THE SALVATION ARMY
USA Western Territory
Adult Rehabilitation Centers Command
180 East Ocean Boulevard, 3'd Floor
Long Beach, CA 90802-4709

FOUNDED IN 1865

January 16, 2017

Re: **Vapor Intrusion Assessment Report**
The Salvation Army Oakland ARC Building
601 Webster Street
Oakland, California
Fuel Leak Case No. R00003084,
Geotracker Global ID T10000003428

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

Submitted by:

Mark Nelson, Major
ARC Command General Secretary

ENVIRONMENTAL • GEOTECHNICAL
BUILDING SCIENCES • MATERIALS TESTING

1117 Lone Palm Avenue, Suite 201B
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January 10, 2017

Mr. Keith Nowell, PG, CHG
Hazardous Materials Specialist
Alameda County Health Care Services Agency
Environmental Health Services, Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Subject: **Vapor Intrusion Assessment Report**
The Salvation Army Oakland ARC Building
601 Webster Street,
Oakland, California,
Fuel Leak Case No. R00003084,
Geotracker Global ID T10000003428

Dear Mr. Nowell,

On behalf of The Salvation Army for their site located at 601 Webster Street in Oakland, California. ATC Group Services LLC (ATC) conducted a sub-slab vapor sampling and risk assessment at the subject site

This Vapor Intrusion Assessment Report summarizes the sub-slab vapor point installation, sub-slab vapor sampling, performed at the site and an evaluation of the risk presented by the detected soil gas beneath the building. The work was conducted in general accordance with ATC's Indoor Air Quality Assessment and Additional Sub-Slab Work Plan (Scope of Work) emailed to Alameda County Environmental Health (ACEH) on October 31, 2014 (ATC, 2014a) and later submitted to ACEH on December 19, 2014 and the Sub-Slab Vapor and Indoor Air Assessment Workplan Addendum (Work Plan), dated December 5, 2014 (ATC, 2014b). The Workplan was revised in response to the ACEH directive letter dated November 17, 2014.

If you have questions or comments regarding this report, please contact us at your convenience.

Sincerely,

ATC Group Services LLC

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Upload list

ACEH FTP website	https://www.acgov.org/aceh/lop/lop.htm
Geotracker website	http://geotracker.waterboards.ca.gov

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RECEIVED
By Alameda County Environmental Health 8:59 am, Jan 25, 2017

Vapor Intrusion Assessment Report

The Salvation Army Oakland ARC Building
601 Webster Street,
Oakland, California,
ACEH Fuel Leak Case No. R00003084,
Geotracker Global ID T10000003428

Submitted to:

Mr. Keith Nowell, PG, CHG
Hazardous Materials Specialist
Alameda County
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

On behalf of:

Salvation Army ARC Command
180 E. Ocean Blvd, 3rd Floor
Long Beach CA 90802

Submitted by:

ATC Group Services, LLC
1117 Lone Palm Avenue
Suite 201B
Modesto, California 95351
ATC Project No. Z054000006-0008

January 10, 2017

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1.0 INTRODUCTION

1.1. SITE DESCRIPTION

The site is The Salvation Army's (TSA) Adult Rehabilitation Center (ARC) (site) located at 601 Webster Street in Oakland, California, as shown on **Figure 1**. The site occupies the entire city block between Webster and Franklin Streets; and between Sixth and Seventh Streets. The northeast portion of the site includes the truck enclosure area. This area is where the former underground storage tank (UST) system was located. Fencing or walls enclose the truck enclosure area, which is used for loading/unloading trucks and for overnight truck parking/security. **Figure 2,** Site Plan illustrates the pertinent site features and the surrounding area.

1.2. SITE HISTORY

According to TSA, the site was purchased by TSA in April of 1920.

In early 2010, TSA made the decision to discontinue onsite fueling of their fleet of commercial trucks and remove the USTs and dispenser equipment from the site. Between November 22, and 23, 2010, a 10,000-gallon UST containing diesel, an 8,000-gallon UST containing gasoline, and the associated fuel dispensers and piping were removed by Terry Hamilton, a California licensed general engineering contractor (CA License 339108). The two USTs were triple rinsed and dry ice was added to render the USTs inert. The USTs were then tested and certified non-hazardous by a Certified Marine Chemist, loaded onto a flatbed truck, and transported to Stanislaus County for use as non-potable water tanks in a fire-suppression system. The USTs appeared to be in good condition, with no visible holes or signs of leakage, however laboratory analysis of soil samples collected from the base of the UST pit indicated that petroleum hydrocarbons (PHCs) related to gasoline were present. Diesel was not detected in any of the soil samples. This work was described in the report produced by Terry Hamilton named *Underground Storage Tank, Removal Report, Jobsite Address: The Salvation Army, 601 Webster Street, Oakland, CA 94607*, dated August 8, 2011.

In early 2011, TSA retained ATC Associates (now ATC Group Services LLC) to investigate and assist in fulfilling obligations that may have resulted from the uninvestigated release.

After a discussion with the Oakland City Fire Department (OFD), ATC developed a *Subsurface Investigation Workplan, Salvation Army, 601 Webster Street, Oakland, California,* dated March 18, 2011. This was a limited-scope workplan designed to derive preliminary information regarding the relative magnitude and distribution of the release to assist OFD in determining if the case could be closed or should be forwarded to the Local Oversight Program (LOP) Agency of Alameda County. The LOP Agency in Alameda County is Alameda County Environmental Health (ACEH) which is part of the Alameda County, Health Care Services Agency. The workplan included advancing five Geoprobe® direct-push borings to first encountered groundwater, estimated to be at approximately 16 to 25 feet below ground surface (bgs). Two of the borings were proposed for placement in the truck enclosure area, two in Franklin Street west of the truck enclosure area, and one within 6th street south of the ARC building.

In September 2011, the environmental case oversight authority was transferred from OFD to ACEH.

In correspondence dated May 2012 and November 2012, ACEH requested changes to the March 18, 2011 workplan originally submitted to the OFD. Cardno ATC responded by producing the *Subsurface Investigation Workplan Revised* dated March 1, 2013. In a letter dated May 31, 2013, ACEH approved the workplan with an additional directive to develop a site conceptual model.

On July 29 and July 30, 2013, Cardno ATC advanced seven direct-push soil borings at the site. Borings SB1 through SB7 were proposed to be advanced to groundwater but due to soil conditions, refusal was met prior to reaching groundwater in most of the borings. Despite the difficulties, sixteen soil samples and six groundwater samples were collected and analyzed at an environmental laboratory. The results of laboratory analyses revealed PHCs contamination within the truck enclosure area surrounding the former UST Pit. Cardno ATC reported on this work in the *Site Conceptual Model with Data Gap Identification, and Preliminary Subsurface Investigation Report, The Salvation Army, 601 Webster Street, Oakland, California, Fuel Leak Case No. R00003084*, dated January 13, 2014.

On July 2, 2014, ACEH arranged a meeting to discuss the site at their offices in Oakland. This meeting was attended by Keith Nowell and Dilan Roe of ACEH, Kaye Patterson and Major Jack Phillips of Salvation Army, and Todd Hafner and Mike Sonke of Cardno ATC. In a follow up email the same date, ACEH directed the development of a workplan that addressed laboratory analysis continuity, lateral and vertical delineation of soil and groundwater contamination, gas intrusion to indoor air, and a sensitive receptor survey. Additionally, ACEH requested a Feasibility Study/ Corrective Action Plan (FS/CAP) submitted by the end of the year, if warranted by the field investigation. In response, Cardno ATC produced and submitted a *Workplan for Continued Subsurface Investigation, The Salvation Army, Adult Rehabilitation Center, 601 Webster Street, Oakland, California*, dated August 14, 2014. This workplan proposed advancing twelve to sixteen membrane interface probe (MIP) borings to screen the soil and water for the presence of contamination followed by the advancement of eight to ten Hollow Stem Auger (HSA) borings and installation of four monitoring wells to confirm the released PHCs concentrations in soil and groundwater. This workplan also included the proposed installation of three subslab soil gas collection points in the basement of the ARC Building following the methodology for soil gas sampling established in the *Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance) October 2013*, as prepared by the San Francisco Bay Regional Water Quality Control Board.

ACEH responded in correspondence dated December 24, 2014. ACEH evaluated the existing data and the results projected to be derived from implantation of the workplan and determined that the site did not meet several of the criteria for the State of California Water Resources Control Board's (Water Board) Low Threat Closure Policy (LTCP) including the Conceptual Site Model (CSM) portion of the General Criteria section. ACEH indicated that LTCP data gaps could not be filled with MIP data. ACEH directed the advancement of additional borings to fill the LTCP data gaps particularly targeting the 0- to 5-foot and 5- to 10-foot zones. ACEH's opinion was that it was premature to collect subslab soil gas samples as described in the workplan unless depth to water data indicates the piezometric surface is less than 2 feet below the base of the foundations. ACEH wanted the preliminary data (including laboratory test results, boring logs and well construction details, depth to water data, and cross sections) collected from the soil and groundwater portion of the investigation for consideration prior to conducting the soil gas portion of the investigation. ACEH stated that if a diesel release had occurred, it did not appear to have been significant and total petroleum hydrocarbons as diesel (TPHd) could be eliminated from the

analysis scope. ACEH directed the placement of three onsite monitoring wells but believed it was premature to identify locations of groundwater monitoring wells in offsite locations.

In February 2015, Cardno ATC responded by reissuing the *Workplan for Continued Subsurface Investigation, The Salvation Army, Adult Rehabilitation Center, 601 Webster Street, Oakland, California,* dated February 24, 2015.

In a letter dated June 1, 2015, ACEH directed the inclusion of several supplemental sampling activities to address data needs under the LTCP. These activities included advancing two additional HSA borings within the footprint of the former UST pit, sampling at additional depths within HSA borings J2, J5, M2, and M5, as well as additional soil sample collection from the interval between ten feet bgs and first encountered groundwater in all borings that showed evidence of contamination. ACEH agreed with the installation of three monitoring wells within the truck enclosure area but wanted Cardno ATC to provide the MIP and HSA data and confer with ACEH prior to installing additional wells. ACEH also believed it was premature to collect soil gas samples until the depth to groundwater (DTW) had been established through the installation and gauging of monitoring wells.

In a letter dated August 3, 2016, ACEH directed the installation and sampling of subslab soil gas sampling points[1] as permanent sampling points, to have the sampling points surveyed by a California licensed surveyor, and to sample, analyze and report on these points quarterly, simultaneous with the quarterly groundwater sampling, analyses, and reporting.

2.0 VAPOR INTRUSION ASSESSMENT

The vapor intrusion assessment conducted at the site was completed under the advisement of a California-licensed Professional Geologist and in accordance with the site-specific safety plan. ATC followed a scope in accordance with the Cardno ATC workplan dated August 14, 2014 and applicable LOP regulatory guidance as provided by ACEH their August 3, 2016 letter. The scope was also performed in general accordance with methodologies for soil gas sampling established in the Advisory Active Soil Gas Investigations, California Environmental Protection Agency, Department of Toxic Substances Control, Los Angeles Regional Water Quality Control Board, San Francisco Regional Water Quality Control Board, July 2015

2.1. PLANNING, PERMITTING & SCHEDULING

ATC scheduled field personnel and equipment to perform the necessary field preparations, job start-up activities, and perform the site investigation activities. As required, ATC notified ACEH at least 72 hours in advance of performing field activities.

2.2. UTILITY CLEARANCE

As required by law, ATC contacted Underground Service Alert (USA) 48 hours prior to the initiation of fieldwork to allow time for utility companies to identify any underground lines, pipes, or cables that may be affected by the drilling activities. ATC supplemented this information by contracting a private subsurface utility surveyor to survey public and private underground utilities

[1] as first proposed by Cardno ATC in February 2015

that could be present in the proposed work area. Ground Penetrating Radar Systems, Inc. (GPRS) of Oakland, California was the surveyor that performed this work.

2.3. VAPOR PIN INSTALLATION

ATC retained the services of Gregg Drilling & Testing, Inc. (Gregg) of Martinez, California to install the vapor pins at the site. Gregg is a California C-57 licensed drilling company (CA license 485165). Gregg installed three (3) Vapor Pin devices distributed by Cox-Colvin & Associates, Inc. (Cox-Colvin), one for each soil gas sampling location. Installation was conducted in accordance with the Cox-Colvin Vapor Pin Installation SOP that is included in **Appendix A**. **Figure** 3 depicts the locations of the three basement subslab vapor pins identified as BSS-1, BSS-2, and BSS-3.

2.4. SURVEYING

On November 17, 2016, Morrow Surveying, a California-Licensed Professional Land Surveyor #8501, surveyed the vapor points by measuring the locations and the concrete immediately adjacent to each vapor point to sub-meter accuracy relative to a known benchmark according to Geotracker standards (NAD83 horizontal datum and NAVD88 vertical datum). This was required because the vapor pins meet the Geo Tracker definition of a permanent sample point that must be professionally surveyed in accordance with the Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & Division 3 of Title 27, CCR). The surveyor's report is included in **Attachment C**.

This survey information was uploaded into the State Water Resources Control Board's (SWRCB) Geotracker database.

2.5. SAMPLING

The sampling of BSS-1, BSS-2, and BSS-3 are described in the following sections.

2.5.1. MANIFOLD ASSEMBLY

In preparation for sampling, a three-way probe sampling assembly was constructed. One of the three ports was attached to a Teflon tube connected to the sub-slab soil gas sampling point. A second port was connected to a vacuum/pressure gauge to measure the vacuum while purging. The third port was used to withdraw soil gas samples. Sample withdrawal rates were restricted to 100 to 200-ml per minute by a flow constrictor device included within the sampling assembly.

2.5.2. PURGING

The sampling assembly was purged by removing three purge volumes of air from the assembly using a 60-ml plastic syringe. Purge volumes were derived by adding the annular void space created within the substrate below the vapor pin because of boring through the slab, and the internal volume of sampling assembly. Once purging was complete, the syringe was removed and replaced with a 200-ml/minute flow restrictor connected to a dedicated 400-ml SUMMA® canisters canister provided by an off-site analytical laboratory. This completed the sampling assembly.

2.5.3. LEAK TESTING

The probe sampling assemblies dedicated to each location were subjected to "shut in" and leak testing prior to use. The "shut in" test was used to check the integrity of the assembly by establishing a vacuum of approximately 10 to 15 inches of mercury (in Hg) by closing external valves and drawing the purging syringe back to create a vacuum and then holding the vacuum steady for approximately 10 minutes. The assembly maintained vacuum of 10 to 15 in Hg over 10 minutes indicating an absence of leaks.

During purging, testing, and sampling activities, a "leak test" was conducted. A temporary plastic enclosure was constructed to envelope the assembly. A leak check compound 1,1-difluoroethane (1,1-DFA) was introduced into the enclosure. This set up exposes the assembly's connections, surface seals, and the top of the temporary soil gas point to the leak check compound.

2.5.4. SAMPLE COLLECTION

One soil gas sample was collected from each of the three (3) subslab vapor pins using a dedicated SUMMA® canister. The Vapor Intrusion Guidance, states that when more than four samples were collected, one (1) duplicate sample is to be collected for QA/QC purposes. Since only three samples were collected, no duplicate sample was indicated.

Once the soil gas samples were collected, the SUMMA® canisters were shipped under chain-of-custody procedures to H&P Mobile Geochemistry, a California-certified laboratory (ELAP Cert #69070) in Carlsbad, California, for analysis.

2.6. SOIL GAS SAMPLE ANALYSES

The contents of each soil gas sample contained within its SUMMA® canister were analyzed as follows:

SOIL GAS SAMPLE ANALYSES	
EPA Method TO-15[2]	
Total Petroleum Hydrocarbons as Gasoline (TPHg)	Ethyl Tertiary Butyl Ether (ETBE)
Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	1,2-Dichloroethane (EDC))
Methyl Tertiary-Butyl Ether (MTBE)	Ethyl Dibromide (EDB)
Tertiary Butyl Alcohol (TBA)	Naphthalene[3]
Di-Isopropyl Ether (DIPE)	1,1-difluoroethane (1,1-DFA)[4]
Tertiary Amyl Methyl Ether (TAME)	

2 The TO-15 analytical method was used since this method typically provide the lowest practical detection limits and better accuracy when compared to EPA Methods 8015M and 8260B.

3 1,1-DFA = leak detection compound

4 Soil gas samples collected are to be analyzed for naphthalene to supply data used in the Direct Contact to Outdoor Air Exposure evaluation of the LTCP.

SOIL GAS SAMPLE ANALYSES - Continued
ASTM D 1946[5]
Oxygen
Carbon dioxide
EPA Method 8015[6]
Methane

ACDEH had requested that one sample be analyzed for naphthalene by test method T0-17, but this was inadvertently overlooked during the ordering of sampling supplies for this sampling event. ATC will ensure that the TO-17 method is implemented in future events.

Analysis was performed using detection limits for the analytes of interest that were less than or equal to the applicable screening levels.

3.0 RESULTS

Laboratory analysis for VOCs indicated the following:

- Benzene was not detected in any sample above the reporting limit of <3.2 µg/m^3.
- Toluene was detected above the reporting limit of <3.8 µg/m^3 in all three samples with a maximum concentration 5.3 µg/m^3 in BSS-3.
- Ethyl benzene was detected above the reporting limit of <4.4 µg/m^3 in one sample, BSS-1, at a concentration of 72 µg/m^3.
- Xylenes were detected above the reporting limit of <8.8 µg/m^3 in one sample, BSS-1, at a concentration of 500 µg/m^3.
- Naphthalene was not detected in any sample above the reporting limit of <5.3 µg/m^3.
- Methylene chloride was detected above the reporting limit of <3.5 µg/m^3 in one sample, BSS-3, at concentration of 14 µg/m^3.
- Leak detection compound 1,1-DFA was not detected above reporting limit of <5.5 µg/m^3 in any of the samples.

No other analytes were reported above the laboratory reporting limits.

Laboratory analysis for atmospheric gases indicated the following:

- Carbon dioxide concentrations ranges from a low of 1.6 % in sample BSS-2 to a high of 2.7 % in sample BSS-3.
- Oxygen concentrations ranges from a low of 11 % in sample BSS-1 to a high of 14 % in sample BSS-2.
- Methane was analyzed but not detected above the reporting limit of 10 ppmv.

ATC performed a Tier I evaluation of the results by comparing the result to Environmental Screening Levels (ESLs) established by the San Francisco Bay Regional Water Quality Control

[5] So called fixed gases - to determine existence of possible bioattenuation zone of the contaminant plume.

[6] The analytical lab recommended Method 8015 as reporting limits were lower.

Board (RWQCB), dated February 2016, Revision 3. Specifically, the results were compared to the ESLs for Subslab/Soil Gas. The results and ESLs are compared in **Table 1**.

Constituents of concern for this vapor intrusion assessment include VOCs associated with PHC, including, but not limited to benzene, ethylbenzene, toluene, xylenes, and naphthalene. None of reported results for the constituents of concern exceeded the Tier I ESLs.

4.0 CONCLUSIONS AND RECOMMENDATIONS

None of the analytical results from the collected subslab vapor samples are in excess of the RWQCB Tier I ESLs, therefore there is no indication of a vapor intrusion risk related to the petroleum hydrocarbon release at this site. ACEH directed quarterly sampling for the purpose of confirmation and assessment of potential seasonal variation in subslab vapor concentrations. ATC anticipates performing the second sampling in the First Quarter 2017.

5.0 LIMITATIONS

For documents cited that were not generated by ATC, the data taken from those documents is used “as is” and is assumed to be accurate. ATC does not guarantee the accuracy of this data and makes no warranties for the referenced work performed nor the inferences or conclusions stated in these documents. This document and the work performed have been undertaken in good faith, with due diligence and with the expertise, experience, capability, and specialized knowledge necessary to perform the work in a good and workperson like manner and within all accepted standards pertaining to providers of environmental services in California at the time of investigation. No soil engineering or geotechnical references are implied or should be inferred. The evaluation of the geologic conditions at the site for this investigation is made from a limited number of data points. Subsurface conditions may vary away from these data points.

TABLES

TABLE 1
Subslab Soil Gas Sample Analytical Results
Salvation Army ARC Building
601 Webster Street
Oakland, California
1 of 1

Sample ID	Sample Date		Benzene	Toluene	Ethyl- benzene	m,p-xylene	o-xylene	MTBE	TBA	DIPE	TAME	ETBE	EDC	EDB	Napthalene	Napthalene	Methylene Chloride	Carbon Dioxide	Oxygen	Methane	1,1 Difluoroethane
		units	*µg/m³*															%	%	*ppmv*	*µg/m³*
		Tier I ESL	48	160,000	560	52,000		5,400	--	--	--	--	54	2.3	41		510	-			-
BSS-1	11/16/16		< 3.2	4.7	72	350	150	< 3.6	< 6.1	< 4.2	< 4.2	< 4.2	< 4.1	< 7.8	< 5.3	NS	< 3.5	2.6	11	< 10	< 5.5
BSS-2	11/16/16		< 3.2	4.7	< 4.4	< 8.8	< 4.4	< 3.6	< 6.1	< 4.2	< 4.2	< 4.2	< 4.1	< 7.8	< 5.3	NS	< 3.5	1.6	14	< 10	< 5.5
BSS-3	11/16/16		< 3.2	5.3	< 4.4	< 8.8	< 4.4	< 3.6	< 6.1	< 4.2	< 4.2	< 4.2	< 4.1	< 7.8	< 5.3	NS	14	2.7	12	< 10	< 5.5
		Analtyical Method	TO15	TO15	TO15	TO15	TO15	TO15	TO15	TO15	TO15	TO15	TO15	TO15	TO15	TO17	TO15				TO15
		Commonly Recognized Source of Analyte	Gasoline					Gasoline							Diesel		Industrial Solvent	Biological Activity			Vapor Test
		Analyte Type	BTEX (main source of octane)					Fuel Oxygenates (anti-knock)					Lead Scavenger		Octane Booster		Chlorinated	Biogenic Indicator Gases			Tracer

Notes:

µg/m3 = Micrograms per cubic meter. All results and ESLs are expressed in µg/m3

ESL = California Environmental Protection Agency, San Francisco Bay Regional Water Quality Control Board's ESL Worksheet, Revision 3, dated February 2016. ATC used the Tier I ESLs for Subslab/Soil.

na = not applicable

ppmv = parts per million by volume or moles per million, by volume

-- = No ESL provided

<x.x = Not detected above laboratory reporting limits

MTBE = Methyl-Tert-Butyl-Ether

TBA = Tertiary Butyl Alcohol

DIPE = Di-Isopropyl Ether

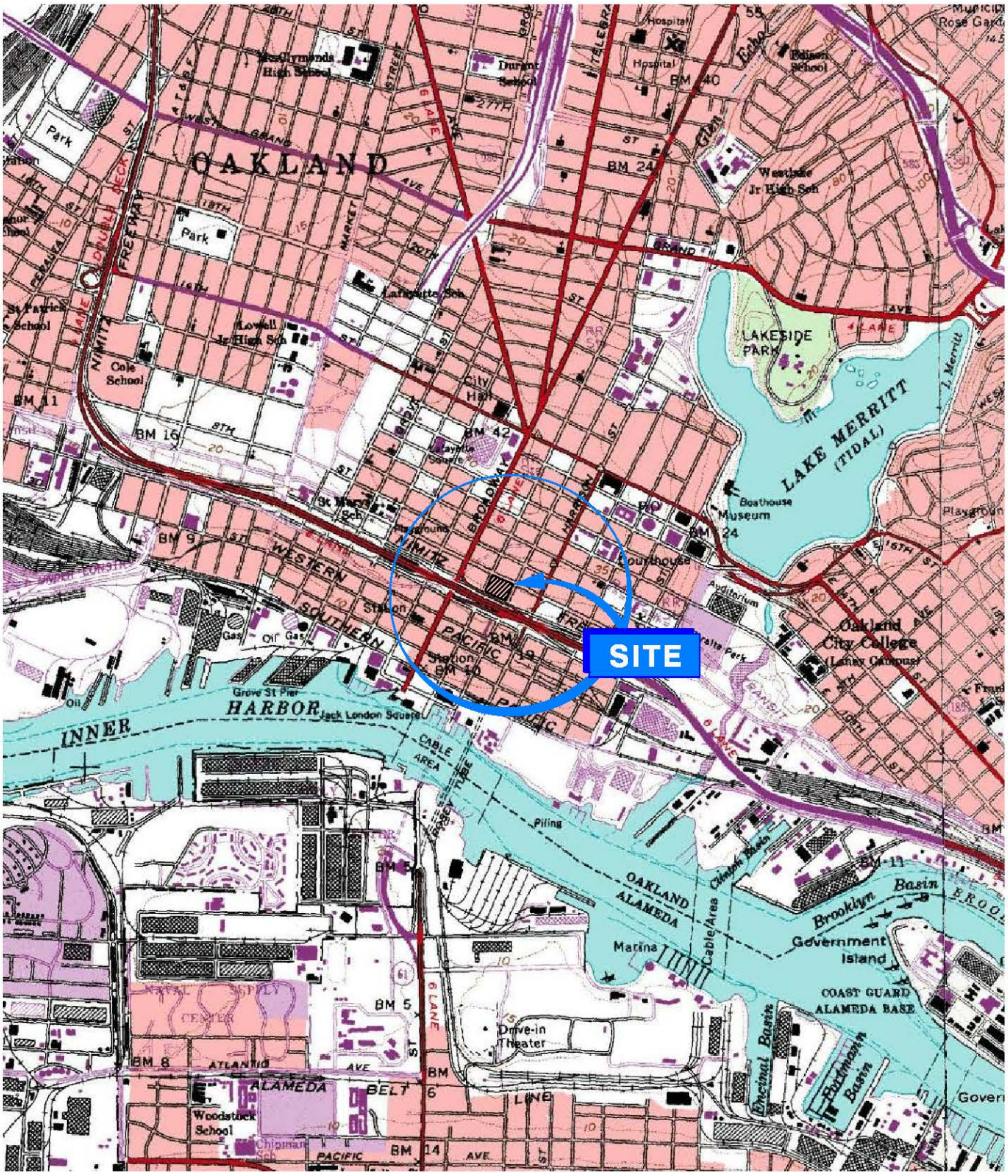
TAME = Tertiary Amyl Methyl Ether

ETBE = Ethyl Tertiary Butyl Ether

EDC = 1,2-Dichloroethane

EDB = Ethyl Dibromide

FIGURES



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP
OAKLAND WEST QUADRANGLE, CALIFORNIA, DATE 1959, PHOTO-UPDATED 1980

FIGURE 1
SITE LOCATION MAP
THE SALVATION ARMY
601 WEBSTER STREET
OAKLAND, CALIFORNIA

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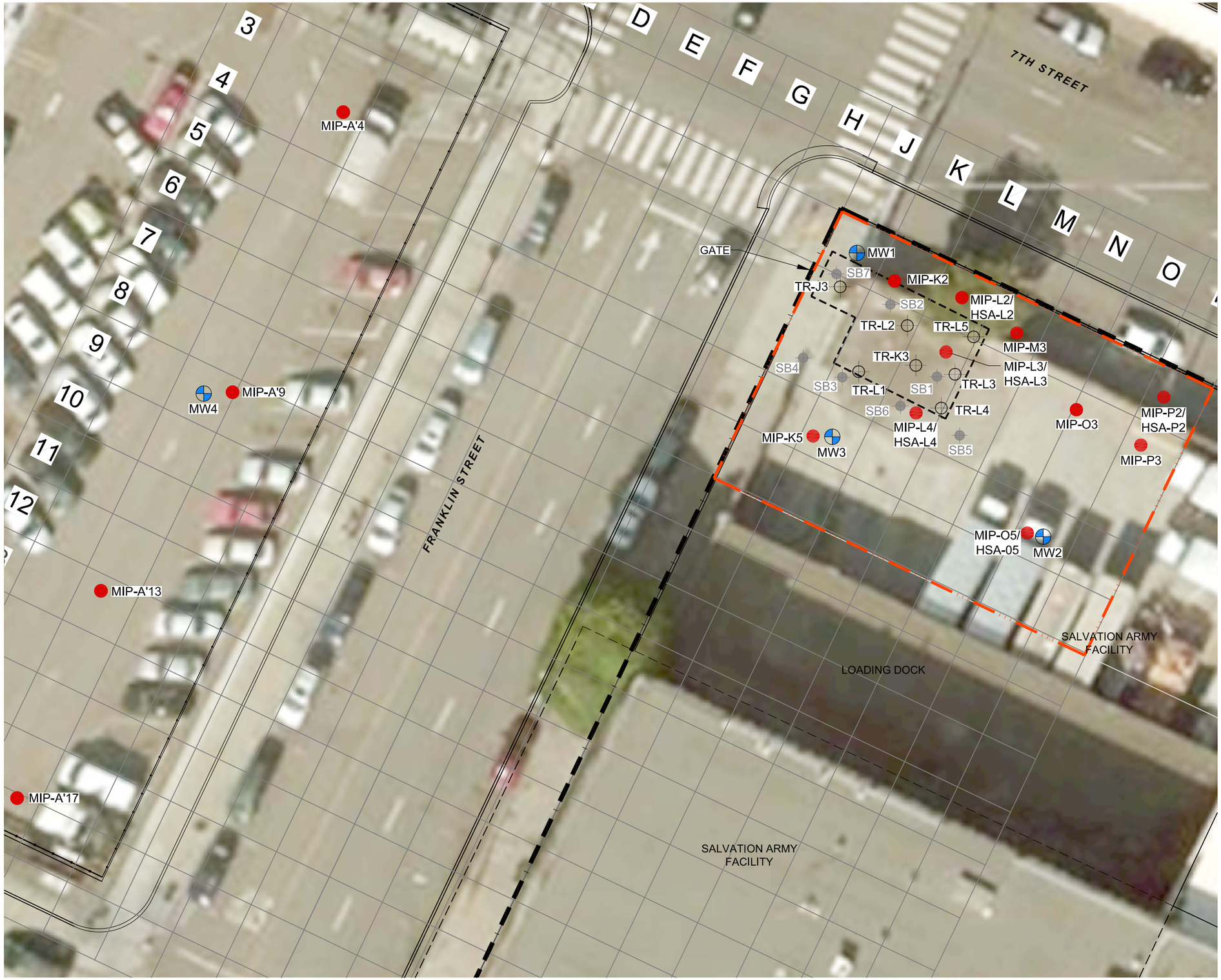
Ph: (209) 579-2221

PROJECT NUMBER: Z054000006		
DESIGNED BY: MDS	APPROVED BY: JH	DATE: 1-22-15
REVIEWED BY: MDS	DRAWN BY: DAW	SCALE: 1:24,000

FILE: M:\Enviromental\25026 – The Salvation Army\TSA-O-UST 601 Webster Oakland\Drawing & Figures\DWGs\04 Denise's CAD Folder\2015 4Q GW Contour 2.dwg



LEGEND

- APPROXIMATE FACILITY BOUNDARY
- FORMER UST
- FORMER EXCAVATION
- TRUCK ENCLOSURE AREA
- TANK REMOVAL SOIL SAMPLE LOCATION
  - TR-J3 = DIESEL-N 14'
  - TR-L1 = PRIOR-WEST 14'
  - TR-L2 = DIESEL-S 14'
  - TR-L3 = GAS CENTER 17'
  - TR-L4 = GAS-WEST 14'
  - TR-L5 = GAS-EAST 14'
  - TR-K3 = BETWEEN TANKS 14'
- FORMER SOIL BORING LOCATION
- MIP AND HSA BORING LOCATION
- MONITORING WELL LOCATION

0 20' 40'

SCALE, FT

N

NOTE: SCALE AND LOCATIONS ARE APPROXIMATE

SITE PLAN

THE SALVATION ARMY
601 WEBSTER STREET
OAKLAND, CA

FIGURE 2

DATE: 8-22-16
DRAWN BY: DAW

PROJECT NUMBER: Z0540000066
APPROVED BY: M. SONKE

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FILE: M:\Enviromental\25026 – The Salvation Army\TSA-O-UST 601 Webster Oakland\Drawing & Figures\DWGs\04 Denise's CAD Folder\2016_Site Plan_Salvation Army.dwg Aug 22, 2016 – 10:24am denise.walp

NOTE: SCALE AND LOCATIONS ARE APPROXIMATE

FIGURE 3

Subslab Soil Gas Sampling Point Locations

THE SALVATION ARMY
601 WEBSTER STREET
OAKLAND, CALIFORNIA

PROJECT NUMBER: 054.25026.0001		
DESIGNED BY: MDS	APPROVED BY: JH	DATE: 8-14-14
REVIEWED BY: MDS	DRAWN BY: DAW	SCALE: 1" = 30'

FILE: W:\25026 Modesto\Cad Files\1-25026.0001-Salvation Army Oakland.dwg

APPENDICES

Appendix **A**

Cox-Colvin
Standard Operating Procedure Installation
and Extraction of the Vapor Pin

Standard Operating Procedure Installation and Extraction of the Vapor Pin™

December 3, 2013

Scope:

This standard operating procedure describes the installation and extraction of the Vapor Pin™ for use in sub-slab soil-gas sampling.

Purpose:

The purpose of this procedure is to assure good quality control in field operations and uniformity between field personnel in the use of the Vapor Pin™ for the collection of sub-slab soil-gas samples.

Equipment Needed:

- Assembled Vapor Pin™ [Vapor Pin™ and silicone sleeve (Figure 1)];
- Hammer drill;
- 5/8-inch diameter hammer bit (Hilti™ TE-YX 5/8" x 22" #00206514 or equivalent);
- 1½-inch diameter hammer bit (Hilti™ TE-YX 1½" x 23" #00293032 or equivalent) for flush mount applications;
- ¾-inch diameter bottle brush;
- Wet/dry vacuum with HEPA filter (optional);
- Vapor Pin™ installation/extraction tool;
- Dead blow hammer;
- Vapor Pin™ flush mount cover, if desired;
- Vapor Pin™ protective cap; and
- VOC-free hole patching material (hydraulic cement) and putty knife or trowel.

Figure 1. Assembled Vapor Pin™.

Installation Procedure:

1) Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.

2) Set up wet/dry vacuum to collect drill cuttings.

3) If a flush mount installation is required, drill a 1½-inch diameter hole at least 1¾-inches into the slab.

4) Drill a 5/8-inch diameter hole through the slab and approximately 1-inch into the underlying soil to form a void.

5) Remove the drill bit, brush the hole with the bottle brush, and remove the loose cuttings with the vacuum.

6) Place the lower end of Vapor Pin™ assembly into the drilled hole. Place the small hole located in the handle of the extraction/installation tool over the Vapor Pin™ to protect the barb fitting and cap, and tap the Vapor Pin™ into place using a dead blow hammer (Figure 2). Make sure

the extraction/installation tool is aligned parallel to the Vapor Pin™ to avoid damaging the barb fitting.

Figure 2. Installing the Vapor Pin™.

For flush mount installations, unscrew the threaded coupling from the installation/extraction handle and use the hole in the end of the tool to assist with the installation (Figure 3).

Figure 3. Flush-mount installation.

During installation, the silicone sleeve will form a slight bulge between the slab and the Vapor Pin™ shoulder. Place the protective cap on Vapor Pin™ to prevent vapor loss prior to sampling (Figure 4).

Figure 4. Installed Vapor Pin™.

7) For flush mount installations, cover the Vapor Pin™ with a flush mount cover, using either the plastic cover or the optional stainless-steel Secure Cover.

8) Allow 20 minutes or more (consult applicable guidance for your situation) for the sub-slab soil-gas conditions to equilibrate prior to sampling.

9) Remove protective cap and connect sample tubing to the barb fitting of the Vapor Pin™ (Figure 5).

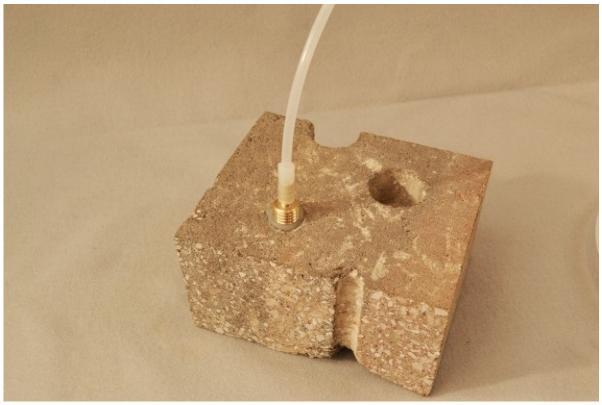

Figure 5. Vapor Pin™ sample connection.

10) Conduct leak tests in accordance with applicable guidance. If the method of leak testing is not specified, an attractive alternative can be the use of a water dam and vacuum pump, as described in SOP Leak Testing the Vapor Pin™ via Mechanical Means (Figure 6).

Figure 6. Water dam used for leak detection.

11) Collect sub-slab soil gas sample. When finished sampling, replace the protective cap and flush mount cover until the next sampling event. If the sampling is complete, extract the Vapor Pin™.

Extraction Procedure:

1) Remove the protective cap, and thread the installation/extraction tool onto the barrel of the Vapor Pin™ (Figure 7). Continue turning the tool to assist in extraction, then pull the Vapor Pin™ from the hole.

2) Fill the void with hydraulic cement and smooth with the trowel or putty knife. Urethane caulk is widely recommended for installing radon systems and can provide a tight seal, but it could also be a source of VOCs during subsequent sampling.

Figure 7. Removing the Vapor Pin™.

3) Prior to reuse, remove the silicone sleeve and discard. Decontaminate the Vapor Pin™ in a hot water and Alconox® wash, then heat in an oven to a temperature of 130° C.

The Vapor Pin™ to designed be used repeatedly; however, replacement parts and supplies will be required periodically. These parts are available on-line at www.CoxColvin.com.

Replacement Parts:

Vapor Pin™ Kit Case - VPC001
Vapor Pins™ - VPIN0522
Silicone Sleeves - VPTS077
Installation/Extraction Tool - VPIE023
Protective Caps - VPPC010
Flush Mount Covers - VPFM050
Water Dam - VPWD004
Brush - VPB026
Secure Cover - VPSCSS001
Spanner Wrench - VPSPAN001

Appendix **B**

Laboratory Analytical Results
Subslab Soil Gas Samples

Mobile Geochemistry Inc.

06 December 2016

Mr. Mike Sonke
ATC Group Services - Modesto
1117 Lone Palm Ave., Suite B
Modesto, CA 95351

H&P Project: ATC112816-13
Client Project: TSAO / Oakland, CA

Dear Mr. Mike Sonke:

Enclosed is the analytical report for the above referenced project. The data herein applies to samples as received by H&P Mobile Geochemistry, Inc. on 28-Nov-16 which were analyzed in accordance with the attached Chain of Custody record(s).

The results for all sample analyses and required QA/QC analyses are presented in the following sections and summarized in the documents:

- Sample Summary
- Case Narrative (if applicable)
- Sample Results
- Quality Control Summary
- Notes and Definitions / Appendix
- Chain of Custody
- Sampling Logs (if applicable)

Unless otherwise noted, I certify that all analyses were performed and reviewed in compliance with our Quality Systems Manual and Standard Operating Procedures. This report shall not be reproduced, except in full, without the written approval of H&P Mobile Geochemistry, Inc.

We at H&P Mobile Geochemistry, Inc. sincerely appreciate the opportunity to provide analytical services to you on this project. If you have any questions or concerns regarding this analytical report, please contact me at your convenience at 760-804-9678.

Sincerely,

Janis La Roux
Laboratory Director

H&P Mobile Geochemistry, Inc. is certified under the California ELAP, the National Environmental Laboratory Accreditation Conference (NELAC) and the Department of Defense Accreditation Programs.

H&P Mobile
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ATC Group Services - Modesto	Project: ATC112816-13	
1117 Lone Palm Ave., Suite B	Project Number: TSAO / Oakland, CA	Reported:
Modesto, CA 95351	Project Manager: Mr. Mike Sonke	06-Dec-16 10:11

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BSS-1	E611108-01	Vapor	16-Nov-16	28-Nov-16
BSS-2	E611108-02	Vapor	16-Nov-16	28-Nov-16
BSS-3	E611108-03	Vapor	16-Nov-16	28-Nov-16

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Modesto, CA 95351	Project Manager: Mr. Mike Sonke	06-Dec-16 10:11

Soil Gas and Vapor Analysis

H&P Mobile Geochemistry, Inc.

Analyte	Result	MDL	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
BSS-1 (E611108-01) Vapor Sampled: 16-Nov-16 Received: 28-Nov-16										
Carbon dioxide	**2.6**		0.20	%	1	EK63016	30-Nov-16	30-Nov-16	ASTM D1945	
Oxygen	**11**		0.20	"	"	"	"	"	"	
Methane	ND		10	ppmv	"	EK63015	30-Nov-16	30-Nov-16	EPA 8015M	
BSS-2 (E611108-02) Vapor Sampled: 16-Nov-16 Received: 28-Nov-16										
Carbon dioxide	**1.6**		0.20	%	1	EK63016	30-Nov-16	30-Nov-16	ASTM D1945	
Oxygen	**14**		0.20	"	"	"	"	"	"	
Methane	ND		10	ppmv	"	EK63015	30-Nov-16	30-Nov-16	EPA 8015M	
BSS-3 (E611108-03) Vapor Sampled: 16-Nov-16 Received: 28-Nov-16										
Carbon dioxide	**2.7**		0.20	%	1	EK63016	30-Nov-16	30-Nov-16	ASTM D1945	
Oxygen	**12**		0.20	"	"	"	"	"	"	
Methane	ND		10	ppmv	"	EK63015	30-Nov-16	30-Nov-16	EPA 8015M	

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Modesto, CA 95351	Project Manager: Mr. Mike Sonke	06-Dec-16 10:11

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	MDL	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
BSS-1 (E611108-01) Vapor Sampled: 16-Nov-16 Received: 28-Nov-16										**J- Report**
1,1-Difluoroethane (LCC)	ND		5.5	ug/m3	1	EL60111	01-Dec-16	01-Dec-16	EPA TO-15	
Dichlorodifluoromethane (F12)	ND		5.0	"	"	"	"	"	"	
Chloromethane	ND		2.1	"	"	"	"	"	"	
Dichlorotetrafluoroethane (F114)	ND		7.1	"	"	"	"	"	"	
Vinyl chloride	ND		2.6	"	"	"	"	"	"	
Bromomethane	ND		16	"	"	"	"	"	"	
Chloroethane	ND		8.0	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND		5.6	"	"	"	"	"	"	
1,1-Dichloroethene	ND		4.0	"	"	"	"	"	"	
Tertiary-butyl alcohol (TBA)	ND		6.1	"	"	"	"	"	"	
1,1,2-Trichlorotrifluoroethane (F113)	ND		7.7	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND		3.5	"	"	"	"	"	"	
Carbon disulfide	ND		6.3	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND		8.0	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND		3.6	"	"	"	"	"	"	
1,1-Dichloroethane	ND		4.1	"	"	"	"	"	"	
2-Butanone (MEK)	ND		30	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND		4.0	"	"	"	"	"	"	
Diisopropyl ether (DIPE)	ND		4.2	"	"	"	"	"	"	
Chloroform	ND		4.9	"	"	"	"	"	"	
Ethyl tert-butyl ether (ETBE)	ND		4.2	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND		5.5	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND		4.1	"	"	"	"	"	"	
Benzene	ND		3.2	"	"	"	"	"	"	
Carbon tetrachloride	ND		6.4	"	"	"	"	"	"	
Tertiary-amyl methyl ether (TAME)	ND		4.2	"	"	"	"	"	"	
Trichloroethene	ND		5.5	"	"	"	"	"	"	
1,2-Dichloropropane	ND		9.4	"	"	"	"	"	"	
Bromodichloromethane	ND		6.8	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND		4.6	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND		8.3	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND		4.6	"	"	"	"	"	"	
Toluene	**4.7**		3.8	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND		5.5	"	"	"	"	"	"	
2-Hexanone (MBK)	ND		8.3	"	"	"	"	"	"	
Dibromochloromethane	ND		8.6	"	"	"	"	"	"	

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1117 Lone Palm Ave., Suite B	Project Number: TSAO / Oakland, CA	Reported:
Modesto, CA 95351	Project Manager: Mr. Mike Sonke	06-Dec-16 10:11

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	MDL	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
BSS-1 (E611108-01) Vapor Sampled: 16-Nov-16 Received: 28-Nov-16										**J- Report**
Tetrachloroethene	ND		6.9	ug/m3	1	EL60111	01-Dec-16	01-Dec-16	EPA TO-15	
1,2-Dibromoethane (EDB)	ND		7.8	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND		7.0	"	"	"	"	"	"	
Chlorobenzene	ND		4.7	"	"	"	"	"	"	
Ethylbenzene	**72**		4.4	"	"	"	"	"	"	
m,p-Xylene	**350**		8.8	"	"	"	"	"	"	
Styrene	ND		4.3	"	"	"	"	"	"	
o-Xylene	**150**		4.4	"	"	"	"	"	"	
Bromoform	ND		10	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND		7.0	"	"	"	"	"	"	
4-Ethyltoluene	ND		5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND		5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND		5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND		12	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND		12	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND		12	"	"	"	"	"	"	
Naphthalene	ND	2.7	5.3	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND		38	"	"	"	"	"	"	
Hexachlorobutadiene	ND		54	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*72.2 %*		*76-134*	"	"	"	"	*S-GC*
Surrogate: Toluene-d8			*104 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene			*86.6 %*		*77-127*	"	"	"	"	
BSS-2 (E611108-02) Vapor Sampled: 16-Nov-16 Received: 28-Nov-16										**J- Report**
1,1-Difluoroethane (LCC)	ND		5.5	ug/m3	1	EL60111	01-Dec-16	01-Dec-16	EPA TO-15	
Dichlorodifluoromethane (F12)	ND		5.0	"	"	"	"	"	"	
Chloromethane	ND		2.1	"	"	"	"	"	"	
Dichlorotetrafluoroethane (F114)	ND		7.1	"	"	"	"	"	"	
Vinyl chloride	ND		2.6	"	"	"	"	"	"	
Bromomethane	ND		16	"	"	"	"	"	"	
Chloroethane	ND		8.0	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND		5.6	"	"	"	"	"	"	
1,1-Dichloroethene	ND		4.0	"	"	"	"	"	"	
Tertiary-butyl alcohol (TBA)	ND		6.1	"	"	"	"	"	"	
1,1,2-Trichlorotrifluoroethane (F113)	ND		7.7	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND		3.5	"	"	"	"	"	"	

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Modesto, CA 95351	Project Manager: Mr. Mike Sonke	06-Dec-16 10:11

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	MDL	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
BSS-2 (E611108-02) Vapor Sampled: 16-Nov-16 Received: 28-Nov-16										**J- Report**
Carbon disulfide	ND		6.3	ug/m3	1	EL60111	01-Dec-16	01-Dec-16	EPA TO-15	
trans-1,2-Dichloroethene	ND		8.0	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND		3.6	"	"	"	"	"	"	
1,1-Dichloroethane	ND		4.1	"	"	"	"	"	"	
2-Butanone (MEK)	ND		30	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND		4.0	"	"	"	"	"	"	
Diisopropyl ether (DIPE)	ND		4.2	"	"	"	"	"	"	
Chloroform	ND		4.9	"	"	"	"	"	"	
Ethyl tert-butyl ether (ETBE)	ND		4.2	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND		5.5	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND		4.1	"	"	"	"	"	"	
Benzene	ND		3.2	"	"	"	"	"	"	
Carbon tetrachloride	ND		6.4	"	"	"	"	"	"	
Tertiary-amyl methyl ether (TAME)	ND		4.2	"	"	"	"	"	"	
Trichloroethene	ND		5.5	"	"	"	"	"	"	
1,2-Dichloropropane	ND		9.4	"	"	"	"	"	"	
Bromodichloromethane	ND		6.8	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND		4.6	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND		8.3	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND		4.6	"	"	"	"	"	"	
Toluene	**4.7**		3.8	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND		5.5	"	"	"	"	"	"	
2-Hexanone (MBK)	ND		8.3	"	"	"	"	"	"	
Dibromochloromethane	ND		8.6	"	"	"	"	"	"	
Tetrachloroethene	ND		6.9	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND		7.8	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND		7.0	"	"	"	"	"	"	
Chlorobenzene	ND		4.7	"	"	"	"	"	"	
Ethylbenzene	ND		4.4	"	"	"	"	"	"	
m,p-Xylene	ND		8.8	"	"	"	"	"	"	
Styrene	ND		4.3	"	"	"	"	"	"	
o-Xylene	ND		4.4	"	"	"	"	"	"	
Bromoform	ND		10	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND		7.0	"	"	"	"	"	"	
4-Ethyltoluene	ND		5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND		5.0	"	"	"	"	"	"	

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Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	MDL	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
BSS-2 (E611108-02) Vapor Sampled: 16-Nov-16 Received: 28-Nov-16										**J- Report**
1,2,4-Trimethylbenzene	ND		5.0	ug/m3	1	EL60111	01-Dec-16	01-Dec-16	EPA TO-15	
1,3-Dichlorobenzene	ND		12	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND		12	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND		12	"	"	"	"	"	"	
Naphthalene	ND	2.7	5.3	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND		38	"	"	"	"	"	"	
Hexachlorobutadiene	ND		54	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*80.3 %*	*76-134*		"	"	"	"	
Surrogate: Toluene-d8			*103 %*	*78-125*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene			*95.1 %*	*77-127*		"	"	"	"	
BSS-3 (E611108-03) Vapor Sampled: 16-Nov-16 Received: 28-Nov-16										**J- Report**
1,1-Difluoroethane (LCC)	ND		5.5	ug/m3	1	EL60111	01-Dec-16	01-Dec-16	EPA TO-15	
Dichlorodifluoromethane (F12)	ND		5.0	"	"	"	"	"	"	
Chloromethane	ND		2.1	"	"	"	"	"	"	
Dichlorotetrafluoroethane (F114)	ND		7.1	"	"	"	"	"	"	
Vinyl chloride	ND		2.6	"	"	"	"	"	"	
Bromomethane	ND		16	"	"	"	"	"	"	
Chloroethane	ND		8.0	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND		5.6	"	"	"	"	"	"	
1,1-Dichloroethene	ND		4.0	"	"	"	"	"	"	
Tertiary-butyl alcohol (TBA)	ND		6.1	"	"	"	"	"	"	
1,1,2-Trichlorotrifluoroethane (F113)	ND		7.7	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	**14**		3.5	"	"	"	"	"	"	
Carbon disulfide	ND		6.3	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND		8.0	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND		3.6	"	"	"	"	"	"	
1,1-Dichloroethane	ND		4.1	"	"	"	"	"	"	
2-Butanone (MEK)	ND		30	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND		4.0	"	"	"	"	"	"	
Diisopropyl ether (DIPE)	ND		4.2	"	"	"	"	"	"	
Chloroform	ND		4.9	"	"	"	"	"	"	
Ethyl tert-butyl ether (ETBE)	ND		4.2	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND		5.5	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND		4.1	"	"	"	"	"	"	
Benzene	ND		3.2	"	"	"	"	"	"	

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Modesto, CA 95351	Project Manager: Mr. Mike Sonke	06-Dec-16 10:11

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	MDL	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
BSS-3 (E611108-03) Vapor Sampled: 16-Nov-16 Received: 28-Nov-16										**J- Report**
Carbon tetrachloride	ND		6.4	ug/m3	1	EL60111	01-Dec-16	01-Dec-16	EPA TO-15	
Tertiary-amyl methyl ether (TAME)	ND		4.2	"	"	"	"	"	"	
Trichloroethene	ND		5.5	"	"	"	"	"	"	
1,2-Dichloropropane	ND		9.4	"	"	"	"	"	"	
Bromodichloromethane	ND		6.8	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND		4.6	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND		8.3	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND		4.6	"	"	"	"	"	"	
Toluene	**5.3**		3.8	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND		5.5	"	"	"	"	"	"	
2-Hexanone (MBK)	ND		8.3	"	"	"	"	"	"	
Dibromochloromethane	ND		8.6	"	"	"	"	"	"	
Tetrachloroethene	ND		6.9	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND		7.8	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND		7.0	"	"	"	"	"	"	
Chlorobenzene	ND		4.7	"	"	"	"	"	"	
Ethylbenzene	ND		4.4	"	"	"	"	"	"	
m,p-Xylene	ND		8.8	"	"	"	"	"	"	
Styrene	ND		4.3	"	"	"	"	"	"	
o-Xylene	ND		4.4	"	"	"	"	"	"	
Bromoform	ND		10	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND		7.0	"	"	"	"	"	"	
4-Ethyltoluene	ND		5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND		5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND		5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND		12	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND		12	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND		12	"	"	"	"	"	"	
Naphthalene	ND	2.7	5.3	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND		38	"	"	"	"	"	"	
Hexachlorobutadiene	ND		54	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*81.4 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8			*105 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene			*92.9 %*		*77-127*	"	"	"	"	

H&P Mobile
Geochemistry Inc.

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760-804-9678 Phone
760-804-9159 Fax

ATC Group Services - Modesto	Project: ATC112816-13	
1117 Lone Palm Ave., Suite B	Project Number: TSAO / Oakland, CA	Reported:
Modesto, CA 95351	Project Manager: Mr. Mike Sonke	06-Dec-16 10:11

Soil Gas and Vapor Analysis - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EK63015 - GC										
Blank (EK63015-BLK1)				Prepared & Analyzed: 30-Nov-16						
Methane	ND	10	ppmv							
Batch EK63016 - GC										
Blank (EK63016-BLK1)				Prepared & Analyzed: 30-Nov-16						
Carbon dioxide	ND	0.20	%							

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1117 Lone Palm Ave., Suite B	Project Number: TSAO / Oakland, CA	Reported:
Modesto, CA 95351	Project Manager: Mr. Mike Sonke	06-Dec-16 10:11

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EL60111 - TO-15										
Blank (EL60111-BLK1)				Prepared & Analyzed: 01-Dec-16						
1,1-Difluoroethane (LCC)	ND	5.5	ug/m3							
Dichlorodifluoromethane (F12)	ND	5.0	"							
Chloromethane	ND	2.1	"							
Dichlorotetrafluoroethane (F114)	ND	7.1	"							
Vinyl chloride	ND	2.6	"							
Bromomethane	ND	16	"							
Chloroethane	ND	8.0	"							
Trichlorofluoromethane (F11)	ND	5.6	"							
1,1-Dichloroethene	ND	4.0	"							
Tertiary-butyl alcohol (TBA)	ND	6.1	"							
1,1,2-Trichlorotrifluoroethane (F113)	ND	7.7	"							
Methylene chloride (Dichloromethane)	ND	3.5	"							
Carbon disulfide	ND	6.3	"							
trans-1,2-Dichloroethene	ND	8.0	"							
Methyl tertiary-butyl ether (MTBE)	ND	3.6	"							
1,1-Dichloroethane	ND	4.1	"							
2-Butanone (MEK)	ND	30	"							
cis-1,2-Dichloroethene	ND	4.0	"							
Diisopropyl ether (DIPE)	ND	4.2	"							
Chloroform	ND	4.9	"							
Ethyl tert-butyl ether (ETBE)	ND	4.2	"							
1,1,1-Trichloroethane	ND	5.5	"							
1,2-Dichloroethane (EDC)	ND	4.1	"							
Benzene	ND	3.2	"							
Carbon tetrachloride	ND	6.4	"							
Tertiary-amyl methyl ether (TAME)	ND	4.2	"							
Trichloroethene	ND	5.5	"							
1,2-Dichloropropane	ND	9.4	"							
Bromodichloromethane	ND	6.8	"							
cis-1,3-Dichloropropene	ND	4.6	"							
4-Methyl-2-pentanone (MIBK)	ND	8.3	"							
trans-1,3-Dichloropropene	ND	4.6	"							
Toluene	ND	3.8	"							
1,1,2-Trichloroethane	ND	5.5	"							

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Modesto, CA 95351	Project Manager: Mr. Mike Sonke	06-Dec-16 10:11

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EL60111 - TO-15										
Blank (EL60111-BLK1)				Prepared & Analyzed: 01-Dec-16						
2-Hexanone (MBK)	ND	8.3	ug/m3							
Dibromochloromethane	ND	8.6	"							
Tetrachloroethene	ND	6.9	"							
1,2-Dibromoethane (EDB)	ND	7.8	"							
1,1,1,2-Tetrachloroethane	ND	7.0	"							
Chlorobenzene	ND	4.7	"							
Ethylbenzene	ND	4.4	"							
m,p-Xylene	ND	8.8	"							
Styrene	ND	4.3	"							
o-Xylene	ND	4.4	"							
Bromoform	ND	10	"							
1,1,2,2-Tetrachloroethane	ND	7.0	"							
4-Ethyltoluene	ND	5.0	"							
1,3,5-Trimethylbenzene	ND	5.0	"							
1,2,4-Trimethylbenzene	ND	5.0	"							
1,3-Dichlorobenzene	ND	12	"							
1,4-Dichlorobenzene	ND	12	"							
1,2-Dichlorobenzene	ND	12	"							
Naphthalene	ND	5.3	"							
1,2,4-Trichlorobenzene	ND	38	"							
Hexachlorobutadiene	ND	54	"							
Surrogate: 1,2-Dichloroethane-d4	*199*		"	*214*		*92.9*	*76-134*			
Surrogate: Toluene-d8	*212*		"	*207*		*102*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*362*		"	*364*		*99.3*	*77-127*			
LCS (EL60111-BS1)				Prepared & Analyzed: 01-Dec-16						
Dichlorodifluoromethane (F12)	85	5.0	ug/m3	101		84.3	59-128			
Vinyl chloride	45	2.6	"	52.0		86.1	64-127			
Chloroethane	46	8.0	"	53.6		86.6	63-127			
Trichlorofluoromethane (F11)	95	5.6	"	113		83.9	62-126			
1,1-Dichloroethene	69	4.0	"	80.8		85.1	61-133			
1,1,2-Trichlorotrifluoroethane (F113)	140	7.7	"	155		88.2	66-126			
Methylene chloride (Dichloromethane)	72	3.5	"	70.8		102	62-115			

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1117 Lone Palm Ave., Suite B	Project Number: TSAO / Oakland, CA	Reported:
Modesto, CA 95351	Project Manager: Mr. Mike Sonke	06-Dec-16 10:11

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EL60111 - TO-15										
LCS (EL60111-BS1)				Prepared & Analyzed: 01-Dec-16						
trans-1,2-Dichloroethene	62	8.0	ug/m3	80.8		77.1	67-124			
1,1-Dichloroethane	67	4.1	"	82.4		81.8	68-126			
cis-1,2-Dichloroethene	69	4.0	"	80.0		86.2	70-121			
Chloroform	85	4.9	"	99.2		85.2	68-123			
1,1,1-Trichloroethane	94	5.5	"	111		84.6	68-125			
1,2-Dichloroethane (EDC)	71	4.1	"	82.4		86.3	65-128			
Benzene	59	3.2	"	64.8		91.5	69-119			
Carbon tetrachloride	110	6.4	"	128		85.9	68-132			
Trichloroethene	130	5.5	"	110		118	71-123			
Toluene	81	3.8	"	76.8		106	66-119			
1,1,2-Trichloroethane	110	5.5	"	111		101	73-119			
Tetrachloroethene	130	6.9	"	138		94.5	66-124			
1,1,1,2-Tetrachloroethane	140	7.0	"	140		97.4	67-129			
Ethylbenzene	93	4.4	"	88.4		105	70-124			
m,p-Xylene	94	8.8	"	88.4		106	61-134			
o-Xylene	93	4.4	"	88.4		105	67-125			
1,1,2,2-Tetrachloroethane	100	7.0	"	140		73.7	65-127			
Surrogate: 1,2-Dichloroethane-d4	*188*		*"*	*214*		*87.7*	*76-134*			
Surrogate: Toluene-d8	*205*		*"*	*207*		*98.9*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*334*		*"*	*364*		*91.7*	*77-127*			

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Modesto, CA 95351	Project Manager: Mr. Mike Sonke	06-Dec-16 10:11

Notes and Definitions

S-GC	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate(s).
J- Report	This sample is reported to the MDL or LOD determined for this method. All confirmed hits above the listed MDL or LOD value and below the RL/LOQ, will be flagged with a "J" result. If an MDL or LOD is not listed, the analyte is ND at the RL.
LCC	Leak Check Compound
ND	Analyte NOT DETECTED at or above the reporting limit
MDL	Method Detection Limit
%REC	Percent Recovery
RPD	Relative Percent Difference

Appendix

H&P Mobile Geochemistry, Inc. is approved as an Environmental Testing Laboratory and Mobile Laboratory in accordance with the DoD-ELAP and the ISO 17025 programs, certification number L15-279-R1.

H&P is approved by the State of Arizona as an Environmental Testing Laboratory and Mobile Laboratory, certification numbers AZM758 and AZ0779.

H&P is approved by the State of California as an Environmental Laboratory and Mobile Laboratory in conformance with the Environmental Laboratory Accreditation Program (ELAP) for the category of Volatile and Semi-Volatile Organic Chemistry of Hazardous Waste, certification numbers 2740, 2741, 2743, 2744, 2745, 2754 & 2930.

H&P is approved by the State of Florida Department of Health under the National Environmental Laboratory Accreditation Conference (NELAC) certification number E871100.

The complete list of stationary and mobile laboratory certifications along with the fields of testing (FOTs) and analyte lists are available at www.handpmg.com/about/certifications.

H&P Mobile Geochemistry, Inc.
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VAPOR / AIR Chain of Custody

DATE: 11-16-16
Page 1 of ____

Lab Client and Project Information

Lab Client/Consultant: ATC Group Services LLC	Project Name / #: TSAO
Lab Client Project Manager: Mike Sonke	Project Location: Oakland, CA
Lab Client Address: 1117 Lone Palm Ave, Suite 201B	Report E-Mail(s): Jim.Kundert@atcassociates.com mike.sonke@atcassociates.com
Lab Client City, State, Zip: Modesto, CA 95351	
Phone Number: 209-579-2221	

Reporting Requirements
- [x] Standard Report [ ] Level III [ ] Level IV
- [ ] Excel EDD [ ] Other EDD:
- [x] CA Geotracker Global ID: T10000603428

Turnaround Time
- [x] 5-7 day Stnd [ ] 24-Hr Rush
- [ ] 3-day Rush [ ] Mobile Lab
- [ ] 48-Hr Rush [ ] Other:

Sampler Information
Sampler(s): Jim Kundert
Signature:
Date: 11-16-16

Sample Receipt (Lab Use Only)

Date Rec'd: 11/28/16	Control #: 161021.01
H&P Project # ATC112816-13	
Lab Work Order # EG11108	
Sample Intact: [x] Yes [ ] No [ ] See Notes Below	
Receipt Gauge ID: 11167	Temp: RT
Outside Lab:	
Receipt Notes/Tracking #: 1293TT6190501799999	
Lab PM Initials: KM	

Additional Instructions to Laboratory: *J-flag Naphthalene only KIM 11/28/16

- [ ] Check if Project Analyte List is Attached
- ** Preferred VOC units (please choose one):*
- [ ] µg/L [x] µg/m³ [ ] ppbv [ ] ppmv

SAMPLE NAME	FIELD POINT NAME (if applicable)	DATE mm/dd/yy	TIME 24hr clock	SAMPLE TYPE Indoor Air (IA), Ambient Air (AA), Subslab (SS), Soil Vapor (SV)	CONTAINER SIZE & TYPE 400mL/1L/6L Summa or Tedlar or Tube	CONTAINER ID (###)	Lab use only: Receipt Vac	VOCs Standard Full List [ ] 8260SV [x] TO-15	VOCs Short List / Project List [ ] 8260SV [ ] TO-15	Oxygenates [ ] 8260SV [x] TO-15	Naphthalene KIM 11/28/16 [ ] 8260SV [x] TO-15 [ ] TO-17m	TPHv as Gas [ ] 8260SVm [ ] TO-15m	TPHv as Diesel (sorbent tube) [ ] TO-17m	Aromatic/Aliphatic Fractions [ ] 8260SVm [ ] TO-15m	Leak Check Compound [x] DFA [ ] IPA [ ] He	Methane by EPA 8015m	Fixed Gases by ASTM D1945 [x] CO2 [x] O2 [ ] N2			
BSS-1	BSS-1	11-16-16	1207	SS	400mL	256	-4.98	X		X	X				X	X	X			
BSS-2	BSS-2	↓	1147	SS	400mL	074	-3.23	X		X	X				X	X	X			
BSS-3	BSS-3	↓	1221	SS	400mL	047	-5.39	X		X	X				X	X	X			

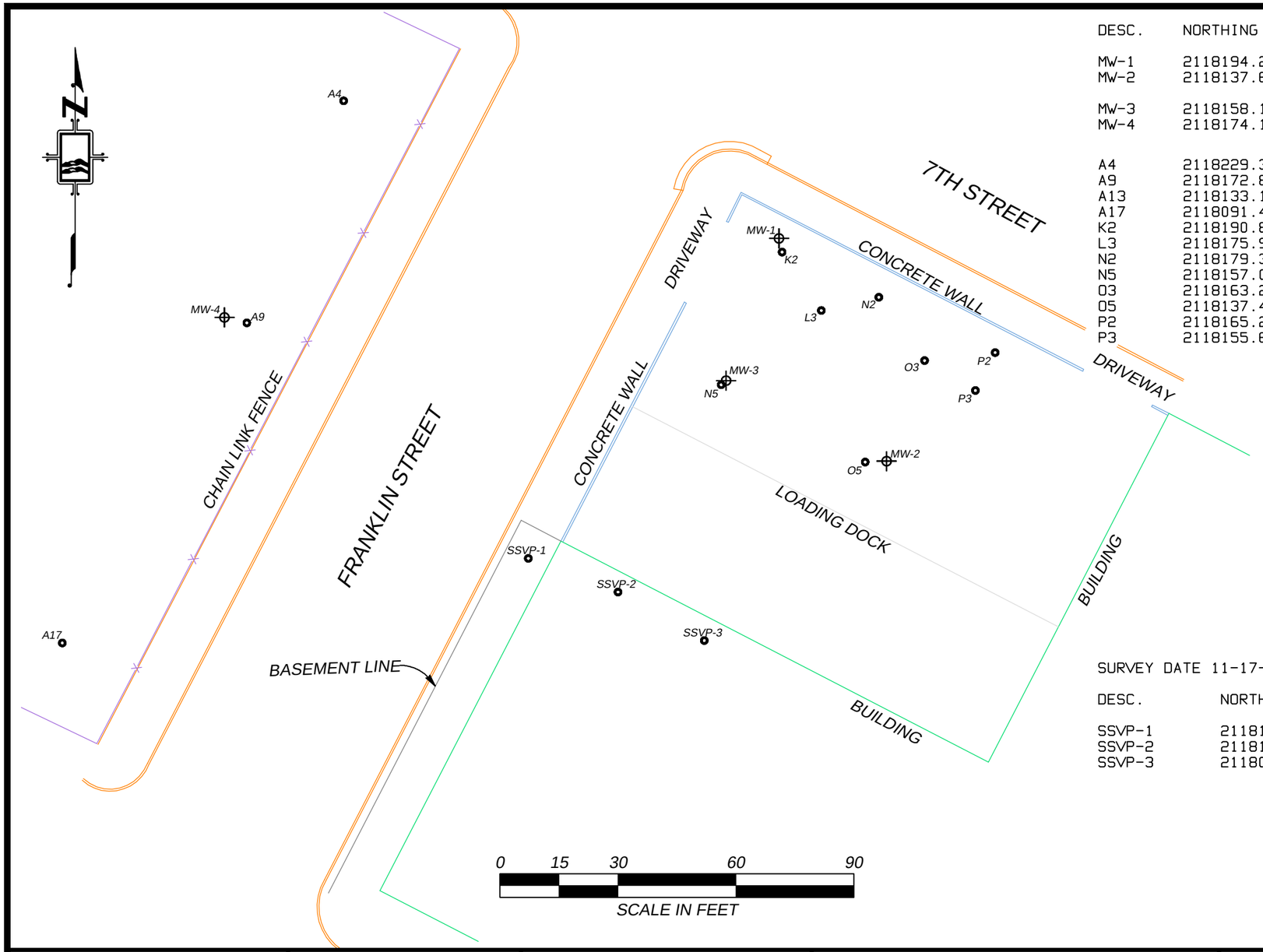
Approved/Relinquished by:	Company: ATC	Date: 11-22-16	Time: 1215	Received by: Jon Chmura	Company: H&P	Date: 11/28/16	Time: 10:10
Approved/Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:
Approved/Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:

*Approval constitutes as authorization to proceed with analysis and acceptance of conditions on back

Rev 08/18/2014

Appendix C

Surveyor Report



DESC.	NORTHING	EASTING	LATITUDE	LONGITUDE	EL.PVC	EL.RIM
MW-1	2118194.2	6049461.7	37.7988535	-122.2728792	32.08	32.32
MW-2	2118137.6	6049489.1	37.7986993	-122.2727808	30.12	30.36
MW-3	2118158.1	6049448.3	37.7987534	-122.2729233	30.45	30.77
MW-4	2118174.1	6049320.7	37.7987909	-122.2733659	30.65	31.09
A4	2118229.3	6049351.0	37.7989439	-122.2732647		
A9	2118172.8	6049326.4	37.7987875	-122.2733461		
A13	2118133.1	6049298.1	37.7986771	-122.2734415		
A17	2118091.4	6049279.4	37.7985615	-122.2735032		
K2	2118190.8	6049462.5	37.7988440	-122.2728763		
L3	2118175.9	6049472.5	37.7988038	-122.2728408		
N2	2118179.3	6049487.1	37.7988138	-122.2727904		
N5	2118157.0	6049447.0	37.7987506	-122.2729277		
O3	2118163.2	6049498.7	37.7987701	-122.2727491		
O5	2118137.4	6049483.6	37.7986985	-122.2727997		
P2	2118165.2	6049516.7	37.7987766	-122.2726871		
P3	2118155.6	6049511.7	37.7987499	-122.2727039		

SURVEY DATE 11-17-16

DESC.	NORTHING	EASTING	LATITUDE	LONGITUDE	EL CONC.
SSVP-1	2118112.9	6049397.9	37.7986267	-122.2730949	19.11
SSVP-2	2118104.3	6049420.8	37.7986043	-122.2730151	19.06
SSVP-3	2118092.0	6049442.7	37.7985717	-122.2729385	19.13

Morrow Surveying
LAND SURVEYORS

1255 Starboard Drive
West Sacramento ~ CA ~ 95691
Phone: 916-372-8124
Fax: 916-372-8538
Email: matt@morrowsurveying.com
www.morrowsurveying.com

DATE: October, 2015
DATE SURVEYED: 10-23-15 SF, 11-17-16
SCALE: 1"=30'
SHEET 1 OF 1
FIELD BOOK:
DRAWING NO. : 0080-036
DRAWN BY: MM

BASIS OF COORDINATES & ELEVATIONS:

COORDINATES ARE CALIFORNIA STATE PLANE ZONE 3 NAD 83 AS VERIFIED BY MORROW SURVEYING.

VERTICAL DATUM IS NAVD '88 BASED ON GPS OBSERVATIONS

MONITORING WELL EXHIBIT

Prepared for:
ATC GROUP SERVICES LLC

601 Webster Street
City of Oakland Alameda County
California