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Thermo Fisher Scientific Inc.

SOIL GAS INVESTIGATION WORK PLAN FOR THE FORMER SEMICONDUCTOR PROPERTY

Former Spectra-Physics Lasers, Inc. and
Former Teledyne Semiconductor Sites
Mountain View, California

May 11, 2016

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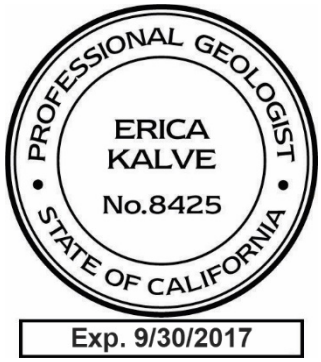

SOIL GAS INVESTIGATION WORK PLAN FOR THE FORMER SEMICONDUCTOR PROPERTY

Former Spectra-Physics Lasers, Inc.
and Former Teledyne Semiconductor Sites
Mountain View, California

Prepared for:

TDY Industries, LLC, regarding the former
Teledyne Semiconductor Site
1300 Terra Bella Avenue
Mountain View, California
and
Thermo Fisher Scientific Inc. regarding the
former Spectra-Physics Lasers, Inc. Site
1250 West Middlefield Road
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FIGURES

Figure 1 Site Vicinity Map and Property Locations

Figure 2 Indoor Air Sampling Locations

Figure 3 Data Gap Investigation Sampling Locations

Figure 4 Data Gap Investigation MIP ECD Data and Grab Groundwater Results

Figure 5 Data Gap Investigation Grab Groundwater and Soil Gas Results

Figure 6 Proposed Additional Soil Gas Sampling Locations

APPENDICES

Appendix A Soil Gas Sampling – PRT System Operation

Appendix B TEG – Northern California Standard Operating Procedure

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1 INTRODUCTION

Arcadis U.S., Inc. (Arcadis) has prepared this Soil Gas Investigation Work Plan (Work Plan) for the Former Teledyne Semiconductor Property on behalf of TDY Industries, LLC and Thermo Fisher Scientific, Inc. (the Companies). This Work Plan details an investigation designed to collect data to assess concentrations of volatile organic compounds (VOCs) in soil gas at 1300 Terra Bella Avenue (the Semiconductor Property), a property within the Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites (the Sites) in Mountain View, California (Figure 1).

This investigation is proposed in response to indoor air sampling results collected from the Semiconductor Property in accordance with the Work Plan to Evaluate Potential Vapor Intrusion in the Off-Property Study Area and at 1250 West Middlefield Road (Arcadis 2010) and the Work Plan Addendum for Vapor Intrusion Evaluation of the Former Teledyne Semiconductor Building Located at 1300 Terra Bella Avenue (Arcadis 2014). Trichloroethene (TCE) was not detected in indoor air samples collected from the Semiconductor Property with the heating, ventilation and air conditioning (HVAC) system operating; however, TCE was detected at concentrations above the long-term screening criteria (United States Environmental Protection Agency [USEPA] Regional Screening Levels; USEPA 2015) in breathing zone and pathway samples collected without the HVAC system operating (Tables 1 through 4 and Figure 2).

2 BACKGROUND

Teledyne Semiconductor manufactured semiconductor components on the property starting in the 1960s and used a variety of synthetic chemicals in their manufacturing processes. VOCs were first detected in groundwater in 1982 and investigations were subsequently initiated at the Semiconductor Property in 1982. Groundwater investigations were conducted at the Semiconductor Property to characterize the distribution of VOCs in soil and groundwater and supported development of appropriate remedial actions. Remedial activities on the Semiconductor Property have included groundwater extraction and, more recently, enhanced reductive dechlorination (ERD). ERD has significantly reduced the concentrations of VOCs in groundwater at the Semiconductor Property. A soil vapor extraction system also operates on the Property and has effectively reduced concentrations of VOCs and methane (an ERD byproduct) in soil vapor along the Semiconductor Property boundary and under a portion of the on-Property building.

3 RELEVANT SEMICONDUCTOR PROPERTY INVESTIGATIONS

LFR Inc. (LFR) completed a data gap investigation between July 2007 and December 2008 in an effort to further assess the distribution of VOCs in soil and groundwater at the Semiconductor Property (LFR 2009). The investigation included the collection of membrane interface probe (MIP) samples, soil gas samples and grab groundwater samples. Data gap investigation sampling locations are presented on Figure 3 and sampling results are presented on Figures 4 and 5 and in Tables 5 and 6. It is important to note that since the completion of the data gap investigation, ERD has been conducted on the Property in

accordance with the Work Plan to Implement Full-Scale ERD Treatability Study (Fishbeck, Thompson, Carr and Huber and S.S. Papadopulos & Associates, Inc. [FTC&H/SSPA] 2010) and associated addenda (FTC&H 2010a, 2010b, 2016). As a result, TCE groundwater concentrations in areas impacted by the ERD have significantly decreased and the results from the data gap investigation would not be expected to accurately represent current conditions in those areas.

Soil gas samples have also been periodically collected from soil vapor probe (SVP) locations on both the interior and exterior of the building. The soil vapor probes were installed on the Property to monitor VOC and methane concentrations in soil vapor in proximity to ERD. The soil vapor probe locations are presented on Figure 2 and sampling results are presented in Table 7.

As mentioned in Section 1, multiple rounds of indoor air sampling have been conducted at the Property to evaluate whether VOCs in shallow groundwater are potentially impacting indoor air by means of vapor intrusion. Air samples have been collected from both breathing zone and pathway locations, with both the HVAC system on and off. Indoor air sampling locations are presented on Figure 2 and the sampling results are presented in Tables 1 through 4.

4 GEOLOGY AND HYDROLOGY

Interbedded alluvial sediments composed of sand, gravel, silt, and clay underlie the Study Area. The uppermost 5 to 10 feet of the subsurface, which comprise the vadose zone being investigated under this Work Plan, consist primarily of clay, gravely clay, and silt with minor sand.

The depth to the shallowest groundwater at the Semiconductor Property is approximately 7 feet below ground surface (bgs).

5 PURPOSE AND SCOPE

The objective of this Work Plan is to further characterize subsurface VOC concentrations in soil gas at the Semiconductor Property to determine whether additional remedial action is appropriate.

As described below, Arcadis proposes to use a direct-push drill rig for the collection of soil gas samples and a mobile laboratory brought to the Semiconductor Property for analysis of the soil gas samples. Sample probes will be advanced at the proposed interior locations (Figure 6), which have been selected based on an evaluation of the data gap investigation results and proximity to the locations where indoor air concentrations were detected above the long-term screening criteria (SPCB-16-BZ-253 and SPCB-16-PW-254). Based on the results of the initial round of samples, additional “step-out” samples may be collected to assess the lateral distribution of VOCs in soil gas. Proposed sample locations are subject to change based on the results of the utility survey.

A sample will also be collected from the void space behind the drywall near indoor air location SPCB-16-BZ-253 (Figure 2).

6 PROPOSED SOIL GAS SAMPLING METHODOLOGY

The following section describes the methodology for the proposed soil gas sampling activities.

References for soil gas sampling include:

- OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, USEPA, June 2015.
- Advisory – Active Soil Gas Investigations, DTSC and California Regional Water Quality Control Board (RWQCB), Los Angeles Region, July 2015 (Soil Gas Advisory).

6.1 Comprehensive Utility Survey

Before temporary soil gas probes are installed, detailed mapping of identifiable subsurface utilities will be completed using several locating methodologies, including ground penetrating radar and electromagnetic techniques. Temporary soil gas probe locations may be changed based on the mapped locations of the subsurface utilities. Mapped subsurface utilities will be provided in an updated figure to be included in an investigation summary report.

6.2 Construction of Soil Gas Probes

Temporary soil gas sampling locations will be installed using direct-push technology with a Post-Run Tubing (PRT) system. Proposed soil gas sampling locations are shown on Figure 6. The PRT system allows for the rapid collection of soil gas samples from the installed point at the desired sampling depth via a 500-milliliter (mL) syringe for laboratory analysis.

The direct-push and PRT system setup consists of a soil gas probe with a steel rod that is hydraulically driven into the subsurface to the desired depth and then withdrawn approximately 6 inches. Appendix A, the “Soil Gas Sampling – PRT System Operation,” presents a visual guide to the direct-push and PRT system setup. The TEG-Northern California Standard Operating Procedure is included as Appendix B.

After the probe is driven to the desired depth, the drive point is then disengaged from the point holder to create a clear pathway for the soil gas. A new piece of Teflon tubing with a PRT adapter is inserted down the center of the steel rod and threaded into the point holder. Sample tubing is replaced after collecting each sample location, eliminating potential sample carryover problems. O-ring connections enable the PRT system to deliver a vacuum-tight seal that prevents sample contamination from ambient air and assures that the sample is collected from the desired depth at the bottom of the boring.

Using the direct-push with PRT system, a direct-push rod will be driven to a target depth of 3 to 4 feet bgs. A second depth interval may be sampled at 6 to 7 feet bgs pending evaluation of initial mobile laboratory results from the first depth interval. After driving the probe rod, disengaging the point, and connecting the sample tubing, the probe will be tested for flow and then allowed to equilibrate for a minimum of 2 hours per the Soil Gas Advisory (DTSC and RWQCB 2015).

If the probe installation procedure described above results in subsurface lithology that does not allow for purging of soil gas (no flow condition), the rods will be withdrawn from the hole and over-drilled using hand-auger techniques, to minimize potential smearing of clays or silts on the sidewalls of the borehole. After this procedure, the probe will be installed and constructed in accordance with the following details:

- A piece of Teflon tubing will be placed within a 6-inch sand pack that will be installed at the desired target depth. The tubing will extend to the surface.
- Approximately 1 foot of dry granular bentonite will be placed above the sand pack. The remaining annulus will be sealed with granular bentonite and hydrated in place to form a tight seal around the tube.
- The tubing at the surface will be labeled with a probe designation and sealed with a three-way valve or compression cap, left in the closed position, to prevent infiltration of water/moisture and ambient air into the subsurface.
- The probe will be allowed to equilibrate with the surrounding soils for 48 hours after which it will be sampled using the procedures described below.

Probe construction will be consistent with requirements outlined in the Soil Gas Advisory (DTSC and RWQCB 2015). Probes will be removed by hand after laboratory results have been received and evaluated, provided that no further analysis is needed. The surface will then be restored.

6.3 Soil Gas Sampling Procedures

Following a 2-hour minimum equilibration period for probes pushed directly to the target interval from which flow can be achieved, and 24 hours for probes encased in a sand pack, and, as stated in the Soil Gas Advisory, Arcadis will perform leak check testing (DTSC and RWQCB 2015). Soil gas samples will then be collected and analyzed.

Arcadis will perform a tracer gas (high-purity helium) leak test to confirm the integrity of the sampling system. The soil gas probe and entire sampling train (valves, tubing, gauges, manifold, and syringes) will be placed in an enclosure. High-purity helium will be released into the enclosure and approximately 10 to 20 percent (%) helium will be maintained in the enclosure as measured by a portable helium detector (MGD-2002 or similar). Three purge volumes, calculated as the sum of the volume of the probe tubing and (if a temporary well installation) the sand pack pore space, will be removed and collected. Purged air will be removed from the sample tubing at a flow rate of less than 200 milliliters per minute (mL/min) with a personal air pump or syringe. Purged air will be collected in a Tedlar bag and gas will be monitored for helium using a portable helium detector to assess if leakage occurred. If a leak percentage of greater than 5% is calculated, the probe and sample train construction will be examined and the leak test will be repeated until a leak percentage of less than 5% is observed.

A soil gas sample will then be collected by extracting a 500-mL sample from the sample tubing using a clean syringe provided by the mobile laboratory.

One duplicate sample per day or once every 20 samples (whichever is more) will be collected using an additional clean syringe and submitted to the laboratory for quality assurance purposes. An equipment blank will be collected and analyzed by the mobile laboratory for each day of sampling to ensure adequate decontamination procedures are used and sampling equipment does not contribute background concentrations of constituents of concern.

Collection of the soil gas samples will be recorded on field notes by the field sampler and samples will be provided under appropriate chain-of-custody protocols to the on-site California state-certified mobile laboratory.

6.4 Laboratory Analytical Methods

Soil gas samples will be analyzed by an on-site mobile laboratory for the following laboratory analyses: TCE, tetrachloroethylene (PCE), cis-1,2-dichloroethene (cis-1.2- DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethene (1,1-DCE), 1,1- dichloroethane (1,1-DCA), Freon 113, and vinyl chloride by Modified USEPA Method 8260. The analytical laboratory reporting limit documentation is included as Appendix C.

6.5 Pre-Field Activities

6.5.1 Drilling Permits and Property Agreements

Prior to the soil gas investigation, access will be coordinated with the property owners and tenants, as necessary. Arcadis will obtain the necessary Santa Clara Valley Water District (SCVWD) permits before commencing the soil gas investigation.

6.5.2 Utility Clearance

Prior to the soil gas investigation, Underground Service Alert (USA) will be notified at least 48 hours in advance to identify public utilities in the vicinity of the proposed sampling locations. In addition, a second private utility locator will be used to identify and clear any utilities in the vicinity of proposed sampling locations. As noted above in Section 6.1, detailed mapping of identifiable subsurface utilities will be completed using this information. Since undisturbed soil gas monitoring locations are desired, at least three lines of evidence based on existing building utility maps, public utility locate, and a private utility locate will be used to clear the area for utilities prior to commencing the investigation.

6.5.3 Health and Safety Plan Update

In accordance with the Occupational Safety and Health Administration (OSHA) “Hazardous Waste Operations and Emergency Response” guidelines (29 Code of Federal Regulations Section 1910.120) and California Occupational Safety and Health Administration (Cal-OSHA) “Hazardous Waste Operations and Emergency Response” guidelines (California Code of Regulations Title 8, Section 5192), Arcadis will update the existing site-specific health and safety plan (HASP) as applicable prior to commencement of fieldwork. The field staff and subcontractors will review the HASP prior to beginning field operations.

6.6 Waste Management

Soil cuttings, concrete cores, and any decontamination water generated during the field activities will be contained in Department of Transportation-approved 55-gallon steel drums. These drums will be appropriately labeled and temporarily stored on the Semiconductor Property pending analytical results. Upon receipt of soil and groundwater analytical results, the drums will be removed from the Property and transported to an appropriate off-site disposal facility.

6.7 Schedule

The soil gas investigation is anticipated to be completed approximately 60 days from the approval of this Work Plan by the RWQCB, pending coordination of access to the Property. Results of the soil gas data evaluation and field implementation activities will be reported within 60 days of completion of the field implementation.

6.8 Evaluation and Reporting

Upon completion of the soil gas investigation, a data report will be prepared and submitted to the RWQCB and the USEPA. At a minimum, the report will include the following items:

- Introduction and background
- Summary of soil gas sampling and analysis results, including data tables and sample location maps
- Summary of field quality assurance/quality control (QA/QC) activities
- Summary of mobile laboratory data validation and QA/QC activities
- Copies of laboratory analytical reports provided by the mobile laboratory
- Conclusions and recommendations, as appropriate

7 REFERENCES

ARCADIS U.S., Inc. (Arcadis). 2010. Work Plan to Evaluate Potential Vapor Intrusion in the Off-Property Study Area and at 1250 West Middlefield Road. September 24.

Arcadis. 2014. Work Plan Addendum for Vapor Intrusion Evaluation of Residential Buildings in the Off-Property Study Area.1300 Terra Bella Avenue and 1250 Middlefield Road. Mountain View, California. February 7.

DTSC and California RWQCB (Los Angeles Region). 2015. Advisory – Active Soil Gas Investigations. July.

Fishbeck, Thompson, Carr & Huber (FTC&H). 2010a. Addendum to the Work Plan. November 17.

FTC&H. 2010b. Work Plan Addendum No. 2, Work Plan to Implement Full-Scale ERD Treatability Study. December 22.

FTC&H. 2016. Work Plan for Third Injection Event, Full Scale Enhanced Reductive Dechlorination (ERD) Treatability Study, Teledyne Semiconductor/Spectra-Phys ics Site, Mountain View, California. February 24.

Fishbeck, Thompson, Carr and Huber and S.S. Papadopulos & Associates, Inc. (FTC&H/SSPA). 2010. Work Plan to Implement Full-Scale ERD Treatability Study. August 16.

LFR Inc. (LFR). 2009. Focused Feasibility Study, Spectra-Physics Lasers, Inc., and Former Teledyne Semiconductor, 1250 West Middlefield Road and 1300 Terra Bella Avenue. June.

United States Environmental Protection Agency. 2015. OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air. Office of Solid Waste and Emergency Response. June.

TABLES

Table 1
Semiconductor Property - HVAC On Air Sampling Results for Breathing Zones
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California

(concentrations reported in micrograms per cubic meter)

Sample ID	Sample Date	Sample Type	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
Tier 1 - Comparison to Background/Outdoor Ambient Air												
IA-5-20110707 (SPCB-16)	7/7/2011	OA	<0.18	<0.13	<0.043	<0.23	<0.67	<0.14	<0.20	<0.18	<0.16	0.47
IA-5-20110818 (SPCB-16)	8/18/2011	OA	<0.18	<0.13	<0.042	<0.22	<0.65	<0.13	<0.20	<0.18	<0.16	0.48
OA-1-20121025 (SPCB-16)	10/25/2012	OA	<0.18	<0.13	<0.042	<0.22	<0.65	<0.13	<0.20	<0.18	<0.16	0.54
OA-2-20121108 (SPCB-16)	11/8/2012	OA	<0.17	<0.13	<0.041	<0.22	<0.64	<0.13	<0.19	<0.18	<0.16	0.50
SPCB-16-OA-192	11/5/2014	OA	<0.17	<0.13	<0.041	<0.22	<0.64	<0.13	<0.19	<0.18	0.47	0.49
Tier 2 - Comparison to Long-Term Health Risk-Based Screening Criteria												
Industrial/Commercial Screening Level (November 2015)[1,4]			3	NA	2.8	2	NA	7.7	880	22,000	0.53	130,000
Tier 3 - Comparison to Short-Term Health Risk-Based Screening Criteria												
Acute Screening Level (September 2015)[2]			NA	793*	1,278	41	793	NA	NA	10,914	488	NA
Short-Term Screening Levels (September 2015)[2]			2	793*	77	41	793	NA	NA	3,820	244	NA
Interim Indoor Short-Term Response Action Levels[3]			7**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indoor Air Sample Results												
IA-1-20110707 (SPCB-16)	7/7/2011	BZ	2.4	<0.13	<0.041	0.28	<0.64	<0.13	<0.19	<0.18	0.34	1.5
IA-2-20110707 (SPCB-16)	7/7/2011	BZ	0.39	<0.13	<0.041	<0.22	<0.64	<0.13	<0.19	<0.18	0.19	0.65
IA-3-20110707 (SPCB-16)	7/7/2011	BZ	0.41	<0.13	<0.042	<0.22	<0.65	<0.13	<0.20	<0.18	0.4	0.62
IA-4-20110711 (SPCB-16)	7/11/2011	BZ[5]	<1.1	<0.79	<0.26	<1.4	<4.0	<0.81	<1.2	<1.1	<0.98	<1.5
IA-1-20110818 (SPCB-16)	8/18/2011	BZ	0.26	<0.12	<0.039	<0.21	<0.60	<0.12	<0.18	<0.16	0.24	0.57
IA-2-20110818 (SPCB-16)	8/18/2011	BZ	0.19	<0.13	<0.041	<0.22	<0.64	<0.13	<0.19	<0.18	0.20	0.51
IA-10-20110818 (SPCB-16)	8/18/2011	BZ	0.47	<0.11	<0.034	<0.18	<0.53	<0.11	<0.16	<0.15	<0.13	0.53
Indoor Air Sample-1-20111201 (SPCB-16)	12/1/2011	BZ	<0.17	<0.12	<0.040	<0.21	<0.62	<0.13	<0.19	<0.17	<0.15	0.52
IA-1-20121025 (SPCB-16)	10/25/2012	BZ	<0.18	<0.13	<0.042	<0.22	<0.65	<0.13	<0.20	<0.18	<0.16	0.55
IA-2-20121025 (SPCB-16)	10/25/2012	BZ	<0.18	<0.13	<0.042	<0.22	<0.65	<0.13	<0.20	<0.18	<0.16	0.53
IA-3-20121025 (SPCB-16)	10/25/2012	BZ	0.19	<0.13	<0.042	<0.22	<0.65	<0.13	<0.20	<0.18	0.24	0.56
IA-4-20121025 (SPCB-16)	10/25/2012	BZ	<0.56	<0.42	<0.13	<0.71	<2.1	<0.42	<0.63	<0.57	1.2	<0.80
IA-10-20121026 (SPCB-16)	10/26/2012	BZ	<0.17	<0.13	<0.041	<0.22	<0.63	<0.13	<0.19	<0.17	<0.16	0.56
IA-103-20121108 (SPCB-16)	11/8/2012	BZ	0.49	<0.14	<0.044	<0.23	<0.68	<0.14	<0.20	<0.19	<0.17	1.7
SPCB-16-BZ-184	11/5/2014	BZ	<0.18	<0.13	<0.042	<0.22	<0.65	<0.13	<0.20	<0.18	0.43	0.46
SPCB-16-BZ-DUP1 (duplicate to PW-181)	11/5/2014	BZ	<0.18	<0.13	<0.042	<0.22	<0.65	<0.13	<0.20	<0.18	0.43	0.49
SPCB-16-BZ-186	11/5/2014	BZ	<0.18	<0.13	<0.042	<0.22	<0.65	<0.13	<0.20	<0.18	0.47	0.46
SPCB-16-BZ-187	11/5/2014	BZ	<0.18	<0.13	<0.043	<0.23	<0.67	<0.14	<0.20	<0.18	0.46	0.47
SPCB-16-BZ-190	11/5/2014	BZ	<0.18	<0.14	<0.044	0.35	<0.68	<0.14	<0.21	<0.19	0.44	0.46
SPCB-16-BZ-191	11/5/2014	BZ	<0.18	<0.13	<0.043	<0.23	<0.67	<0.14	<0.20	<0.18	0.40	0.48
SPCB-16-BZ-194	11/5/2014	BZ	<0.18	<0.13	<0.042	<0.22	<0.66	<0.13	<0.20	<0.18	0.45	0.47
SPCB-16-BZ-195	11/5/2014	BZ[6]	<0.15 UJ	<0.11 UJ	<0.035 UJ	4.1 J	<0.54 UJ	<0.11 UJ	<0.16 UJ	<0.15 UJ	0.43 J	0.47 J
SPCB-16-BZ-196	11/5/2014	BZ	<0.19	<0.14	<0.044	<0.24	<0.69	<0.14	<0.21	<0.19	0.47	0.47
SPCB-16-BZ-198	11/5/2014	BZ	<0.18	<0.13	<0.042	<0.22	<0.65	<0.13	<0.20	<0.18	0.48	0.46

Table 1
Semiconductor Property - HVAC On Air Sampling Results for Breathing Zones
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California

Notes:

1. USEPA RSLs, revised November 2015. Available at: http://www.epa.gov/region9/superfund/prg/
Industrial Air RSLs are derived for exposure durations of 8 hours per day, 250 days per year for 25 years.

2. ATSDR MRLs, revised September 2015. Available at: http://www.atsdr.cdc.gov/mrls/mrllist.asp
Acute MRLs are derived for exposure durations of 1 to 14 days. Short-term (intermediate) MRLs are derived for exposure durations of >14 to 364 days.

3. USEPA Interim Indoor Air Short-Term Response Action Levels for TCE (7 $\mu g/m^3$) from memo from USEPA to Region 9 Superfund Division Staff and Management (USEPA 2014). "EPA Region 9 Response Action Levels and Recommendations to Address Near-Term Inhalation Exposures to TCE in Air from Subsurface Vapor Intrusion". July 9.

4. California-modified indoor air screening level for PCE (2 $\mu g/m^3$) from memo from USEPA to Stephen Hill (USEPA 2013). "EPA Region 9 Guidelines and Supplemental Information Needed for Vapor Intrusion Evaluations at the South Bay National Priorities List (NPL) Sites." December 3.

6. Sample is an integrated 24-hour sample collected over the course of three days using a Nutech 2701 programmable timer/solenoid canister air sampling timer programmed to sample indoor air on a schedule consistent with typical normal and overtime work hours.

7. Sample considered a grab sample due to low vacuum measured at the time of sample collection.

Units in micrograms per cubic meter ($\mu g/m^3$) at 25° Celsius and 1 atmosphere.

* = trans-1,2-DCE MRLs and RSLs are used for cis-1,2-DCE

** = based on a 10-hour workday, as recommended by USEPA for South Bay Sites; 8-hour workday scenario screening level is 8 $\mu g/m^3$.

1,2-DCB = 1,2-dichlorobenzene
1,1-DCA = 1,1-dichloroethane
cis-1,2-DCE = cis-1,2-dichloroethene
trans-1,2-DCE = trans-1,2-dichloroethene
PCE = tetrachloroethene
1,1,1-TCA = 1,1,1-trichloroethane
TCE = trichloroethene
VC = vinyl chloride

BZ = breathing zone sample location
NA = not available
OA = outdoor air sample location

ATSDR = Agency for Toxic Substances and Disease Registry
USEPA = United States Environmental Protection Agency
RSLs = Regional Screening Levels
RWQCB = Regional Water Quality Control Board
MRLs = Minimal Risk Levels

J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.

UJ = The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

Table 2
Semiconductor Property - HVAC On Air Sampling Results for Pathways
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California

(concentrations reported in micrograms per cubic meter)

Sample ID	Sample Date	Sample Type	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
Indoor Air Sample Results												
SPCB-16-PW-185	11/5/2014	PW	<0.17	<0.13	<0.041	<0.22	<0.64	<0.13	<0.19	<0.18	0.52	0.47
SPCB-16-PW-188	11/5/2014	PW	0.52	0.17	<0.026	<0.14	<0.41	<0.083	<0.12	<0.11	0.43	0.29
SPCB-16-PW-189	11/5/2014	PW	0.96	0.31	<0.043	0.28	<0.67	<0.14	<0.20	<0.18	0.52	0.49
SPCB-16-PW-193	11/5/2014	PW	<0.15	<0.11	<0.036	<0.19	<0.55	<0.11	<0.17	<0.15	0.42	0.48
SPCB-16-PW-197	11/5/2014	PW	1.3	<0.13	<0.042	<0.22	<0.66	<0.13	<0.20	<0.18	0.90	0.52
SPCB-16-PW-DUP2 (duplicate to PW-197)	11/5/2014	PW	1.2	<0.13	<0.043	<0.23	<0.66	<0.14	<0.20	<0.18	0.86	0.51

Notes:
Units in micrograms per cubic meter (µg/m³) at 25° Celsius and 1 atmosphere

1,1-DCA = 1,1-dichloroethane
1,2-DCB = 1,2-dichlorobenzene
cis-1,2-DCE = cis-1,2-dichloroethene
trans-1,2-DCE = trans-1,2-dichloroethene
PCE = tetrachloroethene
1,1,1-TCA = 1,1,1-trichloroethane
TCE = trichloroethene
VC = vinyl chloride
PW = pathway sample location

Table 3
Semiconductor Property - HVAC Off Air Sampling Results for Breathing Zones
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Facilities
Mountain View, California

(concentrations reported in micrograms per cubic meter)

Sample ID	Sample Date	Sample Type	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
Tier 1 - Comparison to Background/Outdoor Ambient Air												
SPCB-16-OA-241	4/12/2015	OA	<0.19	<0.14	<0.046	<0.24	<0.70	<0.14	<0.21	<0.19	<0.17	0.48
SPCB-16-OA-258	3/6/2016	OA	<0.14	<0.10	<0.033	<0.18	<0.52	<0.11	<0.16	<0.14	<0.13	0.55
Tier 2 - Comparison to Long-Term Health Risk-Based Screening Criteria												
Industrial/Commercial Screening Level (November 2015)[1,4]			3.0	NA	2.8	2	NA	7.7	880	22,000	0.53	130,000
Tier 3 - Comparison to Short-Term Health Risk-Based Screening Criteria												
Acute Screening Level (September 2015)[2]			NA	793*	1,278	41	793	NA	NA	10,914	488	NA
Short-Term Screening Levels (September 2015)[2]			2	793*	77	41	793	NA	NA	3,820	244	NA
Interim Indoor Short-Term Response Action Levels[3]			7**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indoor Air Sample Results												
SPCB-16-BZ-228	4/12/2015	BZ	<0.18	<0.13	<0.042	<0.22	<0.65	<0.13	<0.20	<0.18	0.31 M	0.49
SPCB-16-BZ-231	4/12/2015	BZ	1.2	0.24	<0.042	<0.22	<0.66	<0.13	<0.20	<0.18	0.21 M	0.49
SPCB-16-BZ-233	4/12/2015	BZ	6.3	<0.13	<0.041	1.1	<0.64	<0.13	<0.19	<0.18	0.26 M	0.84
SPCB-16-BZ-236	4/12/2015	BZ	<0.18	<0.13	<0.043	<0.23	<0.67	<0.14	<0.20	<0.18	<0.17	0.48
SPCB-16-BZ-238	4/12/2015	BZ	<0.18	<0.13	<0.043	<0.23	<0.67	<0.14	<0.20	<0.18	<0.17	0.49
SPCB-16-BZ-239 (duplicate to BZ-238)	4/12/2015	BZ	<0.18	<0.13	<0.042	<0.22	<0.66	<0.13	<0.20	<0.18	0.16 M	0.48
SPCB-16-BZ-240	4/12/2015	BZ	0.42	<0.13	<0.043	<0.23	<0.67	<0.14	<0.20	<0.18	0.17 M	0.50
SPCB-16-BZ-242	4/12/2015	BZ	<0.18	<0.14	<0.044	0.8	<0.68	<0.14	<0.20	<0.19	0.35 M	0.49
SPCB-16-BZ-245	4/12/2015	BZ	<0.17	<0.13	<0.041	1.2	<0.63	<0.13	<0.19	<0.17	0.25	0.47
SPCB-16-BZ-246 (duplicate to BZ-245)	4/12/2015	BZ	<0.18	<0.13	<0.043	1.1	<0.67	<0.14	<0.20	<0.18	0.25	0.46
SPCB-16-BZ-248	4/12/2015	BZ	<0.18	<0.13	<0.043	<0.23	<0.67	<0.14	<0.20	<0.18	<0.16	0.48
SPCB-16-BZ-249	4/12/2015	BZ	<0.18	<0.14	<0.044	<0.23	<0.68	<0.14	<0.21	<0.19	1.2 M	0.48
SPCB-16-BZ-252	3/6/2016	BZ[5]	3.3	<0.13	<0.042	0.56	<0.65	<0.13	<0.20	<0.18	<0.16	0.77
SPCB-16-BZ-253	3/6/2016	BZ[5]	3.3	<0.13	<0.042	0.58	<0.65	<0.13	<0.20	<0.18	<0.16	0.77
SPCB-16-BZ-255	3/6/2016	BZ	0.67	<0.11	<0.036	<0.19	<0.56	<0.11	<0.17	<0.15	0.20	0.57
SPCB-16-BZ-256	3/6/2016	BZ	0.44	<0.13	<0.043	<0.23	<0.66	<0.14	<0.20	<0.18	<0.16	0.56
SPCB-16-BZ-257	3/6/2016	BZ	<0.17	<0.13	<0.041	<0.22	<0.63	<0.13	<0.19	<0.17	<0.16	0.54

Table 3
Semiconductor Property - HVAC Off Air Sampling Results for Breathing Zones
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Facilities
Mountain View, California

Notes:

1. USEPA RSLs, revised November 2015. Available at: http://www.epa.gov/region9/superfund/prg/
Industrial Air RSLs are derived for exposure durations of 8 hours per day, 250 days per year for 25 years.

2. Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs), revised September 2015. Available at: http://www.atsdr.cdc.gov/mrls/mrllist.asp
Acute MRLs are derived for exposure durations of 1 to 14 days. Short-term (intermediate) MRLs are derived for exposure durations of >14 to 364 days.

3. USEPA Interim Indoor Air Short-Term Response Action Levels for TCE (7 $\mu g/m^3$) from memo from USEPA to Region 9 Superfund Division Staff and Management (USEPA 2014). "EPA Region 9 Response Action Levels and Recommendations to Address Near-Term Inhalation Exposures to TCE in Air from Subsurface Vapor Intrusion". July 9.

4. California-modified indoor air screening level for PCE (2 $\mu g/m^3$) from memo from USEPA to Stephen Hill at the RWQCB (USEPA 2013). "EPA Region 9 Guidelines and Supplemental Information Needed for Vapor Intrusion Evaluations at the South Bay National Priorities List (NPL) Sites." December 3.

5. Sample collected after pathway sealing was implemented.

Units in micrograms per cubic meter ($\mu g/m^3$) at 25° Celsius and 1 atmosphere.

* = trans-1,2-DCE MRLs and RSLs are used for cis-1,2-DCE

** = 10-hour workday as recommended by USEPA for South Bay Sites; 8-hour workday scenario screening level is 8 $\mu g/m^3$.

1,1-DCA = 1,1-dichloroethane
1,2-DCB = 1,2-dichlorobenzene
cis-1,2-DCE = cis-1,2-dichloroethene
trans-1,2-DCE = trans-1,2-dichloroethene
PCE = tetrachloroethene
1,1,1-TCA = 1,1,1-trichloroethane
TCE = trichloroethene
VC = vinyl chloride

BZ = breathing zone sample location
NA = not available
OA = outdoor air sample location

ATSDR = Agency for Toxic Substances and Disease Registry
USEPA = United States Environmental Protection Agency
RSLs = Regional Screening Levels
RWQCB = Regional Water Quality Control Board
MRLs = Minimal Risk Levels

M = Reported value may be biased due to apparent matrix interferences.

Table 4
Semiconductor Property - HVAC Off Air Sampling Results for Pathways
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Facilities
Mountain View, California

(concentrations reported in micrograms per cubic meter)

Sample ID	Sample Date	Sample Type	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SPCB-16-PW-229	4/12/2015	PW	<0.17	<0.13	<0.041	<0.22	<0.63	<0.13	<0.19	<0.17	0.18 M	0.49
SPCB-16-PW-237	4/12/2015	PW	3.4	0.72	<0.042	<0.22	<0.65	<0.13	<0.20	<0.18	0.75	0.53
SPCB-16-PW-243	4/12/2015	PW	<0.18	<0.13	<0.043	0.56	<0.67	<0.14	<0.20	<0.18	0.71 M	0.48
SPCB-16-PW-244	4/12/2015	PW	1.6	0.40	<0.036	0.94	<0.56	<0.11	<0.17	<0.15	0.57 M	0.51
SPCB-16-PW-247	4/12/2015	PW	<0.18	<0.13	<0.043	<0.23	<0.67	<0.14	<0.20	<0.18	0.24 M	0.49
SPCB-16-PW-254	3/6/2016	PW	3.4	0.58	<0.042	<0.22	<0.66	<0.13	<0.20	<0.18	0.54	0.63

Units in micrograms per cubic meter (µg/m³) at 25° Celsius and 1 atmosphere.

1,1-DCA = 1,1-dichloroethane
1,2-DCB = 1,2-dichlorobenzene
cis-1,2-DCE = cis-1,2-dichloroethene
trans-1,2-DCE = trans-1,2-dichloroethene
PCE = tetrachloroethene
1,1,1-TCA = 1,1,1-trichloroethane
TCE = trichloroethene
VC = vinyl chloride

PW = pathway sample location

M = Reported value may be biased due to apparent matrix interferences.

Table 5
Data Gap Investigation - Grab Groundwater Analytical Results
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California

Sample Location	Sample ID	Screen Interval (feet bgs)	Groundwater Zone	Sample Date	Matrix	Analytical Method	PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	1,1-DCE	1,2-DCB	Other VOCs	TOTAL VOCs	Comments
Grab Groundwater from MIP Investigation *(Concentrations in micrograms per liter (µg/l))*																
MIP-1	MIP-1-45	45-49	UI	6/14/2007	Grab GW	8260	< 6.3	**1,100**	**80**	< 6.3	< 6.3	< 6.3	< 6.3	**43 J**	**1,223**	43 J µg/l methylene chloride
MIP-2	MIP-2-25	25-29	S	6/15/2007	Grab GW	8260	**30**	**6,400**	**450**	< 25	< 25	< 25	**73**	ND	**6,953**	
MIP-3	MIP-3-44	44-49	UI	6/14/2007	Grab GW	8260	< 17	**4,700**	**200**	< 17	**15 J**	< 17	< 17	**19**	**4,934**	19 µg/l benzene
	MIP-3-60	60-64	LI	6/14/2007	Grab GW	8260	< 500	**160,000**	**560**	< 500	< 500	< 500	< 500	ND	**160,560**	
	MIP-3-76	76-80	LI	6/18/2007	Grab GW	8260	< 2.0	**580**	**2.7**	< 2.0	< 2.0	< 2.0	**1.0 J**	**17.7**	**601.4**	15 J µg/l methylene chloride, 1.4 J benzene, 1.3 J toluene
MIP-4	MIP-4-12	12-26	S	6/18/2007	Grab GW	8260	**1.8**	**180**	**34**	< 1.7	< 1.7	< 1.7	< 1.7	**12.9**	**228.7**	12 J µg/l methylene chloride, 0.9 J 1,1 DCA
	MIP-4-26	26-30	S	6/18/2007	Grab GW	8260	**2.8**	**280**	**70**	**1.0 J**	< 1.7	< 1.7	**3.4**	**3.2**	**360.4**	1.8 µg/l benzene, 1.4 J 1,1 DCA,
MIP-5	MIP-5-36	36-40	UI	6/15/2007	Grab GW	8260	< 0.5	**1.7**	**4.6**	< 0.5	< 0.5	**0.4 J**	< 0.5	**1.1**	**7.8**	0.6 µg/l carbon disulfide, 0.5 J b MTBE
MIP-6	MIP-6-56	56-60	LI	6/15/2007	Grab GW	8260	< 0.5	**8**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.3 J**	**8.3**	0.3 J µg/l carbon disulfide
MIP-7	MIP-7-22	22-26	S	6/18/2007	Grab GW	8260	**0.9 J**	**26**	**230**	**1.5 J**	**3.7**	< 1.7	**3.9**	**12.0**	**278**	12 J µg/l methylene chloride
	MIP-7-42	42-46	UI	6/18/2007	Grab GW	8260	**0.7**	**45**	**42**	**1.0**	**54**	< 0.5	**2.2**	**10.5**	**155.4**	5.6 J µg/l acetone, 3.4 methylene chloride, 1.2 carbon disulfide, 0.3 J 1,1 DCA
MIP-12	MIP-12-42	42-46	UI	6/14/2007	Grab GW	8260	**3.9**	**32**	**15**	< 0.5	< 0.5	< 0.5	**7.0**	**8.9**	**66.8**	6.6 J acetone, 0.9 m,p-Xylene, 0.6 1,2,4-trimethylbenzene, 0.4 J o-xylene, 0.4 J toluene
MIP-13	MIP-13-10	10-14	S	7/3/2007	Grab GW	8260	<0.5	**17**	**86**	**0.7**	<0.5	**1.2**	< 0.5	**2.0**	**106.9**	2.0 µg/l 1,1 DCA
	MIP-13-65	65-69	LI	7/3/2007	Grab GW	8260	<0.5	<0.5	**0.5**	< 0.5	<0.5	< 0.5	< 0.5	ND	**0.5**	
MIP-14	MIP-14-12	12-16	S	6/28/2007	Grab GW	8260	<0.5	**0.4J**	<0.5	< 0.5	<0.5	< 0.5	< 0.5	**13.6**	**14**	11 µg/l acetone, 1.2 carbon disulfide, 0.7 toluene, 0.4 J m,p Xylenes, 0.3 J benzene
	MIP-14-27	27-31	S	6/28/2007	Grab GW	8260	**0.7**	**3.9**	**0.6**	< 0.5	<0.5	< 0.5	< 0.5	**7.6**	**12.8**	7.0 J µg/l acetone, 0.3 J benzene, 0.3 J toluene
Grab Groundwater from Subsequent Data Gap Investigation *(Concentrations in micrograms per liter (µg/l))*																
GGW-1 *(MIP-11)*	GGW-1-12-16 ft	12-16	S	9/28/2008	Grab GW	8260	**1.6**	**60**	**57**	**0.4 J**	< 0.5	**0.4 J**	<0.5	**2.4**	**121.8**	2.4 µg/l 1,1 DCA
	GWW-1-17-21 ft	17-21	S	9/28/2008	Grab GW	8260	<0.5	**15**	**24**	**0.3 J**	< 0.5	**0.4 J**	<0.5	**2.3**	**42.0**	1.3 µg/l 1,1 DCA and 1.0 µg/l chloroform
	GGW-1-41-45ft	41-45	UI	9/28/2008	Grab GW	8260	**0.3 J**	**14**	**18**	<0.5	< 0.5	<0.5	<0.5	**1.7**	**34.0**	0.8 µg/l chloroform, 0.5 J chloromethane, and 0.4 J 1,1 DCA
GGW-2	GGW-2-15-19 ft	15-19	S	9/28/2008	Grab GW	8260	< 0.5	< 0.5	**1.9**	< 0.5	< 0.5	< 0.5	< 0.5	**0.9**	**2.8**	0.9 µg/l 1,1 DCA
	GGW-2-41-45ft	41-45	UI	9/28/2008	Grab GW	8260	< 0.5	**3.3**	**14**	< 0.5	< 0.5	< 0.5	< 0.5	**1.2**	**18.5**	0.6 µg/l chloroform and 0.6 µg/l 1,1 DCA
GGW-3	GGW-3-18-22 ft	18-22	S	9/27/2008	Grab GW	8260	< 0.5	< 0.5	**0.4 J**	<0.5	< 0.5	< 0.5	< 0.5	none detected	**0.4**	
	GGW-3-41-45ft	41-45	UI	9/28/2008	Grab GW	8260	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.4 J**	**0.4**	0.4 J µg/l chloroform
GGW-4 *(MIP-9)*	GGW-4-18-22 ft	18-22	S	9/27/2008	Grab GW	8260	**8.3**	**790**	**58**	< 4.2	< 4.2	**2.9 J**	< 4.2	none detected	**859.2**	
	GGW-4-41-45ft	41-45	UI	9/27/2008	Grab GW	8260	< 0.5	**28**	**6.1**	< 0.5	< 0.5	< 0.5	< 0.5	**0.4 J**	**34.5**	0.4 J µg/l chloroform
GGW-5	GGW-5-15-19 ft	15-19	S	9/28/2008	Grab GW	8260	**2.8**	**58**	**6.0**	<0.5	< 0.5	<0.5	**0.3 J**	none detected	**67.1**	
	GGW-5-26-30 ft	26-30	S	9/28/2008	Grab GW	8260	**3.6**	**650**	**150**	<3.6	< 3.6	<3.6	**4.9**	none detected	**808.5**	
	GGW-5-46-50 ft	46-50	UI	9/28/2008	Grab GW	8260	**5.5 J**	**1,800**	**200**	<8.3	< 8.3	<8.3	**5.0 J**	none detected	**2,010.5**	
GGW-6	GGW-6-18-22 ft	18-22	S	12/14/2008	Grab GW	8260	<1.0	**1.1**	**2.4**	<1.0	<1.0	<1.0	<1.0	none detected	**3.5**	
	GGW-6-26-30 ft	26-30	S	12/14/2008	Grab GW	8260	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	none detected	0.0	
	GGW-6-41-45 ft	41-45	UI	12/14/2008	Grab GW	8260	<1.0	**2.5**	**1.3**	<1.0	<1.0	<1.0	<1.0	none detected	**3.8**	
GGW-7	GGW-7-14-18 ft	14-18	S	12/13/2008	Grab GW	8260	**0.8**	**115**	**59.3**	<2.5	<2.5	<2.5	<2.5	none detected	**175.1**	
	GGW-7-24-28 ft	24-28	S	12/13/2008	Grab GW	8260	<1.0	**1.5**	**1.7**	<1.0	<1.0	<1.0	<1.0	**0.35**	**3.6**	0.35 µg/l 1,1 DCA
	GGW-7-41-45 ft	41-45	UI	12/13/2008	Grab GW	8260	<1.0	**6.1**	**9.7**	<1.0	<1.0	<1.0	<1.0	**0.38**	**16.2**	0.38 µg/l 1,1 DCA
GGW-8	GGW-8-14-18 ft	14-18	S	12/14/2008	Grab GW	8260	<1.0	**120**	**58**	<1.0	<1.0	<1.0	<1.0	**1.7**	**179.7**	1.7 1,1 DCA
	GGW-8-24-28 ft	24-28	S	12/14/2008	Grab GW	8260	<1.0	**2.7**	<1.0	<1.0	<1.0	<1.0	<1.0	none detected	**2.7**	
	GGW-8-40-44 ft	40-44	UI	12/14/2008	Grab GW	8260	<1.0	**14**	**19**	<1.0	<1.0	<1.0	<1.0	none detected	**33.0**	
GGW-9	GGW-9-14-18 ft	14-18	S	12/13/2008	Grab GW	8260	**0.65**	**105**	**68.8**	<2.0	<2.0	**0.79**	**1.5**	**0.87**	**177.6**	0.87 µg/l 1,1 DCA
	GGW-9-24-28 ft	24-28	S	12/13/2008	Grab GW	8260	<1.0	**46**	**95**	<1.0	<1.0	**1.1**	**4.1**	none detected	**146.2**	
	GGW-9-38-42 ft	38-42	UI	12/13/2008	Grab GW	8260	<1.0	**12.0**	**17.4**	<1.0	<1.0	<1.0	**2.1**	**0.8**	**32.3**	0.48 1,1 DCA, 0.32 µg/l benzene
GGW-10	GGW-10-14.5-18.5 ft	14.5-18.5	S	12/12/2008	Grab GW	8260	<1.7	**13.2**	**87.5**	**2.5**	**1.4**	<1.7	**0.66**	none detected	**105.3**	
	GGW-10-24-28 ft	24-28	S	12/12/2008	Grab GW	8260	<25	**1,600**	**370**	<25	**21.6**	<25	**57.7**	**561.0**	**2,610.3**	561 µg/l Tert-Butyl Alcohol
	GGW-10 38-42 ft	38-42	UI	12/12/2008	Grab GW	8260	<1.0	**31.0**	**4.7**	<1.0	<1.0	<1.0	**0.77**	none detected	**36.5**	
	GGW-10-52-56 ft	52-56	LI	12/12/2008	Grab GW	8260	**15.7**	**646**	**5.2**	**0.36**	<1.0	**0.28**	**22.6**	**0.56**	**690.7**	0.56 µg/l Toluene
GGW-11	GGW-11-13-17 ft	13-17	S	12/13/2008	Grab GW	8260	**1.0 J**	**61.0**	**6.2**	<1.3	<1.3	<1.3	**2.9**	none detected	**71.1**	
	GGW-11-24-28 ft	24-28	S	12/13/2008	Grab GW	8260	**<1.0**	**19.8**	**63.6**	<1.0	<1.0	**0.39**	**1.2**	**0.61**	**85.6**	0.61 µg/l 1,1 DCA
	GGW-11-41-45 ft	41-45	UI	12/13/2008	Grab GW	8260	**1.2**	**48.4**	**5.8**	<1.0	<1.0	<1.0	**2.0**	**0.66**	**58.1**	0.34 µg/l chloroform, 0.32 µg/l benzene

Table 5
Data Gap Investigation - Grab Groundwater Analytical Results
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California

Sample Location	Sample ID	Screen Interval (feet bgs)	Groundwater Zone	Sample Date	Matrix	Analytical Method	PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	1,1-DCE	1,2-DCB	Other VOCs	TOTAL VOCs	Comments
GGW-12	MIP-12-14-18	14-18	S	12/14/2008	Grab GW	8260	**0.57**	**12.8**	**5.6**	<1.0	<1.0	<1.0	**1.8**	none detected	**20.8**	
(MIP-12)	MIP-12-24-28	24-28	S	12/14/2008	Grab GW	8260	**0.66**	**34.9**	**3.4**	<1.0	<1.0	<1.0	**3.1**	none detected	**42.1**	

Notes:
Samples analyzed for volatile organic compounds (VOCs) using U.S. Environmental Protection Agency (EPA) Method 8260B
ECD = Electron Capture Detector
S = Shallow Zone = 15 to 35 ft bgs
UI = Upper Intermediate = 35 to 50 ft bgs
LI = Lower Intermediate = 50 to 72 ft bgs
ft bgs = feet below ground surface
PCE = tetrachloroethene
TCE = trichloroethene
cis-1,2-DCE = cis-1,2-dichloroethene
trans-1,2-DCE = trans-1,2-dichloroethene
1,1-DCE = 1,1-dichloroethene
1,2-DCB = 1,2-dichlorobenzene
J = Laboratory estimated concentration

<0.5	Analytical result of sample is not above laboratory reporting limits.
60	Analytical result is above laboratory reporting limits.
790	Analytical result is greater than 500 μg/l Total VOCs.

Table 6
Data Gap Investigation - Soil Gas Analytical Results
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California

Sample Location	Sample ID	Screen Interval (feet)	Sample Date	Matrix	Analytical Method	PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	1,1-DCE	1,2 DCB	Other VOCs	TOTAL VOCs	Comments
Soil Gas ***(Concentrations in micrograms per cubic meter (µg/m^3))***															
SG-6	SG-6-5 ft	5 ft	12/13/2008	Soil-Gas	8260	nf	nf	nf	nf	nf	nf	nf	nf	nf	no flow to collect soil vapor
	SG-6-10 ft	10 ft	12/14/2008	Soil-Gas	8260	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
SG-7	SG-7-5 ft	5 ft	12/13/2008	Soil-Gas	8260	nf	nf	nf	nf	nf	nf	nf	nf	nf	no flow to collect soil vapor
	SG-7-10 ft	10 ft	12/13/2008	Soil-Gas	8260	**180**	**7,200**	**310**	< 100	< 100	< 100	< 100	none detected	**7,690**	
SG-8	SG-8- 6 ft	6 ft	12/13/2008	Soil-Gas	8260	nf	nf	nf	nf	nf	nf	nf	nf	nf	no flow to collect soil vapor
	SG-8-10 ft	10 ft	12/13/2008	Soil-Gas	8260	**1,100**	**20,000**	**420**	< 100	< 100	< 100	< 100	none detected	**21,520**	
SG-9	SG-9-5.5 ft	5.5 ft	12/13/2008	Soil-Gas	8260	nf	nf	nf	nf	nf	nf	nf	nf	nf	no flow to collect soil vapor
	SG-9-10 ft	10 ft	12/14/2008	Soil-Gas	8260	-	-	-	-	-	-	-	-	-	refusal with hammer drill, drill rig unable to access
SG-10	SG-10-5 ft	5 ft	12/13/2008	Soil-Gas	8260	nf	nf	nf	nf	nf	nf	nf	nf	nf	no flow to collect soil vapor
	SG-10-10 ft	10 ft	12/14/2008	Soil-Gas	8260	< 100	**200**	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
	SG-10-10 ft	*10 ft*	*12/14/2008*	*Soil-Gas*	*8260*	*< 100*	***190***	*< 100*	*< 100*	*< 100*	*< 100*	*< 100*	*< 100*	*< 100*	*field duplicate sample*
SG-11	SG-11-5 ft	5 ft	12/13/2008	Soil-Gas	8260	nf	nf	nf	nf	nf	nf	nf	nf	nf	no flow to collect soil vapor
	SG-11-10 ft	10 ft	12/13/2008	Soil-Gas	8260	nf	nf	nf	nf	nf	nf	nf	nf	nf	no flow to collect soil vapor
	SG-11-9.5 ft	9.5 ft	12/14/2008	Soil-Gas	8260	< 100	**900**	< 100	< 100	< 100	< 100	< 100	< 100	**900**	
	SG-11-9.5 ft	*9.5 ft*	*12/14/2008*	*Soil-Gas*	*8260*	*< 100*	***1,000***	*< 100*	*< 100*	*< 100*	*< 100*	*< 100*	*< 100*	***1,000***	*field duplicate sample*
SG-12	SG-12-5 ft	5 ft	12/13/2008	Soil-Gas	8260	nf	nf	nf	nf	nf	nf	nf	nf	nf	no flow to collect soil vapor
	SG-12-10 ft	10 ft	12/13/2008	Soil-Gas	8260	< 100	**1,200**	< 100	< 100	< 100	< 100	< 100	**1,430**	**2,630**	1 purge volume
	SG-12-10 ft	10 ft	12/13/2008	Soil-Gas	8260	< 100	**1,700**	< 100	< 100	< 100	< 100	< 100	**1,110**	**2,810**	3 purge volumes
	SG-12-10 ft	10 ft	12/13/2008	Soil-Gas	8260	< 100	**2,000**	< 100	< 100	< 100	< 100	< 100	**940**	**2,940**	7 purge volumes
SG-13	SG-13-5 ft	5 ft	12/13/2008	Soil-Gas	8260	nf	nf	nf	nf	nf	nf	nf	nf	nf	no flow to collect soil vapor
	SG-13-10 ft	10 ft	12/13/2008	Soil-Gas	8260	**780**	**8,200**	**550**	< 100	< 100	< 100	< 100	< 100	**9,530**	
	SG-13-10 ft	*10 ft*	*12/13/2008*	*Soil-Gas*	*8260*	***850***	***8,900***	***600***	*< 100*	*< 100*	*< 100*	*< 100*	*< 100*	***10,350***	*field duplicate sample*
SG-14	SG-14- 4 ft	4 ft	12/14/2008	Soil-Gas	8260	**1,900**	**15,000**	**180**	< 100	< 100	< 100	< 100	< 100	**17,080**	
	SG-14-10 ft	9 ft	12/14/2008	Soil-Gas	8260	**1,500**	**36,000**	**4,100**	< 100	< 100	< 100	< 100	< 100	**41,600**	
SG-15	SG-15-9 ft	9 ft	12/14/2008	Soil-Gas	8260	**210**	**4,100**	**190**	< 100	< 100	< 100	< 100	< 100	**4,500**	
SG-16	SG-16-10ft	10 ft	12/14/2008	Soil-Gas	8260	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
SG-17	SG-17-10 ft	10 ft	12/14/2008	Soil-Gas	8260	**360**	**9,600**	**330**	< 100	< 100	< 100	< 100	< 100	**10,290**	

Notes:
VOC = volatile organic compounds
Samples analyzed for VOCs using U.S. Environmental Protection Agency (EPA) Method 8260B.
Each soil-gas location was allowed to equilibrate for a minimum of 30 minutes, and seven volumes of air were purged from the tubing before soil-gas samples were collected for analysis.
Soil-gas samples analyzed for VOCs by mobile laboratory using EPA Method 8260B.
Samples in italics are field duplicate samples analyzed by the mobile laboratory.
nf = no flow
na = not accessible; location was not accessible by limited access rig and hammer drill encounter refusal at 5 ft bgs.
ft bgs = feet below ground surface
ND = not detected
PCE = tetrachloroethene
TCE = trichloroethene
cis-1,2-DCE = cis-1,2-dichloroethene
trans-1,2-DCE = trans-1,2-dichloroethene
1,1-DCE = 1,1-dichloroethene
1,2-DCB = 1,2-dichlorobenzene
J = Laboratory estimated concentration
< 0.5 Analytical result of sample is not above laboratory reporting limits.
60 Analytical result is above laboratory reporting limits.

Table 7
Soil Gas Sample Analytical Results for VOCs
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California
(concentrations reported in micrograms per cubic meter)

Sample ID	notes	Sample Date	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SVP-1		05/14/2011	21,000	2,000	<20 J	1,600	35	<31	<46	<42	<38	<59
SVP-1	3	6/20/2011	18,000	2,200	<20	930	<31	<32	<47	<43	<38	<60
SVP-1		7/7/2011	19,000	1,800	<21	1,200	<32	<33	<49	<44	<40	<62
SVP-1		07/20/2011	15,000	1,600	<27	880	<43	<44	<65	<59	<52	<82
SVP-1		08/18/2011	14,000	1,100	<40	910	<61	<63	<93	<84	<76	<120
SVP-1		09/21/2011	15,000	1,100	<27	720	<42	<43	<63	<58	<52	<81
SVP-1	4	10/26/2011	9,600	1,000	<20	1,700	<31	<31	<46	<42	9,600	110
SVP-1	4	11/29/2011	13,000	1,100	<39	510	<60	<62	<91	<83	<74	<120
SVP-1		12/21/2011	11,000	1,300	<20	560	<32	<32	<48	<44	<39	<62
SVP-1	5	1/18/2012	11,000	1,500	<19	570	<30	<30	<45	<41	<37	<58
SVP-1		2/15/2012	11,000	1,300	<20	470	<31	<32	<47	<42	<38	<60
SVP-1		3/14/2012	11,000	1,300	<21	580	<32	<33	<49	<45	<40	90
SVP-1		4/25/2012	8,600	1,100	<13	440	<20	<21	<31	<28	<25	<39
SVP-1		5/15/2012	10,000	1,400	<19	520	<30	<30	<45	<41	<36	220
SVP-1		6/14/2012	13,000	1,400	<20	510	<31	<31	<46	<42	<38	440
SVP-1		7/18/2012	11,000	1,400	<16	520	<24	<25	<37	<34	<30	1,000
SVP-1		8/22/2012	14,000	950	<20	620	<31	<32	<47	<43	<38	1,000
SVP-1		9/20/2012	6,800	180	<7.9	450	<12	<12	<19	<17	<15	110
SVP-1		10/25/2012	7,400	160	<16	620	<25	<26	<38	<34	<31	140
SVP-1		11/28/2012	5,900	110	<10	510	<16	<16	<24	<22	20	590
SVP-1		1/17/2013	4,900	470	<13	380	<21	<21	<32	<29	<26	250
SVP-1		2/20/2013	300	310	<8.4	200	<13	<13	<20	<18	<16	250
SVP-1		3/20/2013	5,100	480	<7.8	440	<12	<12	<18	<16	<15	29
SVP-1		4/25/2013	3,500	430	<7.8	250	<12	<12	<18	<16	<15	49

Table 7
Soil Gas Sample Analytical Results for VOCs
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California
(concentrations reported in micrograms per cubic meter)

Sample ID	notes	Sample Date	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SVP-1		5/24/2013	2,200	300	<2.8	120	<4.4	6	<6.7	<6.0	<5.4	390
SVP-1		6/28/2013	7,900	880	<16	440	<25	<26	<38	<35	<31	490
SVP-1		7/30/2013	5,800	370	<8.0	540	<12	<13	<19	<17	<15	64
SVP-1	6	11/15/2013	7,000	550	<9.9	510	<15	<16	<23	<21	<19	36
SVP-1	6	12/9/2013	5,100	460	<9.9	370	<15	<16	<23	<21	<19	<30
SVP-1	7	1/28/2014	4,600	480	<6.6	280	<10	<10	<16	<14	<12	<20
SVP-1	7	2/13/2014	3,400	370	<6.4	240	<10	<10	<15	<14	<12	<19
SVP-1		4/3/2014	3,300	460	<8.3	240	<13	<13	<20	<18	<16	<25
SVP-1		5/8/2014	3,100	610	<8.3	210	<13	<13	<20	<18	<16	<25
SVP-1		8/14/2014	3,600	480	<7.8	300	<12	<12	<18	<16	<15	170
SVP-1		9/22/2015	2,700	190	<0.39	420	<6.1	4.2	<1.8	4.2	20	24
SVP-2		05/14/2011	5,600	<31	<20 J	1,700	<31	<32	<47	<43	<38	<60
SVP-2	3	6/20/2011	7,400	<31	<20	1,700	<31	<32	<47	<43	<38	<60
SVP-2		7/7/2011	11,000	<32	<20	2,600	<32	<32	<48	<44	<39	73
SVP-2		07/20/2011	7,600	<16	<10	1,400	<16	<16	<24	<22	<20	33
SVP-2		08/18/2011	8,900	<31	<20	1,900	<31	<31	<46	<42	<38	79
SVP-2		09/21/2011	7,800	<24	<16	1,700	<24	<25	<37	<34	<30	63
SVP-2	4	10/26/2011	4,700	<12	<8.1	1,400	<12	<13	<19	<17	<15	73
SVP-2	4	11/29/2011	6,000	<24	<16	1,400	<24	<25	<37	<33	<30	100
SVP-2		12/21/2011	3,900	<13	<8.2	940	<13	<13	<19	<18	<16	130
SVP-2	5	1/18/2012	6,100	<16	<10	1,400	<16	<17	<25	<22	<20	160
SVP-2		2/15/2012	6,100	<15	<9.4	1,500	<15	<15	<22	<20	<18	190
SVP-2		3/14/2012	5,200	<12	<7.8	1,600	<12	<12	<18	<16	<15	260
SVP-2		4/25/2012	4,400	<11	<6.9	1,800	<11	<11	<16	<15	<13	220

Table 7
Soil Gas Sample Analytical Results for VOCs
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California
(concentrations reported in micrograms per cubic meter)

Sample ID	notes	Sample Date	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SVP-2		5/15/2012	5,300	<15	<9.9	1,700	<15	<16	<23	<21	<19	250
SVP-2		6/14/2012	5,800	<15	<9.9	1,700	<15	<16	<23	<21	<19	240
SVP-2		7/18/2012	2,600	<2.0	3.8	1,500	<10	<2.1	<3.1	7.2	4.8	220
SVP-2		8/22/2012	2,100	<5.4	<3.5	1,600	<5.4	<5.5	<8.2	8.4	<6.7	190
SVP-2		9/20/2012	1,800	<4.0	<2.6	1,500	<4.0	<4.1	<6.1	7.2	<5.0	200
SVP-2		10/25/2012	980	<1.2	<0.39	1,200	<6.0	<1.2	<1.8	6.9	4.8	160
SVP-2		11/28/2012	970	<1.3	<0.41	1,100	<6.4	<1.3	<1.9	7.6	4.8	150
SVP-2		1/17/2013	1,600	<1.2	<0.40	1,600	<6.3	<1.3	<1.9	9.0	6.8	150
SVP-2		2/20/2013	110	<0.12	<0.039	76	<0.60	<0.12	<0.18	0.70	0.70	14
SVP-2		3/20/2013	2,300	<1.2	<0.038	1,500	<5.8	<1.2	<1.8	5.90	6.10	110
SVP-2		4/25/2013	2,500	<1.2	<0.038	1,600	<6.0	<1.2	<1.8	6.60	7.10	120
SVP-2		5/24/2013	3,000	<6.3	<4.0	1,700	<6.3	<6.4	<9.5	<8.6	8.50	120
SVP-2		6/28/2013	3,200	<8.4	<5.4	1,800	<8.4	<8.6	<13	<12	<10	110
SVP-2		7/30/2013	2,800	<8.5	<5.5	1,600	<8.5	<8.7	<13	<12	<10	73
SVP-2	6	11/15/2013	2,800	<1.2	<0.4	1,600	<6.2	<1.3	<1.9	5.5	6.5	67
SVP-2	6	12/9/2013	3,000	1.4	<0.4	1,500	<6.1	<1.2	<1.9	5.6	6.4	57
SVP-2		4/3/2014	2,800	<7.5	<4.8	1,400	<7.5	<7.7	<11	<10	<9.3	46
SVP-2		5/8/2014	3,000	<12	<7.8	1,700	<12	<12	<18	<17	<15	120
SVP-2		8/14/2014	2,700	<8.0	<5.2	1,200	<8.0	<8.2	<12	<11	<9.9	50
SVP-2		9/22/2015	1,200	<1.2	<0.4	600	<6.3	<1.3	<1.9	1.8	1.7	18
SVP-3		3/3/2016	<32	69	2,400	<40	120	<24	<36	<32	<29	<46
SVP-4		05/14/2011	12,000	39,000	81 J	<210	2,100	<130	<190	<170	<150	<240
SVP-5		07/21/2011	230	8.2	<0.082	5.6	<1.3	<0.26	<0.39	0.59	3.9	80
SVP-5		08/18/2011	250	4.5	<0.099	6.9	<1.5	<0.31	<0.47	0.63	3.0	27

Table 7
Soil Gas Sample Analytical Results for VOCs
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California
(concentrations reported in micrograms per cubic meter)

Sample ID	notes	Sample Date	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SVP-5		09/21/2011	170	8.8	<0.079	7.6	<1.2	<0.25	<0.37	0.58	1.6	16
SVP-5	4	10/26/2011	110	9.6	0.11	6.8	<0.64	0.14	<0.19	0.43	2.9	83
SVP-5	4	11/29/2011	6.1	<0.12	<0.039	0.85	<0.60	<0.12	<0.46	<0.16	1.7	0.68
SVP-5		12/22/2011	3.1	<0.12	<0.040	0.65	<0.61	<0.12	<0.19	<0.17	1.8	0.96
SVP-5	5	1/18/2012	5.1	0.24	<0.040	0.76	<0.62	<0.13	<0.19	<0.17	3.1	1.7
SVP-5		2/15/2012	5.3	<0.13	<0.042	0.68	<0.65	<0.13	<0.20	<0.18	5.7	1.9
SVP-5		3/14/2012	3.4	<0.12	<0.040	0.72	<0.61	<0.12	0.32	<0.17	5.5	0.66
SVP-5		4/27/2012	5.6	3.2	<0.10	0.84	<1.6	<0.33	0.49	<0.45	5.4	1.9
SVP-5		5/16/2012	1.7	<0.12	<0.040	0.94	<0.63	<0.13	<0.19	<0.17	3.1	0.52
SVP-5		6/15/2012	1.6	<0.13	<0.042	0.66	<0.65	<0.13	<0.20	<0.18	2.2	0.54
SVP-5		7/20/2012	0.78	<0.13	<0.041	0.36	<0.64	<0.13	<0.19	<0.18	1.8	0.61
SVP-5		8/23/2012	<1.2	<0.89	<0.29	<1.5	<4.4	<0.91	<1.3	<1.2	2.8	<1.7
SVP-5		9/21/2012	0.63	<0.12	<0.040	0.30	<0.63	<0.13	<0.19	<0.17	1.6	0.51
SVP-5		10/25/2012	0.50	<0.12	<0.040	0.23	<0.63	<0.13	<0.19	<0.17	1.4	0.57
SVP-5		11/28/2012	0.40	<0.13	<0.041	0.45	<0.64	<0.13	<0.19	<0.18	3.0	0.55
SVP-6		07/21/2011	200	1.3	<0.057	2.2	<0.89	<0.18	<0.27	0.71	1.3	13
SVP-6		08/17/2011	330	8	3.20	2.4	<2.2	<0.44	<0.66	1.1	2.5	310
SVP-6	4	12/22/2011	190	240	6.70	1.1	5.5	<0.37	<0.55	<0.50	2.8	<0.70
SVP-6	5	1/18/2012	200	120	18	1.8	3.2	<0.25	<0.37	<0.34	5.6	0.84
SVP-6		2/15/2012	65	34	0.41	0.78	0.77	<0.13	<0.20	<0.18	6.2	0.77
SVP-6		3/14/2012	18	6.4	0.15	0.29	<0.63	<0.13	<0.19	<0.17	2.2	0.58
SVP-6		4/27/2012	27	14	0.099	0.35	0.71	0.24	<0.18	<0.16	8.1	0.88
SVP-6		5/16/2012	4.5	1.9	0.039	<0.21	<0.60	<0.12	<0.18	<0.16	1.0	0.53
SVP-6		6/15/2012	2.8	1.0	<0.041	<0.22	<0.64	<0.13	<0.19	<0.18	0.74	0.51

Table 7
Soil Gas Sample Analytical Results for VOCs
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California
(concentrations reported in micrograms per cubic meter)

Sample ID	notes	Sample Date	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SVP-6		7/20/2012	3.4	2.0	<0.043	<0.23	<0.67	<0.14	<0.20	<0.18	1.0	1.3
SVP-6		8/23/2012	4.5	4.0	0.21J	<1.2	<3.4	<0.69	<1.0	<0.93	1.1	1.9
SVP-6		9/21/2012	2.2	1.2	0.040	<0.21	<0.61	<0.12	<0.19	<0.17	0.8	0.74
SVP-6		10/25/2012	2.0	0.86	<0.040	1.3	<0.61	<0.12	<0.19	<0.17	1.9	0.70
SVP-6		11/28/2012	0.68	0.24	<0.043	0.37	<0.67	<0.14	<0.20	<0.18	0.65	0.60
SVP-7		07/21/2011	270	0.47	<0.070	29	<1.1	<0.22	<0.33	<0.30	1.4	8.9
SVP-7		08/17/2011	300	0.66	<0.13	31	<2.0	<0.42	<0.62	<0.56	1.8	5.8
SVP-7	4	11/29/2011	960	58	<0.34	62	<5.2	1.4	<4.0	<1.4	1.3	18.0
SVP-7		12/27/2011	200	5.2	<0.060	17	<0.93	<0.19	<0.28	<0.26	1.2	2.2
SVP-7	5	1/18/2012	160	2.9	<0.082	19	<1.3	<0.26	<0.39	<0.35	1.9	2.6
SVP-7		5/16/2012	150	6.4	<0.082	26	<1.3	<0.26	<0.39	<0.35	1.4	2.9
SVP-7		6/15/2012	6.5	0.69	<0.043	1.9	<0.67	<0.14	<0.20	<0.18	0.37	0.51
SVP-7		7/20/2012	55.0	1.6	<0.042	11	<0.65	<0.13	<0.20	<0.18	6.30	3.30
SVP-7		8/23/2012	5.0	0.30	<0.039	1.5	<0.60	<0.12	<0.18	<0.16	4.00	0.59
SVP-7		9/21/2012	5.4	0.27	<0.040	1.6	<0.61	<0.12	<0.19	<0.17	3.50	0.57
SVP-7		10/26/2012	5.0	0.66	<0.041	1.3	<0.64	<0.13	<0.19	<0.18	0.81	0.57
SVP-7		11/28/2012	11	0.53	<0.041	1.5	<0.63	<0.13	<0.19	<0.17	1.10	0.63
SVP-8		07/21/2011	3,600	17	<7.2	560	<11	<11	<17	<15	<14	<21
SVP-8		08/17/2011	5,000	24	<8.4	740	<13	<13	<20	<18	<16	<25
SVP-8		09/21/2011	7,400	<25	<16	890	<25	<26	<38	<34	<31	<48
SVP-8	4	10/26/2011	5,800	14	<8.2	830	<13	<13	<19	<18	<16	36
SVP-8	4	11/29/2011	87	<0.12	<0.039	18	<0.60	<0.12	<0.46	<0.16	0.42	0.59
SVP-8		12/27/2011	660	76	120	53	<12	<12	<18	<16	17	6,000
SVP-8	5	1/18/2012	290	29	0.10	34	<1.2	<0.26	<0.38	<0.34	15	29

Table 7
Soil Gas Sample Analytical Results for VOCs
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California
(concentrations reported in micrograms per cubic meter)

Sample ID	notes	Sample Date	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SVP-8		2/15/2012	63	0.63	<0.042	15	<0.65	<0.13	<0.20	<0.18	7.7	1.6
SVP-8		3/14/2012	75	<0.13	<0.041	18	<0.64	<0.13	<0.19	<0.18	3.0	0.71
SVP-8		4/25/2012	140	<3.4	<2.2	32	<3.4	<3.5	<5.1	<4.7	<4.2	1,800
SVP-8		5/16/2012	40	<0.12	<0.040	13	<0.63	<0.13	<0.19	<0.63	1.3	0.78
SVP-8		6/15/2012	72	<0.13	<0.043	22	<0.67	<0.14	<0.20	<0.18	2.6	0.86
SVP-8		7/20/2012	12	<0.14	<0.045	4.4	<0.69	<0.14	<0.21	<0.19	2.0	0.68
SVP-8		8/23/2012	18	<0.13	<0.042	5.4	<0.65	<0.13	<0.20	<0.18	1.3	0.69
SVP-8		9/20/2012	14	<0.13	<0.042	4.0	<0.65	<0.13	<0.20	<0.18	0.91	0.80
SVP-8		10/26/2012	14	<0.13	<0.042	4.1	<0.65	<0.13	<0.20	<0.18	0.90	0.91
SVP-8		11/28/2012	5.4	<0.20	<0.065	1.6	<1.0	<0.20	<0.30	<0.28	0.59	0.53
SVP-9	3	6/20/2011	12,000	190	<19	3,100	<30	<30	<45	<41	<36	640
SVP-9		07/20/2011	12,000	140	<25	4,000	<39	<40	<59	<54	<48	410
SVP-9		08/17/2011	10,000	53	<17	3,000	<26	<26	<39	<36	<32	280
SVP-9		09/21/2011	5,800	19	<9.9	1,800	<15	<16	<23	<21	22	150
SVP-9	4	10/26/2011	6,200	72	<7.9	2,500	<12	<12	<19	<17	18	480
SVP-9	4	11/29/2011	43	<0.12	<0.039	45	<0.60	<0.12	<0.46	<0.16	1.5	0.91
SVP-9		12/27/2011	23	<0.12	<0.040	24	<0.61	<0.12	<0.19	<0.17	0.81	58
SVP-9	5	1/18/2012	16	<0.12	<0.038	19	<0.59	<0.12	<0.18	<0.16	0.58	6.1
SVP-9		2/15/2012	0.36	<0.13	<0.041	<0.22	<0.64	<0.13	<0.19	<0.18	0.22	0.3
SVP-9		3/14/2012	17	<0.13	<0.041	20	<0.64	<0.13	<0.19	<0.18	0.72	0.56
SVP-9		4/25/2012	43	<0.28	<0.089	49	<1.4	<0.28	0.60	<0.38	1.8	97
SVP-9		5/16/2012	13	<0.13	<0.042	19	<0.65	<0.13	<0.20	<0.18	0.66	0.55
SVP-9		6/15/2012	10	<0.13	<0.043	15	<0.67	<0.14	<0.20	<0.18	0.76	0.72
SVP-9		7/20/2012	17	<0.14	<0.045	22	<0.69	<0.14	<0.21	<0.19	1.1	3.8

Table 7
Soil Gas Sample Analytical Results for VOCs
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California
(concentrations reported in micrograms per cubic meter)

Sample ID	notes	Sample Date	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SVP-9		8/23/2012	41	0.32	<0.043	36	<0.67	<0.14	<0.20	<0.18	1.5	15
SVP-9		9/20/2012	100	0.89	<0.040	75	<0.61	<0.12	<0.19	<0.17	2.6	47
SVP-9		10/26/2012	110	1.2	<0.039	71	<0.60	<0.12	<0.18	<0.16	5.1	11
SVP-9		11/28/2012	130	0.91	<0.055	96	<0.86	<0.18	<0.26	<0.24	12	17
SVP-10		07/21/2011	700	<9.7	<6.2	170	<9.7	<9.9	<15	<13	<12	4,200
SVP-10		08/18/2011	2,200	<11	<6.8	320	<11	<11	<16	<15	<13	18,000 E
SVP-10		09/22/2011	140	0.22	<0.067	19	<1.0	<0.21	<0.32	0.67	0.39	200
SVP-10	4	10/27/2011	3,700	<10	<6.5	270	<10	<10	<15	22	<12	4,100
SVP-10	4	11/30/2011	6,200	<18	<12	410	<18	<19	<28	<25	<22	4,400
SVP-10		12/27/2011	5,000	<12	<7.9	410	<12	<12	<19	23	<15	3,500
SVP-10	5	1/19/2012	3,800	<12	<7.5	230	<12	<12	<18	<16	<14	1,700
SVP-10		2/16/2012	5,400	<15	<9.8	400	<15	<15	<23	<21	<19	1,200
SVP-10		3/15/2012	5,100	<13	<8.2	360	<13	<13	<19	17J	<16	1,300
SVP-10		4/26/2012	5,600	<13	<8.4	520	<13	<13	<20	<18	<16	2,900
SVP-10		5/17/2012	290	<1.2	<0.40	42	<6.1	<1.2	<1.9	<1.7	<1.5	1,600
SVP-10		9/20/2012	6,800	<17	<11	980	<17	<18	<26	<24	<21	9,600
SVP-10		10/26/2012	3,600	<32	<21	880	<32	<33	<49	<45	<40	19,000
SVP-10		11/29/2012	3,800	<310	<200	700	<310	<320	<470	<430	<380	180,000
SVP-10		1/17/2013	660	<75	<48	320	<75	<77	<110	<100	<93	24,000
SVP-10		2/20/2013	180	<7.8	<5.0	72	<7.8	<8.0	<12	<11	<9.6	4,800
SVP-10		5/24/2013	1,400	<620	<400	<1000	<620	<630	<940	<850	<760	36,000
SVP-10	1	6/28/2013	430	<32	<20	270	<32	<32	<48	<44	<39	1,000
SVP-10		7/30/2013	44	<0.52	<0.17	21	<2.6	<0.53	<0.79	<0.71	1.6	600
SVP-10	10	12/29/2014	240	<31	<20	210	<31	<31	<46	<42	<38	32,000

Table 7
Soil Gas Sample Analytical Results for VOCs
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California
(concentrations reported in micrograms per cubic meter)

Sample ID	notes	Sample Date	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SVP-11		5/8/2014	2,100	5.2	<0.41	320	<6.4	<1.3	<9.7	7.8	<1.6	79
SVP-11		8/14/2014	2,600	7.0	<4.2	450	<6.5	<6.7	<9.9	11.0	<8.0	100
SVP-11		11/24/2014	1,700	7.0	<0.40	260	<6.3	<1.3	<1.9	7.8	1.7	68
SVP-11		2/24/2015	1,200	3.1	<0.44	220	<6.9	<1.4	<2.1	5.2	<1.7	68
SVP-11		9/21/2015	3,200	13.0	<0.46	540	<7.1	<1.4	<2.2	10.0	2.3	62
SVP-11		3/3/2016	2,100	<6.7	<4.3	290	<6.7	<6.8	<10	<9.2	<8.2	62
SVP-12		5/8/2014	1,600	<1.2	<0.38	640	<6.0	<1.2	<1.8	2.5	1.7	39
SVP-12		8/14/2014	1,700	<6.5	<4.2	770	<6.5	<6.7	<9.9	<9.0	<8.0	18
SVP-12		11/24/2014	1,500	2.2	<0.39	520	<6.1	<1.2	<1.8	2.4	1.9	27
SVP-12		2/24/2015	1,000	<1.4	<0.45	380	<6.9	<1.4	<2.1	<1.9	<1.7	9
SVP-12		9/21/2015	2,500	15.0	<0.38	980	<6.0	<1.2	<1.8	2.30	1.80	19.0
SVP-12		3/3/2016	1,600	5.6	<0.44	550	<6.8	<1.4	<2.0	<1.9	<1.7	7.2
SVP-13		5/8/2014	26,000	1,400	53	290	<83	<85	<120	<110	<100	<160
SVP-13	8	8/14/2014	70,000	1,800	<100	680	<160	<160	<240	<220	<190	<300
SVP-13		11/24/2014	35,000	1,500	<40	400	<62	<64	<94	<86	<77	<120
SVP-13		2/24/2015	23,000	1,500	29	320	<32	<33	<49	<44	<40	69
SVP-13		9/21/2015	38,000	3,100	<43	640	<67	<68	<100	<92	<82	<130
SVP-13		3/3/2016	16,000	1,300	<28	290	<43	<44	<66	<60	<53	<84
SVP-14		5/8/2014	800	<1.0	<0.34	250	<5.2	<1.1	<1.6	2.4	<1.3	19
SVP-14		8/14/2014	880	<3.2	<2.1	310	<3.2	<3.3	<4.9	<4.4	<4.0	12
SVP-14	9	11/24/2014	na	na	na	na	na	na	na	na	na	na
SVP-14		2/24/2015	520	<0.60	<0.19	180	<3.0	<0.62	<0.91	1.6	0.8	3.9
SVP-14		9/21/2015	580	<0.72	<0.23	240	<3.6	<0.74	<1.1	1.5	1.0	4.4
SVP-14		3/3/2016	640	<0.83	<0.27	220	<4.2	<0.85	<1.3	1.6	<1.0	4.6

Table 7
Soil Gas Sample Analytical Results for VOCs
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California
(concentrations reported in micrograms per cubic meter)

Sample ID	notes	Sample Date	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SVP-15		5/8/2014	500	0.81	<0.26	37	<4.0	<0.81	<1.2	<1.1	4.2	7.0
SVP-15	9	8/14/2014	na	na	na	na	na	na	na	na	na	na
SVP-15		11/24/2014	480	1.00	<0.24	33	<3.8	<0.77	<1.1	1.6	3.4	6.5
SVP-15		2/24/2015	270	<0.32	<0.1	23	<1.6	<0.33	<0.49	0.4	1.2	1.9
SVP-15		9/21/2015	680	1.80	<0.36	61	<5.6	<1.1	<1.7	<1.5	11.0	6.2
SVP-15		3/3/2016	40	<0.12	<0.040	3.3	<0.63	<0.13	<0.19	<0.17	0.4	0.95
SVP-17	4	11/11/2011	12,000	330	<22	66	<35	<35	<53	<48	16,000	<67
SVP-17	4	11/30/2011	18,000	380	<40	<100	<61	<63	<93	<84	<76	<120
SVP-17		12/27/2011	10,000	130	<19	470	<30	<31	<46	<41	<37	<58
SVP-17	5	1/19/2012	11,000	160	<19	480	<30	<30	<45	<41	<37	<58
SVP-17		2/16/2012	11,000	180	<19	490	<30	<30	<45	<41	<36	<57
SVP-17		3/15/2012	9,500	160	<16	380	<24	<25	<37	<34	<30	<48
SVP-17		4/27/2012	10,000	170	<16	530	<24	<25	<37	<34	<30	<48
SVP-17		5/17/2012	11,000	170	<20	580	<32	<32	<48	<44	<39	<62
SVP-17		6/14/2012	13,000	200	<19	580	<30	<30	<45	<41	<36	<57
SVP-17		7/19/2012	11,000	220	<14	560	<21	<22	<32	<29	<26	<41
SVP-17		8/22/2012	2,300	33	<3.8	83	<5.9	<6.0	<9.0	<8.1	<7.3	<11
SVP-17		9/20/2012	11,000	160	<16	540	<24	<25	<37	<34	<30	<48
SVP-17		10/26/2012	8,400	240	<19	490	<30	<30	<45	<41	<36	<57
SVP-17		11/29/2012	7,400	230	<13	380	<20	<20	<30	<27	<24	<38
SVP-17		1/17/2013	5,300	200	<7.6	400	<12	13	<18	<16	<14	<23
SVP-17		2/20/2013	3,900	130	<6.4	190	<9.8	<10	<15	<14	<12	<19
SVP-17		3/20/2013	4,200	71	<7.5	280	<12	<12	<18	<16	<14	<22
SVP-17		4/25/2013	5,900	74	<11	510	<18	<18	<27	<24	<22	<34

Table 7
Soil Gas Sample Analytical Results for VOCs
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California
(concentrations reported in micrograms per cubic meter)

Sample ID	notes	Sample Date	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SVP-17		5/24/2013	6,300	<1200	<790	<2100	<1200	<1200	<1800	<1700	<1500	<2400
SVP-17	1	6/28/2013	510	1.8	<0.19	62	<2.9	<0.59	<1800	<0.80	<0.71	<1.1
SVP-17		7/30/2013	43	0.18	0.05	12	<0.59	<0.12	<0.18	<0.16	<0.15	0.64
SVP-17	6,7	1/28/2014	16	<8.0	<5.1	<14	<8.0	<8.1	<12	<11	<9.8	<15
SVP-17	10	12/29/2014	870	12	<0.38	140	<5.9	<1.2	<1.8	<1.6	2.9	4.6
SVP-18	4	11/11/2011	10,000	120	<14	380	<22	<23	<34	<30	8,700	55
SVP-18	4	11/30/2011	17,000	130	<24	610	<38	<39	<58	<52	<47	<74
SVP-18		12/27/2011	14,000	520	<21	100	<33	<34	<50	<46	<41	77
SVP-18	5	1/19/2012	13,000	450	<25	81	<39	<40	<60	<54	<48	<76
SVP-18		2/16/2012	13,000	420	<21	82	<32	<33	<49	<44	<40	<62
SVP-18		3/15/2012	14,000	460	<19	89	<30	<31	<46	<41	<37	<58
SVP-18		4/26/2012	16,000	440	<21	120	<33	<34	<50	<46	<41	<64
SVP-18		5/17/2012	16,000	400	<32	100	<50	<51	<76	<69	<62	<97
SVP-18		6/14/2012	21,000	490	<29	140	<44	<45	<67	<61	<55	<86
SVP-18		7/19/2012	17,000	500	<23	170	<36	<37	<55	<50	<45	<70
SVP-18		8/22/2012	25,000	460	<40	210	<61	<63	<93	<84	<76	<120
SVP-18		9/20/2012	23,000	520	<39	200	<60	<62	<91	<83	<74	<120
SVP-18		10/26/2012	13,000	440	<28	150	<44	<45	<66	<60	<54	<85
SVP-18		11/29/2012	10,000	280	<20	130	<31	<32	<47	<43	<38	<60
SVP-18		1/17/2013	6,500	97	<7.6	150	<12	<12	<18	<16	<14	<23
SVP-18		2/20/2013	7,000	110	<11	120	<17	<17	<25	<23	<21	<32
SVP-18		3/20/2013	7,600	100	<14	150	<22	<23	<34	<31	<28	<43
SVP-18		4/25/2013	10,000	220	<13	210	<20	<20	<30	<27	<24	47
SVP-18		5/24/2013	13,000	<830	<540	<1400	<830	<850	<1300	<1100	<1000	<1600

Table 7
Soil Gas Sample Analytical Results for VOCs
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California
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Sample ID	notes	Sample Date	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SVP-18	1	6/28/2013	73	<0.32	0.13	4.0	<1.6	<0.33	<0.49	<0.45	<0.40	<0.63
SVP-18		7/30/2013	37	0.21	0.24	1.5	<0.65	<0.13	<0.20	<0.18	0.32	0.68
SVP-18	10	12/29/2014	320	<29	<19	<50	<29	<30	<44	<40	<36	<56
SVP-19	4	11/11/2011	890	<16	<10	270	<16	<16	<24	<22	7,600	34
SVP-19	4	11/30/2011	790	<1.2	<0.39	270	<6.0	<1.2	<4.6	6.8	11	27
SVP-19		12/27/2011	830	<0.77	<0.25	210	<3.8	<0.78	<1.2	5.4	5.2	22
SVP-19	5	1/19/2012	960	<1.2	<0.39	250	<6.1	<1.2	<1.8	5.9	4.6	24
SVP-19		2/16/2012	610	<0.61	<0.20	200	<3.1	<0.63	<0.93	5.1	3.8	17
SVP-19		3/15/2012	130	<0.12	<0.040	42	<0.61	<0.12	<0.19	0.97	0.86	4.0
SVP-19		4/26/2012	890	0.87	0.32	240	<3.2	<0.66	<0.99	6.3	5.3	87
SVP-19		5/17/2012	730	3.0	0.62	260	<3.9	<0.80	<1.2	5.6	4.4	120
SVP-19		8/22/2012	4,600	49	<8.1	720	<12	<13	<19	<17	<15	47
SVP-19		10/26/2012	14,000	1,300	110	1,500	<39	<40	<59	<54	<48	<75
SVP-19		1/17/2013	5,800	1,800	28	970	24	<13	<19	<18	<16	30
SVP-19		2/20/2013	3,800	120	<6.4	570	<9.8	<10	<15	<14	<12	19
SVP-19		5/24/2013	2,900	<250	<160	760	<250	<250	<380	<340	<300	<480
SVP-19		6/28/2013	18	<0.29	0.18	6.9	<1.5	<0.30	<0.44	<0.40	0.72	<0.57
SVP-19		7/30/2013	9.5	0.87	0.15	3.2	<0.66	<0.14	<0.20	<0.18	1.4	0.65
SVP-19	10	12/29/2014	130	<0.30	<0.098	34	<1.5	<0.31	<0.46	0.41J	14	8.1
SVP-20		5/8/2014	34,000	2,800	<68	920	<100	<110	<160	<140	<130	200
SVP-20	8	8/14/2014	93,000	3,900	<200	2,400	<320	<320	<480	<440	<390	<610
SVP-20		11/24/2014	40,000	2,700	<40	1,300	100	<64	<94	<86	<77	<120
SVP-20		2/24/2015	22,000	2,100	<20	880	82	<32	<48	<44	<39	<62
SVP-20		9/21/2015	37,000	3,400	<41	1,800	130	<65	<97	<88	<79	<120

Table 7
Soil Gas Sample Analytical Results for VOCs
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Sites
Mountain View, California
(concentrations reported in micrograms per cubic meter)

Sample ID	notes	Sample Date	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SVP-20		3/3/2016	17,000	2,200	<27	860	110	<42	<63	<57	<51	<80
SVP-21	2	5/8/2014	17,000	1,700	<40	1,100	<62	<63	<94	<85	<76	<120
SVP-21		8/14/2014	15,000	1,300	<28	1,100	<43	<44	<66	<43	<53	<84
SVP-21		11/24/2014	12,000	920	<29	900	<45	<46	<68	<61	<55	<86
SVP-21		2/24/2015	9,500	770	<14	680	38	<23	<34	<30	<27	<43
SVP-21		9/21/2015	14,000	1,300	<21	1,400	73	<34	<50	<46	<41	<64
SVP-21		3/3/2016	6,900	800	<11	680	64	<17	<25	<23	<20	<32

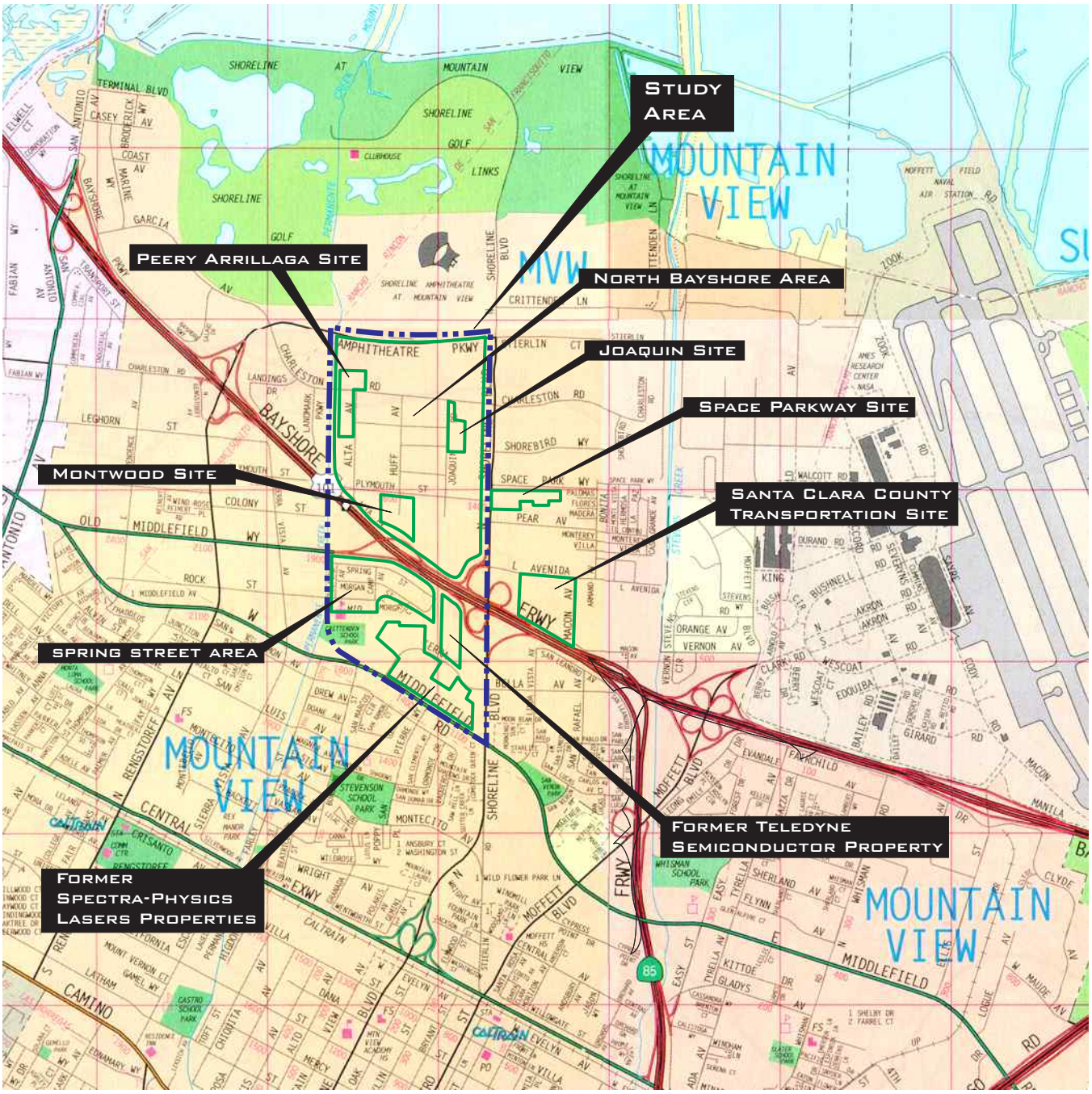
Notes:
Units in micrograms per cubic meter (µg/m³) at 25° Celsius and 1 atmosphere

VOC = volatile organic compound
TCE = trichloroethene
cis-1,2-DCE = cis-1,2-dichloroethene
VC = vinyl chloride
PCE = tetrachloroethene
trans-1,2-DCE = trans-1,2-dichloroethene
1,1-DCA = 1,1-dichloroethane
1,2-DCB = 1,2-dichlorobenzene
1,1,1-TCA = 1,1,1-trichloroethane

< = not detected above the laboratory reporting limit
J = estimated value; recovery of laboratory quality control sample results exceed quality control limits for vinyl chloride.
E = exceeds instrument calibration range
na = not analyzed

(1) - The methane mitigation system was expanded in May and June 2013, to capture soil gas from wells under the building (SVE-16 through SVE-20) .
(2) - The methane mitigtion system was expanded in March 2014, to capture soil gas from wells near the north western property boundary (SVE-21 through SVE -23)
(3) - Injection event, Phase 1, completed at 97 locations across the site (May to June 2011)
(4) - Injection event, Phase 2, completed at 54 locations across the site (October to November 2011)
(5) - Injection event, Phase 3, completed at 4 locations across the site (January 2012)
(6) - Injection event, completed upgradient and under 1300 Terra Bella (November to December 2013)
(7) - Injection event, completed at various locations across the site (January through March 2014)
(8) - Surrogate (4-bromofluorbenzene) exceeded quality control limit of 130% due to matrix effects
(9) - Soil vapor monitoring locaiton inaccessible during the sampling event
(10) - Methane mitigation system non-operational December 9, 2014 through January 5, 2015 due to blower failure (replaced January 6, 2015)

FIGURES



0 1/2 MILE

GRAPHIC SCALE

SOURCE: THOMAS BROS GUIDE

FORMER SPECTRA-PHYSICS LASERS AND
FORMER TELEDYNE SEMICONDUCTOR SITES
MOUNTAIN VIEW, CALIFORNIA

SITE VICINITY MAP AND PROPERTY LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

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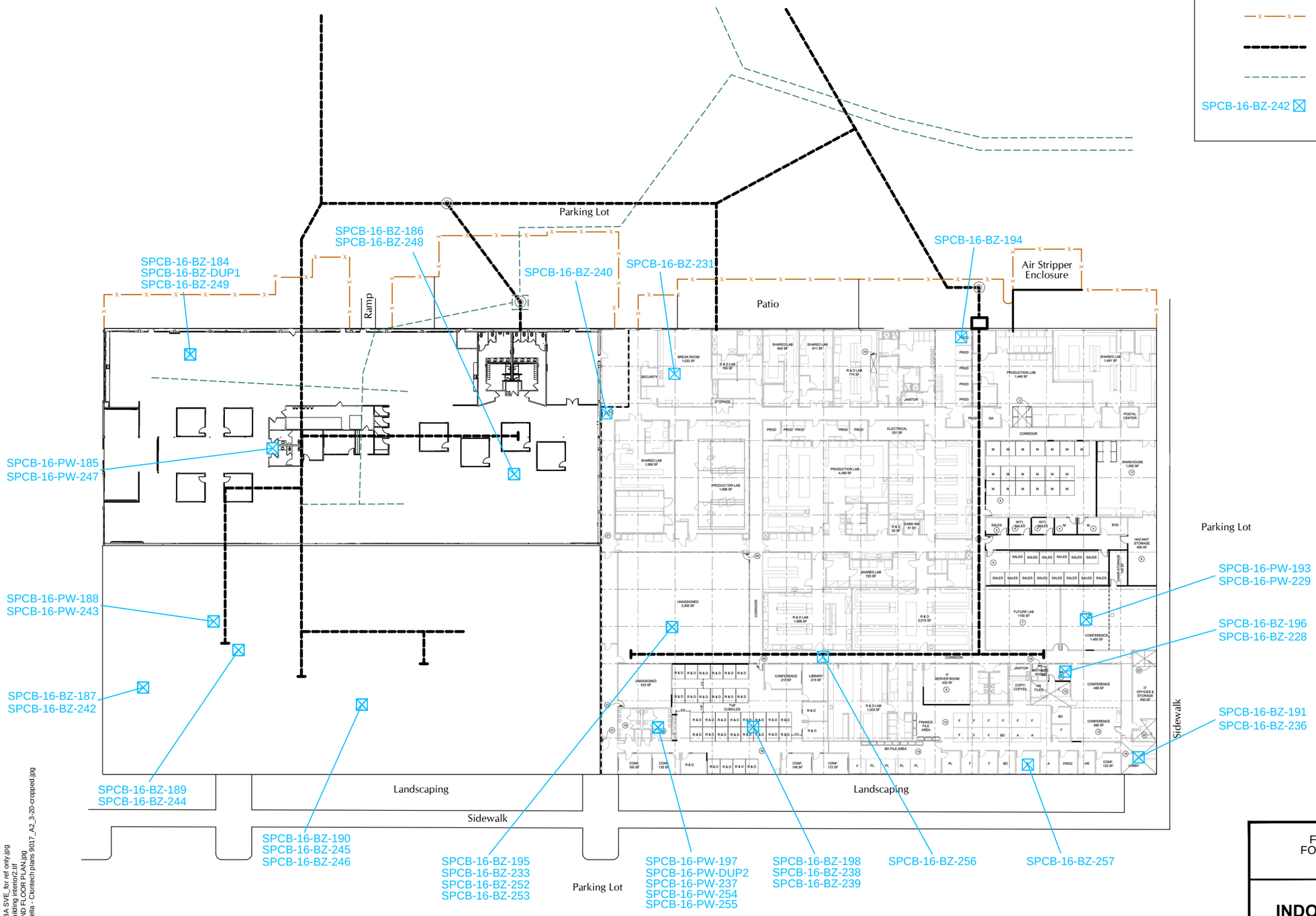


EXPLANATION:

- Fence
- Abandoned Wastewater or Acid Drain Line
- Soil Vapor Extraction (SVE) Line
- SPCB-16-BZ-242 Indoor Air Sampling Location (For Samples Collected from 2014-2016)

0 50' 100'

APPROXIMATE SCALE

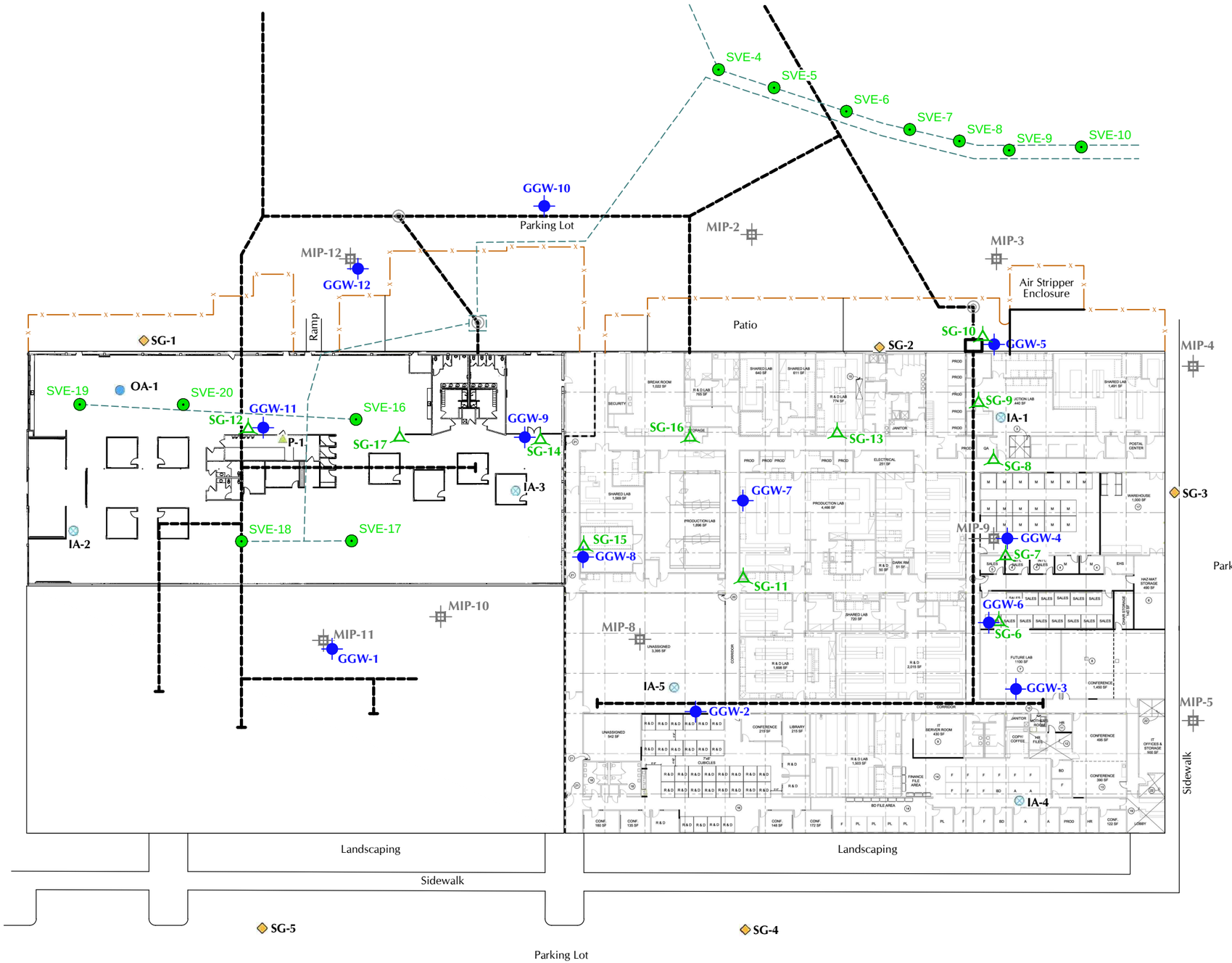
NOTE: ALL FEATURES AND LOCATIONS ARE APPROXIMATE

FORMER SPECTRA-PHYSICS LASERS AND
FORMER TELEDYNE SEMICONDUCTOR SITES
MOUNTAIN VIEW, CALIFORNIA

INDOOR AIR SAMPLING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2



EXPLANATION:

- Fence
- Abandoned Wastewater or Acid Drain Line
- Soil Vapor Extraction (SVE) Line
- GGW-4 — Approximate Location of Grab Groundwater Sample (Shallow and Upper Intermediate, September and December 2008)
- SG-6 — Approximate Location of Soil-Gas Sample (December 2008)
- MIP-4 — Approximate Location of MIP Boring with Select Grab Groundwater Samples (June 2007)
- SVE-4 — Approximate Location of SVE Well
- SG-1 — Soil-Gas Sample Location (PES, April 2004)
- IA-1 — Indoor Air Sample Location (PES, April 2004)
- P-1 — Pathway Sample Location (PES, April 2004)
- OA-1 — Outdoor Air Sample Location (from building roof)

0 50' 100'

APPROXIMATE SCALE

NOTE: ALL FEATURES AND LOCATIONS ARE APPROXIMATE

FORMER SPECTRA-PHYSICS LASERS AND FORMER TELEDYNE SEMICONDUCTOR SITES
MOUNTAIN VIEW, CALIFORNIA

DATA GAP INVESTIGATION BUILDING SITE PLAN WITH ABANDONED DRAIN LINES AND BORING LOCATIONS

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FIGURE 3

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: A. REYES, J. HARRIS
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SITE AND FLOOR PLAN.jpg
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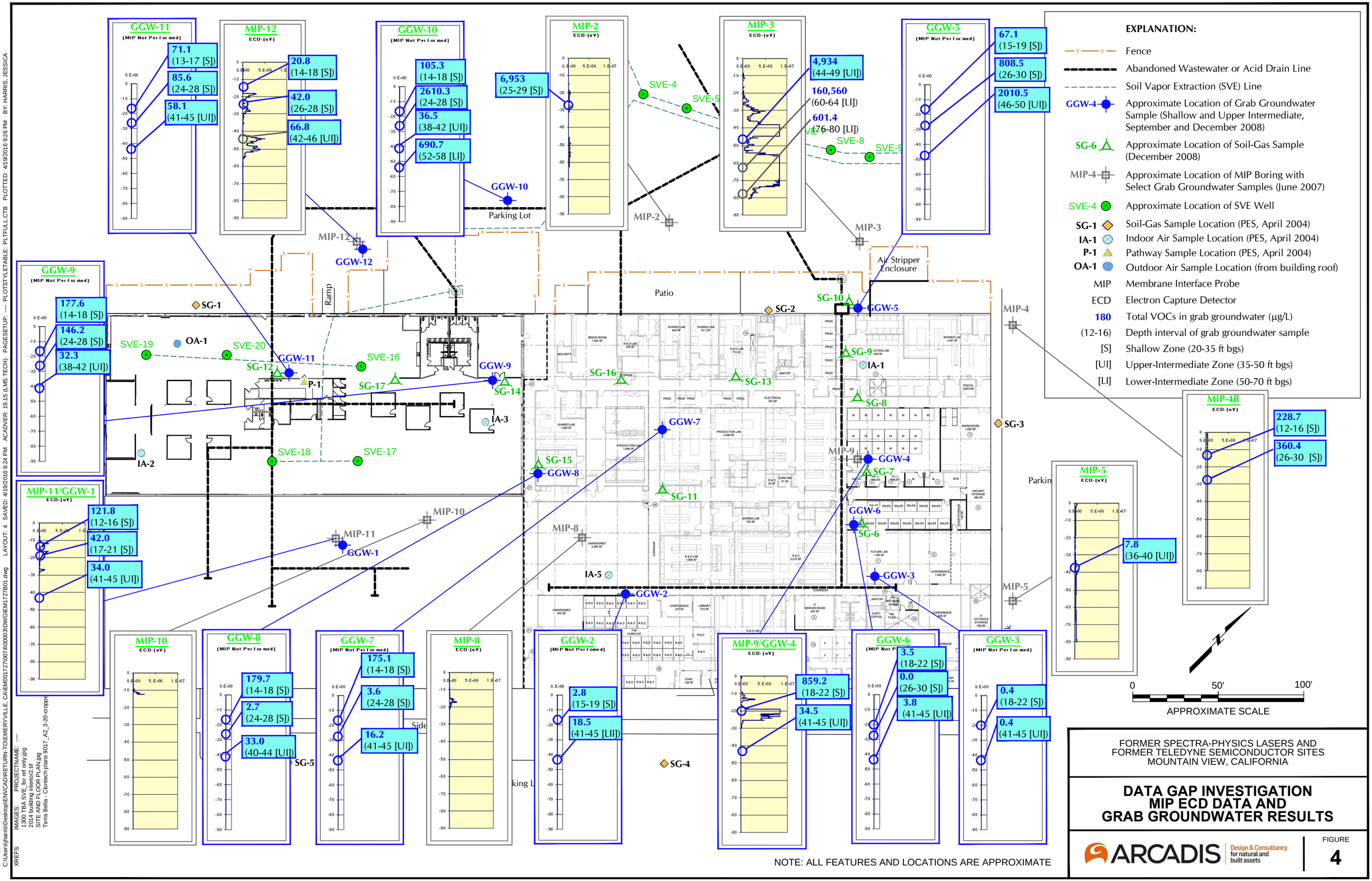

FORMER SPECTRA-PHYSICS LASERS AND FORMER TELEDYNE SEMICONDUCTOR SITES
MOUNTAIN VIEW, CALIFORNIA

DATA GAP INVESTIGATION MIP ECD DATA AND GRAB GROUNDWATER RESULTS

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FIGURE 4

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: A. REYES, J. HARRIS
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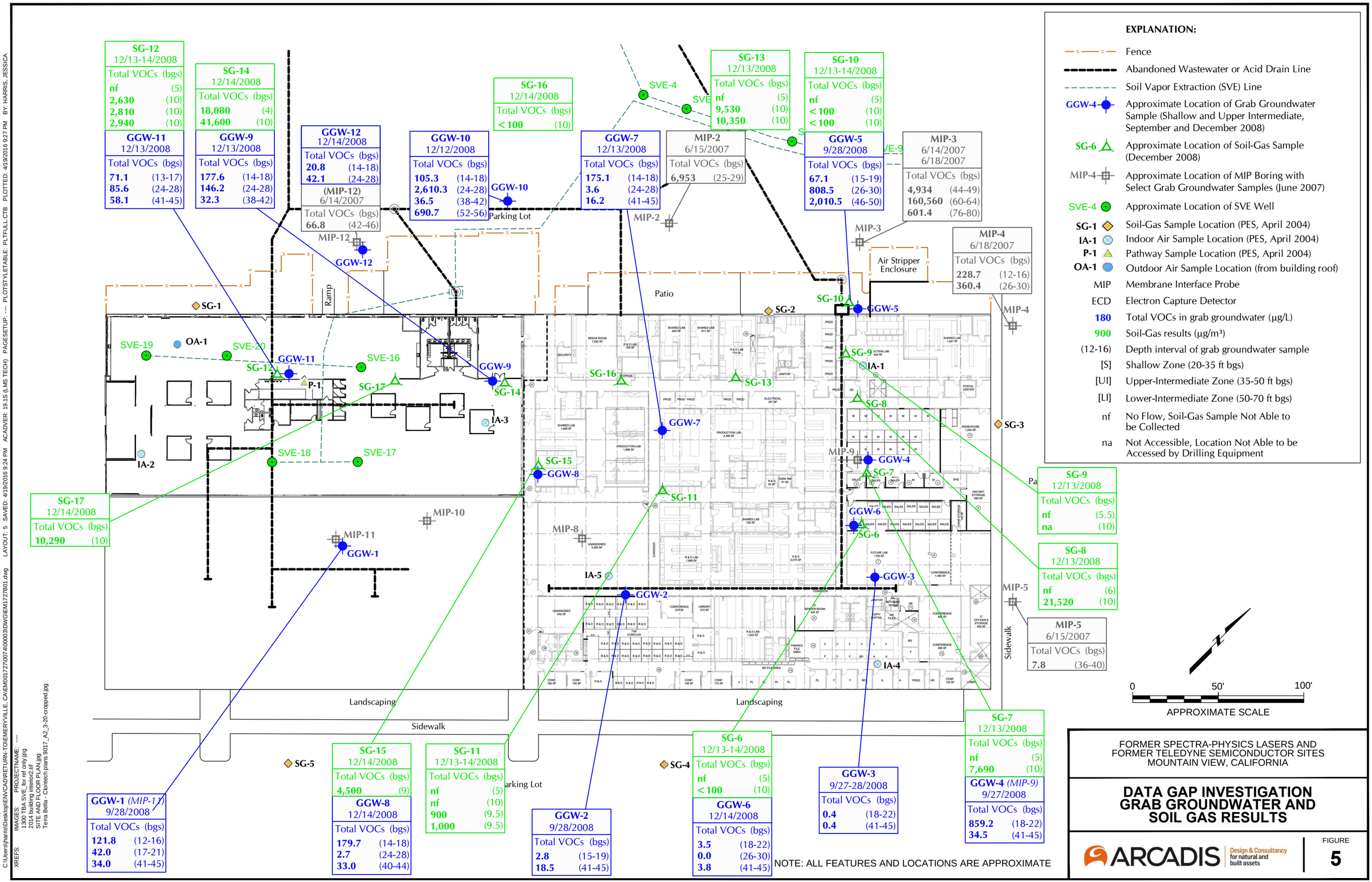

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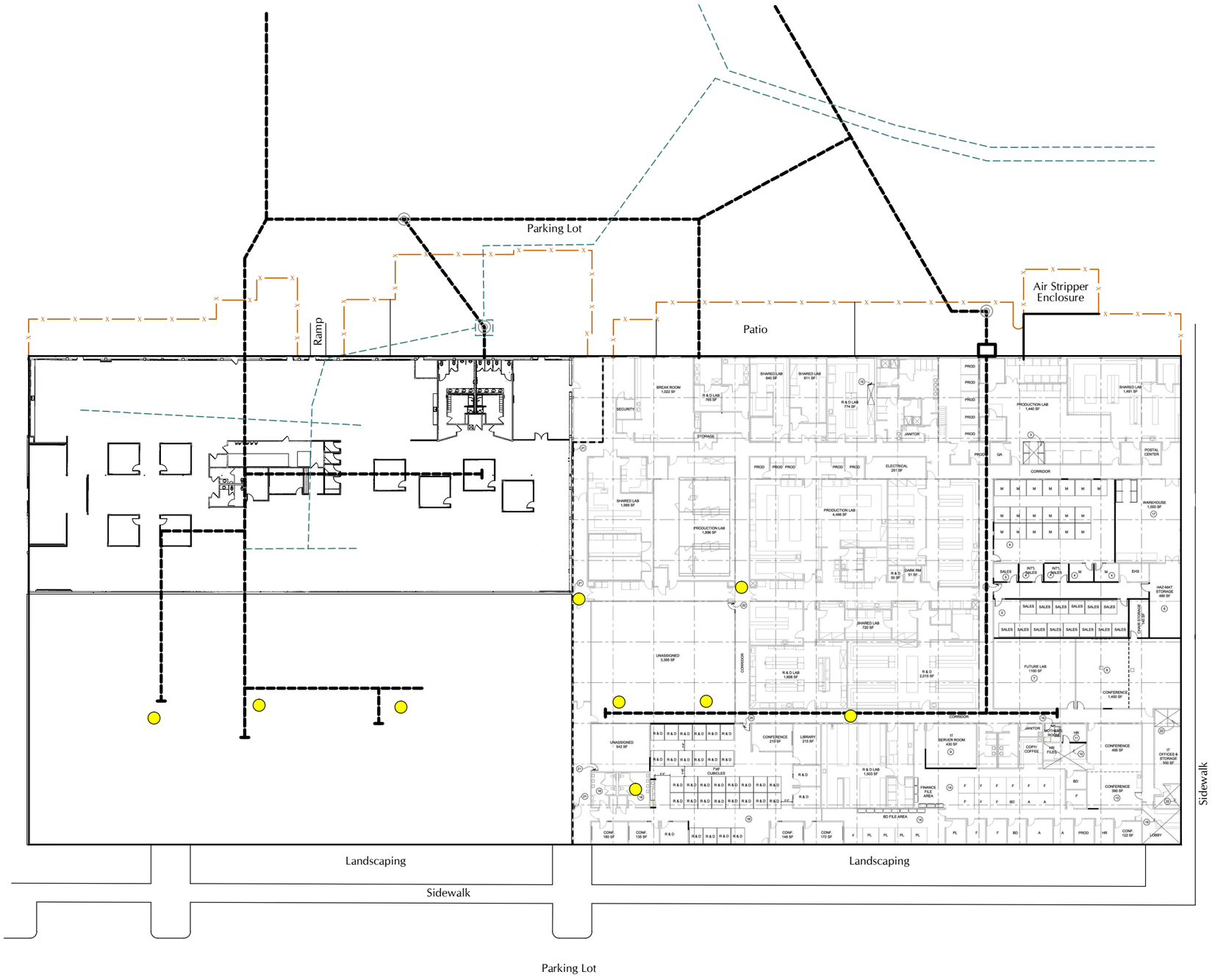

EXPLANATION:

- Fence
- Abandoned Wastewater or Acid Drain Line
- Soil Vapor Extraction (SVE) Line
- Proposed Soil Gas Sampling Location

0 50' 100'

APPROXIMATE SCALE

NOTE: ALL FEATURES AND LOCATIONS ARE APPROXIMATE

FORMER SPECTRA-PHYSICS LASERS AND
FORMER TELEDYNE SEMICONDUCTOR SITES
MOUNTAIN VIEW, CALIFORNIA

PROPOSED SOIL GAS SAMPLING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 6

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: A. REYES, J. HARRIS
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2014 building interior2.tif
SITE AND FLOOR PLAN.jpg
Terra Bella - Clontech plans 9017_A2_3-20-cropped.jpg

APPENDIX A

Soil Gas Sampling – PRT System Operation

Soil Gas Sampling – PRT System Operation

from Geoprobe Systems®

www.geoprobe.com
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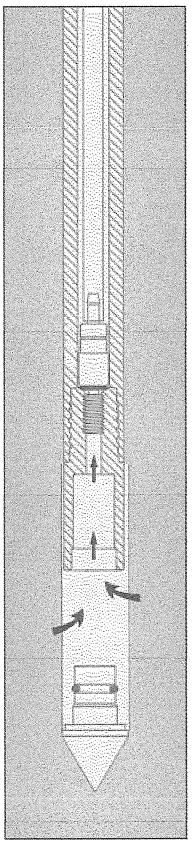


Soil Gas Sampling using the Post-Run Tubing (PRT) System.

Soil Gas Sampling — PRT System Operation

Basics

Using the Post-Run Tubing System, one can drive probe rods to the desired sampling depth, then insert and seal an internal tubing for soil gas sampling. The usual Geoprobe probe rods and driving accessories and the following tools are required:

- PRT Expendable Point Holder
- PRT Adapter
- Selected PRT Tubing

Preparation

1. Clean all parts prior to use. Install O-rings on the PRT Expendable Point Holder and the PRT adapter.

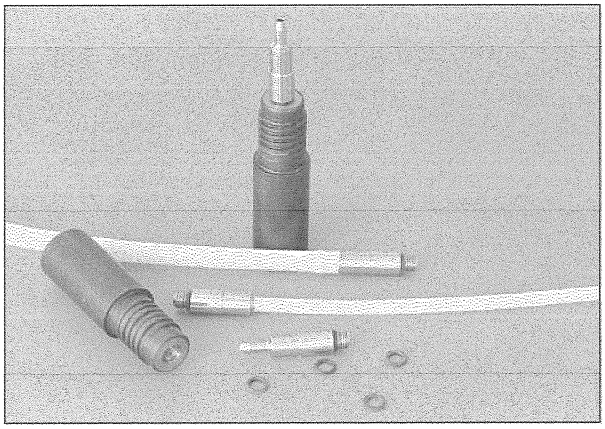
2. Inspect the probe rods and clear them of all obstructions.

3. TEST FIT the adapter with the PRT fitting on the expendable point holder to assure that the threads are compatible and fit together smoothly.

   NOTE: PRT fittings are left-hand threaded.

4. Push the adapter into the end of the selected tubing. Tape may be used on the outside of the adapter and tubing to prevent the tubing from spinning freely around the adapter during connection – especially when using Teflon tubing **(Figure 1)**.

   REMEMBER: The sample will not contact the outside of the tubing or adapter.



PRT SYSTEM PARTS
PRT Expendable Point Holder, PRT Adapters, Tubing, and O-rings.

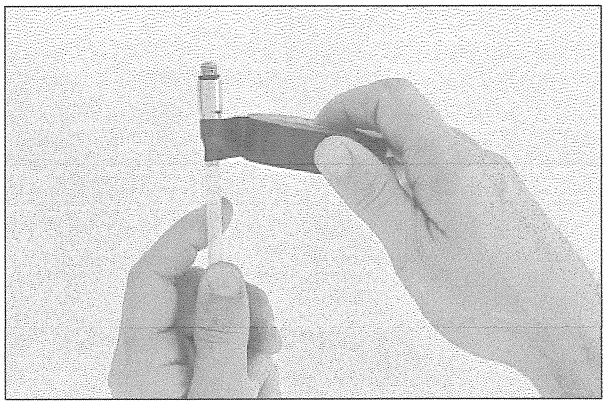


Figure 1. Securing adapter to tubing with tape. NOTE: Tape does not contact soil gas sample.

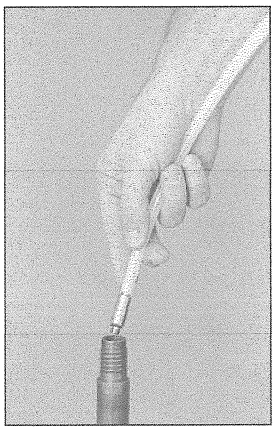


Figure 2. Insertion of tubing and PRT adapter.

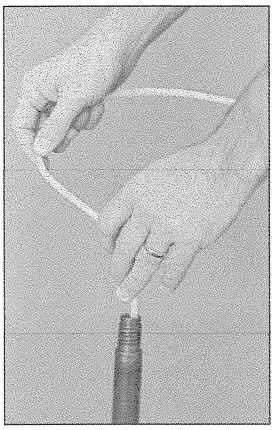
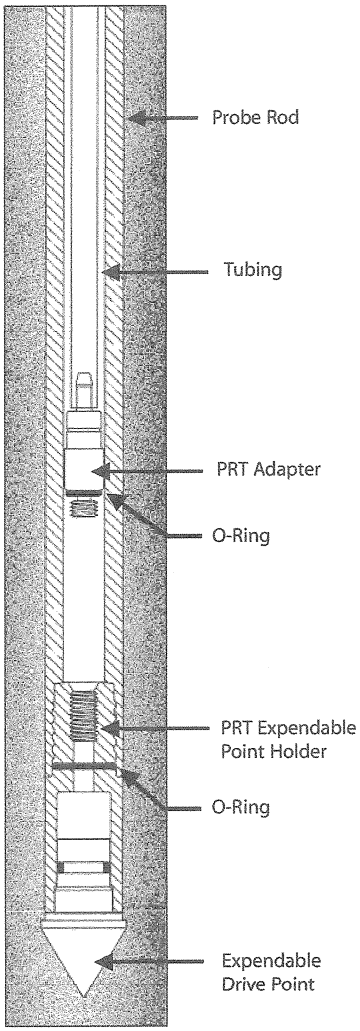


Figure 3. Engaging threads by rotating tubing.

Soil Gas Sampling — PRT System Operation



A cross section of probe rods driven to depth and then retracted to allow for soil gas sampling. The PRT adapter and tubing are now fed through the rods and rotated to form a vacuum-tight connection at the point holder. The result is a continuous run of tubing from the sample level to the surface.

Probing

Drive the PRT tip configuration into the ground. Connect probe rods as necessary to reach the desired depth. After depth has been reached, disengage the expendable point by pulling up on the probe rods. Remove the pull cap from the top probe rod, and position the Geoprobe unit to allow room to work.

Connection

1. Insert the adapter end of the tubing down the inside diameter of the probe rods **(Figure 2)**.

2. Feed the tubing down the rod bore until it hits bottom on the expendable point holder. Allow about 2 ft. (610 mm) of tubing to extend out of the hole before cutting it.

3. Grasp the excess tubing and apply some downward pressure while turning it in a counterclockwise motion to engage the adapter threads with the expendable point holder **(Figure 3)**.

4. Pull up lightly on the tubing to test engagement of the threads. (Failure of adapter to thread could mean that intrusion of soil may have occurred during driving of probe rods or disengagement of drive point.)

Soil Gas Sampling — PRT System Operation

Sampling

1. Connect the outer end of the tubing to the Silicone Tubing Adapter and vacuum hose (or other sampling apparatus).

2. Follow the appropriate sampling procedure for collecting a soil gas sample **(Figure 1)**.

Removal

1. After collecting a sample, disconnect the tubing from the vacuum hose or sampling system.

2. Pull up firmly on the tubing until it releases from the adapter at the bottom of the hole. (Taped tubing requires a stronger pull.)

3. Remove the tubing from the probe rods. Dispose of polyethylene tubing or decontaminate Teflon tubing as protocol dictates.

4. Retrieve the probe rods from the ground and recover the expendable point holder with the attached PRT adapter.

5. Inspect the O-ring at the base of the PRT adapter to verify that proper sealing was achieved during sampling. The O-ring should be compressed. This seal can be tested by capping the open end of the point holder applying vacuum to the PRT adapter.

6. Prepare for the next sample.

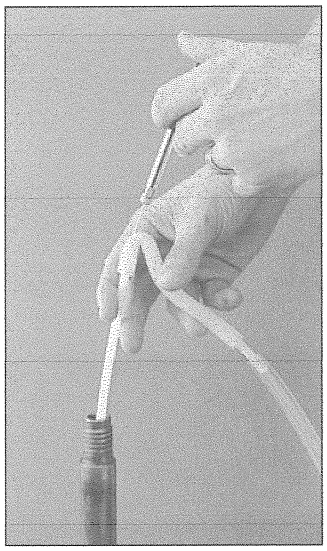


Figure 1. Taking a soil gas sample for direct injection into a GC with the PRT system.

APPENDIX B

TEG – Northern California Standard Operating Procedure

Soil Vapor Sampling and Analysis
Standard Operating Procedures

TEG-Northern California, Inc.

August 2015

Soil Vapor Sampling

Soil vapor is withdrawn from the tubing that runs from the sampling tip to the surface using a 50 cubic centimeter (cc) glass syringe connected via an on-off valve. The sampling point, including the tubing, is nominally purged of three internal dead volumes. A sample of in-situ soil vapor is then withdrawn and immediately transferred to the mobile lab for analysis within minutes of collection. The use of small calibrated syringes allows for careful monitoring of purge and sample volumes. This procedure ensures adequate sample flow is obtained without excessive pumping of air or introduction of surface air into the sample.

For off-site analysis, samples are collected in canisters or in Tedlar bags when allowed. Samples collected in Tedlar bags for VOC analysis are either analyzed on the same day or transferred to a canister.

Use of Tracer Compound to Ensure Probe Seal Integrity

A tracer compound, typically 1,1 difluoroethane (1,1 DFA), iso-propanol (IPA), or hexane is used to test for leaks around the sampling point installation at the ground surface and in the sampling system. The tracer compound is placed under a shroud covering the sample point during sample collection. If the tracer compound is detected, the sampling point is inspected for vacuum integrity, and if necessary, the sample point is reinstalled and another sample is collected.

Sample Flow Rate

Sample collection is timed so that the flow rate does not exceed 200 milliliters per minute. If the mobile lab is on site, this is accomplished by withdrawing the plunger on the syringe at a constant rate of 3 milliliters per second. The collector notes the collection time on a log sheet, and also records any resistance to sample flow that is felt on the syringe during collection. If Summa canisters are used to collect the soil vapor, a flow controller attached to the Summa canister is utilized to maintain a flow rate of 200 milliliters per minute or less.

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teg

Analytical Methodology

The typical analytical protocols TEG uses fulfills the specific EPA analytical methods used and the most recent CA-EPA (DTSC), LA-RWQCB, and SF-RWQCB *Advisory – Active Soil Gas Investigations* (July 2015) (the advisory documents). These methods include analyses for Volatile Organic Compounds (VOCs) by EPA 8260, fixed gases (e.g. oxygen, carbon dioxide, and methane) by GC/TCD, and TPH-diesel by EPA mod8015.

Reporting Limits

Typical reporting limits are outlined below:

Compound	Detector	Report Limit
VOCs by 8260B	Mass Spec	1.0 to 0.01 ug/l-vapor
Methane	FID or TCD	1000 ppmv
Fixed Gases	TCD	1% by vol
H2S	Gold Film	0.10 ppmv

Injection of Soil Vapor Samples

Soil vapor samples from the sampling syringe are injected with surrogates into a purge & trap instrument for VOC analysis. Separate aliquots are directly injected into gas chromatographs for fixed gases and methane analysis, and other methods.

Laboratory Data Logs

The field chemist maintains injection and sample analysis records including date and time of analysis, sampler's name, chemist's name, sample ID number, concentrations of compounds detected, calibration data, and any unusual conditions.

teg

Quality Control Procedures

Sample Quality Control

Each sample is given a unique identification number specifying location and depth. Purge and sample volumes are monitored closely using small calibrated syringes to assure a proper flow of soil gas. This ensures a representative sample is obtained from the sample zone without excessive pumping, which could result in sampling of surface air.

Continuing Calibration (Daily Mid-point Calibration Check)

Mid-point calibration standards are analyzed at the beginning of each day. When calibration checks fall outside the acceptable range, corrective action is performed. This may include verification of the calibration standards, and performing a new calibration curve by the on-site chemist for the analytes in question.

Method Blanks

Method blanks are performed at the start of each day by drawing clean air through the sampling equipment and analyzing. These blanks verify all components of the sampling and analytical system are free of contamination. Additional blanks are performed more often as appropriate depending upon the measured concentrations, generally at a minimum 1 every 20 samples. Blank analyses are typically recorded in the data tables. If a blank shows a measurable amount of any target compound, the on-site chemist will investigate and determine the source, and resolve the contamination problem prior to analyzing any samples.

Duplicate Samples

A duplicate (repetitive) analysis of a sample is typically performed daily and at least one every 20 samples. Additionally, a duplicate analysis is performed when inconsistent data are observed. Because soil vapor duplicates can vary widely, nominal relative percent difference (RPD) acceptance criteria is $\pm$ a factor of 2.

Corrective Action

To minimize the potential for cross-contamination between sampling points, all sampling equipment is cleaned with solvents, potable water, or replaced, as appropriate. Sampling syringes are baked in an oven, or, if disposable, discarded. Corrective action is taken when unexpected contaminant levels are detected in the analytical instruments in the mobile lab. The instruments are inspected, cleaned, repaired, and additional blanks run, as needed.

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APPENDIX C

Analytical Laboratory Reporting Limits

teg

Soil Vapor Target Compounds

	Reporting Limit Vapor ug/m3
1,1,1,2-Tetrachloroethane	100
1,1,1-Trichloroethane	100
1,1,2,2-Tetrachloroethane	100
1,1,2-Trichloroethane	100
1,1-Dichloroethane	100
1,1-Dichloroethene	100
1,2-Dichloroethane	100
Benzene	80
Carbon Tetrachloride	100
Chloroethane	100
Chloroform	100
cis-1,2-Dichloroethene	100
Dichlorodifluoromethane	100
Ethylbenzene	100
m,p-Xylene	200
Methylene Chloride	100
o-Xylene	100
Tetrachloroethene	100
Toluene	200
trans-1,2-Dichloroethene	100
Trichloroethene	100
Trichlorofluoromethane	100
1,1,2-Trichloro-trifluoroethane	100
Vinyl Chloride	100

Leak Check Compound	
1,1 difluoroethane	10000

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