

By Alameda County Environmental Health 3:39 pm, Jan 25, 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

January 21, 2016 Report 0461.R3

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

SUBJECT: SOIL GAS INVESTIGATION REPORT

(SG1 THROUGH SG10)

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 (P&D) has prepared this report documenting soil gas investigation for the subject site on behalf of the property owner Ronald Elvidge and EFI Global, Inc. (EFI). The soil gas wells were installed on November 9 through 11, 2015 and the soil gas wells were sampled on December 2, 2015. The investigation was performed to evaluate the presence and extent of the dry cleaning chemical tetrachloroethene (PCE) in soil gas at the site. The work scope included installation of eight permanent soil wells to a depth of 7 feet below the ground surface (bgs), six permanent soil gas wells to a depth of 17 feet bgs and one permanent Vapor Pin, and sampling of the soil gas wells. The Vapor Pin was not sampled.

This work was performed in accordance with procedures set forth in P&D's Soil Gas Investigation Work Plan dated October 16, 2015 (document 0461.W1). The work plan was approved in an email from Mr. Keith Nowell of the Alameda County Department of Environmental Health (ACDEH) dated November 10, 2015. A Site Location Map is attached as Figure 1 and a Site Plan showing the soil gas well and Vapor Pin locations is attached as Figure 2. All work was performed under the direct supervision of a professional geologist.

BACKGROUND

It is P&D's understanding that the former Red Hanger Kleaners store (also identified in various reports as Red Hanger Cleaners) occupied the ground floor of the subject site building at 6235–6239 College Avenue in Oakland, California from 1987 until 2015 (approximately 28 years), and that the Red Hanger Kleaners business vacated the premises in 2015. The second building to the north at 6251-6255 College Avenue (located at the corner of College Avenue and 63rd Street, see Figure 2) was reported to have been occupied by dry cleaner stores from 1953 to 1987 (approximately 34 years) with Red Hanger Kleaners identified at this location from either 1970 or 1982 to 1987.

The building at 6251 to 6255 College Avenue is occupied by three tenant spaces along College Avenue. Based on discussions with individuals in the dry cleaning industry who report that they were familiar with the owner of the dry cleaning store at 6251 to 6255 College Avenue, the dry cleaning store originally occupied the southernmost of the three tenant spaces and eventually expanded to include the middle tenant space before moving to 6239 College Avenue.

It is unknown when the dry cleaning operations began utilizing tetrachloroethene (PCE) as the dry cleaning solvent. However, it is P&D's understanding that review of Hazardous Materials Business Plans for 6239 College Avenue from April 1991 through March 2007 identified the presence of PCE at the site as early as April 1991 and as late as March 2007.

Review of Figure 2 shows that the first floor of 6239 College Avenue consists of the former Red Hanger Kleaners store occupying the southern portion of the building, with open parking and storage located immediately to the north of the west end of the former Red Hanger Kleaners store. The second and third floor of the building above the first floor parking and storage areas are occupied by offices, bathrooms, hallways and stairwells. The first floor tenant space (the former Red Hanger Kleaners store) is presently vacant. The former dry cleaning machines were located to the south and west of the elevator (see Figure 2).

The locations of features shown inside the Red Hanger Kleaners store, including the locations of the elevator and boiler room, are based on measurements made with a steel tape. Comparison of the locations of the elevator and the boiler room with the locations shown on site plans for each of the floors for the subject property shows that the site plans for the different floors of the building are approximate but not completely accurate regarding the locations of the elevator and the boiler room. The sanitary sewer trench was also determined to be located several feet further to the east than shown in figures in the work plan based on the location of the sanitary sewer cleanout that is located immediately to the north of Red Hanger Kleaners building parking and storage area, and markings of the sanitary sewer location made by a plumber who identified the sanitary sewer location.

Additionally, measurements using a steel tape of the locations of features shown on Figure 2 (as measured from the sidewalk along 63rd Street to the north side of the Red Hanger Kleaners building parking and storage area) shows that site features shown on Figure 2 are accurate, however measurements using a steel tape of the locations of features shown on Figure 2 (as measured from the southwest corner of the property to the north side of the Red Hanger Kleaners building parking and storage area) shows that the parking and storage area as shown on Figure 2 is approximately 3 feet longer than as measured with the steel tape. Measurements made with a steel tape from the west side of the property to College Avenue and from College Avenue to the west side of the property show that the features shown on Figure 2 are accurately shown. These measurements suggest that the southwest corner of the property shown on Figure 2 should be approximately 3 feet further north than shown, with the length of the Red Hanger Kleaners parking and storage area reduced by approximately 3 feet to the north of the stairs. Reconciliation of these site dimensions and site plans is beyond the current scope of work.

Historical investigations at the subject site have detected PCE in soil, groundwater, soil gas, and indoor air. Trichloroethene (TCE) has only been detected in indoor air at the site. A complete discussion of the historical dry cleaner operations and historical investigations of the property is

provided in the July 27, 2015 Youngdahl Phase II Environmental Site Assessment Soil Gas Investigation Report for the subject site (identified in the report title as located at 6335-6339 College Avenue). A site conceptual model is also provided in the October 21, 2014 Youngdahl Phase II Environmental Site Assessment Soil Gas Investigation Work Plan for the subject site. A summary of historical subsurface investigations at the site and the site geology and hydrogeology are also provided in P&D's October 16, 2015 Soil Gas Investigation Work Plan (document 0461.W1).

Documentation of a sub-slab depressurization feasibility test that was performed on November 16, 2015 in the former 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).

FIELD ACTIVITIES

Prior to performing field activities, drilling permit W2015-1009 was obtained from the Alameda County Public Works Agency (ACPWA), site access was scheduled with the property owner, drilling locations were marked with white paint, Underground Service Alert was notified for underground utility location, and a health and safety plan was prepared. Notification of the drilling dates and sampling date were also provided to the ACDEH.

Soil Gas Well Installation and Sample Collection

On November 9, 10 and 11, 2015 permanent soil gas wells were installed to a depth of 7.0 feet bgs at locations SG1-7, SG2-7, SG4-7, SG5-7, SG6-7, SG7-7, SG8-7, and SG10-7 (see Figure 2) and to a depth of 17.0 feet bgs at locations SG2-17, SG3-17, SG5-17, SG6-17, SG7-17, and SG9-17 (see Figure 2). All of the soil gas wells were installed by Vironex, Inc. of Concord (Vironex) using track-mounted 6-inch outside diameter hollow stem augers or a 6-inch outside diameter hand auger. Vapor Pin VP1 was installed by P&D personnel November 11, 2015. On December 2, 2015 all of the soil gas wells were sampled.

Vapor Pin VP1 was installed with a flush-mounted secure cover by P&D on November 11, 2015 at the location shown on Figure 2 in accordance with manufacturer recommended methods as follows: A rotohammer was used to drill a 1.5-inch diameter hole to a depth of 1.75 inches into the concrete slab. A 5/8-inch diameter hole was then drilled through the center of the 1.5-inch diameter hole in the slab to a depth of two inches below the bottom of the concrete slab. The total concrete floor slab thickness was measured to be approximately 6.0 inches. Once drilling was completed a steel rod was inserted into the hole and pushed into the sub-slab materials to a depth of approximately 6 inches below the slab several times to puncture any vapor barrier that might be present, and the hole was then cleaned with a vacuum and a bottle brush. A new Vapor Pin with a new silicone sleeve was then installed in the 5/8-inch diameter hole in the concrete slab and covered with a flush-mounted stainless steel cover. Prior to placement of the flush-mounted stainless steel cover, a plastic cap was placed on the top of the Vapor Pin barb fitting.

All of the boreholes were hand augered to a depth of 7.0 feet bgs with a 3.5-inch outside diameter hand auger (with the exception of location SG1-7 where hand auger refusal was encountered at a depth of 2.0 feet bgs and locations SG7-17 and SG9-17 where hand auger refusal was encountered at a depth of 5.5 feet bgs). All of the boreholes were then enlarged to

their total depth with a track-mounted 6-inch hollow stem auger drill rig with the exception of locations SG4-7, SG8-7 and SG10-7 which were hand augered to a depth of 7.0 feet bgs with a 6-inch outside diameter hand auger.

The soil from the hand auger and hollow stem auger drill cuttings for all of the boreholes was logged in the field in accordance with standard geologic field techniques and the Unified Soil Classification System. All soil from the boreholes was evaluated with a PID equipped with a 10.6 eV bulb that was calibrated using a 100 ppm isobutylene standard. No odors, staining, or discoloration were observed in any of the boreholes, and no soil samples were retained for laboratory analysis. PID values and field observations were recorded on boring logs for each borehole that are attached with this report as Appendix A.

All of the soil gas wells were constructed following the completion of drilling or hand augering by adding a #2/16 Lonestar sack sand to the borehole to fill the lowermost one foot of the borehole with sand. A 0.250-inch outside diameter (0.187-inch inside diameter) Teflon tube with a HDPE filter at the bottom of the tube was inserted to the top of the sand (a depth of one foot above the bottom of the borehole), and additional #2/16 Lonestar sack sand was added to the annular space to two feet above the bottom of the borehole so that the lowermost two feet of the borehole was filled with sand with the filter at the end of the tube was in the middle of the sand interval. A tremie pipe was used for placement of all of the sand that was placed in the boreholes. Hydrated bentonite was then placed in the annular space above the sand to a height of one foot above the sand using a tremie pipe. The remaining borehole was filled with neat cement to a depth of one foot bgs using a tremie pipe. The tubing length was 8 feet for the boreholes that are 7 feet deep, and the tubing length was 18 feet for the boreholes that are 17 feet deep. The top of each soil gas well was enclosed in a well box with a lid that was secured with bolts.

A soil gas sampling manifold with a 1-liter Summa canister as the sampling canister for each sampling location (see Figure 5) 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 5). 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 the purging 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 5) was monitored during sample collection to verify that the vacuum applied to the soil gas well did not exceed 100 inches of water. 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 Teflon or 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 Teflon tubing and HDPE filters were used at each sample collection location. 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.

WEATHER

No precipitation occurred during the day of soil gas sampling (December, 2 2015), or during the five days preceding the day of soil gas sampling. Weather data, including precipitation and barometric pressure for the day of the sampling event and also for the month preceding and rest of December 2015 is provided as Appendix C. The weather station is located at 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 C.

GEOLOGY AND HYDROGEOLOGY

Based on a review of the USGS Oakland West, California Quadrangle topographic map, the subject property is located approximately 200 feet above mean sea level, and the local topography slopes to the southwest (see Figure 1). Based on review of regional geologic maps from U. S. Geological Survey Professional Paper 943, "Flatland Deposits - Their Geology and Engineering Properties and Their Importance to Comprehensive Planning," by E. J. Helley and K. R. Lajoie, 1979, the subject site is underlain by Late Pleistocene Alluvium (Qpa), which is described as weakly consolidated slightly weathered poorly sorted irregularly interbedded clay, silt, sand, and gravel.

Review of the boring logs in Appendix A shows that the subsurface materials encountered in the boreholes drilled to a depth of 17 feet bgs during soil gas well installation in November 2015

consisted predominantly of silt, silty clay and clay, with layers of coarse grained materials consisting of gravelly clayey sand, sandy gravel and clayey gravel measuring from 1 to 5 feet in thickness. The subsurface materials encountered in the soil gas well boreholes are consistent with the Qpa description provided above. No groundwater was encountered in any of the soil gas well boreholes.

Review of the results of the sub-slab depressurization feasibility test that was performed on November 16, 2015 in the former dry cleaner store at the subject site and that is documented in P&D's December 14, 2015 Sub-Slab Depressurization Feasibility Test Report shows that vacuum was measured in soil gas wells SG9-17 and SG10-7 when vapor extraction was performed beneath the floor slab, indicating very good vertical communication of soil gas at the site.

Review of boring logs for historical boreholes at the site shows that the subsurface materials beneath the west end of the Red Hanger Kleaners store where the dry cleaning machines were located was described as consisting predominantly of silty clay to a depth of approximately 12 to 14 feet bgs, beneath which the subsurface materials were described as consisting predominantly of clayey silt and silt with layers of gravelly silty sand or sandy gravelly silt of variable thickness to the total depth explored of 35 feet bgs. To the north of the Red Hanger Kleaners building the subsurface materials are described as consisting predominantly of layers of silty clay and silt, with layers of gravelly silty sand or sandy gravelly silt of variable thickness to the total depth explored of 35 feet bgs. At one borehole located immediately downgradient of the former Kay's Cleaners a gravelly silty sand layer measuring approximately 10 feet in thickness was encountered between the depths of approximately 12 and 22 feet bgs.

Groundwater has historically been encountered at the site as follows:

- By AEI Consultants in May 2005 in borehole SB1 during drilling at a depth of 17.5 feet bgs and was subsequently measured after 5 minutes at a depth of 15.8 feet bgs.
- By Ecology Control Associates under the supervision of EFI on June 28, 2005 during drilling in borehole SB-6 at a depth of 20 feet bgs and was subsequently measured in the borehole at a depth of approximately 16 feet bgs.
- By P&D in August 2008 in boreholes B7 and B8 at depths of 21.3 and 22.6 feet bgs, and was subsequently measured at depths of 22.3 and 21.2 feet bgs prior to groundwater sample collection.
- By ERM West, Inc. in October 2009 in boreholes A-1, AD-3 and AUST-6 during drilling at a depth of 35 feet bgs, and was subsequently measured in these boreholes at a depth of approximately 22 feet bgs. Groundwater was not encountered in borehole A-2.

Groundwater has historically been encountered at the site at depths of approximately 22 feet bgs or greater with the exception of borehole SB1 where groundwater was encountered during drilling at a depth of 17.5 feet bgs and was subsequently measured after 5 minutes at a depth of 15.8 feet bgs, and borehole SB-6 where groundwater was encountered during drilling at a depth of approximately 20 feet bgs and was subsequently measured at a depth of approximately 16 feet bgs. Both of these boreholes where groundwater was historically encountered at depths of less than 20 feet bgs are located at the southern boundary of the property in the western half of the property.

The nearest surface water is Lake Temescal, located approximately 1.1 mile east of the subject site. Based on local topography and consistent southwesterly groundwater flow directions identified from groundwater monitoring well water level data at nearby sites, the assumed groundwater flow direction at the subject site is to the southwest.

LABORATORY ANALYSIS

All of the soil gas samples were analyzed at Eurofins Air Toxics, Limited in Folsom, California. The samples collected in Summa canisters were analyzed for Volatile Organic Compounds (VOCs) including PCE and PCE decomposition products (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride) and DFA (the tracer gas) using EPA Method TO-15. All of the shroud air Tedlar bag samples that were collected during soil gas sample collection were analyzed for the tracer gas DFA using EPA Method TO-15.

The soil gas TO-15 laboratory analytical results are summarized in Table 1A, and the shroud air Tedlar bag sample results are summarized in Table 1B. The percent shroud information reported in Table 1A 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 report and chain of custody documentation are attached with this report as Appendix D.

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. The structures immediately adjacent to the subject site former dry cleaning area to the north, east, and west are identified as follows (see Figure 3):

- 309 63rd Street commercial storage on the ground floor and residential apartments above the ground floor.
- 6251 top 6255 College Avenue commercial stores on the ground floor and residential apartments above the ground floor.
- 6241 top 6247 College Avenue commercial stores on the ground floor and commercial use above the ground floor.
- 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 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 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 Department of Toxic Substances Control (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 vapor intrusion model spreadsheet in December 2014.

The Inhalation Unit Risk factor (IUR) value used for risk calculation and the Reference Concentration (RfC) value 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 July 14, 2014. DTSC RfC values were converted from mg/m³ to ug/m³ for hazard calculation. The 2013 RWQCB User's Guide Table J-2 PCE RfC value of 270 ug/m³ was superseded for risk calculation by the 2014 DTSC PCE RfC value of 35 ug/m3.

Default exposure parameter values provided in the December 2014 DTSC HERO vapor intrusion screening model for soil gas for a residential exposure 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 exposure scenario were used for evaluation of the soil gas sample results at locations SG6, SG7, SG8, SG9 and SG10 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 soil gas incremental risk and hazard quotient calculation results are provided in Table 3A, and the soil gas incremental risk and hazard quotient calculation results are summarized in Table 3B. The vapor intrusion model spreadsheet input sheets which include a results summary for each calculation are attached with this report as Appendix E.

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 3, 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 F.

DISCUSSION AND RECOMMENDATIONS

Review of the boring logs in Appendix A shows that the subsurface materials encountered in the boreholes drilled to a depth of 17 feet bgs during soil gas well installation in November 2015 consisted predominantly of silt, silty clay and clay, with layers of coarse grained materials consisting of gravelly clayey sand, sandy gravel and clayey gravel measuring from 1 to 5 feet in thickness. No groundwater was encountered in any of the soil gas well boreholes.

Review of the Table 1A 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 1B), indicating that atmospheric dilution of the samples during sample collection is not a concern, with the exception of sample SG10-7 where the sample tracer gas concentration was 8.7 percent. Based on the tracer gas concentration detected in sample SG10-7 this sample is not considered to be a valid sample.

Review of Table 1A shows that PCE was detected in all of the soil gas samples at concentrations exceeding the RWQCB December 2013 Table E-2 residential and commercial exposure scenario Environmental Screening Level (ESL) with the exception of samples SG8-7 and SG10-7, where the

PCE concentration exceeded the residential ESL but did not exceed the commercial ESL value. No PCE decomposition products (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride) were detected in any of the soil gas samples. The only other compound detected at a concentration exceeding an ESL was benzene, which was detected in samples SG3-17, SG5-17, SG6-17, SG9-17 and SG9-17 DUP at concentrations exceeding the RWQCB December 2013 Table E-2 residential exposure scenario ESL but not at concentrations exceeding the commercial ESL.

Benzene is not a decomposition product of PCE. The source of the benzene 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.

Review of Figures 3 and 4 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 the soil gas model sensitivity analysis in Table 3 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 (Q_{soil}) , sample depth, and COPC concentration.

Review of the risk and hazard summarized in Table 2B shows that the calculated cumulative incremental risk for all of the soil gas samples exceeds one in a million except for samples SG8-7, SG9-17, SG9-17 DUP, and SG10-7 where the risk was calculated to be less than one in a million. The hazard quotient was calculated to be less than one for all of the soil gas samples except SG2-7 which had a calculated hazard quotient of 1.0. Review of Table 2A shows that almost all of the risk and hazard for each of the soil gas samples is related to PCE.

Based on the soil gas sample results, P&D recommends the installation and sampling of soil gas wells using methods described in this report to further evaluate the extent of PCE in soil gas as follows:

- Proposed shallow soil gas wells at locations SG11, SG13, SG14 and SG15 (see Figure 3).
- Proposed deep soil gas wells at locations SG12, SG16, SG17 and SG18 (see Figure 4).

In addition, P&D recommends the following:

- Collection of one crawl space air sample at the residential building that is located at 323 53rd Street (closest to the subject site), with concurrent collection of an ambient air sample, and
- Collection of soil gas samples from all of the soil gas wells approximately six months
 after the initial December 2, 2015 soil gas sampling event in accordance with DTSC

recommendations for multiple soil gas sampling events for risk and hazard based decision making.

DISTRIBUTION

A copy of this report will be uploaded to the GeoTracker and county websites.

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.

PAUL H. KING No. 5901

Sincerely,

P&D Environmental, Inc.

Paul H. King

Professional Geologist # 5901

Expires: 12/31/17



Table 1A - Summary of Soil Gas Sample Analytical Results

Table 1B - Summary of Soil Gas Shroud Sample Analytical Results - Difluoroethane

Table 2A - Summary of Soil Gas Risk and Hazard Analysis

Table 2B - Soil Gas Risk and Hazard Calculation Results Summary

Table 3 - Summary of Soil Gas Model Sensitivity Analysis

Figure 1 - Site Location Map

Figure 2 - Site Plan Showing Soil Gas Well Locations

Figure 3 - Site Plan Showing PCE Concentrations in Shallow Soil Gas

Figure 4 - Site Plan Showing PCE Concentrations in Deep Soil Gas

Figure 5 - Typical Soil Gas Sampling Manifold

Appendix A – Boring Logs

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

Appendix C - Weather Information

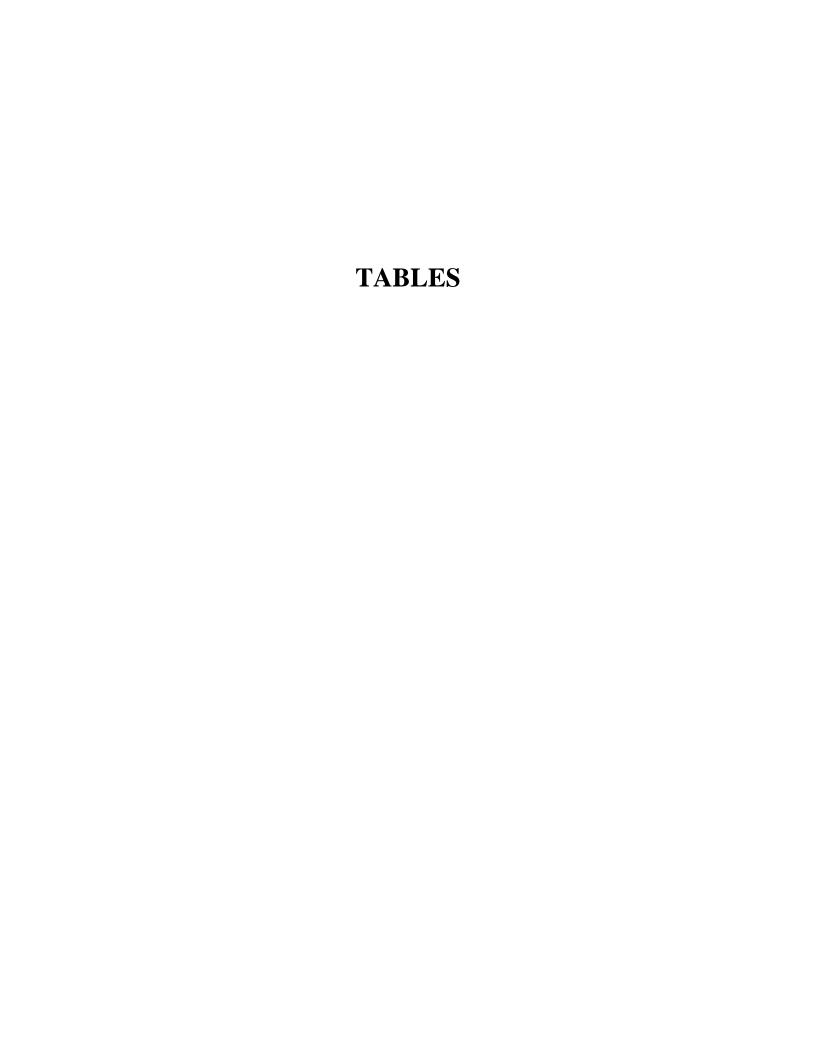
Appendix D - Laboratory Analytical Reports and Chain of Custody Documentation

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

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

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0461.R3



Report 0461.R3							Su		Γable 1A as Sample Analytic	cal Results						
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-Difluoroethene	Percent 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 Carbon Disulfide = 54	1,800	0
SG2-7	12/2/2015	5.0 to 7.0	6.0	ND<81	ND<95	ND<110	ND<110	ND<110	<u>59,000</u>	ND<140	ND<100	ND<100	ND<65	All ND	3,100	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
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 Cyclohexane = 110	520	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 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
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
SG5-17	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
		2010 10 2110					1.00	7.00						Carbon Disulfide = 140		
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
SG6-17	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		
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
SG7-17	12/2/2015	15.0 to 17.0	16.0	ND<120	ND<140	ND<160	ND<160	ND<160	<u>37,000</u>	ND<200	ND<140	ND<140	ND<94	All ND	ND<400	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
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	66,000, a	0
777														Chloroform = 46, Carbon Disulfide = 170, Hexane = 29	00,000, 1	
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 Chloroform = 54, Carbon Disulfide = 190,	9,200, a	0
														Hexane = 39		
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	Ali ND	680,000, a	8.7
ESL ¹				42	160,000	490	Combine	d = 52,000	210	300	3,700	31,000	16	Chloroform = 230, Carbon Disulfide = No Value, Cyclohexane = No Value, Hexane = No Value,	No Value	No Value
ESL ²				420	1,300,000	4,900	Combined	1 = 440,000	2,100	3,000	31,000	260,000	160	Chloroform = 2,300, Carbon Disulfide = No Value, Cyclohexane = No Value, Hexane = No Value,	No Value	No Value
Notes: Feet bgs = Feet Belo	Cround Su	face														-
PCE = Tetrachloroet		race.														-
TCE = Trichloroethe	ne.															
cis-1,2-TCE = cis-1,2																
trans-1,2-TCE = tran DFA = 1,1-Difluoroe									+							-
ND = Not Detected.		540)			1			+	+		+					+
a = Laboratory Note:	_	ument calibration	on range.						1							
Percent Shroud = Th	e ratio of trace	er gas concentra	tion detected in	the soil gas sam	ple to the trace	r gas concentra	ion detected in th	ne shroud air samp	ole, expressed as a	percentage.						
ESL ¹ = Environment	al Screening I	evel, by San Fr	ancisco Bay - R	egional Water (Quality Control	Board, update	d December 2013	3 from Table E-2	- Soil Gas Screeni	ng Levels for E	Evaluation of Po	tential Vapor Intr	usion for Resid	dential Land Use.		
ESI 2 - Environment	al Screening I	aval by San Er	ancisco Ray P	ogional Water (Quality Control	Roard undate	d December 2013	from Table F 2	Soil Gas Screeni	ng Lavals for F	ivaluation of Po	tantial Vanor Intr	ision for Com	marcial/Industrial Land Use		1

ESL = Environmental Screening Level, by San Francisco Bay – Regional Water Quality Control Board, updated December 2013 from Table E-2 – Soil Gas Screening Levels for Evaluation of Potential Vapor Intrusion for Commercial/Industrial Land Use. Values in bold exceed their respective ESL¹ values. Underlined values exceed their respective ESC values.

Results in micrograms per cubic meter (µg/m3), unless otherwise indicated

Table 1B Summary of Soil Gas Shroud Sample Analytical Results - Difluoroethane

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Sample ID	Sample Date	DFA,#							
SG1-7	12/2/2015	21,000,000							
SG2-7	12/2/2015	12,000,000							
SG2-17	12/2/2015	9,200,000							
SG3-17	12/2/2015	8,800,000							
SG4-7	12/2/2015	4,000,000							
SG5-7	12/2/2015	10,000,000							
SG5-17	12/2/2015	7,400,000							
SG6-7	12/2/2015	16,000,000							
SG6-17	12/2/2015	10,000,000							
SG7-7	12/2/2015	18,000,000							
SG7-17	12/2/2015	7,600,000							
SG8-7	12/2/2015	7,400,000							
SG9-17	12/2/2015	9,400,000							
SG10-7	12/2/2015	7,800,000							
Notes:									
ND = Not Detected. # = 1,1-Difluoroethane (DFA) used as leak detection compound									
	DFA) used as leak dete	ection compound							
for TO-15 analysis.	1: 3:								
Results in micrograms p	er cubic meter (µg/m ³),							
unless otherwise indicate	ea.								

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Table 2A Summary of Soil Gas Risk and Hazard Analysis

	Summary	of Soil Gas Risk and				
			Incremental	Hazard		
			risk from	quotient		
			vapor	from vapor		
			intrusion to	intrusion to		
			indoor air,	indoor air,		
	Sample	Concentration	carcinogen	noncarcinogen		
Chemical	Location	$(\mu g/m^3)$	(unitless)	(unitless)	NOTES	CAS#
Chemicai	Location	(μg/III)	(unitiess)	(unitiess)	NOTES	CA5#
SG1-7	SG1-7					
Benzene	RESIDENTIAL	10	9.7E-08	3.0E-03	1	71432
Toluene	6.0 ft. Depth	11	NA	3.0E-05		108883
PCE	0.0 It. Deptii		7.7E-06			
		5,800		1.0E-01		127184
Carbon Disulfide		54	NA	7.7E-05		75150
		TOTAL TO	7 OF 0/	1.05.01		
		TOTALS	7.8E-06	1.0E-01		
502.7	SG2-7					
SG2-7		50,000	7.00.05	1.05.00		125104
PCE	RESIDENTIAL	59,000	7.8E-05	1.0E+00	+	127184
	6.0 ft. Depth		- o- o-	4.0= 00		
		TOTALS	7.8E-05	1.0E+00		
SG2-17	SG2-17					
PCE	RESIDENTIAL	120,000	6.8E-05	8.9E-01		127184
	16.0 ft. Depth					
		TOTALS	6.8E-05	8.9E-01		
SG3-17	SG3-17					
Benzene	RESIDENTIAL	130	5.9E-07	1.8E-02		71432
PCE	16.0 ft. Depth	62,000	3.5E-05	4.6E-01		127184
Cyclohexane	Tota III Bepui	110	NA	7.1E-06		110827
Сустопелине		110	1171	7.1E 00		110027
		TOTALS	3.6E-05	4.8E-01		
<u>SG4-7</u>	SG4-7					
PCE	RESIDENTIAL	3,700	4.9E-06	6.4E-02		127184
	6.0 ft. Depth					
			4.9E-06	6.4E-02		
SG4-7 DUP	SG4-7 DUP					
PCE	RESIDENTIAL	3,700	4.9E-06	6.4E-02		127184
	6.0 ft. Depth					
	1	TOTALS	4.9E-06	6.4E-02		
SG5-7	SG5-7					
PCE	RESIDENTIAL	23,000	3.1E-05	4.0E-01		127184
	6.0 ft. Depth	-,				1
		TOTALS	3.1E-05	4.0E-01		
SG5-17	SG5-17					
Benzene	RESIDENTIAL	56	2.5E-07	7.9E-03		71432
Toluene	16.0 ft. Depth	54	NA	6.8E-05		108883
PCE		15,000	8.5E-06	1.1E-01	1	127184
Carbon Disulfide		140	NA	9.7E-05	1	75150
Carcon Disamac		110	1,112	J.7.2 00		75150
		TOTALS	8.8E-06	1.2E-01		
		2011110	3.02.00	1,22,01		
SG6-7	SG6-7				+ +	
PCE	Commercial	61,000	9.3E-06	1.3E-01	1	127184
	6.0 ft. Depth	01,000	7.56-00	1.515-01	1	12/104
	0.0 It. Deptii	TOTALS	9.3E-06	1.3E-01	+ +	
		TOTALS	3.3E-00	1.3E-U1		
SC 6 17	906 17				+ +	
SG6-17	SG6-17	1.40	7 OF 60	2.25.22		
Benzene	Commercial	140	7.3E-08	2.3E-03	+ -	71432
Toluene	16.0 ft. Depth	170	NA	2.5E-05		108883
PCE		41,000	2.7E-06	3.6E-02		127184
Hexane		89	NA	5.4E-06		110543
	1.1					
		TOTALS	2.8E-06	3.8E-02		

Report 0461.R3 Table 2A

ceport 0401.K3	Summar	y of Soil Gas Risk and	Hazard Analysis			
			Incremental	Hazard		
			risk from	quotient		
			vapor	from vapor		
			intrusion to	intrusion to		
			indoor air,	indoor air,		
	Sample	Concentration	carcinogen	noncarcinogen	 	
Chemical	Location	$(\mu g/m^3)$	(unitless)	(unitless)	NOTES	CAS#
SG7-7	SG7-7		 	+	+	
PCE	Commercial	7,000	1.1E-06	1.4E-02	+ +	127184
CE	6.0 ft. Depth	7,000	1.11-00	1.41.702	+	12/104
		TOTALS	1.1E-06	1.4E-02		
SG7-17	SG7-17		<u> </u>			
PCE	Commercial	37,000	2.4E-06	3.3E-02	+	127184
PCE	16.0 ft. Depth	37,000	2.4E-00	3.3E-02	+ +	12/104
	10.0 п. Берш	TOTALS	2.4E-06	3.3E-02	+	
	000.7					
SG8-7	SG8-7	12	1.45.00	1.25.04		
Benzene	Commercial	13	1.4E-08	4.6E-04	<u> </u>	71432
PCE	6.0 ft. Depth	850	1.3E-07	1.8E-03	+	127184
		TOTALS	1.4E-07	2.3E-03	+ +	
SG9-17	SG9-17		<u> </u> 		-	
Benzene	Commercial	42	2.2E-08	7.0E-04	+ +	71432
Toluene	16.0 ft. Depth	30	2.2E-08 NA	4.5E-06	+ +	108883
PCE	10.0 п. Берш	4,000	2.6E-07	4.5E-06 3.5E-03	+ +	108883
Chloroform		4,000	1.7E-08	2.1E-05	+	67663
Carbon Disulfide		170	NA	1.4E-05	+	75150
Hexane		29	NA NA	1.4E-05 1.8E-06	+ +	110543
Нехане		2)	11/12	1.012-00	+ +	110575
		TOTALS	3.0E-07	4.2E-03		
SG9-17 DUP	SG9-17 DUP		_		-	
Benzene	Commercial	44	2.3E-08	7.4E-04	+	71432
Toluene	16.0 ft. Depth	34	NA NA	5.1E-06	+ +	108883
PCE		4,600	3.0E-07	4.0E-03	+ +	127184
Chloroform		54	2.0E-08	2.4E-05	1	67663
Carbon Disulfide		190	NA	1.6E-05	†	75150
Hexane		39	NA NA	2.4E-06	†	110543
		TOTALS	3.4E-07	4.8E-03	<u> </u>	
SG10-7	SG10-7					
<u>SG10-7</u> PCE	SG10-7 Commercial	1,100	1 7E 07	2.3E-03	+	127184
PCE		1,100	1.7E-07	2.3E-03	+	12/184
	6.0 ft. Depth	TOTALS	1 7E 07	2.2E.02	+	
		IUIALS	1.7E-07	2.3E-03		
			<u> </u>			
NOTES						
PCE = Tetrachloroethene.						

At Locations SG1-7, SG2-7, SG4-7, and SG5-7 spreadsheet default values were used for a residential exposure, with a vadose zone soil type SI (silt), and a sample depth of 6.0 feet (182.88 cm). At locations SG6-7, SG7-7, SG8-7, and SG10-7 spreadsheet default values were used for a commercial exposure with a vadose zone soil type of SI, and a sample depth of 6.0 inches (182.88 cm). At Locations SG2-17, SG3-17, and SG5-17 spreadsheet default values were used for a residential exposure, with a vadose zone soil type SI, and a sample depth of 16.0 feet (487.68 cm). At locations SG6-17, SG7-17, and SG9-17 spreadsheet default values were used for a commercial exposure with a vadose zone soil type SI, and a sample depth of 16.0 feet (487.68 cm). Report 0461.R3 Soil Gas Risk and Hazard Calculation Results Summary

				Soli	Gas Risk and Hazard Calculatio	n Results Summai	•
							Recommendations Based on
			Calculated	Calculated	Calculated		DTSC-Recommended
	Sample		Cumulative Incremental	Cumulative Incremental	Cumulative Incremental	Calculated	Guidance for Action or Response
Soil Gas Sample	Collection	Exposure	Carcinogenic	Carcinogenic Risk	Carcinogenic Risk	Hazard	(Minimum of Two Adequately-Spaced (With Respect
Designation	Date	Scenario	Risk	Alternate Description	Alternate Description	Index	To Time) Soil Gas Sampling Events Needed)
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.
202.5	10/0/0015		# 00F 0#	0.000000	#0.1 UV		
SG2-7	12/2/2015	Residential	7.80E-05	0.000078	78 in a million	1.0	Evaluate need for action- risk greater than 1 in a million and hazard greater than 1.
002.17	12/2/2015	Desidential	6 00E 05	0.000048	60 in a million	0.00	Production of Control Characteristics Control Control
SG2-17	12/2/2015	Residential	6.80E-05	0.000068	68 in a million	0.89	Evaluate need for action- risk greater than 1 in a million.
SG3-17	12/2/2015	Residential	3.60E-05	0.000036	36 in a million	0.48	Evaluate need for action- risk greater than 1 in a million.
303-17	12/2/2013	Residentiai	3.00E-03	0.000036	56 III a IIIIIII0II	0.46	Evaluate need for action- fisk greater train 1 in a minion.
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.
304-7	12/2/2013	Residential	4.70E-00	0.0000049	4.5 iii a iiiiiiioii	0.004	Evaluate need for action- risk greater than 1 in a minion.
SG4-7 DUP	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.
SG5-7	12/2/2015	Residential	3.10E-05	0.000031	31 in a million	0.40	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	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	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	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	10/0/0015		2 407 04	0.000004	2.4.1	0.000	
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	12/2/2015	Commercial	1.40E-07	0.0000014	0.14 in a million	0.0023	No further action.
300-7	12/2/2013	Commercial	1:40E-07	0.0000014	0.14 iii a mimon	0.0023	NO THILDER ACTION.
SG9-17	12/2/2015	Commercial	3.00E-07	0.0000030	0.30 in a million	0.0042	No further action.
SG9-17 DUP	12/2/2015	Commercial	3.40E-07	0.00000034	0.34 in a million	0.0048	No further action.
SG10-7	12/2/2015	Commercial	1.70E-07	0.0000017	0.17 in a million	0.0023	No further action.
Notes:		<u> </u>					
RISK MANAGEMENT		APOR INTRUS					
Risk	<u>Hazard</u>		Response	Activities			
Less than 1 in a million	x < 1.0		No Further Action	None			
Less man 1 m a minion	X ≤ 1.0		No Futulet Action	None			
1 to 100 in a million	x > 1.0	1	Evaluate Need	Possible Actions			
1 to 100 iii a mimoli	A 2 1.0		for Action	o Additional Data Collection			
				o Monitoring			
	1			o Additional Risk Characterization	on		
				o Mitigation			
				o Source Remediation			
More than 100 in a million	n		Response	o Vapor Intrusion Mitigation			
			Action Needed	o Source Remediation			

Table 2B

Table 3
Summary of Soil Gas Model Sensitivity Analysis

	unimary of Son C			, 515
DTSC Vapor Intrusi	on Soil Gas Mod	el (December 2	2014)	
			Incremental	Hazard
			risk from	quotient
			vapor	from vapor
			intrusion to	intrusion to
			indoor air,	indoor air,
	Concentration	Sample Result	carcinogen	noncarcinogen
Chemical	(ug/m ³)	Location	(unitless)	(unitless)
Scenario 1 = Table 1A	Highest Concentrat	tion with Residen	itial Model Def	ault Values Except for
Soil Type =				
PCE	120,000	SG2-17	1.8E-04	2.4E+00
Scenario 2 = Scenario 1				
PCE	120,000	SG2-17	1.8E-04	2.4E+00
Scenario 3 = Scenario 1	volues event soil s	type is CI		
PCE	120.000	SG2-17	1.4E-04	1.9E+00
ICL	120,000	302-17	1.4L-04	1.7L±00
Scenario 4 = Scenario 1	values except soil 1	type is S.		
PCE	120,000	SG2-17	2.6E-04	3.4E+00
Scenario 5 = Scenario 1	values except Q _{soil}	1 Liter per minu	ite.	
PCE	120,000	SG2-17	8.4E-05	1.1E+00
<u>Scenario 6 = Scenario 1</u>				
PCE	120,000	SG2-17	2.6E-04	3.4E+00
				(6.0.0)
Scenario 7 = Scenario 1				
PCE	120,000	SG2-17	1.6E-04	2.1E+00
Scenario 8 = Scenario 1	volues eveent seil e	gag gampling dan	th is 187.68 on	, (16 ft)
PCE	120,000	SG2-17	6.8E-05	8.9E-01
I CL	120,000	502-17	0.012-03	0.715-01
Scenario 9 = Scenario 1	values except PCE	concentration =	12.000 ug/m3.	
PCE	12,000	None	1.8E-05	2.4E-01
Scenario 10 = Scenario	1 values except PC	E concentration		
PCE	12,000,000	None	2.6E-03	3.4E+01
Notes				
PCE = Tetrachloroethen	e.			

FIGURES

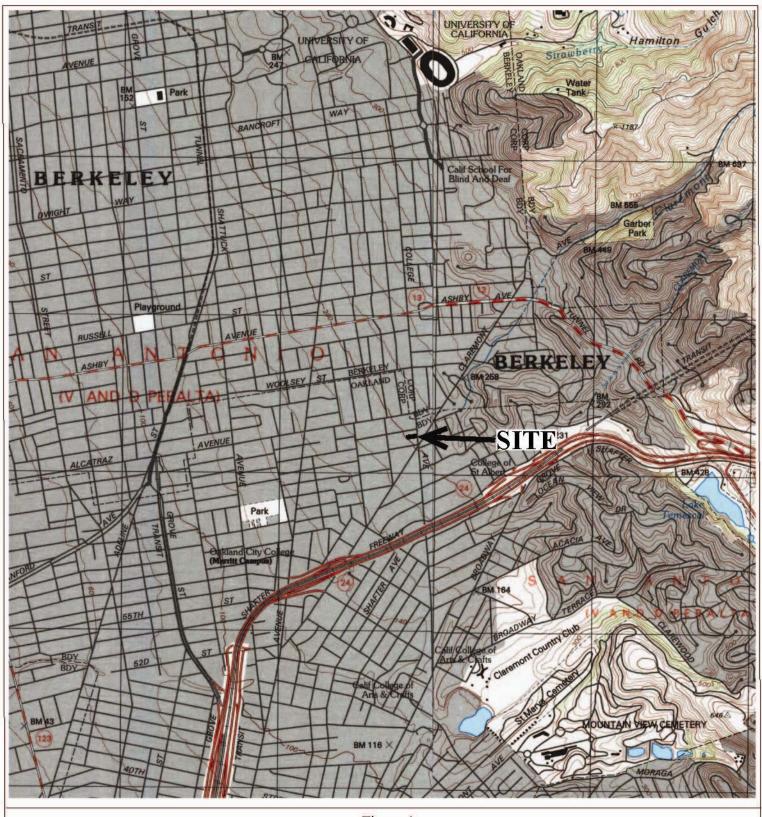
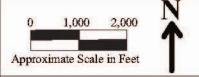
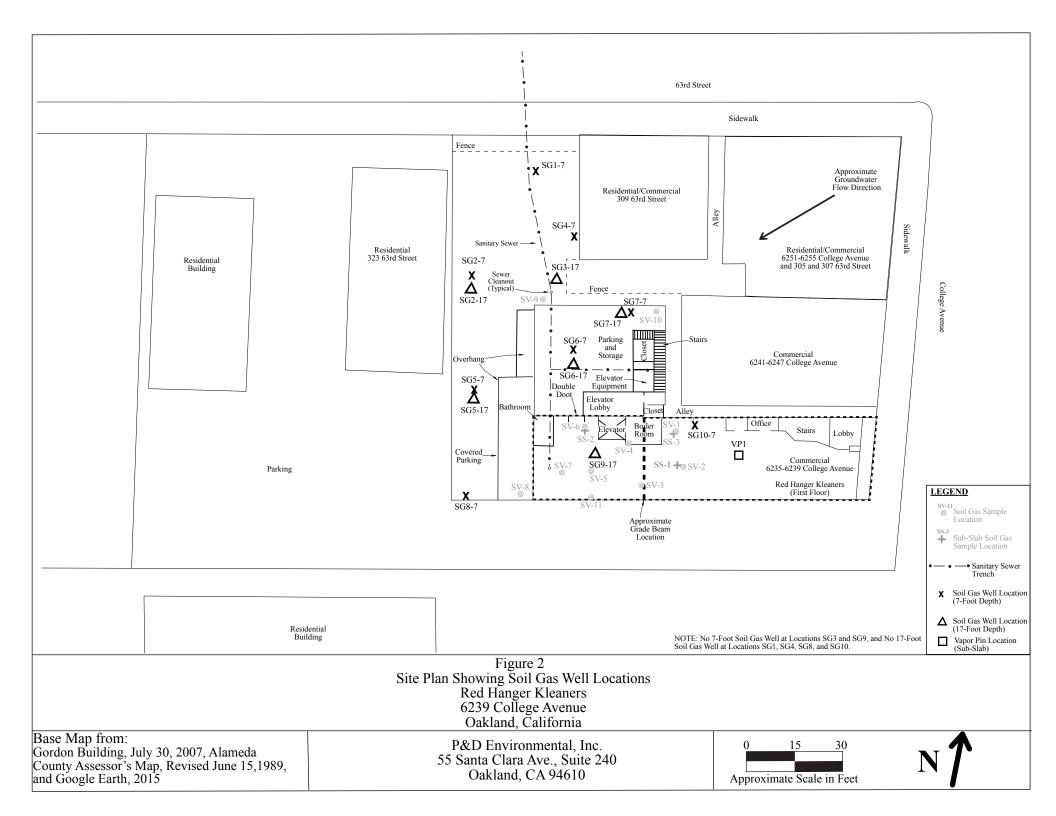


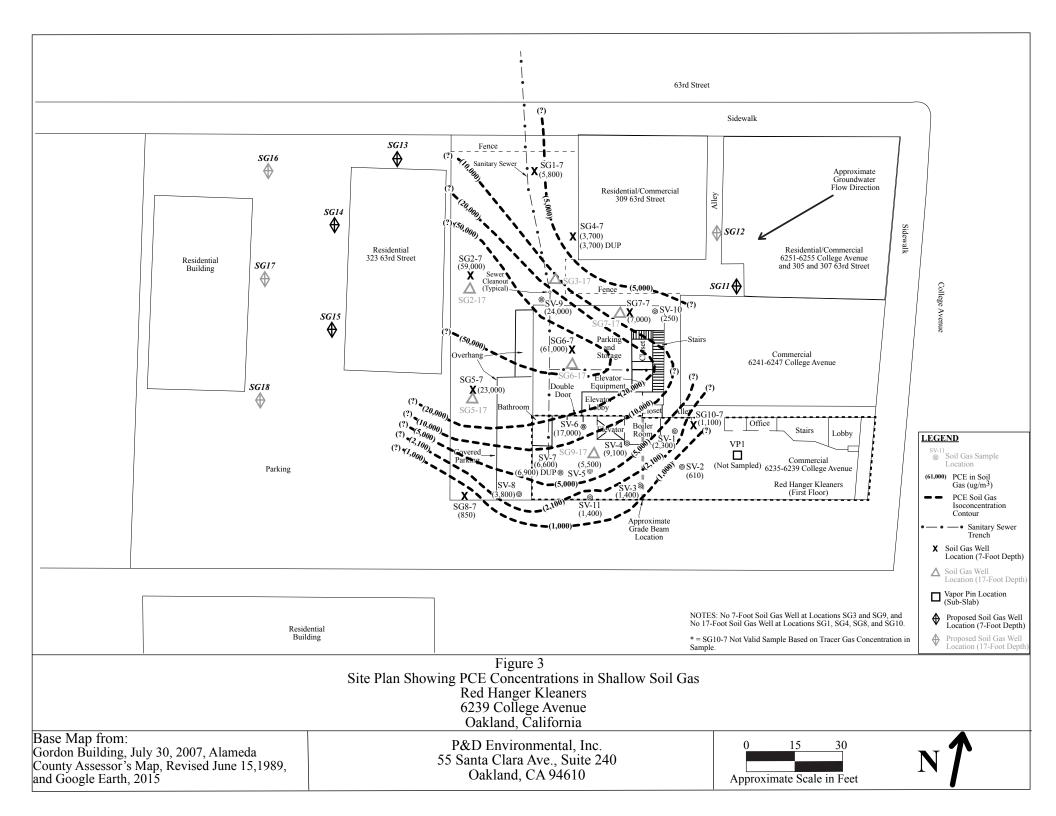
Figure 1 Site Location Map Red Hanger Kleaners 6239 College Avenue Oakland, California

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







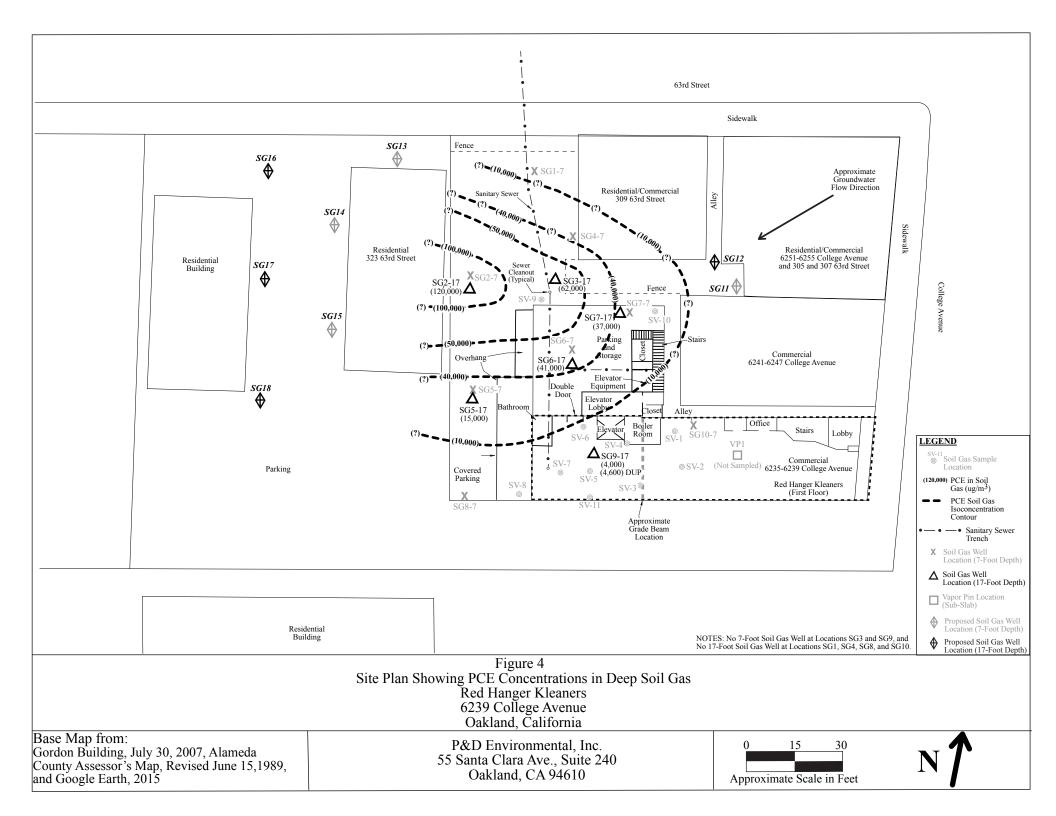




Figure 5
Typical Soil Gas Sampling Manifold
Red Hanger Kleaners
6239 College Avenue
Oakland, California

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

APPENDIX A

Boring Logs

BC	BORING NO.: SG1-7 PROJECT NO.: 0461 PROJECT NAME: Red Hanger Kleaners, 6239 College Ave., Oakland									
В	ORING	LOC	CATION: Approx. 4 ft. south and 14 ft. west of northwest corr						AND DATUM: None	
DF	ILLIN	G AC	GENCY: Vironex, Inc.	DRILLEI	R: Jos	e	DA	TE & TIME STARTED:	DATE & TIME FINISHED:	
DI	RILLIN	G E	QUIPMENT: 6.0-Inch O.D. Hollow Stem Auger Track rig					11/10/15 1430	11/11/15 1300	
C	OMPLE	TIO	N DEPTH: 7.0 Feet BEDROCK DEPTH: No	t Encou	ntere	d		LOGGED BY:	CHECKED BY:	
FI	RST WA	TEI	R DEPTH: Not Encountered NO. OF SAMPLES: No					MLBD	1-MK	
DEPTH (FT.)			DESCRIPTION	GRAPHIC	BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	PID	REM	ARKS	
			0.0 to 0.5 ft. Concrete (6.0-inches)	FILL		Soil Gas Well Constructed	0		red from 0.5 to 2.0 ft.	
			0.5 to 5.0 ft. Brown gravelly silt (ML); medium stiff, dry, with abundant coarse and sub-rounded gravel to 2.0-inch diameter. No solvent odor. (35, 0, 65)			In Borehole	0		lly cored from 2.0 to 7.0 nounted 6.0-inch O.D.	
				ML				hollow stem auger d		
	5		5.0 to 7.0 ft. Dark brown silt (ML); medium stiff, dry. No solvent odor. (0, 0, 100) 6.5 to 7.0 ft. increase in gravel content.				0	Borehole logged from	n soil cuttings.	
F								Drilling Notes:		
E		Ξ						1) Field estimates of	percent gravel,	
	10		=					sand, and fines are sh parentheses.	own in	
		=	=					2) Density determinate qualitative and are no	tions are t based on	
			=					quantitative evaluatio	n.	
		=	=							
	15									
_	10	_	=							
E										
_			=							
	20	\exists	\equiv							
	20	\exists								
_		\exists	=							
		\exists	=							
		\exists								
E	25		=							
		\equiv								
E		=	=							
E	30	\equiv								

ВС	BORING NO.: SG2-7 PROJECT NO.: 0461 PROJECT NAME: Red Hanger Kleaners, 6239 College Ave., Oakland									
\vdash			CATION: Approx. 38 ft. south and 32 ft. west of northwest co				,		AND DATUM: None	
\vdash			GENCY: Vironex, Inc.	DRILLEI			DA	TE & TIME STARTED:	DATE & TIME FINISHED:	
D	RILLIN	G E(QUIPMENT: 6.0-Inch O.D. Hollow Stem Auger Track rig					11/10/15 1300	11/11/15 1315	
C	OMPLE	TIO	N DEPTH: 7.0 Feet BEDROCK DEPTH: No	t Encou	intere	d		CHECKED BY:		
FI		ATEF	R DEPTH: Not Encountered NO. OF SAMPLES: No					MLBD	1-MK	
DEPTH (FT.)			DESCRIPTION	GRAPHIC	BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	PID	REM	ARKS	
_			0.0 to 0.6 ft. Concrete (4.5-inches), gray sand, and baserock. 0.6 to 1.0 ft. Brown gravelly silty clay (CL); medium stiff, moist, with few coarse angular gravel to 0.5-inch diameter. No solvent odor. (15, 5, 80)	FILL CL		Soil Gas Well Constructed In Borehole	0	Borehole hand auger using 3.5-inch O.D.		
_ _ _			1.0 to 2.5 ft. Dark brown silt (ML); medium stiff, moist. No solvent odor. (0, 0, 100)	ML			0		ly cored from 0 to 7.0 nounted 6.0-inch O.D. rill rig.	
	5		2.5 to 6.0 ft. Brown silt (ML); medium stiff, moist. No solvent odor. (0, 0, 100)					Borehole loged from	soil cuttings.	
_		\exists	6.0 to 7.0 ft. Dark brown silty clay (CL); medium stiff, moist. No solvent odor. (0, 0, 100)	CL			0			
	10							Drilling Notes: 1) Field estimates of sand, and fines are sh parentheses. 2) Density determinar qualitative and are no quantitative evaluation	own in tions are t based on	
	20									
	25									
	30	Ī								

ВС	BORING NO.: SG2-17 PROJECT NO.: 0461 PROJECT NAME: Red Hanger Kleaners, 6239 College Ave., Oakland									
ВС	ORING	LOC	CATION: Approx. 41 ft. south and 32 ft. west of northwest co				,		AND DATUM: None	
\vdash			SENCY: Vironex, Inc.	DRILLE			DA	TE & TIME STARTED:	DATE & TIME FINISHED:	
DI	RILLIN	G E(QUIPMENT: 6.0-Inch O.D. Hollow Stem Auger Track rig					11/10/15 1000	11/11/15 1330	
cc	MPLE	TIO	N DEPTH: 17.0 Feet BEDROCK DEPTH: No	t Encou	intere	d		LOGGED BY:	CHECKED BY:	
FII		ATEF	R DEPTH: Not Encountered NO. OF SAMPLES: No.					MLBD	1-MK	
DEPTH (FT.)			DESCRIPTION	GRAPHIC	BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	PID	REM	ARKS	
_			0.0 to 0.6 ft. Concrete (4.5-inches), gray sand, and baserock. 0.6 to 1.0 ft. Brown gravelly silty clay (CL); medium stiff, moist, with few coarse angular gravel to 0.5-inch diameter. No solvent odor. (15, 5, 80)	FILL CL		Soil Gas Well Constructed In Borehole	0	Borehole hand auger using 3.5-inch O.D.		
_ _ _ _			1.0 to 2.5 ft. Dark brown silt (ML); medium stiff, moist. No solvent odor. (0, 0, 100)	ML			0		ly cored from 0 to 17.0 nounted 6.0-inch O.D. rill rig.	
- - -	5		2.5 to 6.0 ft. Brown silt (ML); medium stiff, moist. No solvent odor. (0, 0, 100)						I by visual inspection of ler's observations when	
_ _ _ _			6.0 to 9.0 ft. Dark brown silty clay (CL); medium stiff, moist. No solvent odor. (0, 0, 100)	CL			0	coarse materials wer	e cheountered.	
	10		9.0 to 14.0 ft. Gray clayey gravel (GC); moist, with coarse to sub-rounded gravel to 0.5-inch diameter. No solvent odor. (80, 0, 20)	GC	-		0 0			
	15		14.0 to 15.5 ft. Brown silty clay (CL); stiff, moist. No solvent odor. (0, 0, 100)	CL			0			
_		_	15.5 to 17.0 ft. Gray clayey gravel (GC); moist, with coarse to subrounded gravel to 1.0-inch diameter. No solvent odor. (80, 0, 20)	GC						
	20			-				Drilling Notes: 1) Field estimates of sand, and fines are sh parentheses. 2) Density determina qualitative and are no quantitative evaluation.	own in tions are t based on	
	25							quantitative evaluation	11.	
	23			-						
	30			-						

ВС	BORING NO.: SG3-17 PROJECT NO.: 0461 PROJECT NAME: Red Hanger Kleaners, 6239 College Ave., Oakland									
ВС	RING	LOG	CATION: Approx. 40 ft. south and 7 ft. west of northwest cor	ner of 3	09 63	rd Street		ELEVATION A	AND DATUM: None	
			GENCY: Vironex, Inc. QUIPMENT: 6.0-Inch O.D. Hollow Stem Auger Track rig	DRILLE	R: Jos	e	DA	TE & TIME STARTED: 11/10/15 0800	DATE & TIME FINISHED: 11/11/15 1345	
				t Encou	intere	.d		LOGGED BY:	CHECKED BY:	
<u> </u>			R DEPTH: Not Encountered NO. OF SAMPLES: No.	OF SAMPLES: None				MLBD	THE	
DEPTH (FT.)			DESCRIPTION	GRAPHIC	BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	PID	REM	ARKS	
			0.0 to 1.0 ft. Concrete (5.0-inches) and baserock. —	FILL		Soil Gas Well Constructed	0	Borehole hand auger	red from 0 to 7.0 ft.	
			1.0 to 3.0 ft. Dark brown gravelly silt (ML); medium stiff, dry, with few coarse angular gravel to 0.5-inch diameter. No solvent odor. (15, 0, 85) 3.0 to 4.0 ft. Brown silt (ML); medium stiff, dry.			In Borehole		ft. using a track rig-r	ly cored from 0 to 17.0 nounted 6.0-inch O.D.	
- - -	5		No solvent odor. (0, 0, 100) 4.0 to 5.0 ft. Dark brown gravelly silt (ML); medium stiff, moist, with abundant coarse angular gravel to 1.5-inch diameter. No solvent odor. (25, 5, 70)	ML			0	hollow stem auger drill rig. Borehole was logged by visual inspection		
_ _ _			diameter. No solvent odor. (25, 5, 70) 5.0 to 7.0 ft. Dark brown silt (ML); medium stiff, dry. No solvent odor. (0, 0, 100)		_		0	coarse materials wer	ler's observations when e encountered.	
_			7.0 to 11.0 ft. Dark brown silty clay (CL); medium stiff, moist. No solvent odor. (0, 0, 100)	CL			0			
_	10	_		-						
_ _ _ _			11.0 to 14.0 ft. Brown gravelly silty clay (CL); stiff, moist, with abundant coarse angular gravel to 0.5-inch diameter. No solvent odor. (35, 5, 60)	-			0			
- - -	15		14.0 to 16.5 ft. Brown silty clay (CL); stiff, moist. No solvent odor. (0, 0, 100)	-			0			
_		=	16.5 to 17.0 ft. Gray clayey gravel (GC); moist, with coarse to subrounded gravel to 1.0-inch diameter. No solvent odor. (70, 0, 30)	GC						
Е								Drilling Notes:		
_	20	_		-				1) Field estimates of pand, and fines are sh parentheses.	percent gravel, own in	
	20							2) Density determinate qualitative and are no quantitative evaluation	t based on	
		\equiv	=							
		\exists	=	-						
	25	\exists								
			=	-						
			=							
E			=							
	30									
L	50									

ВС	BORING NO.: SG4-7 PROJECT NO.: 0461 PROJECT NAME: Red Hanger Kleaners, 6239 College Ave., Oakland									
В	DRING	LOC	CATION: Approx. 27 ft. south and 2 ft. west of northwest corn						AND DATUM: None	
DI	RILLIN	G AC	GENCY: Vironex, Inc.	DRILLEI	R: Ale	X	DA	TE & TIME STARTED:	DATE & TIME FINISHED:	
D	RILLIN	G EC	QUIPMENT: 6.0-inch O.D. Hand Auger					11/10/15 1340	11/11/15 1400	
C	OMPLE	TIO	N DEPTH: 7.0 Feet BEDROCK DEPTH: No	t Encou	ntere	d		LOGGED BY:	CHECKED BY:	
FI		ATEF	R DEPTH: Not Encountered NO. OF SAMPLES: No.					MLBD	1-MK	
DEPTH (FT.)			DESCRIPTION	GRAPHIC	BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	PID	REM	ARKS	
E		Ξ	0.0 to 1.0 ft. Dark brown gravelly silty sand (FILL)	FILL		Soil Gas Well Constructed	0	Borehole hand auger using 3.5-inch O.D.		
			1.0 to 3.5 ft. Brown gravelly silt (ML); medium stiff, dry, with abundant gravel to 1.0-inch diameter. No solvent odor. (20, 0, 80)	ML		In Borehole	0	Borehole hand auger ft. using a 6.0-inch C Borehole logged from	ed from 0 to 7.0 O.D. hand auger.	
	5		3.5 to 7.0 ft. Dark brown silt (ML); medium stiff, dry. No solvent odor. (0, 0, 100)				0			
	10							Drilling Notes: 1) Field estimates of sand, and fines are sh parentheses. 2) Density determinate qualitative and are no quantitative evaluation.	tions are t based on	
	15									
	20									
	25									
	30			-						

Bo	BORING NO.: SG5-7 PROJECT NO.: 0461 PROJECT NAME: Red Hanger Kleaners, 6239 College Ave., Oakland										
⊢			CATION: Approx. 33 ft. north and 19 ft. west of southwest co						AND DATUM: None		
⊢			GENCY: Vironex, Inc.	DRILLEI			_	TE & TIME STARTED:	DATE & TIME FINISHED:		
D	RILLIN	G E	QUIPMENT: 6.0-Inch O.D. Hollow Stem Auger Track rig					11/10/15 1150	11/11/15 1430		
C	OMPLE	тю	N DEPTH: 7.0 Feet BEDROCK DEPTH: No	t Encou	ntere	d		LOGGED BY:	CHECKED BY:		
FI	RST W	ATEI	R DEPTH: Not Encountered NO. OF SAMPLES: No					MLBD	1>MK		
DEPTH (FT.)			DESCRIPTION	GRAPHIC	BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	PID	REM	ARKS		
			0.0 to 1.5 ft. Concrete (5.0-inches), gravel, and baserock.	FILL		Soil Gas Well	Soil Gas Well Constructed	Constructed	0	Borehole hand auger using 3.5-inch O.D.	
	5		1.5 to 3.5 ft. Dark brown gravelly silt (ML); medium stiff, dry, with few coarse angular gravel to 0.5-inch diameter. No solvent odor. (15, 0, 85) 3.5 to 7.0 ft. Brown gravelly silt (ML); medium stiff,	ML		In Borehole	0	Borehole continuous	oly cored from 0 to 7.0 mounted 6.0-inch O.D. rill rig.		
	Ü		dry, with few coarse angular gravel to 0.5-inch diameter. No solvent odor. (15, 0, 85)	-			0				
	10 15 20							Drilling Notes: 1) Field estimates of 1 sand, and fines are sh parentheses. 2) Density determinar qualitative and are no quantitative evaluation	own in tions are t based on		
	30	_	_								

BORIN	G NO.	: SG5-1	7 PROJEC	т но.: 046	1 PROJEC	CT NA	ме: Re	d Hai	nger Klean	ers, 6	6239 College Ave.,	Oakland	
BORING LOCATION: Approx. 30 ft. north and 19 ft. west of southwest corner of 6235-6239 College Avenue ELEVATION AND DATUM: None													
DRILLING AGENCY: Vironex, Inc. DRILLER: Jose							e	DA	DATE & TIME FINISHED: 11/11/15				
DRILLING EQUIPMENT: 6.0-Inch O.D. Hollow Stem Auger Track rig								11/10/15 0730	1415				
COMPLETION DEPTH: 17.0 Feet BEDROO				BEDROCK DEPTH:	оск дертн: Not Encountered					LOGGED BY: MLBD	CHECKED BY:		
FIRST WATER DEPTH: No		Not Encountere	d	NO. OF SAMPLES: None					MILDD	1-MK			
A PEDTH (ET)	DEFIN(FL)		DES	CRIPTION			GRAPHIC	BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	PID	REMARKS		
_	=	0.0 to	1.5 ft. Concrete (5.0)-inches), gra	evel, and baserock.	=	FILL		Soil Gas Well Constructed In Borehole	0	Borehole hand auge using 3.5-inch O.D.		
		stiff,	.5 ft. Dark brown dry, with few co- ch diameter. No s	arse angulai	It (ML); medium r gravel to 0.5- r. (15, 0, 85)				п военое	0	Borehole continuously cored from 0 to 17.0 ft. using a track rig-mounted 6.0-inch O.D. hollow stem auger drill rig.		
5 5		3.5 to dry.	7.0 ft. Brown gra with few coarse diameter. No so	angular gra	ML); medium stiff avel to 0.5-inch (15, 0, 85)	f,	ML				Borehole was logged by visual inspection o soil cuttings and driller's observations wher coarse materials were encountered.		
5 10		7.0 to 10.0 ft. Dark brown gravelly silt (M stiff, moist, with some coarse angular grainch diameter. No solvent odor. (25,		llar gravel to 0.5- r. (25, 0, 75)	n				0				
		with ab	0 ft. Clayey gravel (G	r gravel to 0.5- or. (30, 10, 60)	inch diameter. 1 coarse angular grave		CL GC			0			
		moist,	15.0 ft. Brown sa with few coarse a ameter. No solve	lay (CL); stiff, wel to 0.5-inch	´ — — — —	CL			0				
	, <u> </u>	15.0 to 17.0 ft. Dark brown silty gravel (GM); mwith abundant coarse angular gravel to 1.0-inc diameter. No solvent odor. (60, 10, 30)					GM						
_ _ _	=	-									Drilling Notes: 1) Field estimates of sand, and fines are sharentheses.	percent gravel, lown in	
_ 20 _ _ _											2) Density determina qualitative and are no quantitative evaluation	ot based on	
	- - - - 5 -												
20 		- - -											
		-											

BORING NO.: SG6-7 PROJECT NO.: 0461 PROJECT NAME: Red Hanger Kleaners, 6239 College Ave., Oakland											
BORING LOCATION: Approx. 21 ft. north and 11 ft. east of northwest corner of 6235-6239 College Ave. ELEVATION AND DATUM: None											
DF	ILLIN	G AC	GENCY: Vironex, Inc.	e	DA	TE & TIME STARTED:	DATE & TIME FINISHED:				
DI	RILLIN	11/10/15 1020	11/11/15 1445								
COMPLETION DEPTH: 7.0 Feet BEDROCK DEPTH: Not Encountered								LOGGED BY: MLBD CHECKED BY:			
FIRST WATER DEPTH: Not Encountered NO. OF SAMPLES: None											
DEPTH (FT.)			DESCRIPTION	GRAPHIC COLUMN	BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	PID	REM	ARKS		
E		\exists	0.0 to 1.0 ft. Concrete (5.0-inches) and brown gravelly silty sand (FILL).	FILL		Soil Gas Well Constructed	0	Borehole hand augered from 0 to 7.0 ft.			
_			1.0 to 3.0 ft. Dark brown gravelly silt (ML); medium stiff, dry, with few coarse angular gravel to 0.5-inch diameter. No solvent odor. (15, 0, 85) 3.0 to 4.0 ft. Brown gravelly silt (ML); medium stiff, dry, with few coarse angulargravel to 0.5-inch diameter. No solvent odor. (10, 0, 90)	ML		In Borehole	0	using 3.5-inch O.D. hand auger. Borehole continuously cored from 0 to 7.0 ft. using a track rig-mounted 6.0-inch O.D. hollow stem auger drill rig.			
<u>-</u>	5		4.0 to 7.0 ft. Dark brown gravelly silty clay (CL); stiff, moist, with abundant coarse angular gravel to 0.5-inch diameter. No solvent odor. (30, 10, 60)	CL			0	Borehole logged from soil cuttings.			
_ _ _ _	10							Drilling Notes: 1) Field estimates of percent gravel, sand, and fines are shown in parentheses.			
								2) Density determinations are qualitative and are not based on quantitative evaluation.			
	15										
	20										
	25										
	30	=									

BORIN	G NO.	.: SG6-1	17 PROJECT NO.: 046	l project m	аме: Re	d Ha	nger Klean	ers, (6239 College Ave.,	Oakland	
BORIN	G LO	CATION: A	pprox. 19 ft. north and 11 ft.	east of northwest co	rner of 6	235-0	6239 Colleg	ge A	venue ELEVATION	AND DATUM: None	
DRILLING AGENCY: Vironex, Inc.						driller: Jose			DATE & TIME STARTED: DATE & TIME FINI 11/10/15 11/11/1:		
DRILL	ING E	EQUIPMENT	e: 6.0-Inch O.D. Hollow Ste	m Auger Track rig					1230	1500	
COMP	LETIC	ON DEPTH:	17.0 Feet	BEDROCK DEPTH: N					LOGGED BY: MLBD	CHECKED BY:	
FIRST	WATE	ER DEPTH:	Not Encountered	NO. OF SAMPLES: N	: None		1-MK				
DEPTH (ET)			DESCRIPTION		GRAPHIC	BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	PID	REMARKS		
_	_	0.0 to	o 1.0 ft. Concrete (5.0-inches), and br sand (FILL).	own gravelly silty _	FILL		Soil Gas Well Constructed	\perp 0	Borehole hand augered from 0 to 7.0 ft.		
		stiff,	.0 ft. Dark brown gravelly sil, dry, with few coarse angular ich diameter. No solvent odor 0 ft. Brown gravelly silt (ML); mediu barse angular gravel to 0.5-inch diame	gravel to 0.5- . (15, 0, 85)	ML		In Borehole	0	using 3.5-inch O.D. hand auger. Borehole continuously cored from 0 to 1 ft. using a track rig-mounted 6.0-inch O. hollow stem auger drill rig. Borehole was logged by visual inspectio soil cuttings and driller's observations w coarse materials were encountered.		
5 		4.0 to 7 moist, v	.0 ft. Dark brown gravelly sil with abundant coarse angular diameter. No solvent odor. (2	gravel to 0.5-inch _	CL			0			
			10.5 ft. Dark brown clayey si stiff, moist. No solvent odor.		ML			0			
5 10		10.5 to	o 15.0 ft. Brown silty silty cla moist. No solvent odor. (0, 0	y (CL); stiff, - , 100) -	CL			0			
- 15 - -		 mediun 	o 17.0 ft. Dark brown gravelly cl n dense, moist, with abundant co to 1.0-inch diameter. No solvent	arse sub-rounded -	SC						
		- - - -		- - - - -	_				Drilling Notes: 1) Field estimates of sand, and fines are sh parentheses.	percent gravel, lown in	
_ 20 _ _ _				- - - -					2) Density determina qualitative and are no quantitative evaluation	ot based on	
20 20 25	; -			- - - - - - - - - - -							
	. —			- - -							

ВС	RING	NO.:	SG7-7 PROJECT NO.: 0461 PROJECT NA	ме: Ке	d Ha	nger Klean	ers, (6239 College Ave.,	Oakland
			CATION: Approx. 2 ft. south and 11 ft. west of northwest corr						AND DATUM: None
\vdash			GENCY: Vironex, Inc.	DRILLEI				TE & TIME STARTED:	DATE & TIME FINISHED:
DI	RILLIN	G E	QUIPMENT: 6.0-Inch O.D. Hollow Stem Auger Track rig					11/10/15 0850	11/11/15 1430
C	OMPLE	TIO	N DEPTH: 7.0 Feet BEDROCK DEPTH: No	t Encou	ntere	d		LOGGED BY:	CHECKED BY:
FI		ATEI	R DEPTH: Not Encountered NO. OF SAMPLES: No	ne	1			MLBD	1-MK
DEPTH (FT.) GRAPHIC					BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	PID	REM	ARKS
			0.0 to 0.8 ft. Concrete (7.5-inches). 0.8 to 1.0 ft. Brown gravelly silty sand (FILL). No solvent odor.	FILL		Soil Gas Well Constructed	0	Borehole hand auger using 3.5-inch O.D.	
_ _ _ _			1.0 to 4.0 ft. Dark brown gravelly silt (ML); medium stiff, dry, with few coarse angular gravel to 0.5-inch diameter. No solvent odor. (15, 0, 85)	ML		In Borehole	0	Borehole continuous	ly cored from 0 to 7.0 nounted 6.0-inch O.D.
	5	\exists	4.0 to 4.5 ft. Brown silt (CL); medium stiff, dry. No solvent odor. (0, 0, 100)					Borehole logged from	n soil cuttings.
			4.5 to 7.0 ft. Dark brown silty clay (CL); medium stiff, moist. No solvent odor. (0, 0, 100)	CL			0		
		=						Drilling Notes:	
_								1) Field estimates of pand, and fines are sh	percent gravel, own in
E	10		Ξ					parentheses.	
_		_	=					2) Density determinate qualitative and are no quantitative evaluation	t based on
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E			=						
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BORING	NO.:	SG7-17 PROJECT NO.: 0461 PROJECT N	аме: К	ed Ha	nger Kleane	ers, (6239 College Ave.,	Oakland
BORING	LOG	CATION: Approx. 2 ft. south and 15 ft. west of northwest co	ner of 6	235-6	5239 Colleg	ge Av	venue ELEVATION	AND DATUM: None
DRILLING	G AC	GENCY: Vironex, Inc.	DRILLE	R: Jos	e	DA	TE & TIME STARTED: 11/9/15	DATE & TIME FINISHED: 11/11/15
DRILLIN	G E	QUIPMENT: 6.0-Inch O.D. Hollow Stem Auger Track rig					0815	1445
COMPLE	TIO	N DEPTH: 17.0 Feet BEDROCK DEPTH: N	ot Enco	ıntere	ed		LOGGED BY:	CHECKED BY:
FIRST WA	TEI	R DEPTH: Not Encountered NO. OF SAMPLES: N	one				MLBD	1-MK
DEPTH (FT.)		DESCRIPTION	GRAPHIC COLUMN	BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	PID	REM	ARKS
_		0.0 to 0.5 ft. Concrete (7.5-inches), gravel, and baserock. 0.5 to 1.0 ft. Brown gravelly silty sand (FILL). No solvent odor.	FILL		Soil Gas Well Constructed	0	Borehole hand auger	
_ _ _		1.0 to 4.0 ft. Dark brown gravelly silt (ML); medium stiff, dry, with few coarse angular gravel to 0.5-inch diameter. No solvent odor. (15, 0, 85)	ML		In Borehole		using 3.5-inch O.D. depth. Borehole continuous	sly cored from 0 to 17.0
<u> </u>		4.0 to 4.5 ft. Brown silt (CL); medium stiff, dry.		-		0	ft. using a track rig-r hollow stem auger d	nounted 6.0-inch O.D. rill rig.
5		No solvent odor. (0, 0, 100) 4.5 to 7.0 ft. Dark brown silty clay (CL); medium stiff, dry. No solvent odor. (0, 0, 100) 5.0 to 7.0 ft. Increase in gravel content to 2.0-inch diameter. Hand auger refusal depth at 5.5 ft.	CL			0		d by visual inspection of ler's observations when e encountered.
		7.0 to 9.0 ft. Dark brown silty clay (CL); stiff, moist. No solvent odor. (0, 0, 100)				0		
_ _ 10		9.0 to 10.0 ft. Gray sandy gravel (GW); dry, with coarse angular gravel to 1.5-inch diameter. No solvent odor. (60, 15, 25)	GW					
		10.0 to 14.0 ft. Brown sandy clay (CL); stiff, moist. No solvent odor. (10, 15, 75)	- - - -			0		
15 15 		14.0 to 17.0 ft. Brown silty clay (CL); stiff, moist. No solvent odor. (0, 0, 100)	CL			0		
_							Drilling Notes:	
_		=======================================					1) Field estimates of sand, and fines are sh	percent gravel, own in
20 							parentheses. 2) Density determina qualitative and are no quantitative evaluation	ot based on
_	_	- -	_					
25		Ξ						
_ 25		=						
_	_	=						
_	_							
_								
_ _ 30	_							

$\overline{}$	RING		SG8-7 PROJECT NO.: 0461 PROJECT	NAM	ıE: Re	d Hai	nger Kleane	ers. (6239 College Ave.,	Oakland	
			CATION: Approx. 2 ft. north and 19 ft. west of southwest co							AND DATUM: None	
			GENCY: Vironex, Inc.		RILLER			_	TE & TIME STARTED:	DATE & TIME FINISHED:	
DI	RILLIN	G EC	QUIPMENT: 6-Inch O.D. Hand Auger						11/10/15 1055	11/11/15 1500	
СС	OMPLE	TIO	N DEPTH: 7.0 Feet BEDROCK DEPTH: 1	Not 1	Encou	ntere	d		LOGGED BY:	CHECKED BY:	
FI	RST W	ATEF	R DEPTH: Not Encountered NO. OF SAMPLES: N	None	e			MLBD MLBD			
DESCRIPTION Output Description					GRAPHIC COLUMN	BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	all	REM	ARKS	
		-	0.0 to 0.5 ft. Concrete (6.0-inches).		Concrete		Soil Gas Well Constructed	0	Borehole hand auger		
		\exists	0.5 to 1.5 ft. Brown gravelly sand (FILL). No solvent odor.		FILL		In Borehole		using 3.5-inch O.D.	hand auger.	
E		\exists	1.5 to 2.7 ft. Concrete (14.5-inches).		Concrete				Borehole hand auger ft. using a 6.0-inch C	red from 0 to 7.0 O.D. hand auger	
	5		2.7 to 5.0 ft. Dark brown gravelly silt (ML); medium stiff, dry, with some coarse angular gravel to 0.5-inch diameter. No solvent odor. (20, 0, 80)		М			0	Borehole logged from	· ·	
_	3		5.0 to 7.0 ft. Brown silt (CL); medium stiff, dry, with few coarse angular gravel to 0.5-inch diameter. No solvent odor. (10, 0, 90)		ML			0			
		=	-						Drilling Notes:		
									1) Field estimates of sand, and fines are sh parentheses.	percent gravel, own in	
	10		- - -						2) Density determinate qualitative and are no quantitative evaluation	t based on	
		\equiv							quantitative evaluatio	ni.	
E											
	15	=	-								
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_	20		-	\exists							
		\exists									
		\exists									
	25										
		=									
	20	=									
	30										

во	RING	NO.:	SG9-17 PROJECT NO.: 0461 PROJECT	NAM	ie: Re	d Haı	nger Klean	ers, (6239 College Ave.,	Oakland	
ВС	RING	LOC	CATION: Inside 6235-6239 College Avenue Approx. 11 ft. sou	ıth aı	nd 19 f	t. eas	t of northwe	est co	orner ELEVATION	AND DATUM: None	
\vdash			SENCY: Vironex, Inc.		DRILLER	R: Jose	e	DA	TE & TIME STARTED: 11/9/15	DATE & TIME FINISHED: 11/11/15	
DF	RILLIN	G E(QUIPMENT: 6.0-Inch O.D. Hollow Stem Auger Track rig						0815	1515	
CC	MPLE	TIO		вергоск рертн: Not Encountered					LOGGED BY: MLBD	CHECKED BY:	
FII		TEF	R DEPTH: Not Encountered NO. OF SAMPLES:						I	1, W.F.	
DEPTH (FT.)			DESCRIPTION		GRAPHIC	BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	PID	REM	MARKS	
			0.0 to 1.0 ft. Concrete (6.0-inches), 1-inch of sand, plastic membrane, and 5-inches of pea gravel.				Soil Gas Well Constructed In Borehole	0	Borehole hand auger using 3.5-inch O.D.		
			1.0 to 3.0 ft. Brown gravelly clayey sand (FILL).				in Borenoie		depth.	L d f 0 t - 17 0	
			3.0 to 7.0 ft. Gray gravelly silty sand (FILL); dry,		FILL			0	ft. using a track rig-r hollow stem auger d		
	5		dense, with abundant coarse angular gravel to 1.75- inch diameter, nails, and metal debris. No solvent odor.					0	Borehole was logged soil cuttings and dril coarse materials wer	I by visual inspection of ler's observations when e encountered.	
E			7.0 to 9.0 ft. Dark brown sandy clay (CL); moist, stiff. No solvent odor. $(0,20,80)$		CL			0			
	10	\equiv	9.0 to 10.0 ft. Dark brown silt (ML); moist, stiff. No solvent odor. (0, 0, 100)		ML						
								0			
	15		10.0 to 17.0 ft. Brown clay (CL); moist, stiff. No solvent odor. (0, 0, 100)		CL			0			
									Drilling Notes:		
_	20	_							1) Field estimates of sand, and fines are sh parentheses.	percent gravel, own in	
	20								2) Density determinate qualitative and are no quantitative evaluation	t based on	
E											
E				\exists							
	25	\exists		\exists							
	-										
				=							
E		=									
F		\exists		7							
	30	=									

ВС	RING	NO.:	SG10-7 PROJECT NO.: 0461 PROJECT NA	ме: Re	d Hai	nger Klean	ers. (6239 College Ave.,	Oakland	
\vdash			EATION: Inside 6235-6239 College Avenue Approx. 2 ft. south						AND DATUM: None	
⊢			GENCY: Vironex, Inc.	DRILLEI				TE & TIME STARTED:	DATE & TIME FINISHED:	
DF	ILLIN	G E	QUIPMENT: 6-Inch O.D. Hand Auger				ļ	11/11/15 0905	11/11/15 1530	
cc	MPLE	TIO	N DEPTH: 7.0 Feet BEDROCK DEPTH: No	t Encou	intere	d		LOGGED BY:	CHECKED BY:	
FII	RST WA	ATE	R DEPTH: Not Encountered NO. OF SAMPLES: No.	ne			MLBD MK			
DESCRIPTION			DESCRIPTION	GRAPHIC	BLOW COUNT PER 6"	WELL CONSTRUCTION LOG	PID	REM	ARKS	
		_	0.0 to 0.5 ft. Concrete (6.0-inches).	-		Soil Gas Well	0	Borehole hand auger		
E		\exists	0.5 to 2.0 ft. Sand and gravel (FILL).	FILL		Constructed In Borehole		using 3.5-inch O.D.	hand auger.	
			2.0 to 4.5 ft. Dark brown clay (CL); moist, medium stiff. No solvent odor. (0, 0, 100)	CL			0	Borehole hand auger ft. using a 6.0-inch C Borehole logged from	D.D. hand auger.	
E	5	\exists	4.5 to 5.5 ft. Dark brown clayey gravelly sand (SW); moist, medium dense, with abundant coarse to sub-rounded gravel to 1.0-inch diameter. No solvent odor. (35, 45, 20)	SW				Dorenoic logged from	ii soii cuttings.	
			5.5 to 7.0 ft. Dark brown gravelly clay (CL); moist, medium stiff, with some coarse angular gravel to 0.5-inch diameter. No solvent odor. (20, 0, 80)	CL			0			
			inch diameter. No solvent odor. (20, 0, 80)					Drilling Notes:		
								1) Field estimates of plant, and fines are sh	percent gravel,	
	10		<u> </u>					parentheses.		
_		=	=	-				2) Density determinat qualitative and are no quantitative evaluatio	t based on	
		Ξ	Ξ					quantitative evaluatio	п.	
			_	-						
			=	-						
	15			-						
Ē			\equiv	_						
			=	-						
			=							
	20									
_			_	-						
			=	-						
		=	=	-						
	25	\exists								
_	43			-						
_			=	-						
			=	-						
_	30	_	_	-						

APPENDIX B

Purge Volume Calculations and Soil Gas Sampling Data Sheets

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Appendix A

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.

ft. x 12 in./ft) =V tubing = 3.14 x (0.0935 x2.64) x (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 x (24 X 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:

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

The total tubing volume to be purged is purge volumes.

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

=

243

V TOTAL = + default 200 cubic centimeters 200 43 The flow controller has a nominal flow rate of cubic centimeters per minute. 150

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.

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Appendix A

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 x18 ft. x 12 in./ft) =) x (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 x (24 X 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 = cubic inches. 5.93 To convert to cubic centimeters: cubic cubic inches x 16.39 cubic centimeters/cubic inches = V total = 97.2 centimeters. The total tubing volume to be purged is purge volumes. cubic V purge total = 97.2 cubic centimeters x 97 centimeters. V TOTAL = + default 200 cubic centimeters 200 97 = 297

cubic centimeters per minute.

minutes.

seconds.

1.98

119

Notes:

Yellow hi-lite indicates data entry required.

The flow controller has a nominal flow rate of

The purge time is calculated as follows:

T purge = 297 cubic centimeters/

Converting the purge time to seconds,

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

150

1.98

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.

cubic centimeters per minute =

minutes x 60seconds/ minute =

150

P.1 0/2 SOIL GAS SAMPLING DATA SHEET
Address 6337 COLEGE AVE, OA KLAND CA
Probe Method (check one)
o PRT
Sampler Name 1133 / 1144 o Temp Well
Drilling Company 120 NEX Begin sample End sample Time Canister Initial Start leak End leak ADDITIONAL Start of collection collection Teflon tube Soil Gas Probe Probe Vacuum check check leak check tracer das vacuum (In vacuum (In after ocation Depth Installation Check (In. Hg) vacuum (In. vacuum (In. vacuum (In. Hg) Start PURGE End PURGE Hg) and sample Completed Canister # 0800 37715 Designation (Ft.) collection SG 1-7 6 vac - 30 vac - 35 vac - 35 vac time 0800 time 0835 time 845 time 091100 091231 vac-30 vac - 5 ppm 0 tim092720im093/50im0938 DFA 0935 sg 2-7 6 111922 vac - 30 vac - 25_vac - 25_vac - 25_vac - 35627 time 0810 time 1045 time 1055 time vac=30 vac=5 ppm 7 DF+ 1(15 time 1/140 time 1/3520 me 1/37 110500 110637 34171 vac 30 vac - 25 vac time 11 10 time SG 2-17 16 vac = 30 vac = 5 ppm 24 DFA (124 111800 111958 time (13 30 time 12950 time 132 34088 vac 38 vac 25 vac 25 vac 35 vac time 808 time 1007 time 1017 time SG 3-17 16 101300 101458 vac-30 vac-5 ppm 9 DFA 1020 time 6740tim 02605 time 1009 14 | 557 vac - 30 vac - 25 vac SG4-7 6 vac-30 vac-5 ppm 0 DFA 09 29 time 09 30 10 time 09 43 15 time 09 45 091300 091437 SGH-7 6 1028 vac - 30 vac - 25 vac - 25 vac time 0805 time 0900 time 091300 091437 vac 30 vac - 5 ppm 0 time 930 10 time 0943 15 time 0945 37311 vac = 30 vac = 24 vac = 24 vac time 0 2 15 time 2 30 time 2 40 time sc 5-7 6 135900 140137 vac 30 vac - 5 ppm 2 DFA (304) time 304 20 mm 2 3111 0 mm 2 314 34634 vac-30 vac-24 vac-24 vac time818 time1245 time 1255 time SG 5-17 16 130800 130958 vac* 30 vac - 5 ppm 1.3 DFA 13 20 time 320 30 time 13 25 37300 vac 28 vac 23 vac 23 vac 11me 1425 time 1435 time SG 6-7 6 143700 143837 vac-30 vac-5 ppm 12 DFA 1442 time 44 1666 1449 566 1451 3039 vac - 30 vac - 23 vac - 23 vac time (825 time 1440 time 1450 time sG6-1716 vac 30 vac - 5 ppm 14 DFA 1451 144600 144758 33416 vac -30 vac - 23 vac - 23 vac time | 335 time | 345 time SG 7-7 6 134800 134937 vac - 30 vac - 5 ppm 0 D-A 1358 12730 vac - 30 vac - 33 vac - 33 vac - 33 vac time 2830 time 1340 time 1350 time SG 7-17 16 vac 30 vac 4 ppm 6 DFA 1411 135800 135958 34129 vac - 30 vac - 35 vac - 35 vac time 888 time 6930 time 6940 time sg8-76 103400 103537 vac-30 vac-5 ppm 0 D FA 1038 time 10390 time 104535 time 1047

SOIL GAS SAMPLING DATA SHEET
Address
Job #
Date
Sampler Name
Drilling Company Probe Method (check one) o PRT o Temp Well Permanent Well o Vapor Pin Begin Sample sample End sample PID value in Time Canister Initial Start leak End leak ADDITIONAL Start of collection collection Teflon tube Soil Gas Probe Probe Vacuum check check leak check tracer gas vacuum (In. vacuum (In. after Location Installation Check (In. Hg) vacuum (In. vacuum (In. vacuum (In. Hg) Start PURGE End PURGE Completed Canister # injection Designation (Ft.) SG9-17 6 and time Hg) and time Hg) and time vac 29 vac 22 vac 12 vac time 1510 time 1520 time Hg) and Hg) and sample and time 36397 vac-39 vac-32 vac-32 vac time 830 time 1510 time 1520 time SG9-17 DuP 152500 [52658] time time time vac - 29 vac - 5 ppm / 14 time 5 200 time 5 465 5 time / 5 48 9477 vac-30 vac-21 vac time 1510 time 525 time 1535 time (53700 | 53837 | time SG10-7 6 vac - 30 vac - 5 ppm 14 DFA 1549 time54800 time55550 time 1558 SG vac vac time time time time time time time time SG vac vac vac vac vac ppm time time time time time time time time time SG vac vac vac vac vac vac ppm time SG vac vac vac vac vac ppm time time time time time time time time time SG vac vac vac vac vac vac ppm time time time time time time time time time SG vac vac vac vac vac vac ppm time time time time time time time time time SG vac vac vac vac vac vac ppm time SG vac vac vac vac vac vac time SG vac vac vac vac vac vac ppm time time time time time time time time time SG vac vac vac vac ppm time time time time time time time time time

APPENDIX C

Weather Information

About This Weather Station

Weather Station ID: KCABERKE41

Station Name: Elmwood

Latitude / Longitude: N 37 ° 51 ' 18 ", W 122 ° 15 ' 5 "

Elevation: 253 City: Berkeley State: CA

Hardware: AcuRite Pro Weather Center

Software: Acu-link.com

Weather History Table November 1, 2015 - December 31, 2015

2015	Tempera	ature		Dew Poir	nt		Humidity	y		Speed			Pressure			Precip. Accum.
Nov	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Gust	High	Avg	Low	Sum
1	83.3 °F	63.6 °F	54 °F	61.6 °F	58.1 °F	52.3 °F	96 %	84 %	47 %	5 mph	1 mph	0 mph	29.92 in	29.81 in	29.7 in	0.37 in
2	73.9 °F	56.3 °F	47.1 °F	57.1 °F	51.3 °F	44.4 °F	97 %	85 %	49 %	5 mph	1 mph	0 mph	29.69 in	29.6 in	29.51 in	0.49 in
3	77.5 °F	55.2 °F	46 °F	47.4 °F	44.2 °F	39.9 °F	90 %	70 %	30 %	5 mph	1 mph	0 mph	29.72 in	29.65 in	29.58 in	0 in
4	64 °F	48 °F	42.4 °F	42.9 °F	35.4 °F	32.4 °F	84 %	62 %	32 %	3 mph	0 mph	0 mph	29.9 in	29.81 in	29.71 in	0 in
5	76.5 °F	54.4 °F	41.7 °F	51 °F	41.4 °F	33 °F	81 %	64 %	30 %	5 mph	0 mph	0 mph	30.03 in	29.97 in	29.9 in	0 in
6	80.1 °F	57.8 °F	45.3 °F	45.3 °F	42.1 °F	39.7 °F	88 %	60 %	27 %	3 mph	0 mph	0 mph	30.03 in	29.99 in	29.95 in	0 in
7	80.8 °F	58.8 °F	43.2 °F	50 °F	45.5 °F	41.6 °F	95 %	67 %	30 %	3 mph	1 mph	0 mph	29.95 in	29.87 in	29.79 in	0 in
8	67.6 °F	57.9 °F	46.8 °F	55.3 °F	51 °F	44.4 °F	94 %	78 %	60 %	5 mph	1 mph	0 mph	29.79 in	29.75 in	29.71 in	0 in
9	63.3 °F	50.9 °F	45.5 °F	52.9 °F	45.8 °F	42.8 °F	96 %	84 %	57 %	3 mph	1 mph	0 mph	29.81 in	29.74 in	29.67 in	0.14 in
10	72.1 °F	49.6 °F	39.2 °F	46 °F	42.3 °F	37.6 °F	97 %	78 %	37 %	3 mph	0 mph	0 mph	30.11 in	29.96 in	29.81 in	0 in
11	73.8 °F	54.1 °F	40.6 °F	49.9 °F	42.7 °F	38.3 °F	97 %	68 %	37 %	4 mph	1 mph	0 mph	30.18 in	30.12 in	30.06 in	0 in
12	78.8 °F	52.2 °F	39.7 °F	47.9 °F	42 °F	37.3 °F	95 %	72 %	31 %	4 mph	0 mph	0 mph	30.06 in	29.97 in	29.88 in	0 in
13	81 °F	53.9 °F	40.8 °F	48.8 °F	41.9 °F	37.1 °F	97 %	69 %	28 %	2 mph	0 mph	0 mph	29.88 in	29.82 in	29.76 in	0 in
14	76.3 °F	52.1 °F	41 °F	50.7 °F	44.1 °F	36.4 °F	94 %	77 %	38 %	3 mph	0 mph	0 mph	29.77 in	29.69 in	29.6 in	0 in
15	66.6 °F	54.3 °F	47.3 °F	51 °F	44.2 °F	33.7 °F	97 %	70 %	46 %	10 mph	2 mph	0 mph	29.86 in	29.69 in	29.51 in	0.4 in
16	68.5 °F	51.7 °F	41.5 °F	35.6 °F	32.5 °F	25.1 °F	76 %	51 %	22 %	6 mph	1 mph	0 mph	30.09 in	29.98 in	29.86 in	0 in
17	76.8 °F	55.1 °F	46.8 °F	51.6 °F	44.2 °F	35 °F	94 %	69 %	39 %	3 mph	1 mph	0 mph	30.12 in	30.07 in	30.02 in	0 in
18	79.5 °F	56.3 °F	44.6 °F	55.7 °F	49.4 °F	43 °F	96 %	80 %	44 %	4 mph	0 mph	0 mph	30.04 in	29.96 in	29.88 in	0 in
19	80.4 °F	56.7 °F	43.7 °F	52.4 °F	47.9 °F	42.6 °F	98 %	76 %	37 %	4 mph	0 mph	0 mph	29.95 in	29.9 in	29.85 in	0 in
20	81.9 °F	57.4 °F	48.2 °F	55.9 °F	50.5 °F	46.5 °F	97 %	81 %	39 %	4 mph	0 mph	0 mph	29.89 in	29.84 in	29.79 in	0 in
21	78.1 °F	58.4 °F	46.6 °F	53 °F	46 °F	42 °F	98 %	67 %	40 %	4 mph	1 mph	0 mph	29.86 in	29.81 in	29.75 in	0 in
22	80.6 °F	57.3 °F	46 °F	51.9 °F	47.9 °F	44 °F	94 %	74 %	36 %	2 mph	0 mph	0 mph	29.78 in	29.72 in	29.66 in	0 in
23	57 °F	51.4 °F	45.7 °F	51 °F	48.2 °F	44.1 °F	98 %	89 %	77 %	2 mph	0 mph	0 mph	29.72 in	29.68 in	29.64 in	0 in
24	63 °F	51.6 °F	42.4 °F	52.2 °F	44.4 °F	38.2 °F	95 %	78 %	42 %	8 mph	1 mph	0 mph	29.7 in	29.67 in	29.64 in	0.16 in
25	63.1 °F	44.8 °F	36.3 °F	42.2 °F	36.5 °F	32.3 °F	97 %	75 %	38 %	5 mph	0 mph	0 mph	29.79 in	29.72 in	29.64 in	0.05 in
26	64.2 °F 68.2 °F	44.8 °F	36 °F	33.3 °F	28.1 °F 24.2 °F	22.9 °F 22.2 °F	86 %	55 %	25 %	4 mph	1 mph	0 mph	29.89 in	29.84 in 29.88 in	29.79 in	0 in
27 28	65.1 °F	45.4 °F 48.2 °F	33.6 °F 36.9 °F	27.8 °F 24.9 °F	21.2 °F	18.3 °F	73 % 60 %	46 %	20 %	4 mph	0 mph	0 mph	29.92 in		29.84 in	0 in 0 in
29	72.7 °F	48.9 °F	37.4 °F	24.9 F 29.3 °F	23.1 °F	16.3 F	68 %	35 % 37 %	21 % 20 %	8 mph	2 mph	0 mph	29.93 in 29.98 in	29.89 in 29.94 in	29.85 in 29.9 in	0 in
						10 F	00 /0	31 /0	20 /0	7 mph	1 mph	0 mph	29.90 111	29.94 111	29.9 111	UIII
30	53.2 °⊢	44.6 °F	34.7 °F	38.7 °F	31.7 °F	27.7 °F	81 %	61 %	47 %	7 mph	0 mph	0 mph	29.99 in	29.96 in	29.93 in	0 in
30	53.2 °F	44.6 °F	34.7 °F	38.7 °F	31.7 °F	27.7 °F	81 %	61 %	47 %	7 mph	0 mph	0 mph	29.99 in	29.96 in	29.93 in	0 in Precip.
2015	53.2 °F		34.7 °F	38.7 °F		27.7 °F	81 % Humidity		47 %		0 mph	0 mph	29.99 in		29.93 in	0 in Precip. Accum.
	Tempera	ature	34.7 °F	Dew Poir	nt	27.7 °F	Humidity		47 % Low	Speed	0 mph	0 mph Gust	Pressure	•	29.93 in	Precip.
2015 Dec	Tempera High	ature Avg	Low	Dew Poir	nt Avg		Humidity High	y Avg	Low	Speed High	Avg	Gust	Pressure High	Avg	Low	Precip. Accum. Sum
2015	Tempera	ature		Dew Poir	nt	Low	Humidity	y		Speed High 3 mph	Avg 1 mph	Gust 0 mph	Pressure	•		Precip. Accum.
2015 Dec 1	Tempera High 71.2 °F	ature Avg 50.9 °F	Low 41.5 °F	Dew Poir High 40.3 °F	nt Avg 33.8 °F	Low 27 °F	Humidity High 73 %	Avg 53 %	Low 28 % 35 %	Speed High 3 mph 3 mph	Avg 1 mph 0 mph	Gust 0 mph 0 mph	Pressure High 30.02 in 30 in	Avg 29.97 in	Low 29.92 in	Precip. Accum. Sum 0 in
2015 Dec 1 2	Tempera High 71.2 °F 66.2 °F 61.9 °F	Avg 50.9 °F 52.4 °F 58.9 °F	Low 41.5 °F 42.1 °F 57.6 °F	Dew Poin High 40.3 °F 42.7 °F 58.6 °F	Avg 33.8 °F 38.3 °F 56.6 °F	Low 27 °F 34.8 °F 55.5 °F	Humidity High 73 % 77 % 96 %	Avg 53 % 61 % 92 %	Low 28 % 35 % 86 %	Speed High 3 mph 3 mph 1 mph	Avg 1 mph 0 mph 0 mph	Gust 0 mph 0 mph 0 mph	Pressure High 30.02 in 30 in 30.06 in	Avg 29.97 in 29.93 in 30.03 in	Low 29.92 in 29.86 in 30.01 in	Precip. Accum. Sum 0 in 0 in 0.06 in
2015 Dec 1 2 6 7	Tempera High 71.2 °F 66.2 °F 61.9 °F 69.4 °F	Avg 50.9 °F 52.4 °F 58.9 °F 57.1 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F	Dew Poin High 40.3 °F 42.7 °F 58.6 °F 57.8 °F	Avg 33.8 °F 38.3 °F 56.6 °F 54.4 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F	Humidity High 73 % 77 % 96 % 98 %	Avg 53 % 61 % 92 % 91 %	Low 28 % 35 % 86 % 64 %	Speed High 3 mph 3 mph 1 mph 2 mph	Avg 1 mph 0 mph 0 mph 0 mph	Gust 0 mph 0 mph 0 mph 0 mph	Pressure High 30.02 in 30 in 30.06 in 30.08 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in	Low 29.92 in 29.86 in 30.01 in 29.99 in	Precip. Accum. Sum 0 in 0 in 0.06 in 0.01 in
2015 Dec 1 2	Tempera High 71.2 °F 66.2 °F 61.9 °F 69.4 °F 67.3 °F	Avg 50.9 °F 52.4 °F 58.9 °F	Low 41.5 °F 42.1 °F 57.6 °F	Dew Poin High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.4 °F	Avg 33.8 °F 38.3 °F 56.6 °F	Low 27 °F 34.8 °F 55.5 °F	Humidity High 73 % 77 % 96 % 98 % 98 %	Avg 53 % 61 % 92 % 91 % 91 %	Low 28 % 35 % 86 % 64 % 70 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph	Avg 1 mph 0 mph 0 mph 0 mph	Gust 0 mph 0 mph 0 mph 0 mph 0 mph	Pressure High 30.02 in 30 in 30.06 in 30.08 in 30.03 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.98 in	29.92 in 29.86 in 30.01 in 29.99 in 29.93 in	Precip. Accum. Sum 0 in 0 in 0.06 in
2015 Dec 1 2 6 7	Tempera High 71.2 °F 66.2 °F 61.9 °F 69.4 °F	Avg 50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F	Dew Poin High 40.3 °F 42.7 °F 58.6 °F 57.8 °F	Avg 33.8 °F 38.3 °F 56.6 °F 54.4 °F 53.7 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F	Humidity High 73 % 77 % 96 % 98 %	Avg 53 % 61 % 92 % 91 %	Low 28 % 35 % 86 % 64 %	Speed High 3 mph 3 mph 1 mph 2 mph	Avg 1 mph 0 mph 0 mph 0 mph	Gust 0 mph 0 mph 0 mph 0 mph	Pressure High 30.02 in 30 in 30.06 in 30.08 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in	Low 29.92 in 29.86 in 30.01 in 29.99 in	Precip. Accum. Sum 0 in 0 in 0.06 in 0.01 in
2015 Dec 1 2 6 7 8 9	Tempera High 71.2 °F 66.2 °F 61.9 °F 69.4 °F 67.3 °F 66.2 °F	Avg 50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 58.7 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F	Dew Poin High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.4 °F 57.8 °F	Avg 33.8 °F 38.3 °F 56.6 °F 54.4 °F 53.7 °F 55.5 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F	Humidity High 73 % 77 % 96 % 98 % 98 % 98 %	Avg 53 % 61 % 92 % 91 % 91 % 89 %	Low 28 % 35 % 86 % 64 % 70 % 74 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 4 mph	Avg 1 mph 0 mph 0 mph 0 mph 0 mph 0 mph 0 mph	Gust 0 mph	Pressure High 30.02 in 30 in 30.06 in 30.08 in 30.03 in 29.95 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.98 in 29.85 in	29.92 in 29.86 in 30.01 in 29.99 in 29.93 in 29.74 in	Precip. Accum. Sum 0 in 0 in 0.06 in 0.01 in 0 in
2015 Dec 1 2 6 7 8 9	Tempera High 71.2 °F 66.2 °F 61.9 °F 69.4 °F 67.3 °F 66.2 °F 68 °F	Ature Avg 50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 58.7 °F 56.3 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 48 °F	Dew Poin High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.4 °F 57.8 °F 58 °F	Avg 33.8 °F 38.3 °F 56.6 °F 54.4 °F 53.7 °F 55.5 °F 51.6 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 45.5 °F	Humidity High 73 % 77 % 96 % 98 % 98 % 98 %	Avg 53 % 61 % 92 % 91 % 91 % 89 % 85 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 4 mph 6 mph	Avg 1 mph 0 mph 0 mph 0 mph 0 mph 1 mph 1 mph	Gust 0 mph	Pressure High 30.02 in 30 in 30.06 in 30.08 in 30.03 in 29.95 in 29.73 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.98 in 29.85 in 29.67 in	Low 29.92 in 29.86 in 30.01 in 29.99 in 29.93 in 29.74 in 29.61 in	Precip. Accum. Sum 0 in 0 in 0 oin 0.06 in 0.01 in 0 in 0 in 0 in 0 in
2015 Dec 1 2 6 7 8 9 10	Tempera High 71.2 °F 66.2 °F 61.9 °F 69.4 °F 67.3 °F 66.2 °F 68 °F 65.3 °F	50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 58.7 °F 56.3 °F 49.4 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 48 °F 41.7 °F	Dew Poin High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.8 °F 58 °F 48.7 °F	Avg 33.8 °F 38.3 °F 56.6 °F 54.4 °F 53.7 °F 55.5 °F 51.6 °F 43.8 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 45.5 °F 40.6 °F	Humidity High 73 % 77 % 96 % 98 % 98 % 98 % 98 % 99 %	Avg 53 % 61 % 92 % 91 % 91 % 89 % 85 % 83 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 % 45 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 4 mph 6 mph 7 mph	Avg 1 mph 0 mph 0 mph 0 mph 0 mph 1 mph 1 mph	Gust 0 mph	Pressure High 30.02 in 30 in 30.06 in 30.08 in 30.03 in 29.95 in 29.73 in 29.81 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.98 in 29.85 in 29.67 in 29.68 in	29.92 in 29.86 in 30.01 in 29.99 in 29.93 in 29.74 in 29.61 in	Precip. Accum. Sum 0 in 0 in 0 006 in 0.01 in 0 38 in 0 3 in
2015 Dec 1 2 6 7 8 9 10 11	Tempera High 71.2 °F 66.2 °F 61.9 °F 69.4 °F 67.3 °F 66.2 °F 68 °F 65.3 °F 64.9 °F	50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 56.3 °F 49.4 °F 52 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 48 °F 41.7 °F 40.3 °F	Dew Poin High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.8 °F 57.8 °F 58 °F 48.7 °F 48.3 °F	33.8 °F 38.3 °F 56.6 °F 54.4 °F 55.5 °F 51.6 °F 43.8 °F 43.6 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 45.5 °F 40.6 °F 38 °F	Humidity High 73 % 77 % 96 % 98 % 98 % 98 % 99 % 94 %	Avg 53 % 61 % 92 % 91 % 89 % 85 % 83 % 75 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 % 45 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 4 mph 6 mph 7 mph 3 mph	Avg 1 mph 0 mph 0 mph 0 mph 1 mph 1 mph 1 mph 1 mph	Gust 0 mph	Pressure High 30.02 in 30 in 30.06 in 30.08 in 30.03 in 29.95 in 29.73 in 29.81 in 29.94 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.98 in 29.85 in 29.67 in 29.68 in 29.87 in	29.92 in 29.86 in 30.01 in 29.99 in 29.93 in 29.74 in 29.61 in 29.56 in 29.8 in	Precip. Accum. Sum 0 in 0 in 0.06 in 0.01 in 0
2015 Dec 1 2 6 7 8 9 10 11 12 13	Tempera High 71.2 °F 66.2 °F 61.9 °F 69.4 °F 67.3 °F 66.2 °F 68 °F 65.3 °F 64.9 °F 60.8 °F	50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 56.3 °F 49.4 °F 52 °F 49.8 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 48 °F 41.7 °F 40.3 °F 42.6 °F	Dew Poin High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.8 °F 58 °F 48.7 °F 48.3 °F 50.1 °F	33.8 °F 38.3 °F 56.6 °F 54.4 °F 53.7 °F 55.5 °F 51.6 °F 43.8 °F 43.6 °F 43.9 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 40.6 °F 38 °F 36.5 °F	Humidity High 73 % 77 % 96 % 98 % 98 % 98 % 99 % 94 % 97 %	Avg 53 % 61 % 92 % 91 % 91 % 89 % 85 % 83 % 75 % 81 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 % 45 % 46 % 57 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 4 mph 6 mph 7 mph 3 mph 9 mph	Avg 1 mph 0 mph 0 mph 0 mph 1 mph 1 mph 1 mph 2 mph 2 mph	Gust 0 mph	Pressure High 30.02 in 30 in 30.06 in 30.08 in 30.03 in 29.95 in 29.73 in 29.81 in 29.94 in 29.93 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.85 in 29.85 in 29.67 in 29.68 in 29.87 in 29.78 in	29.92 in 29.86 in 30.01 in 29.99 in 29.93 in 29.74 in 29.61 in 29.56 in 29.8 in 29.62 in	Precip. Accum. Sum 0 in 0 in 0 in 0.06 in 0.01 in 0 in 0 in 0 in 0 in 0 in 0.38 in 0 in 0.86 in
2015 Dec 1 2 6 7 8 9 10 11 12 13	Tempera High 71.2 °F 66.2 °F 61.9 °F 69.4 °F 67.3 °F 66.2 °F 68 °F 65.3 °F 64.9 °F 60.8 °F 61.3 °F	50.9 °F 50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 56.3 °F 49.4 °F 49.8 °F 47.5 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 48 °F 41.7 °F 40.3 °F 42.6 °F 41.4 °F	Dew Poin High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.8 °F 58.8 °F 48.7 °F 48.3 °F 50.1 °F 37.3 °F	Avg 33.8 °F 38.3 °F 56.6 °F 54.4 °F 55.5 °F 51.6 °F 43.8 °F 43.9 °F 35.5 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 45.5 °F 40.6 °F 38 °F 36.5 °F 31 °F	Humidity High 73 % 77 % 96 % 98 % 98 % 98 % 99 % 94 % 97 % 81 %	Avg 53 % 61 % 92 % 91 % 89 % 85 % 83 % 75 % 81 % 65 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 % 45 % 46 % 57 % 35 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 4 mph 6 mph 7 mph 3 mph 9 mph 5 mph	Avg 1 mph 0 mph 0 mph 0 mph 1 mph 0 mph 1 mph 1 mph 1 mph 1 mph 1 mph	Gust 0 mph	Pressure High 30.02 in 30 in 30.06 in 30.08 in 30.03 in 29.95 in 29.73 in 29.81 in 29.94 in 29.93 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.98 in 29.67 in 29.68 in 29.87 in 29.78 in 29.88 in	29.92 in 29.86 in 30.01 in 29.99 in 29.93 in 29.74 in 29.61 in 29.56 in 29.82 in 29.83 in	Precip. Accum. Sum 0 in 0 in 0.06 in 0.01 in 0 in 0 in 0 in 0 in 0.38 in 0.3 in 0 in 0.86 in 0 in
2015 Dec 1 2 6 7 8 9 10 11 12 13 14	Tempera High 71.2 °F 66.2 °F 69.4 °F 67.3 °F 66.2 °F 65.3 °F 64.9 °F 64.9 °F 66.8 °F 61.3 °F 66 °F	Avg 50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 56.3 °F 49.4 °F 49.8 °F 47.5 °F 46.1 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 48 °F 41.7 °F 40.3 °F 42.6 °F 41.4 °F 36.5 °F	Dew Poin High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.8 °F 58.8 °F 48.7 °F 48.7 °F 48.3 °F 50.1 °F 37.3 °F	Avg 33.8 °F 38.3 °F 56.6 °F 54.4 °F 55.5 °F 51.6 °F 43.8 °F 43.6 °F 43.9 °F 35.5 °F 30.7 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 45.5 °F 40.6 °F 38 °F 36.5 °F 31 °F 25.5 °F	Humidity High 73 % 77 % 96 % 98 % 98 % 98 % 99 % 94 % 97 % 81 %	Avg 53 % 61 % 92 % 91 % 91 % 89 % 85 % 83 % 75 % 81 % 65 % 59 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 % 45 % 46 % 57 % 35 % 24 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 4 mph 6 mph 7 mph 3 mph 9 mph 5 mph 7 mph	Avg 1 mph 0 mph 0 mph 0 mph 1 mph	Gust 0 mph	Pressure High 30.02 in 30 in 30.06 in 30.08 in 30.03 in 29.95 in 29.73 in 29.84 in 29.94 in 29.93 in 29.93 in 29.97 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.98 in 29.87 in 29.67 in 29.68 in 29.78 in 29.88 in 29.88 in 29.88 in	Low 29.92 in 29.86 in 30.01 in 29.99 in 29.93 in 29.74 in 29.61 in 29.56 in 29.83 in 29.83 in 29.88 in	Precip. Accum. Sum 0 in 0 in 0 006 in 0.01 in 0 in 0 in 0 in 0.38 in 0.3 in 0 in 0.86 in 0 in
2015 Dec 1 2 6 7 8 9 10 11 12 13 14 15 16	Tempera High 71.2° °F 66.2° °F 66.9° °F 67.3° °F 66.8° °F 66.9° °F 60.8° °F 66.8° °F 66.7° °F	Avg 50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 56.3 °F 49.4 °F 52 °F 49.8 °F 47.5 °F 46.1 °F 45.2 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 48 °F 41.7 °F 40.3 °F 42.6 °F 41.4 °F 36.5 °F 33.8 °F	Dew Poil High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.8 °F 58 °F 48.7 °F 48.3 °F 50.1 °F 37.3 °F 37.5 °F 40.2 °F	33.8 °F 38.3 °F 56.6 °F 54.4 °F 55.5 °F 51.6 °F 43.8 °F 43.9 °F 35.5 °F 30.7 °F 32.8 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 40.6 °F 38 °F 36.5 °F 25.5 °F 28.7 °F	Humidity High 73 % 96 % 98 % 98 % 98 % 99 % 94 % 97 % 81 % 83 % 85 %	Avg 53 % 61 % 92 % 91 % 89 % 85 % 83 % 75 % 81 % 65 % 64 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 % 46 % 57 % 35 % 24 % 32 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 4 mph 6 mph 7 mph 3 mph 9 mph 5 mph 7 mph 4 mph	Avg 1 mph 0 mph 0 mph 0 mph 1 mph 0 mph 1 mph	Gust 0 mph	Pressure High 30.02 in 30.06 in 30.08 in 30.03 in 29.95 in 29.73 in 29.81 in 29.94 in 29.93 in 29.93 in 29.97 in 30.03 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.98 in 29.67 in 29.68 in 29.78 in 29.78 in 29.88 in 29.92 in 30 in	29.92 in 29.86 in 30.01 in 29.99 in 29.93 in 29.74 in 29.61 in 29.62 in 29.83 in 29.88 in 29.88 in 29.97 in	Precip. Accum. Sum 0 in 0 in 0 0.06 in 0.01 in 0
2015 Dec 1 2 6 7 8 9 10 11 12 13 14 15 16 17	Tempera High 71.2 °F 66.2 °F 61.9 °F 69.4 °F 66.3 °F 68.8 °F 65.3 °F 64.9 °F 60.8 °F 66.7 °F 66.7 °F 64.6 °F	Avg 50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 58.7 °F 56.3 °F 49.4 °F 49.4 °F 49.4 °F 45.2 °F 48.8 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 48 °F 41.7 °F 40.3 °F 42.6 °F 41.4 °F 36.5 °F 33.8 °F 36.9 °F	Dew Poil High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.8 °F 48.7 °F 48.3 °F 50.1 °F 37.3 °F 47.3 °F 48.2 °F 49.2 °F	Avg 33.8 °F 38.3 °F 56.6 °F 54.4 °F 55.5 °F 51.6 °F 43.8 °F 43.9 °F 35.5 °F 30.7 °F 32.8 °F 41 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 40.6 °F 38 °F 31 °F 25.5 °F 25.5 °F 33.1 °F	Humidity High 73 % 96 % 98 % 98 % 98 % 99 % 94 % 97 % 81 % 93 % 85 % 94 %	Avg 53 % 61 % 92 % 91 % 89 % 85 % 85 % 81 % 65 % 64 % 78 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 % 46 % 57 % 35 % 24 % 32 % 49 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 4 mph 6 mph 7 mph 3 mph 9 mph 5 mph 7 mph 4 mph 2 mph	Avg 1 mph 0 mph 0 mph 0 mph 1 mph 0 mph 1 mph	Gust 0 mph	Pressure High 30.02 in 30 in 30.06 in 30.08 in 30.03 in 29.95 in 29.97 in 29.94 in 29.93 in 29.93 in 29.97 in 30.03 in 30.06 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.98 in 29.85 in 29.68 in 29.87 in 29.78 in 29.88 in 29.92 in 30 in 29.99 in	29.92 in 29.86 in 30.01 in 29.99 in 29.93 in 29.74 in 29.56 in 29.62 in 29.83 in 29.88 in 29.88 in 29.97 in 29.92 in	Precip. Accum. Sum 0 in 0 in 0 0.06 in 0.01 in 0
2015 Dec 1 2 6 7 8 9 10 11 12 13 14 15 16 17 18	Tempera High 71.2 °F 66.2 °F 69.4 °F 67.3 °F 66.2 °F 68 °F 64.9 °F 60.8 °F 61.3 °F 66.7 °F 66.6 °F 59.7 °F	Avg 50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 58.7 °F 49.4 °F 49.4 °F 47.5 °F 45.2 °F 48 °F 51.4 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 41.7 °F 40.3 °F 42.6 °F 41.4 °F 33.8 °F 33.8 °F 36.9 °F 42.3 °F	Dew Poil High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.8 °F 48.7 °F 48.3 °F 50.1 °F 37.3 °F 40.2 °F 49 °F	Avg 33.8 °F 38.3 °F 56.6 °F 54.4 °F 55.5 °F 43.8 °F 43.6 °F 43.9 °F 35.5 °F 30.7 °F 32.8 °F 46.8 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 40.6 °F 38 °F 36.5 °F 31 °F 25.5 °F 28.7 °F 33.1 °F 40.7 °F	Humidity High 73 % 77 % 96 % 98 % 98 % 98 % 99 % 94 % 97 % 81 % 93 % 94 %	Avg 53 % 61 % 92 % 91 % 89 % 85 % 83 % 75 % 81 % 65 % 64 % 78 % 85 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 % 45 % 46 % 57 % 35 % 24 % 32 % 49 % 64 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 4 mph 6 mph 7 mph 3 mph 5 mph 7 mph 5 mph 7 mph 9 mph 5 mph 7 mph	Avg 1 mph 0 mph 0 mph 0 mph 1 mph 0 mph 1 mph	Gust 0 mph	Pressure High 30.02 in 30.06 in 30.08 in 30.03 in 29.95 in 29.73 in 29.94 in 29.93 in 29.97 in 30.03 in 30.06 in 29.92 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.85 in 29.68 in 29.68 in 29.87 in 29.88 in 29.88 in 29.92 in 30 in 29.99 in 29.81 in	29.92 in 29.86 in 30.01 in 29.99 in 29.74 in 29.56 in 29.56 in 29.83 in 29.83 in 29.83 in 29.92 in 29.92 in 29.7 in	Precip. Accum. Sum 0 in 0 in 0 in 0.06 in 0.01 in 0
2015 Dec 1 2 6 7 8 9 10 11 12 13 14 15 16 17 18	Tempera High 71.2 °F 66.2 °F 69.4 °F 67.3 °F 66.2 °F 65.3 °F 66.9 °F 60.8 °F 61.3 °F 66.7 °F 66.7 °F 65.7 °F	50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 58.7 °F 56.3 °F 49.4 °F 49.8 °F 47.5 °F 46.1 °F 45.2 °F 48 °F 51.4 °F 49.5 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 48 °F 41.7 °F 40.3 °F 42.6 °F 41.4 °F 36.5 °F 33.8 °F 36.9 °F 42.3 °F 37.9 °F	Dew Poin High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.8 °F 58.8 °F 48.7 °F 48.3 °F 50.1 °F 37.3 °F 40.2 °F 40.2 °F 50.2 °F	Avg 33.8 °F 38.3 °F 56.6 °F 54.4 °F 55.5 °F 51.6 °F 43.8 °F 43.9 °F 35.5 °F 30.7 °F 32.8 °F 41 °F 46.8 °F 44.2 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 45.6 °F 38 °F 36.5 °F 31 °F 25.5 °F 28.7 °F 33.1 °F 40.7 °F 36.1 °F	Humidity High 73 % 77 % 96 % 98 % 98 % 98 % 99 % 94 % 97 % 81 % 93 % 85 % 94 % 97 %	Avg 53 % 61 % 92 % 91 % 91 % 89 % 85 % 83 % 75 % 81 % 65 % 59 % 64 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 % 45 % 46 % 57 % 32 % 49 % 64 % 44 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 4 mph 6 mph 7 mph 5 mph 7 mph 5 mph 7 mph 9 mph 5 mph 9 mph 9 mph 9 mph	Avg 1 mph 0 mph 0 mph 0 mph 0 mph 1 mph	Gust 0 mph	Pressure High 30.02 in 30 in 30.06 in 30.08 in 30.03 in 29.95 in 29.91 in 29.93 in 29.93 in 29.97 in 30.03 in 30.06 in 29.92 in 29.91 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.85 in 29.67 in 29.68 in 29.78 in 29.78 in 29.92 in 30 in 29.99 in 29.81 in 29.81 in	29.92 in 29.86 in 30.01 in 29.99 in 29.74 in 29.56 in 29.56 in 29.83 in 29.83 in 29.88 in 29.92 in 29.97 in 29.77 in	Precip. Accum. Sum 0 in 0 in 0 in 0.06 in 0.01 in 0
2015 Dec 1 2 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	Tempera High 71.2 °F 66.2 °F 61.9 °F 69.4 °F 67.3 °F 66.3 °F 64.9 °F 60.8 °F 66.7 °F 66.7 °F 66.7 °F 65.7 °F 59.7 °F 53.1 °F	Avg 50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 58.7 °F 56.3 °F 49.4 °F 52 °F 47.5 °F 46.1 °F 45.2 °F 48 °F 51.4 °F 49.5 °F 45.9 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 48 °F 41.7 °F 40.3 °F 41.4 °F 36.5 °F 33.8 °F 36.9 °F 42.3 °F 42.3 °F 42.5 °F	Dew Poil High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.8 °F 58 °F 48.7 °F 48.3 °F 50.1 °F 37.3 °F 37.5 °F 40.2 °F 50.3 °F 50.3 °F	Avg 33.8 °F 56.6 °F 54.4 °F 55.7 °F 51.6 °F 43.8 °F 43.9 °F 35.5 °F 30.7 °F 32.8 °F 41 °F 46.8 °F 44.2 °F 43.2 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 40.6 °F 38 °F 31 °F 25.5 °F 28.7 °F 33.1 °F 40.7 °F 36.1 °F 35.2 °F	Humidity High 73 % 96 % 98 % 98 % 99 % 94 % 97 % 81 % 93 % 85 % 94 % 97 %	Avg 53 % 61 % 92 % 91 % 89 % 85 % 83 % 75 % 81 % 65 % 65 % 64 % 78 % 84 % 91 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 % 45 % 46 % 32 % 49 % 64 % 44 % 73 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 4 mph 6 mph 7 mph 3 mph 5 mph 7 mph 5 mph 5 mph 5 mph 5 mph 5 mph	Avg 1 mph 0 mph 0 mph 0 mph 1 mph 0 mph 1 mph	Gust 0 mph	Pressure High 30.02 in 30.06 in 30.08 in 30.08 in 30.95 in 29.95 in 29.94 in 29.93 in 29.97 in 30.03 in 30.06 in 30.06 in 30.06 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.98 in 29.67 in 29.68 in 29.87 in 29.78 in 29.88 in 29.92 in 30 in 29.99 in 29.81 in 29.81 in 29.94 in	Low 29.92 in 29.86 in 30.01 in 29.99 in 29.93 in 29.74 in 29.61 in 29.88 in 29.83 in 29.88 in 29.97 in 29.77 in 29.77 in 29.89 in	Precip. Accum. Sum 0 in 0 in 0.06 in 0.01 in 0
2015 Dec 1 2 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	Tempera High 71.2 °F 66.2 °F 61.9 °F 69.4 °F 67.3 °F 66.2 °F 66.8 °F 66.3 °F 66.8 °F 66.7 °F 66.7 °F 66.7 °F 65.7 °F 53.1 °F 53.1 °F	Avg 50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 58.7 °F 56.3 °F 49.4 °F 52 °F 49.8 °F 47.5 °F 45.2 °F 48.8 °F 51.4 °F 49.5 °F 49.9 °F 53.9 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 48 °F 41.7 °F 40.3 °F 42.6 °F 41.6 5 °F 33.8 °F 36.9 °F 42.3 °F 42.3 °F 50.2 °F	Dew Poil High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.8 °F 58 °F 48.7 °F 48.3 °F 50.1 °F 37.5 °F 40.2 °F 40.2 °F 50.3 °F 50.3 °F 50.3 °F 50.4 °F	33.8 °F 38.3 °F 56.6 °F 54.4 °F 53.7 °F 55.5 °F 43.8 °F 43.9 °F 30.7 °F 30.7 °F 32.8 °F 41 °F 44.2 °F 44.2 °F 43.3 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 40.6 °F 38 °F 36.5 °F 25.5 °F 25.5 °F 40.7 °F 36.1 °F 35.2 °F 49.4 °F	Humidity High 773 % 96 % 98 % 98 % 98 % 99 % 94 % 97 % 81 % 93 % 85 % 94 % 97 % 97 % 97 %	Avg 53 % 61 % 92 % 91 % 89 % 85 % 83 % 75 % 81 % 65 % 64 % 78 % 85 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 % 46 % 57 % 32 % 49 % 64 % 44 % 73 % 96 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 6 mph 7 mph 3 mph 5 mph 9 mph 5 mph 5 mph 5 mph 5 mph 6 mph	Avg 1 mph 0 mph 0 mph 0 mph 1 mph	Gust 0 mph	Pressure High 30.02 in 30.06 in 30.08 in 30.03 in 29.95 in 29.91 in 30.03 in 29.93 in 29.93 in 29.97 in 30.03 in 30.06 in 29.92 in 29.91 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.98 in 29.67 in 29.68 in 29.78 in 29.78 in 29.82 in 29.99 in 29.99 in 29.81 in 29.81 in 29.81 in 29.76 in	29.92 in 29.86 in 30.01 in 29.99 in 29.93 in 29.74 in 29.61 in 29.83 in 29.83 in 29.88 in 29.97 in 29.92 in 29.77 in 29.89 in 29.81 in	Precip. Accum. Sum 0 in 0 in 0 0.06 in 0.01 in 0
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2015 Dec 1 2 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	Tempera High 71.2 °F 66.2 °F 66.9 °F 69.4 °F 66.3 °F 66.3 °F 66.3 °F 66.3 °F 66.7 °F 66.6 °F 66.7 °F 65.1 °F 65.1 °F 65.1 °F 65.1 °F 66.7 °F 66.7 °F 66.7 °F 66.7 °F	Avg 50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 56.3 °F 49.4 °F 52 °F 49.8 °F 47.5 °F 46.1 °F 45.2 °F 48.8 °F 51.4 °F 49.5 °F 45.9 °F 53.9 °F 55.5 °F 47.7 °F 42.9 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 48 °F 41.7 °F 40.3 °F 41.4 °F 36.5 °F 33.8 °F 36.9 °F 42.3 °F 42.3 °F 42.3 °F 42.3 °F 42.3 °F 36.9 °F 37.9 °F 36.5 °F 50.2 °F 48.4 °F 39.7 °F 35.8 °F 33.6 °F	Dew Poil High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.8 °F 58 °F 48.7 °F 48.3 °F 50.1 °F 37.3 °F 37.5 °F 40.2 °F 50.2 °F 50.2 °F 50.3 °F 50.4 °F 50.5 °F 41.8 °F 41.8 °F	33.8 °F 38.3 °F 56.6 °F 54.4 °F 55.5 °F 51.6 °F 43.8 °F 43.9 °F 35.5 °F 30.7 °F 32.8 °F 41 °F 44.2 °F 44.2 °F 43.2 °F 53.3 °F 53.3 °F 53.3 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 45.5 °F 40.6 °F 38 °F 31 °F 25.5 °F 28.7 °F 33.1 °F 40.7 °F 35.2 °F 49.4 °F 42.5 °F 34.8 °F 34.8 °F 34.9 °F 32.1 °F	Humidity High 73 % 96 % 98 % 98 % 98 % 99 % 94 % 97 % 97 % 99 % 99 %	Avg 53 % 61 % 92 % 91 % 89 % 85 % 83 % 75 % 86 % 65 % 64 % 78 % 81 % 91 % 91 % 91 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 % 45 % 46 % 57 % 32 % 49 % 64 % 44 % 73 % 96 % 76 % 40 % 53 % 42 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 6 mph 7 mph 3 mph 5 mph 9 mph 5 mph 5 mph 9 mph 5 mph 5 mph 6 mph 7 mph 6 mph	Avg 1 mph 0 mph 0 mph 0 mph 1 mph	Gust 0 mph	Pressure High 30.02 in 30.06 in 30.08 in 30.03 in 29.95 in 29.97 in 29.93 in 29.97 in 30.03 in 30.06 in 29.92 in 29.91 in 29.91 in 29.91 in 29.97 in 30 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.98 in 29.67 in 29.68 in 29.87 in 29.88 in 29.92 in 30 in 29.99 in 29.91 in 29.91 in 29.94 in 29.96 in 29.76 in 29.76 in 29.76 in 29.76 in 29.76 in	Low 29.92 in 29.86 in 30.01 in 29.99 in 29.93 in 29.74 in 29.62 in 29.83 in 29.88 in 29.97 in 29.89 in 29.77 in 29.89 in 29.61 in 29.88 in 29.70 in 29.88 in 29.97 in 29.89 in 29.70 in 29.89 in 29.89 in 29.88 in 29.88 in	Precip. Accum. Sum 0 in 0 in 0.06 in 0.01 in 0
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2015 Dec 1 2 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	Tempera High 71.2 °F 66.2 °F 66.2 °F 69.4 °F 67.3 °F 66.3 °F 66.9 °F 66.7 °F 66.7 °F 66.7 °F 65.7 °F 63.1 °F 59.7 °F 63.1 °F 59.7 °F 63.1 °F 59.7 °F 63.1 °F 59.7 °F 63.1 °F 65.2 °F 66.2 °F	Avg 50.9 °F 52.4 °F 58.9 °F 57.1 °F 56.5 °F 58.7 °F 56.3 °F 49.4 °F 49.8 °F 47.5 °F 45.2 °F 49.5 °F 45.9 °F 55.5 °F 47.7 °F 42.9 °F 46.8 °F 40.6 °F	Low 41.5 °F 42.1 °F 57.6 °F 49.8 °F 50 °F 52 °F 48 °F 41.7 °F 40.3 °F 42.6 °F 41.4 °F 36.9 °F 42.3 °F 37.9 °F	Dew Poil High 40.3 °F 42.7 °F 58.6 °F 57.8 °F 57.8 °F 58 °F 48.7 °F 48.3 °F 40.2 °F 40.2 °F 40.2 °F 40.6 °F 56.4 °F 56.5 °F 41.8 °F 46.1 °F 41.8 °F 46.1 °F 41.8 °F 42.1 °F 39.5 °F	Avg 33.8 °F 38.3 °F 56.6 °F 54.4 °F 55.5 °F 51.6 °F 43.8 °F 43.9 °F 30.7 °F 30.7 °F 32.8 °F 44.2 °F 44.2 °F 43.3 °F 44.2 °F 43.3 °F 43.3 °F 43.3 °F 43.3 °F 53 °F 38.8 °F 40.4 °F 35.3 °F 35.3 °F 35.3 °F 35.1 °F	Low 27 °F 34.8 °F 55.5 °F 48.4 °F 49.2 °F 50.9 °F 40.6 °F 38 °F 31 °F 25.5 °F 33.1 °F 40.7 °F 36.1 °F 35.2 °F 49.4 °F 42.5 °F 34.8 °F 32.1 °F 22.8 °F 26.1 °F	Humidity High 73 % 96 % 98 % 98 % 98 % 99 % 94 % 97 % 81 % 97 % 99 % 94 % 97 % 99 % 94 % 97 % 98 % 97 % 99 %	Avg 53 % 61 % 92 % 91 % 89 % 85 % 83 % 75 % 81 % 65 % 84 % 78 % 85 % 84 % 91 % 91 % 91 % 74 % 77 %	Low 28 % 35 % 86 % 64 % 70 % 74 % 55 % 45 % 46 % 57 % 32 % 49 % 64 % 44 % 73 % 96 % 76 % 40 % 53 % 42 % 25 % 45 %	Speed High 3 mph 3 mph 1 mph 2 mph 3 mph 4 mph 6 mph 7 mph 5 mph 6 mph 7 mph 8 mph 7 mph 8 mph 7 mph 8 mph 7 mph 9	Avg 1 mph 0 mph 0 mph 0 mph 1 mph	Gust 0 mph	Pressure High 30.02 in 30 in 30.06 in 30.08 in 30.03 in 29.95 in 29.93 in 29.93 in 29.93 in 29.92 in 29.91 in 29.91 in 29.91 in 29.91 in 29.91 in 29.91 in 29.93 in 29.91 in 30.08 in 30.08 in 30.08 in 30.08 in 30.08 in 30.09 in	Avg 29.97 in 29.93 in 30.03 in 30.03 in 29.98 in 29.85 in 29.68 in 29.78 in 29.78 in 29.92 in 30 in 29.99 in 29.91 in 29.94 in 29.76 in 29.76 in 29.76 in 29.96 in 30.16 in 29.98 in	29.92 in 29.86 in 30.01 in 29.93 in 29.74 in 29.56 in 29.83 in 29.62 in 29.83 in 29.97 in 29.97 in 29.77 in 29.71 in 29.61 in 29.68 in 29.68 in 29.69 in 29.69 in 29.84 in 30.09 in 29.86 in 29.86 in	Precip. Accum. Sum 0 in 0 in 0 in 0 0.06 in 0 0.01 in 0
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APPENDIX D

Laboratory Analytical Reports and Chain of Custody Documentation

- Air Toxics Work Order # 1512124 Soil Gas Sample Results
- Air Toxics Work Order # 1512047 Shroud Air Sample Results



12/18/2015 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 #: 1512124

Dear Mr. Paul King

The following report includes the data for the above referenced project for sample(s) received on 12/3/2015 at Air Toxics Ltd.

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

Thank you for choosing 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 to 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 #: 1512124

Work Order Summary

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

P & D Environmental
55 Santa Clara
55 Santa Clara
Suite 240

P & D Environmental
55 Santa Clara
Suite 240

Oakland, CA 94610 Oakland, CA 94610

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

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

DATE RECEIVED: 12/03/2015 CONTACT: COLLEGE AVE. Kyle Vagadori.

			RECEIPT	FINAL
FRACTION#	<u>NAME</u>	<u>TEST</u>	VAC./PRES.	PRESSURE
01A	SG1-7	TO-15	5.3 "Hg	14.6 psi
02A	SG2-7	TO-15	6.3 "Hg	14.7 psi
03A	SG2-17	TO-15	4.9 "Hg	14.7 psi
04A	SG3-17	TO-15	4.9 "Hg	14.7 psi
05A	SG4-7	TO-15	4.3 "Hg	14.7 psi
06A	SG4-7 DUP	TO-15	4.1 "Hg	14.8 psi
07A	SG5-7	TO-15	5.1 "Hg	14.6 psi
08A	SG5-17	TO-15	4.9 "Hg	14.8 psi
09A	SG6-7	TO-15	4.7 "Hg	15 psi
10A	SG6-17	TO-15	5.7 "Hg	14.9 psi
11A	SG7-7	TO-15	1.8 "Hg	14.8 psi
12A	SG7-17	TO-15	2.4 "Hg	15 psi
13A	SG8-7	TO-15	4.9 "Hg	14.6 psi
14A	SG9-17	TO-15	1.4 "Hg	15 psi
15A	SG9-17 DUP	TO-15	4.7 "Hg	15.3 psi
16A	SG10-7	TO-15	3.1 "Hg	15.1 psi
17A	Lab Blank	TO-15	NA	NA
17B	Lab Blank	TO-15	NA	NA
18A	CCV	TO-15	NA	NA
18B	CCV	TO-15	NA	NA
19A	LCS	TO-15	NA	NA
19AA	LCSD	TO-15	NA	NA
19B	LCS	TO-15	NA	NA

Continued on next page



WORK ORDER #: 1512124

Work Order Summary

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

P & D Environmental
55 Santa Clara
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 HANGER KLEANERS 6239

DATE RECEIVED: 12/03/2015 CONTACT: COLLEGE AVE. Kyle Vagadori DATE COMPLETED: 12/18/2015

FRACTION# NAME TEST VAC./PRES. PRESSURE
19BB LCSD TO-15 NA NA

	fleide flages	
CERTIFIED BY:	0 00	DATE: 12/18/15

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935 Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program) Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.

Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards



LABORATORY NARRATIVE EPA Method TO-15 P & D Environmental Workorder# 1512124

Sixteen 1 Liter Summa Canister samples were received on December 03, 2015. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan 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.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

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.

Due to the linear calibration range of the instrument, the reporting limit for 1,3-Butadiene and Bromomethane was raised from 5.0ppbv to 20ppbv for samples SG2-17, SG6-7 and SG7-17.

Dilution was performed on samples SG1-7, SG2-7, SG2-17, SG3-17, SG4-7, SG4-7 DUP, SG5-7, SG5-17, SG6-7, SG6-17, SG7-17, SG9-17, SG9-17 DUP and SG10-7 due to the presence of high level target species.

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.

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 FULL SCAN

Client Sample ID: SG1-7 Lab ID#: 1512124-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)	
Carbon Disulfide	9.7	17	30	54	
Benzene	2.4	3.2	7.7	10	
Toluene	2.4	2.9	9.1	11	
Tetrachloroethene	2.4	860	16	5800	
1,1-Difluoroethane	9.7	660	26	1800	

Client Sample ID: SG2-7

Lab ID#: 1512124-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ua/m3)	Amount (ug/m3)
Compound	(ppuv)	(bhna)	(ug/ilio)	(ug/iii3)
Tetrachloroethene	25	8700	170	59000
1,1-Difluoroethane	100	1100	270	3100

Client Sample ID: SG2-17

Lab ID#: 1512124-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)	
Tetrachloroethene	150	18000	1000	120000	-
1,1-Difluoroethane	600	1600	1600	4200	

Client Sample ID: SG3-17

Lab ID#: 1512124-04A

Compound	Rɒt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Cyclohexane	24	31	82	110
Benzene	24	42	76	130
Tetrachloroethene	24	9200	160	62000
1,1-Difluoroethane	96	190	260	520

Client Sample ID: SG4-7 Lab ID#: 1512124-05A



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

Client Sample ID: SG4-7 Lab ID#: 1512124-05A

	Rpt. Limit	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Compound	(ppbv)			
Tetrachloroethene	4.7	550	32	3700
1,1-Difluoroethane	19	37000 E	50	100000 E

Client Sample ID: SG4-7 DUP

Lab ID#: 1512124-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	2.3	540	16	3700
1,1-Difluoroethane	9.3	2400 E	25	6400 E

Client Sample ID: SG5-7

Lab ID#: 1512124-07A

	Rpt. Limit	Amount	Rpt. Limit	Amount	
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)	
Tetrachloroethene	12	3400	81	23000	
1,1-Difluoroethane	48	220	130	600	

Client Sample ID: SG5-17

Lab ID#: 1512124-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Disulfide	24	47	75	140
Benzene	6.0	17	19	56
Toluene	6.0	14	23	54
Tetrachloroethene	6.0	2300	41	15000
1,1-Difluoroethane	24	210	65	570

Client Sample ID: SG6-7

Lab ID#: 1512124-09A

Compound	Rpt. Limit	Amount	Rpt. Limit	Amount
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Tetrachloroethene	70	9000	480	61000



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

Client Sample ID: SG6-7

Lab ID#: 1512124-09A

1,1-Difluoroethane 280 720 760 2000

Client Sample ID: SG6-17

Lab ID#: 1512124-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Hexane	21	25	73	89
Benzene	21	42	66	140
Toluene	21	45	78	170
Tetrachloroethene	21	6000	140	41000
1,1-Difluoroethane	83	200	220	540

Client Sample ID: SG7-7

Lab ID#: 1512124-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	4.3	1000	29	7000
1,1-Difluoroethane	17	550	46	1500

Client Sample ID: SG7-17

Lab ID#: 1512124-12A

	Rbt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Tetrachloroethene	37	5500	250	37000

Client Sample ID: SG8-7

Lab ID#: 1512124-13A

O-man and	Rpt. Limit	Amount	Rpt. Limit	Amount	
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)	
Benzene	1.2	4.2	3.8	13	
Tetrachloroethene	1.2	120	8.1	850	
1,1-Difluoroethane	4.8	79	13	210	



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

Client Sample ID: SG9-17 Lab ID#: 1512124-14A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Disulfide	17	55	53	170
Hexane	4.2	8.4	15	29
Chloroform	4.2	9.5	21	46
Benzene	4.2	13	14	42
Toluene	4.2	7.9	16	30
Tetrachloroethene	4.2	580	29	4000
1,1-Difluoroethane	17	24000 E	46	66000 E

Client Sample ID: SG9-17 DUP

Lab ID#: 1512124-15A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Disulfide	19	61	60	190
Hexane	4.8	11	17	39
Chloroform	4.8	11	24	54
Benzene	4.8	14	15	44
Toluene	4.8	9.0	18	34
Tetrachloroethene	4.8	670	33	4600
1,1-Difluoroethane	19	3400 E	52	9200 E

Client Sample ID: SG10-7

Lab ID#: 1512124-16A

	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Tetrachloroethene	23	160	150	1100
1,1-Difluoroethane	90	250000 E	240	680000 E



Client Sample ID: SG1-7 Lab ID#: 1512124-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: Dil. Factor:	a121515 Date of Collection: 12/2/15 9:31:00 AM 4.84 Date of Analysis: 12/15/15 06:18 PM			
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	2.4	Not Detected	12	Not Detected
Freon 114	2.4	Not Detected	17	Not Detected
Chloromethane	24	Not Detected	50	Not Detected
Vinyl Chloride	2.4	Not Detected	6.2	Not Detected
1,3-Butadiene	2.4	Not Detected	5.4	Not Detected
Bromomethane	24	Not Detected	94	Not Detected
Chloroethane	9.7	Not Detected	26	Not Detected
Freon 11	2.4	Not Detected	14	Not Detected
Ethanol	9.7	Not Detected	18	Not Detected
Freon 113	2.4	Not Detected	18	Not Detected
1,1-Dichloroethene	2.4	Not Detected	9.6	Not Detected
Acetone	24	Not Detected	57	Not Detected
2-Propanol	9.7	Not Detected	24	Not Detected
Carbon Disulfide	9.7	17	30	54
3-Chloropropene	9.7	Not Detected	30	Not Detected
Methylene Chloride	24	Not Detected	84	Not Detected
Methyl tert-butyl ether	2.4	Not Detected	8.7	Not Detected
trans-1,2-Dichloroethene	2.4	Not Detected	9.6	Not Detected
Hexane	2.4	Not Detected	8.5	Not Detected
1,1-Dichloroethane	2.4	Not Detected	9.8	Not Detected
2-Butanone (Methyl Ethyl Ketone)	9.7	Not Detected	28	Not Detected
cis-1,2-Dichloroethene	2.4	Not Detected	9.6	Not Detected
Tetrahydrofuran	2.4	Not Detected	7.1	Not Detected
Chloroform	2.4	Not Detected	12	Not Detected
1,1,1-Trichloroethane	2.4	Not Detected	13	Not Detected
Cyclohexane	2.4	Not Detected	8.3	Not Detected
Carbon Tetrachloride	2.4	Not Detected	15	Not Detected
2,2,4-Trimethylpentane	2.4	Not Detected	11	Not Detected
Benzene	2.4	3.2	7.7	10
1,2-Dichloroethane	2.4	Not Detected	9.8	Not Detected
Heptane	2.4	Not Detected	9.9	Not Detected
Trichloroethene	2.4	Not Detected	13	Not Detected
1,2-Dichloropropane	2.4	Not Detected	11	Not Detected
1,4-Dioxane	9.7	Not Detected	35	Not Detected
Bromodichloromethane	2.4	Not Detected	16	Not Detected
cis-1,3-Dichloropropene	2.4	Not Detected	11	Not Detected
4-Methyl-2-pentanone	2.4	Not Detected	9.9	Not Detected
Toluene	2.4	2.9	9.1	11
trans-1,3-Dichloropropene	2.4	Not Detected	11	Not Detected
1,1,2-Trichloroethane	2.4	Not Detected	13	Not Detected
Tetrachloroethene	2.4	860	16	5800
2-Hexanone	9.7	Not Detected	40	Not Detected



Client Sample ID: SG1-7 Lab ID#: 1512124-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a121515	Date of Collection: 12/2/15 9:31:00 AM
Dil. Factor:	4.84	Date of Analysis: 12/15/15 06:18 PM

DII. Factor.	4.04	Date of Affaiysis. 12/15/15 06.16 FM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	2.4	Not Detected	21	Not Detected
1,2-Dibromoethane (EDB)	2.4	Not Detected	18	Not Detected
Chlorobenzene	2.4	Not Detected	11	Not Detected
Ethyl Benzene	2.4	Not Detected	10	Not Detected
m,p-Xylene	2.4	Not Detected	10	Not Detected
o-Xylene	2.4	Not Detected	10	Not Detected
Styrene	2.4	Not Detected	10	Not Detected
Bromoform	2.4	Not Detected	25	Not Detected
Cumene	2.4	Not Detected	12	Not Detected
1,1,2,2-Tetrachloroethane	2.4	Not Detected	17	Not Detected
Propylbenzene	2.4	Not Detected	12	Not Detected
4-Ethyltoluene	2.4	Not Detected	12	Not Detected
1,3,5-Trimethylbenzene	2.4	Not Detected	12	Not Detected
1,2,4-Trimethylbenzene	2.4	Not Detected	12	Not Detected
1,3-Dichlorobenzene	2.4	Not Detected	14	Not Detected
1,4-Dichlorobenzene	2.4	Not Detected	14	Not Detected
alpha-Chlorotoluene	2.4	Not Detected	12	Not Detected
1,2-Dichlorobenzene	2.4	Not Detected	14	Not Detected
1,2,4-Trichlorobenzene	9.7	Not Detected	72	Not Detected
Hexachlorobutadiene	9.7	Not Detected	100	Not Detected
1,1-Difluoroethane	9.7	660	26	1800

••		Method	
Surrogates	%Recovery	Limits	
Toluene-d8	105	70-130	
1,2-Dichloroethane-d4	104	70-130	
4-Bromofluorobenzene	94	70-130	



Client Sample ID: SG2-7 Lab ID#: 1512124-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: Dil. Factor:	a121529 50.6		Date of Collection: 12/2/15 11:25:00 AM Date of Analysis: 12/16/15 03:32 AM	
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	25	Not Detected	120	Not Detected
Freon 114	25	Not Detected	180	Not Detected
Chloromethane	250	Not Detected	520	Not Detected
Vinyl Chloride	25	Not Detected	65	Not Detected
1,3-Butadiene	25	Not Detected	56	Not Detected
Bromomethane	250	Not Detected	980	Not Detected
Chloroethane	100	Not Detected	270	Not Detected
Freon 11	25	Not Detected	140	Not Detected
Ethanol	100	Not Detected	190	Not Detected
Freon 113	25	Not Detected	190	Not Detected
1,1-Dichloroethene	25	Not Detected	100	Not Detected
Acetone	250	Not Detected	600	Not Detected
2-Propanol	100	Not Detected	250	Not Detected
Carbon Disulfide	100	Not Detected	320	Not Detected
3-Chloropropene	100	Not Detected	320	Not Detected
Methylene Chloride	250	Not Detected	880	Not Detected
Methyl tert-butyl ether	25	Not Detected	91	Not Detected
trans-1,2-Dichloroethene	25	Not Detected	100	Not Detected
Hexane	25	Not Detected	89	Not Detected
1,1-Dichloroethane	25	Not Detected	100	Not Detected
2-Butanone (Methyl Ethyl Ketone)	100	Not Detected	300	Not Detected
cis-1,2-Dichloroethene	25	Not Detected	100	Not Detected
Tetrahydrofuran	25	Not Detected	75	Not Detected
Chloroform	25	Not Detected	120	Not Detected
1,1,1-Trichloroethane	25	Not Detected	140	Not Detected
Cyclohexane	25	Not Detected	87	Not Detected
Carbon Tetrachloride	25	Not Detected	160	Not Detected
2,2,4-Trimethylpentane	25	Not Detected	120	Not Detected
Benzene	25	Not Detected	81	Not Detected
1,2-Dichloroethane	25	Not Detected	100	Not Detected
Heptane	25	Not Detected	100	Not Detected
Trichloroethene	25	Not Detected	140	Not Detected
1,2-Dichloropropane	25	Not Detected	120	Not Detected
1,4-Dioxane	100	Not Detected	360	Not Detected
Bromodichloromethane	25	Not Detected	170	Not Detected
cis-1,3-Dichloropropene	25	Not Detected	110	Not Detected
4-Methyl-2-pentanone	25 25	Not Detected	100	Not Detected
4-Methyl-2-pentanone Toluene	25 25	Not Detected	95	Not Detected
trans-1,3-Dichloropropene	25 25	Not Detected	110	Not Detected
1,1,2-Trichloroethane	25 25	Not Detected	140	Not Detected
	25 25	8700	170	59000
Tetrachloroethene				
2-Hexanone	100	Not Detected	410	Not Detected



Client Sample ID: SG2-7 Lab ID#: 1512124-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a121529	Date of Collection: 12/2/15 11:25:00 AM
Dil. Factor:	50.6	Date of Analysis: 12/16/15 03:32 AM

Dil. Factor:	50.6	Date of Analysis: 12/16/15 03:32 AM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	25	Not Detected	220	Not Detected
1,2-Dibromoethane (EDB)	25	Not Detected	190	Not Detected
Chlorobenzene	25	Not Detected	120	Not Detected
Ethyl Benzene	25	Not Detected	110	Not Detected
m,p-Xylene	25	Not Detected	110	Not Detected
o-Xylene	25	Not Detected	110	Not Detected
Styrene	25	Not Detected	110	Not Detected
Bromoform	25	Not Detected	260	Not Detected
Cumene	25	Not Detected	120	Not Detected
1,1,2,2-Tetrachloroethane	25	Not Detected	170	Not Detected
Propylbenzene	25	Not Detected	120	Not Detected
4-Ethyltoluene	25	Not Detected	120	Not Detected
1,3,5-Trimethylbenzene	25	Not Detected	120	Not Detected
1,2,4-Trimethylbenzene	25	Not Detected	120	Not Detected
1,3-Dichlorobenzene	25	Not Detected	150	Not Detected
1,4-Dichlorobenzene	25	Not Detected	150	Not Detected
alpha-Chlorotoluene	25	Not Detected	130	Not Detected
1,2-Dichlorobenzene	25	Not Detected	150	Not Detected
1,2,4-Trichlorobenzene	100	Not Detected	750	Not Detected
Hexachlorobutadiene	100	Not Detected	1100	Not Detected
1,1-Difluoroethane	100	1100	270	3100

		Method	
Surrogates	%Recovery	Limits	
Toluene-d8	108	70-130	
1,2-Dichloroethane-d4	105	70-130	
4-Bromofluorobenzene	97	70-130	



Client Sample ID: SG2-17 Lab ID#: 1512124-03A EPA METHOD TO-15 GC/MS

File Name: 14121811 Date of Collection: 12/2/15 11:29:00 AM
Dil. Factor: 30.2 Date of Analysis: 12/18/15 01:17 PM

Dil. Factor:	30.2	Date of Analysis: 12/18/15 01:17 PM		
	Rpt. Limit	Amount Rpt. Limit Amount		
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	150	Not Detected	750	Not Detected
Freon 114	150	Not Detected	1000	Not Detected
Chloromethane	600	Not Detected	1200	Not Detected
Vinyl Chloride	150	Not Detected	380	Not Detected
1,3-Butadiene	600	Not Detected	1300	Not Detected
Bromomethane	600	Not Detected	2300	Not Detected
Chloroethane	600	Not Detected	1600	Not Detected
Freon 11	150	Not Detected	850	Not Detected
Ethanol	600	Not Detected	1100	Not Detected
Freon 113	150	Not Detected	1200	Not Detected
1,1-Dichloroethene	150	Not Detected	600	Not Detected
Acetone	600	Not Detected	1400	Not Detected
2-Propanol	600	Not Detected	1500	Not Detected
Carbon Disulfide	150	Not Detected	470	Not Detected
3-Chloropropene	600	Not Detected	1900	Not Detected
Methylene Chloride	150	Not Detected	520	Not Detected
Methyl tert-butyl ether	150	Not Detected	540	Not Detected
trans-1,2-Dichloroethene	150	Not Detected	600	Not Detected
Hexane	150	Not Detected	530	Not Detected
1,1-Dichloroethane	150	Not Detected	610	Not Detected
2-Butanone (Methyl Ethyl Ketone)	600	Not Detected	1800	Not Detected
cis-1,2-Dichloroethene	150	Not Detected	600	Not Detected
Tetrahydrofuran	150	Not Detected	440	Not Detected
Chloroform	150	Not Detected	740	Not Detected
1,1,1-Trichloroethane	150	Not Detected	820	Not Detected
Cyclohexane	150	Not Detected	520	Not Detected
Carbon Tetrachloride	150	Not Detected	950	Not Detected
2,2,4-Trimethylpentane	150	Not Detected	700	Not Detected
Benzene	150	Not Detected	480	Not Detected
1,2-Dichloroethane	150	Not Detected	610	Not Detected
Heptane	150	Not Detected	620	Not Detected
Trichloroethene	150	Not Detected	810	Not Detected
1,2-Dichloropropane	150	Not Detected	700	Not Detected
1,4-Dioxane	600	Not Detected	2200	Not Detected
Bromodichloromethane	150	Not Detected	1000	Not Detected
cis-1,3-Dichloropropene	150	Not Detected	680	Not Detected
4-Methyl-2-pentanone	150	Not Detected	620	Not Detected
Toluene	150	Not Detected	570	Not Detected
trans-1,3-Dichloropropene	150	Not Detected	680	Not Detected
1,1,2-Trichloroethane	150	Not Detected	820	Not Detected
Tetrachloroethene	150	18000	1000	120000
2-Hexanone	600	Not Detected	2500	Not Detected



Client Sample ID: SG2-17 Lab ID#: 1512124-03A EPA METHOD TO-15 GC/MS

File Name: 14121811 Date of Collection: 12/2/15 11:29:00 AM
Dil. Factor: 30.2 Date of Analysis: 12/18/15 01:17 PM

DII. Factor:	30.2	Date of Analysis: 12/18/15 01:17 PM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	150	Not Detected	1300	Not Detected
1,2-Dibromoethane (EDB)	150	Not Detected	1200	Not Detected
Chlorobenzene	150	Not Detected	700	Not Detected
Ethyl Benzene	150	Not Detected	660	Not Detected
m,p-Xylene	150	Not Detected	660	Not Detected
o-Xylene	150	Not Detected	660	Not Detected
Styrene	150	Not Detected	640	Not Detected
Bromoform	150	Not Detected	1600	Not Detected
Cumene	150	Not Detected	740	Not Detected
1,1,2,2-Tetrachloroethane	150	Not Detected	1000	Not Detected
Propylbenzene	150	Not Detected	740	Not Detected
4-Ethyltoluene	150	Not Detected	740	Not Detected
1,3,5-Trimethylbenzene	150	Not Detected	740	Not Detected
1,2,4-Trimethylbenzene	150	Not Detected	740	Not Detected
1,3-Dichlorobenzene	150	Not Detected	910	Not Detected
1,4-Dichlorobenzene	150	Not Detected	910	Not Detected
alpha-Chlorotoluene	150	Not Detected	780	Not Detected
1,2-Dichlorobenzene	150	Not Detected	910	Not Detected
1,2,4-Trichlorobenzene	600	Not Detected	4500	Not Detected
Hexachlorobutadiene	600	Not Detected	6400	Not Detected
1,1-Difluoroethane	600	1600	1600	4200

••		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	102	70-130	
Toluene-d8	100	70-130	
4-Bromofluorobenzene	99	70-130	



Client Sample ID: SG3-17 Lab ID#: 1512124-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: Dil. Factor:	a121530 47.8		of Collection: 12/2 of Analysis: 12/16	
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	24	Not Detected	120	Not Detected
Freon 114	24	Not Detected	170	Not Detected
Chloromethane	240	Not Detected	490	Not Detected
Vinyl Chloride	24	Not Detected	61	Not Detected
1,3-Butadiene	24	Not Detected	53	Not Detected
Bromomethane	240	Not Detected	930	Not Detected
Chloroethane	96	Not Detected	250	Not Detected
Freon 11	24	Not Detected	130	Not Detected
Ethanol	96	Not Detected	180	Not Detected
Freon 113	24	Not Detected	180	Not Detected
1,1-Dichloroethene	24	Not Detected	95	Not Detected
Acetone	240	Not Detected	570	Not Detected
2-Propanol	96	Not Detected	230	Not Detected
Carbon Disulfide	96	Not Detected	300	Not Detected
3-Chloropropene	96	Not Detected	300	Not Detected
Methylene Chloride	240	Not Detected	830	Not Detected
Methyl tert-butyl ether	24	Not Detected	86	Not Detected
trans-1,2-Dichloroethene	24	Not Detected	95	Not Detected
Hexane	24	Not Detected	84	Not Detected
1,1-Dichloroethane	24	Not Detected	97	Not Detected
2-Butanone (Methyl Ethyl Ketone)	96	Not Detected	280	Not Detected
cis-1,2-Dichloroethene	24	Not Detected	95	Not Detected
Tetrahydrofuran	24	Not Detected	70	Not Detected
Chloroform	24	Not Detected	120	Not Detected
1,1,1-Trichloroethane	24	Not Detected	130	Not Detected
Cyclohexane	24	31	82	110
Carbon Tetrachloride	24	Not Detected	150	Not Detected
2,2,4-Trimethylpentane	24	Not Detected	110	Not Detected
Benzene	24	42	76	130
1,2-Dichloroethane	24	Not Detected	97	Not Detected
Heptane	24	Not Detected	98	Not Detected
Trichloroethene	24	Not Detected	130	Not Detected
1,2-Dichloropropane	24	Not Detected	110	Not Detected
1,4-Dioxane	96	Not Detected	340	Not Detected
Bromodichloromethane	24	Not Detected	160	Not Detected
cis-1,3-Dichloropropene	24	Not Detected	110	Not Detected
4-Methyl-2-pentanone	24	Not Detected	98	Not Detected
Toluene	24	Not Detected	90	Not Detected
trans-1,3-Dichloropropene	24	Not Detected	110	Not Detected
1,1,2-Trichloroethane	24	Not Detected	130	Not Detected
Tetrachloroethene	24	9200	160	62000
2-Hexanone	96	Not Detected	390	Not Detected



Client Sample ID: SG3-17 Lab ID#: 1512124-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a121530	Date of Collection: 12/2/15 10:26:00 AM
Dil. Factor:	47.8	Date of Analysis: 12/16/15 04:10 AM

Dil. Factor:	47.8	Date of Analysis: 12/16/15 04:10 AM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	24	Not Detected	200	Not Detected
1,2-Dibromoethane (EDB)	24	Not Detected	180	Not Detected
Chlorobenzene	24	Not Detected	110	Not Detected
Ethyl Benzene	24	Not Detected	100	Not Detected
m,p-Xylene	24	Not Detected	100	Not Detected
o-Xylene	24	Not Detected	100	Not Detected
Styrene	24	Not Detected	100	Not Detected
Bromoform	24	Not Detected	250	Not Detected
Cumene	24	Not Detected	120	Not Detected
1,1,2,2-Tetrachloroethane	24	Not Detected	160	Not Detected
Propylbenzene	24	Not Detected	120	Not Detected
4-Ethyltoluene	24	Not Detected	120	Not Detected
1,3,5-Trimethylbenzene	24	Not Detected	120	Not Detected
1,2,4-Trimethylbenzene	24	Not Detected	120	Not Detected
1,3-Dichlorobenzene	24	Not Detected	140	Not Detected
1,4-Dichlorobenzene	24	Not Detected	140	Not Detected
alpha-Chlorotoluene	24	Not Detected	120	Not Detected
1,2-Dichlorobenzene	24	Not Detected	140	Not Detected
1,2,4-Trichlorobenzene	96	Not Detected	710	Not Detected
Hexachlorobutadiene	96	Not Detected	1000	Not Detected
1,1-Difluoroethane	96	190	260	520

		Method Limits	
Surrogates	%Recovery		
Toluene-d8	107	70-130	
1,2-Dichloroethane-d4	101	70-130	
4-Bromofluorobenzene	96	70-130	



Client Sample ID: SG4-7 Lab ID#: 1512124-05A

EPA METHOD TO-15 GC/MS FULL SCAN

		3 GC/NIS FULL SCAL	•	
File Name: Dil. Factor:	a121516 9.34	Date of Collection: 12/2/15 9:43:00 AM Date of Analysis: 12/15/15 06:42 PM		
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	4.7	Not Detected	23	Not Detected
Freon 114	4.7	Not Detected	33	Not Detected
Chloromethane	47	Not Detected	96	Not Detected
Vinyl Chloride	4.7	Not Detected	12	Not Detected
1,3-Butadiene	4.7	Not Detected	10	Not Detected
Bromomethane	47	Not Detected	180	Not Detected
Chloroethane	19	Not Detected	49	Not Detected
Freon 11	4.7	Not Detected	26	Not Detected
Ethanol	19	Not Detected	35	Not Detected
Freon 113	4.7	Not Detected	36	Not Detected
	4.7	Not Detected	18	Not Detected
1,1-Dichloroethene	4.7 47	Not Detected Not Detected	18 110	Not Detected Not Detected
Acetone		Not Detected		Not Detected
2-Propanol	19	Not Detected	46	Not Detected
Carbon Disulfide	19		58 58	
3-Chloropropene	19	Not Detected Not Detected	58	Not Detected
Methylene Chloride	47		160	Not Detected
Methyl tert-butyl ether	4.7	Not Detected	17	Not Detected
trans-1,2-Dichloroethene	4.7	Not Detected	18	Not Detected
Hexane	4.7	Not Detected	16	Not Detected
1,1-Dichloroethane	4.7	Not Detected	19	Not Detected
2-Butanone (Methyl Ethyl Ketone)	19	Not Detected	55	Not Detected
cis-1,2-Dichloroethene	4.7	Not Detected	18	Not Detected
Tetrahydrofuran	4.7	Not Detected	14	Not Detected
Chloroform	4.7	Not Detected	23	Not Detected
1,1,1-Trichloroethane	4.7	Not Detected	25	Not Detected
Cyclohexane	4.7	Not Detected	16	Not Detected
Carbon Tetrachloride	4.7	Not Detected	29	Not Detected
2,2,4-Trimethylpentane	4.7	Not Detected	22	Not Detected
Benzene	4.7	Not Detected	15	Not Detected
1,2-Dichloroethane	4.7	Not Detected	19	Not Detected
Heptane	4.7	Not Detected	19	Not Detected
Trichloroethene	4.7	Not Detected	25	Not Detected
1,2-Dichloropropane	4.7	Not Detected	22	Not Detected
1,4-Dioxane	19	Not Detected	67	Not Detected
Bromodichloromethane	4.7	Not Detected	31	Not Detected
cis-1,3-Dichloropropene	4.7	Not Detected	21	Not Detected
4-Methyl-2-pentanone	4.7	Not Detected	19	Not Detected
Toluene	4.7	Not Detected	18	Not Detected
trans-1,3-Dichloropropene	4.7	Not Detected	21	Not Detected
1,1,2-Trichloroethane	4.7	Not Detected	25	Not Detected
Tetrachloroethene	4.7	550	32	3700
2-Hexanone	19	Not Detected	76	Not Detected



Client Sample ID: SG4-7 Lab ID#: 1512124-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a121516	Date of Collection: 12/2/15 9:43:00 AM		
Dil. Factor:	9.34	Date of Analysis: 12/15		/15 06:42 PM
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	4.7	Not Detected	40	Not Detected
1.2-Dibromoethane (EDR)	47	Not Detected	36	Not Detected

Dibromochloromethane	4.7	Not Detected	40	Not Detected
1,2-Dibromoethane (EDB)	4.7	Not Detected	36	Not Detected
Chlorobenzene	4.7	Not Detected	21	Not Detected
Ethyl Benzene	4.7	Not Detected	20	Not Detected
m,p-Xylene	4.7	Not Detected	20	Not Detected
o-Xylene	4.7	Not Detected	20	Not Detected
Styrene	4.7	Not Detected	20	Not Detected
Bromoform	4.7	Not Detected	48	Not Detected
Cumene	4.7	Not Detected	23	Not Detected
1,1,2,2-Tetrachloroethane	4.7	Not Detected	32	Not Detected
Propylbenzene	4.7	Not Detected	23	Not Detected
4-Ethyltoluene	4.7	Not Detected	23	Not Detected
1,3,5-Trimethylbenzene	4.7	Not Detected	23	Not Detected
1,2,4-Trimethylbenzene	4.7	Not Detected	23	Not Detected
1,3-Dichlorobenzene	4.7	Not Detected	28	Not Detected
1,4-Dichlorobenzene	4.7	Not Detected	28	Not Detected
alpha-Chlorotoluene	4.7	Not Detected	24	Not Detected
1,2-Dichlorobenzene	4.7	Not Detected	28	Not Detected
1,2,4-Trichlorobenzene	19	Not Detected	140	Not Detected
Hexachlorobutadiene	19	Not Detected	200	Not Detected
1,1-Difluoroethane	19	37000 E	50	100000 E

E = Exceeds instrument calibration range.

		Method
Surrogates	%Recovery	Limits
Toluene-d8	105	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	92	70-130



2-Hexanone

Client Sample ID: SG4-7 DUP Lab ID#: 1512124-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a121517	Date of Collection: 12/2/15 9:43:00 AM Date of Analysis: 12/15/15 07:21 PM		
Dil. Factor:	4.65			
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	2.3	Not Detected	11	Not Detected
Freon 114	2.3	Not Detected	16	Not Detected
Chloromethane	23	Not Detected	48	Not Detected
Vinyl Chloride	2.3	Not Detected	5.9	Not Detected
1,3-Butadiene	2.3	Not Detected	5.1	Not Detected
Bromomethane	23	Not Detected	90	Not Detected
Chloroethane	9.3	Not Detected	24	Not Detected
Freon 11	2.3	Not Detected	13	Not Detected
Ethanol	9.3	Not Detected	18	Not Detected
Freon 113	2.3	Not Detected	18	Not Detected
1,1-Dichloroethene	2.3	Not Detected	9.2	Not Detected
Acetone	23	Not Detected	55	Not Detected
2-Propanol	9.3	Not Detected	23	Not Detected
Carbon Disulfide	9.3	Not Detected	29	Not Detected
3-Chloropropene	9.3	Not Detected	29	Not Detected
Methylene Chloride	23	Not Detected	81	Not Detected
Methyl tert-butyl ether	2.3	Not Detected	8.4	Not Detected
trans-1,2-Dichloroethene	2.3	Not Detected	9.2	Not Detected
Hexane	2.3	Not Detected	8.2	Not Detected
1,1-Dichloroethane	2.3	Not Detected	9.4	Not Detected
2-Butanone (Methyl Ethyl Ketone)	9.3	Not Detected	27	Not Detected
cis-1,2-Dichloroethene	2.3	Not Detected	9.2	Not Detected
Tetrahydrofuran	2.3	Not Detected	6.8	Not Detected
Chloroform	2.3	Not Detected	11	Not Detected
1,1,1-Trichloroethane	2.3	Not Detected	13	Not Detected
Cyclohexane	2.3	Not Detected	8.0	Not Detected
Carbon Tetrachloride	2.3	Not Detected	15	Not Detected
2,2,4-Trimethylpentane	2.3	Not Detected	11	Not Detected
Benzene	2.3	Not Detected	7.4	Not Detected
1,2-Dichloroethane	2.3	Not Detected	9.4	Not Detected
Heptane	2.3	Not Detected	9.5	Not Detected
Trichloroethene	2.3	Not Detected	12	Not Detected
1,2-Dichloropropane	2.3	Not Detected	11	Not Detected
1,4-Dioxane	9.3	Not Detected	34	Not Detected
Bromodichloromethane	2.3	Not Detected	16	Not Detected
cis-1,3-Dichloropropene	2.3	Not Detected	10	Not Detected
4-Methyl-2-pentanone	2.3	Not Detected	9.5	Not Detected
Toluene	2.3	Not Detected	8.8	Not Detected
trans-1,3-Dichloropropene	2.3	Not Detected	10	Not Detected
1,1,2-Trichloroethane	2.3	Not Detected	13	Not Detected
Tetrachloroethene	2.3	540	16	3700
1 Gu aci il ci l cu i ci i c	2.0	0- 1 0	10	3700

Not Detected

38

Not Detected

9.3



Client Sample ID: SG4-7 DUP Lab ID#: 1512124-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a121517	Date of Collection: 12/2/15 9:43:00 AM
Dil. Factor:	4.65	Date of Analysis: 12/15/15 07:21 PM

Dii. i actor.	4.03	Date of Arialysis. 12/13/13 07.21 Fivi		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	2.3	Not Detected	20	Not Detected
1,2-Dibromoethane (EDB)	2.3	Not Detected	18	Not Detected
Chlorobenzene	2.3	Not Detected	11	Not Detected
Ethyl Benzene	2.3	Not Detected	10	Not Detected
m,p-Xylene	2.3	Not Detected	10	Not Detected
o-Xylene	2.3	Not Detected	10	Not Detected
Styrene	2.3	Not Detected	9.9	Not Detected
Bromoform	2.3	Not Detected	24	Not Detected
Cumene	2.3	Not Detected	11	Not Detected
1,1,2,2-Tetrachloroethane	2.3	Not Detected	16	Not Detected
Propylbenzene	2.3	Not Detected	11	Not Detected
4-Ethyltoluene	2.3	Not Detected	11	Not Detected
1,3,5-Trimethylbenzene	2.3	Not Detected	11	Not Detected
1,2,4-Trimethylbenzene	2.3	Not Detected	11	Not Detected
1,3-Dichlorobenzene	2.3	Not Detected	14	Not Detected
1,4-Dichlorobenzene	2.3	Not Detected	14	Not Detected
alpha-Chlorotoluene	2.3	Not Detected	12	Not Detected
1,2-Dichlorobenzene	2.3	Not Detected	14	Not Detected
1,2,4-Trichlorobenzene	9.3	Not Detected	69	Not Detected
Hexachlorobutadiene	9.3	Not Detected	99	Not Detected
1,1-Difluoroethane	9.3	2400 E	25	6400 E

E = Exceeds instrument calibration range.

		Method
Surrogates	%Recovery	Limits
Toluene-d8	105	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	94	70-130



2-Hexanone

Client Sample ID: SG5-7 Lab ID#: 1512124-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: Dil. Factor:	a121518 24.0		of Collection: 12/2 of Analysis: 12/15	
	Rpt. Limit	Amount Rpt. Limit Amo		
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	12	Not Detected	59	Not Detected
Freon 114	12	Not Detected	84	Not Detected
Chloromethane	120	Not Detected	250	Not Detected
Vinyl Chloride	12	Not Detected	31	Not Detected
1,3-Butadiene	12	Not Detected	26	Not Detected
Bromomethane	120	Not Detected	470	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	120	Not Detected	280	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	120	Not Detected	420	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
·	12	Not Detected	49	Not Detected
4-Methyl-2-pentanone	12	Not Detected	49 45	Not Detected
Toluene	12	Not Detected	45 54	Not Detected
trans-1,3-Dichloropropene	12			Not Detected
1,1,2-Trichloroethane		Not Detected	65	
Tetrachloroethene	12	3400	81	23000

Not Detected

200

Not Detected

48



Client Sample ID: SG5-7 Lab ID#: 1512124-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a121518	Date of Collection: 12/2/15 1:11:00 PM
Dil. Factor:	24.0	Date of Analysis: 12/15/15 07:45 PM

Dii. i actor.	24.0	Date of Affaiysis. 12/13/13 07.43 F 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	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	220	130	600

••		Method Limits	
Surrogates	%Recovery		
Toluene-d8	106	70-130	
1,2-Dichloroethane-d4	102	70-130	
4-Bromofluorobenzene	94	70-130	



Client Sample ID: SG5-17 Lab ID#: 1512124-08A

	EPA METHOD TO-15 GC/MS FULL SCAN			
File Name: Dil. Factor:	a121519 Date of Collection: 12/2/15 1:24:00 PM 12.0 Date of Analysis: 12/15/15 08:23 PM			
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	6.0	Not Detected	30	Not Detected
Freon 114	6.0	Not Detected	42	Not Detected
Chloromethane	60	Not Detected	120	Not Detected
Vinyl Chloride	6.0	Not Detected	15	Not Detected
1,3-Butadiene	6.0	Not Detected	13	Not Detected
Bromomethane	60	Not Detected	230	Not Detected
Chloroethane	24	Not Detected	63	Not Detected
Freon 11	6.0	Not Detected	34	Not Detected
Ethanol	24	Not Detected	45	Not Detected
Freon 113	6.0	Not Detected	46	Not Detected
1,1-Dichloroethene	6.0	Not Detected	24	Not Detected
Acetone	60	Not Detected	140	Not Detected
2-Propanol	24	Not Detected	59	Not Detected
Carbon Disulfide	24	47	75	140
3-Chloropropene	24	Not Detected	75	Not Detected
Methylene Chloride	60	Not Detected	210	Not Detected
Methyl tert-butyl ether	6.0	Not Detected	22	Not Detected
trans-1,2-Dichloroethene	6.0	Not Detected	24	Not Detected
Hexane	6.0	Not Detected	21	Not Detected
1,1-Dichloroethane	6.0	Not Detected	24	Not Detected
2-Butanone (Methyl Ethyl Ketone)	24	Not Detected	71	Not Detected
cis-1,2-Dichloroethene	6.0	Not Detected	24	Not Detected
Tetrahydrofuran	6.0	Not Detected	18	Not Detected
Chloroform	6.0	Not Detected	29	Not Detected
1,1,1-Trichloroethane	6.0	Not Detected	33	Not Detected
Cyclohexane	6.0	Not Detected	21	Not Detected
Carbon Tetrachloride	6.0	Not Detected	38	Not Detected
2,2,4-Trimethylpentane	6.0	Not Detected	28	Not Detected
Benzene	6.0	17	19	56
1,2-Dichloroethane	6.0	Not Detected	24	Not Detected
Heptane	6.0	Not Detected	24	Not Detected
Trichloroethene	6.0	Not Detected	32	Not Detected
1,2-Dichloropropane	6.0	Not Detected	28	Not Detected
1,4-Dioxane	24	Not Detected	86	Not Detected
Bromodichloromethane	6.0	Not Detected	40	Not Detected
cis-1,3-Dichloropropene	6.0	Not Detected	27	Not Detected
4-Methyl-2-pentanone	6.0	Not Detected	24	Not Detected
Toluene	6.0	14	23	54
trans-1,3-Dichloropropene	6.0	Not Detected	27	Not Detected
1,1,2-Trichloroethane	6.0	Not Detected	33	Not Detected
Tetrachloroethene	6.0	2300	41	15000
2-Hexanone	24	Not Detected	98	Not Detected



Client Sample ID: SG5-17 Lab ID#: 1512124-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a121519	Date of Collection: 12/2/15 1:24:00 PM
Dil. Factor:	12.0	Date of Analysis: 12/15/15 08:23 PM

DII. Factor.	12.0	Date of Analysis. 12/15/15 08.25 PW		
Compound	Rɒt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	6.0	Not Detected	51	Not Detected
1,2-Dibromoethane (EDB)	6.0	Not Detected	46	Not Detected
Chlorobenzene	6.0	Not Detected	28	Not Detected
Ethyl Benzene	6.0	Not Detected	26	Not Detected
m,p-Xylene	6.0	Not Detected	26	Not Detected
o-Xylene	6.0	Not Detected	26	Not Detected
Styrene	6.0	Not Detected	26	Not Detected
Bromoform	6.0	Not Detected	62	Not Detected
Cumene	6.0	Not Detected	29	Not Detected
1,1,2,2-Tetrachloroethane	6.0	Not Detected	41	Not Detected
Propylbenzene	6.0	Not Detected	29	Not Detected
4-Ethyltoluene	6.0	Not Detected	29	Not Detected
1,3,5-Trimethylbenzene	6.0	Not Detected	29	Not Detected
1,2,4-Trimethylbenzene	6.0	Not Detected	29	Not Detected
1,3-Dichlorobenzene	6.0	Not Detected	36	Not Detected
1,4-Dichlorobenzene	6.0	Not Detected	36	Not Detected
alpha-Chlorotoluene	6.0	Not Detected	31	Not Detected
1,2-Dichlorobenzene	6.0	Not Detected	36	Not Detected
1,2,4-Trichlorobenzene	24	Not Detected	180	Not Detected
Hexachlorobutadiene	24	Not Detected	260	Not Detected
1,1-Difluoroethane	24	210	65	570

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



Client Sample ID: SG6-7 Lab ID#: 1512124-09A EPA METHOD TO-15 GC/MS

File Name: 14121812 Date of Collection: 12/2/15 2:49:00 PM
Dil. Factor: 14.1 Date of Analysis: 12/18/15 02:11 PM

Dil. Factor:	14.1	Date of Analysis: 12/18/15 02:11		
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	70	Not Detected	350	Not Detected
Freon 114	70	Not Detected	490	Not Detected
Chloromethane	280	Not Detected	580	Not Detected
Vinyl Chloride	70	Not Detected	180	Not Detected
1,3-Butadiene	280	Not Detected	620	Not Detected
Bromomethane	280	Not Detected	1100	Not Detected
Chloroethane	280	Not Detected	740	Not Detected
Freon 11	70	Not Detected	400	Not Detected
Ethanol	280	Not Detected	530	Not Detected
Freon 113	70	Not Detected	540	Not Detected
1,1-Dichloroethene	70	Not Detected	280	Not Detected
Acetone	280	Not Detected	670	Not Detected
2-Propanol	280	Not Detected	690	Not Detected
Carbon Disulfide	70	Not Detected	220	Not Detected
3-Chloropropene	280	Not Detected	880	Not Detected
Methylene Chloride	70	Not Detected	240	Not Detected
Methyl tert-butyl ether	70	Not Detected	250	Not Detected
trans-1,2-Dichloroethene	70	Not Detected	280	Not Detected
Hexane	70	Not Detected	250	Not Detected
1,1-Dichloroethane	70	Not Detected	280	Not Detected
2-Butanone (Methyl Ethyl Ketone)	280	Not Detected	830	Not Detected
cis-1,2-Dichloroethene	70	Not Detected	280	Not Detected
Tetrahydrofuran	70	Not Detected	210	Not Detected
Chloroform	70	Not Detected	340	Not Detected
1,1,1-Trichloroethane	70	Not Detected	380	Not Detected
Cyclohexane	70	Not Detected	240	Not Detected
Carbon Tetrachloride	70	Not Detected	440	Not Detected
2,2,4-Trimethylpentane	70	Not Detected	330	Not Detected
Benzene	70	Not Detected	220	Not Detected
1,2-Dichloroethane	70	Not Detected	280	Not Detected
Heptane	70	Not Detected	290	Not Detected
Trichloroethene	70	Not Detected	380	Not Detected
1,2-Dichloropropane	70	Not Detected	320	Not Detected
1,4-Dioxane	280	Not Detected	1000	Not Detected
Bromodichloromethane	70	Not Detected	470	Not Detected
cis-1,3-Dichloropropene	70	Not Detected	320	Not Detected
4-Methyl-2-pentanone	70	Not Detected	290	Not Detected
Toluene	70	Not Detected	260	Not Detected
trans-1,3-Dichloropropene	70	Not Detected	320	Not Detected
1,1,2-Trichloroethane	70	Not Detected	380	Not Detected
Tetrachloroethene	70	9000	480	61000
2-Hexanone	280	Not Detected	1200	Not Detected



Client Sample ID: SG6-7 Lab ID#: 1512124-09A EPA METHOD TO-15 GC/MS

File Name: 14121812 Date of Collection: 12/2/15 2:49:00 PM
Dil. Factor: 14.1 Date of Analysis: 12/18/15 02:11 PM

		14.1 Date of Allary 513. 12/10/10 02.1111 W		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	70	Not Detected	600	Not Detected
1,2-Dibromoethane (EDB)	70	Not Detected	540	Not Detected
Chlorobenzene	70	Not Detected	320	Not Detected
Ethyl Benzene	70	Not Detected	310	Not Detected
m,p-Xylene	70	Not Detected	310	Not Detected
o-Xylene	70	Not Detected	310	Not Detected
Styrene	70	Not Detected	300	Not Detected
Bromoform	70	Not Detected	730	Not Detected
Cumene	70	Not Detected	350	Not Detected
1,1,2,2-Tetrachloroethane	70	Not Detected	480	Not Detected
Propylbenzene	70	Not Detected	350	Not Detected
4-Ethyltoluene	70	Not Detected	350	Not Detected
1,3,5-Trimethylbenzene	70	Not Detected	350	Not Detected
1,2,4-Trimethylbenzene	70	Not Detected	350	Not Detected
1,3-Dichlorobenzene	70	Not Detected	420	Not Detected
1,4-Dichlorobenzene	70	Not Detected	420	Not Detected
alpha-Chlorotoluene	70	Not Detected	360	Not Detected
1,2-Dichlorobenzene	70	Not Detected	420	Not Detected
1,2,4-Trichlorobenzene	280	Not Detected	2100	Not Detected
Hexachlorobutadiene	280	Not Detected	3000	Not Detected
1,1-Difluoroethane	280	720	760	2000

		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	98	70-130



Client Sample ID: SG6-17 Lab ID#: 1512124-10A

EPA METHOD TO-15 GC/MS FULL SCAN					
File Name:	File Name: a121528 Date of Collection: 12/2/15 2:55:00 PM				
Dil. Factor:	41.4	Date of Analysis: 12/16/15 03:08 AM			
	Rpt. Limit	Amount	Rpt. Limit	Amount	
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)	
Freon 12	21	Not Detected	100	Not Detected	
Freon 114	21	Not Detected	140	Not Detected	
Chloromethane	210	Not Detected	430	Not Detected	
Vinyl Chloride	21	Not Detected	53	Not Detected	
1,3-Butadiene	21	Not Detected	46	Not Detected	
Bromomethane	210	Not Detected	800	Not Detected	
Chloroethane	83	Not Detected	220	Not Detected	
Freon 11	21	Not Detected	120	Not Detected	
Ethanol	83	Not Detected	160	Not Detected	
Freon 113	21	Not Detected	160	Not Detected	
1,1-Dichloroethene	21	Not Detected	82	Not Detected	
Acetone	210	Not Detected	490	Not Detected	
2-Propanol	83	Not Detected	200	Not Detected	
Carbon Disulfide	83	Not Detected	260	Not Detected	
3-Chloropropene	83	Not Detected	260	Not Detected	
Methylene Chloride	210	Not Detected	720	Not Detected	
Methyl tert-butyl ether	21	Not Detected	75	Not Detected	
trans-1,2-Dichloroethene	21	Not Detected	82	Not Detected	
Hexane	21	25	73	89	
1,1-Dichloroethane	21	Not Detected	84	Not Detected	
2-Butanone (Methyl Ethyl Ketone)	83	Not Detected	240	Not Detected	
cis-1,2-Dichloroethene	21	Not Detected	82	Not Detected	
Tetrahydrofuran	21	Not Detected	61	Not Detected	
Chloroform	21	Not Detected	100	Not Detected	
1,1,1-Trichloroethane	21	Not Detected	110	Not Detected	
Cyclohexane	21	Not Detected	71	Not Detected	
Carbon Tetrachloride	21	Not Detected	130	Not Detected	
2,2,4-Trimethylpentane	21	Not Detected	97	Not Detected	
Benzene	21	42	66	140	
1,2-Dichloroethane	21	Not Detected	84	Not Detected	
Heptane	21	Not Detected	85	Not Detected	
Trichloroethene	21	Not Detected	110	Not Detected	
1,2-Dichloropropane	21	Not Detected	96	Not Detected	
1,4-Dioxane	83	Not Detected	300	Not Detected	
Bromodichloromethane	21	Not Detected	140	Not Detected	
cis-1,3-Dichloropropene	21	Not Detected	94	Not Detected	
4-Methyl-2-pentanone	21	Not Detected	85	Not Detected	
Toluene	21	45	78	170	
trans-1,3-Dichloropropene	21	Not Detected	94	Not Detected	
1,1,2-Trichloroethane	21	Not Detected	110	Not Detected	
Tetrachloroethene	21	6000	140	41000	
2-Hexanone	83	Not Detected	340	Not Detected	



Client Sample ID: SG6-17 Lab ID#: 1512124-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a121528	Date of Collection: 12/2/15 2:55:00 PM
Dil. Factor:	41.4	Date of Analysis: 12/16/15 03:08 AM

DII. Factor:	41.4	Date of Analysis: 12/16/15 03:08 AM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	21	Not Detected	180	Not Detected
1,2-Dibromoethane (EDB)	21	Not Detected	160	Not Detected
Chlorobenzene	21	Not Detected	95	Not Detected
Ethyl Benzene	21	Not Detected	90	Not Detected
m,p-Xylene	21	Not Detected	90	Not Detected
o-Xylene	21	Not Detected	90	Not Detected
Styrene	21	Not Detected	88	Not Detected
Bromoform	21	Not Detected	210	Not Detected
Cumene	21	Not Detected	100	Not Detected
1,1,2,2-Tetrachloroethane	21	Not Detected	140	Not Detected
Propylbenzene	21	Not Detected	100	Not Detected
4-Ethyltoluene	21	Not Detected	100	Not Detected
1,3,5-Trimethylbenzene	21	Not Detected	100	Not Detected
1,2,4-Trimethylbenzene	21	Not Detected	100	Not Detected
1,3-Dichlorobenzene	21	Not Detected	120	Not Detected
1,4-Dichlorobenzene	21	Not Detected	120	Not Detected
alpha-Chlorotoluene	21	Not Detected	110	Not Detected
1,2-Dichlorobenzene	21	Not Detected	120	Not Detected
1,2,4-Trichlorobenzene	83	Not Detected	610	Not Detected
Hexachlorobutadiene	83	Not Detected	880	Not Detected
1,1-Difluoroethane	83	200	220	540

••		Method	
Surrogates	%Recovery	Limits	
Toluene-d8	109	70-130	
1,2-Dichloroethane-d4	102	70-130	
4-Bromofluorobenzene	96	70-130	



Client Sample ID: SG7-7 Lab ID#: 1512124-11A

File Name:	a121523		of Collection: 12/2	
Dil. Factor:	8.54	Date of Analysis: 12/16/15 12:21 AM		
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	4.3	Not Detected	21	Not Detected
Freon 114	4.3	Not Detected	30	Not Detected
Chloromethane	43	Not Detected	88	Not Detected
Vinyl Chloride	4.3	Not Detected	11	Not Detected
1,3-Butadiene	4.3	Not Detected	9.4	Not Detected
Bromomethane	43	Not Detected	160	Not Detected
Chloroethane	17	Not Detected	45	Not Detected
Freon 11	4.3	Not Detected	24	Not Detected
Ethanol	17	Not Detected	32	Not Detected
Freon 113	4.3	Not Detected	33	Not Detected
1,1-Dichloroethene	4.3	Not Detected	17	Not Detected
Acetone	43	Not Detected	100	Not Detected
2-Propanol	17	Not Detected	42	Not Detected
Carbon Disulfide	17	Not Detected	53	Not Detected
3-Chloropropene	17	Not Detected	53	Not Detected
Methylene Chloride	43	Not Detected	150	Not Detected
Methyl tert-butyl ether	4.3	Not Detected	15	Not Detected
trans-1,2-Dichloroethene	4.3	Not Detected	17	Not Detected
Hexane	4.3	Not Detected	15	Not Detected
1,1-Dichloroethane	4.3	Not Detected	17	Not Detected
2-Butanone (Methyl Ethyl Ketone)	17	Not Detected	50	Not Detected
cis-1,2-Dichloroethene	4.3	Not Detected	17	Not Detected
Tetrahydrofuran	4.3	Not Detected	12	Not Detected
Chloroform	4.3	Not Detected	21	Not Detected
1,1,1-Trichloroethane	4.3	Not Detected	23	Not Detected
Cyclohexane	4.3	Not Detected	15	Not Detected
Carbon Tetrachloride	4.3	Not Detected	27	Not Detected
2,2,4-Trimethylpentane	4.3	Not Detected	20	Not Detected
Benzene	4.3	Not Detected	14	Not Detected
1,2-Dichloroethane	4.3	Not Detected	17	Not Detected
Heptane	4.3	Not Detected	17	Not Detected
Trichloroethene	4.3	Not Detected	23	Not Detected
1,2-Dichloropropane	4.3	Not Detected	20	Not Detected
1,4-Dioxane	17	Not Detected	62	Not Detected
Bromodichloromethane	4.3	Not Detected	29	Not Detected
cis-1,3-Dichloropropene	4.3	Not Detected	19	Not Detected
4-Methyl-2-pentanone	4.3	Not Detected	17	Not Detected
Toluene	4.3	Not Detected	16	Not Detected
trans-1,3-Dichloropropene	4.3	Not Detected	19	Not Detected
1,1,2-Trichloroethane	4.3	Not Detected	23	Not Detected
Tetrachloroethene	4.3	1000	29	7000
2-Hexanone	17	Not Detected	70	Not Detected



Client Sample ID: SG7-7 Lab ID#: 1512124-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a121523	Date of Collection: 12/2/15 2:03:00 PM
Dil. Factor:	8.54	Date of Analysis: 12/16/15 12:21 AM

DII. Factor:	8.34	Date of Analysis: 12/16/15 12:21 AM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	4.3	Not Detected	36	Not Detected
1,2-Dibromoethane (EDB)	4.3	Not Detected	33	Not Detected
Chlorobenzene	4.3	Not Detected	20	Not Detected
Ethyl Benzene	4.3	Not Detected	18	Not Detected
m,p-Xylene	4.3	Not Detected	18	Not Detected
o-Xylene	4.3	Not Detected	18	Not Detected
Styrene	4.3	Not Detected	18	Not Detected
Bromoform	4.3	Not Detected	44	Not Detected
Cumene	4.3	Not Detected	21	Not Detected
1,1,2,2-Tetrachloroethane	4.3	Not Detected	29	Not Detected
Propylbenzene	4.3	Not Detected	21	Not Detected
4-Ethyltoluene	4.3	Not Detected	21	Not Detected
1,3,5-Trimethylbenzene	4.3	Not Detected	21	Not Detected
1,2,4-Trimethylbenzene	4.3	Not Detected	21	Not Detected
1,3-Dichlorobenzene	4.3	Not Detected	26	Not Detected
1,4-Dichlorobenzene	4.3	Not Detected	26	Not Detected
alpha-Chlorotoluene	4.3	Not Detected	22	Not Detected
1,2-Dichlorobenzene	4.3	Not Detected	26	Not Detected
1,2,4-Trichlorobenzene	17	Not Detected	130	Not Detected
Hexachlorobutadiene	17	Not Detected	180	Not Detected
1,1-Difluoroethane	17	550	46	1500

••		Method Limits	
Surrogates	%Recovery		
Toluene-d8	106	70-130	
1,2-Dichloroethane-d4	98	70-130	
4-Bromofluorobenzene	93	70-130	



Client Sample ID: SG7-17 Lab ID#: 1512124-12A EPA METHOD TO-15 GC/MS

File Name: 14121813 Date of Collection: 12/2/15 2:19:00 PM
Dil. Factor: 7.33 Date of Analysis: 12/18/15 02:58 PM

Dil. Factor:	7.33	Date of Analysis: 12/18/15 02:58		
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	37	Not Detected	180	Not Detected
Freon 114	37	Not Detected	260	Not Detected
Chloromethane	150	Not Detected	300	Not Detected
Vinyl Chloride	37	Not Detected	94	Not Detected
1,3-Butadiene	150	Not Detected	320	Not Detected
Bromomethane	150	Not Detected	570	Not Detected
Chloroethane	150	Not Detected	390	Not Detected
Freon 11	37	Not Detected	200	Not Detected
Ethanol	150	Not Detected	280	Not Detected
Freon 113	37	Not Detected	280	Not Detected
1,1-Dichloroethene	37	Not Detected	140	Not Detected
Acetone	150	Not Detected	350	Not Detected
2-Propanol	150	Not Detected	360	Not Detected
Carbon Disulfide	37	Not Detected	110	Not Detected
3-Chloropropene	150	Not Detected	460	Not Detected
Methylene Chloride	37	Not Detected	130	Not Detected
Methyl tert-butyl ether	37	Not Detected	130	Not Detected
trans-1,2-Dichloroethene	37	Not Detected	140	Not Detected
Hexane	37	Not Detected	130	Not Detected
1,1-Dichloroethane	37	Not Detected	150	Not Detected
2-Butanone (Methyl Ethyl Ketone)	150	Not Detected	430	Not Detected
cis-1,2-Dichloroethene	37	Not Detected	140	Not Detected
Tetrahydrofuran	37	Not Detected	110	Not Detected
Chloroform	37	Not Detected	180	Not Detected
1,1,1-Trichloroethane	37	Not Detected	200	Not Detected
Cyclohexane	37	Not Detected	130	Not Detected
Carbon Tetrachloride	37	Not Detected	230	Not Detected
2,2,4-Trimethylpentane	37	Not Detected	170	Not Detected
Benzene	37	Not Detected	120	Not Detected
1,2-Dichloroethane	37	Not Detected	150	Not Detected
Heptane	37	Not Detected	150	Not Detected
Trichloroethene	37	Not Detected	200	Not Detected
1,2-Dichloropropane	37	Not Detected	170	Not Detected
1,4-Dioxane	150	Not Detected	530	Not Detected
Bromodichloromethane	37	Not Detected	240	Not Detected
cis-1,3-Dichloropropene	37	Not Detected	170	Not Detected
4-Methyl-2-pentanone	37	Not Detected	150	Not Detected
Toluene	37	Not Detected	140	Not Detected
trans-1,3-Dichloropropene	37	Not Detected	170	Not Detected
1,1,2-Trichloroethane	37	Not Detected	200	Not Detected
Tetrachloroethene	37	5500	250	37000
2-Hexanone	150	Not Detected	600	Not Detected



Client Sample ID: SG7-17 Lab ID#: 1512124-12A EPA METHOD TO-15 GC/MS

File Name: 14121813 Date of Collection: 12/2/15 2:19:00 PM
Dil. Factor: 7.33 Date of Analysis: 12/18/15 02:58 PM

	7.00	Dute of Affairy 313. 12/10/10 02:00 1 14		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	37	Not Detected	310	Not Detected
1,2-Dibromoethane (EDB)	37	Not Detected	280	Not Detected
Chlorobenzene	37	Not Detected	170	Not Detected
Ethyl Benzene	37	Not Detected	160	Not Detected
m,p-Xylene	37	Not Detected	160	Not Detected
o-Xylene	37	Not Detected	160	Not Detected
Styrene	37	Not Detected	160	Not Detected
Bromoform	37	Not Detected	380	Not Detected
Cumene	37	Not Detected	180	Not Detected
1,1,2,2-Tetrachloroethane	37	Not Detected	250	Not Detected
Propylbenzene	37	Not Detected	180	Not Detected
4-Ethyltoluene	37	Not Detected	180	Not Detected
1,3,5-Trimethylbenzene	37	Not Detected	180	Not Detected
1,2,4-Trimethylbenzene	37	Not Detected	180	Not Detected
1,3-Dichlorobenzene	37	Not Detected	220	Not Detected
1,4-Dichlorobenzene	37	Not Detected	220	Not Detected
alpha-Chlorotoluene	37	Not Detected	190	Not Detected
1,2-Dichlorobenzene	37	Not Detected	220	Not Detected
1,2,4-Trichlorobenzene	150	Not Detected	1100	Not Detected
Hexachlorobutadiene	150	Not Detected	1600	Not Detected
1,1-Difluoroethane	150	Not Detected	400	Not Detected

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



trans-1,3-Dichloropropene

1,1,2-Trichloroethane

Tetrachloroethene 2-Hexanone

Client Sample ID: SG8-7 Lab ID#: 1512124-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: Dil. Factor:	a121522 2.38	Date of Collection: 12/2/15 10:45 Date of Analysis: 12/15/15 11:56		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	5.9	Not Detected
Freon 114	1.2	Not Detected	8.3	Not Detected
Chloromethane	12	Not Detected	24	Not Detected
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,3-Butadiene	1.2	Not Detected	2.6	Not Detected
Bromomethane	12	Not Detected	46	Not Detected
Chloroethane	4.8	Not Detected	12	Not Detected
Freon 11	1.2	Not Detected	6.7	Not Detected
Ethanol	4.8	Not Detected	9.0	Not Detected
Freon 113	1.2	Not Detected	9.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Acetone	12	Not Detected	28	Not Detected
2-Propanol	4.8	Not Detected	12	Not Detected
Carbon Disulfide	4.8	Not Detected	15	Not Detected
3-Chloropropene	4.8	Not Detected	15	Not Detected
Methylene Chloride	12	Not Detected	41	Not Detected
Methyl tert-butyl ether	1.2	Not Detected	4.3	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Hexane	1.2	Not Detected	4.2	Not Detected
1,1-Dichloroethane	1.2	Not Detected	4.8	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.8	Not Detected	14	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.5	Not Detected
Chloroform	1.2	Not Detected	5.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
Cyclohexane	1.2	Not Detected	4.1	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.5	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.6	Not Detected
Benzene	1.2	4.2	3.8	13
1,2-Dichloroethane	1.2	Not Detected	4.8	Not Detected
Heptane	1.2	Not Detected	4.9	Not Detected
Trichloroethene	1.2	Not Detected	6.4	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.5	Not Detected
1,4-Dioxane	4.8	Not Detected	17	Not Detected
Bromodichloromethane	1.2	Not Detected	8.0	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.4	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	4.9	Not Detected
Toluene	1.2	Not Detected	4.5	Not Detected
10.00110	1.2	1131 2 3100100	- 4	N. D. C. C. C.

Not Detected

Not Detected

120

Not Detected

5.4

6.5

8.1

19

Not Detected

Not Detected

850

Not Detected

1.2

1.2

1.2

4.8



Client Sample ID: SG8-7 Lab ID#: 1512124-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a121522	Date of Collection: 12/2/15 10:45:00 AM
Dil. Factor:	2.38	Date of Analysis: 12/15/15 11:56 PM

Dii. I detoi.	2.30	Date of Affaiysis. 12/13/13 11:50 FW		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.2	Not Detected	10	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	9.1	Not Detected
Chlorobenzene	1.2	Not Detected	5.5	Not Detected
Ethyl Benzene	1.2	Not Detected	5.2	Not Detected
m,p-Xylene	1.2	Not Detected	5.2	Not Detected
o-Xylene	1.2	Not Detected	5.2	Not Detected
Styrene	1.2	Not Detected	5.1	Not Detected
Bromoform	1.2	Not Detected	12	Not Detected
Cumene	1.2	Not Detected	5.8	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	8.2	Not Detected
Propylbenzene	1.2	Not Detected	5.8	Not Detected
4-Ethyltoluene	1.2	Not Detected	5.8	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	5.8	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	5.8	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.2	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.2	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.2	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.2	Not Detected
1,2,4-Trichlorobenzene	4.8	Not Detected	35	Not Detected
Hexachlorobutadiene	4.8	Not Detected	51	Not Detected
1,1-Difluoroethane	4.8	79	13	210

		WELLIOU
Surrogates	%Recovery	Limits
Toluene-d8	105	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	95	70-130



Client Sample ID: SG9-17 Lab ID#: 1512124-14A

		S GC/VIS FULL SCAL			
File Name: Dil. Factor:	a121524 8.48		Date of Collection: 12/2/15 3:46:00 PM Date of Analysis: 12/16/15 12:59 AM		
	Rpt. Limit				
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)	
Freon 12	4.2	Not Detected	21	Not Detected	
Freon 114	4.2	Not Detected	30	Not Detected	
Chloromethane	42	Not Detected	88	Not Detected	
Vinyl Chloride	4.2	Not Detected	11	Not Detected	
1,3-Butadiene	4.2	Not Detected	9.4	Not Detected	
Bromomethane	42	Not Detected	160	Not Detected	
Chloroethane	17	Not Detected	45	Not Detected	
Freon 11	4.2	Not Detected	24	Not Detected	
Ethanol	17	Not Detected	32	Not Detected	
Freon 113	4.2	Not Detected	32	Not Detected	
1,1-Dichloroethene	4.2	Not Detected	17	Not Detected	
Acetone	42	Not Detected	100	Not Detected	
2-Propanol	17	Not Detected	42	Not Detected	
Carbon Disulfide	17	55	53	170	
3-Chloropropene	17	Not Detected	53	Not Detected	
Methylene Chloride	42	Not Detected	150	Not Detected	
Methyl tert-butyl ether	4.2	Not Detected	15	Not Detected	
trans-1,2-Dichloroethene	4.2	Not Detected	17	Not Detected	
Hexane	4.2	8.4	15	29	
1,1-Dichloroethane	4.2	Not Detected	17	Not Detected	
	17	Not Detected	50	Not Detected	
2-Butanone (Methyl Ethyl Ketone) cis-1,2-Dichloroethene	4.2	Not Detected	17	Not Detected	
Tetrahydrofuran	4.2	Not Detected	12	Not Detected	
Chloroform	4.2	9.5	21	46	
1,1,1-Trichloroethane	4.2	Not Detected	23	Not Detected	
Cyclohexane	4.2	Not Detected	14	Not Detected	
Carbon Tetrachloride	4.2 4.2	Not Detected Not Detected	14 27	Not Detected	
2,2,4-Trimethylpentane	4.2	Not Detected	20	Not Detected	
Benzene	4.2	13	14	42	
1,2-Dichloroethane	4.2	Not Detected	17	Not Detected	
	4.2	Not Detected	17	Not Detected	
Heptane Trichloroothono	4.2 4.2	Not Detected Not Detected	23	Not Detected	
Trichloroethene	4.2 4.2	Not Detected Not Detected	23 20	Not Detected	
1,2-Dichloropropane	4.2 17	Not Detected Not Detected	61	Not Detected	
1,4-Dioxane Bromodichloromethane	4.2	Not Detected	28	Not Detected	
	4.2	Not Detected	19	Not Detected	
cis-1,3-Dichloropropene	4.2 4.2	Not Detected Not Detected	19	Not Detected	
4-Methyl-2-pentanone	4.2 4.2	7.9	16	30	
Toluene	4.2 4.2	7.9 Not Detected	19	Not Detected	
trans-1,3-Dichloropropene	4.2 4.2	Not Detected Not Detected	23	Not Detected	
1,1,2-Trichloroethane					
Tetrachloroethene	4.2	580	29	4000	
2-Hexanone	17	Not Detected	69	Not Detected	



Client Sample ID: SG9-17 Lab ID#: 1512124-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a121524	Date of Collection: 12/2/15 3:46:00 PM		
Dil. Factor:	8.48	Date of Analysis: 12/16/15 12:59 AM		
	Rpt. Limit	Amount	Rpt. Limit	Amount

Dil. I dotor.	0.40	Date of Affaiysis. 12/10/13 12:39 Af		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	4.2	Not Detected	36	Not Detected
1,2-Dibromoethane (EDB)	4.2	Not Detected	32	Not Detected
Chlorobenzene	4.2	Not Detected	20	Not Detected
Ethyl Benzene	4.2	Not Detected	18	Not Detected
m,p-Xylene	4.2	Not Detected	18	Not Detected
o-Xylene	4.2	Not Detected	18	Not Detected
Styrene	4.2	Not Detected	18	Not Detected
Bromoform	4.2	Not Detected	44	Not Detected
Cumene	4.2	Not Detected	21	Not Detected
1,1,2,2-Tetrachloroethane	4.2	Not Detected	29	Not Detected
Propylbenzene	4.2	Not Detected	21	Not Detected
4-Ethyltoluene	4.2	Not Detected	21	Not Detected
1,3,5-Trimethylbenzene	4.2	Not Detected	21	Not Detected
1,2,4-Trimethylbenzene	4.2	Not Detected	21	Not Detected
1,3-Dichlorobenzene	4.2	Not Detected	25	Not Detected
1,4-Dichlorobenzene	4.2	Not Detected	25	Not Detected
alpha-Chlorotoluene	4.2	Not Detected	22	Not Detected
1,2-Dichlorobenzene	4.2	Not Detected	25	Not Detected
1,2,4-Trichlorobenzene	17	Not Detected	120	Not Detected
Hexachlorobutadiene	17	Not Detected	180	Not Detected
1,1-Difluoroethane	17	24000 E	46	66000 E

E = Exceeds instrument calibration range.

· ·		Method	
Surrogates	%Recovery	Limits	
Toluene-d8	108	70-130	
1,2-Dichloroethane-d4	100	70-130	
4-Bromofluorobenzene	92	70-130	



Client Sample ID: SG9-17 DUP Lab ID#: 1512124-15A

		5 GCIVIS FULL SCAL		
File Name: Dil. Factor:	a121525 9.68		of Collection: 12/2 of Analysis: 12/16	
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	4.8	Not Detected	24	Not Detected
Freon 114	4.8	Not Detected	34	Not Detected
Chloromethane	48	Not Detected	100	Not Detected
Vinyl Chloride	4.8	Not Detected	12	Not Detected
1,3-Butadiene	4.8	Not Detected	11	Not Detected
Bromomethane	48	Not Detected	190	Not Detected
Chloroethane	19	Not Detected	51	Not Detected
Freon 11	4.8	Not Detected	27	Not Detected
Ethanol	19	Not Detected	36	Not Detected
Freon 113	4.8	Not Detected	37	Not Detected
1,1-Dichloroethene	4.8	Not Detected	19	Not Detected
Acetone	48	Not Detected	110	Not Detected
2-Propanol	19	Not Detected	48	Not Detected
Carbon Disulfide	19	61	60	190
3-Chloropropene	19	Not Detected	60	Not Detected
Methylene Chloride	48	Not Detected	170	Not Detected
Methyl tert-butyl ether	4.8	Not Detected	17	Not Detected
trans-1,2-Dichloroethene	4.8	Not Detected	19	Not Detected
Hexane	4.8	11	17	39
1,1-Dichloroethane	4.8	Not Detected	20	Not Detected
2-Butanone (Methyl Ethyl Ketone)	19	Not Detected	57	Not Detected
cis-1,2-Dichloroethene	4.8	Not Detected	19	Not Detected
Tetrahydrofuran	4.8	Not Detected	14	Not Detected
Chloroform	4.8	11	24	54
1,1,1-Trichloroethane	4.8	Not Detected	26	Not Detected
Cyclohexane	4.8	Not Detected	17	Not Detected
Carbon Tetrachloride	4.8	Not Detected	30	Not Detected
2,2,4-Trimethylpentane	4.8	Not Detected	23	Not Detected
Benzene	4.8	14	15	44
1,2-Dichloroethane	4.8	Not Detected	20	Not Detected
Heptane	4.8	Not Detected	20	Not Detected
Trichloroethene	4.8	Not Detected	26	Not Detected
1,2-Dichloropropane	4.8	Not Detected	22	Not Detected
1,4-Dioxane	19	Not Detected	70	Not Detected
Bromodichloromethane	4.8	Not Detected	32	Not Detected
cis-1,3-Dichloropropene	4.8	Not Detected	22	Not Detected
4-Methyl-2-pentanone	4.8	Not Detected	20	Not Detected
Toluene	4.8	9.0	18	34
trans-1,3-Dichloropropene	4.8	Not Detected	22	Not Detected
1,1,2-Trichloroethane	4.8	Not Detected	26	Not Detected
Tetrachloroethene	4.8	670	33	4600
2-Hexanone	19	Not Detected	79	Not Detected
- HONGHOHO	10	. 101 2 3100104	. 0	. 101 20100104



Client Sample ID: SG9-17 DUP Lab ID#: 1512124-15A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: a121525 Date of Collection: 12/2/15 3:46:00 PM Dil. Factor: 9.68 Date of Analysis: 12/16/15 01:24 AM		Rnt. Limit	Amount	Rpt. Limit	Amount
File Name: a121525 Date of Collection: 12/2/15 3:46:00 PM	Dil. Factor:	9.68	Dat	e of Analysis: 12/16/	15 01:24 AM
	File Name:	a121525	Dat	e of Collection: 12/2/	15 3:46:00 PM

	V.00	24.0 0.7.1.4.1,0.0.1 12,10,10 0.112.17.1.		,
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	4.8	Not Detected	41	Not Detected
1,2-Dibromoethane (EDB)	4.8	Not Detected	37	Not Detected
Chlorobenzene	4.8	Not Detected	22	Not Detected
Ethyl Benzene	4.8	Not Detected	21	Not Detected
m,p-Xylene	4.8	Not Detected	21	Not Detected
o-Xylene	4.8	Not Detected	21	Not Detected
Styrene	4.8	Not Detected	21	Not Detected
Bromoform	4.8	Not Detected	50	Not Detected
Cumene	4.8	Not Detected	24	Not Detected
1,1,2,2-Tetrachloroethane	4.8	Not Detected	33	Not Detected
Propylbenzene	4.8	Not Detected	24	Not Detected
4-Ethyltoluene	4.8	Not Detected	24	Not Detected
1,3,5-Trimethylbenzene	4.8	Not Detected	24	Not Detected
1,2,4-Trimethylbenzene	4.8	Not Detected	24	Not Detected
1,3-Dichlorobenzene	4.8	Not Detected	29	Not Detected
1,4-Dichlorobenzene	4.8	Not Detected	29	Not Detected
alpha-Chlorotoluene	4.8	Not Detected	25	Not Detected
1,2-Dichlorobenzene	4.8	Not Detected	29	Not Detected
1,2,4-Trichlorobenzene	19	Not Detected	140	Not Detected
Hexachlorobutadiene	19	Not Detected	210	Not Detected
1,1-Difluoroethane	19	3400 E	52	9200 E

E = Exceeds instrument calibration range.

		Method	
Surrogates	%Recovery	Limits	
Toluene-d8	110	70-130	
1,2-Dichloroethane-d4	100	70-130	
4-Bromofluorobenzene	98	70-130	



Client Sample ID: SG10-7 Lab ID#: 1512124-16A

		5 GCNIS FULL SCAL		
File Name: Dil. Factor:	a121532 45.2	Date of Collection: 12/2/15 3:55:00 PM Date of Analysis: 12/16/15 05:10 AM		
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	23	Not Detected	110	Not Detected
Freon 114	23	Not Detected	160	Not Detected
Chloromethane	230	Not Detected	470	Not Detected
Vinyl Chloride	23	Not Detected	58	Not Detected
1,3-Butadiene	23	Not Detected	50	Not Detected
Bromomethane	230	Not Detected	880	Not Detected
Chloroethane	90	Not Detected	240	Not Detected
Freon 11	23	Not Detected	130	Not Detected
Ethanol	90	Not Detected	170	Not Detected
Freon 113	23	Not Detected	170	Not Detected
1,1-Dichloroethene	23	Not Detected	90	Not Detected
Acetone	230	Not Detected	540	Not Detected
2-Propanol	90	Not Detected	220	Not Detected
Carbon Disulfide	90	Not Detected	280	Not Detected
3-Chloropropene	90	Not Detected	280	Not Detected
Methylene Chloride	230	Not Detected	780	Not Detected
Methyl tert-butyl ether	23	Not Detected	81	Not Detected
trans-1,2-Dichloroethene	23	Not Detected	90	Not Detected
Hexane	23	Not Detected	80	Not Detected
1,1-Dichloroethane	23	Not Detected	91	Not Detected
2-Butanone (Methyl Ethyl Ketone)	90	Not Detected	270	Not Detected
cis-1,2-Dichloroethene	23	Not Detected	90	Not Detected
Tetrahydrofuran	23	Not Detected	67	Not Detected
Chloroform	23	Not Detected	110	Not Detected
1,1,1-Trichloroethane	23	Not Detected	120	Not Detected
Cyclohexane	23	Not Detected	78	Not Detected
Carbon Tetrachloride	23	Not Detected	140	Not Detected
2,2,4-Trimethylpentane	23	Not Detected	100	Not Detected
Benzene	23	Not Detected	72	Not Detected
1,2-Dichloroethane	23	Not Detected	91	Not Detected
Heptane	23	Not Detected	93	Not Detected
Trichloroethene	23	Not Detected	120	Not Detected
1,2-Dichloropropane	23	Not Detected	100	Not Detected
1,4-Dioxane	90	Not Detected	320	Not Detected
Bromodichloromethane	23	Not Detected	150	Not Detected
cis-1,3-Dichloropropene	23	Not Detected	100	Not Detected
4-Methyl-2-pentanone	23	Not Detected	92	Not Detected
Toluene	23	Not Detected	85	Not Detected
trans-1,3-Dichloropropene	23	Not Detected	100	Not Detected
1,1,2-Trichloroethane	23	Not Detected	120	Not Detected
Tetrachloroethene	23	160	150	1100
	90	Not Detected	370	Not Detected
2-Hexanone	90	Not Detected	3/0	Not Detected



Client Sample ID: SG10-7 Lab ID#: 1512124-16A

EPA METHOD TO-15 GC/MS FULL SCAN

	Dat Limit	Amount Pot Limit Amount
Dil. Factor:	45.2	Date of Analysis: 12/16/15 05:10 AM
File Name:	a121532	Date of Collection: 12/2/15 3:55:00 PM

Dii. i actor.	43.2	Date of Affaiysis. 12/10/13 03:10 Aiv		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	23	Not Detected	190	Not Detected
1,2-Dibromoethane (EDB)	23	Not Detected	170	Not Detected
Chlorobenzene	23	Not Detected	100	Not Detected
Ethyl Benzene	23	Not Detected	98	Not Detected
m,p-Xylene	23	Not Detected	98	Not Detected
o-Xylene	23	Not Detected	98	Not Detected
Styrene	23	Not Detected	96	Not Detected
Bromoform	23	Not Detected	230	Not Detected
Cumene	23	Not Detected	110	Not Detected
1,1,2,2-Tetrachloroethane	23	Not Detected	160	Not Detected
Propylbenzene	23	Not Detected	110	Not Detected
4-Ethyltoluene	23	Not Detected	110	Not Detected
1,3,5-Trimethylbenzene	23	Not Detected	110	Not Detected
1,2,4-Trimethylbenzene	23	Not Detected	110	Not Detected
1,3-Dichlorobenzene	23	Not Detected	140	Not Detected
1,4-Dichlorobenzene	23	Not Detected	140	Not Detected
alpha-Chlorotoluene	23	Not Detected	120	Not Detected
1,2-Dichlorobenzene	23	Not Detected	140	Not Detected
1,2,4-Trichlorobenzene	90	Not Detected	670	Not Detected
Hexachlorobutadiene	90	Not Detected	960	Not Detected
1,1-Difluoroethane	90	250000 E	240	680000 E

E = Exceeds instrument calibration range.

		Method	
Surrogates	%Recovery	Limits	
Toluene-d8	107	70-130	
1,2-Dichloroethane-d4	98	70-130	
4-Bromofluorobenzene	98	70-130	



Client Sample ID: Lab Blank Lab ID#: 1512124-17A

File Name: Dil. Factor:	a121507c 1.00		of Collection: NA of Analysis: 12/1	5/15 12:59 PM
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50 0.50	Not Detected Not Detected	2.7 2.3	Not Detected
1,2-Dichloropropane	2.0	Not Detected	7.2	Not Detected Not Detected
1,4-Dioxane Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
	0.50	Not Detected	2.3	Not Detected Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.0	Not Detected
4-Methyl-2-pentanone Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Z-I ICXAIIUIIC	2.0	NOT DETECTED	0.2	NOT DETECTED



Client Sample ID: Lab Blank Lab ID#: 1512124-17A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: Dil. Factor:	a121507c 1.00	Date of Collection: NA Date of Analysis: 12/15/15 12:59 PM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected
1,1-Difluoroethane	2.0	Not Detected	5.4	Not Detected

Totalior Type: 1477 Not Applicable		Method	
Surrogates	%Recovery	Limits	
Toluene-d8	106	70-130	
1,2-Dichloroethane-d4	100	70-130	
4-Bromofluorobenzene	80	70-130	



Client Sample ID: Lab Blank Lab ID#: 1512124-17B EPA METHOD TO-15 GC/MS

File Name: 14121810a Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 12/18/15 12:51 PM

Dil. Factor:	1.00	1.00 Date of Analysis: 12/18/15 12:51 PM		3/15 12:51 PM
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(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	20	Not Detected	44	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	5.0	Not Detected	16	Not Detected
3-Chloropropene	20	Not Detected	63	Not Detected
Methylene Chloride	5.0	Not Detected	17	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#: 1512124-17B EPA METHOD TO-15 GC/MS

File Name:	14121810a	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 12/18/15 12:51 PM

1.00	Date	of Analysis: 12/18	715 12:51 PW
Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
5.0	Not Detected	42	Not Detected
5.0	Not Detected	38	Not Detected
5.0	Not Detected	23	Not Detected
5.0	Not Detected	22	Not Detected
5.0	Not Detected	22	Not Detected
5.0	Not Detected	22	Not Detected
5.0	Not Detected	21	Not Detected
5.0	Not Detected	52	Not Detected
5.0	Not Detected	24	Not Detected
5.0	Not Detected	34	Not Detected
5.0	Not Detected	24	Not Detected
5.0	Not Detected	24	Not Detected
5.0	Not Detected	24	Not Detected
5.0	Not Detected	24	Not Detected
5.0	Not Detected	30	Not Detected
5.0	Not Detected	30	Not Detected
5.0	Not Detected	26	Not Detected
5.0	Not Detected	30	Not Detected
20	Not Detected	150	Not Detected
20	Not Detected	210	Not Detected
20	Not Detected	54	Not Detected
	Rpt. Limit (ppbv) 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.	Rot. Limit (ppbv) Amount (ppbv) 5.0 Not Detected 5.0 Not Detected	Rot. Limit (ppbv) Amount (ppbv) Rpt. Limit (ug/m3) 5.0 Not Detected 42 5.0 Not Detected 38 5.0 Not Detected 23 5.0 Not Detected 22 5.0 Not Detected 22 5.0 Not Detected 21 5.0 Not Detected 52 5.0 Not Detected 24 5.0 Not Detected 30 5.0

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	106	70-130	
Toluene-d8	99	70-130	
4-Bromofluorobenzene	99	70-130	



Client Sample ID: CCV Lab ID#: 1512124-18A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: a121502 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 12/15/15 10:05 AM

Freen 114 105 Chloromethane 104 Vinyl Chloride 102 1,3-Butadiene 95 Bromomethane 98 Chloroethane 97 Freon 11 102 Ethanol 97 Freon 113 101 1,1-Dichloroethene 98 Acetone 100 2-Propanol 104 Carbon Disulfide 97 3-Chloropropene 99 Methylene Chloride 108 Methyl tert-butyl ether 100 trans-1,2-Dichloroethene 99 Hexane 103 1,1-Dichloroethane 105 2-Butanone (Methyl Ethyl Ketone) 115 cis-1,2-Dichloroethene 104 Tetrahydrofuran 106 Chloroform 109 1,1,1-Trichloroethane 105 Cyclohexane 99 Carbon Tetrachloride 106 Cyclohexane 109 Carbon Tetrachloride 106	Compound	%Recovery
Chloromethane 104 Vinyl Chloride 102 Ja-Butadiene 95 Bromomethane 98 Chloroethane 97 Freon 11 102 Ethanol 97 Freon 113 101 1,1-Dichloroethene 98 Acetone 100 2-Propanol 104 Carbon Disulfide 97 3-Chloropropene 99 Methylene Chloride 108 Methyl ether to 100 trans-1,2-Dichloroethene 199 Hexane 100 1,1-Dichloroethane 105 2-Butanone (Methyl Ethyl Ketone) 115 sis-1,2-Dichloroethene 104 Tetrahydrofuran 106 Chloroform 106 Chloroform 109 1,1,1-Trichloroethane 105 Cyclohexane 99 Carbon Tetrachloride 106 Cyclohexane 112 Labon Tetrachloride 106 Cy	Freon 12	107
Vinyl Chloride 102 1,3-Butadiene 95 Bromomethane 98 Chloroethane 97 Freon 11 102 Ethanol 97 Freon 113 101 1,1-Dichloroethene 98 Acetone 100 2-Propanol 104 Carbon Disulfide 97 3-Chloropropene 99 Methylene Chloride 108 Methyl tert-butyl ether 100 trans-1,2-Dichloroethene 99 Hexane 103 1,1-Dichloroethane 105 2-Butanone (Methyl Ethyl Ketone) 115 cis-1,2-Dichloroethene 104 Tetrahydrofuran 106 Chloroform 109 1,1,1-Trichloroethane 105 Cyclohexane 99 Cyclohexane 99 Cyclohoroethane 111 Benzene 112 1,2-Dichloroethane 112 1,2-Dichloropropane 108 <t< td=""><td>Freon 114</td><td>105</td></t<>	Freon 114	105
1,3-Butadiene 95	Chloromethane	104
1,3-Butadiene 95	Vinyl Chloride	102
Bromomethane 98 Chloroethane 97 Freon 11 102 Ethanol 97 Freon 113 101 1,1-Dichloroethene 98 Acetone 100 2-Propanol 104 Carbon Disulfide 97 3-Chloropropene 99 Methylene Chloride 108 Methyl tert-butyl ether 100 trans-1,2-Dichloroethene 99 Hexane 103 1,1-Dichloroethane 105 2-Butanone (Methyl Ethyl Ketone) 115 cis-1,2-Dichloroethane 104 Tetrahydrofuran 106 Chloroform 109 1,1-Trichloroethane 105 Cyclohexane 99 Cyclohexane 99 Cyclohexane 105 Cyclohorothane 111 Benzene 112 1+eptane 111 Trichloroethane 108 1,4-Dioxane 107 Bromodichloromethan		95
Freon 11 102 Ethanol 97 Freon 113 101 1,1-Dichloroethene 98 Acetone 100 2-Propanol 104 Carbon Disulfide 97 3-Chloropropene 99 Methylere Chloride 108 Methyl tert-butyl ether 100 trans-1,2-Dichloroethene 99 Hexane 103 1,1-Dichloroethane 105 2-Butanone (Methyl Ethyl Ketone) 115 cis-1,2-Dichloroethene 104 Tetrahydrofuran 106 Chloroform 109 1,1,1-Tichloroethane 105 Cyclohexane 99 Cyclohexane 99 Cyclohexane 106 2,2,4-Trimethylpentane 111 Benzene 112 1,2-Dichloroethane 112 Heptane 111 Tichloroethene 124 1,2-Dichloropropane 108 1,4-Dioxane 107 <	Bromomethane	98
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Freon 113 101 1,1-Dichloroethene 98 Acetone 100 2-Propanol 104 Carbon Disulfide 97 3-Chloropropene 99 Methyler-Chloride 108 Methyl tert-butyl ether 100 trans-1,2-Dichloroethene 99 Hexane 103 1,1-Dichloroethane 105 2-Butanone (Methyl Ethyl Ketone) 115 cis-1,2-Dichloroethene 104 Tetrahydrofuran 106 Chloroform 109 1,1,1-Trichloroethane 105 Cyclohexane 99 Carbon Tetrachloride 106 Cay,4-Trimethylpentane 111 Benzene 112 1,2-Dichloroethane 112 Heptane 111 Trichloroethene 124 1,2-Dichloropropane 108 1,4-Dioxane 107 Bromodichloromethane 111 cis-1,3-Dichloropropene 116 4-Methyl-2-pentanone	Freon 11	102
1,1-Dichloroethene 98 Acetone 100 2-Propanol 104 Carbon Disulfide 97 3-Chloropropene 99 Methylene Chloride 108 Methyl tert-butyl ether 100 trans-1,2-Dichloroethene 99 Hexane 103 1,1-Dichloroethane 105 2-Butanone (Methyl Ethyl Ketone) 115 cis-1,2-Dichloroethene 104 Tetrahydrofuran 106 Chloroform 109 1,1,1-Trichloroethane 105 Cyclohexane 99 Carbon Tetrachloride 106 2,2,4-Trimethylpentane 111 Benzene 112 1,2-Dichloroethane 112 Heptane 111 Trichloroethene 124 1,2-Dichloropropane 108 1,4-Dioxane 107 Bromodichloromethane 111 cis-1,3-Dichloropropene 116 4-Methyl-2-pentanone 111 Toluene 112 1,1,2-Trichloroethane 109 <td>Ethanol</td> <td>97</td>	Ethanol	97
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Acetone 100 2-Propanol 104 Carbon Disulfide 97 3-Chloropropene 99 Methyl tert-butyl ether 100 trans-1,2-Dichloroethene 199 Hexane 103 1,1-Dichloroethane 105 2-Butanone (Methyl Ethyl Ketone) 115 cis-1,2-Dichloroethene 104 Tetrahydrofuran 106 Chloroform 109 1,1,1-Trichloroethane 105 Cyclohexane 99 Carbon Tetrachloride 106 2,2,4-Trimethylpentane 111 Benzene 112 1,2-Dichloroethane 112 1+eptane 111 Trichloroethene 124 1,2-Dichloropropane 108 1,4-Dioxane 107 Bromodichloromethane 111 cis-1,3-Dichloropropene 116 4-Methyl-2-pentanone 111 Totuene 111 trans-1,3-Dichloroptopene 112 1,1,2-Trichloroethane 109	1,1-Dichloroethene	98
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Cyclohexane 99 Carbon Tetrachloride 106 2,2,4-Trimethylpentane 111 Benzene 112 1,2-Dichloroethane 112 Heptane 111 Trichloroethene 124 1,2-Dichloropropane 108 1,4-Dioxane 107 Bromodichloromethane 111 cis-1,3-Dichloropropene 116 4-Methyl-2-pentanone 111 Toluene 111 trans-1,3-Dichloropropene 112 1,1,2-Trichloroethane 109 Tetrachloroethene 108	1,1,1-Trichloroethane	105
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Heptane 111 Trichloroethene 124 1,2-Dichloropropane 108 1,4-Dioxane 107 Bromodichloromethane 111 cis-1,3-Dichloropropene 116 4-Methyl-2-pentanone 111 Toluene 111 trans-1,3-Dichloropropene 112 1,1,2-Trichloroethane 109 Tetrachloroethene 108	Benzene	112
Trichloroethene 124 1,2-Dichloropropane 108 1,4-Dioxane 107 Bromodichloromethane 111 cis-1,3-Dichloropropene 116 4-Methyl-2-pentanone 111 Toluene 111 trans-1,3-Dichloropropene 112 1,1,2-Trichloroethane 109 Tetrachloroethene 108	1,2-Dichloroethane	112
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1,4-Dioxane 107 Bromodichloromethane 111 cis-1,3-Dichloropropene 116 4-Methyl-2-pentanone 111 Toluene 111 trans-1,3-Dichloropropene 112 1,1,2-Trichloroethane 109 Tetrachloroethene 108	Trichloroethene	124
Bromodichloromethane 111 cis-1,3-Dichloropropene 116 4-Methyl-2-pentanone 111 Toluene 111 trans-1,3-Dichloropropene 112 1,1,2-Trichloroethane 109 Tetrachloroethene 108	1,2-Dichloropropane	108
cis-1,3-Dichloropropene 116 4-Methyl-2-pentanone 111 Toluene 111 trans-1,3-Dichloropropene 112 1,1,2-Trichloroethane 109 Tetrachloroethene 108		107
4-Methyl-2-pentanone111Toluene111trans-1,3-Dichloropropene1121,1,2-Trichloroethane109Tetrachloroethene108	Bromodichloromethane	111
4-Methyl-2-pentanone111Toluene111trans-1,3-Dichloropropene1121,1,2-Trichloroethane109Tetrachloroethene108	cis-1,3-Dichloropropene	116
Toluene 111 trans-1,3-Dichloropropene 112 1,1,2-Trichloroethane 109 Tetrachloroethene 108	4-Methyl-2-pentanone	
1,1,2-Trichloroethane109Tetrachloroethene108	Toluene	111
1,1,2-Trichloroethane109Tetrachloroethene108	trans-1,3-Dichloropropene	112
	1,1,2-Trichloroethane	109
	Tetrachloroethene	108
	2-Hexanone	112



Client Sample ID: CCV Lab ID#: 1512124-18A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: a121502 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 12/15/15 10:05 AM

Compound	%Recovery	
Dibromochloromethane	113	
1,2-Dibromoethane (EDB)	113	
Chlorobenzene	112	
Ethyl Benzene	111	
m,p-Xylene	116	
o-Xylene	118	
Styrene	126	
Bromoform	115	
Cumene	117	
1,1,2,2-Tetrachloroethane	100	
Propylbenzene	117	
4-Ethyltoluene	115	
1,3,5-Trimethylbenzene	114	
1,2,4-Trimethylbenzene	102	
1,3-Dichlorobenzene	97	
1,4-Dichlorobenzene	104	
alpha-Chlorotoluene	115	
1,2-Dichlorobenzene	110	
1,2,4-Trichlorobenzene	94	
Hexachlorobutadiene	96	
1,1-Difluoroethane	90	

		Method	
Surrogates	%Recovery	Limits	
Toluene-d8	106	70-130	
1,2-Dichloroethane-d4	98	70-130	
4-Bromofluorobenzene	98	70-130	



Client Sample ID: CCV Lab ID#: 1512124-18B EPA METHOD TO-15 GC/MS

File Name: 14121802 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 12/18/15 09:15 AM

Freon 12 101 Freon 114 96 Chloromethane 102 Vinyl Chloride 97 1,3-Butadiene 96 Bromomethane 98 Chloroethane 95 Freon 11 103 Ethanol 108 Freon 113 98 1,1-Dichloroethene 98 Acetone 96 2-Propanol 102 Carbon Disulfide 102 3-Chloropropene 98 Methylene Chloride 96 Methylene Chloride 96 Methylether thutylether 111 trans-1,2-Dichloroethene 93 Hexane 98 Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethane 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 2,2,4-Trimethylpenta	Compound	%Recovery
Chloromethane 102 Vinyl Chloride 97 1,3-Butadiene 96 Bromomethane 98 Chloroethane 95 Freon 11 103 Ethanol 108 Freon 113 98 1,1-Dichloroethene 98 Acetone 96 2-Propanol 102 Carbon Disulfide 102 3-Chloropropene 98 Methylere Chloride 96 Methylere Chloride 96 Methyl tert-butyl ether 111 trans-1,2-Dichloroethene 93 Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1-1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96	Freon 12	101
Vinyl Chloride 97 1,3-Butadiene 96 Bromomethane 98 Chloroethane 95 Freon 11 103 Ethanol 108 Freon 113 98 1,1-Dichloroethene 98 Acetone 96 2-Propanol 102 Carbon Disulfide 102 3-Chloropropene 98 Methylene Chloride 96 Methyl tert-butyl ether 111 trans-1,2-Dichloroethene 93 Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2-4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 <td< td=""><td>Freon 114</td><td>96</td></td<>	Freon 114	96
1,3-Butadiene 96 Bromomethane 98 Chloroethane 95 Freon 11 103 Ethanol 108 Freon 113 98 1,1-Dichloroethene 98 Acetone 96 2-Propanol 102 Carbon Disulfide 102 3-Chloropropene 98 Methylene Chloride 96 Methyl tert-butyl ether 111 trans-1,2-Dichloroethene 93 Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethane 104 <	Chloromethane	102
Bromomethane	Vinyl Chloride	97
Chloroethane 95 Freon 11 103 Ethanol 108 Freon 113 98 1,1-Dichloroethene 98 Acetone 96 2-Propanol 102 3-Chloropropene 98 Methylene Chloride 96 Methylene Chloride 96 Methyl tert-butyl ether 111 trans-1,2-Dichloroethene 93 Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 96 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 104 1,2-Dichloropropane 101 1,4-Dioxane 102	1,3-Butadiene	96
Freon 11 103 Ethanol 108 Freon 113 98 1,1-Dichloroethene 98 Acetone 96 2-Propanol 102 Carbon Disulfide 102 3-Chloropropene 98 Methylene Chloride 96 Methyler-butyl ether 111 trans-1,2-Dichloroethene 93 Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104 <td>Bromomethane</td> <td>98</td>	Bromomethane	98
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Acetone 96 2-Propanol 102 Carbon Disulfide 102 3-Chloropropene 98 Methylene Chloride 96 Methyl tert-butyl ether 111 trans-1,2-Dichloroethene 93 Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	Freon 113	98
2-Propanol 102 Carbon Disulfide 102 3-Chloropropene 98 Methylene Chloride 96 Methyl tert-butyl ether 111 trans-1,2-Dichloroethene 93 Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	1,1-Dichloroethene	98
Carbon Disulfide 102 3-Chloropropene 98 Methylene Chloride 96 Methyl tert-butyl ether 111 trans-1,2-Dichloroethene 93 Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	Acetone	96
Carbon Disulfide 102 3-Chloropropene 98 Methylene Chloride 96 Methyl tert-butyl ether 111 trans-1,2-Dichloroethene 93 Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	2-Propanol	102
Methylene Chloride 96 Methyl tert-butyl ether 111 trans-1,2-Dichloroethene 93 Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	•	102
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Methyl tert-butyl ether 111 trans-1,2-Dichloroethene 93 Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	Methylene Chloride	96
trans-1,2-Dichloroethene 93 Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	-	111
Hexane 98 1,1-Dichloroethane 100 2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104		93
2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104		98
2-Butanone (Methyl Ethyl Ketone) 102 cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	1,1-Dichloroethane	100
cis-1,2-Dichloroethene 102 Tetrahydrofuran 94 Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	2-Butanone (Methyl Ethyl Ketone)	102
Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	cis-1,2-Dichloroethene	102
Chloroform 101 1,1,1-Trichloroethane 103 Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	Tetrahydrofuran	94
Cyclohexane 89 Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	-	101
Carbon Tetrachloride 108 2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	1,1,1-Trichloroethane	103
2,2,4-Trimethylpentane 100 Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	Cyclohexane	89
Benzene 96 1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	Carbon Tetrachloride	108
1,2-Dichloroethane 104 Heptane 96 Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	2,2,4-Trimethylpentane	100
Heptane96Trichloroethene881,2-Dichloropropane1011,4-Dioxane102Bromodichloromethane104	Benzene	96
Trichloroethene 88 1,2-Dichloropropane 101 1,4-Dioxane 102 Bromodichloromethane 104	1,2-Dichloroethane	104
1,2-Dichloropropane1011,4-Dioxane102Bromodichloromethane104	Heptane	96
1,4-Dioxane102Bromodichloromethane104	Trichloroethene	88
Bromodichloromethane 104	1,2-Dichloropropane	101
	1,4-Dioxane	102
	Bromodichloromethane	104
cis-1,3-Dichloropropene 110	cis-1,3-Dichloropropene	110
4-Methyl-2-pentanone 85		85
Toluene 97	Toluene	97
trans-1,3-Dichloropropene 118	trans-1,3-Dichloropropene	118
1,1,2-Trichloroethane 99		99
Tetrachloroethene 98	Tetrachloroethene	98
2-Hexanone 105	2-Hexanone	105



Client Sample ID: CCV Lab ID#: 1512124-18B EPA METHOD TO-15 GC/MS

File Name: 14121802 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 12/18/15 09:15 AM

Compound	%Recovery	
Dibromochloromethane	103	
1,2-Dibromoethane (EDB)	102	
Chlorobenzene	98	
Ethyl Benzene	96	
m,p-Xylene	100	
o-Xylene	100	
Styrene	98	
Bromoform	101	
Cumene	99	
1,1,2,2-Tetrachloroethane	107	
Propylbenzene	98	
4-Ethyltoluene	98	
1,3,5-Trimethylbenzene	95	
1,2,4-Trimethylbenzene	97	
1,3-Dichlorobenzene	100	
1,4-Dichlorobenzene	94	
alpha-Chlorotoluene	114	
1,2-Dichlorobenzene	96	
1,2,4-Trichlorobenzene	80	
Hexachlorobutadiene	79	
1,1-Difluoroethane	103	

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	96	70-130	
Toluene-d8	100	70-130	
4-Bromofluorobenzene	98	70-130	



Client Sample ID: LCS Lab ID#: 1512124-19A

File Name:	a121503	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 12/15/15 10:43 AM

DII. Factor.		s. 12/13/13 10.43 AM Method
Compound	%Recovery	Limits
Freon 12	114	70-130
Freon 114	116	70-130
Chloromethane	107	70-130
Vinyl Chloride	108	70-130
1,3-Butadiene	96	70-130
Bromomethane	104	70-130
Chloroethane	106	70-130
Freon 11	108	70-130
Ethanol	98	70-130
Freon 113	104	70-130
1,1-Dichloroethene	104	70-130
Acetone	102	70-130
2-Propanol	113	70-130
Carbon Disulfide	90	70-130
3-Chloropropene	94	70-130
Methylene Chloride	112	70-130
Methyl tert-butyl ether	100	70-130
trans-1,2-Dichloroethene	106	70-130
Hexane	107	70-130
1,1-Dichloroethane	108	70-130
2-Butanone (Methyl Ethyl Ketone)	112	70-130
cis-1,2-Dichloroethene	105	70-130
Tetrahydrofuran	111	70-130
Chloroform	111	70-130
1,1,1-Trichloroethane	109	70-130
Cyclohexane	106	70-130
Carbon Tetrachloride	109	70-130
2,2,4-Trimethylpentane	117	70-130
Benzene	117	70-130
1,2-Dichloroethane	112	70-130
Heptane	115	70-130
Trichloroethene	109	70-130
1,2-Dichloropropane	110	70-130
1,4-Dioxane	117	70-130
Bromodichloromethane	118	70-130
cis-1,3-Dichloropropene	113	70-130
4-Methyl-2-pentanone	119	70-130
Toluene	116	70-130
trans-1,3-Dichloropropene	113	70-130
1,1,2-Trichloroethane	112	70-130
Tetrachloroethene	110	70-130
2-Hexanone	122	70-130



Client Sample ID: LCS Lab ID#: 1512124-19A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: a121503 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 12/15/15 10:43 AM

		Method
Compound	%Recovery	Limits
Dibromochloromethane	117	70-130
1,2-Dibromoethane (EDB)	115	70-130
Chlorobenzene	114	70-130
Ethyl Benzene	115	70-130
m,p-Xylene	117	70-130
o-Xylene	122	70-130
Styrene	128	70-130
Bromoform	122	70-130
Cumene	119	70-130
1,1,2,2-Tetrachloroethane	122	70-130
Propylbenzene	123	70-130
4-Ethyltoluene	124	70-130
1,3,5-Trimethylbenzene	117	70-130
1,2,4-Trimethylbenzene	126	70-130
1,3-Dichlorobenzene	101	70-130
1,4-Dichlorobenzene	100	70-130
alpha-Chlorotoluene	107	70-130
1,2-Dichlorobenzene	102	70-130
1,2,4-Trichlorobenzene	118	70-130
Hexachlorobutadiene	118	70-130
1 1 Diffuoroathone	Not Spiked	

1,1-Difluoroethane Not Spiked

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



Client Sample ID: LCSD Lab ID#: 1512124-19AA

File Name:	a121504	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 12/15/15 11:07 AM

Dil. Factor:	1.00 Date of Analysi	s: 12/15/15 11:07 AM
Compound	%Recovery	Method Limits
Freon 12	113	70-130
Freon 114	113	70-130
Chloromethane	104	70-130
Vinyl Chloride	106	70-130
1,3-Butadiene	98	70-130
Bromomethane	103	70-130
Chloroethane	105	70-130
Freon 11	108	70-130
Ethanol	99	70-130
Freon 113	104	70-130
1,1-Dichloroethene	102	70-130
Acetone	99	70-130
2-Propanol	111	70-130
Carbon Disulfide	89	70-130
3-Chloropropene	93	70-130
Methylene Chloride	112	70-130
Methyl tert-butyl ether	100	70-130
trans-1,2-Dichloroethene	103	70-130
Hexane	104	70-130
1,1-Dichloroethane	108	70-130
2-Butanone (Methyl Ethyl Ketone)	115	70-130
cis-1,2-Dichloroethene	107	70-130
Tetrahydrofuran	111	70-130
Chloroform	109	70-130
1,1,1-Trichloroethane	108	70-130
Cyclohexane	103	70-130
Carbon Tetrachloride	108	70-130
2,2,4-Trimethylpentane	116	70-130
Benzene	115	70-130
1,2-Dichloroethane	116	70-130
Heptane	109	70-130
Trichloroethene	110	70-130
1,2-Dichloropropane	109	70-130
1,4-Dioxane	116	70-130
Bromodichloromethane	117	70-130
cis-1,3-Dichloropropene	112	70-130
4-Methyl-2-pentanone	115	70-130
Toluene	114	70-130
trans-1,3-Dichloropropene	112	70-130
1,1,2-Trichloroethane	108	70-130
Tetrachloroethene	109	70-130
2-Hexanone	119	70-130



Client Sample ID: LCSD Lab ID#: 1512124-19AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: a121504 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 12/15/15 11:07 AM

		Method
Compound	%Recovery	Limits
Dibromochloromethane	114	70-130
1,2-Dibromoethane (EDB)	115	70-130
Chlorobenzene	111	70-130
Ethyl Benzene	115	70-130
m,p-Xylene	115	70-130
o-Xylene	122	70-130
Styrene	125	70-130
Bromoform	118	70-130
Cumene	116	70-130
1,1,2,2-Tetrachloroethane	120	70-130
Propylbenzene	120	70-130
4-Ethyltoluene	117	70-130
1,3,5-Trimethylbenzene	117	70-130
1,2,4-Trimethylbenzene	126	70-130
1,3-Dichlorobenzene	118	70-130
1,4-Dichlorobenzene	119	70-130
alpha-Chlorotoluene	132 Q	70-130
1,2-Dichlorobenzene	123	70-130
1,2,4-Trichlorobenzene	133 Q	70-130
Hexachlorobutadiene	130	70-130
1,1-Difluoroethane	Not Spiked	

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 $\label{eq:Q} \textbf{Q} = \textbf{Exceeds Quality Control limits}.$

		Method Limits
Surrogates	%Recovery	
Toluene-d8	105	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	98	70-130



Client Sample ID: LCS Lab ID#: 1512124-19B

EPA METHOD TO-15 GC/MS

File Name:	14121808	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 12/18/15 11:53 AM
		11 (1 1

		Method
Compound	%Recovery	Limits
Freon 12	116	70-130
Freon 114	116	70-130
Chloromethane	105	70-130
Vinyl Chloride	111	70-130
1,3-Butadiene	107	70-130
Bromomethane	110	70-130
Chloroethane	100	70-130
Freon 11	116	70-130
Ethanol	90	70-130
Freon 113	104	70-130
1,1-Dichloroethene	107	70-130
Acetone	104	70-130
2-Propanol	110	70-130
Carbon Disulfide	95	70-130
3-Chloropropene	106	70-130
Methylene Chloride	106	70-130
Methyl tert-butyl ether	103	70-130
trans-1,2-Dichloroethene	100	70-130
Hexane	110	70-130
1,1-Dichloroethane	110	70-130
2-Butanone (Methyl Ethyl Ketone)	110	70-130
cis-1,2-Dichloroethene	107	70-130
Tetrahydrofuran	97	70-130
Chloroform	109	70-130
1,1,1-Trichloroethane	110	70-130
Cyclohexane	98	70-130
Carbon Tetrachloride	119	70-130
2,2,4-Trimethylpentane	110	70-130
Benzene	101	70-130
1,2-Dichloroethane	112	70-130
Heptane	104	70-130
Trichloroethene	93	70-130
1,2-Dichloropropane	108	70-130
1,4-Dioxane	106	70-130
Bromodichloromethane	108	70-130
cis-1,3-Dichloropropene	106	70-130
4-Methyl-2-pentanone	87	70-130
Toluene	102	70-130
trans-1,3-Dichloropropene	108	70-130
1,1,2-Trichloroethane	106	70-130
Tetrachloroethene	104	70-130
2-Hexanone	109	70-130



Client Sample ID: LCS Lab ID#: 1512124-19B EPA METHOD TO-15 GC/MS

File Name: 14121808 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 12/18/15 11:53 AM

		Method
Compound	%Recovery	Limits
Dibromochloromethane	108	70-130
1,2-Dibromoethane (EDB)	108	70-130
Chlorobenzene	104	70-130
Ethyl Benzene	106	70-130
m,p-Xylene	106	70-130
o-Xylene	108	70-130
Styrene	104	70-130
Bromoform	109	70-130
Cumene	107	70-130
1,1,2,2-Tetrachloroethane	118	70-130
Propylbenzene	108	70-130
4-Ethyltoluene	106	70-130
1,3,5-Trimethylbenzene	102	70-130
1,2,4-Trimethylbenzene	103	70-130
1,3-Dichlorobenzene	106	70-130
1,4-Dichlorobenzene	104	70-130
alpha-Chlorotoluene	123	70-130
1,2-Dichlorobenzene	108	70-130
1,2,4-Trichlorobenzene	95	70-130
Hexachlorobutadiene	91	70-130
1,1-Difluoroethane	Not Spiked	

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



Client Sample ID: LCSD Lab ID#: 1512124-19BB EPA METHOD TO-15 GC/MS

File Name: 14121809 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 12/18/15 12:17 PM

	0/8	Method
Compound	%Recovery	Limits
Freon 12	115	70-130
Freon 114	107	70-130
Chloromethane	102	70-130
Vinyl Chloride	107	70-130
1,3-Butadiene	98	70-130
Bromomethane	110	70-130
Chloroethane	99	70-130
Freon 11	109	70-130
Ethanol	88	70-130
Freon 113	100	70-130
1,1-Dichloroethene	102	70-130
Acetone	107	70-130
2-Propanol	108	70-130
Carbon Disulfide	92	70-130
3-Chloropropene	98	70-130
Methylene Chloride	100	70-130
Methyl tert-butyl ether	99	70-130
trans-1,2-Dichloroethene	96	70-130
Hexane	103	70-130
1,1-Dichloroethane	107	70-130
2-Butanone (Methyl Ethyl Ketone)	105	70-130
cis-1,2-Dichloroethene	103	70-130
Tetrahydrofuran	94	70-130
Chloroform	106	70-130
1,1,1-Trichloroethane	109	70-130
Cyclohexane	96	70-130
Carbon Tetrachloride	112	70-130
2,2,4-Trimethylpentane	108	70-130
Benzene	101	70-130
1,2-Dichloroethane	106	70-130
Heptane	99	70-130
Trichloroethene	96	70-130
1,2-Dichloropropane	106	70-130
1,4-Dioxane	105	70-130
Bromodichloromethane	108	70-130
cis-1,3-Dichloropropene	101	70-130
4-Methyl-2-pentanone	86	70-130
Toluene	102	70-130
trans-1,3-Dichloropropene	111	70-130
1,1,2-Trichloroethane	104	70-130
Tetrachloroethene	104	70-130
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Client Sample ID: LCSD Lab ID#: 1512124-19BB EPA METHOD TO-15 GC/MS

File Name: 14121809 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 12/18/15 12:17 PM

		Method
Compound	%Recovery	Limits
Dibromochloromethane	107	70-130
1,2-Dibromoethane (EDB)	105	70-130
Chlorobenzene	105	70-130
Ethyl Benzene	103	70-130
m,p-Xylene	106	70-130
o-Xylene	108	70-130
Styrene	103	70-130
Bromoform	107	70-130
Cumene	104	70-130
1,1,2,2-Tetrachloroethane	115	70-130
Propylbenzene	105	70-130
4-Ethyltoluene	104	70-130
1,3,5-Trimethylbenzene	101	70-130
1,2,4-Trimethylbenzene	103	70-130
1,3-Dichlorobenzene	106	70-130
1,4-Dichlorobenzene	101	70-130
alpha-Chlorotoluene	116	70-130
1,2-Dichlorobenzene	107	70-130
1,2,4-Trichlorobenzene	92	70-130
Hexachlorobutadiene	85	70-130
1,1-Difluoroethane	Not Spiked	

Container Type. W. Not Applicable		Method			
Surrogates	%Recovery	Limits			
1,2-Dichloroethane-d4	100	70-130			
Toluene-d8	100	70-130			
4-Bromofluorobenzene	102	70-130			

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	Results and billing to: P&D Environmental, Inc. lab@pdenviro.com	REMARKS:												AND DESCRIPTION OF THE PERSONS ASSESSMENT							

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esterranceoncessurviculos.	Results and billing to: P&D Environmental, Inc. lab@pdenviro.com					REMARKS:		<u></u> -	4	LEF	ح ح	ŽSH,	UA						



12/13/2015
Mr. Paul King
P & D Environmental
55 Santa Clara
Suite 240
Oakland CA 94610

Project Name: RED HANGER KLEANERS 6239 COLLEGE AVE OAK

Project #: 0461

Workorder #: 1512047

Dear Mr. Paul King

The following report includes the data for the above referenced project for sample(s) received on 12/3/2015 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: 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 #: 1512047

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 HANGER KLEANERS 6239

DATE RECEIVED: 12/03/2015 CONTACT: COLLEGE AVE OAK Kyle Vagadori

DATE COMPLETED: 12/13/2015

			RECEIPT	FINAL
FRACTION #	<u>NAME</u>	<u>TEST</u>	VAC./PRES.	<u>PRESSURE</u>
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	SG5-7	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
07A	SG5-17	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
08A	SG6-7	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
09A	SG6-17	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
10A	SG7-7	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
11A	SG7-17	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
12A	SG8-7	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
13A	SG9-17	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
14A	SG10-7	Modified TO-15 (5&20 ppbv	Tedlar Bag	Tedlar Bag
15A	Lab Blank	Modified TO-15 (5&20 ppbv	NA	NA
16A	CCV	Modified TO-15 (5&20 ppbv	NA	NA

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CERTIFIED BY:	0 0	DATE: $\frac{12/13/15}{}$
CERTIFIED DIT		2.112.

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935 Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program) Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015. 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# 1512047

Fourteen 1 Liter Tedlar Bag samples were received on December 03, 2015. 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

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.

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

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#: 1512047-01A

Lau 1D#: 151204/-01A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	2000000	7900000	5400000	21000000
Client Sample ID: SG2-7				
Lab ID#: 1512047-02A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	2000000	4500000	5400000	12000000
Client Sample ID: SG2-17				
Lab ID#: 1512047-03A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	2000000	3400000	5400000	9200000
Client Sample ID: SG3-17				
Lab ID#: 1512047-04A				
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	2000000	3200000	5400000	8800000
Client Sample ID: SG4-7				
Lab ID#: 1512047-05A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	330000	1500000	900000	4000000
Client Sample ID: SG5-7				
Lab ID#: 1512047-06A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	1000000	3800000	2700000	10000000



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

Client Sample ID: SG5-17
Lab ID#: 1512047-07A

Lab ID#: 1512047-07A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	1000000	2800000	2700000	7400000
Client Sample ID: SG6-7				
Lab ID#: 1512047-08A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	1000000	5800000	2700000	16000000
Client Sample ID: SG6-17				
Lab ID#: 1512047-09A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	1000000	3800000	2700000	10000000
Client Sample ID: SG7-7				
Lab ID#: 1512047-10A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	1000000	6900000	2700000	18000000
Client Sample ID: SG7-17				
Lab ID#: 1512047-11A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	1000000	2800000	2700000	7600000
Client Sample ID: SG8-7				
Lab ID#: 1512047-12A				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	1000000	2700000	2700000	7400000



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

Client Sample ID: SG9-17 Lab ID#: 1512047-13A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	1000000	3500000	2700000	9400000
Client Sample ID: SG10-7				

Lab ID#: 1512047-14A

Compound	Rpt. Limit (ppbv)	(ppbv)	(ug/m3)	(ug/m3)	
1,1-Difluoroethane	1000000	2900000	2700000	7800000	



Client Sample ID: SG1-7 Lab ID#: 1512047-01A EPA METHOD TO-15 GC/MS

File Name:	14120418	Date of Collection: 12/2/15 9:25:00 AM
Dil. Factor:	100000	Date of Analysis: 12/4/15 08:48 PM

	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	2000000	7900000	5400000	21000000

7.		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	95	70-130



Client Sample ID: SG2-7 Lab ID#: 1512047-02A

EPA METHOD TO-15 GC/MS

File Name:	14120419	Dat	e of Collection: 12/2	/15 11:15:00 AM
Dil. Factor:	100000	Dat	e of Analysis: 12/4/1	5 09:10 PM
	Rpt. Limit	Amount	Rpt. Limit	Amount

	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	2000000	4500000	5400000	12000000

,,		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	112	70-130
4-Bromofluorobenzene	95	70-130



Client Sample ID: SG2-17 Lab ID#: 1512047-03A

EPA METHOD TO-15 GC/MS

File Name:	14120420	Date of Collection: 12/2/15 11:24:00 AM		
Dil. Factor:	100000	Dat	e of Analysis: 12/4/1	5 09:33 PM
•	Rpt. Limit	Amount	Rpt. Limit	Amount

Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)	
1.1-Difluoroethane	2000000	3400000	5400000	9200000	

<i>,</i> . •		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	106	70-130	
Toluene-d8	100	70-130	
4-Bromofluorobenzene	97	70-130	



Client Sample ID: SG3-17 Lab ID#: 1512047-04A

EPA METHOD TO-15 GC/MS

File Name: Dil. Factor:	14120421 100000	Date of Collection: 12/2/15 10:20:00 AM Date of Analysis: 12/4/15 09:55 PM		
Compound	Rpt. Limit (ppbv)			Amount (ug/m3)

3200000

5400000

2000000

8800000

Container Type: 1 Liter Tedlar Bag

1,1-Difluoroethane

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	111	70-130	
Toluene-d8	101	70-130	
4-Bromofluorobenzene	98	70-130	



Client Sample ID: SG4-7 Lab ID#: 1512047-05A

EPA METHOD TO-15 GC/MS

File Name:	14120423 Date of Collection: 12/2/15 9:29:00			2/15 9:29:00 AM
Dil. Factor:	16700	Date of Analysis: 12/5/15 06:18 AM		15 06:18 AM
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	330000	1500000	900000	4000000

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	109	70-130	
Toluene-d8	98	70-130	
4-Bromofluorobenzene	91	70-130	



Client Sample ID: SG5-7 Lab ID#: 1512047-06A

EPA METHOD TO-15 GC/MS

File Name:	14120424	Date of Collection: 12/2/15 1:04:00 PN			
Dil. Factor:	50000	Date of Analysis: 12/5/15 06:44 AM			
Compound	Rpt. Limit	Amount	Rpt. Limit	Amount	
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)	
1,1-Difluoroethane	1000000	3800000	2700000	10000000	

-		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	107	70-130	
Toluene-d8	107	70-130	
4-Bromofluorobenzene	90	70-130	



Client Sample ID: SG5-17 Lab ID#: 1512047-07A

EPA METHOD TO-15 GC/MS

File Name:	14120425	Date of Collection: 12/2/15 1:20:00		
Dil. Factor:	50000	Date of Analysis: 12/5/15 07:12 AN		
Compound	Rpt. Limit	Amount	Rpt. Limit	Amount
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	1000000	2800000	2700000	7400000

		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	94	70-130



Client Sample ID: SG6-7 Lab ID#: 1512047-08A

EPA METHOD TO-15 GC/MS

File Name:	14120426	Date of Collection: 12/2/15 2:42:00 PM		
Dil. Factor:	50000	Date of Analysis: 12/5/15 07:37 AM		
Compound	Rpt. Limit	Amount	Rpt. Limit	Amount
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1 1-Difluoroethane	100000	5800000	2700000	16000000

-		Method Limits	
Surrogates	%Recovery		
1,2-Dichloroethane-d4	114	70-130	
Toluene-d8	97	70-130	
4-Bromofluorobenzene	100	70-130	



Client Sample ID: SG6-17 Lab ID#: 1512047-09A

EPA METHOD TO-15 GC/MS

File Name:	14120427	Date of Collection: 12/2/15 2:51:00 PM		
Dil. Factor:	50000	Date of Analysis: 12/5/15 08:08 AM		
Compound	Rpt. Limit	Amount	Rpt. Limit	Amount
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	1000000	3800000	2700000	10000000

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	111	70-130	
Toluene-d8	102	70-130	
4-Bromofluorobenzene	98	70-130	



Client Sample ID: SG7-7 Lab ID#: 1512047-10A

EPA METHOD TO-15 GC/MS

File Name:	14120428	Date of Collection: 12/2/15 1:58:00 PM		
Dil. Factor:	50000	Date of Analysis: 12/5/15 08:31 AM		
Compound	Rpt. Limit	Amount	Rpt. Limit	Amount
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1 1-Difluoroethane	1000000	6900000	2700000	18000000

		Method	
Surrogates	%Recovery	Limits	
1,2-Dichloroethane-d4	101	70-130	
Toluene-d8	99	70-130	
4-Bromofluorobenzene	97	70-130	



Client Sample ID: SG7-17 Lab ID#: 1512047-11A

EPA METHOD TO-15 GC/MS

File Name: Dil. Factor:	14120429 50000	Date of Collection: 12/2/15 2:11:00 PM Date of Analysis: 12/5/15 08:59 AM		
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Difluoroethane	1000000	2800000	2700000	7600000

,,		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	115	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	95	70-130



Client Sample ID: SG8-7 Lab ID#: 1512047-12A

EPA METHOD TO-15 GC/MS

File Name: 14120430 Date of Collection: 12/2/15 10:38:00 Al Dil. Factor: 50000 Date of Analysis: 12/5/15 09:22 AM	•	Dut Limit	Amount Dat Limit Amount
File Name: 14120430 Date of Collection: 12/2/15 10:38:00 Al	Dil. Factor:	50000	Date of Analysis: 12/5/15 09:22 AM
	File Name:	14120430	Date of Collection: 12/2/15 10:38:00 /

	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)
1,1-Difluoroethane	1000000	2700000	2700000	7400000

,,		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	91	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	95	70-130



Client Sample ID: SG9-17 Lab ID#: 1512047-13A

EPA METHOD TO-15 GC/MS

File Name:	14120431	Date of Collection: 12/2/15 3:31:00 PM				
Dil. Factor:	50000	Date of Analysis: 12/5/15 09:49 AM				
Compound	Rpt. Limit	Amount	Rpt. Limit	Amount		
	(ppbv)	(ppbv)	(ug/m3)	(ug/m3)		
1,1-Difluoroethane	1000000	3500000	2700000	9400000		

		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	92	70-130



Client Sample ID: SG10-7 Lab ID#: 1512047-14A

EPA METHOD TO-15 GC/MS

File Name: Dil. Factor:	14120432 50000	Date of Collection: 12/2/15 3:49:00 PM Date of Analysis: 12/5/15 10:51 AM				
Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)		
1,1-Difluoroethane	1000000	2900000	2700000	7800000		

		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	112	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	80	70-130



Client Sample ID: Lab Blank Lab ID#: 1512047-15A

EPA METHOD TO-15 GC/MS

File Name:	14120406c	Dat	te of Collection: NA	
Dil. Factor:	1.00	Dat	te of Analysis: 12/4/1	15 04:22 PM
	Rpt. Limit	Amount	Rpt. Limit	Amount
Compound	(vdqq)	(ppby)	(ua/m3)	(ua/m3)

1,1-Difluoroethane 20 Not Detected 54 Not Detected

Container Type: NA - Not Applicable

<i>,</i>		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	110	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	97	70-130



Client Sample ID: CCV Lab ID#: 1512047-16A

EPA METHOD TO-15 GC/MS

File Name: 14120405 Date of Collection: NA
Dil. Factor: 1.00 Date of Analysis: 12/4/15 03:57 PM

Compound %Recovery

1,1-Difluoroethane 90

Container Type: NA - Not Applicable

		Method
Surrogates	%Recovery	Limits
1,2-Dichloroethane-d4	109	70-130
Toluene-d8	92	70-130
4-Bromofluorobenzene	102	70-130

APPENDIX E

DTSC December 2014 Vapor Intrusion Risk and Hazard Calculation Work Sheets

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

DATA ENTRY SHEET

Scenario: Residential Chemical: Benzene

				DATA ENTRE								
			Soil	Gas Concentration	ı Data				Result	s Summary		
	Desette	ENTER	ENTER		ENTER			Soil Gas Conc. A	ttenuation Factor	Indoor Air Conc.	Cancer	Noncancer
	Reset to		Soil		Soil			(µg/m ³)	(unitless)	(µg/m³)	Risk	Hazard
	Defaults	Chemical	gas	OR	gas			1.00E+01	9.4E-04	9.4E-03	9.7E-08	3.0E-03
		CAS No.	conc.,		conc.,		·					<u>.</u>
		(numbers only,	C_g		C_g							
		no dashes)	(μg/m³)		(ppmv)	Chemical						
		71432	1.00E+01			Benzene						
						MESSAGE: See VLO and/or toxicity criteria		chemical properties				
		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 space floor,	depth	soil	soil type (used to estimate	OR	soil vapor permeability,					
		Space floor, L _F	below grade, L _s	temperature, T _S	soil vapor	OR	permeability, k _v					
		:			·		(cm ²)					
		(15 or 200 cm)	(cm)	(°C)	permeability)	·	(CIII)					
		15	182.88	24	SI			†				
	MORE ↓	ENTER 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 ^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	.	ENTER Average vapor flow rate into bldg. (Leave blank to calcula Q _{soil} (L/m)	ate) -				
C	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 _C	AT _{NC}	ED	EF	ET	ACH					
	Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹	_				
				-				-				
NEW=>	Residential	70	26	26	350	24	0.5					

END

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

DATA ENTRY SHEET

Scenario: Residential Chemical: Toluene

Results Summary

Indoor Air Conc.

(μg/m³) **9.4E-03**

Cancer

Risk

NA

Noncancer

Hazard

3.0E-05

		Soil	Gas Concentration	n Data			Kesuit	
Donot to	ENTER	ENTER		ENTER		Soil Gas Conc.	Attenuation Factor	
Reset to		Soil		Soil		(µg/m³)	(unitless)	
Defaults	Chemical	gas	OR	gas		1.10E+01	8.6E-04	
	CAS No.	conc.,		conc.,				
	(numbers only,	C_{g}		C_{g}				
	no dashes)	(μg/m³)	•	(ppmv)	Chemical		-	
			•				=	
	108883	1.10E+01			Toluene		=	

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE Ψ	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm²)
	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, θ_w^V (cm^3/cm^3)		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (L/m)
	SI	1.35	0.489	0.167		5
MORE Ψ	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
Lookup Receptor Parameters	carcinogens, AT _C	noncarcinogens, AT _{NC}	duration, ED	frequency, EF	Time ET	Rate ACH
Faiailleteis	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
NEW=> Residential	70	26	26	350	24 (NEW)	0.5 (NEW)
END						

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

Scenario: Residential

Tetrachloroethylene

Results Summary

Indoor Air Conc.

(μg/m³) 3.7E+00

Cancer

Risk

7.7E-06

Noncancer

Hazard

1.0E-01

			DATA ENTRY S	SHEET			Chemical:	Tetrachloroet
		Soil	Gas Concentration	n Data				Result
Reset to Defaults	ENTER Chemical CAS No. (numbers only,	ENTER Soil gas conc., Cq	OR OR	ENTER Soil gas conc., Cq			Soil Gas Conc. (μg/m³) 5.80E+03	Attenuation Factor (unitless) 6.3E-04
	no dashes)	(μg/m³)	_	(ppmv)	Chemical			
	127184	5.80E+03	-]		Tetrachloroethyle	ene		
	ENTER Depth	ENTER	ENTER	ENTER		ENTER]	
MORE ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _s (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm²)		
	15	182.88	24	SI			1	
MORE ↓	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, Pb ^A (g/cm ³)	ENTER Vadose zone soil total porosity, n (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)		ENTER Average vapor flow rate into bldg Leave blank to calcu Q _{soil} (L/m)		
	SI	1.35	0.489	0.167		5		
MORE ↓	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange		

END

Residential

Lookup Receptor

Parameters

carcinogens,

 AT_{C}

(yrs)

70

noncarcinogens,

AT_{NC}

(yrs)

26

duration,

ED

(yrs)

26

frequency,

EF

(days/yr)

350

Time

ET

(hrs/day)

24

(NEW)

Rate

ACH

(hour)⁻¹

0.5

(NEW)

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

DATA ENTRY SHEET

Scenario: Residential Chemical: Carbon disulfide

Results Summary

Indoor Air Conc.

(μg/m³) **5.6E-02**

Cancer

Risk

NA

Noncancer

Hazard

7.7E-05

		Soil		Result				
Reset to Defaults	Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C _g (µg/m³)	OR	ENTER Soil gas conc., C _g (ppmv)	Chemical		Soil Gas Conc. A (μg/m³) 5.40E+01	Attenuation Factor (unitless) 1.0E-03
	75150	5.40E+01			Carbon disulfide			
	ENTER	ENTER	ENTER	ENTER		ENTER	7	

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm²)
	15	182.88	24	SI		

ENTER

ENTER

soil type Lookup Soil Parameters	soil dry bulk density, ρ_b^A (g/cm ³)	soil total porosity, n ^V (unitless)	soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ \ \ \ \ }$ (cm^3/cm^3)		flow rate into bldg. (Leave blank to calculate) Q _{soil} (L/m)
SI	1.35	0.489	0.167		5
ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
•	•	,			Rate ACH
(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
70	26	26	350	24 (NEW)	0.5 (NEW)
	ENTER Averaging time for carcinogens, AT _C (yrs)	Lookup Soil Parameters (g/cm³) SI 1.35 ENTER Averaging time for carcinogens, AT _C (yrs) (yrs)	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Lookup Soil Parameters (g/cm³) (unitless) (cm³/cm³) SI 1.35 0.489 0.167 ENTER ENTER ENTER ENTER ENTER ENTER Averaging time for time for Exposure Exposure Carcinogens, noncarcinogens, AT _C AT _{NC} ED EF ET (yrs) (yrs) (yrs) (days/yr) (hrs/day)

ENTER

ENTER

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

Scenario: Residential

Tetrachloroethylene

Results Summary

Indoor Air Conc.

 $(\mu g/m^3)$

3.7E+01

Cancer

Risk

7.8E-05

Noncancer

Hazard

1.0E+00

		DATA ENTRY SHEET									
		Soil	Gas Concentration	n Data				Results			
Reset to	ENTER	ENTER Soil	<u> </u>	ENTER Soil			Soil Gas Conc. (µg/m³)	Attenuation Factor (unitless)			
Defaults	Chemical	gas	OR	gas			5.90E+04	6.3E-04			
	CAS No. (numbers only,	conc., C _g		conc., $C_{\rm g}$							
	no dashes)	(μg/m³)	•	(ppmv)	Chemical						
	127184	5.90E+04]		Tetrachloroethyle	ene					
	ENTER	ENTER	ENTER	ENTER		ENTER	7				
	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	0.0	soil vapor					
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,					
	L_{F}	Ls	Ts	soil vapor		k _v 2.					
	(15 or 200 cm)	(cm)	(°C)	permeability)	ı	(cm ²)	4				
	15	182.88	24	SI			1				
MORE	ENTER Vandose zone	ENTER Vadose zone	ENTER Vadose zone	ENTER Vadose zone		ENTER Average vapor					
J.	SCS	soil dry	soil total	soil water-filled		flow rate into bldg					
	soil type	bulk density,		porosity,	(Leave blank to calcul					
	Lookup Soil	ρ _b ^A	porosity, n ^V	θ_{w}^{V}	,	Q_{soil}	,				
	Parameters	(g/cm ³)	(unitless)	(cm ³ /cm ³)	i	(L/m)	_				
	SI	1.35	0.489	0.167		5]				
MORE ¥	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER					

Lookup Receptor

Parameters

Residential

END

Averaging

time for

carcinogens,

 AT_{C}

(yrs)

70

Averaging

time for

noncarcinogens,

AT_{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

(NEW)

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) 3.2E+01

Cancer

Risk

6.8E-05

Noncancer

Hazard

8.9E-01

		Soil	Gas Concentratio	n Data				Result
Reset to Defaults	ENTER Chemical	ENTER Soil	OB	ENTER Soil			(µg/m³)	Attenuation Factor (unitless)
Deladio	CAS No. (numbers only,	gas conc., C_g	OR	gas conc., C _g			1.20E+05	2.7E-04
	no dashes)	(μg/m³)	•	(ppmv)	Chemical			
	127184	1.20E+05			Tetrachloroethylene			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER		
MORE	below grade	Soil gas		Vadose zone		Jser-defined		

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _s (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k_v (cm ²)
	15	487.68	24	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 ^V (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $		Average vapor flow rate into bldg. (Leave blank to calculate) $Q_{soil} \\ (L/m)$
		SI	1.35	0.489	0.167		5
	MORE ¥	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
	Lookup Receptor	carcinogens, AT _C	noncarcinogens, AT_{NC}	duration, ED	frequency, EF	Time ET	Rate ACH
Į	Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
EW=>	Residential	70	26	26	350	24 (NEW)	0.5 (NEW)
	END					,	, ,

ENTER

ENTER

ENTER

ENTER

Cancer

Risk

5.9E-07

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: Benzene

		Soil	Gas Concentration	n Data				Result	s Summary
Reset to Defaults	ENTER Chemical	ENTER Soil gas	OR	ENTER Soil gas			Soil Gas Conc. (μg/m³) 1.30E+02	Attenuation Factor (unitless) 4.4E-04	Indoor Air Conc. (µg/m³) 5.7E-02
	CAS No. (numbers only, no dashes)	conc., C _g (μg/m³)		conc., C_g (ppmv)	Chemical				
	71432	1.30E+02			Benzene				
					MESSAGE: See VLOOK and/or toxicity criteria for		chemical properties		
	ENTER Depth	ENTER	ENTER	ENTER	and toxiony official to	ENTER			
MORE V	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm ²)			
	15	487.68	24	SI	1				
MORE ↓	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, Pb ^A (g/cm ³)	ENTER Vadose zone soil total porosity, n (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	(L	ENTER Average vapor flow rate into bldg. Leave blank to calcula Q _{soil} (L/m)	ate)		
			(unitless)		<u>-</u> -	(L/M)			
	SI	1.35	0.489	0.167		5			
MORE 🔱	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange			
Lookup Receptor Parameters	carcinogens, AT _C (yrs)	noncarcinogens, AT _{NC} (yrs)	duration, ED (yrs)	frequency, EF (days/yr)	Time ET (hrs/day)	Rate ACH (hour) ⁻¹			
NEW=> Residential	70	26	26	350	24	0.5	-]		
TABLE					(NEW)	(NEW)			

END

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

Scenario: Residential

Tetrachloroethylene

Results Summary

Indoor Air Conc.

(μg/m³) 1.7E+01

Cancer

Risk

3.5E-05

Noncancer

Hazard

4.6E-01

	_		DATA ENTRY S	SHEET			Chemical:	Tetrachloroet
		Soil	Gas Concentration	n Data				Result
Reset to	ENTER	ENTER Soil		ENTER Soil			Soil Gas Conc. (µg/m³)	Attenuation Factor (unitless)
Defaults	Chemical	gas	OR	gas			6.20E+04	2.7E-04
	CAS No.	conc.,		conc.,				
	(numbers only,	C_g		C_g				
	no dashes)	(μg/m ³)	_	(ppmv)	Chemical			
	127184	6.20E+04	1		Tetrachloroethyle	ene		
	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_{F}	L_s	Ts	soil vapor		k _v		
	(15 or 200 cm)	(cm)	(°C)	permeability)	•	(cm ²)	_	
	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 [∨]	porosity, $\theta_{w}^{\ V}$	(Leave blank to calcu	iate)	
	Lookup Soil Parameters	ρ _b ^A				Q_{soil}		
	1 diameters	(g/cm ³)	(unitless)	(cm ³ /cm ³)	i	(L/m)	_	
	SI	1.35	0.489	0.167		5		
MORE								

Last Update: December 2014
DTSC Human and Ecological Risk Office

 $\mathbf{\Psi}$

Lookup Receptor

Parameters

Residential

END

ENTER

Averaging

time for

carcinogens,

 AT_{C}

(yrs)

70

ENTER

Averaging

time for

noncarcinogens,

AT_{NC}

(yrs)

26

ENTER

Exposure

duration,

ED

(yrs)

26

ENTER

Exposure

frequency,

EF

(days/yr)

350

ENTER

Exposure

Time

ET

(hrs/day)

24

(NEW)

ENTER

Air Exchange

Rate

ACH

(hour)⁻¹

0.5

(NEW)

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

DATA ENTRY SHEET

Scenario: Residential Chemical: Cyclohexane

Results Summary

Indoor Air Conc.

(μg/m³) **4.4E-02**

Cancer

Risk

NA

Noncancer

Hazard

7.1E-06

		Soil C			Result		
Reset to Defaults	ENTER Chemical	ENTER Soil gas	OR	ENTER Soil gas		Soil Gas Conc. (µg/m³) 1.10E+02	Attenuation Factor (unitless) 4.0E-04
	CAS No. (numbers only, no dashes)	conc., C _g (μg/m³)		conc., C _g (ppmv)	Chemical		
	110827	1.10E+02			Cyclohexane		

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _s (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm ²)
	15	487.68	24	SI		

MORE ↓	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, ρ _b ^A (g/cm ³)	Vadose zone soil total porosity, n ^V (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $		Average vapor flow rate into bldg. (Leave blank to calculate) $Q_{\text{soil}} \begin{tabular}{l} (L/m) \end{tabular}$
	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
Lookup Recepto	carcinogens, AT _C	noncarcinogens, AT_{NC}	duration, ED	frequency, EF	Time ET	Rate ACH
Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
NEW=> Residential	70	26	26	350	24 (NEW)	0.5 (NEW)
END					(1424)	(IAEAA)

ENTER

ENTER

ENTER

ENTER

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) 2.3E+00

Cancer

Risk

4.9E-06

Noncancer

Hazard

6.4E-02

		Soil G	as 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		3.70E+03	6.3E-04
	CAS No. (numbers only,	conc., C _g		conc., C _g			
	no dashes)	(μg/m³)		(ppmv)	Chemical		
	127184	3.70E+03			Tetrachloroethylene		

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm²)
	15	182.88	24	SI		

ENTER

ENTER

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 ^V (unitless)	Vadose zone soil water-filled porosity, θ_w^V (cm³/cm³)		Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (L/m)
	SI	1.35	0.489	0.167		5
MORE ¥	ENTER Averaging	ENTER Averaging	ENTER	ENTER	ENTER	ENTER
	time for carcinogens,	time for noncarcinogens,	Exposure duration,	Exposure frequency,	Exposure Time	Air Exchange Rate
Lookup Receptor Parameters	AT_C	AT _{NC}	ED	EF	ET	ACH
Faianieleis	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
NEW=> Residential	70	26	26	350	24	0.5
END					(NEW)	(NEW)

ENTER

ENTER

15

ENTER

182.88

ENTER

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) 2.3E+00

Cancer

Risk

4.9E-06

Noncancer

Hazard

6.4E-02

		Soil	Gas Concentration	n Data				Result
D	ENTER	ENTER		ENTER			Soil Gas Conc. A	Attenuation Factor
Reset to		Soil		Soil			(µg/m³)	(unitless)
Defaults	Chemical	gas	OR	gas			3.70E+03	6.3E-04
	CAS No.	conc.,		conc.,				
	(numbers only,	C_g		C_g				
	no dashes)	(μg/m³)	_	(ppmv)	Chemical			
	127184	3.70E+03	1		Tetrachloroethylene)		
	ENTER	ENTER	ENTER	ENTER		ENTER	7	
MODE	Depth	0 - 11		Madaaaaa		Harrie de Corred		
MORE ↓	below grade to bottom	Soil gas	Averege	Vadose zone SCS		User-defined vadose zone		
	of enclosed	sampling depth	Average soil	soil type		soil vapor		
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,		
	L _F	L _s	T _S	soil vapor	OIT	k _v		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm ²)		

	MORE ↓	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, $ ho_b^A$ (g/cm ³)	Vadose zone soil total porosity, n ^V (unitless)	Vadose zone soil water-filled porosity, θ _w (cm³/cm³)		Average vapor flow rate into bldg. (Leave blank to calculate) $\frac{Q_{soil}}{(L/m)}$
		SI	1.35	0.489	0.167		5
	MORE ↓	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Evolungo
		carcinogens,	noncarcinogens,	duration,	frequency,	Time	Air Exchange Rate
	Lookup Receptor	AT _C	AT _{NC}	ED	EF	ET	ACH
	Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
NEW=>	Residential	70	26	26	350	24	0.5
	END					(NEW)	(NEW)

24

ENTER

SI

ENTER

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

Scenario: Residential

Chemical: Tetrachloroethylene

Results Summary

Indoor Air Conc.

(μg/m³) 1.5E+01

Cancer

Risk

3.1E-05

Noncancer

Hazard

4.0E-01

			DATA ENTRY S	SHEET			Cnemical:	letrachioroe	ŧτι
		Soil	Gas Concentration	n Data				Resu	lts
Reset to	ENTER	ENTER Soil	<u> </u>	ENTER Soil			Soil Gas Conc. (µg/m³)	Attenuation Factor (unitless)	_
Defaults	Chemical	gas	OR	gas			2.30E+04	6.3E-04	
	CAS No.	conc.,		conc.,					
	(numbers only,	C_g		C_g					
	no dashes)	(μg/m³)	ı	(ppmv)	Chemical				
	127184	2.30E+04			Tetrachloroethyle	ene			
							-		
	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	0.5	soil vapor			
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,			
	L_{F}	L _s	Ts	soil vapor		k _v			
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm ²)	1		
	15	182.88	24	SI			-		
	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 ^V	porosity,	(Leave blank to calcul	ate)		
	Lookup Soil Parameters	ρ_b^A	• • • • • • • • • • • • • • • • • • • •	θ_{w}^{V}		Q_{soil}			
	Parameters	(g/cm ³)	(unitless)	(cm ³ /cm ³)		(L/m)	-		
	SI	1.35	0.489	0.167		5]		
MORE ↓	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER			
•	Averaging	Averaging	ENIER	ENIER	ENIER	ENIER			
	time for	time for	Exposure	Exposure	Exposure	Air Exchange			
	carcinogens,	noncarcinogens,	duration,	frequency,	Time	Rate			
Lookup Receptor	AT _C	AT _{NC}	ED ED	EF	ET	ACH			
Parameters	76	NC				7.011			

Parameters

Residential

END

(yrs)

70

(yrs)

26

(yrs)

26

(days/yr)

350

(hrs/day)

24

(NEW)

(hour)⁻¹

0.5

(NEW)

Cancer

Risk

2.5E-07

Noncancer

Hazard

7.9E-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: Residential Chemical: Benzene

		Soil	Gas Concentration	n Data				Result	ts Summary
Reset to	ENTER	ENTER		ENTER			Soil Gas Conc. A	Attenuation Factor	Indoor Air Cond
		Soil		Soil			(µg/m³)	(unitless)	(µg/m³)
Defaults	Chemical	gas	OR	gas			5.60E+01	4.4E-04	2.5E-02
	CAS No.	conc.,		conc.,					
	(numbers only,	C _g		C_g					
	no dashes)	(μg/m³)		(ppmv)	Chemical				
	71432	5.60E+01			Benzene				
	7 1432	5.60E+01			•	OKUP table comments on o	chemical properties		
					and/or toxicity criteria f	for this chemical.	_		
	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_{F}	L _s	Ts	soil vapor		k _v			
	(15 or 200 cm)	(cm)	(°C)	permeability)	•	(cm ²)			
	15	487.68	24	SI			1		
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, θ_w^V (cm^3/cm^3)		ENTER Average vapor flow rate into bldg. (Leave blank to calcula Q _{soil} (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			
Leelon Beerrin	carcinogens,	noncarcinogens,	duration,	frequency,	Time	Rate			
Lookup Receptor Parameters	AT _C	AT _{NC}	ED	EF	ET	ACH			
i didilicicis	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹	≡ :		
Residential	70	26	26	350	24	0.5	1		

END

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

DATA ENTRY SHEET

Scenario: Residential Chemical: Toluene

Results Summary

Indoor Air Conc.

(μg/m³) **2.1E-02**

Cancer

Risk

NA

Noncancer

Hazard

6.8E-05

		Soil	Gas Concentration	n Data			Result
Reset to	ENTER	ENTER Soil		ENTER Soil		Soil Gas Conc. Attenu (μg/m³)	ation Factor (unitless)
Defaults	Chemical	gas	OR	gas		5.40E+01	3.9E-04
	CAS No. (numbers only,	conc., C _g		conc., C_g			
	no dashes)	(μg/m ³)	1	(ppmv)	Chemical		
	108883	5.40E+01			Toluene		

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _s (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm ²)
	15	487.68	24	SI		

		ENTER	ENTER	ENTER	ENTER		ENTER
	MORE ↓	Vandose zone SCS	Vadose zone soil dry	Vadose zone soil total	Vadose zone soil water-filled		Average vapor flow rate into bldg.
		soil type	bulk density,	porosity,	porosity,		(Leave blank to calculate)
		Lookup Soil	ρ_b^A	n [∨]	θ_{w}^{V}		Q_{soil}
		Parameters	(g/cm ³)	(unitless)	(cm ³ /cm ³)		(L/m)
		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 _C	AT _{NC}	ED	EF	ET	ACH
	Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
					T		
EW=>	Residential	70	26	26	350	24	0.5
						(NEW)	(NEW)
	END						

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

Scenario: Residential

al: Tetrachloroethylene

Results Summary

Indoor Air Conc.

(μg/m³) **4.0E+00**

Cancer

Risk

8.5E-06

Noncancer

Hazard

1.1E-01

	<u> </u>		DATA ENTRY S	SHEET			Chemical:	Tetrachloroeti
		Soil	Gas Concentration	n Data				Results
Reset to	ENTER	ENTER Soil		ENTER Soil			Soil Gas Conc. (μg/m³)	Attenuation Factor (unitless)
Defaults	Chemical	gas	OR	gas			1.50E+04	2.7E-04
	CAS No.	conc.,		conc.,		•		
	(numbers only,	C_g		C_g				
	no dashes)	(μg/m³)	_	(ppmv)	Chemical			
			=					
	127184	1.50E+04			Tetrachloroethyl	ene		
	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_{F}	L_s	T _S	soil vapor		k_v		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm ²)		
	15	487.68	24	SI				
MORE	ENTER Vandose zone	ENTER Vadose zone	ENTER Vadose zone	ENTER Vadose zone		ENTER Average vapor		
•	SCS soil type	soil dry bulk density	soil total	soil water-filled	,	flow rate into bldg. I eave blank to calcula	ata)	

	MORE ↓	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, ρ_b^A (g/cm ³)	Vadose zone soil total porosity, n ^V (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $		Average vapor flow rate into bldg. (Leave blank to calculate) $Q_{soil} \begin{tabular}{l} Q_{soil} \end{tabular}$
		SI	1.35	0.489	0.167		5
	MORE 🖖	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
	Lookup Receptor	carcinogens, AT _C	noncarcinogens, AT _{NC}	duration, ED	frequency, EF	Time ET	Rate ACH
l	Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
NEW=>	Residential	70	26	26	350	24	0.5
	END					(NEW)	(NEW)

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

DATA ENTRY SHEET

Scenario: Residential Chemical: Carbon disulfide

Results Summary

Indoor Air Conc.

(μg/m³) **7.1E-02**

Cancer

Risk

NA

Noncancer

Hazard

9.7E-05

		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		1.40E+02	5.1E-04
	CAS No. (numbers only,	conc., C _g		conc., C_g			
	no dashes)	(μg/m³)		(ppmv)	Chemical		
	75150	1.40E+02			Carbon disulfide		

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _s (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm ²)
	15	487.68	24	SI		

ENTER

ENTER

MORE ↓	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, ρ_b^A (g/cm ³)	Vadose zone soil total porosity, n ^V (unitless)	Vadose zone soil water-filled porosity, θ _w ^V (cm³/cm³)		Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (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
Lookup Recepto	carcinogens, AT _C	noncarcinogens, AT_{NC}	duration, ED	frequency, EF	Time ET	Rate ACH
Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
EW=> Residential	70	26	26	350	24	0.5
Residential	1 10	20	20	330	(NEW)	(NEW)
END]					

ENTER

ENTER

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

Scenario: Commercial

Tetrachloroethylene

Results Summary

Indoor Air Conc.

(μg/m³) 1.9E+01

Cancer

Risk

9.3E-06

Noncancer

Hazard

1.3E-01

			DATA ENTRY S	SHEET			Chemical:	Tetrachloroet
		Soil	Gas Concentration	n Data				Results
Reset to	ENTER	ENTER Soil		ENTER Soil			(µg/m³)	Attenuation Factor (unitless)
Defaults	Chemical	gas	OR	gas			6.10E+04	3.2E-04
	CAS No. (numbers only,	conc., C _g		conc., C_g				
	no dashes)	(μg/m³)	-	(ppmv)	Chemical			
	127184	6.10E+04			Tetrachloroethyle	ene		
							7	
	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	OR	soil vapor		
	space floor, L _F	below grade, L _s	temperature, T _S	(used to estimate soil vapor	UR	permeability, k _v		
	•		(°C)	·		(cm ²)		
	(15 or 200 cm)	(cm)	(C)	permeability)	•	(Cm)	+	
	15	182.88	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 [∨]	porosity,	(1	Leave blank to calcu	late)	
	Lookup Soil Parameters	ρ_b^A		θ_{w}^{V}		Q_{soil}		
	Parameters	(g/cm ³)	(unitless)	(cm ³ /cm ³)	•	(L/m)	_	
	SI	1.35	0.489	0.167		5		
MORE ↓	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER		

Last Update: December 2014 DTSC Human and Ecological Risk Office

Lookup Receptor

Parameters

Commercial

END

Averaging

time for

carcinogens,

 AT_{C}

(yrs)

70

Averaging

time for

noncarcinogens,

AT_{NC}

(yrs)

25

Exposure

duration,

ED

(yrs)

25

Exposure

frequency,

EF

(days/yr)

250

Exposure

Time

ET

(hrs/day)

8 (NEW) Air Exchange

Rate

ACH

(hour)⁻¹

(NEW)

Cancer

Risk

7.3E-08

Noncancer

Hazard

2.3E-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: Benzene

			DATALININ						
		Soil	Gas Concentration	n Data				Result	s Summary
Reset to	ENTER	ENTER		ENTER			Soil Gas Conc. A	ttenuation Factor	Indoor Air Conc.
		Soil		Soil			(µg/m³)	(unitless)	(µg/m³)
Defaults	Chemical	gas	OR	gas			1.40E+02	2.2E-04	3.1E-02
	CAS No.	conc.,		conc.,					
	(numbers only,	C_g		C_g					
	no dashes)	(μg/m ³)		(ppmv)	Chemical				
		(1.9)	1	(i		
	71432	1.40E+02			Benzene				
	71102	1.102.02		l .	MESSAGE: See VLOOK	(LID table comments on	chemical properties		
					and/or toxicity criteria for		crieffical properties		
	ENTER	ENTER	ENTER	ENTER		ENTER			
	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}	Ls	Ts	soil vapor		k _v			
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm ²)			
	(10 01 200 011)	(=/	(- /	раннасаннуу	1	(- /			
	15	487.68	24	SI					
MORE ¥	ENTER 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 ^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	(I	ENTER Average vapor flow rate into bldg. Leave blank to calcul Q _{soil} (L/m)			
	SI	1.35	0.489	0.167		5]		
MORE ↓ Lookup Receptor Parameters	ENTER Averaging time for carcinogens, AT _C (yrs)	ENTER Averaging time for noncarcinogens, AT _{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure Time ET (hrs/day)	ENTER Air Exchange Rate ACH (hour) ⁻¹			
					• • • • • • • • • • • • • • • • • • • •		=		
EW=> Commercial	70	25	25	250	8	1			
		<u> </u>			(NEW)	(NEW)			

END

15

487.68

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

DATA ENTRY SHEET

Scenario: Commercial Chemical: Toluene

Results Summary

Indoor Air Conc.

(μg/m³) **3.3E-02**

Cancer

Risk

NA

Noncancer

Hazard

2.5E-05

		Soil	Gas Concentration	n Data				Results
Reset to Defaults	ENTER Chemical CAS No. (numbers only,	ENTER Soil gas conc., C _q	OR	ENTER Soil gas conc., C _g			Soil Gas Conc. (μg/m³) 1.70E+02	Attenuation Factor (unitless) 2.0E-04
	no dashes)	(μg/m³)	_	(ppmv)	Chemical			
	108883	1.70E+02	1		Toluene			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER]	
MORE ↓	below grade to bottom of enclosed space floor, L _F	Soil gas sampling depth below grade, L _s	Average soil temperature, T _S	Vadose zone SCS soil type (used to estimate soil vapor	OR	User-defined vadose zone soil vapor permeability, k _v		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm ²)		

SI

MORE ¥	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, ρ _b ^A (g/cm³)	ENTER Vadose zone soil total porosity, n ^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (L/m)
	SI	1.35	0.489	0.167		5
MORE 🔱	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
Lookup Receptor Parameters	carcinogens, AT _C	noncarcinogens, AT _{NC}	duration, ED	frequency, EF	Time ET	Rate ACH (hour) ⁻¹
	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(Hour)
NEW=> Commercial	70	25	25	250	8 (NEW)	1 (NEW)
END						

24

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) **5.5E+00**

Cancer

Risk

2.7E-06

Noncancer

Hazard

3.6E-02

				DATA ENTRY S	PHEET				
			Soil	Gas Concentration	n Data				Results
	Decette	ENTER	ENTER		ENTER			Soil Gas Conc. A	Attenuation Factor
	Reset to		Soil		Soil			(µg/m³)	(unitless)
	Defaults	Chemical	gas	OR	gas			4.10E+04	1.3E-04
		CAS No.	conc.,		conc.,			-	
		(numbers only,	C _q		C _q				
		no dashes)	(μg/m ³)		(ppmv)	Chemical			
		107101	1.105.01			T-4			
		127184	4.10E+04			Tetrachloroethyl	ene		
		ENTER	ENTER	ENTER	ENTER		ENTER	1	
		Depth							
	MORE ↓	below grade	Soil gas		Vadose zone		User-defined		
	Ψ	to bottom	sampling	Average	SCS		vadose zone		
		of enclosed	depth	soil	soil type	OR	soil vapor		
		space floor,	below grade,	temperature,	(used to estimate	UR	permeability,		
		L _F	L _s	Ts	soil vapor		k _v		
		(15 or 200 cm)	(cm)	(°C)	permeability)		(cm ²)	-	
		15	487.68	24	SI			1	
	MORE ¥	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, Pb ^A (g/cm ³)	ENTER Vadose zone soil total porosity, n ^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)		ENTER Average vapor flow rate into bldg. (Leave blank to calcul Q _{soil} (L/m)		
		SI	1.35	0.489	0.167		5	1	
								_	
	MORE								
	•	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER		
		Averaging	Averaging						
		time for	time for	Exposure	Exposure	Exposure	Air Exchange		
1	Laslum Dassetti	carcinogens,	noncarcinogens,	duration,	frequency,	Time	Rate		
	Lookup Receptor Parameters	AT _C	AT _{NC}	ED	EF	ET	ACH		
l	r alailleteis	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹	=	
NEW=>	Communical	70	25	25	250	0	1 1	1	
IAEAA=>	Commercial	70	25	25	∠50	8	1 1	<u>J</u>	

END

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

DATA ENTRY SHEET

Scenario: Commercial Chemical: Hexane

Results Summary

Indoor Air Conc.

(μg/m³) **1.7E-02**

Cancer

Risk

NA

Noncancer

Hazard

5.4E-06

		Soil (Gas Concentration	Data				Result
Reset to Defaults	ENTER Chemical	ENTER Soil gas	OR	ENTER Soil gas			Soil Gas Conc. A (μg/m³) 8.90E+01	uttenuation Factor (unitless) 1.9E-04
	CAS No. (numbers only, no dashes)	conc., C _g (μg/m³)		conc., C _g (ppmv)	Chemical			
	110543	8.90E+01			Hexane			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER		

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ₩	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _s (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm ²)
	15	487.68	24	SI		

ENTER

ENTER

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

ENTER

ENTER

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) 2.2E+00

Cancer

Risk

1.1E-06

Noncancer

Hazard

1.4E-02

			DATA ENTRY S	SHEET			Chemical:	retrachioroe	u
		Soil (Gas Concentration	n Data				Resul	ţ۶
Reset to	ENTER	ENTER Soil		ENTER Soil			Soil Gas Conc. A	Attenuation Factor (unitless)	
Defaults	Chemical CAS No.	gas conc.,	OR	gas conc.,			7.00E+03	3.2E-04	_
	(numbers only,	C _g		C _g					
	no dashes)	(μg/m³)		(ppmv)	Chemical				
	127184	7.00E+03			Tetrachloroethy	ylene			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER	1		
MORE ↓	below grade to bottom	Soil gas sampling	Average	Vadose zone SCS		User-defined vadose zone			
	of enclosed space floor,	depth below grade,	soil temperature,	soil type (used to estimate	OR	soil vapor permeability,			
	L _F (15 or 200 cm)	L _s (cm)	T _S (°C)	soil vapor permeability)		k _v (cm²)			
	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, θ_w^V (cm^3/cm^3)		ENTER Average vapor flow rate into bldg. (Leave blank to calcul Q _{soil} (L/m)			
	SI	1.35	0.489	0.167		5	-]		
MORE 🗸	ENTED	ENTER	ENTER	ENTER	ENTED	ENTED			
Ψ	ENTER Averaging	Averaging	ENTER	ENTER	ENTER	ENTER			
	time for carcinogens,	time for noncarcinogens,	Exposure duration,	Exposure frequency,	Exposure Time	Air Exchange Rate			
Lookup Receptor Parameters	AT _C (yrs)	AT _{NC} (yrs)	ED (yrs)	EF (days/yr)	ET (hrs/day)	ACH (hour) ⁻¹			
Commercial					, , , , ,	, ,	= 7		
Commercial	70	25	25	250	8	1	I		

END

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) **5.0E+00**

Cancer

Risk

2.4E-06

Noncancer

Hazard

3.3E-02

			D/ (I/ CEITITITE	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
		Soil (Gas Concentration	n Data				Resu	lts
Reset to	ENTER	ENTER		ENTER			Soil Gas Conc. A	Attenuation Factor	_
		Soil		Soil			(μg/m³)	(unitless)	
Defaults	Chemical	gas	OR	gas			3.70E+04	1.3E-04	
	CAS No.	conc.,		conc.,					
	(numbers only,	C_g		C_g					
	no dashes)	(μg/m³)		(ppmv)	Chemical				
	127184	3.70E+04			Tetrachloroethylei	ne			
	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 _F	L _s	T _S	soil vapor		k _v			
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm ²)			
	(15 01 200 CIII)	(CIII)	(0)	permeability)		(CIII)			
	15	487.68	24	SI					
MORE Ψ	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, Pb ^A (g/cm ³)	ENTER Vadose zone soil total porosity, n ^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	(L	ENTER Average vapor flow rate into bldg. eave blank to calcula Q _{soil} (L/m)	ate)		
	SI	1.35	0.489	0.167		5]		
MORE ↓	ENTER	ENTER	ENTER	ENTED	ENTER	ENTER			
Ψ	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER			
	Averaging	Averaging	F	F	F	A:= F.,,eb====			
	time for	time for	Exposure duration,	Exposure	Exposure Time	Air Exchange Rate			
Lookup Receptor	carcinogens,	noncarcinogens,		frequency, EF	ET				
Parameters	AT _C	AT _{NC}	ED			ACH			
	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹	=		
		,		,		1	1		

Commercial

END

70

25

25

250

8 (NEW)

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

Scenario: Commercial Chemical: Benzene

Reset to Defaults Summary Soil Gas Concentration Data Summary Soil Gas Concentration Data Summary Soil Gas Concentration Data Summary Soil Gas Concentration Factor Indoor Africance Indoor Ind					Chemical:	Benzene						
Reset to Defaults			Soil	Gas Concentration	n Data				Result	s Summary		
Defaults	Desette	ENTER				1		Soil Gas Conc.	Attenuation Factor	Indoor Air Conc.	Cancer	Noncancer
CAS No. (numbers only, no disables) (ugim²) (upim²) (ppmw) (chemical modelshes) (ugim²) (upim²) (ppmw) (chemical modelshes) (ugim²) (upim²) (Soil		Soil			(µg/m³)	(unitless)	(µg/m³)	Risk	Hazard
C	Defaults	Chemical	gas	OR	gas			1.30E+01	4.7E-04	6.1E-03	1.4E-08	4.6E-04
Toolsay		CAS No.	conc.,		conc.,		!					
## Average Soil By Business Soil Systems So		(numbers only,	C _g		C_g							
## Average Soil By Business Soil Systems So		no dashes)	(μg/m ³)		(ppmv)	Chemical						
MORE WORE		,	" " "	•	M 1 /							
## ENTER Depth ENTER Depth Soil vapor (soil		71432	1.30E+01			Benzene						
## ENTER Depth Depth								chemical properties				
Depth		ENTER	ENTER	FNTFR		and/or toxicity criteria		1				
MORE			ENTER	Livien	Livien		LIVILIN					
to bottom sampling depth soil of enclosed space floor, below grade, Lr Ls Ts soil vapor (used to estimate OR permeability, Lr Ls Ts soil vapor (vcm)	MORE		Soil gas		Vadose zone		User-defined					
Space floor, Delow grade, Lemperature, Lem				Average	SCS		vadose zone					
L _F L _s T _S soli vapor (cm) (°C) permeability) (cm²) 15 182.88 24 SI MORE Vandose zone Soli dry bulk density. porosity, Loxup Soil ype Bulk density. porosity, (unitless) (cm³/cm³) ((unitless)		of enclosed	depth	soil	soil type		soil vapor					
Comparison Co		space floor,	below grade,			OR	permeability,					
School Parameters ENTER ENTER ENTER ENTER Averaging time for carcinogens, noncarcinogens, Parameters Lookup Receptor Parameters Lookup Receptor Parameters Cyrs) Cyrs) Cyrs) Cyrs) Commercial Cyrs) Commercial Cyrs) Commercial Cyrs) Commercial Cyrs) Cyrs) Cyrs) Cyrs) Commercial Cyrs) Cyrs		L_F	L _s	Ts	soil vapor							
## ENTER Control of the first		(15 or 200 cm)	(cm)	(°C)	permeability)	_	(cm ²)					
## ENTER Control of the first												
MORE ↓ Vandose zone SCS Vadose zone soil dry soil total soil water-filled soil water-filled flow rate into bldg. Average vapor flow rate into bldg. Lookup Soil Parameters Lookup Soil Parameters Pb A (g/cm³) (unitless) n V (eave blank to calculate) SI 1.35 0.489 0.167 5 MORE ↓ ENTER Averaging time for tor carcinogens, ATc ATc (yrs) Exposure Exposure Exposure Exposure ATc Carcinogens, anoncarcinogens, anoncarcinogens		15	182.88	24	SI							
Parameters (g/cm³)		Vandose zone SCS	Vadose zone soil dry	Vadose zone soil total	Vadose zone soil water-filled		Average vapor flow rate into bldg.	ate)				
Parameters (g/cm³)			ρ _h ^A	n ^V	θ_{w}^{V}		Q _{soil}	•				
SI 1.35 0.489 0.167 5				(unitless)								
MORE Lookup Receptor Parameters AT _C AT _{NC} ED EF ET ACH Parameters (yrs) (yrs) (yrs) (days/yr) (hrs/day) (hour) ⁻¹ NEW⇒ Commercial 70 25 25 25 250 8 1			(3 - /	(2	(**************************************		(=)	•				
ENTER Averaging Averaging time for time for Exposure Exposure Exposure Air Exchange carcinogens, noncarcinogens, duration, frequency, Time Rate AT _C AT _{NC} ED EF ET ACH (yrs) (yrs) (yrs) (days/yr) (hrs/day) (hour) ⁻¹ NEW=> Commercial 70 25 25 25 250 8 1		SI	1.35	0.489	0.167]	5					
ENTER Averaging Averaging time for time for Exposure Exposure Exposure Air Exchange carcinogens, noncarcinogens, duration, frequency, Time Rate AT _C AT _{NC} ED EF ET ACH (yrs) (yrs) (yrs) (days/yr) (hrs/day) (hour) ⁻¹ NEW=> Commercial 70 25 25 25 250 8 1												
Averaging dime for time for Exposure Exposure Exposure Exposure Air Exchange Carcinogens, noncarcinogens, duration, frequency, Time Rate AT _C AT _{NC} ED EF ET ACH (yrs) (yrs) (yrs) (days/yr) (hrs/day) (hour)-1 NEW=> Commercial 70 25 25 25 250 8 1												
Lookup Receptor Parameters AT _C AT _{NC} ED EF ET ACH (yrs) (yrs) (yrs) (days/yr) (hrs/day) (hour)-1 NEW=> Commercial 70 25 25 25 8 1	•			ENTER	ENTER	ENTER	ENTER					
Lookup Receptor Parameters Commercial To 25 25 25 25 8 1												
Lookup Receptor Parameters AT _C AT _{NC} ED EF ET ACH (yrs) (yrs) (yrs) (days/yr) (hrs/day) (hour) ⁻¹ NEW=> Commercial 70 25 25 250 8 1												
Parameters (yrs) (yrs) (yrs) (days/yr) (hrs/day) (hour)-1 NEW=> Commercial 70 25 25 250 8 1	Lookun Recentor											
(yrs) (yrs) (yrs) (days/yr) (hrs/day) (nour) NEW=> Commercial 70 25 25 250 8 1												
		(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻ '	=				
	NEW-X	70	25	25	250		1 4	1				
	Gommercial	70		25	Z 0U							

END

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

Scenario: Commercial

Chemical: Tetrachloroethylene

Results Summary

Indoor Air Conc.

(µg/m³) 2.7E-01

Cancer

Risk

1.3E-07

Noncancer

Hazard

1.8E-03

			DATA ENTRY S	SHEET			Cnemical:	letrachioroet
		Soil (Gas Concentration	n Data				Result
Reset to	ENTER	ENTER Soil		ENTER Soil			(µg/m³)	Attenuation Factor (unitless)
Defaults	Chemical	gas	OR	gas			8.50E+02	3.2E-04
	CAS No. (numbers only,	conc.,		conc.,				
	•	C _g		C _g	01			
	no dashes)	(μg/m³)		(ppmv)	Chemical			
	127184	8.50E+02			Tetrachloroethyl	ene		
	ENTER	ENTER	ENTER	ENTER		ENTER	7	
	Depth	ENIER	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_{F}	L_s	Ts	soil vapor		k _v		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm ²)		
	15	182.88	24	SI			4	
	15	102.00	24	31			_	
	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 [∨]	porosity, $\theta_w^{\ \ V}$	((Leave blank to calcul	late)	
	Lookup Soil Parameters	ρ _b ^A				Q_{soil}		
	1 didirectors	(g/cm ³)	(unitless)	(cm ³ /cm ³)		(L/m)	_	
	SI	1.35	0.489	0.167		5		
MORE ↓	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER		
	Averaging	Averaging	ENTER	ENIER	ENTER	ENTER		
	time for	time for	Exposure	Exposure	Exposure	Air Exchange		
	carcinogens,	noncarcinogens,	duration,	frequency,	Time	Rate		
Lookup Receptor	ATc	AT _{NC}	ED	EF	ET	ACH		
Parameters	(yrs)	(vrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹		
Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹	=	

Commercial

END

70

25

25

250

8 (NEW)

(NEW)

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

DATA ENTRY SHEET

Scenario: Commercial Chemical: Benzene

			DATA ENTRY S	SHEET		Chemical:	Benzene				
		Soil (Gas Concentration	n Data				Result	ts Summary		
Desertes	ENTER	ENTER	040 001100111141101	ENTER]		Soil Gas Conc.	Attenuation Factor	Indoor Air Conc.	Cancer	Noncancer
Reset to		Soil		Soil			(µg/m³)	(unitless)	(µg/m³)	Risk	Hazard
Defaults	Chemical	gas	OR	gas			4.20E+01	2.2E-04	9.3E-03	2.2E-08	7.0E-04
	CAS No.	conc.,		conc.,							
	(numbers only,	C_g		C_g							
	no dashes)	(μg/m ³)		(ppmv)	Chemical						
		(F-9)		(FF****)							
	71432	4.20E+01			Benzene			-			
						OKUP table comments on of for this chemical.	chemical properties	-			
	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 _F	Ls	Ts	soil vapor		k _v					
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm ²)					
	(10 01 200 011)	(6111)	(0)	permeability)		(6)					
	15	487.68	24	SI	1		1				
MORE ↓	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, Pb ^A (g/cm ³)	ENTER Vadose zone soil total porosity, n (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm³/cm³)		ENTER Average vapor flow rate into bldg. (Leave blank to calcula Q _{soil} (L/m)	ate)				
	SI	1.35	0.489	0.167	I	5	J				
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	AT _C	AT _{NC}	ED	EF	ET	ACH					
Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹					
	V -7	V -/	V -/	11-11	,		=				
NEW=> Commercial	70	25	25	250	8	1]				
END					(NEW)	(NEW)					
END											

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

DATA ENTRY SHEET

Scenario: Commercial Chemical: Toluene

(cm²)

Results Summary

Indoor Air Conc.

(μg/m³) **5.9E-03**

Cancer

Risk

NA

Noncancer

Hazard

4.5E-06

		Soil	Gas Concentration	n Data				Results
Reset to Defaults	Chemical CAS No.	ENTER Soil gas	OR	ENTER Soil gas			Soil Gas Conc. A (μg/m³) 3.00E+01	Attenuation Factor (unitless) 2.0E-04
	CAS No. (numbers only, no dashes)	conc., C _g (μg/m³)	_	conc., C _g (ppmv)	Chemical			
	108883	3.00E+01]		Toluene			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER		
MORE ↓	below grade to bottom of enclosed space floor, L _F	Soil gas sampling depth below grade, L _s	Average soil temperature, T _S	Vadose zone SCS soil type (used to estimate soil vapor	OR	User-defined vadose zone soil vapor permeability, k _v		

(°C)

24

permeability)

SI

(cm)

487.68

(15 or 200 cm)

15

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 ^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (L/m)
	SI	1.35	0.489	0.167		5
MORE Ψ	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
Lookup Receptor Parameters	carcinogens, AT _C (yrs)	noncarcinogens, AT _{NC} (yrs)	duration, ED (yrs)	frequency, EF (days/yr)	Time ET (hrs/day)	Rate ACH (hour) ⁻¹
NEW=> Commercial	70	25	25	250	8 (NEW)	1 (NEW)

END

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

Scenario: Commercial

Chemical: Tetrachloroethylene

Results Summary

Indoor Air Conc.

 $(\mu g/m^3)$

5.4E-01

Cancer

Risk

2.6E-07

Noncancer

Hazard

3.5E-03

			DATA ENTRY S	SHEET			Cnemical:	letrachioroet
		Soil	Gas Concentration	n Data				Result
Reset to	ENTER	ENTER Soil		ENTER Soil			(µg/m³)	Attenuation Factor (unitless)
Defaults	Chemical	gas	OR	gas			4.00E+03	1.3E-04
	CAS No. (numbers only,	conc., C _g		conc., C _g				
	no dashes)	(μg/m³)	•	(ppmv)	Chemical			
	127184	4.00E+03]		Tetrachloroethyle	ene		
	ENTER Depth	ENTER	ENTER	ENTER		ENTER	7	
MORE ↓	below grade to bottom of enclosed space floor, L _F	Soil gas sampling depth below grade, L _s	Average soil temperature, T _S	Vadose zone SCS soil type (used to estimate soil vapor	OR	User-defined vadose zone soil vapor permeability, k _v		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm ²)		
	15	487.68	24	SI				
MORE ¥	ENTER Vandose zone SCS Soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, ρ _b ^A (g/cm ³)	ENTER Vadose zone soil total porosity, n ^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	(L	ENTER Average vapor flow rate into bldg Leave blank to calcu Q _{soil} (L/m)		
	SI	1.35	0.489	0.167		5		
MORE ↓	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER		

Lookup Receptor

Parameters

Commercial

END

Averaging

time for

carcinogens,

 AT_{C}

(yrs)

70

Averaging

time for

noncarcinogens,

AT_{NC}

(yrs)

25

Exposure

duration,

ED

(yrs)

25

Exposure

frequency,

EF

(days/yr)

250

Exposure

Time

ET

(hrs/day)

8 (NEW) Air Exchange

Rate

ACH

(hour)⁻¹

(NEW)

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

DATA ENTRY SHEET

Scenario: Commercial Chemical: Chloroform

Results Summary

Indoor Air Conc.

(μg/m³) **8.9E-03**

Cancer

Risk

1.7E-08

Noncancer

Hazard

2.1E-05

		Soil	Gas Concentration	Data			Result
Reset to Defaults	ENTER Chemical	ENTER Soil gas	OR	ENTER Soil gas		Soil Gas Conc. A (μg/m³) 4.60E+01	unitless) 1.9E-04
	CAS No. (numbers only, no dashes)	conc., C _g (μg/m³)	,	conc., C _g (ppmv)	Chemical		
	67663	4.60E+01			Chloroform		

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ₩	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm²)
	15	487.68	24	SI		

ENTER

ENTER

MORE ↓	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, $\rho_b^A \ (g/cm^3)$	Vadose zone soil total porosity, n ^V (unitless)	Vadose zone soil water-filled porosity, θ_w^V (cm³/cm³)		Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (L/m)
	SI	1.35	0.489	0.167		5
MORE ↓	ENTER Averaging	ENTER Averaging	ENTER	ENTER	ENTER	ENTER
Lookup Receptor Parameters	time for carcinogens, AT _C	time for noncarcinogens, AT _{NC}	Exposure duration, ED	Exposure frequency, EF	Exposure Time ET	Air Exchange Rate ACH
Farameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
NEW=> Commercial	70	25	25	250	8 (NEW)	(NEW)
END					()	()

ENTER

ENTER

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

DATA ENTRY SHEET

Scenario: Commercial Chemical: Carbon disulfide

ENTER

Results Summary

Indoor Air Conc.

 $(\mu g/m^3)$

4.3E-02

Cancer

Risk

NA

Noncancer

Hazard

1.4E-05

		Soil (Gas Concentratio	n Data				Result
Reset to	ENTER	ENTER		ENTER			Soil Gas Conc. A	Attenuation Factor
		Soil		Soil			(µg/m³)	(unitless)
Defaults	Chemical	gas	OR	gas			1.70E+02	2.5E-04
	CAS No.	conc.,		conc.,				
	(numbers only,	C_g		C_g				
	no dashes)	(μg/m³)		(ppmv)	Chemical			
	75150	1.70E+02			Carbon disulfide			
	75150	1.70E+02			Carbon disunide			
	ENTER	ENTED	ENTED	ENTED		ENTER	7	
	Depth	ENTER	ENTER	ENTER		ENTER		
MORE	below grade	Soil gas		Vadose zone		User-defined		

ENTER Depth	ENTER	ENTER	ENTER		ENTER
below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k_v (cm²)
15	487.68	24	SI		

ENTER

MORE ↓	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, $ ho_b^A$ (g/cm ³)	Vadose zone soil total porosity, n ^V (unitless)	Vadose zone soil water-filled porosity, θ _w ^V (cm³/cm³)		Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (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
Lookup Bosontor	carcinogens,	noncarcinogens,	duration,	frequency,	Time	Rate
Lookup Receptor Parameters	AT _C	AT _{NC}	ED	EF	ET	ACH
T didiffeters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
EW=> Commercial	70	25	25	250	8	
Commercial	70	25	25	250		(NITIAN)
END					(NEW)	(NEW)

ENTER

ENTER

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

DATA ENTRY SHEET

Scenario: Commercial Chemical: Hexane

Results Summary

Indoor Air Conc.

(μg/m³) **5.4E-03**

Cancer

Risk

NA

Noncancer

Hazard

1.8E-06

									_
		Soil	Gas Concentration	n Data				Result	•
Reset to Defaults	ENTER Chemical	ENTER Soil gas	OR	ENTER Soil gas			Soil Gas Conc. <i>A</i> (μg/m³) 2.90E+01	Attenuation Factor (unitless) 1.9E-04	_
	CAS No. (numbers only, no dashes)	conc., C _g (μg/m³)		conc., C _g (ppmv)	Chemical				
	110543	2.90E+01			Hexane				
	ENTER Depth	ENTER	ENTER	ENTER		ENTER			
MORE	helow grade	Soil ras		Vadose zone		I Iser-defined			

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k_v (cm^2)
	15	487.68	24	SI		

MORE ¥	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, Pb ^A (g/cm ³)	Vadose zone soil total porosity, n ^V (unitless)	Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)		Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (L/m)
	SI	1.35	0.489	0.167		5
MORE ¥	ENTER Averaging	ENTER Averaging	ENTER	ENTER	ENTER	ENTER
Lookup Receptor Parameters	time for carcinogens, AT _C (yrs)	time for noncarcinogens, AT _{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)	Exposure Time ET (hrs/day)	Air Exchange Rate ACH (hour) ⁻¹
NEW=> Commercial	70	25	25	250	8	1
END					(NEW)	(NEW)

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

DATA ENTRY SHEET

Scenario: Commercial Chemical: Benzene

Results Summary

Indoor Air Conc.

(μg/m³) **9.7E-03**

Cancer

Risk

2.3E-08

Noncancer

Hazard

7.4E-04

		Soil	Gas Concentration	n Data				Result
D	ENTER	ENTER		ENTER		İ	Soil Gas Conc. At	tenuation Factor
Reset to		Soil		Soil			(µg/m³)	(unitless)
Defaults	Chemical	gas	OR	gas			4.40E+01	2.2E-04
	CAS No.	conc.,		conc.,		-		
	(numbers only,	C_g		C_g				
	no dashes)	(μg/m ³)		(ppmv)	Chemical			
	·		1					
	71432	4.40E+01			Benzene			
						KUP table comments on cl	nemical properties	
					and/or toxicity criteria for			
	ENTER	ENTER	ENTER	ENTER		ENTER		
	Depth	0.11						
MORE ↓	below grade	Soil gas	A	Vadose zone SCS		User-defined		
	to bottom of enclosed	sampling depth	Average soil	soil type		vadose zone soil vapor		
	space floor,	below grade,	temperature,	(used to estimate	OR	permeability,		
	L _F	L _s	T _S	soil vapor	OIX	k _v		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm ²)		
	(15 01 200 CIII)	(CIII)	(0)	permeability)	•	(CIII)		
	15	487.68	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 ^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)		ENTER Average vapor flow rate into bldg. (Leave blank to calcula Q _{soil} (L/m)	te)	
	21	4.05	0.400	0.407	1			
	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		
Lookup Receptor	carcinogens,	noncarcinogens,	duration, ED	frequency, EF	Time ET	Rate ACH		
Parameters	AT _C	AT _{NC}						
	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹		

Commercial

END

70

25

25

250

8

Reset to

Defaults

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

DATA ENTRY SHEET

Scenario: Commercial Chemical: Toluene

Results Summary

Indoor Air Conc.

(μg/m³) **6.7E-03**

Cancer

Risk

NA

Noncancer

Hazard

5.1E-06

Soil Gas Conc. Attenuation Factor (µg/m³) (unitless)
(µg/m³) (unitless)
3.40E+01 2.0E-04
<u> </u>
-

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm²)
	15	487.68	24	SI		

	MORE ↓	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, Pb (g/cm³)	Vadose zone soil total porosity, n ^V (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (L/m)
		SI	1.35	0.489	0.167		5
	MORE ↓	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
	Lookup Receptor Parameters	carcinogens, AT _C	noncarcinogens, AT _{NC}	duration, ED	frequency, EF	Time ET	Rate ACH
	Farameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
W=>	Commercial	70	25	25	250	8	1
	END					(NEW)	(NEW)

NEW

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) **6.2E-01**

Cancer

Risk

3.0E-07

Noncancer

Hazard

4.0E-03

		Soil (Gas Concentration	n Data			Result
Reset to Defaults	ENTER Chemical	ENTER Soil gas	OR	ENTER Soil gas		Soil Gas Conc. (μg/m³) 4.60E+03	Attenuation Factor (unitless) 1.3E-04
	CAS No. (numbers only, no dashes)	conc., C _g (μg/m³)		conc., C _g (ppmv)	Chemical		
	127184	4.60E+03			Tetrachloroethylene		

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _s (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm²)
	15	487.68	24	SI		

	MORE ↓	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm³)	ENTER Vadose zone soil total porosity, n ^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	(ENTER Average vapor flow rate into bldg. Leave blank to calculate) Q _{soil} (L/m)
		SI	1.35	0.489	0.167		5
	MORE ¥	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
	Lookup Receptor	carcinogens, $AT_{\mathbb{C}}$	noncarcinogens, AT_{NC}	duration, ED	frequency, EF	Time ET	Rate ACH
Į	raiailleleis	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
W=>	Commercial	70	25	25	250	8 (NEW)	1 (NEW)
	END					,	, ,

NEW

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

DATA ENTRY SHEET

Scenario: Commercial Chemical: Chloroform

Results Summary

Indoor Air Conc.

(μg/m³) 1.0E-02

Cancer

Risk

2.0E-08

Noncancer

Hazard

2.4E-05

	Result							
Donot to	ENTER	ENTER		ENTER	7		Soil Gas Conc. A	Attenuation Factor
Reset to		Soil		Soil			(µg/m³)	(unitless)
Defaults	Chemical	gas	OR	gas			5.40E+01	1.9E-04
	CAS No. (numbers only,	conc., C_g		conc., C_g				
	no dashes)	(μg/m³)		(ppmv)	Chemical			
	67663	5.40E+01			Chloroform			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER]	

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm²)
	15	487.68	24	SI		

ENTER

ENTER

MORE ↓	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, $\rho_b^A \end{pmatrix}$ (g/cm³)	Vadose zone soil total porosity, n ^V (unitless)	Vadose zone soil water-filled porosity, θ _w (cm³/cm³)		Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (L/m)
	SI	1.35	0.489	0.167		5
MORE ¥	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
Lookup Receptor	carcinogens, AT _C	noncarcinogens, AT _{NC}	duration, ED	frequency, EF	Time ET	Rate ACH
Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
		1 05 1	0.5	050		
NEW=> Commercial	70	25	25	250	(NEW)	(NEW)
END					(I4E44)	(MEAA)

ENTER

ENTER

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

DATA ENTRY SHEET

Scenario: Commercial Chemical: Carbon disulfide

Results Summary

Indoor Air Conc.

(μg/m³) **4.8E-02**

Cancer

Risk

NA

Noncancer

Hazard

1.6E-05

		Soil	Gas Concentratio	n Data				Result
Reset to Defaults	ENTER Chemical	ENTER Soil gas	OR	ENTER Soil gas			Soil Gas Conc. / (μg/m³) 1.90E+02	Attenuation Factor (unitless) 2.5E-04
	CAS No. (numbers only, no dashes)	conc., C _g (µg/m³)		conc., C _g (ppmv)	Chemical			
	75150	1.90E+02			Carbon disulfide			
	ENTER Depth	ENTER	ENTER	ENTER		ENTER		
MORE	below grade	Soil gas		Vadose zone		User-defined		

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm ²)
	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 (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (L/m)
	SI	1.35	0.489	0.167		5
MORE V	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
Lookup Receptor Parameters	carcinogens, AT _C (yrs)	noncarcinogens, AT _{NC} (yrs)	duration, ED (yrs)	frequency, EF (days/yr)	Time ET (hrs/day)	Rate ACH (hour) ⁻¹
NEW=> Commercial	70	25	25	250	8 (NEW)	1 (NEW)
END					(14144)	(14244)

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

DATA ENTRY SHEET

Scenario: Commercial Chemical: Hexane

Results Summary

Indoor Air Conc.

(μg/m³) **7.3E-03**

Cancer

Risk

NA

Noncancer

Hazard

2.4E-06

	Soil Gas Concentration Data							Results		
Reset to Defaults	Chemical CAS No. (numbers only,	ENTER Soil gas conc., C _g	OR	ENTER Soil gas conc., C _g			Soil Gas Conc. / (μg/m³) 3.90E+01	Attenuation Factor (unitless) 1.9E-04		
	no dashes)	(μg/m ³)		(ppmv)	Chemical					
	110543	3.90E+01			Hexane					
	ENTER Depth	ENTER	ENTER	ENTER		ENTER				

	ENTER Depth	ENTER	ENTER	ENTER		ENTER
MORE ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm²)
	15	487.68	24	SI		

	MORE ↓	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, Pb (g/cm³)	Vadose zone soil total porosity, n ^V (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (L/m)
		SI	1.35	0.489	0.167		5
	MORE ↓	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
	Lookup Receptor Parameters	carcinogens, AT _C	noncarcinogens, AT _{NC}	duration, ED	frequency, EF	Time ET	Rate ACH
	Farameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
W=>	Commercial	70	25	25	250	8	1
	END					(NEW)	(NEW)

NEW

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

Scenario: Commercial

Tetrachloroethylene

Results Summary

Indoor Air Conc.

(µg/m³) 3.5E-01

Cancer

Risk

1.7E-07

Noncancer

Hazard

2.3E-03

			DATA ENTRY S	SHEET			Chemical:	Tetrachloroet
		Soil	Gas Concentration	n Data				Result
Reset to Defaults	Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C _g (µg/m³)	OR	ENTER Soil gas conc., C _g (ppmv)	Chemical		Soil Gas Conc. (μg/m³) 1.10E+03	Attenuation Factor (unitless) 3.2E-04
	127184	1.10E+03			Tetrachloroethyle	ene		
MORE ¥	ENTER Depth below grade to bottom	ENTER Soil gas sampling	ENTER Average	ENTER Vadose zone SCS		ENTER User-defined vadose zone		
	of enclosed space floor, L _F (15 or 200 cm)	depth below grade, L _s (cm)	soil temperature, T _s (°C)	soil type (used to estimate soil vapor permeability)	OR	soil vapor permeability, k _v (cm ²)		
	15	182.88	24	SI			<u> </u>	
MORE ↓	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, Pb ^A (g/cm ³)	ENTER Vadose zone soil total porosity, n (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	(ENTER Average vapor flow rate into bldg Leave blank to calcu Q _{soil} (L/m)		
	SI	1.35	0.489	0.167		5		
MORE ↓	ENTER Averaging	ENTER Averaging	ENTER	ENTER	ENTER	ENTER		

Lookup Receptor

Parameters

Commercial

END

time for

carcinogens,

 AT_{C}

(yrs)

70

time for

noncarcinogens,

AT_{NC}

(yrs)

25

Exposure

duration,

ED

(yrs)

25

Exposure

frequency,

EF

(days/yr)

250

Exposure

Time

ET

(hrs/day)

8 (NEW) Air Exchange

Rate

ACH

(hour)⁻¹

(NEW)

APPENDIX F

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/m³)

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, T_S L_s soil vapor k_v (15 or 200 cm) (cm) (°C) permeability) (cm²) 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 _ь ^A (g/cm³)	n [∨] (unitless)	θ _w ^V (cm³/cm³)		Q _{soil} (L/m)
	SI	1.35	0.489	0.167		5
MORE ↓	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
Lookup Receptor Parameters	carcinogens, AT _C	noncarcinogens, AT _{NC}	duration, ED	frequency, EF	Time ET	Rate ACH
	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
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 _g (µg/m³)	OR	ENTER Soil gas conc., C _g (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 _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (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 ^V (unitless)	Vadose zone soil water-filled porosity, $\theta_w^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $		Average vapor flow rate into bldg. (Leave blank to calculate) $Q_{soil} = \frac{(L/m)}{}$
		SI	1.35	0.489	0.167		5
	MORE ↓	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
	Lookup Receptor Parameters	carcinogens, AT _C (yrs)	noncarcinogens, AT _{NC} (yrs)	duration, ED (yrs)	frequency, EF (days/yr)	Time ET (hrs/day)	Rate ACH (hour) ⁻¹
EW=>	Residential	70	26	26	350	24 (NEW)	0.5 (NEW)
	END					()	(1.247)

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 _g (μg/m³)		conc., C _g (ppmv)	Chemical				
	127184	1.20E+05	.]	(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 ↓	below grade to bottom of enclosed space floor, L _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm ²)
	15	152	24	CL		

ENTER

MORE ↓	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, ρ_b^A (g/cm ³)	Vadose zone soil total porosity, n ^V (unitless)	Vadose zone soil water-filled porosity, θ_w^V (cm³/cm³)		Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (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 _C	noncarcinogens, AT_NC	duration, ED	frequency, EF	Time ET	Rate ACH
Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
EW=> Residential	70	26	26	350	24	0.5
Residential	70	20	20	330	(NEW)	(NEW)
END						

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_{ν}

(cm²)

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 _q	OR	ENTER Soil gas conc., C _g			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 ↓	below grade to bottom	Soil gas sampling	Average	Vadose zone SCS		User-defined vadose zone		

soil

temperature,

 T_{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 _{soil} (L/m)
	S	1.66	0.375	0.054		5
MORE ↓	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 _q	OR	gas conc., C _q			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 ↓	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 _F	below grade, L _s	temperature, T _S	(used to estimate soil vapor	OR	permeability, k _v			
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm ²)	-		
	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 _{soil} (L/m)
		SI	1.35	0.489	0.167		1
	MORE ↓	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
	Lookup Receptor	carcinogens, AT _C	noncarcinogens, AT_{NC}	duration, ED	frequency, EF	Time ET	Rate ACH
l	Parameters	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
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

15

152

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 _g		conc., C _g				
	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 _F	below grade, L_s	temperature, T_S	(used to estimate soil vapor	OR	permeability, k _v		
	(15 or 200 cm)	(cm)	(°C)	permeability)		(cm ²)		

	MORE ¥	ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density,	ENTER Vadose zone soil total porosity, n (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (L/m)
		SI	1.35	0.489	0.167		96
	MORE 🔱	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
	Lookup Receptor Parameters	carcinogens, AT _C	noncarcinogens, AT _{NC}	duration, ED	frequency, EF	Time ET	Rate ACH
((yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
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/m³) **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 ³)		(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 _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _s (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm ²)
	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, θ_w^V (cm^3/cm^3)		ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q _{soil} (L/m)
	SI	1.35	0.489	0.167		5
MORE V	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange
Lookup Receptor Parameters	carcinogens, AT _C	noncarcinogens, AT _{NC}	duration, ED	frequency, EF	Time ET	Rate ACH
	(yrs)	(yrs)	(yrs)	(days/yr)	(hrs/day)	(hour) ⁻¹
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 _g (μg/m³)	ı	conc., C _g (ppmv)	Chemical			
	127184	1.20E+05			Tetrachloroethyle	ene		
	ENTER Depth	ENTER	ENTER	ENTER		ENTER]	
MORE ↓	below grade to bottom of enclosed space floor, L _F	Soil gas sampling depth below grade, L _s	Average soil temperature, T _S	Vadose zone SCS soil type (used to estimate soil vapor	OR	User-defined vadose zone soil vapor permeability, k _v		
	(15 or 200 cm)	(cm) 487.68	(°C)	permeability)		(cm ²)		
	13	407.00	27	31		<u> </u>	_	
MORE ψ	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		
	Lookup Soil Parameters	ρ _b ^A (g/cm ³)	porosity, n ^V (unitless)	θ _w ^V (cm ³ /cm ³)		Q _{soil} (L/m)	_ _	
	SI	1.35	0.489	0.167	I	5		
MORE ↓	ENTER Averaging time for	ENTER Averaging time for	ENTER Exposure	ENTER Exposure	ENTER Exposure	ENTER Air Exchange		
Lookup Receptor	carcinogens, AT _C	noncarcinogens, AT_{NC}	duration, ED	frequency, EF	Time ET	Rate ACH		

Parameters

Residential

END

(yrs)

70

(yrs)

26

(yrs)

26

(days/yr)

350

(hrs/day)

24

(NEW)

(hour)⁻¹

0.5

(NEW)

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

		Soil	Gas Concentration	Data			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/m³)	_	(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 _F (15 or 200 cm)	Soil gas sampling depth below grade, L _s (cm)	Average soil temperature, T _S (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm ²)
15	152	24	SI		

ENTER

MORE ¥	Vandose zone SCS soil type Lookup Soil Parameters	Vadose zone soil dry bulk density, ρ _b ^A (g/cm ³)	Vadose zone soil total porosity, n ^V (unitless)	Vadose zone soil water-filled porosity, θ _w ^V (cm³/cm³)		Average vapor flow rate into bldg. (Leave blank to calculate) $Q_{\text{soil}} = \frac{(L/m)}{}$
	SI	1.35	0.489	0.167		5
MORE ↓	ENTER Averaging	ENTER Averaging	ENTER	ENTER	ENTER	ENTER
	time for carcinogens,	time for noncarcinogens,	Exposure duration,	Exposure frequency,	Exposure Time	Air Exchange Rate
Lookup Receptor Parameters	AT _C (yrs)	AT _{NC} (yrs)	ED (yrs)	EF (days/yr)	ET (hrs/day)	ACH (hour) ⁻¹
N=> Residential	70	26	26	350	24	0.5
END					(NEW)	(NEW)

ENTER

NEW

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

Scenario: Residential

Tetrachloroethylene

Results Summary

Indoor Air Conc.

(μg/m³) 8.8E+03

Cancer

Risk

1.8E-02

Noncancer

Hazard

2.4E+02

		Chemical:	Tetrachloroeth					
		Soil		Results				
Reset to Defaults	ENTER Chemical	ENTER Soil gas	OR	ENTER Soil gas			Soil Gas Conc. A (μg/m³) 1.20E+07	Attenuation Factor (unitless) 7.3E-04
	CAS No. (numbers only, no dashes)	conc., C _g (μg/m³)		conc., C _g (ppmv)	Chemical			
	127184	1.20E+07	<u> </u>		Tetrachloroethyle	ne		
	ENTER Depth	ENTER	ENTER	ENTER		ENTER		
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 _F (15 or 200 cm)	below grade, L _s (cm)	temperature, T _s (°C)	(used to estimate soil vapor permeability)	OR	permeability, k _v (cm²)		
·	15	152	24	SI	· 	(5)		
MORE ↓	ENTER Vandose zone SCS soil type	ENTER Vadose zone soil dry bulk density,	ENTER Vadose zone soil total porosity, n ^V	ENTER Vadose zone soil water-filled porosity,	(I	ENTER Average vapor flow rate into bldg eave blank to calcul		
	Lookup Soil Parameters	ρ _b ^A (g/cm ³)	n ^v (unitless)	$\theta_{\rm w}^{\rm V}$ (cm ³ /cm ³)		Q _{soil} (L/m)	_	
I	SI	1.35	0.489	0.167		5		

	MORE ↓	ENTER Averaging	ENTER Averaging	ENTER	ENTER	ENTER	ENTER
	Lookup Receptor Parameters	time for carcinogens, AT _C (yrs)	time for noncarcinogens, AT _{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)	Exposure Time ET (hrs/day)	Air Exchange Rate ACH (hour) ⁻¹
NEW=	Residential	70	26	26	350	24	0.5
	END			-		(NEW)	(NEW)