ABF Freight
P.O. Box 10048 (72917-0048)
3801 Old Greenwood Road
Fort Smith, AR 72903
479.785.8700
abf.com

March 21, 2017

Mr. Mark Detterman, RG, CEG
Senior Hazardous Materials Specialist
Alameda County Environmental Health Department
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: **Submittal Acknowledgement Statement-**
Site Investigation Report
ABF Freight System Facility (SLIC Case No. RO#0003134)
4575 Tidewater Avenue
Oakland, California

Dear Mr. Detterman:

I have read and acknowledge the content, recommendations and/or conclusions in the attached document or report submitted on my behalf to SCDEH's FTP server and the SWRCB's Geotracker Website.

Sincerely,

Michael K. Rogers
Director, Real Estate
ArcBest Corporation

March 21, 2017
Project 154.011.003

Mr. Mark Detterman, RG, CEG
Senior Hazardous Materials Specialist
Alameda County Environmental Health Department
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: *Site Investigation Report*
ABF Freight System Facility
4575 Tidewater Avenue
Oakland, California
RO#0003033 and RO#0003134

Dear Mr. Detterman:

This letter, prepared by Trinity Source Group, Inc. (Trinity) on behalf of ABF Freight System, Inc. (ABF), presents a *Site Investigation Report (Report)* for the referenced site (Figures 1 and 2). The scope of work was performed in accordance with Trinity's October 11, 2016 *Data Gaps Work Plan*, which proposed the installation of one additional sub-slab vapor sampling probe and sampling of each of the three sub-slab vapor probes. The additional investigation was requested by the Alameda County Environmental Health Department (ACEHD) in a letter dated August 30, 2016.

The October 11, 2016 work plan was approved by the ACEHD in a letter dated January 6, 2017 with the following conditions:

- Analysis of the tracer gas shroud contents samples
- If the proposed sub-slab vapor sampling probe does not sufficiently define the northerly extent of tetrachloroethene (PCE), then additional sub-slab vapor sampling probes should be installed and sampled

The ACEHD letter is included in Attachment A of this *Report.*

BACKGROUND

The site encompasses approximately 6.7 acres situated between Tidewater Avenue and the water channel extending north from San Leandro Bay, which separate the cities of Alameda and Oakland (Figures 1 and 2). Land-use in the area is industrial.

Currently the site is in use as a trucking terminal with a maintenance building located near the southwestern property boundary. One aboveground storage tank that existed adjacent to the maintenance building, and was labeled with “Diesel Fuel”, “Not in Use”, and “Permanently Closed Jan. 1995”, was removed by ABF on August 13, 2014. An underground clarifier is in use near the maintenance building. The underground storage tanks (USTs) at the site were also located near the maintenance building. The maintenance building is used for routine maintenance of site vehicles, and is infrequently occupied.

The site consists of two separate cases: one for petroleum hydrocarbons and another for chlorinated solvents as tetrachloroethene (PCE). The petroleum hydrocarbon case is currently under consideration for closure under the low–threat closure policy for a commercial land use scenario. The PCE case is active, and the PCE sub-slab vapor concentrations beneath the maintenance shop in the two existing sub-slab probes (SVP-1 and SVP-2) are below the commercial Environmental Screening Level[1]. A table summarizing the results of sub-slab vapor sampling is presented as Table 1.

A detailed site background is provided in Trinity’s January 9, 2015 *Data Gap Investigation Work Plan and Focused Site Conceptual Model (SCM).*

SCOPE OF WORK

The following scope of work was performed to further assess the potential for vapor intrusion of halogenated volatile organic compounds (HVOCs) to the truck maintenance shop building. This scope of work was based upon the following Department of Toxic Substances Control and the California Environmental Protection Agency guidance documents:

- *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance),* October 2011
- *Advisory Active Soil Gas Investigations*, July 2015

The scope of work consisted of the installation of one additional sub-slab vapor probe and sampling of each of the three sub-slab vapor probes.

Prefield

Prefield tasks included preparing a site-specific health and safety plan and providing notification to the ACEHD of the schedule of field activities. Permits were not required prior to conducting field activities.

Sub-Slab Vapor Probe Installation

On February 16, 2017, one additional sub-slab probe, designated SVP-3, was installed through the concrete building slab north of Probe SVP-2 as shown on Figure 2. Trinity used Vapor Pin™ technology

[1] San Francisco Bay Regional Water Quality Control Board, *Environmental Screening Levels,* February 2016 (Revision 3).

for the sub-slab vapor probe. The Vapor Pin™ installation procedures are presented in Attachments B and B-1.

Sub-Slab Vapor Probe Sampling and Analysis

On February 16, 2017, sub-slab vapor probes SVP-1, SVP-2, and SVP-3 were sampled using Summa canisters and a helium shroud as summarized in the field procedures presented in Attachment B and B-2. As per regulatory guidance[2], the sub-slab vapor sample collected from SVP-3 was collected at least 2 hours after installation.

During sub-slab vapor probe purging and sampling, the sampling canister and sampling equipment were placed in a vapor sampling shroud where helium was introduced as a leak-check indicator. A schematic diagram of the sub-slab vapor probe sampling equipment is included in Attachment B as Figure B-1. As requested by the ACEHD in a letter dated November 1, 2016, samples of each of the shroud contents during the sampling of SVP-1, SVP-2, and SVP-3 were collected for laboratory analysis of the leak check indicator.

Laboratory Analysis

Samples were transmitted to Curtis & Tompkins Laboratories, a state-certified laboratory (ELAP #2896) under chain of custody, for analysis for PCE, trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), 1,1-dichloroethene (1,1-DCE) and vinyl chloride using EPA Method TO-15. The shroud contents sample and the sub-slab samples were analyzed for helium using ASTM Method D1946.

GeoTracker Uploads

Analytical data for this investigation have been uploaded to the California State GeoTracker database. GeoTracker upload confirmations are included in Attachment C.

RESULTS OF SUB-SLAB VAPOR PROBE SAMPLING

The sub-slab vapor analytical data described below is presented in Table 1.

- PCE was detected in Probes SVP-1, SVP-2, and SVP-3 at concentrations of 9.2 micrograms per cubic meter (μg/m^3), 520 μg/m^3, and 73 μg/m^3, respectively.
- A field duplicate sample collected from SVP-1 was collected, and PCE was detected at a concentration of 11 μg/m^3.
- TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, and vinyl chloride were not detected in the sub-slab vapor samples at or above the laboratory reporting limits.
- Analysis of shroud contents for helium detected between 14 percent and 18 percent.

[2] Department of Toxic Substances Control's *Advisory Active Soil Gas Investigations*, July 2015, Page 10.

- The shroud contents sample collected during sampling of SVP-1 contained 15 percent helium, and sub-slab vapor Sample SVP-1 contained 4.7 percent helium, which is above the 5% acceptable air leakage rate specified by regulatory guidance[3]. However, as noted in the certified analytical report, the 4.7 percent helium detected in Sample SVP-1 was due to carryover from one of the previously analyzed shroud contents samples; therefore, helium may not have been present in Sample SVP-1.
- The duplicate vapor sample collected from Probe SVP-1 did not contain helium at or above the laboratory reporting limit of 0.18 $\mu g/m^3$; therefore, PCE result from the sample designated as "SVP-1 – Duplicate" can be considered valid.

Field data sheets for the sub-slab vapor sampling are presented in Attachment D. Certified analytical reports and chain-of-custody documentation are presented as Attachment E.

CONCLUSIONS

Based on the results of the February 16, 2017 sub-slab vapor sampling, the extent of PCE in sub-slab vapor to the north of Probe SVP-2 has been delineated to a concentration of 73 $\mu g/m^3$. Further, the concentration of PCE in each of these sub-slab vapor samples in the maintenance building was below the commercial Environmental Screening Level[4] of 2,100 $\mu g/m^3$.

Based on the results of the sub-slab vapor sampling and work previously performed, the site should be considered for low-threat closure.

---

[3] Ibid. Page 22.

[4] San Francisco Bay Regional Water Quality Control Board, Revision 3, February 22, 2016

If you have questions, please call Trinity at (831) 426-5600.

Sincerely,

TRINITY SOURCE GROUP, INC.

Information, conclusions, and recommendations made by Trinity in this document regarding this site have been prepared under the supervision of and reviewed by the licensed professional whose signature appears below.

Debra J. Moser, PG, CEG, CHG
Senior Geologist

Brady Nagle
Project Manager

Attachments:

Table 1: Sub-Slab Vapor Analytical Data

Figure 1: Site Location Map
Figure 2: Sub-Slab Vapor Sampling Probe Location

Attachment A: Regulatory Correspondence
Attachment B: Sub-Slab Vapor Probe Installation and Sampling Field Procedures
Attachment B-1: Cox – Colvin Standard Operating Procedure Installation and Extraction of the Vapor Pin™
Attachment B-2: Curtis & Tompkins Field Guide for Use of C&T Helium Shrouds
Attachment C: GeoTracker Upload Documentation
Attachment D: Field Data Sheets
Attachment E: Certified Analytical Reports, Chain of Custody

DISTRIBUTION

A copy of this submittal has been forwarded to:

Mr. Mike Rogers (via email to mkrogers@arkbest.com)

Leroy Griffin (via email to lgriffin@oaklandnet.com)

TABLE

Table 1
Sub-Slab Vapor Analytical Data

ABF Freight System Facility
4575 Tidewater Avenue
Oakland, California

Sample ID	Sample Date	Analytical Test Methods																
		ASTM D-1946				EPA TO-15											EPA TO-17	
		Carbon Dioxide (%)	Methane (%)	Oxygen (%)	Helium (%)	PCE (µg/m^3)	1,1,2-TCA (µg/m^3)	1,2,4 - TMB (µg/m3)	TPHg (µg/m^3)	Benzene (µg/m^3)	Toluene (µg/m^3)	Ethyl Benzene (µg/m^3)	Ethyl Acetate (µg/m^3)	Total Xylenes (µg/m^3)	Ethanol (µg/m^3)	Other VOCs (µg/m^3)	Naphthalene (µg/m^3)	TPHd (µg/m3)
Sub-Slab Vapor Samples																		
SVP-1	6/20/2012	**2.2**	<0.0001	**16**	**0.049**	**60**	<11	<10	<1,800	<2.8	<7.7	<8.8	**20**	<27	**180**	ND	<2.0	NA
SVP-1	12/17/2012	NA	NA	NA	**8.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.6	<125
SVP-1	1/17/2013	**0.83**	<0.0002	**20**	**0.23**	**16**	<11	<10	**1,300**	<6.5	<7.7	**9.6**	**33**	**77**	**290**	**Acetone, 340**	**2.0**	NA
SVP-1	2/16/2017	NA	NA	NA	**4.7**	**9.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, and Vinyl Chloride not detected**	NA	NA
SVP-1 (QC Sample)	2/16/2017	NA	NA	NA	<0.18	**11**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, and Vinyl Chloride not detected**	NA	NA
SVP-2	6/20/2012	0.22	0.00018	**18**	<0.005	**530**	**38**	**13**	**1,900**	**2.9**	**11**	**20**	**19**	**160**	**100**	**Acetone, 230**	**3.4**	NA
SVP-2	12/17/2012	NA	NA	NA	**1.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.6	<125
SVP-2	1/17/2013	NA	NA	NA	**40**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVP-2	2/5/2013	1.21	<0.0009	**17.1**	NA	**901**	<0.03	**0.02**	NA	**0.03**	**0.02**	<0.02	<0.02	**0.04**	NA	**Acetone, 20.4 1,1-DFE, 12.5 (leak check) Others as listed on Certified Analytical Report**	NA	NA
SVP-2 (QC Sample)	2/5/2013	1.22	<0.001	**17.3**	NA	**971**	<0.03	**0.064**	**450***	**0.15**	**0.21**	<0.02	<0.02	**0**	**NA**	**Acetone, 67.1 1,1-DFE, 426 (leak check) Others as listed on Certified Analytical Report**	NA	NA
SVP-2	2/16/2017	NA	NA	NA	<0.21	**520**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, and Vinyl Chloride not detected**	NA	NA
SVP-3	2/16/2017	NA	NA	NA	<0.19	**73**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, and Vinyl Chloride not detected**	NA	NA

Table 1
Sub-Slab Vapor Analytical Data

ABF Freight System Facility
4575 Tidewater Avenue
Oakland, California

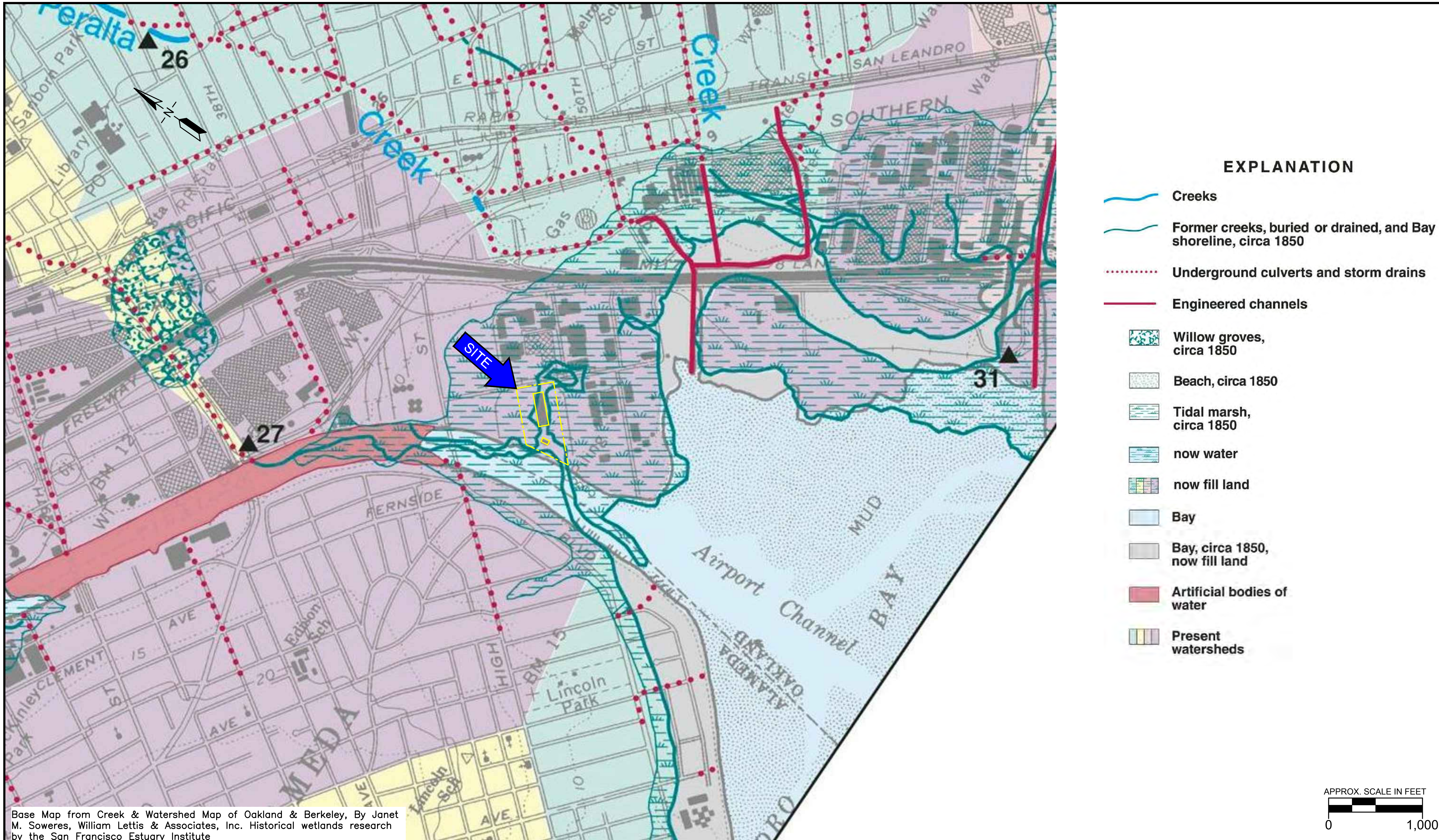
Shoud Content Samples

SVP-1	2/16/2017	NA	NA	NA	**15**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVP-2	2/16/2017	NA	NA	NA	**14**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVP-3	2/16/2017	NA	NA	NA	**18**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	ESLs for Commercial Land Use					2,100	770	---	2,500,000	420	1,300,000	4,900	NA	440,000	---	---	360	570,000

Notes:

ID = Identification
ASTM = American Society for Testing Materials
EPA = Environmental Protection Agency
% = Percentage
$\mu g/m^3$ = micrograms per meter cubed
PCE = Tetracholoroethene
1,1,2-TCA = 1,1,2 - Trichloroethane
1,2,4-TMB = 1,2,4 - Trimethylbenzene
TPHg = Total Petroleum Hydrcarbons as Gasoline
VC = Vinyl chloride
1,1-DCE = 1,1-Dichloroethene
trans-1,2-DCE = trans-1,2-Dichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene
TCE = Trichloroethene
1,1-DFE = 1,1-Difluoroethane
< = Not detected at or above detection limit
ND = Not detected
NA = Not analyzed
--- = Not applicable
Bold = data detected above laboratory detection limits
* Duplicate sampled was analyzed for TPHg; result of 450 ($\mu g/m^3$) was attributed to single discrete peak (PCE).
ESLs = Environmental Screening Levels - February 2016 (Revision 3)
SFRWQCB = San Francisco Bay Regional Water Quality Control Board, California EPA
http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/ESL/ESL%20Workbook_ESLs_Interim%20Final_22Feb16_Rev3_PDF.pdf

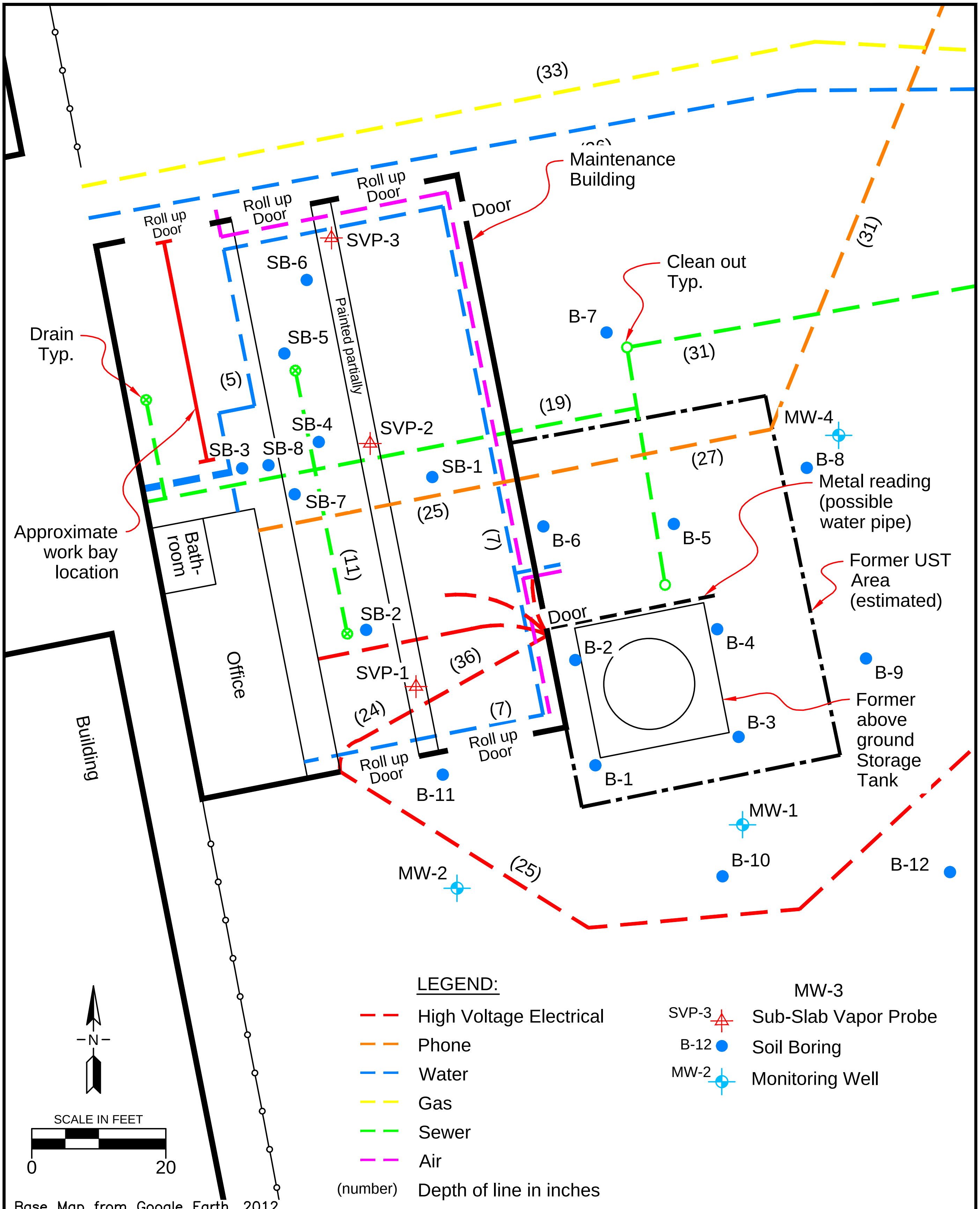
FIGURES



Base Map from Creek & Watershed Map of Oakland & Berkeley, By Janet M. Soweres, William Lettis & Associates, Inc. Historical wetlands research by the San Francisco Estuary Institute

PREPARED BY	SITE LOCATION MAP	PROJECT: 154.009.001
TRINITY source group, inc. Environmental Consultants 119 Encinal Street Santa Cruz, California 95060 v: 831.426.5600 f: 831.426.5602	ABF Freight System Facility 4575 Tidewater Ave. Oakland, California	FIGURE: 1

REF. 154_001\154.008.001 fig1.dwg



PREPARED BY
TRINITY
source group, inc.
Environmental Consultants
119 Encinal Street
Santa Cruz, California 95060
v: 831.426.5600
f: 831.426.5602

SUB-SLAB VAPOR SAMPLING PROBE LOCATION

ABF Freight System Facility
4575 Tidewater Ave.
Oakland, California

PROJECT:
154.011.003

FIGURE:
2

REF. 154_001\154.011.003 fig2.dwg - 2/27/2017 2:35 PM

ATTACHMENT A

Regulatory Correspondence

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
REBECCA GEBHART, Interim Director

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

January 6, 2017

Arkansas Bandag Corporation
PO Box 10048
Fort Smith AR 72917

Mr. Mike Rogers
ABF Freight Systems, Inc.
PO Box 10048
Fort Smith AR 72917
(Sent via electronic mail to: mrogers@arcb.com)

Subject: Conditional Work Plan Approval; Site Cleanup Program Case No. RO0003134 and GeoTracker Global ID T00000005825; ABF Freight Maintenance Shop, 4575 Tidewater Avenue, Oakland, CA 94601

Dear Mr. Rogers:

Alameda County Department of Environmental Health (ACDEH) staff has reviewed the case file for the above-referenced site, including the *Data Gaps Work Plan,* dated October 11, 2016. The document was prepared and submitted on your behalf by the Trinity Source Group, Inc (Trinity). Thank you for submitting the work plan.

Based on ACEH staff review of the referenced documents and of the case file we generally concur with the recently proposed scope of work, provided that the modifications requested in the technical comments below are addressed and incorporated during the implementation, unless an alternate scope of work outside that described in the Work Plan and technical comments below is proposed. We request that you address the following technical comments, submit the requested document, and upon ACEH approval, perform the proposed work, and send us the technical reports requested below. Please provide 72-hour advance written notification to this office (e-mail preferred to: mark.detterman@acgov.org) prior to the start of field activities.

TECHNICAL COMMENTS

1. **Work Plan Modifications** – The referenced work plan proposes a series of actions with which ACDEH is in general agreement of undertaking; however, ACDEH requests modifications to the approach. Otherwise, please submit a report by the date specified below.
   a. **Shroud Tracer Concentrations** – In the event the tracer is detected in the sub-slab vapor samples, in order to determine the magnitude of the leak, and thus the acceptability of the vapor sample, ACDEH requests that the tracer concentration of the shroud be additionally analyzed. Department of Toxic Substances Control (DTSC) guidance allows up to a 5 percent leak rate.
   b. **Delineation of PCE Extent** – In the event that the proposed vapor pin does not sufficiently define the northerly extent of tetrachloroethene (PCE) contamination, ACDEH additionally requests the installation of additional vapor pins at appropriate locations in order to achieve this goal.

SUBMITTAL ACKNOWLEDGEMENT STATEMENT

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

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

Please make this change to your submittals to ACDEH.

TECHNICAL REPORT REQUEST

Please upload technical reports to the ACDEH ftp site (Attention: Mark Detterman), and to the State Water Resources Control Board's Geotracker website, in accordance with the specified file naming convention below, according to the following schedule:

- **March 24, 2017** – Site Investigation Report
  File to be named: RO3134_SWI_R_yyyy-mm-dd

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

If you have any questions, please call me at (510) 567-6876 or send me an electronic mail message at mark.detterman@acgov.org.

Sincerely,

Digitally signed by Mark Detterman
DN: cn=Mark Detterman, o=ACEH, ou=ACEH, email=mark.detterman@acgov.org, c=US
Date: 2017.01.06 12:02:34 -08'00'

Mark E. Detterman, PG, CEG
Senior Hazardous Materials Specialist

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

cc: Debra Moser, Trinity Source Group, Inc, 500 Chestnut Street, Suite 225, Santa Cruz, CA 95060
(Sent via electronic mail to: djm@tsgcorp.net)

Dilan Roe, ACDEH, (Sent via electronic mail to: dilan.roe@acgov.org)
Paresh Khatri, ACDEH; (Sent via electronic mail to: paresh.khatri@acgov.org)
Mark Detterman, ACDEH, (Sent via electronic mail to: mark.detterman@acgov.org)
Electronic File; GeoTracker

ATTACHMENT B

Sub-Slab Vapor Probe Installation and Sampling Field Procedures

ATTACHMENT B

SUB-SLAB VAPOR PROBE INSTALLATION AND SAMPLING FIELD PROCEDURES

Sub-Slab Vapor Probe Installation

Trinity utilizes the attached Cox-Colvin & Associates, Inc., Vapor Pin™ Standard Operating Procedures for installation of sub-slab vapor probes. These procedures are presented in Attachment B-1.

Probe Sampling and Analysis – Fixed Laboratory

Sub-slab probes may be sampled for analysis by a fixed laboratory. The samples are collected into Summa canisters, following the procedures described below.

Sub-Slab Vapor Sample Collection

Sampling Set-up

Mobilization for sub-slab vapor sampling will not occur if measurable precipitation or site irrigation near the sampling location has occurred in the previous five days.

Prior to sampling, the sampling technician puts on a new pair of clean gloves, and the sub-slab probe is uncapped and quickly connected to a Swagelok manifold. A tee fitting is connected to two one-liter Summa canisters with a pressure gauge installed on each of these fittings.

The two Summa canisters are connected by approximately 1 to 2 feet of tubing and a third tee fitting. The vacuum reading on each canister is confirmed and recorded before proceeding. Purge and sample Summa canisters are connected in tandem to a manifold that is connected to the soil vapor probe valve by 1 to 2 feet of Teflon tubing. The vacuum reading of each canister is confirmed and recorded before proceeding. The vacuum reading is expected to be 30 inches of Mercury ("Hg). The soil vapor sampling manifold is equipped with a 100- to 200-milliliter per minute (ml/min) flow regulator and a laboratory-supplied particulate filter.

A schematic drawing of the sub-slab vapor probe sampling set-up is shown on Figure B-1.

Leak Testing

A vacuum test is conducted on the connections between the Summa canisters and the valve on the downstream side of the flow regulator for 10 minutes by opening and closing the purge canister valve to place a test vacuum on the assembly. Sampling is terminated if gauge vacuum is not maintained for 10 minutes.

Additional leak testing is performed during the sub-slab vapor sampling by placing a shroud over the sampling train and sub-slab probe and introducing helium into the shroud. Helium concentration in the shroud atmosphere is measured throughout sample collection using an appropriate helium field meter. Additionally, samples of the shroud contents from each sub-slab vapor sampling were collected in Tedlar bags for helium analysis. Helium is analyzed in the sub-slab vapor samples by the laboratory to determine if the sample stream was compromised. These procedures are presented in Attachment B-2.

Purging

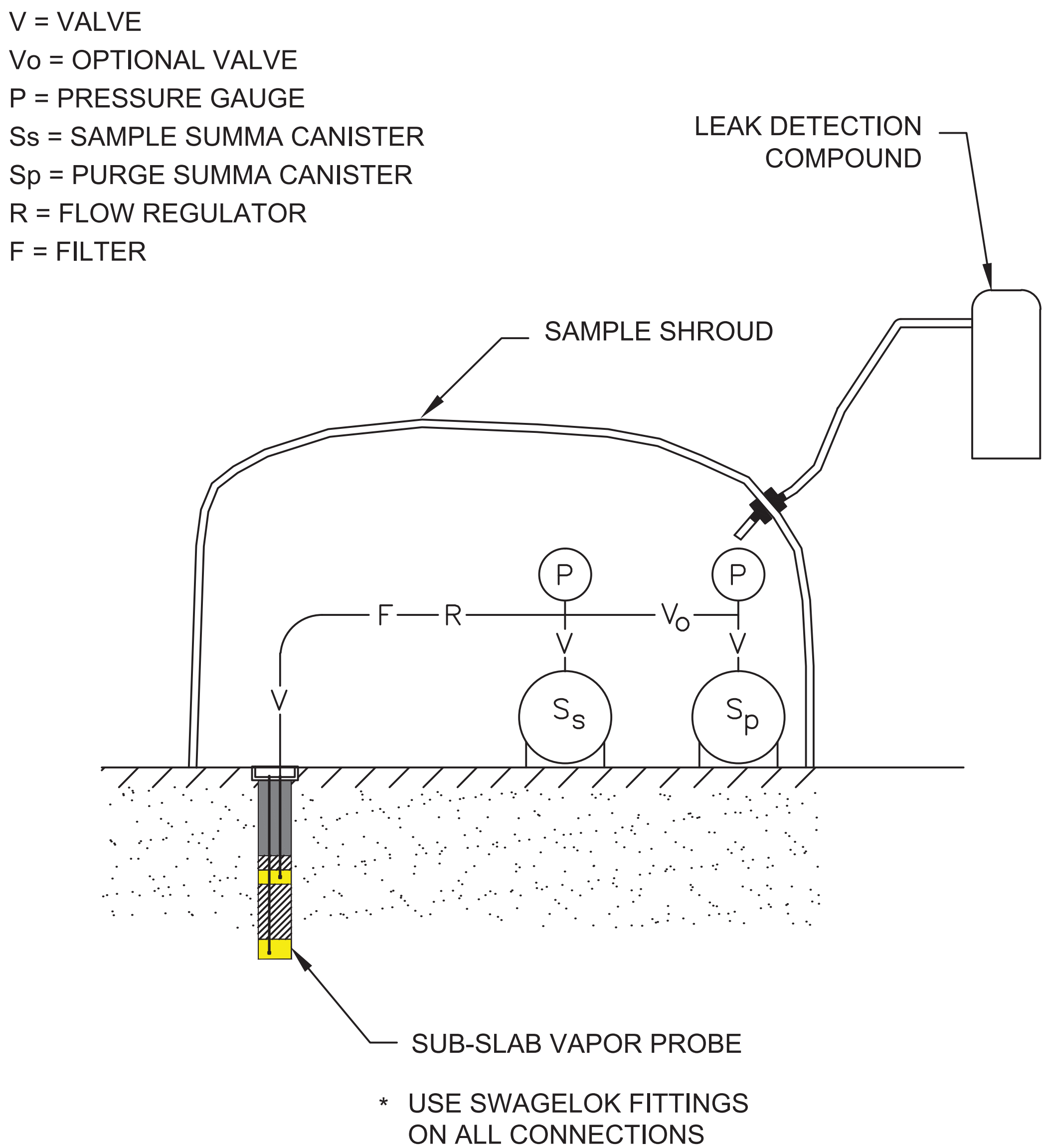
If the vacuum test is successful, purging is conducted. The purge canister valve and the valve on the downstream side of the particulate filter are opened and the time is recorded. The purge canister valve is closed after three volumes of air have been purged from the sample apparatus and tubing. The amount of air purged is measured based on the time that the flow-control orifice is opened, with a flow rate of 100 to 200-ml/min, and based on a discernible vacuum drop on the purge canister pressure gauge. The time at which purging is terminated is recorded. Because of the small volume of the sub-slab probe, the purge time is minimal.

Sampling

Following purging, the sample Summa canister valve is opened to begin sample collection. The time at which sample collection begins is recorded.

The flow-control orifice is maintained at 100 to 200-ml/min, and is kept open until the sample Summa canister pressure gauge indicates approximately -5 ”Hg. At that point, the sample canister valve is closed and the time recorded. The tee fitting on the sample canister is replaced with a laboratory-supplied brass plug.

The sample canister is labeled and chain-of-custody maintained by recording: sample name, sample date, sample time, final vacuum, canister and flow controller serial numbers, initials of sample collector, and the compounds to be analyzed by the certified laboratory. The sample canisters are stored in a container that blocks sunlight to the opaque canister and does not subject the air-tight canister to changes in pressure and temperature. The sample canisters are delivered to the analytical laboratory via ground transportation under chain-of-custody documentation.



REF. 169_001\169.003.001 figC2.dwg

PREPARED BY
TRINITY source group, inc.
Environmental Consultants
119 Encinal Street
Santa Cruz, California 95060
v: 831.426.5600
f: 831.426.5602

SUB-SLAB VAPOR PROBE SAMPLING EQUIPMENT SCHEMATIC

ABF Freight System Facility
4575 Tidewater Avenue
Oakland, California

PROJECT: 154.010.001

FIGURE: B-1

ATTACHMENT B-1

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

Standard Operating Procedure
Installation and Extraction of the Vapor Pin™

May 20, 2011

Scope:

This standard operating procedure describes the installation and extraction of the Vapor Pin™[1] 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, as necessary;
- Vapor Pin™ protective cap; and
- VOC-free hole patching material (hydraulic cement) and putty knife or trowel.

[1] Cox-Colvin & Associates, Inc., designed and developed the Vapor Pin™; a patent is pending.

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.

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 [(e.g., real-time monitoring of oxygen levels on extracted sub-slab soil gas, or placement of a water

dam around the Vapor Pin™) Figure 6]. Consult your local guidance for possible tests.

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 (Figure 8).

Figure 7. Removing the Vapor Pin™.

Figure 8. Extracted Vapor Pin™.

2) Fill the void with hydraulic cement and smooth with the trowel or putty knife.

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

ATTACHMENT B-2

Curtis & Tompkins Field Guide for Use of C&T Helium Shrouds

Field Guide for

USE OF C&T HELIUM SHROUDS

November 2013

www.curtisandtompkins.com *ph: (510) 486-0900* *2323 Fifth St, Berkeley, CA 94710*

Field Guide for Use of C&T Helium Shrouds

Table of Contents

Field Guide for Use of C&T Helium Shrouds

1.0 INTRODUCTION

Sampling soil gas wells using Helium leak tracer is not inherently difficult using C&T's equipment, it is relatively unforgiving of mistakes. The equipment has been field tested and through these tests we've learned that good results necessitate reviewing this document and following the procedures specified here. We strongly encourage practicing set-up, Helium charging the shroud, using the detectors, and breakdown. We've seen a very strong correlation between a thorough equipment orientation and successful sampling events. User errors related to a lack of orientation and preparation are the primary root cause of sampling errors and equipment failures.

The equipment supplied by C&T has been critically cleaned, assembled, and leak tested using both pressurized Helium and vacuum decay methods. The preparation of all sampling equipment and media has been thoroughly documented.

If you suspect the sampling equipment is damaged or not functional, before using it please inform your project manager by calling the lab at 510-486-0900. Used and returned damaged equipment will be assessed cost for repair and replacement. Please do not disassemble and reassemble sampling trains and shrouds. They have been critically cleaned, assembled and leak checked for your use without further need for alteration. By breaking connections in sampling trains, users invalidate the lab's cleaning and prep effort.

2.0 USE OF & CARE FOR THE C&T HELIUM DETECTORS

When used properly, C&T's diffusion cell He sensors provide real time measurement of Helium concentration in air from 1% to 99% Helium to accuracies of 0.1%. Prior to delivery, C&T He sensors are calibrated and performance verified. If, upon initial check, you discover the He gauge is apparently not working properly, call your C&T project manager immediately; repair and replacement costs will be assessed for all sensors returned damaged to the lab.

Figure 1: Diffusion Cell (left) and flow through cell (right) Helium Detectors

Battery Charges last 4 hours: Helium Detectors using rechargeable NiCd batteries are fully charged before leaving the lab and hold a charge for 4 hours of use. Turn detectors on for use and off immediately after use and you'll make it through a day's sampling event without losing charge. The lab does not supply rechargers to users because the Diffusion and Flow through types use employ different voltages, using the wrong charger damages the detectors.

3 position switch: **On** is up, **Off** is neutral and down.

Required use technique for accurate Helium tracer measurements: These He sensors are sufficiently durable for portable field use; however they are precision measurement devices unforgiving of mistreatment or abuse, accordingly;

- Keep the He sensor clean at all times, particularly around the white diffusion membrane cell opening. Dirt on, or in the diffusion cell well will compromise calibration and result in extra fees for cleaning and recalibration.

- The C&T He sensors are shock sensitive. Dropping the gauges onto a hard surface from a height of 2' or more can compromise calibration and may irreversibly damage the sensor and cause replacement or maintenance cost assessments. Please store and transport the gauges in the foam lined box provided.

- Helium detectors are moisture sensitive, don't get them wet

Accepting C&T He sensors binds your firm to the following conditions of use.

Replacement costs are $900 + applicable shipping costs and sales tax. Minimum diagnostic, recalibration, and maintenance charges for damaged sensors are $120.

3.0 SETTING UP

Equipment: The following equipment should be present in the supply kit provided from the lab:

1) Integral shroud box and sampling train with 3 port valve
2) Helium supply components a) Helium bottle(s) (one bottle supplies enough for 4 wells), b) Braided steel Helium transfer tube with male QT connectors and; 3) Helium supply regulator with female QT connector
3) Helium Detector: Diffusion cell type (4 hours use on one charge)
4) Helium Detector: Flow through type (4 hours use on one charge)
5) Male QT ¼" OD Teflon tubing connector for connecting in port on flow through Helium detector to Purge port on Shroud
6) QT Vacuum gauge
7) 1.4 liter Sample canisters, one for each sample to be taken, some users request an extra to cover any aborted sampling events, well relocations etc…
8) Graphite or Ceramic ferules for joining ¼" OD Teflon tubing to well, one provided in each shroud/train inside the nut in the open port of the 3 port valve used to connect the soil gas well to the train.

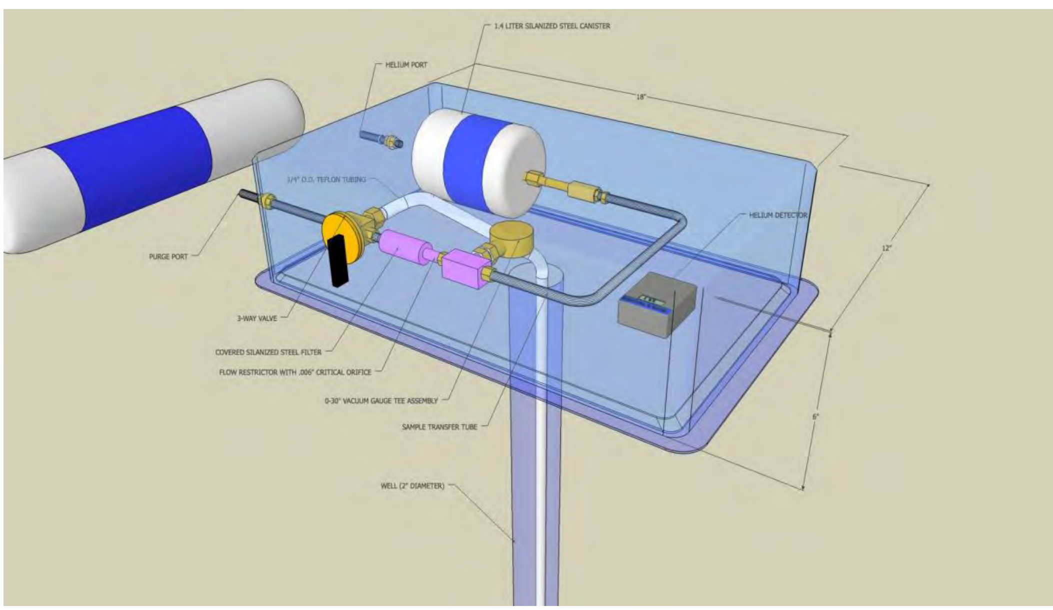
Equipment not Supplied by C&T: You will need the following items to complete your work; these items are not supplied by C&T unless specially requested:

1) Well purge suction source, alternatives available from the lab are: a) 50 ml disposable syringe with tubing adapters, b) evacuated 6 liter summa canister with 180 ml/min flow restrictor and filter, c) battery powered vacuum pump, d) 110V VAC powered vacuum pump
2) ½" x 9/16" open end combination wrench and one small crescent wrench. These are the tools needed to make compression fitting connections. C&T does not rent wrenches.
3) Extra Graphite or ceramic ferules as needed to insure you make a good well to train connection
4) ¼ OD Teflon tubing…Typically the well drillers have a lot of this stuff, if you need it
5) Knife (for cutting Teflon tubing)

Position the shroud lid over the well. Consistent Helium concentrations arise when the shrouds are used with the wellhead box lids provided. Some user protocols specify no box lid, in these cases, piling dirt around the edges of the box works to keep Helium inside the shroud. On windy days, a plastic windscreen employed either as a cover over the shroud or as an "air dam" has provided good results. We've experimented with using yoga mat material as "gaskets" for subslab sampling with mixed results.

If you're using the lid, and we recommend you do, position the lid over the wellhead with the tubing arising through the hole in the lid. There is an audible snap when the lid is optimally attached.

Figure 2: Helium Tracer Shroud Components



Once the shroud lid is positioned over the well, check that the 3 way valve is in the ***off*** position and the train pressure gauge showing a vacuum. This is your indication that the train is leak free since leaving the lab and all you need do is make a tight connection from the well to the open port on the 3 way valve. If the 3 way valve is not in the ***off*** position as a result of some error in shipment, there may be no vacuum on the gauge. At this point, your sampling protocols will determine whether the train can be used or not.

All trains leave the lab holding vacuum with decay rates less than 5” in 12 hours. Many shroud trains have inconsequentially slow leaks; trains are stored more than 3 days since being shipped from the lab may have no vacuum showing on the gauge. In these cases, you can check the vacuum decay rate by connecting an extra canister to the train and observing the vacuum decay rate.

4.0 CONNECTING THE WELL TO THE TRAIN 3-PORT VALVE

To connect the soil gas well to the sampling train, you will be joining ¼” Teflon tubing to the 3 port valve. Either a ceramic or graphite ferule has been provided inside the nut on the open port of the 3 port valve for you to make this connection. The most important component in a compression fitting is the ferrule, which is prone to damage. Care should be used when installing it although if ceramic or graphite ferules become defective, it is easy to install a replacement.

A “straight” even tubing end in the ¼” OD Teflon tubing from the well to the 3 port valve is important to making a “tight” connection. Use a knife rather than scissors to cut the tubing at a 90 degree angle to the tube axis. Remove any “burrs” or irregularities in the tubing end before attempting the connection. Slip the nut over the tubing, then the ferule. The ferule should “point” toward the 3-port valve. Usually, it is not possible to install ferules “backwards”.

Keeping the 3 way valve in the ***off*** position, attach the well tubing to the open 3 way valve port. Avoid excessive force when tightening the nut. If the nut is over-tightened, the ceramic or graphite ferrule frequently deforms improperly causing the joint to fail. Over-tightening is the most common cause of leaks in compression fittings. A good way to make these connections is to tighten the nut first by hand until it is too difficult to continue and then tightened the nut a full 360 degree turn with a 9/16” open end wrench; no more than a 1 and 1/4 turn should be needed to create a leak tight connection.

5.0 ATTACHING THE SAMPLE CANISTER TO THE TRAIN

Check the vacuum in the sample canister using the QT Vacuum gauge, it should read -30” of Hg (full vacuum) if it reads less, use another sample canister. While keeping the 3 way valve in the ***off*** position, attach the canister to the female QT fitting at the rear of the sampling train as follows:

Pull the external sleeve of the female QT connector back to its stop, insert the male valve stem and allow the sleeve to return to its spring loaded position. When the QT connection is made the canister (male) valve is open to the train. Try to pull the canister off the train without retracting the female QT sleeve. A correctly made QT connection cannot be broken without retracting the sleeve on the female valve stem.

A word about Micro QT Fittings: Micro Quick connect valves (QT) offer superior performance and ease of use compared to alternative tubing connections and valves. QT fittings provide highly reliable leak free connections without tools especially for fittings that are made and broken frequently.

Fine sand and/or grit (such as dry bentonite) damages male and female QT valves and connections. Keep both male and female QT valve components scrupulously clean. Please use the orange or red plastic caps provided for the male QT fittings, they protect the valve stem while shipping and protect your sample during return shipment to the lab.

When removing or replacing orange plastic protective caps on the male QT fittings, push them straight on and pull then straight off the valve stem. Twisting the cap counterclockwise while removing or replacing on the valve stem can dissemble the valve stem causing vacuum and/or sample loss.

6.0 POSITIONING THE SHROUD OVER THE WELL

Position the diffusion Helium gauge out of the way on a portion of the lid that allows you a good view of the display with the shroud in place. Then invert the shroud assembly over the lid and snap lid into position.

With the shroud assembled in place, you should be able to view the vacuum gauge well enough to verify that vacuum is holding and you can see the Helium detector display. Our apologies for the opaque portions of the boxes, if you know of hard plastic boxes, with clear panels we'd love to learn about them.

7.0 CHARGING THE SHROUD WITH HELIUM

C&T provides Aluminum lecture bottles filled with 300 psi Helium; each bottle of Helium contains 48 liters at atmospheric pressure, enough to easily supply 20% Helium atmospheres to 6 single Shrouds and 3 double shrouds. The amount of Helium used depends predominantly on wind and time required to sample the well, with experience, you'll use less Helium. Your protocol will specify the Helium concentration in the shroud. The following guidance is based on sampling under a 20-25% Helium in air atmosphere. Regardless of your target helium concentration, your objective should be to maintain a steady concentration of Helium during the sampling event at levels above 10% Helium in air.

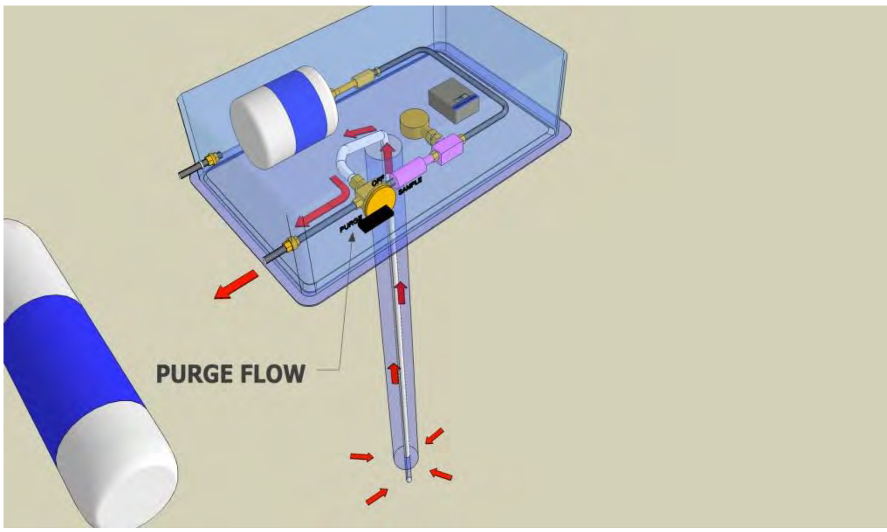
Locate and assemble the Lecture bottle, Helium transfer line, and the gas supply regulator. Tighten the brass nut attaching the regulator to the bottle one half turn past finger tight with a crescent or 9/16" open end wrench. The regulator is preset to deliver Helium at ideal pressure; ***you need not adjust the regulator***. Add Helium to the shroud by opening and closing the valve at the top of the bottle. Attach the Helium transfer line using the QT fittings at the regulator and at the Helium port on the shroud.

To provide Helium flow, slowly open the lecture bottle valve by twisting ***counterclockwise*** about ¼ turn.

Deliver 10 lbs of Helium at a time to the ***single*** shroud and 20 lbs to the ***double***. The diffusion cell Helium detector will respond in about 30 seconds to the new concentration. Unstable Helium detector readings reflect turbulent gas mixing inside the shroud. Plug holes between the shroud and the surface, use plastic sheeting to create an "air dam" or take other measures to air movement around the shroud and thus turbulence inside the shroud.

Monitor the Helium concentration displayed on the gauge in the shroud for about a minute in single shrouds, 90 seconds or longer in doubles. Under ideal conditions, 40 psi from the bottle will charge a single shroud to 25% helium concentration; double shrouds will require 80 psi. 25% Helium concentrations are maintained in the lab (zero wind) for 6-10 minutes. You may add more helium while purging and sampling. We suggest 10 psi increments for singles and 20 psi for doubles by opening the lecture bottle valve ¼ turn. We suggest users record/document the Helium concentration in the shroud at a minimum of 2 minute intervals during sampling.

Figure 3: Purge Flow Diagram



8.0 PURGE TESTING THE WELL UNDER HELIUM

This test will help you establish the integrity of the well and the train to well connection. If no Helium is detected in the purge gas flow using this technique, one can assume the well is tight to breakthrough, and the train connections are all tight, and thus there will be no Helium detected in the sample that goes to the lab.

While getting the Helium concentration established, assemble the well purge train. Place the inline Helium detector between the shroud and whatever device (evacuated canister, syringe, or vacuum pump) that you're using to provide purge suction.

With the Helium atmosphere established in the shroud at 20% or more, and the purge system ready to operate, begin purging by moving the 3 way valve selector position to ***Purge*** and then establishing suction on the purge line.

Observe the inline Helium detector display while applying suction on the purge line. If you've purged enough vapors from the well to represent the entire volume of the path from the surface (under Helium atmosphere) to the distal end of the sampling tube and back up the tube and through the detector without detecting any Helium, your well shows signs of integrity and you may have a good leak free sample.

CA-DTSC guidance provides the opinion that a 5% ambient air dilution is inconsequential to sample integrity. When sampling under a 20% Helium in air atmosphere, 1% Helium detected in the purge gas represents a 5% ambient air sample dilution.

9.0 SAMPLING THE WELL UNDER HELIUM

After you've completed purging the well, verify the reading on the Vacuum gauge of the train is -30 inches and that you have a steady state concentration of Helium between 20-25%, and then begin sampling by moving the 3 way selector valve to the ***Sample*** position.

Monitor the Helium concentration in the shroud by recording the reading on the diffusion cell detector inside the shroud every other minute or so. Add Helium from the bottle as needed to maintain a steady state concentration of Helium under the shroud.

Figure 4: Sampling Flow Diagram

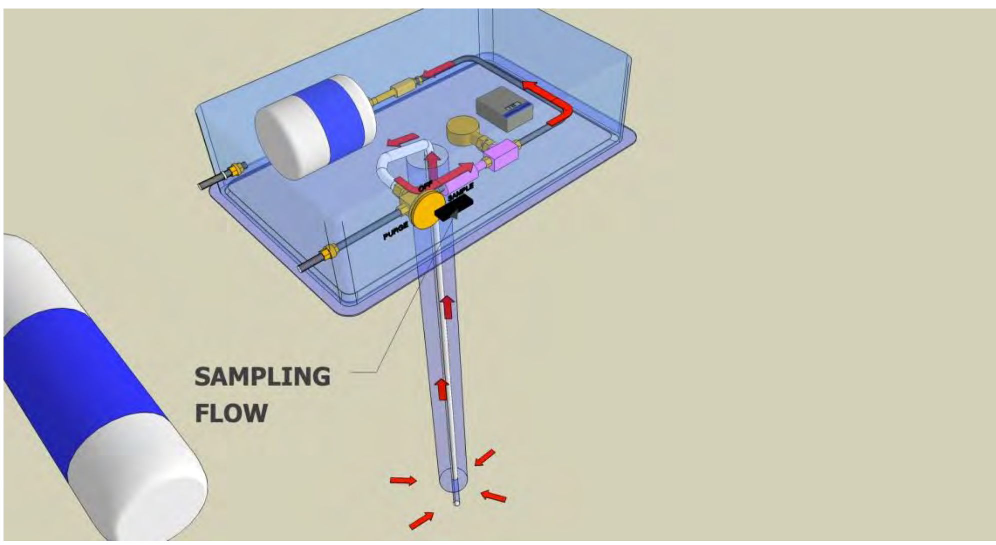
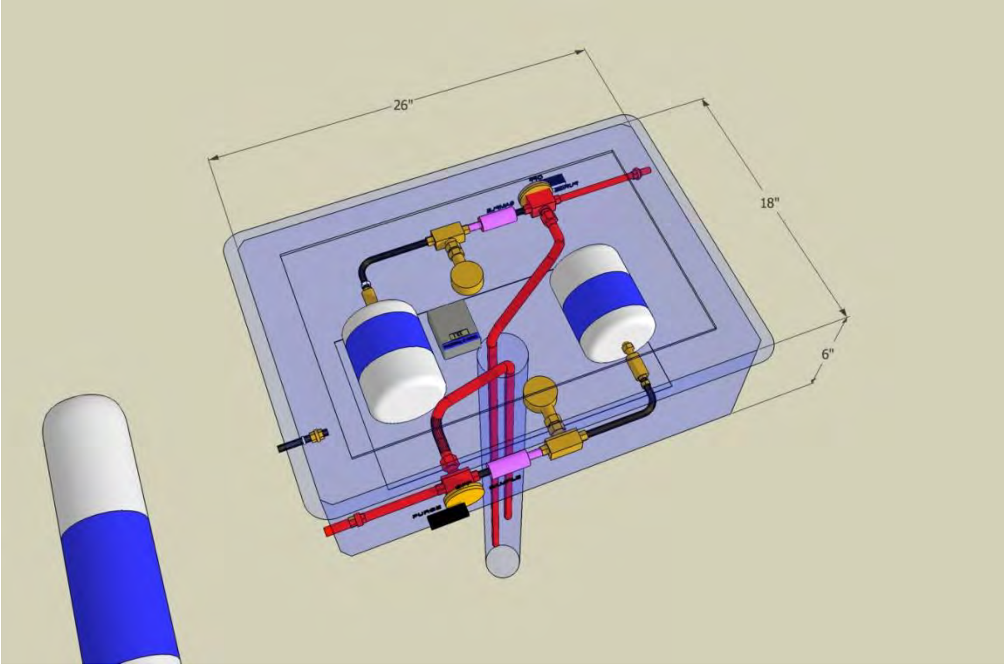


Figure 5: Dual Depth Well Sampling Shroud



ATTACHMENT C

GeoTracker Upload Documentation

STATE WATER RESOURCES CONTROL BOARD
GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	EDF
Report Title:	Site Investigation Report
Report Type:	Site Investigation
Facility Global ID:	T10000005825
Facility Name:	ABF FREIGHT MAINTENANCE SHOP
File Name:	286111_edf_air_massunits.zip
Organization Name:	Trinity Source Group, Inc.
Username:	TRINITY SOURCE GROUP
IP Address:	63.249.96.11
Submittal Date/Time:	3/15/2017 11:02:19 AM
Confirmation Number:	7915701508

VIEW QC REPORT

VIEW DETECTIONS REPORT

ATTACHMENT D

Field Data Sheets

SOIL GAS INVESTIGATION
PURGE, SAMPLE & LEAK TEST - FIELD DATA SHEET
6 Liter Summa

TRINITY source group, inc. Environmental Consultants

SCANNED

Project No.: 154.011.002
Facility Name: ABF Freight
Address: 4575 Tidewater Avenue; Oakland, CA
Staff: ~~Eric Choi~~ BRADY NAGLE, CHEYNE H
Date:
Tubing Size (in): 3/16 ID; 1/4 OD

Purge Test Location: SVP-1
Purge Method: 6L Summa Canister
Leak Test Compound : Helium
Flow Control Orifice (ml/min): Approximately ~~100 ml/min~~ 150 ml/min
Bore Hole Dia. (in):NA

Purge Volume Calculation

Inner Tubing Radius (inches)	Area of Inner Tubing Radius (pi*r2)	Tubing Length (ft)	Convert feet to inches	Total Tubing Volume (ml)	Bore Hole Radius (inches)	Area of Bore Hole (r2*pi)	Length of Bore Hole (in)	Total Bore Hole Volume (ml)	No. of Tubing + Bore Hole Volumes to Purge	Conv. of cubic inches to ml	Total Purge Volume (ml)	Total Purge Volume (L) [L= ml/1000]	Max. Purge rate (ml/min)	Est. Purge Time (min)	Inches of Mercury (5"/Liter)
	NO	TUBING			0.3125	0.307	6	30.169	1	16.387	30.169	0.030	100	0.30	0
					0.3125	0.307	6	30.169	3	16.387	90.507	0.091	100	0.91	0
					0.3125	0.307	6	30.169	7	16.387	211.182	0.211	100	2.11	1

Notes:

Purge volume for tubing can be calculated as follows:
(a) 3.141593(Pi) * tubing radius r^2 * inches of tubing * 16.3870641(conversion of cubic inches to milliliters)
Purge volume for the bore hole can be calculated as follow:
(b) 3.141593(Pi) * bore hole r^2 * inches of bore hole * 16.3870641(conversion of cubic inches to milliliters)

Total purge volume can be calculated as follows:
a + b * number of tubing/bore hole volume to be purged = total purge volume
Estimated purge time can be calculated as follows:
total purge volume (ml) ÷ purge rate (max of 167 ml/min)

Purging & Sampling Data								Leak Tests Data			Field Readings / Information				
Calculated Total Purge Volume (ml)	Time Start Purging (24 hr)	Time Stop Purging (24 hr)	Initial & Final Vacuum Gauge Reading (Hg")	Cumulative Total Volume Purged (ml)	Time Start Sampling (24 hr)	Time Stop Sampling (24 hr)	Final Vacuum Gauge Reading (Hg")	Iso-propanol Applied (yes/no)	Vacuum Train Leak Check (pass/fail)	Vacuum Train Test Start Time/ Vacuum (Hg")	Vacuum Train Test Stop Time/ Vacuum (Hg")	Probe Install Date	Probe Install Time	Purge Volumes	Probe Depth (Feet)
90.507 ~~30.169~~	1200	1202	~23"Hg/ ~21"Hg	~90	1203	1225	5"Hg	No/ Helium ~~Not Helium~~	PASS					1	0.66
~~90.507~~														3	0.66
~~211.182~~														7	0.66

Notes:

SHROUD Helium Sample : ~~SVP-1 @ 1200~~ SVP-1-SHROUD@1200.

(X2 Samples collected → SVP-1
@ 1203 SVP-1-DUP)

SHROUD ID. A00244
PURGE CANNISTER ID : 354
SAMPLE CANNISTER ID :
SVP-1 = 279
SVP-1-DUP = 69

Init. SHROUD Helium (%) : 20%
SHROUD. HELIUM DURING [illegible] SVP-1-SHROUD COLLECTION : ~17
SHROUD Helium during Sampling : 18.6%
FINAL SHROUD HELIUM : 20.6% (@1225)

SOIL GAS INVESTIGATION
PURGE, SAMPLE & LEAK TEST - FIELD DATA SHEET
6 Liter Summa

TRINITY source group, inc. Environmental Consultants

SCANNED

Project No.:	154.011.002	Purge Test Location:	SVP-2
Facility Name:	ABF Freight	Purge Method:	6L Summa Canister
Address:	4575 Tidewater Avenue; Oakland, CA	Leak Test Compound :	Helium
Staff:	~~Eric Choi~~ BRADY NAGLE, CHEYNE H	Flow Control Orifice (ml/min):	Approximately 100 ml/min
Date:	Tubing Size (in): 3/16 ID; 1/4 OD	Bore Hole Dia. (in):NA	

Purge Volume Calculation

Inner Tubing Radius (inches)	Area of Inner Tubing Radius (pi*r2)	Tubing Length (ft)	Convert feet to inches	Total Tubing Volume (ml)	Bore Hole Radius (inches)	Area of Bore Hole (r2*pi)	Length of Bore Hole (in)	Total Bore Hole Volume (ml)	No. of Tubing + Bore Hole Volumes to Purge	Conv. of cubic inches to ml	Total Purge Volume (ml)	Total Purge Volume (L) [L= ml/1000]	Max. Purge rate (ml/min)	Est. Purge Time (min)	Inches of Mercury (5"/Liter)
	NO	TUBING			0.3125	0.307	6	30.169	1	16.387	30.169	0.030	100	0.30	0
					0.3125	0.307	6	30.169	3	16.387	90.507	0.091	100/150	0.91/1.5	0
					0.3125	0.307	6	30.169	7	16.387	211.182	0.211	100	2.11	1

Notes:

Purge volume for tubing can be calculated as follows:
(a) 3.141593(Pi) * tubing radius r^2 * inches of tubing * 16.3870641(conversion of cubic inches to milliliters)

Purge volume for the bore hole can be calculated as follow:
(b) 3.141593(Pi) * bore hole r^2 * inches of bore hole * 16.3870641(conversion of cubic inches to milliliters)

Total purge volume can be calculated as follows:
a + b * number of tubing/bore hole volume to be purged = total purge volume

Estimated purge time can be calculated as follows:
total purge volume (ml) ÷ purge rate (max of 167 ml/min)

Purging & Sampling Data								Leak Tests Data			Field Readings / Information				
Calculated Total Purge Volume (ml)	Time Start Purging (24 hr)	Time Stop Purging (24 hr)	Initial & Final Vacuum Gauge Reading (Hg")	Cumulative Total Volume Purged (ml)	Time Start Sampling (24 hr)	Time Stop Sampling (24 hr)	Final Vacuum Gauge Reading (Hg")	Iso-propanol Applied (yes/no)	Vacuum Train Leak Check (pass/fail)	Vacuum Train Test Start Time/ Vacuum (Hg")	Vacuum Train Test Stop Time/ Vacuum (Hg")	Probe Install Date	Probe Install Time	Purge Volumes	Probe Depth (Feet)
90.507 ~~30.169~~	1132	1133	25"/23"	90.5	1134	1146	-6"Hg	NO/ Helium	Pass	1050/-30"Hg	1100/-30"Hg	X	X	1	0.66
~~90.507~~														3	0.66
~~211.182~~														7	0.66

Notes:

- SHROUD SAMPLE COLLECTED @ 1132 (SVP-2-SHROUD)
- SAMPLE COLLECTED @ 1134 (SVP-2)

SHROUD ID: A 80062
PURGE CANNISTER ID: 354
SAMPLE CANNISTER ID: 104

Init. Helium in SHROUD: 20.6%
Helium During Shroud Sample collection: 20.3%
SHROUD HELIUM DURING SAMPLING: 22.6%
FINAL Helium: 18.7%

SOIL GAS INVESTIGATION
PURGE, SAMPLE & LEAK TEST - FIELD DATA SHEET
6 Liter Summa

TRINITY source group, inc. Environmental Consultants

SCANNED

Project No.: 154.011.002

Facility Name: ABF Freight

Address: 4575 Tidewater Avenue; Oakland, CA

Staff: ~~Eric Choi~~ BRADY NAGLE, CHEYNE H

Date:

Tubing Size (in): 3/16 ID; 1/4 OD

Purge Test Location: SVP-3

Purge Method: 6L Summa Canister

Leak Test Compound : Helium

Flow Control Orifice (ml/min): Approximately ~~100 ml/min~~ 150 mL/min

Bore Hole Dia. (in):NA

Purge Volume Calculation

Inner Tubing Radius (inches)	Area of Inner Tubing Radius (pi*r2)	Tubing Length (ft)	Convert feet to inches	Total Tubing Volume (ml)	Bore Hole Radius (inches)	Area of Bore Hole (r2*pi)	Length of Bore Hole (in)	Total Bore Hole Volume (ml)	No. of Tubing + Bore Hole Volumes to Purge	Conv. of cubic inches to ml	Total Purge Volume (ml)	Total Purge Volume (L) [L= ml/1000]	Max. Purge rate (ml/min)	Est. Purge Time (min)	Inches of Mercury (5"/Liter)
		NO TUBING			0.3125	0.307	6	30.169	1	16.387	30.169	0.030	100	0.30	0
					0.3125	0.307	6	30.169	3	16.387	90.507	0.091	~~100~~ 150	~~0.91~~ 1.58	0
					0.3125	0.307	6	30.169	7	16.387	211.182	0.211	100	2.11	1

Notes:

Purge volume for tubing can be calculated as follows:

(a) 3.141593(Pi) * tubing radius r^2 * inches of tubing * 16.3870641(conversion of cubic inches to milliliters)

Purge volume for the bore hole can be calculated as follow:

(b) 3.141593(Pi) * bore hole r^2 * inches of bore hole * 16.3870641(conversion of cubic inches to milliliters)

Total purge volume can be calculated as follows:

a + b * number of tubing/bore hole volume to be purged = total purge volume

Estimated purge time can be calculated as follows:

total purge volume (ml) ÷ purge rate (max of 167 ml/min)

Purging & Sampling Data								Leak Tests Data				Field Readings / Information			
Calculated Total Purge Volume (ml)	Time Start Purging (24 hr)	Time Stop Purging (24 hr)	Initial & Final Vacuum Gauge Reading (Hg")	Cumulative Total Volume Purged (ml)	Time Start Sampling (24 hr)	Time Stop Sampling (24 hr)	Final Vacuum Gauge Reading (Hg")	Isopropanol Applied (yes/no)	Vacuum Train Leak Check (pass/fail)	Vacuum Train Test Start Time/ Vacuum (Hg")	Vacuum Train Test Stop Time/ Vacuum (Hg")	Probe Install Date	Probe Install Time	Purge Volumes	Probe Depth (Feet)
~~80.169~~ 90.507	1255	1257	-19"Hg / -15"Hg	90.507	1258	1310	-5"	No/ Helium	Pass	1245 / 30"Hg	1255 / 30"Hg	—	—	1	0.66
90.507														3	0.66
211.182														7	0.66

Notes:

SVP-3 SHROUD (SHROUD SAMPLE) Collected @ 1257

SVP-3 collected @ 1258

SHROUD ID: A0316

PURGE CANNISTER ID: 354

SAMPLE CANNISTER ID: 175

INIT. HELIUM: 23.6%

~~SHR~~ HELIUM DURING SHROUD SAMPLING: 22.7%

HELIUM DURING SAMPLING 22.0%

FINAL HELIUM: 21.4%

O:\admin\forms\soil vapor sampling form.xls

TRINITY
source group, inc.
Environmental Consultants
119 Encinal Street
Santa Cruz, California 95060
v: 831.426.5600
f: 831.426.5602

SCANNED

FIELD DATA SHEET

Client: ABF Freight
Job Address: 4575 Tidewater Ave, Oakland, CA
Weather Conditions: ~~Overcast~~ Sunny
Equipment at Site: Soil Vapor Sampling Equip, Roto, Small tools
Arrival Time: 0945
Departure Time: 1340

Project #: 154.011.002
Date: 2/16/17
Personnel: ~~Brady F~~
Cheyne H
Brady N

FIELD NOTES

0600 BN + CH arrive @ office. Loading equipment into field truck.
0645. Mobilizing to site ~~office~~ (using TUNDRA)
0945. - Arrive onsite. BN + CH checking-in with front office ABF ~~personell~~ personnel (Craig).
- Contacts Curtis & Tompkins for sampling equipment delivery
↳ Will Rice to arrive onsite @ ~1000.
1000 - BN + CH inspecting SVP-1 & SVP-2 for damages/needed repairs or replacement.
1030 - CH + BN installing SVP-3 near Northern middle roll-up door (see field figure for location).
1045. - SVP-3 installation complete. - will wait until 1245 to sample
1100 - Will Rice (Curtis & Tompkins) onsite.
- Begin setting up ~~eq~~ sampling equipment @ SVP-2. Will Rice providing instructions / demo of how to use sampling equipment.
1230. - Will Rice offsite. Completed SVP-1, SVP-2 (+ SVP-2 dup) sampling.
setting up equipment @ SVP-3 for sampling
1320 - SVP sampling complete. Begin site cleanup
1330 - CH + BN informing ABF ~~of~~ that fieldwork is complete.
1340 - offsite. → will drive to Curtis & Tompkins Lab to relinquish samples (includes shroud helium samples (x3))

Signature

ATTACHMENT E

Certified Analytical Reports and Chain of Custody Documentation


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

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

Laboratory Job Number 286111
ANALYTICAL REPORT

Trinity Source Group Inc.	Project : 154.011.002
119 Encinal Street	Location : ABF
Santa Cruz, CA 95060	Level : II

Sample ID	Lab ID
SVP-1	286111-001
SVP-1-DUP	286111-002
SVP-2	286111-003
SVP-3	286111-004
SVP-1-SHROUD	286111-005
SVP-2-SHROUD	286111-006
SVP-3-SHROUD	286111-007

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

Signature: Will Rice Date: 02/23/2017

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

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**286111**
Client:	**Trinity Source Group Inc.**
Project:	**154.011.002**
Location:	**ABF**
Request Date:	**02/16/17**
Samples Received:	**02/16/17**

This data package contains sample and QC results for seven air samples, requested for the above referenced project on 02/16/17. The samples were received intact.

Volatile Organics in Air by MS (EPA TO-15):
No analytical problems were encountered.

Volatile Organics in Air GC (ASTM D1946):
There was Helium carryover and resulting contamination in our sequence from the high concentration Tedlar Bag samples into sample -001. Unfortunately we are unable to clear this helium from the SUMMA, however its DUP is clean and the results are comparable. No analytical problems were encountered.

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

AIR TESTING CHAIN OF CUSTODY
& PURCHASE ORDER

Page 1 of 1

Chain of Custody # :

C&T LOGIN # 286111

Project No: 154.011.002
Project Name: ABF
EDD Format: ______ Rpt Level: II III IV
Turnaround Time: ☐ RUSH ______ X Standard

Sampler: Brady Nagle, Cheyne Hirota
Report To: David Reinsma
Company: Trinity Source Group
Telephone: 831-426-5600
Email: labstrinity@gmail.com

Lab No.	Sample ID.	Date Collected	Time Collected	Canister ID (Bar Code #)	Flow Controller ID	Sample Volume (Gauge Reading)	PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, Vinyl chloride (TO-15)	Helium (leak check compound)			
1	SVP-1	2/16/17	1203	279	A00244	-5"Hg	X	X			
2	SVP-1-DUP	↓	1203	69	A00244	5"Hg	X	X			
3	SVP-2	↓	1134	104	A00052	-6"Hg	X	X			
4	SVP-3	↓	1258	175	A00316	-5"Hg	X	X			
5	SVP-1-SHROUD	↓	1200	—	—	—		X			
6	SVP-2-SHROUD	↓	1132	—	—	—		X			
7	SVP-3-SHROUD	↓	1257	—	—	—		X			

Notes:

RELIQUISHED BY: Cheyne Hirota	RECEIVED BY:
2/16/17 @ 1430 DATE/TIME	[signature] 2/16/17 14:40 DATE/TIME
DATE/TIME	DATE/TIME
DATE/TIME	DATE/TIME

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 286111 Date Received 2/16/17 Number of coolers Ø

Client TSGT Project ABF/154.011.002

Date Opened 2/16/17 By (print) EWA (sign) [signature]

Date Logged in ↓ By (print) ↓ (sign) ↓

Date Labeled ↓ By (print) ↓ (sign) ↓

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

2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☑ NO
   How many Name Date

2B. Were custody seals intact upon arrival? YES NO (N/A)

3. Were custody papers dry and intact when received? (YES) NO

4. Were custody papers filled out properly (ink, signed, etc)? (YES) NO

5. Is the project identifiable from custody papers? (If so fill out top of form) (YES) NO

6. Indicate the packing in cooler: (if other, describe)

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

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

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

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

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

8. Were Method 5035 sampling containers present? YES (NO)
   If YES, what time were they transferred to freezer?

9. Did all bottles arrive unbroken/unopened? (YES) NO

10. Are there any missing / extra samples? YES (NO)

11. Are samples in the appropriate containers for indicated tests? (YES) NO

12. Are sample labels present, in good condition and complete? (YES) NO

13. Do the sample labels agree with custody papers? (YES) NO

14. Was sufficient amount of sample sent for tests requested? (YES) NO

15. Are the samples appropriately preserved? YES NO (N/A)

16. Did you check preservatives for all bottles for each sample? YES NO (N/A)

17. Did you document your preservative check? (pH strip lot#) YES NO (N/A)

18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO (N/A)

19. Did you change the hold time in LIMS for preserved terracores? YES NO (N/A)

20. Are bubbles > 6mm absent in VOA samples? YES NO (N/A)

21. Was the client contacted concerning this sample delivery? YES (NO)
    If YES, Who was called? By Date:

COMMENTS

Curtis & Tompkins, Ltd.

Detections Summary for 286111

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

Client : Trinity Source Group Inc.
Project : 154.011.002
Location : ABF

Client Sample ID : SVP-1 Laboratory Sample ID : 286111-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Tetrachloroethene	1.4		0.88	ppbv	As Recd	1.750	EPA TO-15	METHOD
Helium	47,000		1,800	ppmv	As Recd	1.750	ASTM D1946	METHOD

Client Sample ID : SVP-1-DUP Laboratory Sample ID : 286111-002

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Tetrachloroethene	1.6		0.89	ppbv	As Recd	1.770	EPA TO-15	METHOD

Client Sample ID : SVP-2 Laboratory Sample ID : 286111-003

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Tetrachloroethene	77		1.0	ppbv	As Recd	2.080	EPA TO-15	METHOD

Client Sample ID : SVP-3 Laboratory Sample ID : 286111-004

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Tetrachloroethene	11		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD

Client Sample ID : SVP-1-SHROUD Laboratory Sample ID : 286111-005

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Helium	150,000		1,000	ppmv	As Recd	1.000	ASTM D1946	METHOD

Client Sample ID : SVP-2-SHROUD Laboratory Sample ID : 286111-006

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Helium	140,000		1,000	ppmv	As Recd	1.000	ASTM D1946	METHOD

Client Sample ID : SVP-3-SHROUD Laboratory Sample ID : 286111-007

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Helium	180,000		1,000	ppmv	As Recd	1.000	ASTM D1946	METHOD

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	286111	Location:	ABF
Client:	Trinity Source Group Inc.	Prep:	METHOD
Project#:	154.011.002	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	244645
Units (V):	ppbv	Sampled:	02/16/17
Units (M):	ug/m3	Received:	02/16/17

Field ID:	SVP-1	Diln Fac:	1.750
Type:	SAMPLE	Analyzed:	02/19/17
Lab ID:	286111-001		

Analyte	Result (V)	RL	Result (M)	RL
Vinyl Chloride	ND	0.88	ND	2.2
1,1-Dichloroethene	ND	0.88	ND	3.5
trans-1,2-Dichloroethene	ND	0.88	ND	3.5
cis-1,2-Dichloroethene	ND	0.88	ND	3.5
Trichloroethene	ND	0.88	ND	4.7
Tetrachloroethene	1.4	0.88	9.2	5.9

Surrogate	%REC	Limits
Bromofluorobenzene	101	70-130

Field ID:	SVP-1-DUP	Diln Fac:	1.770
Type:	SAMPLE	Analyzed:	02/19/17
Lab ID:	286111-002		

Analyte	Result (V)	RL	Result (M)	RL
Vinyl Chloride	ND	0.89	ND	2.3
1,1-Dichloroethene	ND	0.89	ND	3.5
trans-1,2-Dichloroethene	ND	0.89	ND	3.5
cis-1,2-Dichloroethene	ND	0.89	ND	3.5
Trichloroethene	ND	0.89	ND	4.8
Tetrachloroethene	1.6	0.89	11	6.0

Surrogate	%REC	Limits
Bromofluorobenzene	104	70-130

Field ID:	SVP-2	Diln Fac:	2.080
Type:	SAMPLE	Analyzed:	02/19/17
Lab ID:	286111-003		

Analyte	Result (V)	RL	Result (M)	RL
Vinyl Chloride	ND	1.0	ND	2.7
1,1-Dichloroethene	ND	1.0	ND	4.1
trans-1,2-Dichloroethene	ND	1.0	ND	4.1
cis-1,2-Dichloroethene	ND	1.0	ND	4.1
Trichloroethene	ND	1.0	ND	5.6
Tetrachloroethene	77	1.0	520	7.1

Surrogate	%REC	Limits
Bromofluorobenzene	101	70-130

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

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	286111	Location:	ABF
Client:	Trinity Source Group Inc.	Prep:	METHOD
Project#:	154.011.002	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	244645
Units (V):	ppbv	Sampled:	02/16/17
Units (M):	ug/m3	Received:	02/16/17

Field ID:	SVP-3	Diln Fac:	1.920
Type:	SAMPLE	Analyzed:	02/19/17
Lab ID:	286111-004		

Analyte	Result (V)	RL	Result (M)	RL
Vinyl Chloride	ND	0.96	ND	2.5
1,1-Dichloroethene	ND	0.96	ND	3.8
trans-1,2-Dichloroethene	ND	0.96	ND	3.8
cis-1,2-Dichloroethene	ND	0.96	ND	3.8
Trichloroethene	ND	0.96	ND	5.2
Tetrachloroethene	11	0.96	73	6.5

Surrogate	%REC	Limits
Bromofluorobenzene	101	70-130

Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC873413	Analyzed:	02/18/17

Analyte	Result (V)	RL	Result (M)	RL
Vinyl Chloride	ND	0.50	ND	1.3
1,1-Dichloroethene	ND	0.50	ND	2.0
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4

Surrogate	%REC	Limits
Bromofluorobenzene	101	70-130

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

14.0

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	286111	Location:	ABF
Client:	Trinity Source Group Inc.	Prep:	METHOD
Project#:	154.011.002	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	244645
Units (V):	ppbv	Analyzed:	02/18/17
Diln Fac:	1.000		

Type: BS   Lab ID: QC873411

Analyte	Spiked	Result (V)	%REC	Limits
Vinyl Chloride	5.000	4.470	89	70-130
1,1-Dichloroethene	5.000	4.903	98	70-130
trans-1,2-Dichloroethene	5.000	5.807	116	70-130
cis-1,2-Dichloroethene	5.000	5.769	115	70-130
Trichloroethene	5.000	5.127	103	70-130
Tetrachloroethene	5.000	5.397	108	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	106	70-130

Type: BSD   Lab ID: QC873412

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Vinyl Chloride	5.000	4.563	91	70-130	2	20
1,1-Dichloroethene	5.000	4.877	98	70-130	1	20
trans-1,2-Dichloroethene	5.000	5.901	118	70-130	2	20
cis-1,2-Dichloroethene	5.000	5.662	113	70-130	2	20
Trichloroethene	5.000	5.294	106	70-130	3	20
Tetrachloroethene	5.000	5.609	112	70-130	4	20

Surrogate	%REC	Limits
Bromofluorobenzene	103	70-130

RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	286111	Location:	ABF
Client:	Trinity Source Group Inc.	Prep:	METHOD
Project#:	154.011.002	Analysis:	ASTM D1946
Analyte:	Helium	Batch#:	244589
Matrix:	Air	Sampled:	02/16/17
Units:	ppmv	Received:	02/16/17
Units (Mol %):	MOL %	Analyzed:	02/16/17

Field ID	Type	Lab ID	Result	RL	Result (Mol %)	RL	Diln Fac
SVP-1	SAMPLE	286111-001	47,000	1,800	4.7	0.18	1.750
SVP-1-DUP	SAMPLE	286111-002	ND	1,800	ND	0.18	1.770
SVP-2	SAMPLE	286111-003	ND	2,100	ND	0.21	2.080
SVP-3	SAMPLE	286111-004	ND	1,900	ND	0.19	1.920
	BLANK	QC873204	ND	1,000	ND	0.10	1.000

ND= Not Detected
RL= Reporting Limit
Result Mol %= Result in Mole Percent

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	286111	Location:	ABF
Client:	Trinity Source Group Inc.	Prep:	METHOD
Project#:	154.011.002	Analysis:	ASTM D1946
Analyte:	Helium	Batch#:	244589
Matrix:	Air	Sampled:	02/16/17
Units:	ppmv	Received:	02/16/17
Diln Fac:	1.000	Analyzed:	02/16/17

Field ID	Type	Lab ID	Result	RL
SVP-1-SHROUD	SAMPLE	286111-005	150,000	1,000
SVP-2-SHROUD	SAMPLE	286111-006	140,000	1,000
SVP-3-SHROUD	SAMPLE	286111-007	180,000	1,000
	BLANK	QC873204	ND	1,000

ND= Not Detected
RL= Reporting Limit

11.0

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	286111	Location:	ABF
Client:	Trinity Source Group Inc.	Prep:	METHOD
Project#:	154.011.002	Analysis:	ASTM D1946
Analyte:	Helium	Diln Fac:	1.000
Matrix:	Air	Batch#:	244589
Units:	ppmv	Analyzed:	02/16/17

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC873202	100,000	84,570	85	70-130		
BSD	QC873203	100,000	84,110	84	70-130	1	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	286111	Location:	ABF
Client:	Trinity Source Group Inc.	Prep:	METHOD
Project#:	154.011.002	Analysis:	ASTM D1946
Analyte:	Helium	Diln Fac:	1.000
Matrix:	Air	Batch#:	244589
Units:	ppmv	Analyzed:	02/16/17

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC873202	100,000	84,570	85	70-130		
BSD	QC873203	100,000	84,110	84	70-130	1	20

RPD= Relative Percent Difference