November 30, 2011

Ms. Barbara Cook, P.E.
Acting Assistant Deputy Director
Brownfield and Environmental Reuse Program
Department of Toxic Substances Control
700 Heinz Avenue, Suite 200
Berkeley, California

Attention: Lynn Nakashima
Sent via: email

Subject: Soil Gas Sampling Results, Campus Bay and University of California Richmond Field Station Property Boundary, Richmond, California.

Dear Ms. Cook:

Terraphase Engineering Inc. (Terraphase) has prepared this letter report on behalf of Zeneca Inc. to transmit to the California Department of Toxic Substances Control (DTSC) the data collected from a soil gas investigation completed along the boundary between Campus Bay and the University of California (UC) Richmond Field Station (RFS), located in Richmond, California. The area of the soil gas investigation is illustrated in Figure 1. This letter report has been prepared in accordance with the requirements of the California Department of Toxic Substances Control (DTSC) Site Investigation and Remediation Order, Docket No. IS/E-RAO 06/07-005 ("the DTSC Order"). Cherokee Simeon Venture I, LLC (CSV), Zeneca, The Regents of the University of California, and Bayer Crop Science Inc. are respondents to the DTSC Order ("the Respondents"). The samples were collected and analyzed pursuant to the August 31, 2011 Terraphase Work Plan, "Soil Gas Investigation Work Plan Describing Sampling Along the Campus Bay and the University of California Richmond Field Station Property Border, Richmond California" (the Soil Gas Sampling Work Plan).

Background

In 2010, a groundwater investigation was completed by Tetra Tech EM Inc. at the UCRFS property on behalf of UC. The DTSC reviewed the data collected along the property boundary between UCRFS and Campus Bay in conjunction with groundwater data previously collected at Campus Bay. Based on that data, the DTSC prepared a March 8, 2011 letter ("the March 8, 2011 Letter"), requiring the Respondents to:

1. Prepare a work plan to develop a field investigation that will assess potential sources for volatile organic compounds (VOCs) detected in groundwater along the UCRFS property boundary;

Terraphase Engineering Inc.
414 13th Street, Suite 400
Oakland, California 94612
www.terraphase.com

2. Assess VOC concentrations in soil gas where groundwater VOC concentrations may be highest; and
3. Identify locations where additional groundwater monitoring wells may be warranted.

In response to the March 8, 2011 letter, Terraphase prepared the June 14, 2011 work plan, "Revised Field Sampling Work Plan to Further Assess Volatile Organic Compound Concentrations Detected in Groundwater Collected from PZ-7, MW-22, and in the vicinity of the UC Slurry Wall" ("the Field Sampling Work Plan") on behalf of Zeneca. The DTSC approved the Field Sampling Work Plan in a June 15, 2011 letter and Terraphase implemented the first phase of field activities from June 20, 2011 to June 28, 2011. The first phase of the investigation included advancing a total of 13 soil borings using membrane interface probe/cone penetrometer test (MIP/CPT) technology in the vicinity of monitoring wells PZ-7, MW-22, and MW-19 at Campus Bay. Grab groundwater samples were collected from each of the soil borings and submitted to an analytical laboratory for VOC analysis. The data was provided to the DTSC in an August 4, 2011 technical memorandum prepared by Terraphase ("the Technical Memorandum").

Upon review of the Technical Memorandum, the DTSC issued an August 9, 2011 letter requiring the Respondents to submit a work plan to collect soil gas samples at the UCRFS along the boundary with Campus Bay. On behalf of Zeneca, Terraphase prepared and submitted to the DTSC the Soil Gas Sampling Work Plan. The DTSC approved the Soil Gas Sampling Work Plan in a letter dated September 12, 2011. This letter report describes the activities completed by Terraphase in accordance with the Soil Gas Sampling Work Plan and provides the data collected.

Field Activities

Terraphase subcontracted Vironex Environmental Field Services (Vironex) from Pacheco, California, a California-licensed drilling contractor, to install five soil-gas monitoring wells under the supervision of a Terraphase geologist. On September 28, 2011, Vironex installed the five soil-gas wells numbered SG-118 through SG-122 on the UCRFS property at the approximate locations illustrated in Figure 1. The soil gas wells were installed at various depths ranging from 4.5 to 5.5 feet below ground surface (bgs). Determination of the final depths for the soil gas wells took into account the shallow groundwater in the vicinity of the soil gas well locations as well as the lithology encountered during installation.

The soil gas wells were installed in accordance with the procedures referenced in the Soil Gas Sampling Work Plan with the exception of the method used to advance the soil borings. As a way to manage the risk of damage to underground utilities, UCRFS representatives requested that the soil borings for the soil gas wells be advanced using hand auguring equipment instead of a direct push drill rig. The shallow nature of groundwater in the area of the soil gas wells restricted the total depth that the soil gas wells could be installed. Therefore, hand auguring equipment was sufficient to advance the soil borings.

Prior to advancing the soil borings, the depth to groundwater measurements previously recorded at monitoring wells in the vicinity of soil gas wells were reviewed. The soil cuttings from each soil boring were collected to record lithology. The lithology was assessed to identify permeable zones suitable for the collection of soil gas samples. The soil lithology and the nearest depth to water measurement are included on each soil gas well construction log provided as Attachment 1. Each soil-gas well was constructed of a 0.25-inch-diameter, one-inch-long stainless steel screen section that is threaded to

stainless steel tubing of sufficient length to extend to the ground surface. The one-inch stainless steel screen was installed in the middle of an approximately 1-foot think layer of No. 2/12 sand. Approximately 2 feet to 2.5 feet of granular bentonite was then placed above the sand layer. The granular bentonite was installed in approximately 6-inch lifts, with each lift hydrated prior to placement of the next lift. A bentonite-cement grout was used to fill the remaining annulus to approximately 0.5 bgs. Near the ground surface, the stainless steel tubing is finished with a quick connect fitting and a threaded end cap. The assembly was completed with a 4-inch-diameter, traffic-rated well vault. The soil gas well construction details are provided in Attachment 1.

After the soil-gas wells were installed, the surface seals were allowed to cure for 48 hours. Due to rain storms that occurred following the soil gas well installation, the soil gas wells were not sampled until October 18, 2011, following 6 days of dry weather. The soil gas samples were collected in accordance with the procedures described in the Soil Gas Sampling Work Plan. The tubing of each soil-gas well was evacuated using a syringe. A volume of air equal to one tubing volume was removed from each well. Prior to the sample collection a clear flexible shroud (i.e., plastic sheeting) was placed around the top of the soil-gas well and the soil gas sample apparatus. The air inside the shroud was enriched with helium to a minimum concentration of 15% by volume (measured using a portable helium detector). The Summa canister sampling assembly consisted of a 1-liter canister (under 30 inches mercury vacuum) and a laboratory-supplied manifold, which contained a pressure gauge and a flow controller set to allow a vapor flow of 170 milliliters per minute. Sample was collected until the vacuum in the Summa canister dropped to approximately 5 inches of mercury.

Soil-gas samples were labeled for chain-of-custody transport to Curtis & Tompkins, Ltd. of Berkeley, California. The samples were analyzed for VOCs using EPA Method TO-15 and helium using ASTM D1946.

Soil Gas Sample Results

The analytical results of the soil gas sampling are provided on Table 1. The soil gas samples contained acetone, carbon disulfide, methylene chloride, n-hexane, 2-butanone, benzene, trichloroethene (TCE), and tetrachloroethene above the laboratory detection limits. Helium was not detected above laboratory detection limits in any of the samples collected. The helium analytical data as well as the concentration of helium measured under the sampling shroud is included on Table 1. The results of the soil gas samples were compared to the site-specific goals (SSGs) for the commercial/industrial worker (CIW) and groundskeeper/maintenance worker (GMW) prepared for Campus Bay and presented in the April 30, 2008, “Revised Human Health Risk Assessment and Calculation of Site-Specific Goals for Lot 1, 2, and 3” prepared by Erler and Kalinowski, Inc. The SSGs are included in Table 1 for reference. The VOC concentrations detected were all below the CIW and GMW SSGs. In addition, the soil gas data was compared to the California Human Health Screening Level (CHHSL) for vapor intrusion in the commercial/industrial land use scenario. The applicable CHHSLs are included in Table 1. The VOCs detected in the soil gas data are at concentrations below the applicable CHHSLs. The soil gas laboratory analytical report is provided as Attachment 2.

Summary

When assessing the groundwater data presented in the Technical Memorandum, TCE is the halogenated VOC that is most consistently detected in shallow groundwater underlying the boundary between Campus Bay and the UCRFS at concentrations above applicable screening criteria. The TCE concentrations detected in soil gas samples collected by Terraphase at UCRFS ranged from <5.0 µg/m^3 to 1,000 µg/m^3. The range of concentrations is all below applicable screening criteria. Figure 1 provides the TCE concentrations detected in the soil gas samples with the TCE concentrations detected in shallow groundwater underlying this area, including data collected at the UCRFS property.

Zeneca understands that the DTSC has required the University of California to collect additional soil data on the UCRFS property. The additional data to be collected at UCRFS can be assessed in conjunction with the data presented in the Technical Memorandum and this letter report to determine if additional investigation and/or monitoring locations are warranted. If you have any questions with regard to the information provided in this letter report, please do not hesitate to give me a call at (510) 326-1473.

Sincerely,

For Terraphase Engineering Inc.

Andrew Romolo, P.G. (8110)
Vice President and Principal Geologist

Attachments:
Table 1: Soil Gas Analytical Results, Campus Bay and UC Richmond Field Station Property Boundary, Richmond, California

Figure 1: Soil Gas Monitoring Well Locations and TCE Results

Attachment 1: Soil Gas Well Construction Logs
Attachment 2: Soil Gas Laboratory Analytical Report

cc:
Mr. Bill Marsh, Esq. - Edgcomb Law Group
Mr. Doug Mosteller - for Cherokee Simeon Venture I, LLC
Ms. Lynn Nakashima - DTSC
Mr. Brian Spiller - Zeneca Inc.
Mr. Karl Hans – University of California
Mr. Anthony Garvin, Esq. - University of California
Ms. Jenifer Beatty – Arcadis-U.S., Inc.

TABLES

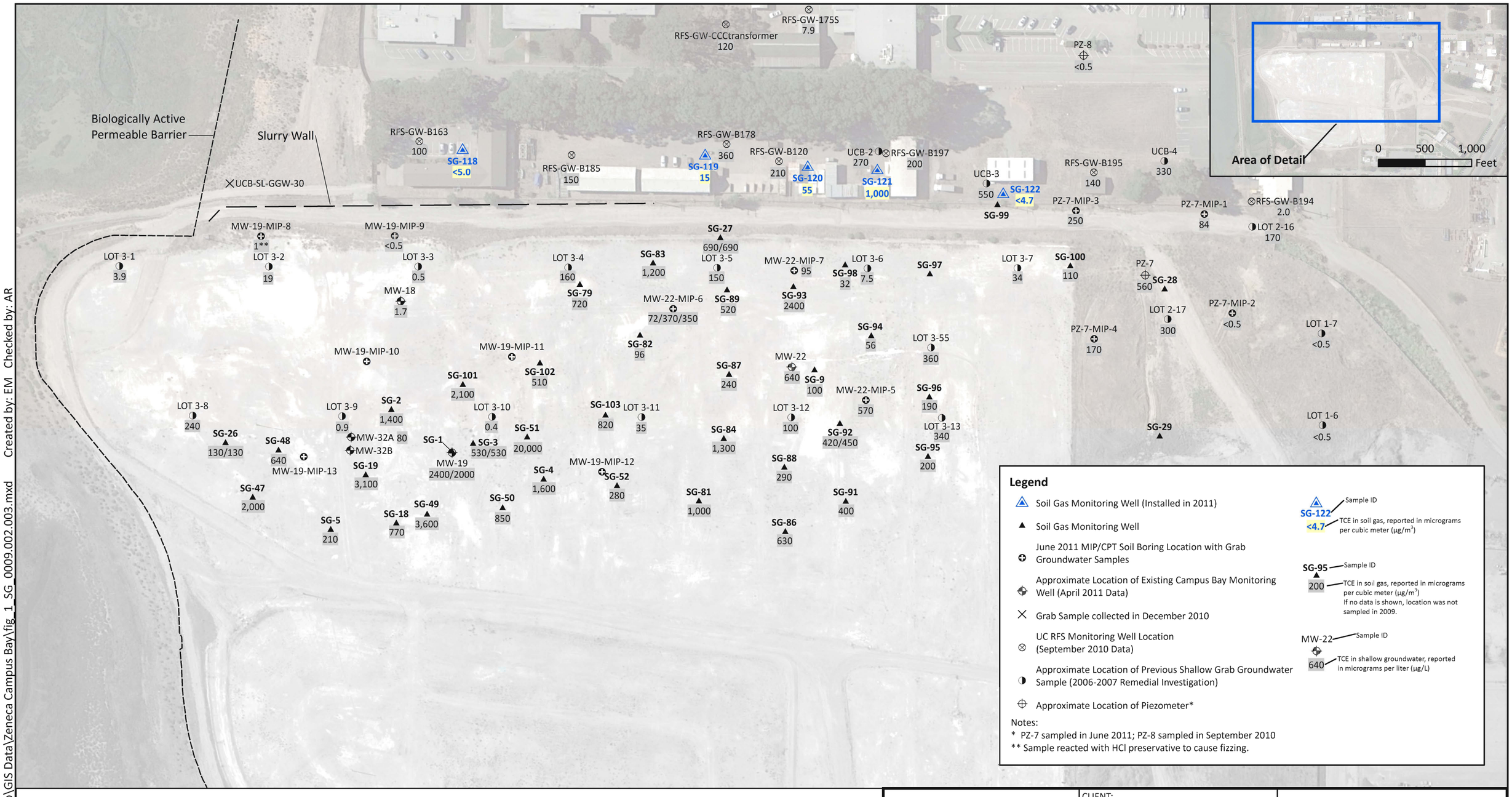
Table 1
Soil-Gas Analytical Results
Campus Bay and UC Richmond Field Station Property Boundary, Richmond, California

Sample	Date Sampled	Acetone ($\mu g/m^3$)	Carbon Disulfide ($\mu g/m^3$)	Methylene chloride ($\mu g/m^3$)	n-Hexane ($\mu g/m^3$)	2-Butanone ($\mu g/m^3$)	Benzene ($\mu g/m^3$)	TCE ($\mu g/m^3$)	PCE ($\mu g/m^3$)	Helium %	Concentration of Helium Under the Shroud (%) Low	High
SG-118	18-Oct-11	<8.8	<2.9	**3.4**	**75**	<2.7	<3.0	<5.0	<6.3	<1.9%	29.9%	49.1%
SG-119	18-Oct-11	<8.4	**5.8**	<3.1	<3.1	<2.6	<2.8	**15**	<6.0	<1.8%	22.8%	37.9%
SG-120	18-Oct-11	**18**	**6.8**	<3.0	<3.0	**2.8**	**3.4**	**55**	**6.4**	<2%	32.1%	46.4%
SG-121	18-Oct-11	**16**	<3.2	<3.5	<3.6	<3.0	**5.2**	**1,000**	**15**	<1.7%	25.2%	44.8%
SG-122	18-Oct-11	<8.3	**3.1**	<3.0	<3.1	<2.6	<2.8	<4.7	<5.9	<1.7%	15.3%	40.0%
SSG (CIW)		--	22,000,000	80,000	--	--	4,800	77,000	29,000	--	--	--
SSG (GWM)		--	--	--	--	--	340,000	5,300,000	1,900,000	--	--	--
CHHSL		--	--	--	--	--	122	1,770	603	--	--	--

Notes:

PCE - Tetrachloroethylene or tetrachloroethene
TCE - Trichloroethylene or trichloroethene
CIW - Construction/industrial worker scenario
GWM - Groundskeeper maintainence worker scenario
($\mu g/m^3$) - Micrograms per cubic meter
(mg/m^3) - Milligrams per cubic meter
< - Indicates that the analyte was not detected at or below the laboratory reporting limit shown.
RWQCB ESLs - California Regional Water Quality Control Board, San Francisco Bay Region, Environmental Screening Levels (Residential and Commercial / Industri
BOLD - Indicates that a concentration exceeds the laboratory's reporting limit.
CHHSL - California Human Health Screening Level (CHHSL) for Vapor Intrusion, Table 2, Commercial/Industrial Land Use

FIGURES



Legend

- Soil Gas Monitoring Well (Installed in 2011)
- Soil Gas Monitoring Well
- June 2011 MIP/CPT Soil Boring Location with Grab Groundwater Samples
- Approximate Location of Existing Campus Bay Monitoring Well (April 2011 Data)
- Grab Sample collected in December 2010
- UC RFS Monitoring Well Location (September 2010 Data)
- Approximate Location of Previous Shallow Grab Groundwater Sample (2006-2007 Remedial Investigation)
- Approximate Location of Piezometer*

SG-122 (Sample ID) / <4.7 — TCE in soil gas, reported in micrograms per cubic meter (µg/m³)

SG-95 (Sample ID) / 200 — TCE in soil gas, reported in micrograms per cubic meter (µg/m³). If no data is shown, location was not sampled in 2009.

MW-22 (Sample ID) / 640 — TCE in shallow groundwater, reported in micrograms per liter (µg/L)

Notes:
* PZ-7 sampled in June 2011; PZ-8 sampled in September 2010
** Sample reacted with HCl preservative to cause fizzing.

Source:
Aerial imagery captured on 10/1/2009 (Google, 2010).

0 125 250 Feet
1 Inch = 125 Feet

N

SAFETY FIRST

terraphase engineering

CLIENT:	Zeneca, Inc.
PROJECT:	Campus Bay Richmond, CA
PROJECT NUMBER:	0009.002.003

Soil Gas Monitoring Well Locations and TCE Results

FIGURE 1

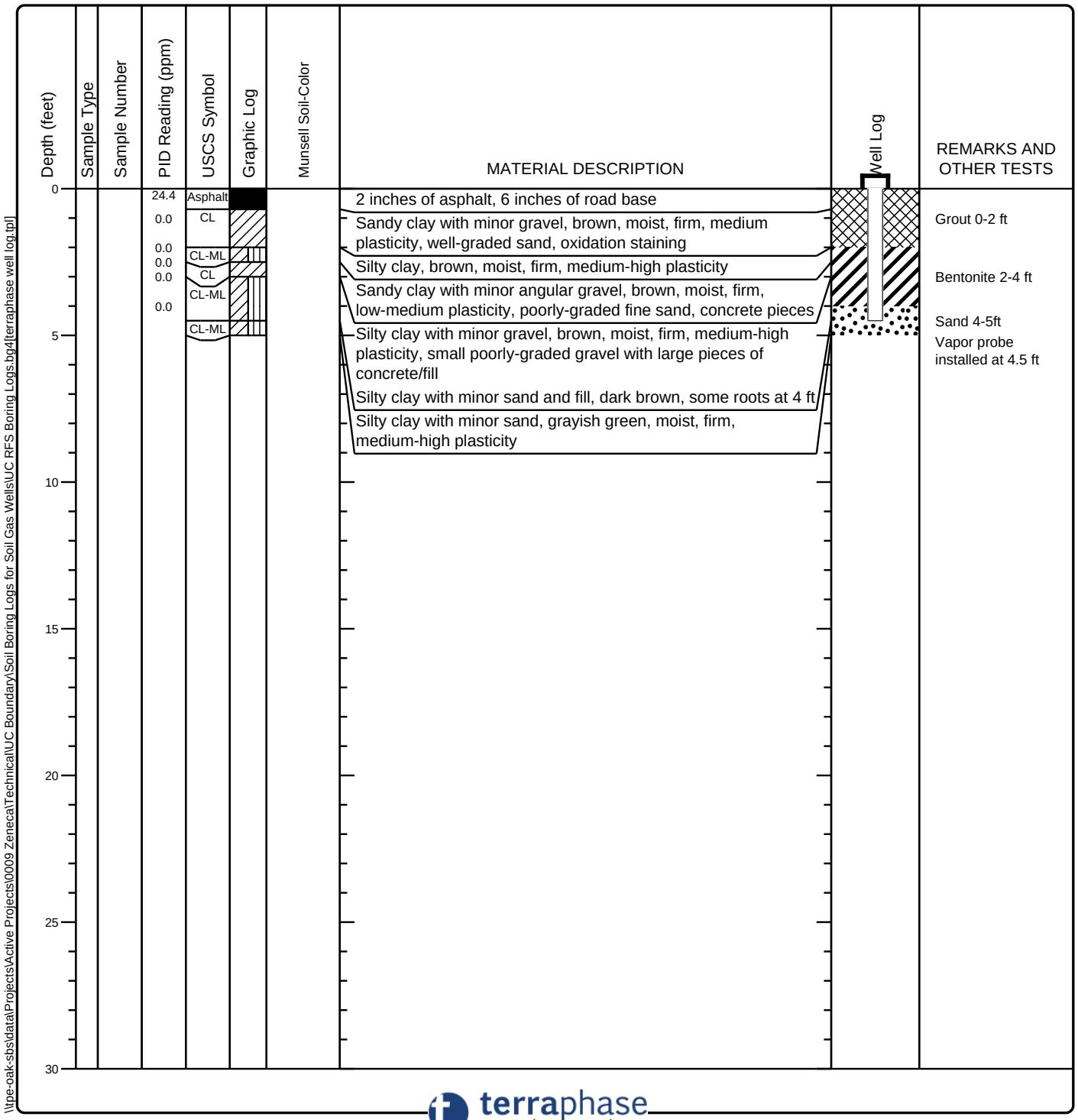
File: J:\GIS Backup\GIS Data\Zeneca Campus Bay\fig_1_SG_0009.002.003.mxd Created by: EM Checked by: AR

Attachment 1:
Soil Gas Well Construction Logs

Project: UC Boundary Investigation
Project Location: UC Richmond Field Station, Richmond, CA
Project Number: 0009.002.005

Log of Boring SG-118
Sheet 1 of 1

Date(s) Drilled **09/28/2011**	Logged By **KQM**	Checked By **AMR**
Drilling Method **Hand Auger**	Drill Bit Size/Type **3 inch**	Total Depth of Borehole **5 feet bgs**
Drill Rig Type **N/A**	Drilling Contractor **Vironex**	Approximate Surface Elevation **To be surveyed**
Groundwater Level and Date Measured **6.1 ft bgs at GW-B163 at 0850 on 09/28/2011**	Sampling Method(s) **Hand Auger Cuttings**	Hammer Data **N/A**
Borehole Backfill **cement grout**	Location **Adjacent to RFS-GW-B163 groundwater monitoring well**	



\\tpe-oak-sbs\data\Projects\Active Projects\0009 Zeneca\Technical\UC Boundary\Soil Boring Logs for Soil Gas Wells\UC RFS Boring Logs.bg4[terraphase well log.tpl]

terraphase engineering

Project: UC Boundary Investigation
Project Location: UC Richmond Field Station, Richmond, CA
Project Number: 0009.002.005

Key to Log of Boring
Sheet 1 of 1

Depth (feet)	Sample Type	Sample Number	PID Reading (ppm)	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Well Log	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

1. Depth (feet): Depth in feet below the ground surface.
2. Sample Type: Type of soil sample collected at the depth interval shown.
3. Sample Number: Sample identification number.
4. PID Reading (ppm): The reading from a photo-ionization detector, in parts per million. CB denotes sample reading was taken in a closed (sealed) Ziplock(TM) bag. NB denotes the reading of the sample was taken with no bag, in the opening in coring sleeve. This semi-closed space has minor influences from ambient air. OH indicates a reading taken from the open hole.
5. USCS Symbol: USCS symbol of the subsurface material.
6. Graphic Log: Graphic depiction of the subsurface material encountered.
7. Munsell Soil-Color: Color of subsurface material according to Munsell soil-color charts.
8. MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
9. Well Log: Graphical representation of well installed upon completion of drilling and sampling.
10. REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

MATERIAL GRAPHIC SYMBOLS

- Asphaltic Concrete (AC)
- Bentonite
- Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)
- SILTY CLAY (CL-ML)
- Grout
- Poorly graded SAND (SP)

TYPICAL SAMPLER GRAPHIC SYMBOLS

- Shelby Tube (Thin-walled, fixed head)
- Direct push acetate liner
- Auger sampler
- Bulk Sample
- 3-inch-OD California w/ brass rings
- CME Sampler
- Grab Sample
- 2.5-inch-OD Modified California w/ brass liners
- Pitcher Sample
- Soil Sample for Lab Analysis
- 2-inch-OD unlined split spoon (SPT)
- Shelby Tube (Thin-walled, fixed head)

OTHER GRAPHIC SYMBOLS

- Water level (at time of drilling, ATD)
- Water level (after waiting)
- Minor change in material properties within a stratum
- Inferred/gradational contact between strata
- Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

\\tpe-oak-sbs\data\Projects\Active Projects\0009 Zeneca\Technical\UC Boundary\Soil Boring Logs for Soil Gas Wells\UC RFS Boring Logs.bg4[terraphase well log.tpl]

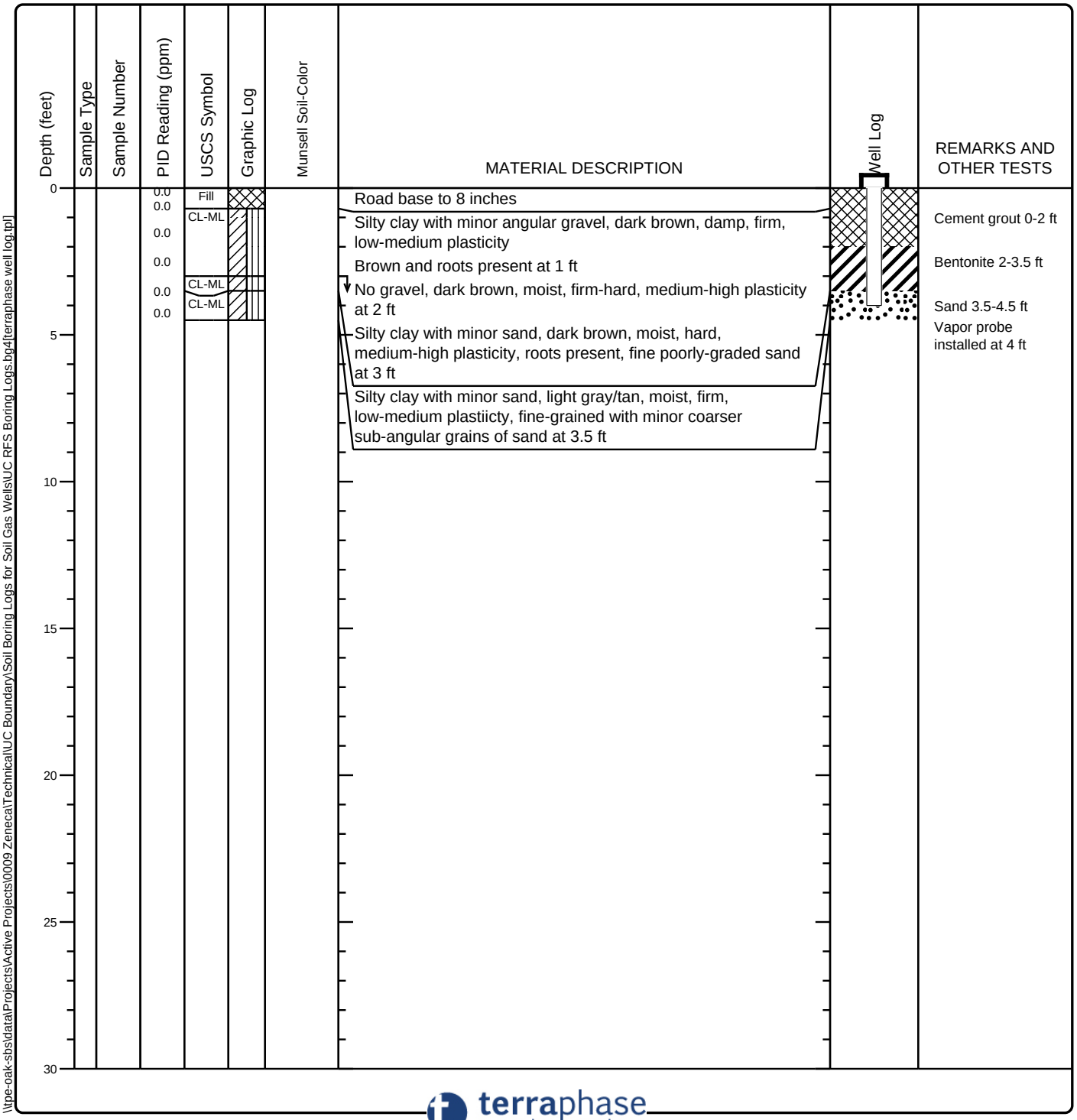
terraphase engineering

Figure B-1

Project: UC Boundary Investigation
Project Location: UC Richmond Field Station, Richmond, CA
Project Number: 0009.002.005

Log of Boring SG-119
Sheet 1 of 1

Date(s) Drilled **09/28/2011**	Logged By **KQM**	Checked By **AMR**
Drilling Method **Hand Auger**	Drill Bit Size/Type **3 inch**	Total Depth of Borehole **4.5 feet bgs**
Drill Rig Type **N/A**	Drilling Contractor **Vironex**	Approximate Surface Elevation **To be surveyed**
Groundwater Level and Date Measured **5.6 ft bgs at GW-B178 on 11/1/2010**	Sampling Method(s) **Hand Auger Cuttings**	Hammer Data **N/A**
Borehole Backfill **cement grout**	Location **Adjacent to RFS-GW-B178 groundwater monitoring well**	



\\tpe-oak-sbs\data\Projects\Active Projects\0009 Zeneca\Technical\UC Boundary\Soil Boring Logs for Soil Gas Wells\UC RFS Boring Logs.bg4[terraphase well log.tpl]

terraphase engineering

Project: UC Boundary Investigation
Project Location: UC Richmond Field Station, Richmond, CA
Project Number: 0009.002.005

Key to Log of Boring

Sheet 1 of 1

Depth (feet)	Sample Type	Sample Number	PID Reading (ppm)	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Well Log	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

1. Depth (feet): Depth in feet below the ground surface.
2. Sample Type: Type of soil sample collected at the depth interval shown.
3. Sample Number: Sample identification number.
4. PID Reading (ppm): The reading from a photo-ionization detector, in parts per million. CB denotes sample reading was taken in a closed (sealed) Ziplock(TM) bag. NB denotes the reading of the sample was taken with no bag, in the opening in coring sleeve. This semi-closed space has minor influences from ambient air. OH indicates a reading taken from the open hole.
5. USCS Symbol: USCS symbol of the subsurface material.
6. Graphic Log: Graphic depiction of the subsurface material encountered.
7. Munsell Soil-Color: Color of subsurface material according to Munsell soil-color charts.
8. MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
9. Well Log: Graphical representation of well installed upon completion of drilling and sampling.
10. REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

MATERIAL GRAPHIC SYMBOLS

- Bentonite
- SILTY CLAY (CL-ML)
- AF
- Grout
- Poorly graded SAND (SP)

TYPICAL SAMPLER GRAPHIC SYMBOLS

- Shelby Tube (Thin-walled, fixed head)
- Direct push acetate liner
- Auger sampler
- Bulk Sample
- 3-inch-OD California w/ brass rings
- CME Sampler
- Grab Sample
- 2.5-inch-OD Modified California w/ brass liners
- Pitcher Sample
- Soil Sample for Lab Analysis
- 2-inch-OD unlined split spoon (SPT)
- Shelby Tube (Thin-walled, fixed head)

OTHER GRAPHIC SYMBOLS

- Water level (at time of drilling, ATD)
- Water level (after waiting)
- Minor change in material properties within a stratum
- Inferred/gradational contact between strata
- Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

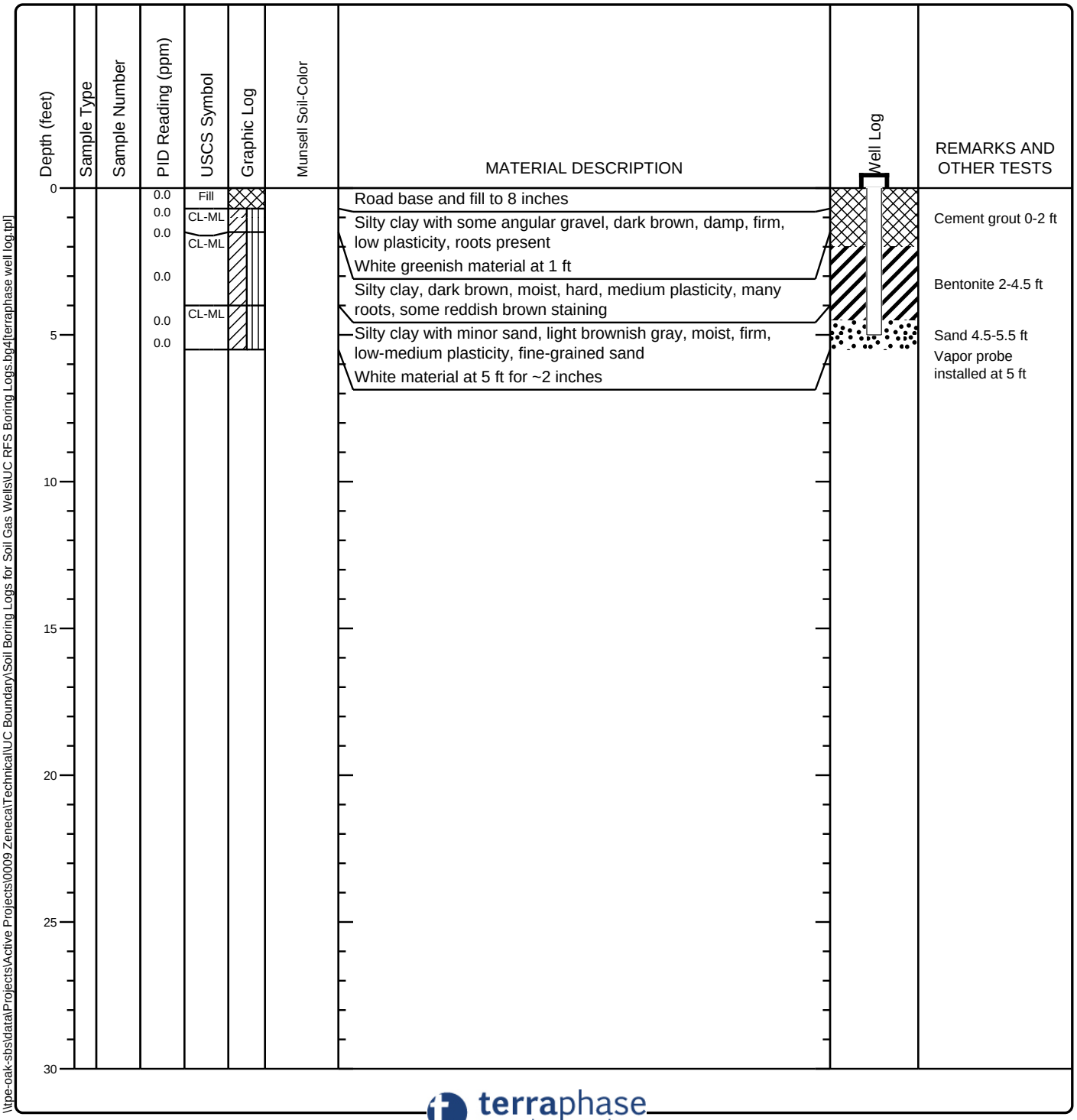
terraphase engineering

Figure B-1

Project: UC Boundary Investigation
Project Location: UC Richmond Field Station, Richmond, CA
Project Number: 0009.002.005

Log of Boring SG-120
Sheet 1 of 1

Date(s) Drilled **09/28/2011**	Logged By **KQM**	Checked By **AMR**
Drilling Method **Hand Auger**	Drill Bit Size/Type **3 inch**	Total Depth of Borehole **5.5 feet bgs**
Drill Rig Type **N/A**	Drilling Contractor **Vironex**	Approximate Surface Elevation **To be surveyed**
Groundwater Level and Date Measured **6.75 ft bgs at GW-B120 on 11/1/2010**	Sampling Method(s) **Hand Auger Cuttings**	Hammer Data **N/A**
Borehole Backfill **cement grout**	Location **Adjacent to RFS-GW-B120 groundwater monitoring well**	



\\tpe-oak-sbs\data\Projects\Active Projects\0009 Zeneca\Technical\UC Boundary\Soil Boring Logs for Soil Gas Wells\UC RFS Boring Logs.bg4[terraphase well log.tpl]

terraphase engineering

Project: UC Boundary Investigation
Project Location: UC Richmond Field Station, Richmond, CA
Project Number: 0009.002.005

Key to Log of Boring

Sheet 1 of 1

Depth (feet)	Sample Type	Sample Number	PID Reading (ppm)	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Well Log	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

1. Depth (feet): Depth in feet below the ground surface.
2. Sample Type: Type of soil sample collected at the depth interval shown.
3. Sample Number: Sample identification number.
4. PID Reading (ppm): The reading from a photo-ionization detector, in parts per million. CB denotes sample reading was taken in a closed (sealed) Ziplock(TM) bag. NB denotes the reading of the sample was taken with no bag, in the opening in coring sleeve. This semi-closed space has minor influences from ambient air. OH indicates a reading taken from the open hole.
5. USCS Symbol: USCS symbol of the subsurface material.
6. Graphic Log: Graphic depiction of the subsurface material encountered.
7. Munsell Soil-Color: Color of subsurface material according to Munsell soil-color charts.
8. MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
9. Well Log: Graphical representation of well installed upon completion of drilling and sampling.
10. REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

MATERIAL GRAPHIC SYMBOLS

- Bentonite
- SILTY CLAY (CL-ML)
- AF
- Grout
- Poorly graded SAND (SP)

TYPICAL SAMPLER GRAPHIC SYMBOLS

- Shelby Tube (Thin-walled, fixed head)
- Direct push acetate liner
- Auger sampler
- Bulk Sample
- 3-inch-OD California w/ brass rings
- CME Sampler
- Grab Sample
- 2.5-inch-OD Modified California w/ brass liners
- Pitcher Sample
- Soil Sample for Lab Analysis
- 2-inch-OD unlined split spoon (SPT)
- Shelby Tube (Thin-walled, fixed head)

OTHER GRAPHIC SYMBOLS

- Water level (at time of drilling, ATD)
- Water level (after waiting)
- Minor change in material properties within a stratum
- Inferred/gradational contact between strata
- Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

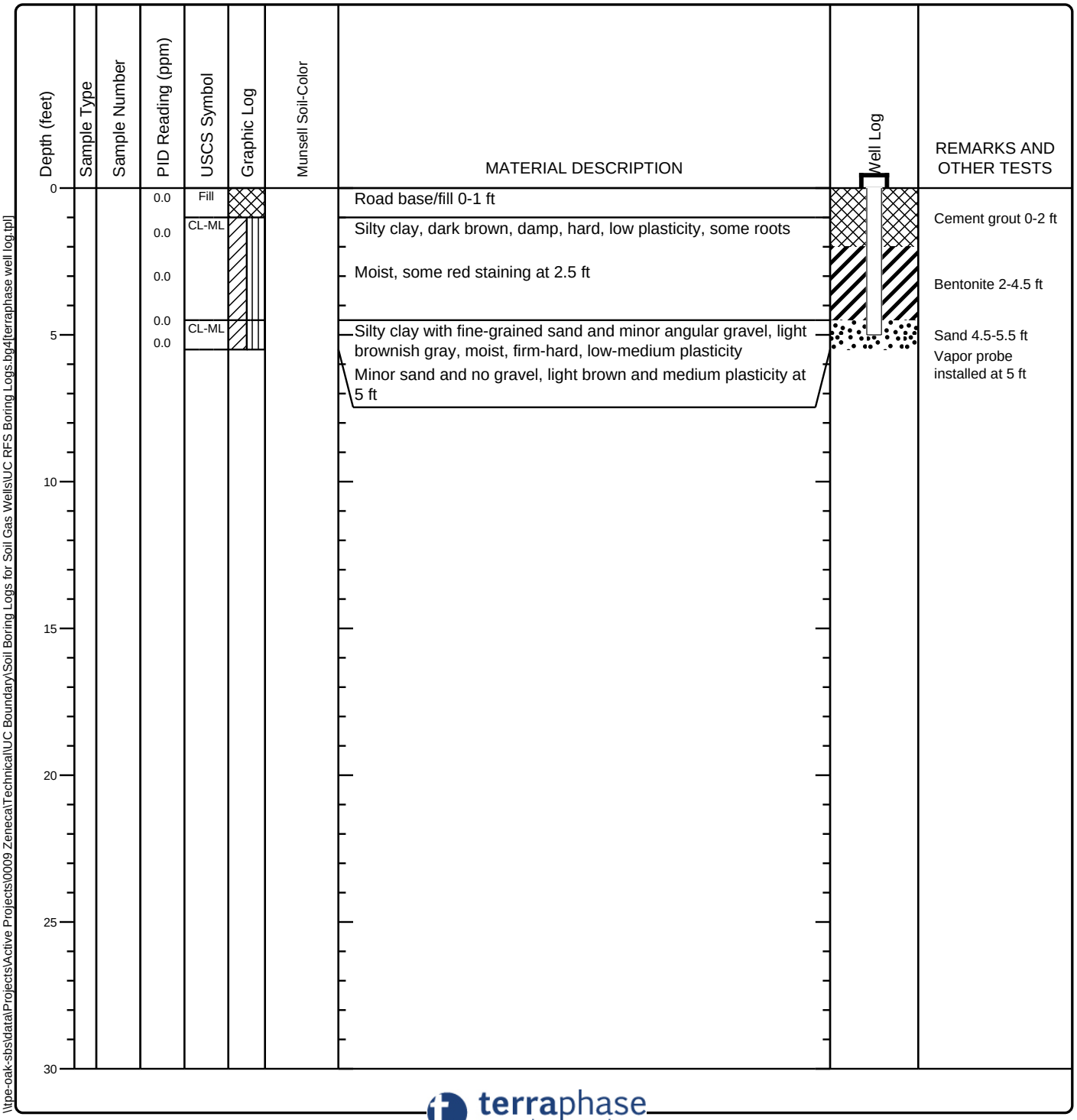
terraphase engineering

Figure B-1

Project: UC Boundary Investigation
Project Location: UC Richmond Field Station, Richmond, CA
Project Number: 0009.002.005

Log of Boring SG-121
Sheet 1 of 1

Date(s) Drilled **09/28/2011**	Logged By **KQM**	Checked By **AMR**
Drilling Method **Hand Auger**	Drill Bit Size/Type **3 inch**	Total Depth of Borehole **5.5 feet bgs**
Drill Rig Type **N/A**	Drilling Contractor **Vironex**	Approximate Surface Elevation **To be surveyed**
Groundwater Level and Date Measured **7.94 ft bgs at GW-B197 on 11/1/2010**	Sampling Method(s) **Hand Auger Cuttings**	Hammer Data **N/A**
Borehole Backfill **cement grout**	Location **Adjacent to RFS-GW-B197 groundwater monitoring well**	



\\tpe-oak-sbs\data\Projects\Active Projects\0009 Zeneca\Technical\UC Boundary\Soil Boring Logs for Soil Gas Wells\UC RFS Boring Logs.bg4[terraphase well log.tpl]

terraphase engineering

Project: UC Boundary Investigation
Project Location: UC Richmond Field Station, Richmond, CA
Project Number: 0009.002.005

Key to Log of Boring

Sheet 1 of 1

Depth (feet)	Sample Type	Sample Number	PID Reading (ppm)	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Well Log	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

1. Depth (feet): Depth in feet below the ground surface.
2. Sample Type: Type of soil sample collected at the depth interval shown.
3. Sample Number: Sample identification number.
4. PID Reading (ppm): The reading from a photo-ionization detector, in parts per million. CB denotes sample reading was taken in a closed (sealed) Ziplock(TM) bag. NB denotes the reading of the sample was taken with no bag, in the opening in coring sleeve. This semi-closed space has minor influences from ambient air. OH indicates a reading taken from the open hole.
5. USCS Symbol: USCS symbol of the subsurface material.
6. Graphic Log: Graphic depiction of the subsurface material encountered.
7. Munsell Soil-Color: Color of subsurface material according to Munsell soil-color charts.
8. MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
9. Well Log: Graphical representation of well installed upon completion of drilling and sampling.
10. REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

MATERIAL GRAPHIC SYMBOLS

- Bentonite
- SILTY CLAY (CL-ML)
- AF
- Grout
- Poorly graded SAND (SP)

TYPICAL SAMPLER GRAPHIC SYMBOLS

- Shelby Tube (Thin-walled, fixed head)
- Direct push acetate liner
- Auger sampler
- Bulk Sample
- 3-inch-OD California w/ brass rings
- CME Sampler
- Grab Sample
- 2.5-inch-OD Modified California w/ brass liners
- Pitcher Sample
- Soil Sample for Lab Analysis
- 2-inch-OD unlined split spoon (SPT)
- Shelby Tube (Thin-walled, fixed head)

OTHER GRAPHIC SYMBOLS

- Water level (at time of drilling, ATD)
- Water level (after waiting)
- Minor change in material properties within a stratum
- Inferred/gradational contact between strata
- Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

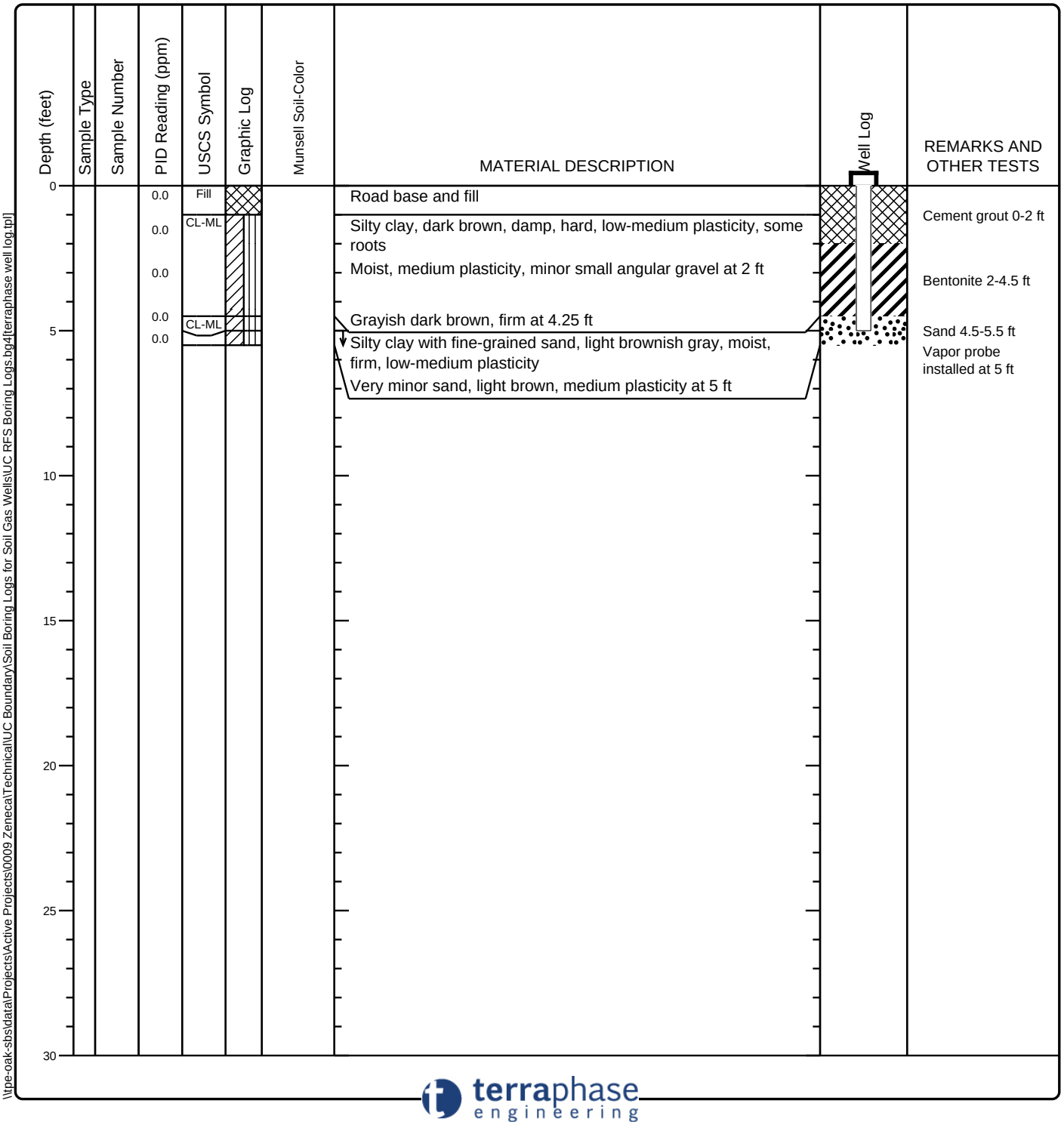
terraphase engineering

Figure B-1

Project: UC Boundary Investigation
Project Location: UC Richmond Field Station, Richmond, CA
Project Number: 0009.002.005

Log of Boring SG-122
Sheet 1 of 1

Date(s) Drilled **09/28/2011**	Logged By **KQM**	Checked By **AMR**
Drilling Method **Hand Auger**	Drill Bit Size/Type **3 inch**	Total Depth of Borehole **5.5 feet bgs**
Drill Rig Type **N/A**	Drilling Contractor **Vironex**	Approximate Surface Elevation
Groundwater Level and Date Measured **8.66 ft bgs at GW-B195 on 11/1/2010**	Sampling Method(s) **N/A**	Hammer Data **N/A**
Borehole Backfill **cement grout**	Location **Adjacent to former SG-99 soil vapor well and near RFS-GW-B195 groundwater monitoring well**	



\\tpe-oak-sbs\data\Projects\Active Projects\0009 Zeneca\Technical\UC Boundary\Soil Boring Logs for Soil Gas Wells\UC RFS Boring Logs.bg4[terraphase well log.tpl]

terraphase engineering

Project: UC Boundary Investigation
Project Location: UC Richmond Field Station, Richmond, CA
Project Number: 0009.002.005

Key to Log of Boring

Sheet 1 of 1

Depth (feet)	Sample Type	Sample Number	PID Reading (ppm)	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Well Log	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

1. Depth (feet): Depth in feet below the ground surface.
2. Sample Type: Type of soil sample collected at the depth interval shown.
3. Sample Number: Sample identification number.
4. PID Reading (ppm): The reading from a photo-ionization detector, in parts per million. CB denotes sample reading was taken in a closed (sealed) Ziplock(TM) bag. NB denotes the reading of the sample was taken with no bag, in the opening in coring sleeve. This semi-closed space has minor influences from ambient air. OH indicates a reading taken from the open hole.
5. USCS Symbol: USCS symbol of the subsurface material.
6. Graphic Log: Graphic depiction of the subsurface material encountered.
7. Munsell Soil-Color: Color of subsurface material according to Munsell soil-color charts.
8. MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
9. Well Log: Graphical representation of well installed upon completion of drilling and sampling.
10. REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

MATERIAL GRAPHIC SYMBOLS

- Bentonite
- SILTY CLAY (CL-ML)
- AF
- Grout
- Poorly graded SAND (SP)

TYPICAL SAMPLER GRAPHIC SYMBOLS

- Shelby Tube (Thin-walled, fixed head)
- Direct push acetate liner
- Auger sampler
- Bulk Sample
- 3-inch-OD California w/ brass rings
- CME Sampler
- Grab Sample
- 2.5-inch-OD Modified California w/ brass liners
- Pitcher Sample
- Soil Sample for Lab Analysis
- 2-inch-OD unlined split spoon (SPT)
- Shelby Tube (Thin-walled, fixed head)

OTHER GRAPHIC SYMBOLS

- Water level (at time of drilling, ATD)
- Water level (after waiting)
- Minor change in material properties within a stratum
- Inferred/gradational contact between strata
- Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

terraphase engineering

Figure B-1

Attachment 2:
Soil Gas Laboratory Analytical Report

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

Laboratory Job Number 232029
ANALYTICAL REPORT

Terraphase Engineering	Project : 0009.002.005
414 13th Street	Location : UC Boundary
Oakland, CA 94612	Level : II

Sample ID	Lab ID
SG-122	232029-001
SG-120	232029-002
SG-121	232029-003
SG-119	232029-004
SG-118	232029-005

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: _____ Date: 11/03/2011
Project Manager

NELAP # 01107CA

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**232029**
Client:	**Terraphase Engineering**
Project:	**0009.002.005**
Location:	**UC Boundary**
Request Date:	**10/18/11**
Samples Received:	**10/18/11**

This data package contains sample and QC results for five air samples, requested for the above referenced project on 10/18/11. 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):
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

Chain of Custody # : _____

C&T LOGIN # 232029

Project No: 0009.002.005
Project Name: UC Berkeley Investigation
EDD Format: _____ **Rpt Level:** II III IV
Turnaround Time: ☑ RUSH 48 hours ☑ Standard

Sampler: Kara Q-M & Emily Maier
Report To: Andrew. Remole@
Company: Terraphase
Telephone: 510-645-1850
Email: Andrew.Remole@Terraphase.com

Lab No.	Sample ID.	Sampling Information					TESTING REQUESTED				
		Date Collected	Time Collected	Canister ID (Bar Code #)	Flow Controller ID	Sample Volume (Gauge Reading)	TO-15 STANDARD TAT	TO-3: C6-C12 GRO	TO-3M: C1-C6 Hydrocarbons	D1946: (Please Circle Targets) H_2 (He) N_2 O_2 CO CO_2 CH_4 RUSH TAT	
1	SG-122	10/18/11	1012	402	A00025	5	✓			✓	
2	SG-120	10/18/11	1055	323	A00035	5	✓			✓	
3	SG-121	10/18/11	1137	254	A00017	5	✓			✓	
4	SG-119	10/18/11	1229	134	A00093	5	✓			✓	
5	SG-118	10/18/11	1305	408	A00037	5	✓			✓	

Notes: RUSH He for 48 hours. Standard for TO-15 analysis

RELIQUISHED BY:		RECEIVED BY:	
Kara Q-M	10/18/11 1615 DATE/TIME	Troy Bass	10/18/11 1615 DATE/TIME
	DATE/TIME		DATE/TIME
	DATE/TIME		DATE/TIME

inlab

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 232029 Date Received 10/18/11 Number of coolers _____
Client Terraphase Project VC Boundary Investigation
Date Opened 10/18/11 By (print) Vidia Gurshi (sign) [signature]
Date Logged in ↓ 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) _____
   ☐ Samples Received on ice & cold without a temperature blank
   ☐ 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? _____ 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

_____
_____
_____
_____
_____
_____

Rev 8, 6/11

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Field ID:	SG-122	Diln Fac:	1.740
Lab ID:	232029-001	Batch#:	180766
Matrix:	Air	Sampled:	10/18/11
Units (V):	ppbv	Received:	10/18/11
Units (M):	ug/m3	Analyzed:	11/02/11

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.87	ND	4.3
Freon 114	ND	0.87	ND	6.1
Chloromethane	ND	0.87	ND	1.8
Vinyl Chloride	ND	0.87	ND	2.2
1,3-Butadiene	ND	0.87	ND	1.9
Bromomethane	ND	0.87	ND	3.4
Chloroethane	ND	0.87	ND	2.3
Trichlorofluoromethane	ND	0.87	ND	4.9
Acrolein	ND	3.5	ND	8.0
1,1-Dichloroethene	ND	0.87	ND	3.4
Freon 113	ND	0.87	ND	6.7
Acetone	ND	3.5	ND	8.3
Carbon Disulfide	0.99	0.87	3.1	2.7
Methylene Chloride	ND	0.87	ND	3.0
trans-1,2-Dichloroethene	ND	0.87	ND	3.4
MTBE	ND	0.87	ND	3.1
n-Hexane	ND	0.87	ND	3.1
1,1-Dichloroethane	ND	0.87	ND	3.5
Vinyl Acetate	ND	0.87	ND	3.1
cis-1,2-Dichloroethene	ND	0.87	ND	3.4
2-Butanone	ND	0.87	ND	2.6
Ethyl Acetate	ND	0.87	ND	3.1
Tetrahydrofuran	ND	0.87	ND	2.6
Chloroform	ND	0.87	ND	4.2
1,1,1-Trichloroethane	ND	0.87	ND	4.7
Cyclohexane	ND	0.87	ND	3.0
Carbon Tetrachloride	ND	0.87	ND	5.5
Benzene	ND	0.87	ND	2.8
1,2-Dichloroethane	ND	0.87	ND	3.5
n-Heptane	ND	0.87	ND	3.6
Trichloroethene	ND	0.87	ND	4.7
1,2-Dichloropropane	ND	0.87	ND	4.0
Bromodichloromethane	ND	0.87	ND	5.8
cis-1,3-Dichloropropene	ND	0.87	ND	3.9
4-Methyl-2-Pentanone	ND	0.87	ND	3.6

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 #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Field ID:	SG-122	Diln Fac:	1.740
Lab ID:	232029-001	Batch#:	180766
Matrix:	Air	Sampled:	10/18/11
Units (V):	ppbv	Received:	10/18/11
Units (M):	ug/m3	Analyzed:	11/02/11

Analyte	Result (V)	RL	Result (M)	RL
Toluene	ND	0.87	ND	3.3
trans-1,3-Dichloropropene	ND	0.87	ND	3.9
1,1,2-Trichloroethane	ND	0.87	ND	4.7
Tetrachloroethene	ND	0.87	ND	5.9
2-Hexanone	ND	0.87	ND	3.6
Dibromochloromethane	ND	0.87	ND	7.4
1,2-Dibromoethane	ND	0.87	ND	6.7
Chlorobenzene	ND	0.87	ND	4.0
Ethylbenzene	ND	0.87	ND	3.8
m,p-Xylenes	ND	0.87	ND	3.8
o-Xylene	ND	0.87	ND	3.8
Styrene	ND	0.87	ND	3.7
Bromoform	ND	0.87	ND	9.0
1,1,2,2-Tetrachloroethane	ND	0.87	ND	6.0
4-Ethyltoluene	ND	0.87	ND	4.3
1,3,5-Trimethylbenzene	ND	0.87	ND	4.3
1,2,4-Trimethylbenzene	ND	0.87	ND	4.3
1,3-Dichlorobenzene	ND	0.87	ND	5.2
1,4-Dichlorobenzene	ND	0.87	ND	5.2
Benzyl chloride	ND	0.87	ND	4.5
1,2-Dichlorobenzene	ND	0.87	ND	5.2
1,2,4-Trichlorobenzene	ND	0.87	ND	6.5
Hexachlorobutadiene	ND	0.87	ND	9.3
Naphthalene	ND	3.5	ND	18

Surrogate	%REC	Limits
Bromofluorobenzene	104	74-136

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 #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Field ID:	SG-120	Diln Fac:	1.700
Lab ID:	232029-002	Batch#:	180766
Matrix:	Air	Sampled:	10/18/11
Units (V):	ppbv	Received:	10/18/11
Units (M):	ug/m3	Analyzed:	11/02/11

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.85	ND	4.2
Freon 114	ND	0.85	ND	5.9
Chloromethane	ND	0.85	ND	1.8
Vinyl Chloride	ND	0.85	ND	2.2
1,3-Butadiene	ND	0.85	ND	1.9
Bromomethane	ND	0.85	ND	3.3
Chloroethane	ND	0.85	ND	2.2
Trichlorofluoromethane	ND	0.85	ND	4.8
Acrolein	ND	3.4	ND	7.8
1,1-Dichloroethene	ND	0.85	ND	3.4
Freon 113	ND	0.85	ND	6.5
Acetone	7.6	3.4	18	8.1
Carbon Disulfide	2.2	0.85	6.8	2.6
Methylene Chloride	ND	0.85	ND	3.0
trans-1,2-Dichloroethene	ND	0.85	ND	3.4
MTBE	ND	0.85	ND	3.1
n-Hexane	ND	0.85	ND	3.0
1,1-Dichloroethane	ND	0.85	ND	3.4
Vinyl Acetate	ND	0.85	ND	3.0
cis-1,2-Dichloroethene	ND	0.85	ND	3.4
2-Butanone	0.95	0.85	2.8	2.5
Ethyl Acetate	ND	0.85	ND	3.1
Tetrahydrofuran	ND	0.85	ND	2.5
Chloroform	ND	0.85	ND	4.2
1,1,1-Trichloroethane	ND	0.85	ND	4.6
Cyclohexane	ND	0.85	ND	2.9
Carbon Tetrachloride	ND	0.85	ND	5.3
Benzene	1.1	0.85	3.4	2.7
1,2-Dichloroethane	ND	0.85	ND	3.4
n-Heptane	ND	0.85	ND	3.5
Trichloroethene	10	0.85	55	4.6
1,2-Dichloropropane	ND	0.85	ND	3.9
Bromodichloromethane	ND	0.85	ND	5.7
cis-1,3-Dichloropropene	ND	0.85	ND	3.9
4-Methyl-2-Pentanone	ND	0.85	ND	3.5

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 #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Field ID:	SG-120	Diln Fac:	1.700
Lab ID:	232029-002	Batch#:	180766
Matrix:	Air	Sampled:	10/18/11
Units (V):	ppbv	Received:	10/18/11
Units (M):	ug/m3	Analyzed:	11/02/11

Analyte	Result (V)	RL	Result (M)	RL
Toluene	ND	0.85	ND	3.2
trans-1,3-Dichloropropene	ND	0.85	ND	3.9
1,1,2-Trichloroethane	ND	0.85	ND	4.6
Tetrachloroethene	0.94	0.85	6.4	5.8
2-Hexanone	ND	0.85	ND	3.5
Dibromochloromethane	ND	0.85	ND	7.2
1,2-Dibromoethane	ND	0.85	ND	6.5
Chlorobenzene	ND	0.85	ND	3.9
Ethylbenzene	ND	0.85	ND	3.7
m,p-Xylenes	ND	0.85	ND	3.7
o-Xylene	ND	0.85	ND	3.7
Styrene	ND	0.85	ND	3.6
Bromoform	ND	0.85	ND	8.8
1,1,2,2-Tetrachloroethane	ND	0.85	ND	5.8
4-Ethyltoluene	ND	0.85	ND	4.2
1,3,5-Trimethylbenzene	ND	0.85	ND	4.2
1,2,4-Trimethylbenzene	ND	0.85	ND	4.2
1,3-Dichlorobenzene	ND	0.85	ND	5.1
1,4-Dichlorobenzene	ND	0.85	ND	5.1
Benzyl chloride	ND	0.85	ND	4.4
1,2-Dichlorobenzene	ND	0.85	ND	5.1
1,2,4-Trichlorobenzene	ND	0.85	ND	6.3
Hexachlorobutadiene	ND	0.85	ND	9.1
Naphthalene	ND	3.4	ND	18

Surrogate	%REC	Limits
Bromofluorobenzene	104	74-136

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 #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Field ID:	SG-121	Diln Fac:	2.030
Lab ID:	232029-003	Batch#:	180766
Matrix:	Air	Sampled:	10/18/11
Units (V):	ppbv	Received:	10/18/11
Units (M):	ug/m3	Analyzed:	11/02/11

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.0	ND	5.0
Freon 114	ND	1.0	ND	7.1
Chloromethane	ND	1.0	ND	2.1
Vinyl Chloride	ND	1.0	ND	2.6
1,3-Butadiene	ND	1.0	ND	2.2
Bromomethane	ND	1.0	ND	3.9
Chloroethane	ND	1.0	ND	2.7
Trichlorofluoromethane	ND	1.0	ND	5.7
Acrolein	ND	4.1	ND	9.3
1,1-Dichloroethene	ND	1.0	ND	4.0
Freon 113	ND	1.0	ND	7.8
Acetone	6.6	4.1	16	9.6
Carbon Disulfide	ND	1.0	ND	3.2
Methylene Chloride	ND	1.0	ND	3.5
trans-1,2-Dichloroethene	ND	1.0	ND	4.0
MTBE	ND	1.0	ND	3.7
n-Hexane	ND	1.0	ND	3.6
1,1-Dichloroethane	ND	1.0	ND	4.1
Vinyl Acetate	ND	1.0	ND	3.6
cis-1,2-Dichloroethene	ND	1.0	ND	4.0
2-Butanone	ND	1.0	ND	3.0
Ethyl Acetate	ND	1.0	ND	3.7
Tetrahydrofuran	ND	1.0	ND	3.0
Chloroform	ND	1.0	ND	5.0
1,1,1-Trichloroethane	ND	1.0	ND	5.5
Cyclohexane	ND	1.0	ND	3.5
Carbon Tetrachloride	ND	1.0	ND	6.4
Benzene	1.6	1.0	5.2	3.2
1,2-Dichloroethane	ND	1.0	ND	4.1
n-Heptane	ND	1.0	ND	4.2
Trichloroethene	200	1.0	1,000	5.5
1,2-Dichloropropane	ND	1.0	ND	4.7
Bromodichloromethane	ND	1.0	ND	6.8
cis-1,3-Dichloropropene	ND	1.0	ND	4.6
4-Methyl-2-Pentanone	ND	1.0	ND	4.2

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 #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Field ID:	SG-121	Diln Fac:	2.030
Lab ID:	232029-003	Batch#:	180766
Matrix:	Air	Sampled:	10/18/11
Units (V):	ppbv	Received:	10/18/11
Units (M):	ug/m3	Analyzed:	11/02/11

Analyte	Result (V)	RL	Result (M)	RL
Toluene	ND	1.0	ND	3.8
trans-1,3-Dichloropropene	ND	1.0	ND	4.6
1,1,2-Trichloroethane	ND	1.0	ND	5.5
Tetrachloroethene	2.3	1.0	15	6.9
2-Hexanone	ND	1.0	ND	4.2
Dibromochloromethane	ND	1.0	ND	8.6
1,2-Dibromoethane	ND	1.0	ND	7.8
Chlorobenzene	ND	1.0	ND	4.7
Ethylbenzene	ND	1.0	ND	4.4
m,p-Xylenes	ND	1.0	ND	4.4
o-Xylene	ND	1.0	ND	4.4
Styrene	ND	1.0	ND	4.3
Bromoform	ND	1.0	ND	10
1,1,2,2-Tetrachloroethane	ND	1.0	ND	7.0
4-Ethyltoluene	ND	1.0	ND	5.0
1,3,5-Trimethylbenzene	ND	1.0	ND	5.0
1,2,4-Trimethylbenzene	ND	1.0	ND	5.0
1,3-Dichlorobenzene	ND	1.0	ND	6.1
1,4-Dichlorobenzene	ND	1.0	ND	6.1
Benzyl chloride	ND	1.0	ND	5.3
1,2-Dichlorobenzene	ND	1.0	ND	6.1
1,2,4-Trichlorobenzene	ND	1.0	ND	7.5
Hexachlorobutadiene	ND	1.0	ND	11
Naphthalene	ND	4.1	ND	21

Surrogate	%REC	Limits
Bromofluorobenzene	76	74-136

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 #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Field ID:	SG-119	Diln Fac:	1.770
Lab ID:	232029-004	Batch#:	180766
Matrix:	Air	Sampled:	10/18/11
Units (V):	ppbv	Received:	10/18/11
Units (M):	ug/m3	Analyzed:	11/02/11

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.89	ND	4.4
Freon 114	ND	0.89	ND	6.2
Chloromethane	ND	0.89	ND	1.8
Vinyl Chloride	ND	0.89	ND	2.3
1,3-Butadiene	ND	0.89	ND	2.0
Bromomethane	ND	0.89	ND	3.4
Chloroethane	ND	0.89	ND	2.3
Trichlorofluoromethane	ND	0.89	ND	5.0
Acrolein	ND	3.5	ND	8.1
1,1-Dichloroethene	ND	0.89	ND	3.5
Freon 113	ND	0.89	ND	6.8
Acetone	ND	3.5	ND	8.4
Carbon Disulfide	1.9	0.89	5.8	2.8
Methylene Chloride	ND	0.89	ND	3.1
trans-1,2-Dichloroethene	ND	0.89	ND	3.5
MTBE	ND	0.89	ND	3.2
n-Hexane	ND	0.89	ND	3.1
1,1-Dichloroethane	ND	0.89	ND	3.6
Vinyl Acetate	ND	0.89	ND	3.1
cis-1,2-Dichloroethene	ND	0.89	ND	3.5
2-Butanone	ND	0.89	ND	2.6
Ethyl Acetate	ND	0.89	ND	3.2
Tetrahydrofuran	ND	0.89	ND	2.6
Chloroform	ND	0.89	ND	4.3
1,1,1-Trichloroethane	ND	0.89	ND	4.8
Cyclohexane	ND	0.89	ND	3.0
Carbon Tetrachloride	ND	0.89	ND	5.6
Benzene	ND	0.89	ND	2.8
1,2-Dichloroethane	ND	0.89	ND	3.6
n-Heptane	ND	0.89	ND	3.6
Trichloroethene	2.9	0.89	15	4.8
1,2-Dichloropropane	ND	0.89	ND	4.1
Bromodichloromethane	ND	0.89	ND	5.9
cis-1,3-Dichloropropene	ND	0.89	ND	4.0
4-Methyl-2-Pentanone	ND	0.89	ND	3.6

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 #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Field ID:	SG-119	Diln Fac:	1.770
Lab ID:	232029-004	Batch#:	180766
Matrix:	Air	Sampled:	10/18/11
Units (V):	ppbv	Received:	10/18/11
Units (M):	ug/m3	Analyzed:	11/02/11

Analyte	Result (V)	RL	Result (M)	RL
Toluene	ND	0.89	ND	3.3
trans-1,3-Dichloropropene	ND	0.89	ND	4.0
1,1,2-Trichloroethane	ND	0.89	ND	4.8
Tetrachloroethene	ND	0.89	ND	6.0
2-Hexanone	ND	0.89	ND	3.6
Dibromochloromethane	ND	0.89	ND	7.5
1,2-Dibromoethane	ND	0.89	ND	6.8
Chlorobenzene	ND	0.89	ND	4.1
Ethylbenzene	ND	0.89	ND	3.8
m,p-Xylenes	ND	0.89	ND	3.8
o-Xylene	ND	0.89	ND	3.8
Styrene	ND	0.89	ND	3.8
Bromoform	ND	0.89	ND	9.1
1,1,2,2-Tetrachloroethane	ND	0.89	ND	6.1
4-Ethyltoluene	ND	0.89	ND	4.4
1,3,5-Trimethylbenzene	ND	0.89	ND	4.4
1,2,4-Trimethylbenzene	ND	0.89	ND	4.4
1,3-Dichlorobenzene	ND	0.89	ND	5.3
1,4-Dichlorobenzene	ND	0.89	ND	5.3
Benzyl chloride	ND	0.89	ND	4.6
1,2-Dichlorobenzene	ND	0.89	ND	5.3
1,2,4-Trichlorobenzene	ND	0.89	ND	6.6
Hexachlorobutadiene	ND	0.89	ND	9.4
Naphthalene	ND	3.5	ND	19

Surrogate	%REC	Limits
Bromofluorobenzene	103	74-136

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 #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Field ID:	SG-118	Diln Fac:	1.860
Lab ID:	232029-005	Batch#:	180825
Matrix:	Air	Sampled:	10/18/11
Units (V):	ppbv	Received:	10/18/11
Units (M):	ug/m3	Analyzed:	11/02/11

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.93	ND	4.6
Freon 114	ND	0.93	ND	6.5
Chloromethane	ND	0.93	ND	1.9
Vinyl Chloride	ND	0.93	ND	2.4
1,3-Butadiene	ND	0.93	ND	2.1
Bromomethane	ND	0.93	ND	3.6
Chloroethane	ND	0.93	ND	2.5
Trichlorofluoromethane	ND	0.93	ND	5.2
Acrolein	ND	3.7	ND	8.5
1,1-Dichloroethene	ND	0.93	ND	3.7
Freon 113	ND	0.93	ND	7.1
Acetone	ND	3.7	ND	8.8
Carbon Disulfide	ND	0.93	ND	2.9
Methylene Chloride	0.98	0.93	3.4	3.2
trans-1,2-Dichloroethene	ND	0.93	ND	3.7
MTBE	ND	0.93	ND	3.4
n-Hexane	21	0.93	75	3.3
1,1-Dichloroethane	ND	0.93	ND	3.8
Vinyl Acetate	ND	0.93	ND	3.3
cis-1,2-Dichloroethene	ND	0.93	ND	3.7
2-Butanone	ND	0.93	ND	2.7
Ethyl Acetate	ND	0.93	ND	3.4
Tetrahydrofuran	ND	0.93	ND	2.7
Chloroform	ND	0.93	ND	4.5
1,1,1-Trichloroethane	ND	0.93	ND	5.1
Cyclohexane	ND	0.93	ND	3.2
Carbon Tetrachloride	ND	0.93	ND	5.9
Benzene	ND	0.93	ND	3.0
1,2-Dichloroethane	ND	0.93	ND	3.8
n-Heptane	ND	0.93	ND	3.8
Trichloroethene	ND	0.93	ND	5.0
1,2-Dichloropropane	ND	0.93	ND	4.3
Bromodichloromethane	ND	0.93	ND	6.2
cis-1,3-Dichloropropene	ND	0.93	ND	4.2
4-Methyl-2-Pentanone	ND	0.93	ND	3.8

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 #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Field ID:	SG-118	Diln Fac:	1.860
Lab ID:	232029-005	Batch#:	180825
Matrix:	Air	Sampled:	10/18/11
Units (V):	ppbv	Received:	10/18/11
Units (M):	ug/m3	Analyzed:	11/02/11

Analyte	Result (V)	RL	Result (M)	RL
Toluene	ND	0.93	ND	3.5
trans-1,3-Dichloropropene	ND	0.93	ND	4.2
1,1,2-Trichloroethane	ND	0.93	ND	5.1
Tetrachloroethene	ND	0.93	ND	6.3
2-Hexanone	ND	0.93	ND	3.8
Dibromochloromethane	ND	0.93	ND	7.9
1,2-Dibromoethane	ND	0.93	ND	7.1
Chlorobenzene	ND	0.93	ND	4.3
Ethylbenzene	ND	0.93	ND	4.0
m,p-Xylenes	ND	0.93	ND	4.0
o-Xylene	ND	0.93	ND	4.0
Styrene	ND	0.93	ND	4.0
Bromoform	ND	0.93	ND	9.6
1,1,2,2-Tetrachloroethane	ND	0.93	ND	6.4
4-Ethyltoluene	ND	0.93	ND	4.6
1,3,5-Trimethylbenzene	ND	0.93	ND	4.6
1,2,4-Trimethylbenzene	ND	0.93	ND	4.6
1,3-Dichlorobenzene	ND	0.93	ND	5.6
1,4-Dichlorobenzene	ND	0.93	ND	5.6
Benzyl chloride	ND	0.93	ND	4.8
1,2-Dichlorobenzene	ND	0.93	ND	5.6
1,2,4-Trichlorobenzene	ND	0.93	ND	6.9
Hexachlorobutadiene	ND	0.93	ND	9.9
Naphthalene	ND	3.7	ND	20

Surrogate	%REC	Limits
Bromofluorobenzene	100	74-136

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

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC616511	Diln Fac:	1.000
Matrix:	Air	Batch#:	180766
Units (V):	ppbv	Analyzed:	11/01/11

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	0.50	ND	1.5
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3
4-Methyl-2-Pentanone	ND	0.50	ND	2.0

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

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC616511	Diln Fac:	1.000
Matrix:	Air	Batch#:	180766
Units (V):	ppbv	Analyzed:	11/01/11

Analyte	Result (V)	RL	Result (M)	RL
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	103	70-136

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

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	180766
Units (V):	ppbv	Analyzed:	11/01/11
Diln Fac:	1.000		

Type: BS Lab ID: QC616512

Analyte	Spiked	Result (V)	%REC	Limits
Freon 12	10.00	8.863	89	70-130
Freon 114	10.00	9.387	94	70-130
Chloromethane	10.00	9.014	90	70-130
Vinyl Chloride	10.00	9.336	93	70-130
1,3-Butadiene	10.00	9.521	95	70-130
Bromomethane	10.00	9.165	92	70-130
Chloroethane	10.00	8.317	83	70-130
Trichlorofluoromethane	10.00	9.004	90	70-130
Acrolein	10.00	8.284	83	70-136
1,1-Dichloroethene	10.00	8.540	85	70-130
Freon 113	10.00	8.660	87	70-130
Acetone	10.00	8.904	89	70-130
Carbon Disulfide	10.00	8.489	85	70-130
Methylene Chloride	10.00	8.423	84	70-130
trans-1,2-Dichloroethene	10.00	9.183	92	70-130
MTBE	10.00	8.762	88	70-130
n-Hexane	10.00	8.506	85	70-130
1,1-Dichloroethane	10.00	8.532	85	70-130
Vinyl Acetate	10.00	8.288	83	70-130
cis-1,2-Dichloroethene	10.00	8.786	88	70-130
2-Butanone	10.00	9.013	90	70-130
Ethyl Acetate	10.00	9.540	95	70-130
Tetrahydrofuran	10.00	9.884	99	70-130
Chloroform	10.00	8.641	86	70-130
1,1,1-Trichloroethane	10.00	9.499	95	70-130
Cyclohexane	10.00	9.306	93	70-130
Carbon Tetrachloride	10.00	9.495	95	70-130
Benzene	10.00	9.392	94	70-130
1,2-Dichloroethane	10.00	9.272	93	70-130
n-Heptane	10.00	8.698	87	70-130
Trichloroethene	10.00	9.004	90	70-130
1,2-Dichloropropane	10.00	9.462	95	70-130
Bromodichloromethane	10.00	9.346	93	70-130
cis-1,3-Dichloropropene	10.00	9.218	92	70-130

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

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	180766
Units (V):	ppbv	Analyzed:	11/01/11
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
4-Methyl-2-Pentanone	10.00	9.774	98	70-130
Toluene	10.00	8.539	85	70-130
trans-1,3-Dichloropropene	10.00	9.372	94	70-130
1,1,2-Trichloroethane	10.00	9.095	91	70-130
Tetrachloroethene	10.00	8.737	87	70-130
2-Hexanone	10.00	9.450	95	70-134
Dibromochloromethane	10.00	9.316	93	70-130
1,2-Dibromoethane	10.00	9.110	91	70-130
Chlorobenzene	10.00	8.309	83	70-130
Ethylbenzene	10.00	7.807	78	70-130
m,p-Xylenes	20.00	16.23	81	70-130
o-Xylene	10.00	8.715	87	70-130
Styrene	10.00	8.599	86	70-130
Bromoform	10.00	9.045	90	70-130
1,1,2,2-Tetrachloroethane	10.00	9.205	92	70-130
4-Ethyltoluene	10.00	9.255	93	70-130
1,3,5-Trimethylbenzene	10.00	9.099	91	70-130
1,2,4-Trimethylbenzene	10.00	9.456	95	70-130
1,3-Dichlorobenzene	10.00	8.688	87	70-130
1,4-Dichlorobenzene	10.00	8.695	87	70-130
Benzyl chloride	10.00	7.850	79	70-130
1,2-Dichlorobenzene	10.00	8.684	87	70-130
1,2,4-Trichlorobenzene	10.00	9.199	92	70-130
Hexachlorobutadiene	10.00	8.796	88	70-130
Naphthalene	10.00	8.359	84	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	101	70-136

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

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	180766
Units (V):	ppbv	Analyzed:	11/01/11
Diln Fac:	1.000		

Type: BSD Lab ID: QC616513

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Freon 12	10.00	9.057	91	70-130	2	20
Freon 114	10.00	9.606	96	70-130	2	20
Chloromethane	10.00	9.398	94	70-130	4	20
Vinyl Chloride	10.00	9.346	93	70-130	0	20
1,3-Butadiene	10.00	9.931	99	70-130	4	20
Bromomethane	10.00	9.382	94	70-130	2	20
Chloroethane	10.00	8.497	85	70-130	2	20
Trichlorofluoromethane	10.00	9.128	91	70-130	1	20
Acrolein	10.00	8.227	82	70-136	1	20
1,1-Dichloroethene	10.00	8.683	87	70-130	2	20
Freon 113	10.00	8.824	88	70-130	2	20
Acetone	10.00	8.893	89	70-130	0	20
Carbon Disulfide	10.00	8.679	87	70-130	2	20
Methylene Chloride	10.00	8.450	85	70-130	0	20
trans-1,2-Dichloroethene	10.00	9.380	94	70-130	2	20
MTBE	10.00	9.004	90	70-130	3	20
n-Hexane	10.00	8.684	87	70-130	2	20
1,1-Dichloroethane	10.00	8.579	86	70-130	1	20
Vinyl Acetate	10.00	8.369	84	70-130	1	20
cis-1,2-Dichloroethene	10.00	9.054	91	70-130	3	20
2-Butanone	10.00	9.248	92	70-130	3	20
Ethyl Acetate	10.00	9.805	98	70-130	3	20
Tetrahydrofuran	10.00	9.959	100	70-130	1	20
Chloroform	10.00	8.844	88	70-130	2	20
1,1,1-Trichloroethane	10.00	9.611	96	70-130	1	20
Cyclohexane	10.00	9.739	97	70-130	5	20
Carbon Tetrachloride	10.00	9.804	98	70-130	3	20
Benzene	10.00	9.642	96	70-130	3	20
1,2-Dichloroethane	10.00	9.587	96	70-130	3	20
n-Heptane	10.00	8.625	86	70-130	1	20
Trichloroethene	10.00	9.378	94	70-130	4	20
1,2-Dichloropropane	10.00	9.840	98	70-130	4	20
Bromodichloromethane	10.00	9.660	97	70-130	3	20
cis-1,3-Dichloropropene	10.00	9.569	96	70-130	4	20

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

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	180766
Units (V):	ppbv	Analyzed:	11/01/11
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
4-Methyl-2-Pentanone	10.00	9.857	99	70-130	1	20
Toluene	10.00	8.665	87	70-130	1	20
trans-1,3-Dichloropropene	10.00	9.411	94	70-130	0	20
1,1,2-Trichloroethane	10.00	9.428	94	70-130	4	20
Tetrachloroethene	10.00	9.053	91	70-130	4	20
2-Hexanone	10.00	9.510	95	70-134	1	20
Dibromochloromethane	10.00	9.822	98	70-130	5	20
1,2-Dibromoethane	10.00	9.487	95	70-130	4	20
Chlorobenzene	10.00	8.544	85	70-130	3	20
Ethylbenzene	10.00	8.140	81	70-130	4	20
m,p-Xylenes	20.00	17.30	86	70-130	6	20
o-Xylene	10.00	9.155	92	70-130	5	20
Styrene	10.00	8.982	90	70-130	4	20
Bromoform	10.00	9.391	94	70-130	4	20
1,1,2,2-Tetrachloroethane	10.00	9.196	92	70-130	0	20
4-Ethyltoluene	10.00	9.671	97	70-130	4	20
1,3,5-Trimethylbenzene	10.00	9.402	94	70-130	3	20
1,2,4-Trimethylbenzene	10.00	9.696	97	70-130	3	20
1,3-Dichlorobenzene	10.00	9.132	91	70-130	5	20
1,4-Dichlorobenzene	10.00	9.251	93	70-130	6	20
Benzyl chloride	10.00	8.189	82	70-130	4	20
1,2-Dichlorobenzene	10.00	9.036	90	70-130	4	20
1,2,4-Trichlorobenzene	10.00	8.114	81	70-130	13	20
Hexachlorobutadiene	10.00	8.770	88	70-130	0	20
Naphthalene	10.00	7.724	77	70-130	8	24

Surrogate	%REC	Limits
Bromofluorobenzene	104	70-136

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

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	180825
Units (V):	ppbv	Analyzed:	11/02/11
Diln Fac:	1.000		

Type: BS Lab ID: QC616757

Analyte	Spiked	Result (V)	%REC	Limits
Freon 12	10.00	9.185	92	70-130
Freon 114	10.00	9.547	95	70-130
Chloromethane	10.00	9.422	94	70-130
Vinyl Chloride	10.00	9.243	92	70-130
1,3-Butadiene	10.00	9.911	99	70-130
Bromomethane	10.00	9.134	91	70-130
Chloroethane	10.00	8.359	84	70-130
Trichlorofluoromethane	10.00	9.059	91	70-130
Acrolein	10.00	8.300	83	70-136
1,1-Dichloroethene	10.00	8.691	87	70-130
Freon 113	10.00	8.918	89	70-130
Acetone	10.00	9.168	92	70-130
Carbon Disulfide	10.00	8.569	86	70-130
Methylene Chloride	10.00	8.557	86	70-130
trans-1,2-Dichloroethene	10.00	9.086	91	70-130
MTBE	10.00	8.937	89	70-130
n-Hexane	10.00	8.325	83	70-130
1,1-Dichloroethane	10.00	8.622	86	70-130
Vinyl Acetate	10.00	8.027	80	70-130
cis-1,2-Dichloroethene	10.00	8.752	88	70-130
2-Butanone	10.00	9.035	90	70-130
Ethyl Acetate	10.00	9.407	94	70-130
Tetrahydrofuran	10.00	10.89	109	70-130
Chloroform	10.00	8.725	87	70-130
1,1,1-Trichloroethane	10.00	10.40	104	70-130
Cyclohexane	10.00	10.56	106	70-130
Carbon Tetrachloride	10.00	10.49	105	70-130
Benzene	10.00	9.877	99	70-130
1,2-Dichloroethane	10.00	10.21	102	70-130
n-Heptane	10.00	9.174	92	70-130
Trichloroethene	10.00	9.667	97	70-130
1,2-Dichloropropane	10.00	10.30	103	70-130
Bromodichloromethane	10.00	10.16	102	70-130
cis-1,3-Dichloropropene	10.00	9.526	95	70-130

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

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	180825
Units (V):	ppbv	Analyzed:	11/02/11
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
4-Methyl-2-Pentanone	10.00	10.47	105	70-130
Toluene	10.00	8.678	87	70-130
trans-1,3-Dichloropropene	10.00	9.366	94	70-130
1,1,2-Trichloroethane	10.00	9.632	96	70-130
Tetrachloroethene	10.00	9.164	92	70-130
2-Hexanone	10.00	9.792	98	70-134
Dibromochloromethane	10.00	9.866	99	70-130
1,2-Dibromoethane	10.00	9.294	93	70-130
Chlorobenzene	10.00	8.445	84	70-130
Ethylbenzene	10.00	8.490	85	70-130
m,p-Xylenes	20.00	17.78	89	70-130
o-Xylene	10.00	9.595	96	70-130
Styrene	10.00	9.422	94	70-130
Bromoform	10.00	9.455	95	70-130
1,1,2,2-Tetrachloroethane	10.00	9.316	93	70-130
4-Ethyltoluene	10.00	10.18	102	70-130
1,3,5-Trimethylbenzene	10.00	10.31	103	70-130
1,2,4-Trimethylbenzene	10.00	10.57	106	70-130
1,3-Dichlorobenzene	10.00	9.705	97	70-130
1,4-Dichlorobenzene	10.00	9.829	98	70-130
Benzyl chloride	10.00	8.406	84	70-130
1,2-Dichlorobenzene	10.00	9.833	98	70-130
1,2,4-Trichlorobenzene	10.00	9.669	97	70-130
Hexachlorobutadiene	10.00	9.411	94	70-130
Naphthalene	10.00	9.069	91	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	106	70-136

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

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	180825
Units (V):	ppbv	Analyzed:	11/02/11
Diln Fac:	1.000		

Type: BSD Lab ID: QC616758

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Freon 12	10.00	9.056	91	70-130	1	20
Freon 114	10.00	9.274	93	70-130	3	20
Chloromethane	10.00	9.494	95	70-130	1	20
Vinyl Chloride	10.00	9.233	92	70-130	0	20
1,3-Butadiene	10.00	9.864	99	70-130	0	20
Bromomethane	10.00	9.027	90	70-130	1	20
Chloroethane	10.00	8.352	84	70-130	0	20
Trichlorofluoromethane	10.00	8.768	88	70-130	3	20
Acrolein	10.00	8.358	84	70-136	1	20
1,1-Dichloroethene	10.00	8.555	86	70-130	2	20
Freon 113	10.00	8.712	87	70-130	2	20
Acetone	10.00	8.857	89	70-130	3	20
Carbon Disulfide	10.00	8.553	86	70-130	0	20
Methylene Chloride	10.00	8.392	84	70-130	2	20
trans-1,2-Dichloroethene	10.00	9.355	94	70-130	3	20
MTBE	10.00	8.998	90	70-130	1	20
n-Hexane	10.00	8.749	87	70-130	5	20
1,1-Dichloroethane	10.00	8.487	85	70-130	2	20
Vinyl Acetate	10.00	8.312	83	70-130	3	20
cis-1,2-Dichloroethene	10.00	8.869	89	70-130	1	20
2-Butanone	10.00	9.251	93	70-130	2	20
Ethyl Acetate	10.00	9.685	97	70-130	3	20
Tetrahydrofuran	10.00	10.10	101	70-130	7	20
Chloroform	10.00	8.636	86	70-130	1	20
1,1,1-Trichloroethane	10.00	9.709	97	70-130	7	20
Cyclohexane	10.00	10.06	101	70-130	5	20
Carbon Tetrachloride	10.00	9.727	97	70-130	8	20
Benzene	10.00	9.583	96	70-130	3	20
1,2-Dichloroethane	10.00	9.667	97	70-130	5	20
n-Heptane	10.00	9.074	91	70-130	1	20
Trichloroethene	10.00	9.459	95	70-130	2	20
1,2-Dichloropropane	10.00	10.08	101	70-130	2	20
Bromodichloromethane	10.00	9.708	97	70-130	5	20
cis-1,3-Dichloropropene	10.00	9.676	97	70-130	2	20

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

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	180825
Units (V):	ppbv	Analyzed:	11/02/11
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
4-Methyl-2-Pentanone	10.00	10.27	103	70-130	2	20
Toluene	10.00	8.592	86	70-130	1	20
trans-1,3-Dichloropropene	10.00	9.623	96	70-130	3	20
1,1,2-Trichloroethane	10.00	9.507	95	70-130	1	20
Tetrachloroethene	10.00	8.925	89	70-130	3	20
2-Hexanone	10.00	9.559	96	70-134	2	20
Dibromochloromethane	10.00	9.620	96	70-130	3	20
1,2-Dibromoethane	10.00	9.267	93	70-130	0	20
Chlorobenzene	10.00	8.431	84	70-130	0	20
Ethylbenzene	10.00	8.089	81	70-130	5	20
m,p-Xylenes	20.00	16.89	84	70-130	5	20
o-Xylene	10.00	9.096	91	70-130	5	20
Styrene	10.00	8.652	87	70-130	9	20
Bromoform	10.00	9.261	93	70-130	2	20
1,1,2,2-Tetrachloroethane	10.00	9.059	91	70-130	3	20
4-Ethyltoluene	10.00	9.502	95	70-130	7	20
1,3,5-Trimethylbenzene	10.00	9.272	93	70-130	11	20
1,2,4-Trimethylbenzene	10.00	9.540	95	70-130	10	20
1,3-Dichlorobenzene	10.00	9.156	92	70-130	6	20
1,4-Dichlorobenzene	10.00	9.176	92	70-130	7	20
Benzyl chloride	10.00	8.076	81	70-130	4	20
1,2-Dichlorobenzene	10.00	8.852	89	70-130	11	20
1,2,4-Trichlorobenzene	10.00	8.124	81	70-130	17	20
Hexachlorobutadiene	10.00	8.602	86	70-130	9	20
Naphthalene	10.00	7.674	77	70-130	17	24

Surrogate	%REC	Limits
Bromofluorobenzene	103	70-136

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

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC616759	Diln Fac:	1.000
Matrix:	Air	Batch#:	180825
Units (V):	ppbv	Analyzed:	11/02/11

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	0.50	ND	1.5
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3
4-Methyl-2-Pentanone	ND	0.50	ND	2.0

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

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC616759	Diln Fac:	1.000
Matrix:	Air	Batch#:	180825
Units (V):	ppbv	Analyzed:	11/02/11

Analyte	Result (V)	RL	Result (M)	RL
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	103	70-136

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

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	ASTM D1946
Analyte:	Helium	Sampled:	10/18/11
Matrix:	Air	Received:	10/18/11
Units:	ppmv	Analyzed:	10/19/11
Batch#:	180257		

Field ID	Type	Lab ID	Result	RL	Diln Fac
SG-122	SAMPLE	232029-001	ND	1,700	1.740
SG-120	SAMPLE	232029-002	ND	1,700	1.700
SG-121	SAMPLE	232029-003	ND	2,000	2.030
SG-119	SAMPLE	232029-004	ND	1,800	1.770
SG-118	SAMPLE	232029-005	ND	1,900	1.860
	BLANK	QC614464	ND	1,000	1.000

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	232029	Location:	UC Boundary
Client:	Terraphase Engineering	Prep:	METHOD
Project#:	0009.002.005	Analysis:	ASTM D1946
Analyte:	Helium	Diln Fac:	1.000
Matrix:	Air	Batch#:	180257
Units:	ppmv	Analyzed:	10/19/11

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC614462	100,000	102,400	102	70-130		
BSD	QC614463	100,000	98,470	98	70-130	4	20

RPD= Relative Percent Difference