08/11/2016 **CONTACT:** Kelly Buettner 08/16/2016

			RECEIPT	FINAL
FRACTION #	NAME	<u>TEST</u>	VAC./PRES.	<b>PRESSURE</b>
01A	SG1-7	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
02A	SG2-7	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
03A	SG2-17	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
04A	SG3-17	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
05A	SG4-7	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
06A	SG4-17	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
07A	SG5-7	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
08A	SG5-17	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
09A	SG6-7	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
10A	SG6-17	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
11A	SG7-7	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
12A	SG7-17	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
13A	SG8-7	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
14A	SG9-17	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
15A	SG10-7	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
16A	SG11-17	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
17A	Lab Blank	Modified TO-15 (5&20 ppbv	NA	NA
18A	CCV	Modified TO-15 (5&20 ppbv	NA	NA

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CERTIFIED BY:	0 00	DATE: 08/16/16
CERTIFIED DI.		2.112.

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-15-9, UT NELAP CA0093332015-6, VA NELAP - 8113, WA NELAP - C935 Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program) Accreditation number: CA300005, Effective date: 10/18/2015, Expiration date: 10/17/2016. Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, Inc.



#### LABORATORY NARRATIVE EPA Method TO-15 Soil Gas P & D Environmental Workorder# 1608178

Sixteen 1 Liter Tedlar Bag samples were received on August 11, 2016. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating up to 50 mLs of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

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

#### **Receiving Notes**

There were no receiving discrepancies.

#### **Analytical Notes**

Dilution was performed on all of the samples due to the presence of high level target species.

Method TO-15 is validated for samples collected in specially treated canisters. As such, the use of Tedlar bags for sample collection is outside the scope of the method and not recommended for ambient or indoor air samples. It is the responsibility of the data user to determine the usability of TO-15 results generated from Tedlar bags.

#### **Definition of Data Qualifying Flags**

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

- B Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
  - J Estimated value.
  - E Exceeds instrument calibration range.
  - S Saturated peak.
  - Q Exceeds quality control limits.
- U Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.
  - UJ- Non-detected compound associated with low bias in the CCV
  - N The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue



# **Summary of Detected Compounds EPA METHOD TO-15 GC/MS**

Client Sample ID: SG1-7 Lab ID#: 1608178-01A

Lab 1D11. 1000170-0111				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	1000000	3300000	2700000	9000000
Client Sample ID: SG2-7				
Lab ID#: 1608178-02A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	1000000	2400000	2700000	6400000
Client Sample ID: SG2-17				
Lab ID#: 1608178-03A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	1000000	5900000	2700000	16000000
Client Sample ID: SG3-17				
Lab ID#: 1608178-04A				
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	500000	11000000	1400000	31000000
Client Sample ID: SG4-7				
Lab ID#: 1608178-05A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	500000	6700000	1400000	18000000
Client Sample ID: SG4-17				
Lab ID#: 1608178-06A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	500000	5900000	1400000	16000000



# **Summary of Detected Compounds EPA METHOD TO-15 GC/MS**

Client Sample ID: SG5-7
Lab ID#: 1608178-07A

Lau 1D#: 10001/0-0/A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	500000	3500000	1400000	9400000
Client Sample ID: SG5-17				
Lab ID#: 1608178-08A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	500000	4800000	1400000	13000000
Client Sample ID: SG6-7				
Lab ID#: 1608178-09A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	500000	2800000	1400000	7700000
Client Sample ID: SG6-17				
Lab ID#: 1608178-10A				
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	500000	3600000	1400000	9700000
Client Sample ID: SG7-7				
Lab ID#: 1608178-11A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	500000	2800000	1400000	7700000
Client Sample ID: SG7-17				
Lab ID#: 1608178-12A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	500000	4500000	1400000	12000000



# **Summary of Detected Compounds EPA METHOD TO-15 GC/MS**

Client Sample ID: SG8-7 Lab ID#: 1608178-13A

Lab ID#: 1608178-13A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	500000	2800000	1400000	7600000
Client Sample ID: SG9-17				
Lab ID#: 1608178-14A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	500000	2400000	1400000	6500000
Client Sample ID: SG10-7				
Lab ID#: 1608178-15A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	500000	2800000	1400000	7700000
Client Sample ID: SG11-17				
Lab ID#: 1608178-16A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	500000	3600000	1400000	9600000



## Client Sample ID: SG1-7 Lab ID#: 1608178-01A

#### **EPA METHOD TO-15 GC/MS**

File Name: Dil. Factor:	14081212 50000		e of Collection: 8/10 e of Analysis: 8/12/1	
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	1000000	3300000	2700000	9000000

		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	95	70-130



## Client Sample ID: SG2-7 Lab ID#: 1608178-02A

#### **EPA METHOD TO-15 GC/MS**

File Name: Dil. Factor:	14081213 50000	Date of Collection: 8/10/16 8:19:00 AN Date of Analysis: 8/12/16 03:53 PM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1 1-Difluoroethane	100000	2400000	2700000	6400000

,,		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	92	70-130	
Toluene-d8	100	70-130	
4-Bromofluorobenzene	97	70-130	



## Client Sample ID: SG2-17 Lab ID#: 1608178-03A

#### **EPA METHOD TO-15 GC/MS**

File Name:	14081216	Date of Collection: 8/10/16 8:59:00 AM		
Dil. Factor:	50000	Date of Analysis: 8/12/16 05:03 PM		
Compound	Rpt. Limit	Amount	Rpt. Limit	Amount
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	1000000	5900000	2700000	16000000

,,		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	89	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	93	70-130



## Client Sample ID: SG3-17 Lab ID#: 1608178-04A

#### **EPA METHOD TO-15 GC/MS**

File Name:	14081217	Date of Collection: 8/10/16 10:03:00 Al		
Dil. Factor:	25000	Date of Analysis: 8/12/16 05:26 PM		
Compound	Rpt. Limit	Amount	Rpt. Limit	Amount
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	500000	11000000	1400000	31000000

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	92	70-130	
Toluene-d8	101	70-130	
4-Bromofluorobenzene	93	70-130	



## Client Sample ID: SG4-7 Lab ID#: 1608178-05A

#### **EPA METHOD TO-15 GC/MS**

File Name:	14081218	Date of Collection: 8/10/16 10:56:00 AN		
Dil. Factor:	25000	Date of Analysis: 8/12/16 05:46 PM		
Compound	Rpt. Limit	Amount	Rpt. Limit	Amount
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	500000	6700000	1400000	18000000

7,1		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	96	70-130



## Client Sample ID: SG4-17 Lab ID#: 1608178-06A

#### **EPA METHOD TO-15 GC/MS**

File Name:	14081219	Date of Collection: 8/10/16 11:38:00 AN		
Dil. Factor:	25000	Date of Analysis: 8/12/16 06:05 PM		
Compound	Rpt. Limit	Amount	Rpt. Limit	Amount
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	500000	5900000	1400000	16000000

,,		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	91	70-130	
Toluene-d8	99	70-130	
4-Bromofluorobenzene	94	70-130	



#### Client Sample ID: SG5-7 Lab ID#: 1608178-07A EPA METHOD TO-15 GC/MS

File Name: 14081220 Date of Collection: 8/10/16 2:47:00 PM
Dil. Factor: 25000 Date of Analysis: 8/12/16 06:24 PM

<b>2</b>	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1.1-Difluoroethane	500000	3500000	1400000	9400000

,,		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	91	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	97	70-130



## Client Sample ID: SG5-17 Lab ID#: 1608178-08A

#### **EPA METHOD TO-15 GC/MS**

File Name:	14081221	Date of Collection: 8/10/16 3:30:00 PM		
Dil. Factor:	25000	Date of Analysis: 8/12/16 06:43 PM		
Compound	Rpt. Limit	Amount	Rpt. Limit	Amount
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	500000	4800000	1400000	13000000

-		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	97	70-130



### Client Sample ID: SG6-7 Lab ID#: 1608178-09A

#### **EPA METHOD TO-15 GC/MS**

File Name:	14081222	Date of Collection: 8/10/16 5:34:00 F		
Dil. Factor:	25000	Date of Analysis: 8/12/16 07:03 PM		
Compound	Rpt. Limit	Amount	Rpt. Limit	Amount
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	500000	2800000	1400000	7700000

,,		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	97	70-130



## Client Sample ID: SG6-17 Lab ID#: 1608178-10A

#### **EPA METHOD TO-15 GC/MS**

File Name:	14081223	Date of Collection: 8/10/16 5:03:00 PM		
Dil. Factor:	25000	Date of Analysis: 8/12/16 07:23 PM		
Compound	Rpt. Limit	Amount	Rpt. Limit	Amount
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1 1-Difluoroethane	500000	3600000	1400000	9700000

<i>,</i> . •		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	89	70-130	
Toluene-d8	99	70-130	
4-Bromofluorobenzene	96	70-130	



## Client Sample ID: SG7-7 Lab ID#: 1608178-11A

#### **EPA METHOD TO-15 GC/MS**

File Name: Dil. Factor:	14081224 25000	Date of Collection: 8/10/16 6:05:00 PM Date of Analysis: 8/12/16 07:42 PM		
Compound	Rpt. Limit (ppbv)	Amount Rpt. Limit Amou		Amount (ug/m3)
1.1-Difluoroethane	500000	2800000	1400000	7700000

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	92	70-130	
Toluene-d8	98	70-130	
4-Bromofluorobenzene	97	70-130	



## Client Sample ID: SG7-17 Lab ID#: 1608178-12A

#### **EPA METHOD TO-15 GC/MS**

File Name: Dil. Factor:	14081225 25000	Date of Collection: 8/10/16 6:33:00 PN Date of Analysis: 8/12/16 08:01 PM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1.1-Difluoroethane	500000	4500000	1400000	12000000

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	94	70-130	
Toluene-d8	102	70-130	
4-Bromofluorobenzene	94	70-130	



#### Client Sample ID: SG8-7 Lab ID#: 1608178-13A EPA METHOD TO-15 GC/MS

File Name: 14081226 Date of Collection: 8/10/16 4:22:00 PM

Dil. Factor:	25000		Date of Analysis: 8/12/16 08:20 PM	
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
4.4 Difference the sec	W 1 /	,	( )	( )
1.1-Difluoroethane	500000	2800000	1400000	7600000

-		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	94	70-130



## Client Sample ID: SG9-17 Lab ID#: 1608178-14A

#### **EPA METHOD TO-15 GC/MS**

File Name: Dil. Factor:	14081227 25000	Date of Collection: 8/11/16 10:53:00 AM Date of Analysis: 8/12/16 08:42 PM						
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)				
1,1-Difluoroethane	500000	2400000	1400000	6500000				

<i>,</i> . •		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	95	70-130



## Client Sample ID: SG10-7 Lab ID#: 1608178-15A

#### **EPA METHOD TO-15 GC/MS**

File Name: Dil. Factor:	14081228 25000		Date of Collection: 8/11/16 11:25:00 A Date of Analysis: 8/12/16 09:12 PM				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)			
1,1-Difluoroethane	500000	2800000	1400000	7700000			

,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	92	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	94	70-130



### Client Sample ID: SG11-17 Lab ID#: 1608178-16A

#### **EPA METHOD TO-15 GC/MS**

File Name: Dil. Factor:	14081229 25000		e of Collection: 8/10 e of Analysis: 8/12/1	
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	500000	3600000	1400000	9600000

,,,,		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	88	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	96	70-130



## Client Sample ID: Lab Blank Lab ID#: 1608178-17A

**EPA METHOD TO-15 GC/MS** 

File Name: Dil. Factor:	14081208a 1.00		Date of Collection: NA Date of Analysis: 8/12/16 01:11 PM				
Compound	Rpt. Limit	Amount	Rpt. Limit (ua/m3)	Amount (ug/m3)			

1,1-Difluoroethane 20 Not Detected 54 Not Detected

**Container Type: NA - Not Applicable** 

		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	91	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	96	70-130



## Client Sample ID: CCV Lab ID#: 1608178-18A

#### **EPA METHOD TO-15 GC/MS**

File Name: 14081202 Date of Collection: NA

Dil. Factor: 1.00 Date of Analysis: 8/12/16 09:08 AM

Compound %Recovery

1,1-Difluoroethane 115

Container Type: NA - Not Applicable

		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	88	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	102	70-130

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## **APPENDIX F**

## DTSC December 2014 Vapor Intrusion Risk and Hazard Calculation Work Sheets

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

## Department of Toxic Substances Control Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential

Chemical: Tetrachloroethylene

Results Summary								
Soil Gas Conc.	Attenuation Factor	Indoor Air Conc.	Cancer	Noncancer				
(µg/m <sup>3</sup> )	(unitless)	(µg/m³)	Risk	Hazard				
1.00E+03	6.3E-04	6.3E-01	1.3E-06	1.7E-02				

Reset to Defaults

_	Soil	Gas Concentratio	n Data		
ENTER	ENTER		ENTER		Soil Gas Conc.
	Soil		Soil		(µg/m³)
Chemical	gas	OR	gas		1.00E+03
CAS No.	conc.,		conc.,		<u></u>
(numbers only,	C <sub>q</sub>		$C_q$		
no dashes)	(μg/m³)	-	(ppmv)	Chemical	
		_			
127184	1.00E+03	1		Tetrachloroethylene	

MORE **↓** 

ENTER Depth	ENTER	ENTER	ENTER		ENTER
below grade to bottom of enclosed space floor, L <sub>F</sub> (15 or 200 cm)	Soil gas sampling depth below grade, L <sub>s</sub> (cm)	Average soil temperature, T <sub>S</sub> (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k <sub>v</sub> (cm²)
15	182.88	24	SI		

	ENTER	ENTER	ENTER	ENTER
MORE	Vandose zone	Vadose zone	Vadose zone	Vadose zone
Ψ	SCS	soil dry	soil total	soil water-filled
	soil type	bulk density,	porosity,	porosity,
	Lookup Soil	$\rho_{b}^{\;A}$	n <sup>∨</sup>	$\theta_{w}^{V}$
	Parameters	(g/cm <sup>3</sup> )	(unitless)	(cm <sup>3</sup> /cm <sup>3</sup> )
		•	•	
	SI	1.35	0.489	0.167

ENTER
Average vapor
flow rate into bldg.
(Leave blank to calculate)
Q<sub>soil</sub>
(L/m)

MORE <b>↓</b>	<b>ENTER</b> Averaging	ENTER Averaging	ENTER	ENTER	ENTER	ENTER
Lookup Receptor Parameters	time for carcinogens, AT <sub>C</sub> (yrs)	time for noncarcinogens, AT <sub>NC</sub> (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)	Exposure Time ET (hrs/day)	Air Exchange Rate ACH (hour) <sup>-1</sup>
Residential	70	26	26	350	24	0.5

END

NEW=>

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

(15 or 200 cm)

15

#### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential

(cm<sup>2</sup>)

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) **9.5E+00** 

Cancer

Risk

2.0E-05

Noncancer

Hazard

2.6E-01

		Soil	Gas Concentration	n Data				Result	
Reset to	ENTER	ENTER		ENTER			Soil Gas Conc. A	Attenuation Factor	_
		Soil		Soil			(µg/m³)	(unitless)	
Defaults	Chemical	gas	OR	gas			1.50E+04	6.3E-04	
	CAS No.	conc.,		conc.,					
	(numbers only,	$C_g$		$C_g$					
	no dashes)	(μg/m³)	_	(ppmv)	Chemical				
			=						
	127184	1.50E+04			Tetrachloroethyle	ne			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER			
MORE	below grade	Soil gas		Vadose zone		User-defined			
Ψ	to bottom	sampling	Average	SCS		vadose zone			
	of enclosed	depth	soil	soil type		soil vapor			
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,			
	$L_{F}$	$L_s$	T <sub>S</sub>	soil vapor		$k_v$			

(°C)

24

(cm)

182.88

permeability)

SI

MORE ↓	Vandose zone SCS soil type  Lookup Soil Parameters	ENTER  Vadose zone soil dry bulk density,  Pb^A (g/cm³)	ENTER Vadose zone soil total porosity, n  (unitless)	ENTER  Vadose zone soil water-filled porosity, $\theta_w$ (cm³/cm³)		Average vapo flow rate into blo (Leave blank to calo Q <sub>soil</sub> (L/m)
	SI	1.35	0.489	0.167		5
MORE <b>↓</b>	ENTER Averaging	ENTER Averaging	ENTER	ENTER	ENTER	ENTER
<b>↓</b>	Averaging time for carcinogens,	Averaging time for noncarcinogens,	Exposure duration,	Exposure frequency,	Exposure Time	Air Exchange Rate
	Averaging time for	Averaging time for	Exposure	Exposure	Exposure	Air Exchange

Risk

2.2E-05

Noncancer

Hazard

2.9E-01

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

#### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

 $(\mu g/m^3)$ 

1.1E+01

			DATA ENTRY S	SHEET			Cileilicai.	retracilioroe	u
		Soil	Gas Concentration	n Data				Resul	t
Reset to	ENTER	ENTER Soil	Cao Concentiation	ENTER Soil			Soil Gas Conc. A (μg/m³)	Attenuation Factor (unitless)	_
Defaults	Chemical	gas	OR	gas			3.90E+04	2.7E-04	-
	CAS No.	conc.,		conc.,					-
	(numbers only,	Cq		$C_g$					
	no dashes)	(μg/m³)	=	(ppmv)	Chemical				
	127184	3.90E+04	1		Tetrachloroethyl	one			
	127 104	3.90E+04	1		retracilioroethyl	ene			
	ENTER	ENTER	ENTER	ENTER		ENTER			
MORE	Depth below grade	Soil gas		Vadose zone		User-defined			
₩ J	to bottom	sampling	Average	SCS		vadose zone			
	of enclosed	depth	soil	soil type		soil vapor			
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,			
	L <sub>F</sub>	L <sub>s</sub>	T <sub>S</sub>	soil vapor		k <sub>v</sub>			
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )			
	,	, ,			1		7		
	15	487.68	24	SI					
MORE ↓	ENTER Vandose zone SCS soil type  Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density,	ENTER Vadose zone soil total porosity, n <sup>V</sup> (unitless)	ENTER  Vadose zone soil water-filled porosity, $\theta_w^V$ $(cm^3/cm^3)$		ENTER Average vapor flow rate into bldg (Leave blank to calcu Q <sub>soil</sub> (L/m)			
	SI	1.35	0.489	0.167		5			
MORE <b>↓</b>	<b>ENTER</b> Averaging	<b>ENTER</b> Averaging	ENTER	ENTER	ENTER	ENTER			
	time for	# f	F.,,,,,,,,,,	F	F.,,,,,,,,,	Ain Evelones			

Lookup Receptor

Parameters

END

NEW=> Residential

time for

carcinogens,

 $AT_{C}$ 

(yrs)

70

time for

noncarcinogens,

 $\mathsf{AT}_\mathsf{NC}$ 

(yrs)

26

Exposure

duration,

ED

(yrs)

26

Exposure

frequency, EF

(days/yr)

350

Exposure

Time

ET

(hrs/day)

24

(NEW)

Air Exchange

Rate

ACH

(hour)-1

0.5

Risk

2.4E-07

Noncancer

Hazard

2.8E-04

**Results Summary** 

Indoor Air Conc.

(μg/m³) **2.9E-02** 

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

#### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential Chemical: Chloroform

			DATA ENTRY S	SHEET			Onemical.	Omoroioim
		Soil	Gas Concentration	n Data				Result
Reset to	ENTER	ENTER Soil		ENTER Soil			Soil Gas Conc. A	Attenuation Factor (unitless)
Defaults	Chemical	gas	OR	gas			7.40E+01	3.9E-04
	CAS No.	conc.,		conc.,				
	(numbers only, no dashes)	C <sub>g</sub> (μg/m³)		$C_g$ (ppmv)	Chemical			
	no dasnes)	(μg/III )		(ррпіч)	Chemical			
	67663	7.40E+01			Chloroform			
	ENTER	ENTER	ENTER	ENTER		ENTER	7	
	ENTER Depth	ENTER	ENTER	ENIER		ENTER		
MORE	below grade	Soil gas		Vadose zone		User-defined		
₩	to bottom	sampling	Average	SCS		vadose zone		
	of enclosed	depth	soil	soil type		soil vapor		
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,		
	L <sub>F</sub> (15 or 200 cm)	L <sub>s</sub>	T <sub>S</sub> (°C)	soil vapor		k <sub>v</sub> (cm²)		
	(15 or 200 cm)	(cm)	( C)	permeability)		(CIII )		
	15	487.68	24	SI			j	
MORE ¥	ENTER Vandose zone SCS Soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, Pb (g/cm³)	ENTER Vadose zone soil total porosity, n (unitless)	ENTER Vadose zone soil water-filled porosity, $\theta_w^V$ $(cm^3/cm^3)$		ENTER Average vapor flow rate into bldg. (Leave blank to calcul Q <sub>soil</sub> (L/m)		
	SI	1.35	0.489	0.167		5	]	
MORE <b>↓</b>	ENTER Averaging	<b>ENTER</b> Averaging	ENTER	ENTER	ENTER	ENTER		
	time for	time for	Exposure	Exposure	Exposure	Air Exchange		
Lookup Receptor	carcinogens, AT <sub>C</sub>	noncarcinogens, AT <sub>NC</sub>	duration, ED	frequency, EF	Time ET	Rate ACH		
Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) <sup>-1</sup>		
	(310)	(310)	(310)	(44,0,1)	(IIIO/GGy)	()	-	

END

NEW=> Residential

70

26

26

350

24

(NEW)

0.5

Risk

NA

Noncancer

Hazard

1.3E-05

**Results Summary** 

Indoor Air Conc.

(μg/m³) **2.7E-02** 

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

#### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential Chemical: Tetrahydrofuran

		Soil	Gas Concentration	n Data				Resu	lts
Reset to	ENTER	ENTER		ENTER			Soil Gas Conc. A	ttenuation Factor	
		Soil		Soil			(μg/m³)	(unitless)	
Defaults	Chemical	gas	OR	gas			5.90E+01	4.7E-04	
	CAS No.	conc.,		conc.,					
	(numbers only,	C <sub>g</sub>		$C_g$					
	no dashes)	(μg/m³)	-	(ppmv)	Chemical				
			-						
	109999	5.90E+01			Tetrahydrofuran				
					MESSAGE: See VLOOK		chemical properties		
	ENTER	ENTER	ENTER	ENTER	and/or toxicity criteria for	ENTER	1		
	Depth	LIVILIX	LIVILIX	LIVILIX		LIVILIX			
MORE	below grade	Soil gas		Vadose zone		User-defined			
<b>₩</b>	to bottom	sampling	Average	SCS		vadose zone			
	of enclosed	depth	soil	soil type		soil vapor			
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,			
	$L_F$	$L_s$	Ts	soil vapor		k <sub>v</sub>			
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )			
		1	T						
	15	487.68	24	SI					
MORE ₩	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, ρ <sub>b</sub> <sup>A</sup> (g/cm³)	ENTER Vadose zone soil total porosity, n <sup>V</sup> (unitless)	ENTER  Vadose zone soil water-filled porosity, $\theta_w^V$ $(cm^3/cm^3)$	(L	ENTER Average vapor flow rate into bldg. eave blank to calcula Q <sub>soil</sub> (L/m)	ate)		
	SI	1.35	0.489	0.167		5			
MORE ₩	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER			
	Averaging	Averaging	_	_	_				
	time for	time for	Exposure	Exposure	Exposure	Air Exchange			
Lookup Receptor	carcinogens, AT <sub>C</sub>	noncarcinogens, AT <sub>NC</sub>	duration, ED	frequency, EF	Time ET	Rate ACH			
Parameters	· -		(yrs)		(hrs/day)	(hour) <sup>-1</sup>			
	(yrs)	(yrs)	(yrs)	(days/yr)	(IIIS/uay)	(Hour)	•		
Residential	70	26	26	350	24	0.5	]		
> Residential							ı		

END

Risk

5.7E-06

Noncancer

Hazard

7.4E-02

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

#### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) 2.7E+00

		Soil (	Gas Concentratio	n Data				Results
Reset to Defaults	ENTER	ENTER Soil		ENTER Soil			(µg/m³)	Attenuation Factor (unitless)
Delauits	Chemical CAS No. (numbers only, no dashes)	gas conc., C <sub>g</sub> (μg/m³)	OR	gas conc., C <sub>g</sub> (ppmv)	Chemical		1.00E+04	2.7E-04
	127184	1.00E+04			Tetrachloroethylene			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER		
MORE	below grade	Soil gas		Vadose zone		User-defined		

ENTER	ENTER	ENTER	ENTER		ENTER
Depth					
below grade	Soil gas		Vadose zone		User-defined
to bottom	sampling	Average	SCS		vadose zone
of enclosed	depth	soil	soil type		soil vapor
space floor,	below grade,	temperature,	(used to estimate	OR	permeability,
$L_F$	$L_s$	$T_S$	soil vapor		$k_v$
(15 or 200 cm)	(cm)	(°C)	permeability)	1	(cm <sup>2</sup> )
15	487.68	24	SI		

	MORE ↓	ENTER Vandose zone SCS soil type  Lookup Soil Parameters	ENTER  Vadose zone soil dry bulk density,	ENTER Vadose zone soil total porosity, n <sup>V</sup> (unitless)	ENTER  Vadose zone soil water-filled porosity, $\theta_{w}^{V}$ (cm³/cm³)		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q <sub>soil</sub> (L/m)
		SI	1.35	0.489	0.167		5
	MORE ₩	ENTER Averaging time for	ENTER Averaging time for	<b>ENTER</b> Exposure	ENTER Exposure	ENTER Exposure	<b>ENTER</b> Air Exchange
	Lookup Receptor Parameters	carcinogens, AT <sub>C</sub> (yrs)	noncarcinogens, AT <sub>NC</sub> (yrs)	duration, ED (yrs)	frequency, EF (days/yr)	Time ET (hrs/day)	Rate ACH (hour) <sup>-1</sup>
NEW=>	Residential	70	26	26	350	24 (NEW)	0.5 (NEW)
	END						

Risk

1.1E-07

Noncancer

Hazard

1.4E-03

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

Scenario: Residential

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

 $(\mu g/m^3)$ 

5.3E-02

			DATA ENTRY S	SHEET			Cnemical:	letrachioroe	Į.
		Soil	Gas Concentration	n Nata				Result	Ŀ
Reset to	ENTER	ENTER Soil	Gas Concentration	ENTER Soil			Soil Gas Conc. (µg/m³)	Attenuation Factor (unitless)	=
Defaults	Chemical	gas	OR	gas			8.30E+01	6.3E-04	-
	CAS No.	conc.,		conc.,					
	(numbers only,	$C_g$		$C_g$					
	no dashes)	(μg/m³)	=	(ppmv)	Chemical				
	127184	8.30E+01			Tetrachloroethyl	ene			
	ENTER	ENTER	ENTER	ENTER		ENTER	7		
	Depth	LIVILIX	LIVILIX	LIVILIX		LIVILIX			
MORE	below grade	Soil gas		Vadose zone		User-defined			
Ψ	to bottom	sampling	Average	SCS		vadose zone			
	of enclosed	depth	soil	soil type		soil vapor			
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,			
	$L_{F}$	L <sub>s</sub>	Ts	soil vapor		k <sub>v</sub>			
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )	-		
	15	182.88	24	SI			-		
	ENTER	ENTER	ENTER	ENTER		ENTER			
MORE	Vandose zone	Vadose zone	Vadose zone	Vadose zone		Average vapor			
<b>↓</b>	SCS	soil dry	soil total	soil water-filled		flow rate into bldg			
	soil type	bulk density,	porosity, n <sup>V</sup>	porosity,	(	Leave blank to calcul	ate)		
	Lookup Soil Parameters	ρ <sub>b</sub> <sup>A</sup> (g/cm³)		$\theta_{\rm w}^{\rm V}$ (cm <sup>3</sup> /cm <sup>3</sup> )		Q <sub>soil</sub>			
	Talameters	(g/cm )	(unitless)	(CIII /CIII )	•	(L/m)	_		
	SI	1.35	0.489	0.167		5			
MORE <b>↓</b>	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER			
	Averaging	Averaging	_	_	_				

Lookup Receptor

Parameters

END

NEW=> Residential

time for

carcinogens,

 $AT_{C}$ 

(yrs)

70

time for

noncarcinogens,

 $\mathsf{AT}_\mathsf{NC}$ 

(yrs)

26

Exposure

duration,

ED

(yrs)

26

Exposure

frequency, EF

(days/yr)

350

Exposure

Time

ET

(hrs/day)

24

(NEW)

Air Exchange

Rate

ACH

(hour)<sup>-1</sup>

0.5

Risk

5.5E-06

Noncancer

Hazard

7.2E-02

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

Scenario: Residential

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m<sup>3</sup>) **2.6E+00** 

	DATA ENTRY SHEET								
		Soil		Resu					
Reset to	ENTER	ENTER Soil		ENTER Soil			Soil Gas Conc. (μg/m³)	Attenuation Factor (unitless)	
Defaults	Chemical	gas	OR	gas			9.80E+03	2.7E-04	
	CAS No.	conc.,		conc.,					
	(numbers only,	C <sub>g</sub>		$C_g$					
	no dashes)	(μg/m³)	=	(ppmv)	Chemical				
	127184	9.80E+03	]		Tetrachloroethylene	)			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER			
MORE	below grade	Soil gas		Vadose zone		User-defined			
Ψ	to bottom	sampling	Average	SCS		vadose zone			
	of enclosed	depth	soil	soil type		soil vapor			
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,			
	$L_F$	$L_s$	Ts	soil vapor		k <sub>v</sub>			
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )	_		
	15	487.68	24	SI			_		
	ENTER	ENTER	ENTER	ENTER		ENTER			

Average vapor flow rate into bldg. (Leave blank to calculate)  Q <sub>soil</sub> (L/m)
5
ENTER  Air Exchange
Rate ACH (hour) <sup>-1</sup>
0.5 (NEW)
)

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

 $(\mu g/m^3)$ 

3.5E+00

Cancer

Risk

7.3E-06

Noncancer

Hazard

9.5E-02

		Result					
Reset to Defaults	ENTER	ENTER Soil		ENTER Soil		(µg/m³)	Attenuation Factor (unitless)
Delaulis	Chemical	gas	OR	gas		5.50E+03	6.3E-04
	CAS No. (numbers only,	conc., C <sub>g</sub>		conc., $C_g$			
	no dashes)	(μg/m³)	<b>=</b>	(ppmv)	Chemical		i
	127184	5.50E+03	1		Tetrachloroethylene		

**ENTER ENTER ENTER ENTER ENTER** Depth MORE below grade Soil gas Vadose zone User-defined to bottom SCS sampling Average vadose zone of enclosed depth soil soil type soil vapor space floor, below grade, temperature, (used to estimate OR permeability,  $L_s$ Ts soil vapor (15 or 200 cm) (°C) permeability) (cm<sup>2</sup>) (cm) 15 182.88 24 SI

MORE ¥	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER  Vadose zone soil dry bulk density,  Pb  (g/cm³)	ENTER Vadose zone soil total porosity, n  (unitless)	ENTER  Vadose zone soil water-filled porosity, $\theta_w^V$ $(cm^3/cm^3)$		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q <sub>soil</sub> (L/m)
	SI	1.35	0.489	0.167		5
MORE $\psi$	ENTER Averaging time for	ENTER Averaging time for	<b>ENTER</b> Exposure	<b>ENTER</b> Exposure	<b>ENTER</b> Exposure	<b>ENTER</b> Air Exchange
Lookup Receptor Parameters	carcinogens, AT <sub>C</sub> (yrs)	noncarcinogens, AT <sub>NC</sub> (yrs)	duration, ED (yrs)	frequency, EF (days/yr)	Time ET (hrs/day)	Rate ACH (hour) <sup>-1</sup>
NEW=> Residential END	70	26	26	350	24 (NEW)	0.5 (NEW)

Risk

1.4E-06

Noncancer

Hazard

1.8E-02

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(µg/m³) 6.5E-01

			DATA ENTRY S	SHEET				
		Soil (	Gas Concentration	n Data				Result
Reset to	ENTER	ENTER Soil		ENTER Soil			Soil Gas Conc. A (µg/m³)	Attenuation Factor (unitless)
Defaults	Chemical	gas	OR	gas			2.40E+03	2.7E-04
	CAS No.	conc.,		conc.,				
	(numbers only,	C <sub>g</sub>		$C_{g}$				
	no dashes)	(μg/m³)		(ppmv)	Chemical			
	127184	2.40E+03			Tetrachloroethy	lene		
							-	
	ENTER Depth	ENTER	ENTER	ENTER		ENTER		
MORE	below grade	Soil gas		Vadose zone		User-defined		
₩	to bottom	sampling	Average	SCS		vadose zone		
	of enclosed space floor,	depth below grade,	soil temperature,	soil type (used to estimate	OR	soil vapor permeability,		
	L <sub>F</sub>	L <sub>s</sub>	T <sub>S</sub>	soil vapor	OK	k <sub>v</sub>		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )		
		ζ- /	, ,	7,				
	15	487.68	24	SI				
MORE ¥	ENTER Vandose zone SCS Soil type Lookup Soil Parameters	ENTER  Vadose zone soil dry bulk density, ρ <sub>b</sub> <sup>A</sup> (g/cm³)	ENTER Vadose zone soil total porosity, n <sup>V</sup> (unitless)	ENTER Vadose zone soil water-filled porosity, $\theta_w$ (cm³/cm³)		ENTER Average vapor flow rate into bldg. (Leave blank to calcul: Q <sub>soil</sub> (L/m)	ate)	
	SI	1.35	0.489	0.167		5	]	
MORE								
₩ <b>-</b>	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER		
	Averaging	Averaging						
	time for	time for	Exposure	Exposure	Exposure	Air Exchange		
Lookup Receptor	carcinogens,	noncarcinogens,	duration,	frequency,	Time	Rate		
Parameters	AT <sub>C</sub>	AT <sub>NC</sub>	ED (comp.)	EF	ET (table)	ACH		
	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) <sup>-1</sup>	-	

END

NEW=> Residential

70

26

26

350

24

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Commercial

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) 2.7E+00

Cancer

Risk

1.3E-06

Noncancer

Hazard

1.7E-02

		Soil	Gas Concentratio	n Data				Result
Reset to Defaults	Chemical CAS No. (numbers only,	ENTER Soil gas conc., C <sub>q</sub>	OR	ENTER Soil gas conc., C <sub>q</sub>			Soil Gas Conc. (μg/m³) 8.40E+03	Attenuation Factor (unitless) 3.2E-04
	no dashes)	(μg/m³)	=,	(ppmv)	Chemical			
	127184	8.40E+03	]		Tetrachloroethylene			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER		
MORE	below grade	Soil gas		Vadose zone		User-defined		

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
•	below grade to bottom	Soil gas sampling	Average	Vadose zone SCS		User-defined vadose zone
	of enclosed space floor, L <sub>F</sub> (15 or 200 cm)	depth below grade, L <sub>s</sub> (cm)	soil temperature, T <sub>S</sub> (°C)	soil type (used to estimate soil vapor permeability)	OR	soil vapor permeability, k <sub>v</sub> (cm²)
	15	182 88	24	SI		

MORE ¥	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER  Vadose zone soil dry bulk density, $\rho_b^A$ (g/cm³)	Vadose zone soil total porosity,	ENTER  Vadose zone soil water-filled porosity, θ <sub>w</sub> (cm³/cm³)		Average vapor flow rate into bldg. (Leave blank to calculate)
[	SI	1.35	(unitless) 0.489	0.167		(L/m) 5
MORE ↓	ENTER Averaging time for	ENTER Averaging time for	<b>ENTER</b> Exposure	ENTER Exposure	<b>ENTER</b> Exposure	<b>ENTER</b> Air Exchange
Lookup Receptor Parameters	carcinogens, AT <sub>C</sub> (yrs)	noncarcinogens, AT <sub>NC</sub> (yrs)	duration, ED (yrs)	frequency, EF (days/yr)	Time ET (hrs/day)	Rate ACH (hour) <sup>-1</sup>
NEW=> Commercial END	70	25	25	250	8 (NEW)	1 (NEW)

Risk

5.6E-07

Noncancer

Hazard

7.6E-03

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Commercial

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

 $(\mu g/m^3)$ 

1.2E+00

			DATA ENTRY S	SHEET			Onemical.	retracinoroc	
		Soil (	Gas Concentration	n Data				Resul	t
Reset to	ENTER	ENTER Soil		ENTER Soil			(µg/m³)	Attenuation Factor (unitless)	_
Defaults	Chemical	gas	OR	gas			8.60E+03	1.3E-04	
	CAS No.	conc.,		conc.,					
	(numbers only,	C <sub>g</sub>		$C_g$					
	no dashes)	(μg/m³)		(ppmv)	Chemical				
	127184	8.60E+03			Tetrachloroethyl	ene			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER	1		
MORE	below grade	Soil gas		Vadose zone		User-defined			
<del>.</del>	to bottom	sampling	Average	SCS		vadose zone			
	of enclosed	depth	soil	soil type		soil vapor			
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,			
	L <sub>F</sub>	L <sub>s</sub>	Ts	soil vapor		k <sub>v</sub>			
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )			
	(10 01 200 0111)	(4)	( - /	ротпостину	•	(-)	1		
	15	487.68	24	SI					
MORE ↓	ENTER Vandose zone SCS Soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, pb <sup>A</sup> (g/cm³)	ENTER Vadose zone soil total porosity, n <sup>V</sup> (unitless)	ENTER Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ }$ $(cm^3/cm^3)$		ENTER Average vapor flow rate into bldg. (Leave blank to calcul Q <sub>soil</sub> (L/m)			
	SI	1.35	0.489	0.167		5	]		
MORE ₩	ENTER Averaging	ENTER Averaging	ENTER	ENTER	ENTER	ENTER			
	time for	time for	Exposure	Exposure	Exposure	Air Exchange			
	carcinogens,	noncarcinogens,	duration,	frequency,	Time	Rate			
Lookup Receptor	ATC	AT <sub>NC</sub>	ED	EF	ET	ACH			
Parameters	1					₁_1			

Parameters

END

NEW=> Commercial

(yrs)

70

(yrs)

25

(yrs)

25

(days/yr)

250

(hrs/day)

(NEW)

Cancer

Risk

NA

Noncancer

Hazard

3.9E-06

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

Scenario: Commercial Chemical: Tetrahydrofuran

			DATA ENTRY S	SHEET			Cnemical:	Tetranydrofu	ran
		Soil	Gas Concentration	n Data				Result	s Summary
	ENTER	ENTER		ENTER	1		Soil Gas Conc. At	tenuation Factor	Indoor Air Conc.
Reset to		Soil		Soil			(µg/m³)	(unitless)	(µg/m³)
Defaults	Chemical	gas	OR	gas			7.00E+01	4.9E-04	3.4E-02
	CAS No.	conc.,		conc.,					
	(numbers only,	Cq		Cq					
	no dashes)	(μg/m³)		(ppmv)	Chemical				
		1 113		(FF)					
	109999	7.00E+01			Tetrahydrofuran				
					MESSAGE: See VLOO and/or toxicity criteria fo	KUP table comments on our this chemical.	chemical properties		
	ENTER	ENTER	ENTER	ENTER	and toxiony ontone is	ENTER	1		
	Depth								
MORE	below grade	Soil gas		Vadose zone		User-defined			
4	to bottom	sampling	Average	SCS		vadose zone			
<u> </u>	of enclosed	depth	soil	soil type		soil vapor			
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,			
	$L_{F}$	Ls	T <sub>s</sub>	soil vapor		k <sub>v</sub>			
	(15 or 200 cm)	(cm)	(°C)	permeability)	_	(cm <sup>2</sup> )			
		1	1		-				
	15	182.88	24	SI			]		
MORE ↓	ENTER Vandose zone SCS Soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, $\rho_b^A$ (g/cm³)	ENTER Vadose zone soil total porosity, n  (unitless)	ENTER  Vadose zone soil water-filled porosity, $\theta_w$ (cm³/cm³)		ENTER Average vapor flow rate into bldg. (Leave blank to calcula Q <sub>soil</sub> (L/m)	ate)		
	SI	1.35	0.489	0.167	]	5	]		
MORE ↓	ENTER Averaging time for carcinogens,	ENTER Averaging time for noncarcinogens,	ENTER Exposure duration,	ENTER Exposure frequency,	ENTER Exposure Time	ENTER  Air Exchange  Rate			
Lookup Receptor	AT <sub>C</sub>	AT <sub>NC</sub>	ED	EF	ET	ACH			
Parameters	1 , ,	, ,	, ,	(1 ( )		a			

(days/yr)

250

END

NEW=> Commercial

(yrs)

70

(yrs)

25

(yrs)

25

(hrs/day)

(NEW)

Risk

3.7E-07

Noncancer

Hazard

5.0E-03

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

Scenario: Commercial

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

 $(\mu g/m^3)$ 

7.7E-01

	DATA ENTRY SHEET								
		Soil	Gas Concentration				Result	•	
Reset to	ENTER	ENTER Soil	Cas Concentration	ENTER Soil			Soil Gas Conc.	Attenuation Factor (unitless)	
Defaults	Chemical	gas	OR	gas			5.70E+03	1.3E-04	
	CAS No.	conc.,		conc.,					•
	(numbers only,	C <sub>g</sub>		C <sub>q</sub>					
	no dashes)	(μg/m³)		(ppmv)	Chemical				
		110	=	M. F.					
	127184	5.70E+03			Tetrachloroethyl	ene			
	ENTER	ENTER	ENTER	ENTER		ENTER	7		
	Depth								
MORE	below grade	Soil gas		Vadose zone		User-defined			
•	to bottom	sampling	Average	SCS		vadose zone			
	of enclosed	depth	soil	soil type		soil vapor			
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,			
	$L_{F}$	L <sub>s</sub>	T <sub>S</sub>	soil vapor		k <sub>v</sub>			
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )			
			T				_		
	15	487.68	24	SI					
MORE ↓	ENTER Vandose zone SCS soil type	ENTER Vadose zone soil dry bulk density,	ENTER Vadose zone soil total	ENTER Vadose zone soil water-filled porosity,		ENTER Average vapor flow rate into bldg (Leave blank to calcu			
	Lookup Soil	$\rho_b^A$	porosity, n <sup>V</sup>	$\theta_{w}^{V}$	'	Q <sub>soil</sub>	iate)		
	Parameters	(g/cm <sup>3</sup> )	(unitless)	(cm <sup>3</sup> /cm <sup>3</sup> )		(L/m)			
		(g/om )	(driitic33)	(0111 70111 )		(2/11)	_		
	SI	1.35	0.489	0.167		5	7		
			•				_		
MORE Ψ	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER			
	Averaging	Averaging							
	time for	time for	Exposure	Exposure	Exposure	Air Exchange			

Lookup Receptor

Parameters

END

NEW=> Commercial

carcinogens,

 $AT_{C}$ 

(yrs)

70

noncarcinogens,

 $AT_{NC}$ 

(yrs)

25

duration,

ED

(yrs)

25

frequency,

EF

(days/yr)

250

Time

ET

(hrs/day)

(NEW)

Rate

ACH

Risk

1.7E-08

Noncancer

Hazard

2.3E-04

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Commercial

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) **3.5E-02** 

			DATA ENTRY S	SHEET			Onemical.	retracinoroe	,,,
		Soil (	Gas Concentration	n Data				Resul	lt
Reset to	ENTER	ENTER Soil		ENTER Soil			Soil Gas Conc. A (µg/m³)	Attenuation Factor (unitless)	
Defaults	Chemical	gas	OR	gas			1.10E+02	3.2E-04	
	CAS No.	conc.,		conc.,					
	(numbers only,	C <sub>g</sub>		C <sub>g</sub>					
	no dashes)	(μg/m³)		(ppmv)	Chemical				
	127184	1.10E+02			Tetrachloroethyl	ene			
							<b>-</b>		
	ENTER Depth	ENTER	ENTER	ENTER		ENTER			
MORE	below grade	Soil gas		Vadose zone		User-defined			
•	to bottom	sampling	Average	SCS		vadose zone			
	of enclosed	depth	soil	soil type		soil vapor			
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,			
	L <sub>F</sub>	L <sub>s</sub>	T <sub>S</sub> (°C)	soil vapor		k <sub>v</sub> (cm <sup>2</sup> )			
	(15 or 200 cm)	(cm)	( C)	permeability)		(CIII )	_		
	15	182.88	24	SI			<u> </u>		
	ENTER	ENTER	ENTER	ENTER		ENTER			
MORE	Vandose zone	Vadose zone	Vadose zone	Vadose zone		Average vapor			
Ψ	SCS	soil dry	soil total	soil water-filled	,	flow rate into bldg.			
	soil type	bulk density, ρ <sub>ь</sub> <sup>A</sup>	porosity, n <sup>V</sup>	porosity, $\theta_w^{\ \ V}$	(	Leave blank to calcul	ate)		
	Lookup Soil Parameters	ρ <sub>ь</sub> (g/cm <sup>3</sup> )	(unitless)	(cm <sup>3</sup> /cm <sup>3</sup> )		Q <sub>soil</sub> (L/m)			
	· dramotoro	(g/ciii )	(unitiess)	(CIII /CIII )		(L/III)	_		
	SI	1.35	0.489	0.167		5	]		
MORE									
<b>↓</b>	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER			
	Averaging time for	Averaging time for	Evposure	Evpoouro	Evacure	Air Evohance			
	carcinogens,	noncarcinogens,	Exposure duration,	Exposure frequency,	Exposure Time	Air Exchange Rate			
Lookup Receptor	AT <sub>C</sub>	AT <sub>NC</sub>	ED	EF	ET	ACH			
Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) <sup>-1</sup>			
	- 7	12 /	· /	` , , ,	` 7/	, ,			

END

NEW=> Commercial

70

25

25

250

Risk

2.7E-09

Noncancer

Hazard

3.0E-06

**Results Summary** 

Indoor Air Conc.

 $(\mu g/m^3)$ 

1.3E-02

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Commercial Chemical: Ethylbenzene

			DATAENTRE					•
		Soil	Gas Concentration	n Data				Result
Reset to	ENTER	ENTER Soil		ENTER Soil			Soil Gas Conc. A	Attenuation Factor (unitless)
Defaults	Chemical	gas	OR	gas			7.50E+01	1.8E-04
	CAS No.	conc.,		conc.,				
	(numbers only,	$C_g$		$C_g$				
	no dashes)	(μg/m³)	=	(ppmv)	Chemical			
	100414	7.50E+01	- 1		Ethylbenzene			
	100414	7.50⊑+01	<u> </u>		Euryibenzene			
	ENTER	ENTER	ENTER	ENTER		ENTER	]	
	Depth							
MORE	below grade	Soil gas	_	Vadose zone		User-defined		
<b>V</b>	to bottom	sampling	Average	SCS		vadose zone		
	of enclosed space floor,	depth below grade,	soil temperature,	soil type (used to estimate	OR	soil vapor permeability,		
	L <sub>F</sub>	L <sub>s</sub>	T <sub>S</sub>	soil vapor	OK	k <sub>v</sub>		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )		
	(13 01 200 011)	(CIII)	( 0)	permeability)	•	(em)		
	15	487.68	24	SI				
	ENTER	ENTER	ENTER	ENTER		ENTER		
MORE	Vandose zone	Vadose zone	Vadose zone	Vadose zone		Average vapor		
•	SCS	soil dry	soil total	soil water-filled		flow rate into bldg.		
	soil type	bulk density,	porosity, n <sup>V</sup>	porosity,		(Leave blank to calcula	ate)	
	Lookup Soil	$\rho_b^A$		$\theta_{w}^{V}$		$Q_{soil}$		
	Parameters	(g/cm <sup>3</sup> )	(unitless)	(cm <sup>3</sup> /cm <sup>3</sup> )	ī	(L/m)	•	
	01	4.05	0.400	0.407	1		7	
	SI	1.35	0.489	0.167		5	J	
MORE								
<b>V</b>	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER		
	Averaging time for	Averaging time for	Exposure	Exposure	Exposure	Air Exchange		
			LAPOSUIC	LAPOSUIC	_xposure	, iii Excilarige		

Lookup Receptor

Parameters

END

NEW=> Commercial

carcinogens,

 $AT_{C}$ 

(yrs)

70

noncarcinogens,

 $\mathsf{AT}_\mathsf{NC}$ 

(yrs)

25

duration,

ED

(yrs)

25

frequency,

EF

(days/yr)

250

Time

ET

(hrs/day)

(NEW)

Rate

ACH

Risk

NA

Noncancer

Hazard

1.5E-04

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Commercial Chemical: p-Xylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) **6.5E-02** 

			DATA ENTRY S					
		Soil (	Gas Concentration	n Data				Res
Reset to	ENTER	ENTER Soil	odo concentration	ENTER Soil			Soil Gas Conc. A	ttenuation Fact
Defaults	Chemical	gas	OR	gas			3.70E+02	1.8E-04
	CAS No.	conc.,		conc.,				
	(numbers only,	C <sub>g</sub>		C <sub>g</sub>	01			
	no dashes)	(μg/m³)		(ppmv)	Chemical			
	106423	3.70E+02			p-Xylene			
	ENTER Don'th	ENTER	ENTER	ENTER		ENTER	7	
MORE	Depth below grade	Soil gas		Vadose zone		User-defined		
•	to bottom of enclosed	sampling depth	Average soil	SCS soil type		vadose zone soil vapor		
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,		
	L <sub>F</sub>	L <sub>s</sub>	T <sub>S</sub>	soil vapor	0.1	k <sub>v</sub>		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )		
	15	487.68	24	SI			_	
	ENTER	ENTER	ENTER	ENTER		ENTER		
MORE	Vandose zone	Vadose zone	Vadose zone	Vadose zone		Average vapor		
MORE <b>↓</b>	Vandose zone SCS	Vadose zone soil dry	Vadose zone soil total	Vadose zone soil water-filled		Average vapor flow rate into bldg.		
	Vandose zone SCS soil type	Vadose zone soil dry bulk density,	Vadose zone	Vadose zone soil water-filled porosity,		Average vapor flow rate into bldg. (Leave blank to calcul		
	Vandose zone SCS	Vadose zone soil dry	Vadose zone soil total porosity,	Vadose zone soil water-filled		Average vapor flow rate into bldg.		
	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, p <sub>b</sub> <sup>A</sup> (g/cm³)	Vadose zone soil total porosity, n <sup>V</sup> (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $		Average vapor flow rate into bldg. (Leave blank to calcul Q <sub>soil</sub> (L/m)		
	Vandose zone SCS soil type Lookup Soil	Vadose zone soil dry bulk density, $\rho_b^A$	Vadose zone soil total porosity, n <sup>V</sup>	Vadose zone soil water-filled porosity, $\theta_w^V$		Average vapor flow rate into bldg (Leave blank to calcul $\mathbf{Q}_{\text{soil}}$		
₩ORE	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, Pb (g/cm³)	Vadose zone soil total porosity, n <sup>V</sup> (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\vee}$ (cm³/cm³)		Average vapor flow rate into bldg. (Leave blank to calcul Q <sub>soil</sub> (L/m)		
<b>.</b>	Vandose zone SCS soil type Lookup Soil Parameters SI	Vadose zone soil dry bulk density, Pb (g/cm³)	Vadose zone soil total porosity, n <sup>V</sup> (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	ENTER	Average vapor flow rate into bldg. (Leave blank to calcul Q <sub>soil</sub> (L/m)		
₩ORE	Vandose zone SCS soil type Lookup Soil Parameters  SI  ENTER Averaging	Vadose zone soil dry bulk density,  Pb^ (g/cm³)  1.35  ENTER Averaging	Vadose zone soil total porosity, n <sup>V</sup> (unitless)  0.489	Vadose zone soil water-filled porosity, θ <sub>w</sub> ∨ (cm <sup>3</sup> /cm <sup>3</sup> )  0.167  ENTER		Average vapor flow rate into bldg (Leave blank to calcul Q <sub>soil</sub> (L/m)		
₩ORE	Vandose zone SCS soil type Lookup Soil Parameters SI  ENTER Averaging time for	Vadose zone soil dry bulk density, p <sub>b</sub> <sup>A</sup> (g/cm³)  1.35  ENTER Averaging time for	Vadose zone soil total porosity, n <sup>V</sup> (unitless)  0.489  ENTER  Exposure	Vadose zone soil water-filled porosity,	Exposure	Average vapor flow rate into bldg. (Leave blank to calcul Q <sub>soil</sub> (L/m)  5  ENTER  Air Exchange		
₩ORE	Vandose zone SCS soil type Lookup Soil Parameters  SI  ENTER Averaging	Vadose zone soil dry bulk density,  Pb^ (g/cm³)  1.35  ENTER Averaging	Vadose zone soil total porosity, n <sup>V</sup> (unitless)  0.489	Vadose zone soil water-filled porosity, θ <sub>w</sub> ∨ (cm <sup>3</sup> /cm <sup>3</sup> )  0.167  ENTER		Average vapor flow rate into bldg (Leave blank to calcul Q <sub>soil</sub> (L/m)		

25

70

25

250

END

NEW=> Commercial

Risk

NA

Noncancer

Hazard

4.4E-05

**Results Summary** 

Indoor Air Conc.

(μg/m³) **1.9E-02** 

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Commercial Chemical: o-Xylene

		Soil	Gas Concentration	n Data				Res
Reset to	ENTER	ENTER Soil	<u>ous consentiution</u>	ENTER Soil			Soil Gas Conc. A	Attenuation Fact (unitless)
Defaults	Chemical	gas	OR	gas			1.10E+02	1.8E-04
	CAS No.	conc.,		conc.,				
	(numbers only,	C <sub>g</sub>		C <sub>g</sub>				
	no dashes)	(μg/m³)		(ppmv)	Chemical			
	95476	1.10E+02			o-Xylene			
	ENTER	ENTER	ENTER	ENTER		ENTER	7	
MORE	Depth below grade	Soil gas		Vadose zone		User-defined		
•	to bottom	sampling	Average	SCS		vadose zone		
	of enclosed	depth	soil	soil type		soil vapor		
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,		
	L <sub>F</sub>	L <sub>s</sub>	T <sub>S</sub>	soil vapor		k <sub>v</sub>		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )	4	
	15	487.68	24	SI			<del>]</del>	
MORE ↓	ENTER Vandose zone SCS soil type	ENTER Vadose zone soil dry bulk density,	ENTER Vadose zone soil total porosity,	ENTER Vadose zone soil water-filled porosity,		ENTER Average vapor flow rate into bldg (Leave blank to calcul		
	Vandose zone SCS soil type Lookup Soil	Vadose zone soil dry bulk density, $\rho_b^A$	Vadose zone soil total porosity, n <sup>V</sup>	Vadose zone soil water-filled porosity, $\theta_w^V$		Average vapor flow rate into bldg (Leave blank to calcul $\mathbf{Q}_{\mathrm{soil}}$		
	Vandose zone SCS soil type	Vadose zone soil dry bulk density,	Vadose zone soil total porosity,	Vadose zone soil water-filled porosity,		Average vapor flow rate into bldg (Leave blank to calcul		
	Vandose zone SCS soil type Lookup Soil	Vadose zone soil dry bulk density, $\rho_b^A$	Vadose zone soil total porosity, n <sup>V</sup>	Vadose zone soil water-filled porosity, $\theta_w^V$		Average vapor flow rate into bldg (Leave blank to calcul $\mathbf{Q}_{\mathrm{soil}}$		
<b>↓</b> MORE	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, Pb (g/cm³)	Vadose zone soil total porosity, n <sup>V</sup> (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\vee}$ (cm³/cm³)		Average vapor flow rate into bldg (Leave blank to calcul Q <sub>soil</sub> (L/m)		
Ψ	Vandose zone SCS soil type Lookup Soil Parameters SI	Vadose zone soil dry bulk density,  Pb (g/cm³)  1.35	Vadose zone soil total porosity, n <sup>V</sup> (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	ENTER	Average vapor flow rate into bldg (Leave blank to calcul Q <sub>soil</sub> (L/m)		
₩	Vandose zone SCS soil type Lookup Soil Parameters SI  ENTER Averaging	Vadose zone soil dry bulk density, Pb (g/cm³)	Vadose zone soil total porosity, n <sup>V</sup> (unitless)	Vadose zone soil water-filled porosity, θ <sub>w</sub> ∨ (cm <sup>3</sup> /cm <sup>3</sup> )  0.167  ENTER	ENTER	Average vapor flow rate into bldg (Leave blank to calcul Q <sub>soil</sub> (L/m)		
₩	Vandose zone SCS soil type  Lookup Soil Parameters  SI  ENTER Averaging time for	Vadose zone soil dry bulk density, Pb (g/cm³)  1.35  ENTER Averaging time for	Vadose zone soil total porosity, n\(^V\) (unitless)  0.489  ENTER  Exposure	Vadose zone soil water-filled porosity,	<b>ENTER</b> Exposure	Average vapor flow rate into bldg (Leave blank to calcul Q <sub>soil</sub> (L/m)  5  ENTER  Air Exchange		
₩	Vandose zone SCS soil type Lookup Soil Parameters SI  ENTER Averaging	Vadose zone soil dry bulk density, Pb (g/cm³)	Vadose zone soil total porosity, n <sup>V</sup> (unitless)	Vadose zone soil water-filled porosity, θ <sub>w</sub> ∨ (cm <sup>3</sup> /cm <sup>3</sup> )  0.167  ENTER	ENTER	Average vapor flow rate into bldg (Leave blank to calcul Q <sub>soil</sub> (L/m)		

25

70

25

250

END

NEW=> Commercial

Risk

5.6E-08

Noncancer

Hazard

7.6E-04

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# Department of Toxic Substances Control Vapor Intrusion Screening Model - Soil Gas

Scenario: Commercial

Soil Gas Conc. Attenuation Factor

(μg/m³) **8.60E+02** 

Chemical: Tetrachloroethylene

(unitless)

1.3E-04

**Results Summary** 

Indoor Air Conc.

(μg/m³) **1.2E-01** 

			DATA ENTRY S	SHEET		
		Soil	Gas Concentration	n Data		
Reset to	ENTER	ENTER Soil		ENTER Soil		
Defaults	Chemical	gas	OR	gas		
	CAS No.	conc.,		conc.,		·
	(numbers only,	C <sub>g</sub>		C <sub>g</sub>		
	no dashes)	(μg/m³)	=	(ppmv)	Chemical	
	127184	8.60E+02			Tetrachloroethylene	)
	ENTER	ENTER	ENTER	ENTER		ENTER
MODE	Depth	0 - 11		Madaaa aa		Harada Carad
MORE <b>↓</b>	below grade to bottom	Soil gas sampling	Average	Vadose zone SCS		User-defined vadose zone
	of enclosed	depth	soil	soil type		soil vapor
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,
	L <sub>F</sub> (15 or 200 cm)	L <sub>s</sub> (cm)	T <sub>S</sub> (°C)	soil vapor permeability)		k <sub>v</sub> (cm <sup>2</sup> )
	(10 01 200 011)	(CIII)	( 0)	permeability)	•	(6111)
	15	487.68	24	SI		

		ENTER	ENTER	ENTER	ENTER		ENTER
	MORE	Vandose zone	Vadose zone	Vadose zone	Vadose zone		Average vapor
	<b>↓</b>	SCS	soil dry	soil total	soil water-filled		flow rate into bldg.
		soil type	bulk density,	porosity,	porosity,		(Leave blank to calculate)
		Lookup Soil	$\rho_b^{\ A}$	n <sup>v</sup>	$\theta_{w}^{V}$		$Q_{soil}$
		Parameters	(g/cm <sup>3</sup> )	(unitless)	(cm <sup>3</sup> /cm <sup>3</sup> )		(L/m)
		SI	1.35	0.489	0.167		5
	MORE	ENTER Averaging	ENTER Averaging	ENTER	ENTER	ENTER	ENTER
		time for	time for	Exposure	Exposure	Exposure	Air Exchange
		carcinogens,	noncarcinogens,	duration,	frequency,	Time	Rate
	Lookup Receptor Parameters	$AT_C$	AT <sub>NC</sub>	ED	EF	ET	ACH
	Farameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) <sup>-1</sup>
NEW=>	Commercial	70	25	25	250	8	1
	COCi Oldi					(NEW)	(NEW)
	END					(1211)	( ===,

Risk

2.0E-09

Noncancer

Hazard

2.2E-06

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Commercial Chemical: Ethylbenzene

**Results Summary** 

Indoor Air Conc.

(μg/m³) **9.9E-03** 

			DATA ENTRY S	SHEET				,
		Soil (	Gas Concentration	n Data				Resul
Reset to	ENTER	ENTER Soil		ENTER Soil			Soil Gas Conc. A	Attenuation Factor
Defaults	Chemical	gas	OR	gas			5.60E+01	1.8E-04
	CAS No.	conc.,		conc.,				
	(numbers only,	C <sub>g</sub> (μg/m³)		C <sub>g</sub>	Chamiaal			
	no dashes)	(μg/III )		(ppmv)	Chemical			
	100414	5.60E+01			Ethylbenzene			
	ENTER	ENTER	ENTER	ENTER		ENTED	7	
	ENTER Depth	ENTER	ENTER	ENTER		ENTER		
MORE <b>↓</b>	below grade	Soil gas		Vadose zone		User-defined		
Ψ	to bottom of enclosed	sampling depth	Average soil	SCS soil type		vadose zone soil vapor		
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,		
	L <sub>F</sub>	L <sub>s</sub>	Ts	soil vapor		k <sub>v</sub>		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )		
	15	487.68	24	SI				
MORE ↓	ENTER Vandose zone SCS Soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, $ \begin{array}{c} \rho_b^{\Lambda} \\ (g/cm^3) \end{array}$	ENTER Vadose zone soil total porosity, n <sup>V</sup> (unitless)	ENTER  Vadose zone soil water-filled porosity, $\theta_{w}$ (cm³/cm³)		ENTER Average vapor flow rate into bldg. (Leave blank to calcul Q <sub>soil</sub> (L/m)		
		,	, ,	, ,		(2/11)	-	
	SI	1.35	0.489	0.167		5		
MORE						ENTER		
WOKE ↓	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER		
	Averaging	Averaging						
•	Averaging time for	Averaging time for	Exposure	Exposure	Exposure	Air Exchange		
	Averaging	Averaging						

25

70

25

250

NEW=> Commercial

END

Risk

NA

Noncancer

Hazard

1.5E-04

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Commercial Chemical: p-Xylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) **6.5E-02** 

			DATA ENTRY S					
		Soil (	Gas Concentration	n Data				Res
Reset to	ENTER	ENTER Soil	odo concentration	ENTER Soil			Soil Gas Conc. A	ttenuation Fact
Defaults	Chemical	gas	OR	gas			3.70E+02	1.8E-04
	CAS No.	conc.,		conc.,				
	(numbers only,	C <sub>g</sub>		C <sub>g</sub>	01			
	no dashes)	(μg/m³)		(ppmv)	Chemical			
	106423	3.70E+02			p-Xylene			
	ENTER Don'th	ENTER	ENTER	ENTER		ENTER	7	
MORE	Depth below grade	Soil gas		Vadose zone		User-defined		
•	to bottom of enclosed	sampling depth	Average soil	SCS soil type		vadose zone soil vapor		
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,		
	L <sub>F</sub>	L <sub>s</sub>	T <sub>S</sub>	soil vapor	0.1	k <sub>v</sub>		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )		
	15	487.68	24	SI			_	
	ENTER	ENTER	ENTER	ENTER		ENTER		
MORE	Vandose zone	Vadose zone	Vadose zone	Vadose zone		Average vapor		
MORE <b>↓</b>	Vandose zone SCS	Vadose zone soil dry	Vadose zone soil total	Vadose zone soil water-filled		Average vapor flow rate into bldg.		
	Vandose zone SCS soil type	Vadose zone soil dry bulk density,	Vadose zone	Vadose zone soil water-filled porosity,		Average vapor flow rate into bldg. (Leave blank to calcul		
	Vandose zone SCS	Vadose zone soil dry	Vadose zone soil total porosity,	Vadose zone soil water-filled		Average vapor flow rate into bldg.		
	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, p <sub>b</sub> <sup>A</sup> (g/cm³)	Vadose zone soil total porosity, n <sup>V</sup> (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $		Average vapor flow rate into bldg. (Leave blank to calcul Q <sub>soil</sub> (L/m)		
	Vandose zone SCS soil type Lookup Soil	Vadose zone soil dry bulk density, $\rho_b^A$	Vadose zone soil total porosity, n <sup>V</sup>	Vadose zone soil water-filled porosity, $\theta_w^V$		Average vapor flow rate into bldg (Leave blank to calcul $\mathbf{Q}_{\text{soil}}$		
₩ORE	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, Pb (g/cm³)	Vadose zone soil total porosity, n <sup>V</sup> (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\vee}$ (cm³/cm³)		Average vapor flow rate into bldg. (Leave blank to calcul Q <sub>soil</sub> (L/m)		
<b>.</b>	Vandose zone SCS soil type Lookup Soil Parameters SI	Vadose zone soil dry bulk density, Pb (g/cm³)	Vadose zone soil total porosity, n <sup>V</sup> (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	ENTER	Average vapor flow rate into bldg. (Leave blank to calcul Q <sub>soil</sub> (L/m)		
₩ORE	Vandose zone SCS soil type Lookup Soil Parameters  SI  ENTER Averaging	Vadose zone soil dry bulk density,  Pb^ (g/cm³)  1.35  ENTER Averaging	Vadose zone soil total porosity, n <sup>V</sup> (unitless)  0.489	Vadose zone soil water-filled porosity, θ <sub>w</sub> ∨ (cm <sup>3</sup> /cm <sup>3</sup> )  0.167  ENTER		Average vapor flow rate into bldg (Leave blank to calcul Q <sub>soil</sub> (L/m)		
₩ORE	Vandose zone SCS soil type Lookup Soil Parameters SI  ENTER Averaging time for	Vadose zone soil dry bulk density, p <sub>b</sub> <sup>A</sup> (g/cm³)  1.35  ENTER Averaging time for	Vadose zone soil total porosity, n <sup>V</sup> (unitless)  0.489  ENTER  Exposure	Vadose zone soil water-filled porosity,	Exposure	Average vapor flow rate into bldg. (Leave blank to calcul Q <sub>soil</sub> (L/m)  5  ENTER  Air Exchange		
₩ORE	Vandose zone SCS soil type Lookup Soil Parameters  SI  ENTER Averaging	Vadose zone soil dry bulk density,  Pb^ (g/cm³)  1.35  ENTER Averaging	Vadose zone soil total porosity, n <sup>V</sup> (unitless)  0.489	Vadose zone soil water-filled porosity, θ <sub>w</sub> ∨ (cm <sup>3</sup> /cm <sup>3</sup> )  0.167  ENTER		Average vapor flow rate into bldg (Leave blank to calcul Q <sub>soil</sub> (L/m)		

25

70

25

250

END

NEW=> Commercial

Risk

NA

Noncancer

Hazard

3.7E-05

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Commercial Chemical: o-Xylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) **1.6E-02** 

			DATA ENTRY S	SHEET				o ny ionio
		Soil (	Gas Concentration	n Data				Res
Reset to	ENTER	ENTER Soil	<u> </u>	ENTER Soil			Soil Gas Conc. A	Attenuation Fac
Defaults	Chemical	gas	OR	gas			9.20E+01	1.8E-04
	CAS No.	conc.,		conc.,				
	(numbers only,	C <sub>g</sub>		$C_{g}$				
	no dashes)	(μg/m³)		(ppmv)	Chemical			
	95476	9.20E+01			o-Xylene			
							7	
	ENTER Depth	ENTER	ENTER	ENTER		ENTER		
MORE	below grade	Soil gas		Vadose zone		User-defined		
Ψ	to bottom	sampling	Average	SCS soil type		vadose zone soil vapor		
	of enclosed space floor,	depth below grade,	soil temperature,	(used to estimate	OR	permeability,		
	L <sub>F</sub>	L <sub>s</sub>	T <sub>S</sub>	soil vapor	OIC	k <sub>v</sub>		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )		
		(=)	( - /	parine and many			1	
	15	487.68	24	SI				
MORE ↓	ENTER Vandose zone SCS Soil type Lookup Soil Parameters	ENTER  Vadose zone soil dry bulk density,  Pb  (g/cm³)	ENTER Vadose zone soil total porosity, n <sup>V</sup> (unitless)	ENTER  Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ }$ $(cm^3/cm^3)$		ENTER Average vapor flow rate into bldg. (Leave blank to calcul Q <sub>soil</sub> (L/m)		
	SI	1.35	0.489	0.167		5		
MORE <b>↓</b>	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER		
	Averaging	Averaging	Evacoure	Evacoura	Evnoouss	Air Evobor ==		
	time for carcinogens,	time for noncarcinogens,	Exposure duration,	Exposure frequency,	Exposure Time	Air Exchange Rate		
Lookup Receptor	AT <sub>C</sub>	AT <sub>NC</sub>	ED	EF	ET	ACH		
Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) <sup>-1</sup>		
	(y13)	(y13)	(yi 3)	(uayə/yi)	(IIIə/uay)	(Hour)	-	

25

70

25

250

END

NEW=> Commercial

Risk

6.0E-08

Noncancer

Hazard

8.2E-04

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# Department of Toxic Substances Control Vapor Intrusion Screening Model - Soil Gas

Scenario: Commercial

Soil Gas Conc. Attenuation Factor

(µg/m<sup>3</sup>)

9.30E+02

Chemical: Tetrachloroethylene

(unitless)

1.3E-04

**Results Summary** 

Indoor Air Conc.

 $(\mu g/m^3)$ 

1.3E-01

		Cail	O Ott	Dete		
Reset to	ENTER	ENTER Soil	Gas Concentration	ENTER Soil		
Defaults	Chemical	gas	OR	gas		
	CAS No.	conc.,	0.1	conc.,		
	(numbers only,	C <sub>a</sub>		C <sub>a</sub>		
	no dashes)	(μg/m³)	_	(ppmv)	Chemical	
	107101	0.005.00	<del>-</del> 1			
	127184	9.30E+02			Tetrachloroethy	riene
	ENTER	ENTER	ENTER	ENTER		ENTER
	Depth					
MORE	below grade	Soil gas		Vadose zone		User-defined
Ψ.	to bottom	sampling	Average	SCS		vadose zone
	of enclosed	depth	soil	soil type		soil vapor
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,
	$L_F$	$L_s$	Ts	soil vapor		k <sub>v</sub>
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )
	15	487.68	24	SI		
	ENTER	ENTER	ENTER	ENTER		ENTER
	Vandose zone	Vadose zone	Vadose zone	Vadose zone		Average vapor
MORE		soil dry	soil total	soil water-filled		flow rate into bldg
MORE <b>↓</b>	SCS	,				
	SCS soil type	bulk density,	porosity,	porosity,		(Leave blank to calcul
	soil type  Lookup Soil	bulk density, $\rho_b^{A}$	porosity, n <sup>V</sup>	$\theta_{w}^{V}$		(Leave blank to calcul Q <sub>soil</sub>
	soil type	bulk density,				•

**ENTER** 

Exposure

duration,

ED

(yrs)

25

**ENTER** 

Exposure

frequency, EF

(days/yr)

250

**ENTER** 

Averaging

time for

noncarcinogens,

 $\mathsf{AT}_\mathsf{NC}$ 

(yrs)

25

**ENTER** Averaging

time for

carcinogens,

 $AT_{C}$ 

(yrs)

70

Ψ

Lookup Receptor

Parameters

END

NEW=> Commercial

**ENTER** 

Exposure

Time

ET

(hrs/day)

(NEW)

**ENTER** 

Air Exchange

Rate

ACH

Risk

2.2E-06

Noncancer

Hazard

3.0E-02

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Commercial

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) **4.6E+00** 

			DATA ENTRY S	SHEET					-
		Soil (	Gas Concentration	n Data				Resul	its
Decette	ENTER	ENTER		ENTER			Soil Gas Conc. A	Attenuation Factor	_
Reset to		Soil		Soil			(µg/m³)	(unitless)	
Defaults	Chemical	gas	OR	gas			3.40E+04	1.3E-04	
	CAS No.	conc.,		conc.,					
	(numbers only,	$C_g$		$C_g$					
	no dashes)	(μg/m³)	•	(ppmv)	Chemical				
	127184	3.40E+04	Ī		Tetrachloroethyle	one.			
	127 104	3.40E+04			retracmoroethyle	erie			
	ENTER	ENTER	ENTER	ENTER		ENTER	7		
	Depth	0 "		., .					
MORE	below grade	Soil gas		Vadose zone		User-defined			
	to bottom	sampling	Average	SCS		vadose zone			
	of enclosed space floor,	depth below grade,	soil temperature,	soil type (used to estimate	OR	soil vapor permeability,			
	space floor, L <sub>F</sub>	L <sub>s</sub>	T <sub>S</sub>	soil vapor	UK	k <sub>v</sub>			
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )			
	(13 01 200 011)	(CIII)	( 0)	permeability)		(CIII )	-		
	15	487.68	24	SI			<u> </u>		
	ENTER	ENTER	ENTER	ENTER		ENTER			
MORE	Vandose zone	Vadose zone	Vadose zone	Vadose zone		Average vapor			
Ψ	SCS	soil dry	soil total	soil water-filled		flow rate into bldg			
	soil type	bulk density,	porosity, n <sup>V</sup>	porosity,	(	Leave blank to calcul	ate)		
	Lookup Soil	$\rho_b^A$		$\theta_{w}^{V}$		$Q_{soil}$			
	Parameters	(g/cm <sup>3</sup> )	(unitless)	(cm <sup>3</sup> /cm <sup>3</sup> )		(L/m)	_		
	SI	1.35	0.489	0.167		5	7		
							_		
MORE									
Ψ	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER			
	Averaging	Averaging							
	time for	time for	Exposure	Exposure	Exposure	Air Exchange			
Lastera Bassa (	carcinogens,	noncarcinogens,	duration,	frequency,	Time	Rate			
Lookup Receptor Parameters	AT <sub>C</sub>	AT <sub>NC</sub>	ED	EF	ET	ACH			
i arameters	(vrs)	(vrs)	(vrs)	(davs/vr)	(hrs/dav)	(hour) <sup>-1</sup>			

END

NEW=> Commercial

(yrs)

70

(yrs)

25

(yrs)

25

(days/yr)

250

(hrs/day)

(NEW)

# **APPENDIX G**

# Soil Gas Model Sensitivity Analysis Risk and Hazard Calculation Work Sheets

Hazard

2.4E+00

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

Reset to

Defaults

# Department of Toxic Substances Control Vapor Intrusion Screening Model - Soil Gas

(μg/m<sup>3</sup>)

1.20E+05

no dashes)

127184

DATA ENTRY SHEET

(ppmv)

Scenario: Residential

Chemical: Tetrachloroethylene

	Soil (	Gas Concentration	n Data	Results Sum	ımary
ENTER	ENTER		ENTER	Soil Gas Conc. Attenuation Factor Indoor	Air Conc. C
	Soil		Soil	(μg/m³) (unitless) (μg	g/m³)
Chemical	gas	OR	gas	1.20E+05 7.3E-04 8.8	3E+01 1
CAS No.	conc.,		conc.,		
mbers only,	$C_{g}$		$C_g$		

Chemical

Tetrachloroethylene

**ENTER ENTER ENTER ENTER ENTER** Depth MORE below grade Soil gas Vadose zone User-defined to bottom sampling SCS vadose zone Average of enclosed depth soil soil type soil vapor space floor, below grade, temperature, (used to estimate OR permeability,  $\mathsf{T}_\mathsf{S}$  $L_s$ soil vapor  $k_v$ (15 or 200 cm) (cm) (°C) permeability) (cm<sup>2</sup>) 152 24 SI 15

MORE ¥	ENTER Vandose zone SCS soil type	ENTER Vadose zone soil dry bulk density,	ENTER Vadose zone soil total porosity,	ENTER Vadose zone soil water-filled porosity,		ENTER Average vapor flow rate into bldg. (Leave blank to calculate)
	Lookup Soil Parameters	ρ <sub>ь</sub> <sup>A</sup> (g/cm³)	n <sup>∨</sup> (unitless)	θ <sub>w</sub> <sup>V</sup> (cm³/cm³)		Q <sub>soil</sub> (L/m)
	SI	1.35	0.489	0.167		5
MORE ↓	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	<b>ENTER</b> Exposure	ENTER Exposure	<b>ENTER</b> Air Exchange
Lookup Receptor Parameters	carcinogens, AT <sub>C</sub>	noncarcinogens, AT <sub>NC</sub>	duration, ED	frequency, EF	Time ET	Rate ACH
	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) <sup>-1</sup>
NEW=> Residential END	70	26	26	350	24 (NEW)	0.5 (NEW)

Hazard

2.4E+00

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

Scenario: Residential

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) 8.8E+01

Cancer

Risk

1.8E-04

			DATA ENTRY S	SHEET			Chemical:	retrachioroeti
		Soil	Gas Concentration	n Data				Results
Reset to Defaults	Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C <sub>g</sub> (µg/m³)	OR	ENTER Soil gas conc., C <sub>g</sub> (ppmv)	Chemical		Soil Gas Conc. (μg/m³) 1.20E+05	Attenuation Factor (unitless) 7.3E-04
	127184	1.20E+05	]		Tetrachloroethyle	ene		
	ENTER Depth	ENTER	ENTER	ENTER		ENTER		
MORE ↓	below grade to bottom of enclosed space floor, L <sub>F</sub> (15 or 200 cm)	Soil gas sampling depth below grade, L <sub>s</sub> (cm)	Average soil temperature, T <sub>S</sub> (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k <sub>v</sub> (cm²)		
	15	152	15	SI			]	

	MORE ↓	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, $ ho_b^A$ (g/cm³)	Vadose zone soil total porosity, n <sup>V</sup> (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $		Average vapor flow rate into bldg. (Leave blank to calculate) Q <sub>soil</sub> (L/m)
		SI	1.35	0.489	0.167		5
	MORE ↓	ENTER Averaging time for	ENTER Averaging time for	<b>ENTER</b> Exposure	<b>ENTER</b> Exposure	<b>ENTER</b> Exposure	<b>ENTER</b> Air Exchange
	Lookup Receptor Parameters	carcinogens, AT <sub>C</sub> (yrs)	noncarcinogens, AT <sub>NC</sub> (yrs)	duration, ED (yrs)	frequency, EF (days/yr)	Time ET (hrs/day)	Rate ACH (hour) <sup>-1</sup>
EW=>	Residential	70	26	26	350	24 (NEW)	0.5 (NEW)
	END					()	(1.247)

**ENTER** 

**ENTER** 

**ENTER** 

**ENTER** 

**ENTER** 

Hazard

1.9E+00

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) **6.9E+01** 

Cancer

Risk

1.4E-04

									_
		Soil	Gas Concentration	n Data				Result	
Reset to Defaults	ENTER Chemical	ENTER Soil gas	OR	ENTER Soil gas			Soil Gas Conc. (μg/m³) 1.20E+05	Attenuation Factor (unitless) 5.7E-04	_
	CAS No. (numbers only, no dashes)	conc., C <sub>g</sub> (μg/m³)		conc., C <sub>g</sub> (ppmv)	Chemical				
	127184	1.20E+05	<b>.</b> ]	(pp)	Tetrachloroethylene			• - -	
	ENTER	ENTER	ENTER	ENTER		ENTER	7		
MORE	Depth below grade	Soil gas		Vadose zone		User-defined			

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
ORE <b>↓</b>	below grade to bottom of enclosed space floor, L <sub>F</sub> (15 or 200 cm)	Soil gas sampling depth below grade, L <sub>s</sub> (cm)	Average soil temperature, T <sub>S</sub> (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k <sub>v</sub> (cm <sup>2</sup> )
	15	152	24	CL		

**ENTER** 

MORE ↓	Vandose zone SCS soil type  Lookup Soil Parameters	Vadose zone soil dry bulk density, $\rho_b^A$ (g/cm <sup>3</sup> )	Vadose zone soil total porosity, n <sup>V</sup> (unitless)	Vadose zone soil water-filled porosity, $\theta_w^V$ (cm³/cm³)		Average vapor flow rate into bldg. (Leave blank to calculate)  Q <sub>soil</sub> (L/m)
	CL	1.48	0.442	0.168		5
MORE ↓	ENTER Averaging	ENTER Averaging	ENTER	ENTER	ENTER	ENTER
	time for	time for	Exposure	Exposure	Exposure	Air Exchange
Lookup Receptor	carcinogens, AT <sub>C</sub>	noncarcinogens, $AT_NC$	duration, ED	frequency, EF	Time ET	Rate ACH
Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) <sup>-1</sup>
EW=> Residential	70	26	26	350	24	0.5
Residential	70	20	20	330	(NEW)	(NEW)
END						

**ENTER** 

**ENTER** 

**ENTER** 

**ENTER** 

Hazard

3.4E+00

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

of enclosed

space floor,

(15 or 200 cm)

15

depth

below grade,

 $L_s$ 

(cm)

152

### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential

soil vapor

permeability,

 $k_{\nu}$ 

(cm<sup>2</sup>)

OR

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

 $(\mu g/m^3)$ 

1.2E+02

Cancer

Risk

2.6E-04

		Soil	Gas Concentration	n Data				Result
Reset to Defaults	Chemical CAS No. (numbers only,	ENTER Soil gas conc., C <sub>q</sub>	OR	ENTER Soil gas conc., C <sub>g</sub>			Soil Gas Conc. (μg/m³) 1.20E+05	Attenuation Factor (unitless) 1.0E-03
	no dashes)	(μg/m³)	<u>-</u>	(ppmv)	Chemical			
	127184	1.20E+05	]		Tetrachloroethylene			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER		
MORE <b>↓</b>	below grade to bottom	Soil gas sampling	Average	Vadose zone SCS		User-defined vadose zone		

soil

temperature,

 $\mathsf{T}_{\mathsf{S}}$ 

(°C)

24

soil type

(used to estimate

soil vapor

permeability)

S

MORE ↓	Vandose zone SCS soil type  Lookup Soil Parameters	ENTER  Vadose zone soil dry bulk density,  Pb  (g/cm³)	ENTER  Vadose zone soil total porosity, n  (unitless)	ENTER  Vadose zone soil water-filled porosity, θw (cm³/cm³)		Average vapor flow rate into bldg. (Leave blank to calcula Q <sub>soil</sub> (L/m)
	S	1.66	0.375	0.054		5
MORE <b>↓</b>	ENTER	ENTER Averaging	ENTER	ENTER	ENTER	ENTER
	Averaging					

END

Hazard

1.1E+00

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

Scenario: Residential

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) **4.0E+01** 

Cancer

Risk

8.4E-05

			DATA ENTRY S	SHEET			Cilentical.	retracilioroet	
		Soil	Gas Concentration	n Data				Result	5
Reset to	ENTER	ENTER Soil		ENTER Soil			(μg/m³)	Attenuation Factor (unitless)	
Defaults	Chemical CAS No. (numbers only,	gas conc., C <sub>q</sub>	OR	gas conc., C <sub>q</sub>			1.20E+05	3.3E-04	-
	no dashes)	(μg/m³)	=	(ppmv)	Chemical				
	127184	1.20E+05	1		Tetrachloroethyle	ne			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER	7		
MORE <b>↓</b>	below grade to bottom of enclosed	Soil gas sampling depth	Average soil	Vadose zone SCS soil type		User-defined vadose zone soil vapor			
	space floor, L <sub>F</sub>	below grade, L <sub>s</sub>	temperature, T <sub>S</sub>	(used to estimate soil vapor	OR	permeability, k <sub>v</sub>			
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )	_		
	15	152	24						

	MORE ₩	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER  Vadose zone soil dry bulk density,  pb  (g/cm³)	ENTER Vadose zone soil total porosity, n  (unitless)	ENTER  Vadose zone soil water-filled porosity, $\theta_w^{\ V}$ (cm³/cm³)		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q <sub>soil</sub> (L/m)
		SI	1.35	0.489	0.167		1
	MORE ↓	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	<b>ENTER</b> Exposure	<b>ENTER</b> Exposure	<b>ENTER</b> Air Exchange
	Lookup Receptor	carcinogens, AT <sub>C</sub>	noncarcinogens, $AT_{NC}$	duration, ED	frequency, EF	Time ET	Rate ACH
l	Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) <sup>-1</sup>
NEW=>	Residential	70	26	26	350	24 (NEW)	0.5 (NEW)
ļ	END						

Hazard

3.4E+00

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

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# **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) 1.2E+02

Cancer

Risk

2.6E-04

			DATALLATION	JIILL I				
		Soil	Gas Concentration	n Data				Results
Reset to Defaults	ENTER Chemical	ENTER Soil gas	OR	ENTER Soil gas			Soil Gas Conc. (μg/m³) 1.20E+05	Attenuation Factor (unitless) 1.0E-03
	CAS No. (numbers only,	conc., C <sub>g</sub>		conc., C <sub>g</sub>				
	no dashes)	(μg/m³)	-	(ppmv)	Chemical			
	127184	1.20E+05	1		Tetrachloroethylene			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER	7	
MORE ↓	below grade to bottom of enclosed	Soil gas sampling depth	Average soil	Vadose zone SCS soil type		User-defined vadose zone soil vapor		
	space floor, L <sub>F</sub>	below grade, $L_s$	temperature, $T_S$	(used to estimate soil vapor	OR	permeability, k <sub>v</sub>		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )		

	MORE ¥	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER  Vadose zone soil dry bulk density,	ENTER Vadose zone soil total porosity, n <sup>V</sup> (unitless)	ENTER  Vadose zone soil water-filled porosity, $\theta_w^V$ $(cm^3/cm^3)$		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q <sub>soil</sub> (L/m)
		SI	1.35	0.489	0.167		96
	MORE 🔱	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	<b>ENTER</b> Exposure	ENTER Exposure	ENTER Air Exchange
	Lookup Receptor Parameters	carcinogens, AT <sub>C</sub>	noncarcinogens, AT <sub>NC</sub>	duration, ED	frequency, EF	Time ET	Rate ACH
(		(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) <sup>-1</sup>
EW=>	Residential	70	26	26	350	24	0.5
	END					(NEW)	(NEW)

24

SI

Hazard

2.1E+00

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m<sup>3</sup>) **7.6E+01** 

Cancer

Risk

1.6E-04

		Soil	Gas Concentration	Data				Result
Donat to	ENTER	ENTER		ENTER			Soil Gas Conc. A	Attenuation Factor
Reset to		Soil		Soil			(µg/m³)	(unitless)
Defaults	Chemical	gas	OR	gas			1.20E+05	6.3E-04
	CAS No.	conc.,		conc.,				
	(numbers only,	$C_g$		$C_g$				
	no dashes)	(μg/m <sup>3</sup> )	r	(ppmv)	Chemical		_	
	127184	1.20E+05			Tetrachloroethylene			
	ENTER	ENTER	ENTER	ENTER		ENTER		

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ₩	below grade to bottom of enclosed space floor, L <sub>F</sub> (15 or 200 cm)	Soil gas sampling depth below grade, L <sub>s</sub> (cm)	Average soil temperature, T <sub>s</sub> (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k <sub>v</sub> (cm <sup>2</sup> )
	15	182.88	24	SI		

MORE Ψ	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER  Vadose zone soil dry bulk density,  Pb  (g/cm³)	ENTER Vadose zone soil total porosity, n  (unitless)	ENTER  Vadose zone soil water-filled porosity, $\theta_w^V$ $(cm^3/cm^3)$		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q <sub>soil</sub> (L/m)
	SI	1.35	0.489	0.167		5
MORE ¥	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	<b>ENTER</b> Exposure	<b>ENTER</b> Exposure	<b>ENTER</b> Air Exchange
Lookup Receptor Parameters	carcinogens, AT <sub>C</sub>	noncarcinogens, AT <sub>NC</sub>	duration, ED	frequency, EF	Time ET	Rate ACH
	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) <sup>-1</sup>
NEW=> Residential	70	26	26	350	24 (NEW)	0.5 (NEW)
END						

Hazard

8.9E-01

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

Scenario: Residential

Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) 3.2E+01

Cancer

Risk

6.8E-05

			DATA ENTRY S	SHEET			Chemical:	Tetrachloroet
		Soil	Gas Concentration	n Nata				Result
Reset to Defaults	ENTER Chemical	ENTER Soil gas	OR	ENTER Soil gas			Soil Gas Conc. (μg/m³)  1.20E+05	Attenuation Factor (unitless) 2.7E-04
	CAS No. (numbers only, no dashes)	conc., C <sub>g</sub> (μg/m³)	ı	conc., C <sub>g</sub> (ppmv)	Chemical			
	127184	1.20E+05			Tetrachloroethyle	ene		
	ENTER Depth	ENTER	ENTER	ENTER		ENTER		
MORE ↓	below grade to bottom of enclosed space floor, L <sub>F</sub>	Soil gas sampling depth below grade, L <sub>s</sub>	Average soil temperature,	Vadose zone SCS soil type (used to estimate soil vapor	OR	User-defined vadose zone soil vapor permeability, k <sub>v</sub>		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm <sup>2</sup> )		
	15	487.68	24	SI			J	
MORE	ENTER Vandose zone SCS	ENTER Vadose zone soil dry	ENTER Vadose zone soil total	ENTER Vadose zone soil water-filled		ENTER Average vapor flow rate into bldg.		
Ţ	soil type  Lookup Soil Parameters	bulk density, $\rho_b^A$ $(g/cm^3)$	porosity, n <sup>V</sup> (unitless)	porosity, $\theta_{\rm w}^{\rm V}$ $({\rm cm}^3/{\rm cm}^3)$	(	Leave blank to calcul Q <sub>soil</sub> (L/m)		
	SI	1.35	0.489	0.167		5	]	
MORE ↓	ENTER Averaging	ENTER Averaging	ENTER	ENTER	ENTER	ENTER		
Lookup Receptor	Averaging time for carcinogens, AT <sub>C</sub>	Averaging time for noncarcinogens, AT <sub>NC</sub>	Exposure duration, ED	Exposure frequency, EF	Exposure Time ET	Air Exchange Rate ACH		

Parameters

Residential

END

(yrs)

70

(yrs)

26

(yrs)

26

(days/yr)

350

(hrs/day)

24

(NEW)

(hour)<sup>-1</sup>

0.5

Hazard

2.4E-01

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

### **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) 8.8E+00

Cancer

Risk

1.8E-05

		Result					
Reset to	ENTER	ENTER		ENTER			Attenuation Factor
		Soil		Soil		(µg/m³)	(unitless)
Defaults	Chemical	gas	OR	gas		1.20E+04	7.3E-04
	CAS No.	conc.,		conc.,			
	(numbers only,	$C_g$		$C_g$			
	no dashes)	(μg/m <sup>3</sup> )	_	(ppmv)	Chemical		<u>-</u>
			_				-
	127184	1.20E+04			Tetrachloroethylene		-

MORE Ψ

**ENTER** 

**ENTER** 

ENTER Depth	ENTER	ENTER	ENTER		ENTER
below grade to bottom of enclosed space floor, L <sub>F</sub> (15 or 200 cm)	Soil gas sampling depth below grade, L <sub>s</sub> (cm)	Average soil temperature, T <sub>S</sub> (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k <sub>v</sub> (cm <sup>2</sup> )
15	152	24	SI		

**ENTER** 

MORE Ψ	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, Pb (g/cm³)	Vadose zone soil total porosity, n <sup>V</sup> (unitless)	Vadose zone soil water-filled porosity, θ <sub>w</sub> (cm³/cm³)	(	Average vapor flow rate into bldg. (Leave blank to calculate) $Q_{\text{soil}} = (L/m)$
	SI	1.35	0.489	0.167		5
MORE ↓	ENTER Averaging	<b>ENTER</b> Averaging	ENTER	ENTER	ENTER	ENTER
	time for carcinogens,	time for noncarcinogens,	Exposure duration,	Exposure frequency,	Exposure Time	Air Exchange Rate
Lookup Receptor Parameters	AT <sub>C</sub> (yrs)	AT <sub>NC</sub> (yrs)	ED (yrs)	EF (days/yr)	ET (hrs/day)	ACH (hour) <sup>-1</sup>
N=> Residential	70	26	26	350	24	0.5
END					(NEW)	(NEW)

**ENTER** 

NEW

**ENTER** 

USEPA SG-SCREEN Version 2.0, 04/2003 DTSC Modification December 2014

# **Department of Toxic Substances Control** Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Residential

Chemical: Tetrachloroethylene

**Results Summary** 

Indoor Air Conc.

(μg/m³) 8.8E+03

Cancer

Risk

1.8E-02

Noncancer

Hazard

2.4E+02

			DATA ENTRY	SHEET					Ī
		Soil	Gas Concentration	n Data				Result	Ş
Reset to	ENTER	ENTER Soil		ENTER Soil			Soil Gas Conc. A	Attenuation Factor (unitless)	
Defaults	Chemical	gas	OR	gas			1.20E+07	7.3E-04	_
	CAS No. (numbers only,	conc., C <sub>g</sub>		conc., C <sub>g</sub>					_
	no dashes)	(μg/m <sup>3</sup> )	=.	(ppmv)	Chemical				
	127184	1.20E+07	1		Tetrachloroethyle	ne			
	ENTER	ENTER	ENTER	ENTER		ENTER	7		
	Depth	LIVILIX	LNILK	LIVILIX		LIVILIX			
MORE ↓	below grade to bottom of enclosed space floor, L <sub>F</sub> (15 or 200 cm)	Soil gas sampling depth below grade, L <sub>s</sub> (cm)	Average soil temperature, T <sub>s</sub> (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k <sub>v</sub> (cm <sup>2</sup> )			
	(15 01 200 CIII)	(CIII)	( 0)	permeability)		(CIII )			
	15		24	SI					

	MORE ↓	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density,  pb (g/cm³)	ENTER Vadose zone soil total porosity, n  (unitless)	ENTER Vadose zone soil water-filled porosity, $\theta_w^V$ $(cm^3/cm^3)$		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q <sub>soil</sub> (L/m)
		SI	1.35	0.489	0.167		5
	MORE ↓	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	<b>ENTER</b> Exposure	<b>ENTER</b> Exposure	<b>ENTER</b> Air Exchange
	Lookup Receptor Parameters	carcinogens, AT <sub>C</sub> (yrs)	noncarcinogens, AT <sub>NC</sub> (yrs)	duration, ED (yrs)	frequency, EF (days/yr)	Time ET (hrs/day)	Rate ACH (hour) <sup>-1</sup>
(		(915)	(913)	(913)	(uays/yr)	(IIIS/day)	(Hour)
NEW=>	Residential	70	26	26	350	24 (NEW)	0.5 (NEW)
	END					(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(11200)