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May 23, 2013

RECEIVED
By Alameda County Environmental Health at 2:34 pm, May 29, 2013

Mr. Jerry Wickham, PG
Senior Hazardous Materials Specialist
Alameda County Health Care Services Agency
Environmental Health Services
Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Re: Workplan for Groundwater Investigation Monitoring Well Installation, Vapor Point Destruction, and Excavation Closure
P&D 23rd Avenue Associates
1125 Miller Avenue, Oakland, CA
Clearwater Project No. CB018H
ACEH Fuel Case Leak No. RO0000294

Dear Mr. Wickham,

As the legally authorized representative of the above-referenced project location I have reviewed the attached report prepared by my consultant of record, Clearwater Group. I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document are true and correct to the best of my knowledge.

Sincerely,

John Protopappas

CLEARWATER GROUP
Environmental Services

WORKPLAN FOR GROUNDWATER INVESTIGATION MONITORING WELL INSTALLATION, VAPOR POINT DESTRUCTION, AND EXCAVATION CLOSURE

P&D 23rd Avenue Associates LLC
(Formerly 23rd Avenue Partners)
1125 Miller Avenue
Oakland, California

Prepared by

CLEARWATER GROUP

for

Mr. John Protopappas
P&D 23rd Avenue Associates LLC
(Formerly 23rd Avenue Partners)
Global ID # T0600177455

May 23, 2013

229 Tewksbury Avenue ◆ Point Richmond, California 94801 ◆ Telephone: 510-307-9943 ◆ Fax: 510-232-2823

INTRODUCTION

Clearwater Group (Clearwater) is pleased to submit this *Workplan for Groundwater Investigation, Monitoring Well Installation, Soil Vapor Point Destruction, and Excavation Closure (Workplan)* for the property located at 1125 Miller Avenue, Oakland, California (*Site*) (**Figures 1** and **2**). This *Workplan* is in response to a meeting conducted at the Alameda County Environmental Health Services (ACEH) on November 14, 2011, between Clearwater staff, Mr. Jerry Wickham of the ACEH and Mr. John Protopappas of P&D 23rd Avenue Associates. The purpose of the meeting was to discuss means of completing the *Site* remediation and obtaining *Site* closure. This workplan also responds to ACEH directive letters of December 5, 2012 and March 26, 2013 (**Attachment A**). This report will follow the order of the directives in the March 26, 2013 ACEH letter.

Technical Comment 1

Volatile Organic Compounds (VOCs) in Sub-Slab Soil Vapor

As reported in the Clearwater October 9, 2012, "Update of the Soil Vapor Sample Analytical Report Presented in the Sub-Slab Soil Vapor Sampling Report," tetrachloroethene (PCE) was detected in 3 of 10 sub-slab vapor samples collected on December 9, 2011, at concentrations ranging from 5.7 to 240 micrograms per cubic meter ($\mu g/m^3$). A table with all soil vapor samples to date is presented in **Table 1**. **Figure 3** presents the soil vapor PCE content in plan view. PCE was identified in only 3 locations – soil vapor sampling points SS-1 (5.7 $\mu g/m^3$), SS-4 (130 $\mu g/m^3$), and SS-5 (240 $\mu g/m^3$). All of these locations are situated in the print-shop, a commercial-use area of the structure and all three of these locations are furthest from the residential portion of the structure's ground floor. There are soil vapor points between the three points (in which PCE was detected) and the residential area, and none of them contained PCE. Since the commercial Environmental Screening Limit (ESL) for PCE is 2,100 $\mu g/m^3$, the risk threshold to human health is not reached in this setting for this compound at any of the points. The rest of the detected compounds do not exceed the residential or commercial ESL's. Clearwater proposes destroying the soil vapor points by removing the points by chiseling the points out and sealing the annular space with neat cement (Portland II), and the surface will be finished with concrete.

Technical Comment 2

Volatile Organic Compounds (VOC's) in Groundwater

Groundwater samples obtained at this *Site* have been limited to grab groundwater samples (see **Table 2**). These samples have been limited to the analysis for petroleum hydrocarbon constituents only.

Due to the use of solvents as identified in the Clearwater "Historical Property Uses" Report of December 1, 2010 and as requested in the June 18, 2012 ACEH directive letter, Clearwater requested an update of the Air Toxics' laboratory reporting of analyzed samples collected on December 8, 2011, and December 9, 2011. This reporting included

the EPA method TO-15 full scan (only total petroleum hydrocarbons as gasoline (TPH-g), benzene, toluene, ethylbenzene and xylene (BTEX), and fuel oxygenates were previously reported). The lab was able to report that three of the soil vapor samples did contain PCE.

Due to the detection of PCE in these three sub-slab soil vapor samples (SS-1, 4, 5), PCE was identified as a chemical of concern for the *Site*. In the March 26, 2013 ACEH letter, "the collection of a limited number of groundwater samples for VOC analysis is to be included in the work plan…." A proposal for the installation of five groundwater monitoring wells is covered in Technical Comment 4, below.

Technical Comment 3
Residual Diesel Contamination in the Dispenser Room Area
Analysis of the Dispenser Room Area soil samples indicates that elevated concentrations of total petroleum hydrocarbons as diesel (TPH-d) remain in place beneath the western end of the building (see **Table 3**). Based on low threat closure policy (LTCP) thresholds, the residual hydrocarbon contamination in soil does not pose a health risk.

In addition, TPH-d vapor does not pose a human health risk for vapor intrusion to the western end of the building. Soil vapor samples from location SS-1, closely proximal to the current open excavation, show levels of TPH-d below the ESL. Levels of all other reported constituents are below the laboratory reporting levels. While TPH-d in soil persists, gasoline was not detected in excavation confirmation soil samples. For these reasons, capping the residual contamination area in the dispenser room is consistent with LTCP guidelines.

Information about the hand excavation in the dispenser room was presented in Clearwater's *Sub-Slab Excavation Report*, dated November 8, 2012. For the sub-slab excavation, five confirmation soil samples were collected on 10/16/12. The confirmation sample locations are shown on **Figure 4**.

Clearwater proposes to complete the dispenser room excavation project in the 1125 Miller Avenue building. The excavation was dug to partially remove contaminated, odorous, soil from beneath the dispenser room's concrete slab floor. A total of three 55-gallon drums of impacted soil were removed during the excavation event.

The following five options for closing the dispenser room excavation were discussed during the November 14, 2012, meeting:

Option 1: *Increase the volume of the excavation by hand digging to remove more highly contaminated soil. Undermining the building foundation would limit the extent of the excavation. The excavation would entail jackhammering to remove underlying concrete rubble and fill soil.*

Comments: As the residual is low risk, capping the residual impacted soil is preferred to assuming the risk of compromising the building's foundation with additional excavation.

Option 2: *Treat the contaminated soil in place using oxidants or other remedial compounds. This would require a bench test to ensure that metals are not liberated to groundwater during the treatment. The site was formerly a metals foundry.*

Comments: Capping the mass is preferred to potentially releasing metals to the groundwater by changing the subsurface geochemistry by the addition of chemical oxidants.

Option 3: *Install a passive soil venting system. The excavation would be filled with non-cohesive permeable material with a PVC slotted casing installed within it. The casing would be connected to a passive soil vent on the side of the building. Passive venting should be addressed by the Bay Area Air Quality Management District (BAAQMD) requirements for permits and notifications. The passive soil venting system would be capped by a concrete floor.*

Comments: Due to the low potential for volatilization of the residual diesel and low permeability soil, a Geo-Seal membrane and a cap of 2.5 feet of CDF both covered with a concrete pad with a rebar network secured into the existing pad edges and sealed with a surfacing system should prevent soil vapor migration. This solution will require no maintenance.

Option 4: *Fill the current excavation with controlled density fill. This is an engineered, pourable, self-leveling fill with low permeability.*

Comments: This option is the "cap" and is favored due to the ease of construction, relatively-low cost, reduction in expected migration of soil vapors, and lack of apparatus or facilities to maintain (see **Figure 5** for proposed "cap" construction). In addition, the Controlled Density Fill (CDF) may be excavated at a later date, if required. The controlled density fill will be overlain by an advanced composite gas vapor barrier, such as Geo-SealTM (**Attachment B**).

Option 5: *Reinstall the concrete floor using concrete with a vapor permeability reducing additive, such as Retro-Coat*.

Comments: This option was favored as complementing Option #4, and would further reduce the potential of soil vapors migrating into the building.

Discussion of Materials to be Used to Fill Excavation

Controlled Density Fill

Controlled Density Fill (CDF) is a self-compacting, cementitious material used primarily as a backfill in lieu of compacted backfill. Several terms are currently used to describe this material, including flowable fill, controlled low-strength material, flowable mortar, plastic soil-cement, soil-cement slurry, and K-Krete. CDF is defined as a material that results in a compressive strength of 1,200 psi (8 MPa) or less. Most current applications of CDF require unconfined compressive strengths of 300 psi (2 MPa) or less. This allows for future excavation of the material.

CDF is placed into the excavation as a flowable liquid, yet it hardens and rapidly develops load-bearing properties with no compaction. The properties of flowable fill make it an economical alternative to compacted granular material due to savings of labor and time during placement.

CDF is composed of water, Portland II cement, fine aggregate, fly ash or slag cement. It is a fluid material with a typical slump of 10 inches or more, and has the consistency of a milk shake (the slump is normally determined by a slump test [ASTM C 143] which measures the workability or ease at which wet concrete flows). Like most concrete, CDF may be mixed in central-mix concrete plants, ready-mixed concrete trucks or pugmills (small on-site mixers). Once CDF is transported to the jobsite, the mixture may be placed with chutes, conveyors, buckets, or pumps, depending on the application. CDF is placed continuously in most applications. Internal vibration or compaction is not needed to consolidate mixtures. The flowable characteristics of this material mean it can readily be placed into an excavation and into tight or restricted-access areas where placing and compacting fill is difficult. Its flowability and weight are sufficient for consolidation. Applications that require removal of the CDF at a later date usually limit the maximum compressive strength to less than 200 psi (1.4 MPa).

Geo-Seal

This barrier consists of three layers; a base of geo-textile fabric, a middle layer of a spray-applied sealer, and a protective, proprietary top layer. The top layer protects the seal from punctures and provides a layer of chemical resistance.

Retro-Coat
Retro-Coat is a two-part, odorless, 100% solids coating which is applied over the concrete in two 10-mil coats. Retro-Coat is applied a minimum of 28 days after the concrete is placed.

Summary of Excavation Repair Proposal
The scope of proposed work includes the following updated tasks:

- Fill the dispenser room excavation with CDF level with the base of the existing concrete floor. Approximately 200 gallons (1 cubic yard) of CDF will be ordered from a local concrete supplier. The CDF has a slump of approximately 10 inches and will self-level in the excavation with a minimum of hand leveling. The CDF will be delivered into the excavation from a concrete mixer truck using a chute on the back of the truck. The CDF will be allowed to set for a minimum of 24 hours before applying the Geo-Seal and pouring the concrete floor on top of the CDF.
- Place the Geo-Seal on top of the CDF.
- Replace the concrete floor level with the top of the pre-existing concrete floor. Horizontal reinforcing bars (rebar) dowels will be set into the edges of the sawed concrete floor, and rebar will be used to reinforce the concrete. The original concrete slab did not contain rebar.
- Treat the surface of the replaced concrete with Retro-Coat, a product designed to reduce the vapor permeability of the concrete.
- Dispose of construction debris as non-hazardous waste.
- Include the subsequent Excavation Completion summary in the next report.

Technical Comment 4
Delineation of TPH-d Plume
A soil and groundwater investigation was performed in 2011; this step-out phase did not provide adequate information to establish extent of TPH-d in soil or groundwater. See **Figures 6** and **7** for soil and groundwater extent in plan view. The 2011 step-out grab groundwater samples also did not provide data on groundwater flow direction or gradient, i.e., contaminant migration.

Because there are extensive conduits in the subsurface (**Figure 8**), including but not limited to the estimated 93 potential abandoned wells in a 2,000-foot radius (**Table 4**) (wells identified in the "2,000-Foot-Radius Well Search Report" dated February 21, 2013, by Clearwater), knowledge of the groundwater direction and gradient is required to evaluate potential sensitive receptors.

Groundwater Monitoring Well Installation, Well Development and Sample Collection

Clearwater proposes to install 5 groundwater monitoring wells (**Figure 8**). From release sites to the east and north of the *Site*, the groundwater direction may trend in a west/southwesterly direction. In anticipation of this possibility, the location of the five wells are proposed as follows: upgradient of the former tank pit (MW-3); close but downgradient from the former tank pit (MW-4); and three wells further away from the former tank pit but in the westerly/southwesterly directions (MW-1, MW-2, and MW-5). These wells will confirm groundwater flow direction.

As each well is located either on current or previous city streets, city sidewalks or a former blacksmith (forge), each boring will be cleared by air knife/hand augering to 6 feet bgs. An acetate liner in a tool will be pushed to 25 feet bgs so that the core can be logged.

The groundwater monitoring wells are proposed to be installed with filter packs set between 7 feet bgs and 24 feet bgs (see **Figure 9**). The filter pack and screen are proposed to be set across the *Site* groundwater level, which has an estimated upper level of approximately 17 feet bgs. This estimated groundwater depth is based on the most recent soil and groundwater investigation at the *Site* and on groundwater depth evaluation on data available for nearby sites shown on GeoTracker. Depth-to-groundwater data from the proposed wells will be used to calculate the groundwater elevation iso-contours and gradients to be presented in the future groundwater monitoring reports. Well construction standard operating procedures (SOPs) are provided in **Appendix C**.

Each new well will be developed (after 72 hours) by first bailing sediment from the well, then surging the well with a surge block along the screened interval, followed by bailing and pumping of the well, using a submersible pump, to remove sediment. At least 10 well volumes of groundwater will be removed from each well during development.

The new wells will be surveyed by a California licensed surveyor. The top of well casing elevations will be determined to 1/100 of a foot and referenced to mean sea level.

Groundwater samples will be collected (no sooner than 72 hours after development) from groundwater monitoring wells. The groundwater samples will be collected using EPA-recommended low-flow sampling methods—maintaining a flow rate of less than 500 mL/min and a drawdown of less than 0.3 feet. Low-flow methods are recommended for these soil borings so that interference from suspended sorbed-phase impacts in samples collected from these temporary and non-reproducible sampling points do not alter laboratory findings. The soil borings will be purged using a peristaltic pump with new ¼-inch outside diameter (OD) low-density polyethylene (LDPE) tubing at every

well. Water quality parameters will be collected using a YSI 5600 multi-parameter meter and flow-through cell.

The groundwater samples will be collected by disconnecting or bypassing the flow-through cell and transferring the groundwater directly from the Teflon® tubing to the appropriate lab containers.

If the well is purged dry during low-flow sampling, a groundwater sample will be collected using a check valve and clean tubing as soon as the water level sufficiently recovers to a level at which a sample can be collected.

All groundwater samples will be analyzed for Total Petroleum Hydrocarbons as diesel (TPH-d) by EPA Method 8015; Total Petroleum Hydrocarbons as gasoline (TPH-g); benzene, toluene, ethylbenzene, xylenes (BTEX); volatile organic compounds (VOCs); and halogenated hydrocarbons by method EPA 8260B.

Soil Sample Collection

Continuous soil core samples will be collected from the proposed borings prior to their being converted to a monitoring well. Samples will be screened at four-foot intervals with a photoionization detector (PID) and collected for analysis if the readings are above 100 parts per million as well as within the vadose zone (anticipated at 0–15′), the smear zone (anticipated at 5–17′), and the saturated soils (anticipated at 17′ and below), and for lithologic and hydrogeologic characterization. If discrete impacts are observed, samples will be collected from these locations and screened using PID, visual, and/or olfactory screening. For those soil samples that do not have obvious visual indicators of contamination, acetate liners (drill rig) will be scored every six vertical inches so that olfactory and PID observations can made for screening.

At least two soil samples will be collected from each soil boring/monitoring well for laboratory analysis one at the smear zone and one at depth. If no impacts (visual or PID) are observed, one soil sample will be submitted for laboratory analysis at the interval immediately above the estimated groundwater level. Where impacts are observed, the impacted soil will be collected and sent to a laboratory for analysis.

All soil samples will be analyzed for TPH-d by EPA Method 8015, and TPH-g, BTEX, methyl tert-butyl ether, volatile organic compounds (VOCs), and halogenated hydrocarbons by method EPA 8260B.

Permitting/Health and Safety

Before field activities are initiated, permits for the monitoring wells will be obtained from Alameda County Public Works Agency (ACPWA). Clearwater will obtain an excavation permit from the City of Oakland Building Department for five borings and an encroachment permit from the Department of Public Works to install the four soil borings on City property (park or sidewalk). One of the borings is located on private property. A markout will be done, and Underground Service Alert Network (USAN) will be called for mark-out of utilities at least 10 days before the work.

For the excavation repair, no permits will be required from the ACEH or other agencies. A site-specific Health and Safety Plan (HSP) has already been generated which will cover the activities proposed in this Workplan. The HSP will be signed by the Clearwater project manager and Health & Safety Officer before it is released to the field staff. All field staff will review and sign the HSP before the field activities begin.

For the replacement of the concrete floor it will not be necessary to use Hazardous-Materials (HazMat) certified workers as per CFR 1910.120, as the impacted soil will have been capped by the controlled density fill.

Technical Comment 5
Well Search Report
Clearwater proposes to further delineate the petroleum hydrocarbon plume, identify any impact by volatile organic compounds on the groundwater, identify groundwater direction and gradient, and thereafter perform a door-to-door well survey based on the plume location and migration pattern.

REPORT PREPARATION

The Excavation Completion and Well Installation Report will include a description of the work performed, and manifests for the supplied materials, soil and groundwater samples, as well as Department of Water Resources Form 188 and *Site* photographs. The report will also include figures presenting the excavation filling and concrete floor restoration.

Clearwater's recommendations will indicate any additional risk assessment, remediation techniques, sampling, or investigation that will be required to move the *Site* toward case closure.

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GROUP
Environmental Services

REPORT LIMITATION

All work performed under this contract was directed by a licensed professional. The work was performed in accordance with generally accepted practices at the time the work was performed and completed in accordance with generally acceptable standards. It should be noted that during the course of normal business practices, Clearwater may purchase or use equipment, services, or products in which Clearwater has a professional or financial interest.

This report was prepared under the supervision of a State of California Professional Geologist. Statements, conclusions, and recommendations made in this report are based on information provided to Clearwater, observations of existing *Site* conditions, our general knowledge of the *Site*, limited testing of selected soil and groundwater samples, and interpretations of a limited set of data. Clearwater cannot be held responsible for the accuracy of the analytical work performed by others.

Information and interpretation presented herein are for the use of the client. Third parties should rely upon the information and interpretation contained in this document at their own risk. No other warranties, certifications, or representations, either expressed or implied, are made about the information supplied in this report. The service performed by Clearwater has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the *Site*.

Sincerely,
Clearwater Group

Prepared by:

PROFESSIONAL GEOLOGIST
JAMES ALAN JACOBS
NO. 88
CERTIFIED HYDROGEOLOGIST
STATE OF CALIFORNIA

James A. Jacobs, PG #4815, CHG #88
Chief Hydrogeologist

Reviewed by:

Olivia Jacobs
Chief Executive Officer

FIGURES:

TABLES:

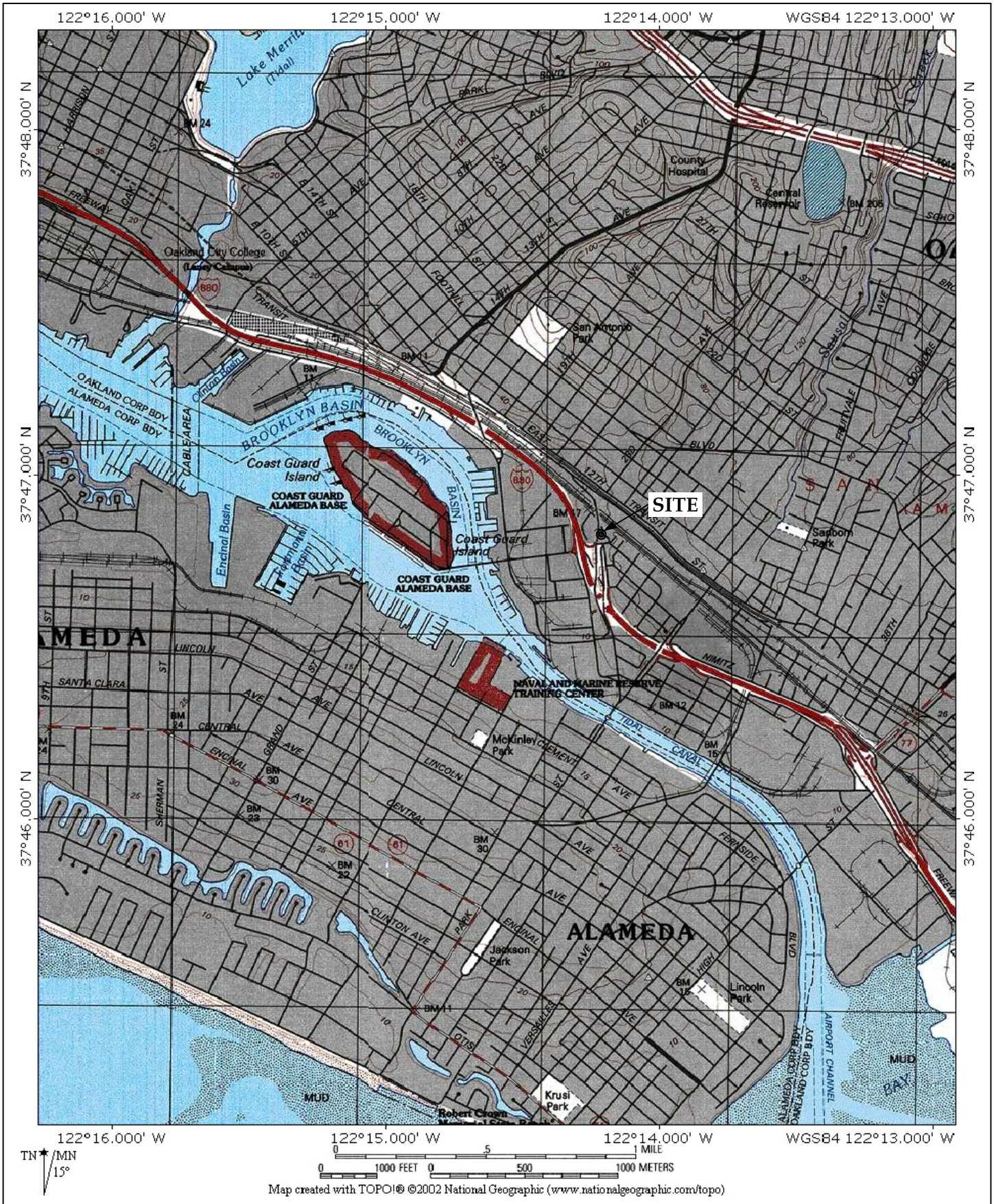
APPENDICES:

DISTRIBUTION

Mr. John Protopappas
Madison Park Financial
155 Grand Avenue, Suite 1025
Oakland, California 94612

Alameda County Environmental Health Services
(Sent via electronic upload to the Geotracker website)

FIGURES



Site Vicinity Map

1125 Miller Avenue
Oakland, California

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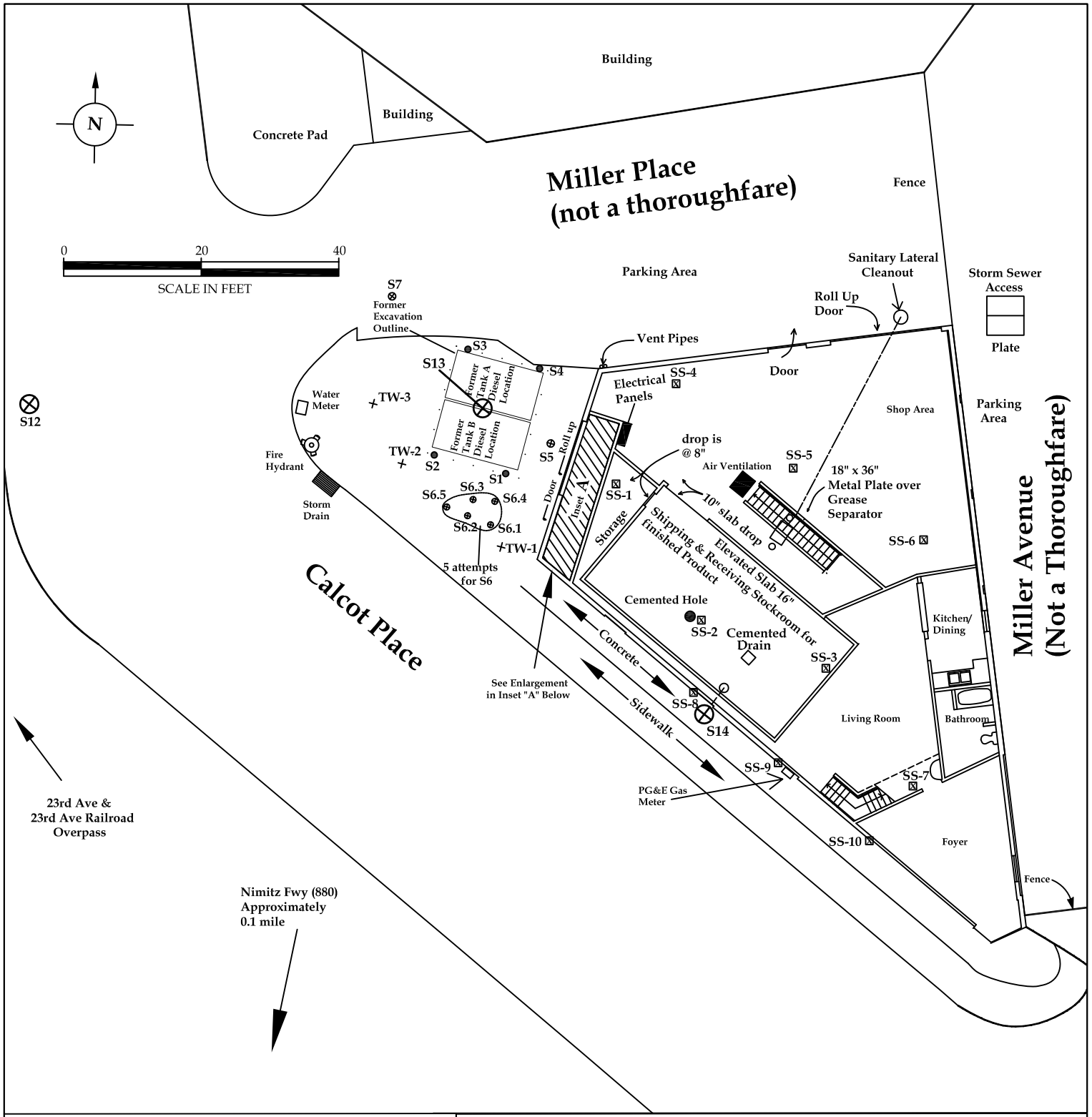
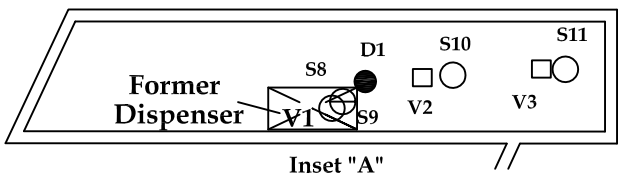
Project No.	Figure Date	Figure
CB018	**05/13**	**1**



LEGEND

⊗ S12-S13	Soil Boring Locations (11/28/11)
⊗–⊖ S14	Slanted Soil Boring Location (11/28/11)
⊠ SS-1-SS-10	Sub-slab Vapor Location (06/17/10, 11/04/10) and 11/10/11)
⊕ S1-S4	Soil Boring Location (12/2/98)
⊕ S5-S8	Soil Boring Location (11/16/05)
● D1	Soil Boring Location (10/24/00)
+ TW-3	Temporary Well (10/24/00)
○ S9-S11	Soil Boring Location (11/15/06)
□ V1-V3	Soil Vapor Location (11/15/06)
. . .	Excavation Outline



Inset "A"

Site Plan

1125 Miller Avenue
Oakland, California

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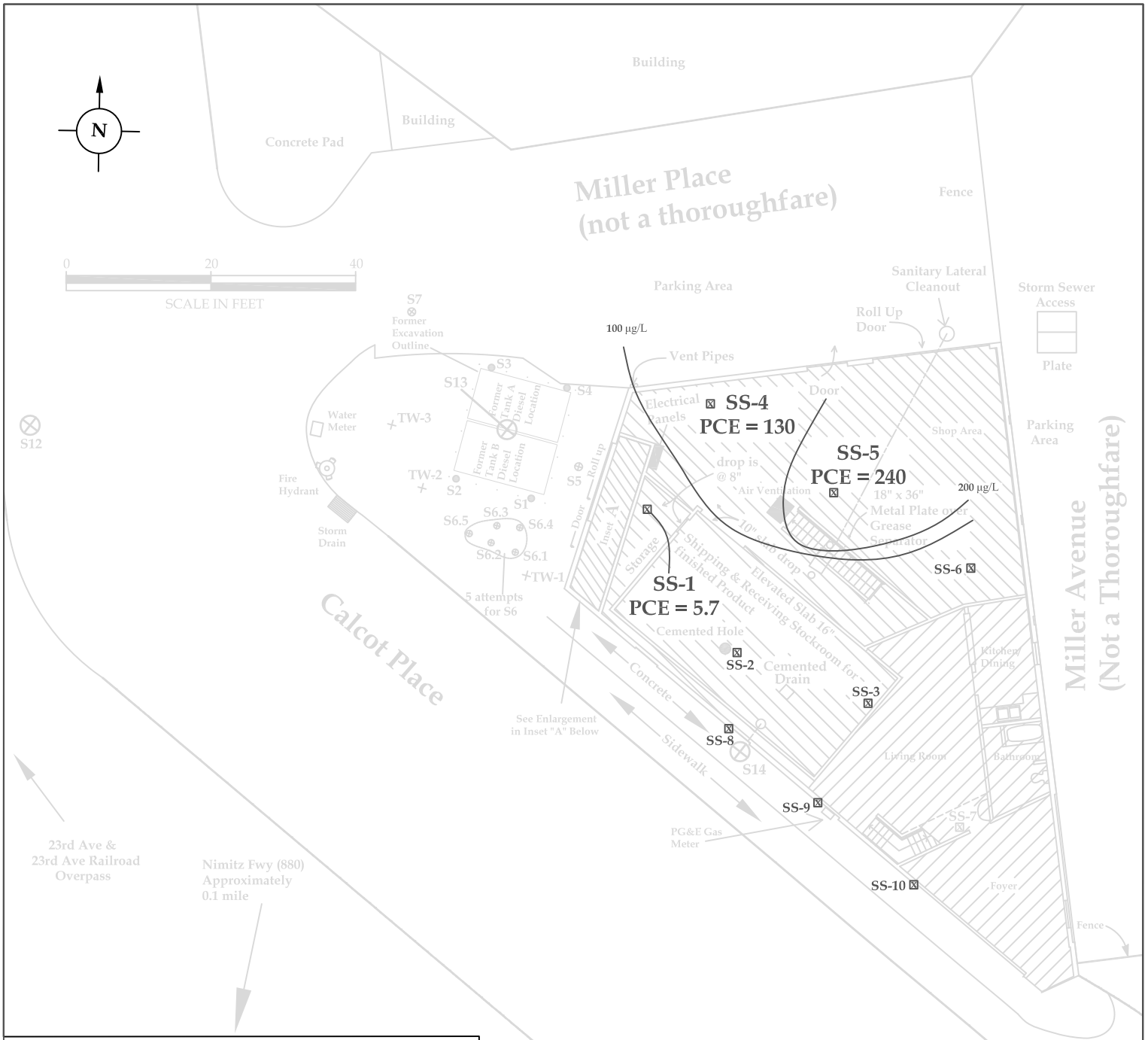
Project No.	Figure Date	Figure
CB018	**05/13**	**2**



LEGEND

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S14	Slanted Soil Boring Location (11/28/11)
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S5-S8	Soil Boring Location (11/16/05)
D1	Soil Boring Location (10/24/00)
TW-3	Temporary Well (10/24/00)
S9-S11	Soil Boring Location (11/15/06)
V1-V3	Soil Vapor Location (11/15/06)
	Excavation Outline
SS-1 PCE = 130	Tetrachloroethylene (PCE) in Soil Vapor (results shown in micrograms per liter)
	Commercial
	Residential

PCE in Soil Vapor

1125 Miller Avenue
Oakland, California

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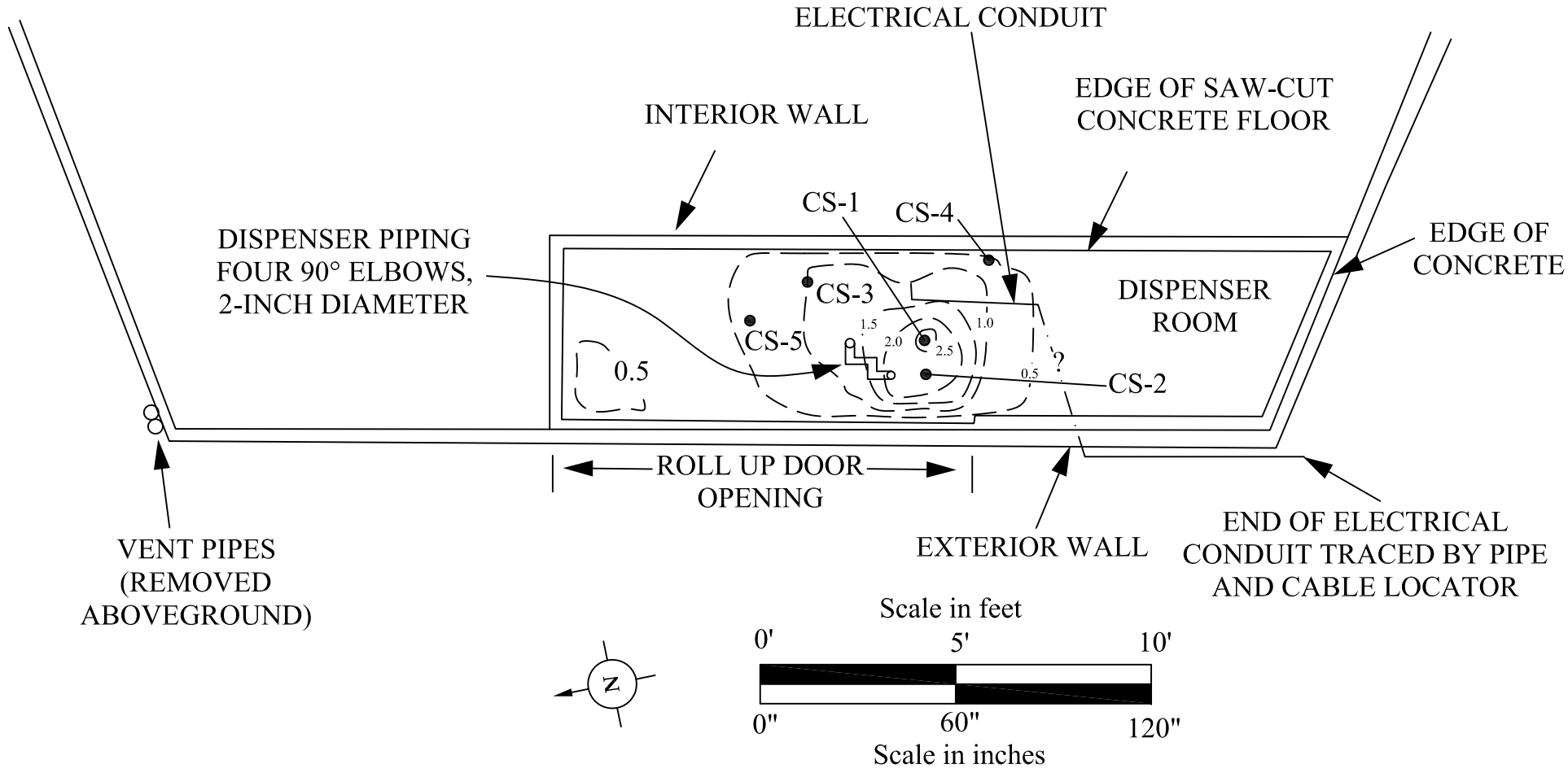
Project No.	Figure Date	Figure
CB018H	**05/13**	**3**

S:\Department\Jobs\CB018 - P&D 23rd Ave. Partners, Oakland\Graphics\CAD\2013\WP for Excavation Closure\CB018H - Fig 3 PCE in Soil Vapor



LEGEND

● **CS-2** **Confirmation Soil Sample Location**

2.0 **Depth of Excavation in feet**

Confirmation Soil Sample Locations

1125 Miller Avenue
Oakland, California

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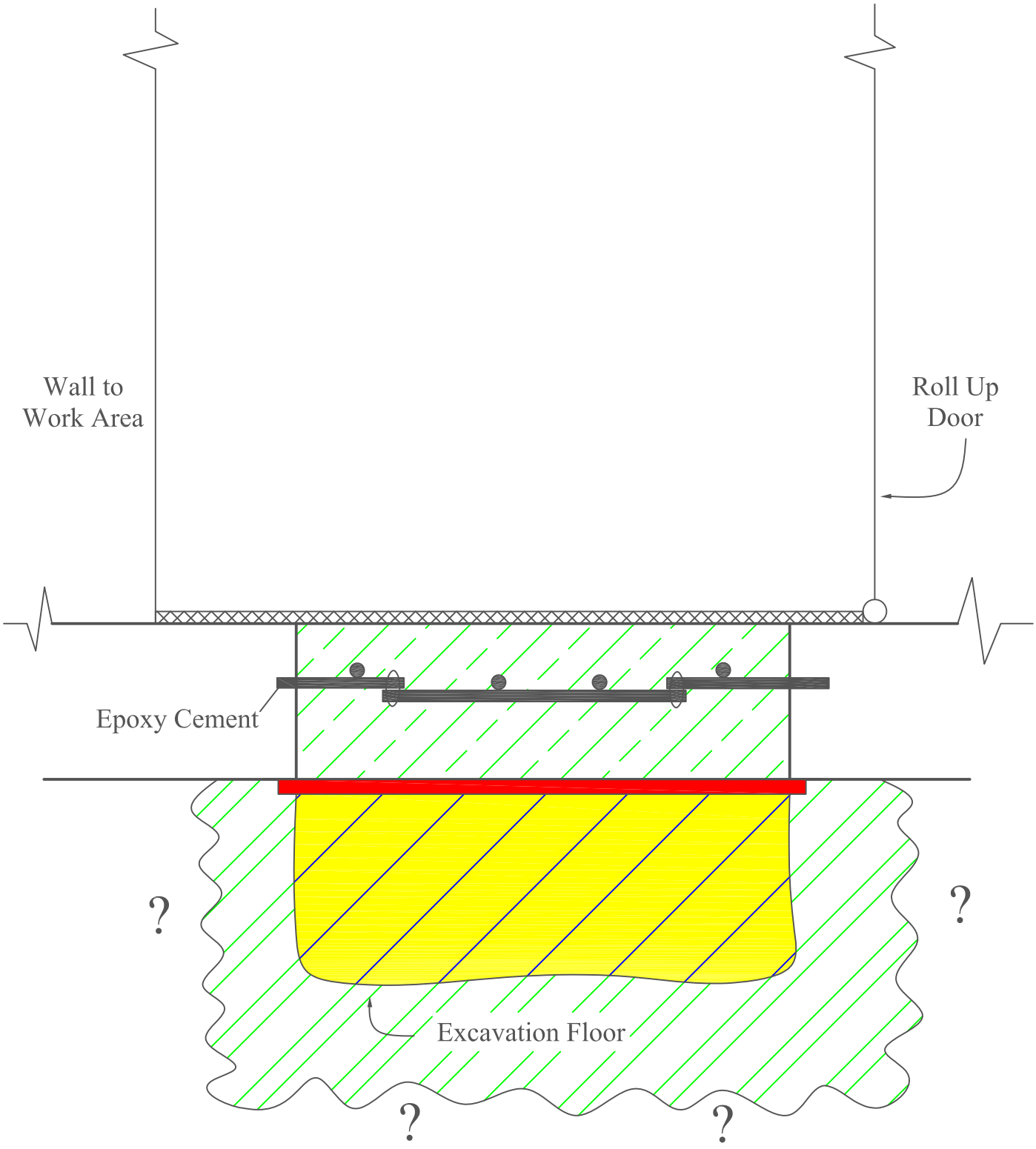
Project No.	Figure Date	Figure
CB018H	**05/13**	**4**

S:\Department\Jobs\CB018 - P&D 23rd Ave. Partners, Oakland\Graphics\CAD\2013\WP for Excavation Closure\CB018H - Fig 4 Confirmation Sample Locations



LEGEND

- Rebar
- Wire Tie
- Retro-Coat
- Existing Slab
- ? Extent of contamination unknown
- Residual
- GeoSeal®
- New Concrete
- Cementitious CDF

Excavation Repair

1125 Miller Avenue
Oakland, California

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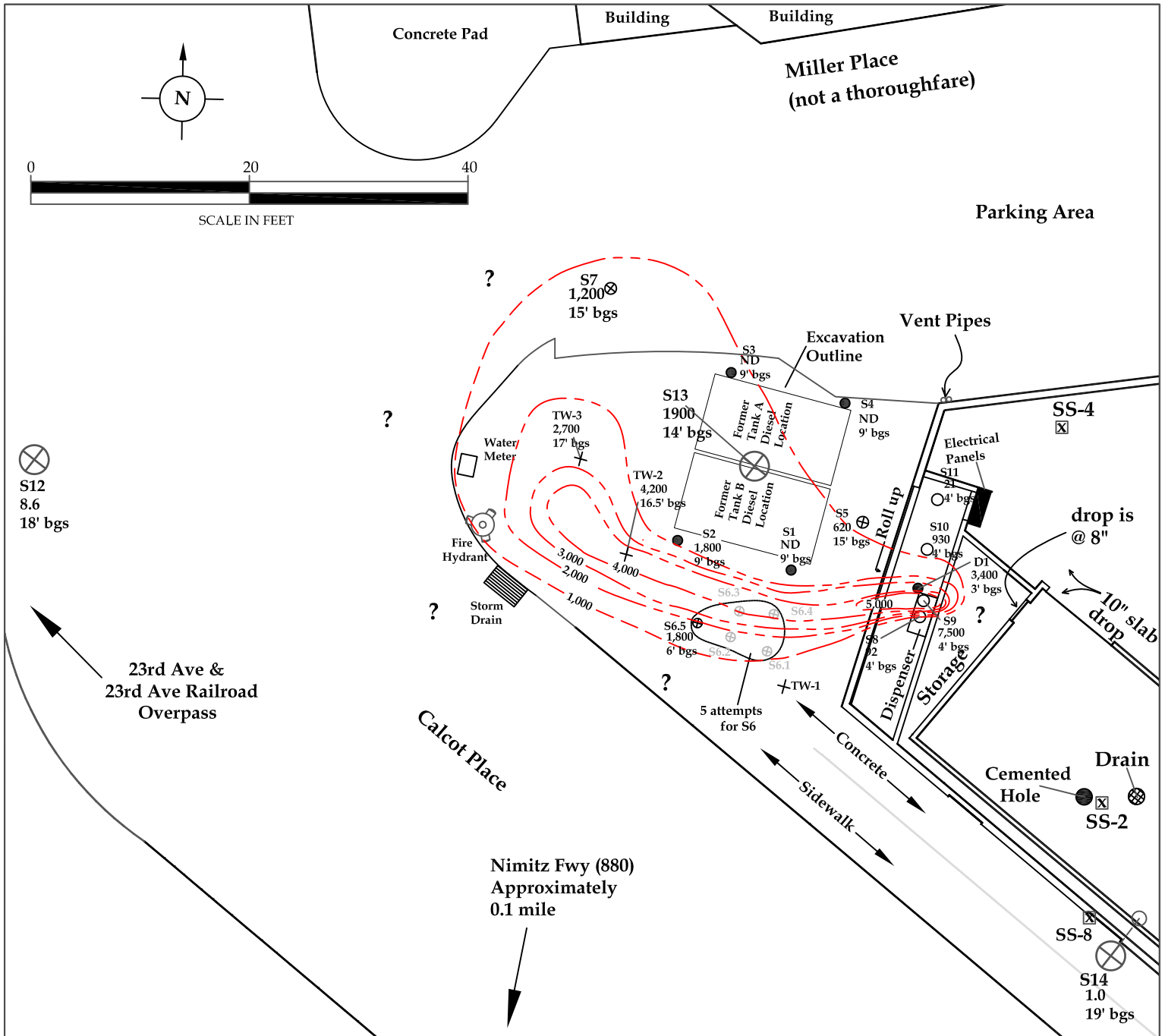
Project No.	Figure Date	Figure
CB018H	**05/13**	**5**

S:\Department\Jobs\CB018 - P&D 23rd Ave. Partners, Oakland\Graphics\CAD\2013\WP for Excavation Closure\CB018H - Fig 5 Excavation Repair



LEGEND

S12-S14	Soil Boring Locations (11/28/11)
S14	Slanted Soil Boring Location (11/28/11)
S1-S4	Soil Boring Location (12/2/98)
S5-S8	Soil Boring Location (11/16/05)
D1	Soil Boring Location (10/24/00)
TW-3	Temporary Well (10/24/00)
S9-S11	Soil Boring Location (11/15/06)
ND	Not Detected Above Laboratory Reporting Limits
1,000	TPH-d Soil Contour
?	Definition of TPH-d impacts not complete in this direction

Note: Soil sample collected over 13-year period between 1998 and 2011. Some TPH-d concentrations may have changed during this time.

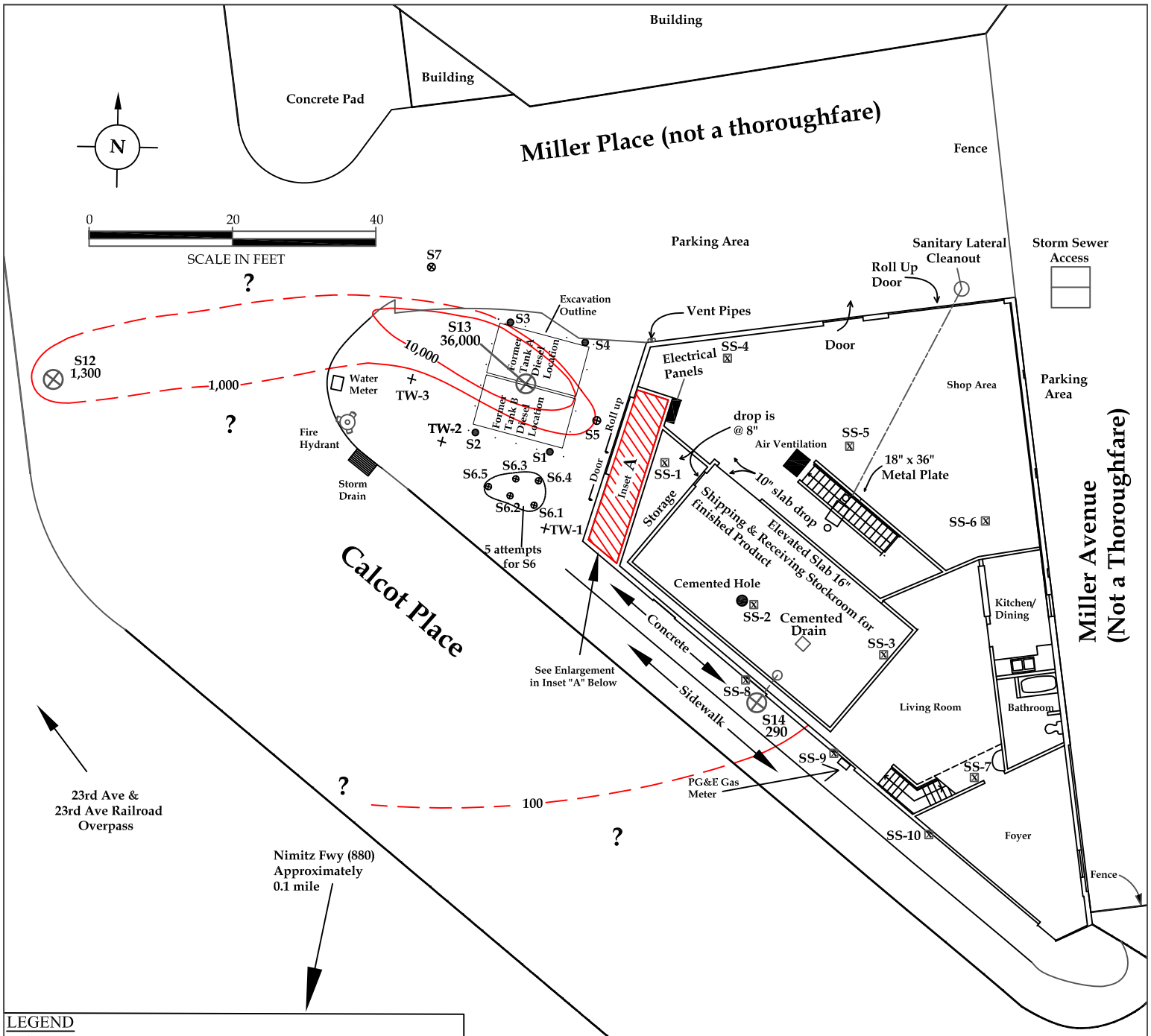
Soil Sample TPH-d Iso-Concentration Contour Map

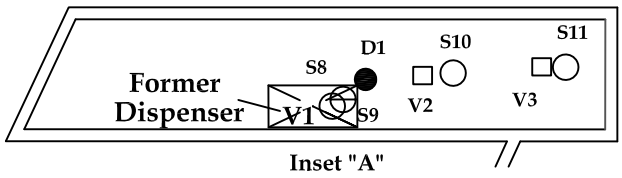
1125 Miller Avenue
Oakland, California

CLEARWATER GROUP

Project No.	Figure Date	Figure
CB018H	05/13	6

S:\Department\Jobs\CB018 - P&D 23rd Ave. Partners, Oakland\Graphics\CAD\2013\WP for Excavation Closure\CB018H - Fig 6 Soil Sample TPH-d Contour Map





LEGEND

S12-S13	Soil Boring Locations (11/28/11)
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TW-3	Temporary Well (10/24/00)
S9-S11	Soil Boring Location (11/15/06)
V1-V3	Soil Vapor Location (11/15/06)
1,000	TPH-d groundwater contour
	Contour lines dashed where inferred
?	Definition of TPH-d impacts not complete in this direction.

Note: Sample data shown were collected between 2,000 and 2011, over an 11-year period. TPH-d concentrations may have changed in this time.

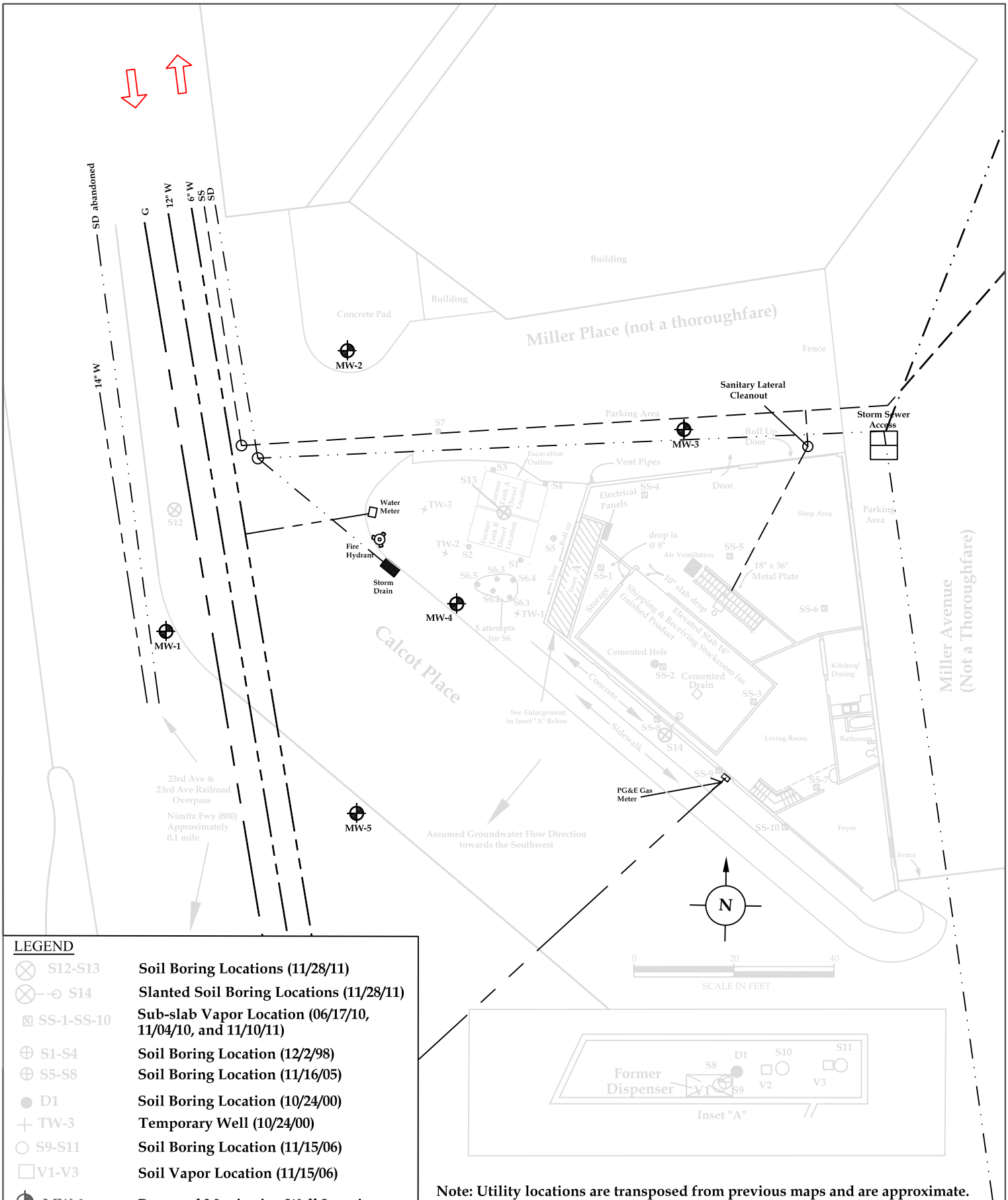
Grab Groundwater Sample TPH-d Iso-Concentration Contour Map

1125 Miller Avenue
Oakland, California

CLEARWATER GROUP

Project No.	Figure Date	Figure
CB018H	05/13	7

S:\Department\Jobs\CB018 - P&D 23rd Ave. Partners, Oakland\Graphics\CAD\2013\WP for Excavation Closure\CB018H - Fig 7 Grab Groundwater TPH-d Contour Map



LEGEND

S12-S13	Soil Boring Locations (11/28/11)
S14	Slanted Soil Boring Locations (11/28/11)
SS-1-SS-10	Sub-slab Vapor Location (06/17/10, 11/04/10, and 11/10/11)
S1-S4	Soil Boring Location (12/2/98)
S5-S8	Soil Boring Location (11/16/05)
D1	Soil Boring Location (10/24/00)
TW-3	Temporary Well (10/24/00)
S9-S11	Soil Boring Location (11/15/06)
V1-V3	Soil Vapor Location (11/15/06)
MW-1	Proposed Monitoring Well Location
G	Gas Line
6" W	Water Line (with size)
SD	Storm Drain
SS	Sanitary Sewer

Note: Utility locations are transposed from previous maps and are approximate.

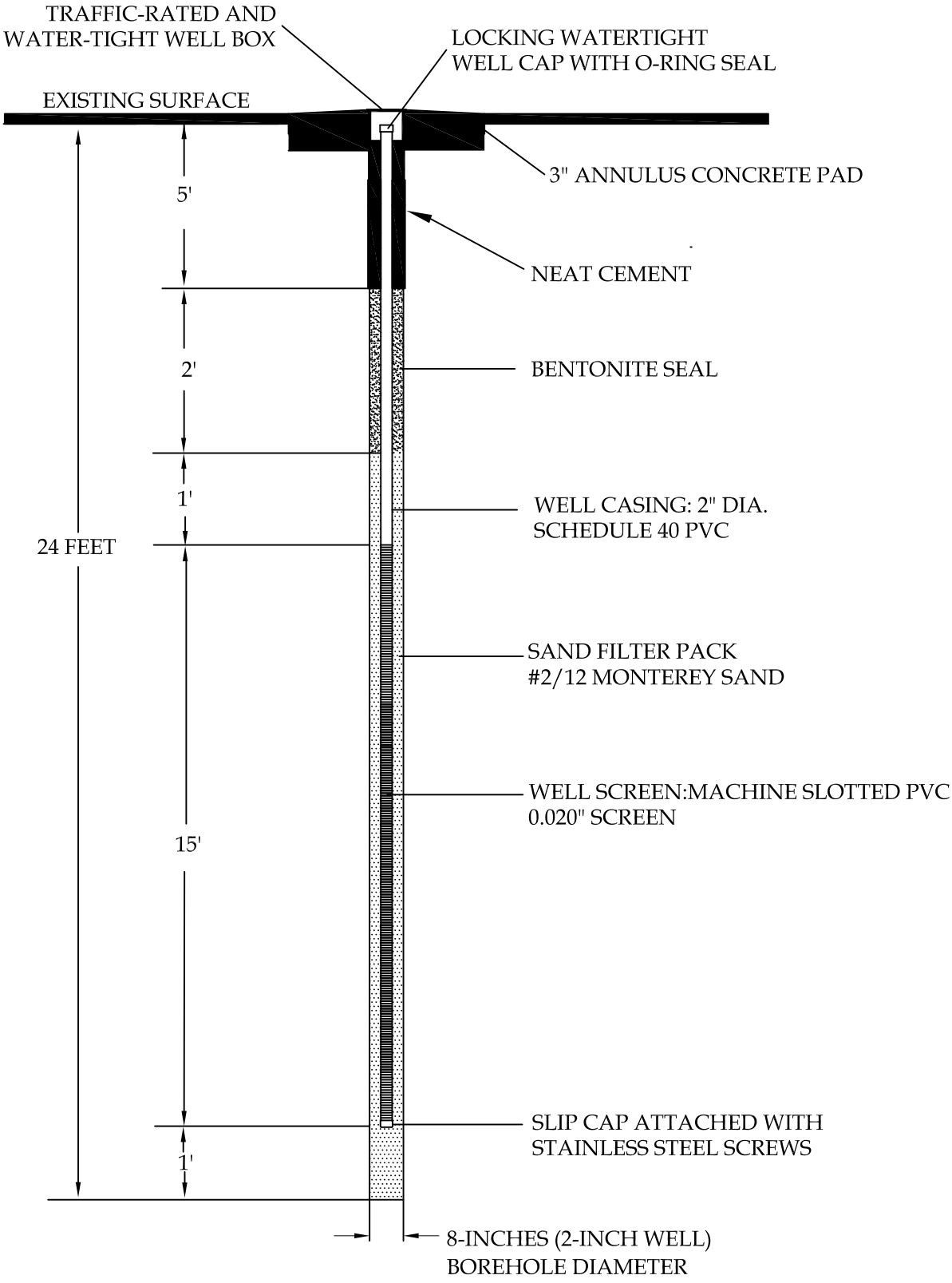
Proposed Monitoring Well Locations

1125 Miller Avenue
Oakland, California

CLEARWATER GROUP

Project No.	Figure Date	Figure
CB018H	**05/13**	**8**

S:\Department\Jobs\CB018 - P&D 23rd Ave. Partners, Oakland\Graphics\CAD\2013\WP for Excavation Closure\CB018H - Fig 8 Proposed Monitoring Well Locations



Note: The cross-section of the vault sidewalls will vary according to the location. The figure shown is for the unimproved garden space. The construction will not vary for the street or sidewalk wells; however, the vault sidewalls will differ.

NOT TO SCALE

Monitoring Well Construction Detail

1125 Miller Avenue
Oakland, California

CLEARWATER GROUP

Project No.	Figure Date	Figure
CB018H	**5/13**	**9**

S:\Department\Jobs\CB018 - P&D 23rd Ave. Partners, Oakland\Graphics\CAD\2013\WP for Excavation Closure\CB018H - Fig 9 Monitoring Well Construction Detail

TABLES

TABLE 1
Cumulative Soil Vapor Sample Analytical Results
P & D 23rd Avenue Associates LLC
1125 Miller Avenue, Oakland, CA
Clearwater Project No. CB018H

Sample (ID)	Sampling Date	Analytical Method	TPH-d (µg/m³)	Naphthalene (µg/m³)	1-Methyl naphthalene (µg/m³)	2-Methyl naphthalene (µg/m³)	TPH-g (µg/m³)	B (µg/m³)	T (µg/m³)	E (µg/m³)	X [E] (µg/m³)	MTBE (µg/m³)	TBA (µg/m³)	ETBE TAME DIPE (µg/m³)	2-Propanol (µg/m³)	Propane
Low-Threat Soil Gas Criteria - No Bioattenuation Zone - Residential/Commercial [J]				**93,000**				**85,000**		**1,100,000**						
CHHSLs, Commercial [I]			NE	110,000	NE	NE	NE	120,000	380,000,000	1,400,000	880,000,000	13,000,000	NE	NE	NE	NE
CHHSLs, Residential [I]			*NE*	*32,000*	*NE*	*NE*	*NE*	*36,000*	*140,000,000*	*420,000*	*320,000,000*	*4,000,000*	*NE*	*NE*	*NE*	*NE*
ESLs, Commerical [A]			1,300,000	360	NE	0	3,100,000	420	1,300,000	4,900	440,000	47,000	0	NE	NE	NE
ESLs, Residential [A]			*160,000*	*36*	*NE*	*0*	*370,000*	*42*	*160,000*	*490*	*520,000*	*4,700*	*0*	*NE*	*NE*	*NE*
V2.2 Suma	11/15/2006	TO-15	--	--	--	--	--	41	43	<7.9	28.4	--	--	--	--	--
V2.2 Suma Duplicate	11/15/2006	TO-15	--	--	--	--	--	42	46	<7.9	29.8	--	--	--	--	--
V2.4 Suma	11/15/2006	TO-15	--	--	--	--	--	<21	<28	<24	<28	--	--	--	--	--
V1.4 1L	11/15/2006	TO-17	>150,000 [F]	--	--	--	--	--	--	--	--	--	--	--	--	--
V1.4 4L	11/15/2006	NIOSH 1550	580,000	--	--	--	--	--	--	--	--	--	--	--	--	--
V1.4 4L Duplicate	11/15/2006	NIOSH 1550	600,000	--	--	--	--	--	--	--	--	--	--	--	--	--
V2.2 1L	11/15/2006	NIOSH 1550	710,000	--	--	--	--	--	--	--	--	--	--	--	--	--
V2.2 4L	11/15/2006	NIOSH 1550	180,000	--	--	--	--	--	--	--	--	--	--	--	--	--
V2.4 1L	11/15/2006	NIOSH 1550	280,000	--	--	--	--	--	--	--	--	--	--	--	--	--
V2.4 4L	11/15/2006	NIOSH 1550	700,000	--	--	--	--	--	--	--	--	--	--	--	--	--
V3.4 1L	11/15/2006	NIOSH 1550	**7,300,000**	--	--	--	--	--	--	--	--	--	--	--	--	--
V3.4 4L	11/15/2006	NIOSH 1550	570,000	--	--	--	--	--	--	--	--	--	--	--	--	--
SS-1	06/17/2010	8260B/ 8015M [C]	<50,000	<100	--	--	<10,000	<100	<200	<100	<200	<100	<1,000	<100	--	--
SS-1	11/04/2010	TO-17/TO-15 [B]	<5,000	<2.5	<2.5	<2.5	<240	<3.8	<4.5	<5.1	<5.1	<4.3	<14	<20 [D]	<12	--
SS-1	04/01/2011	TO-17/TO-15 [B]	<5,000	<2.5	<2.5	<2.5	540	<3.7	<4.4	<5.0	<5.0	<4.2	<14	<19 [D]	<11	--
SS-1	12/09/2011	TO-17/TO-15 [B]	<5,000	<2.5	<2.5	<2.5	<160	<2.5	<2.9	<3.4	<3.4	<2.8	<9.4	<13	<7.6	--
SS-2	06/17/2010	8260B/ 8015M [C]	<50,000	<100	--	--	<10,000	<100	<200	<100	<200	<100	<1,000	<100	--	--
SS-2	11/04/2010	TO-17/TO-15 [B]	<5,000	<2.5	<2.5	<2.5	<240	<3.8	<4.5	<5.2	5.3	<4.3	<14	<20 [D]	<12	--
SS-2	04/01/2011	TO-17/TO-15 [B]	<5,000	<2.5	<2.5	<2.5	530	<3.7	<4.4	<5.0	<5.0	<4.2	<14	<19 [D]	<11	--
SS-2	12/09/2011	TO-17/TO-15 [B]	<5,000	<2.5	<2.5	<2.5	<160	<2.5	<3.0	<3.4	<3.4	<2.8	<9.6	<13	<7.8	--
SS-3	06/17/2010	8260B/ 8015M [C]	<50,000	<100	--	--	37,000	<100	2,600	2,000	6,050	<100	<1,000	<100	--	--
SS-3 Duplicate	06/17/2010	8260B/ 8015M [C]	<50,000	<100	--	--	30,000	<100	2,100	1,600	4,990	<100	<1,000	<100	--	--
SS-3	11/04/2010	TO-17/TO-15 [B]	5,800	8.0	24	**36**	13,000	<8.2	60	560	2,940	<9.2	<31	<43 [D]	<25	--
SS-3	11/04/2010	Modified ASTM D-1945	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.0051%
SS-3	04/01/2011	TO-17/TO-15 [B]	8,200	4.2	7.0	<2.5	8,600	3.8	16	110	650	<3.8	<13	<18 [D]	<10	--
SS-3	12/08/2011	TO-17/TO-15 [B]	<5,000	3.7	8.0	<2.5	12,000	<2.5	3.8	19	119	<2.8	<9.6	<13	<7.8	--
SS-3	12/08/2011	Modified ASTM D-1945	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.0016%
SS-4	06/17/2010	8260B/ 8015M [C]	<50,000	<100	--	--	<10,000	<100	<200	<100	<200	<100	<1,000	<100	--	--
SS-4	11/04/2010	TO-17/TO-15 [B]	<5,000	<2.5	<2.5	<2.5	<240	<3.8	<4.5	<5.2	<5.2	<4.3	<14	<20 [D]	<12	--
SS-4	04/01/2011	TO-17/TO-15 [B]	<5,000	<2.5	<2.5	<2.5	520	<3.7	<4.4	<5.0	<5.0	<4.2	<14	<19 [D]	<11	--
SS-4	12/08/2011	TO-17/TO-15 [B]	9,500 [G]	<2.5	<2.5	<2.5	<160	<2.5	<2.9	<3.4	<3.4	<2.8	<9.4	<13	<7.6	--
SS-5	06/17/2010	8260B/ 8015M [C]	<50,000	<100	--	--	<10,000	<100	<200	<100	<200	<100	<1,000	<100	--	--
SS-5	11/04/2010	TO-17/TO-15 [B]	<5,000	<2.5	<2.5	<2.5	<260	<4.0	<4.7	<5.5	<5.5	<4.5	<15	<21 [D]	<12	--
SS-5 (IPA)	11/04/2010	Modified TO-15 GC/MS	--	--	--	--	--	--	--	--	--	--	--	--	81,000	--
SS-5	04/01/2011	TO-17/TO-15 [B]	<5,000	<2.5	<2.5	<2.5	880	<3.7	8.2	<5.0	<5.0	<4.2	<14	<19 [D]	<11	--

TABLE 1
Cumulative Soil Vapor Sample Analytical Results
P & D 23rd Avenue Associates LLC
1125 Miller Avenue, Oakland, CA
Clearwater Project No. CB018H

Sample (ID)	Sampling Date	Analytical Method	TPH-d (µg/m³)	Naphthalene (µg/m³)	1-Methyl naphthalene (µg/m³)	2-Methyl naphthalene (µg/m³)	TPH-g (µg/m³)	B (µg/m³)	T (µg/m³)	E (µg/m³)	X [E] (µg/m³)	MTBE (µg/m³)	TBA (µg/m³)	ETBE TAME DIPE (µg/m³)	2-Propanol (µg/m³)	Propane
Low-Threat Soil Gas Criteria - No Bioattenuation Zone - Residential/Commercial [J]				**93,000**				**85,000**		**1,100,000**						
CHHSLs, Commercial [I]			NE	110,000	NE	NE	NE	120,000	380,000,000	1,400,000	880,000,000	13,000,000	NE	NE	NE	NE
CHHSLs, Residential [I]			*NE*	*32,000*	*NE*	*NE*	*NE*	*36,000*	*140,000,000*	*420,000*	*320,000,000*	*4,000,000*	*NE*	*NE*	*NE*	*NE*
ESLs, Commerical [A]			1,300,000	360	NE	0	3,100,000	420	1,300,000	4,900	440,000	47,000	0	NE	NE	NE
ESLs, Residential [A]			*160,000*	*36*	*NE*	*0*	*370,000*	*42*	*160,000*	*490*	*520,000*	*4,700*	*0*	*NE*	*NE*	*NE*
SS-5	12/08/2011	TO-15	<5,000	<2.5	<2.5	<2.5	<160	<2.5	<2.9	<3.4	<3.4	<2.8	<9.4	<13	<7.6	--
SS-6	06/17/2010	8260B/ 8015M [C]	<50,000	<100	--	--	<10,000	<100	<200	<100	<200	<100	<1,000	<100	--	--
SS-6	11/04/2010	TO-17/TO-15[A]	<5,000	4.6	<2.5	**4.3**	<250	<3.9	<4.6	<5.3	<5.3	<4.4	<15	<20 [D]	<12	--
SS-6	04/01/2011	TO-17/TO-15[B]	<5,000	<2.5	<2.5	<2.5	400	<3.8	<4.5	<5.2	<5.2	<4.3	<14	<20 [D]	<12	--
SS-6	12/09/2011	TO-17/TO-15[B]	<5,000	<2.5	<2.5	<2.5	<160	<2.5	<3.0	<3.4	<3.4	<2.8	<9.6	<13	<7.8	--
SS-7	*04/01/2011*	*TO-17/TO-15 [B]*	*<5,000*	*10*	*9.0*	***10***	*690*	*<3.8*	*5.9*	*<5.2*	*<5.2*	*<4.3*	*<14*	*<20 [D]*	*85*	--
SS-7 (IPA)	*04/01/2011*	*TO-15*	--	--	--	--	--	--	--	--	--	--	--	--	*93,000*	--
SS-7	*12/09/2011*	*TO-17/TO-15 [B]*	*<5,000*	*<2.5*	*<2.5*	*<2.5*	*520 [F]*	*<2.5*	*<2.9*	*<3.4*	*<3.4*	*<2.8*	*<9.4*	*<13*	*<7.6*	--
SS-7 (IPA)	*12/09/2011*	*TO-15*	--	--	--	--	--	--	--	--	--	--	--	--	*20,000 [H]*	--
SS-8	12/08/2011	TO-17/TO-15[B]	<5,000	<2.5	<2.5	<2.5	340	<2.6	<3.1	<3.6	<3.6	<3.0	<9.9	<14	<8.1	--
SS-9	12/08/2011	TO-17/TO-15[B]	<5,000	<2.5	<2.5	<2.5	310	<2.6	<3.0	<3.5	<3.5	<2.9	<9.8	<13	<7.9	--
SS-10	12/08/2011	TO-17/TO-15[B]	<5,000	<2.5	<2.5	<2.5	1,900	37	160	37	208	<2.7	<9.2	<13	<7.5	--

Notes:

ESL	Environmental Screening Limit
(µg/m³)	Micrograms per cubic meter
TO-15	Samples analyzed using modified EPA method TO-15 for soil vapor collected in specially prepared canisters and analyzed by gas chromatography/mass spectrometry (GC/MS).
TO-17	Samples analyzed using modified EPA method TO-17 for soil vapor samples collected using multi-bed sorbent tubes and analyzed by GC/MS.
NIOSH 1550	Alternative analytical method used for saturated sorbent tubes using chemical extraction (carbon disulfide) and analyzed using gas chromatography/flame ionization detector (GC/FID).
ASTM D-1945	Sample analyzed using modified ASTM D-1945
TPH-d	Total petroleum hydrocarbons detected within the diesel range of C10-C28
TPH-g	Total petroleum hydrocarbons detected within the gasoline range of C6-C12
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total
MTBE	Methyl-t-butyl ether
ETBE	Ethyl-t-butyl ether
TAME	Tert-amyl methyl ether
DIPE	Diisopropyl ether
TBA	tert-Butanol
2-Propanol	2-Propanol is also known as Isopropyl alcohol (IPA)
--	Not Analyzed
<#	Contamination in the sample was below method reporting limits.
bold	Contamination in the sample exceeded environmental screening limits.
italics	Values in italics indicate residnetial limits and results.
NE	Standard Not Established
(ID)	Identification
CHHSL	California Human Health Screening Level - Shallow Soil Gas Human Health Screening Levels

TABLE 1
Cumulative Soil Vapor Sample Analytical Results
P & D 23rd Avenue Associates LLC
1125 Miller Avenue, Oakland, CA
Clearwater Project No. CB018H

Sample (ID)	Sampling Date	Analytical Method	TPH-d (µg/m^3)	Naphthalene (µg/m^3)	1-Methyl naphthalene (µg/m^3)	2-Methyl naphthalene (µg/m^3)	TPH-g (µg/m^3)	B (µg/m^3)	T (µg/m^3)	E (µg/m^3)	X [E] (µg/m^3)	MTBE (µg/m^3)	TBA (µg/m^3)	ETBE TAME DIPE (µg/m^3)	2-Propanol (µg/m^3)	Propane
Low-Threat Soil Gas Criteria - No Bioattenuation Zone - Residential/Commercial [J]				**93,000**				**85,000**		**1,100,000**						
CHHSLs, Commercial [I]			NE	110,000	NE	NE	NE	120,000	380,000,000	1,400,000	880,000,000	13,000,000	NE	NE	NE	NE
CHHSLs, Residential [I]			*NE*	*32,000*	*NE*	*NE*	*NE*	*36,000*	*140,000,000*	*420,000*	*320,000,000*	*4,000,000*	*NE*	*NE*	*NE*	*NE*
ESLs, Commerical [A]			1,300,000	360	NE	0	3,100,000	420	1,300,000	4,900	440,000	47,000	0	NE	NE	NE
ESLs, Residential [A]			*160,000*	*36*	*NE*	*0*	*370,000*	*42*	*160,000*	*490*	*520,000*	*4,700*	*0*	*NE*	*NE*	*NE*

Footnote A	Environmental Screening Levels (ESL), from Summary Table E. Environmental Screening Levels (ESLs) Indoor Air and Soil Gas (Soil Gas values shown), available from http://www.waterboards.ca.gov/rwqcb2/water_issues/programs/ESL/Lookup_Tables_Feb_2013.pdf
Footnote B	TPH-d, Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene by Modified TO-17 VI; TPH-g, B, T, E, X, MTBE, TBA, ETBE, TAME, DIPE by Modified TO-15.
Footnote C	BTEX, Naphthalene, Oxygenates and TPH-g by EPA method 8260B; TPH-d by EPA method 8015m
Footnote D	Analyte is listed as isopropyl ether, not diisopropyl ether.
Footnote E	Xylene is reported as the sum of m,p-Xylene and o-Xylene
Footnote F	Laboratory notes: TPH gasoline was detected at a concentration less than 5 times the reporting limit. Because the preceding sample contained high concentration of TPH-g, the result for TPH-g in this sample may be biased high for possible carry-over. A re-analysis of this sample was not possible due to insufficient sample volume.
Footnote G	Laboratory Notes: The TPH pattern did not resemble that of diesel fuel. The hydrocarbons were distributed in the lighter carbon range of diesel.
Footnote H	Laboratory Notes: Dilution was performed on this sample due to the presence of high level target species.
Footnote I	CHHSLs - *California Human Health Screening Levels, Revised September 2010.* Table 3 Soil Gas Screening Numbers for Volatile Chemicals Below Buildings Constructed Without Engineered Fill Below Sub-Slab Gravel
Footnote J	Bio-attenuation zone as defined by the Water Control Policy for the Low-Threat Underground Storage Tank Closure .
V2.2 Summa (200 mL/min*30 min)	Vapor sample collected at 2 feet below ground surface using 6-liter Summa canister at a flow rate of 200 mL per minute for 30 minutes.
V2.4 Summa (200 mL/min*30 min)	Vapor sample collected at 4 feet below ground surface using 6-liter Summa canister at a flow rate of 200 mL per minute for 30 minutes.
V1.4 1L	Vapor sample collected at 4 feet below ground surface using TO-17 Carbotrap 300 tube at a flow rate of 66.7 mL per minute for 15 minutes. Sample was analyzed using modified EPA method TO-17.
V1.4 4L	Vapor sample collected at 4 feet below ground surface using TO-17 Carbotrap 300 tube at a flow rate of 133.3 mL per minute for 30 minutes.
> ## (S)	Sample results are flagged as greater than saturated peak for analyte.
1L	Sample flow rate equal to 66.7 milliliters per minute for 15 minutes.
4L	Sample flow rate equal to 133.3 milliliters per minute for 30 minutes.

Table 2
Cumulative Groundwater Sample Analytical Results
P & D 23rd Avenue Associates LLC
1125 Miller Avenue, Oakland, CA
Clearwater Project No. CB018H

Sample Point Location	Sample ID	Sampling Date	Depth (feet bgs)	TPH-d (µg/L)	TPH-g (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)
Environmental Screening Levels in µg/L [A]				100	100	1.0	40	30	20	5.0
Low Threat Closure Thresholds [A, B]				**Criterion 1 - No limits defined in Policy[C]**						
TW2	*TW2*	*10/24/2000*	*16´*	*660*	*NA*	*65*	*2.4*	*<0.5*	*3.2*	*<2.5*
TW3	*TW3*	*10/24/2000*	*17´*	*800*	*NA*	*0.9*	*<0.5*	*<0.5*	*<1.5*	*<2.5*
S5	S5	11/16/2005	17´	890	NA	<0.50	<0.50	<0.50	<0.50	NA
S12	S-12	11/28/2011	11-15´	1,300 [D]	<50	<0.50	<0.50	<0.50	<0.50	NA
S13	S-13	11/28/2011	11-15´	36,000	200	<0.50	<0.50	<0.50	<0.50	NA
S14	S-14	11/28/2011	11-15´	290 [D]	<50	<0.50	<0.50	<0.50	<0.50	NA

Notes:

TPH-d	Total petroleum hydrocarbons as diesel using EPA Method 8015/8020 (modified)
TPH-g	Total petroleum hydrocarbons as gasoline using EPA Method 8260B
B	Benzene using EPA Method 8020/8260B
T	Toluene using EPA Method 8020/8260B
E	Ethylene using EPA Method 8020/8260B
X	Xylenes using EPA Method 8020/8260B
MTBE	Methyl tertiary-butyl ether using EPA Method 8260B
µg/L	Micrograms per liter (approximately equal to parts per billion: ppb)
NA	Not analyzed
<###	Not detected in concentrations exceeding the indicated laboratory reporting limit
bgs	Below Ground Surface
bold	Contamination in the sample exceeded Low Threat Closure thresholds.
-	Thresholds not listed in Low Threat Closure guidelines.

Footnote A: Low Threat Closure Thresholds are residential values fromTable 1 (page 8) of *Water Quality Control Policy for Low-Threat Underground Storage Tank Case Closure,* April 19, 2012.

Footnote B: In order to qualify for Low Threat Closure, a site must meet all of the following requirements: a. The unauthorized release is located within the service area of a public water system; b. The unauthorized release consists only of petroleum; c. The unauthorized ("primary") release from the UST system has been stopped; d. Free product has been removed to the maximum extent practicable; e. A conceptual site model that assesses the nature, extent, and mobility of the release has been developed; f. Secondary source removal has been addressed removed to the extent practicable; g. Soil or groundwater has been tested for methyl tert-butyl ether (MTBE) and results reported in accordance with Health and Safety Code section 25296.15; and h. Nuisance as defined by Water Code section 13050 does not exist at the site.

Footnote C: Low Threat Closure, Criterion 1: a) The contaminant plume that exceeds water quality objectives is less than 100 feet in length; b) There is no free product; c) The nearest existing water supply well or surface water body is greater than 250 feet from the defined plume boundary

Footnote D: Laboratory notes: Discrete peaks, higher boiling hydrocarbons present, atypical for Diesel Fuel.

Analytical results reported in *italics* are from the December 31, 2001 *Subsurface Exploration Report* prepared by Environmental Bio-Systems.

Table 3
Cumulative Soil Sample Analytical Results
P & D 23rd Avenue Associates, LLC
1125 Miller Avenue, Oakland, CA
Clearwater Project No. CB018

Soil Boring ID	Sample ID	Collection Depth (feet)	Sampling Date	TPH-d (mg/kg)	TPH-g (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	MTBE (mg/kg)	1,2,4-TMB (mg/kg)	Napthalene (mg/kg)
Shallow Soil ESL[A] for Residential/ Commercial Use				83	83	0.044	2.9	2.3/ 3.3	2.3	0.023	--	1.3/ 2.8
Deep Soil ESL[A] for Residential/ Commercial Use				83	83	0.044	2.9	3.3	2.3	0.023	--	3
Low Threat Closure Thresholds - Residential [A, B]		**0-5 feet bgs**		--	--	**1.9 (8.2)**	--	**21 (89)**	--	--	--	**9.7 (45)**
		5-10 feet bgs		--	--	**2.8 (12)**	--	**32 (134)**	--	--	--	**9.7 (45)**
S1	*S1-9*	*9*	*12/01/1998*	*ND*	*NA*	*ND*	*ND*	*ND*	*ND*	*ND*	NA	NA
S2	*S2-9*	*9*	*12/01/1998*	*1,800*	*NA*	*ND*	*ND*	*ND*	*0.51*	*ND*	NA	NA
S3	*S3-9*	*9*	*12/01/1998*	*ND*	*NA*	*ND*	*ND*	*ND*	*ND*	*ND*	NA	NA
S4	*S4-9*	*9*	*12/01/1998*	*ND*	*NA*	*ND*	*ND*	*ND*	*ND*	*ND*	NA	NA
TW2	*TW2 -16.5*	*16.5*	*10/24/2000*	*4,200*	*NA*	*1.4*	*ND*	*ND*	*ND*	*ND*	NA	NA
TW3	*TW3-17*	*17*	*10/24/2000*	*2,700*	*NA*	*ND*	*ND*	*ND*	*ND*	*ND*	NA	NA
D1	*D1-3*	*3*	*10/24/2000*	*3,400*	*NA*	*ND*	*ND*	*ND*	*ND*	*ND*	NA	NA
D1	*D1-8*	*8*	*10/24/2000*	*34*	*NA*	*ND*	*ND*	*ND*	*ND*	*ND*	NA	NA
S5	S5-5	5	11/16/2005	14[F]	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S5	S5-10	10	11/16/2005	610	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S5	S5-15	15	11/16/2005	620	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S5	S5-20	20	11/16/2005	5.8	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S6	S6-6	6	11/16/2005	1,800[F]	NA	NA[C]	NA[C]	NA[C]	NA[C]	NA[D]	NA	NA
S7	S7-5	5	11/16/2005	150[F]	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S7	S7-10	10	11/16/2005	32[F]	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S7	S7-15	15	11/16/2005	1,200	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S7	S7-20	20	11/16/2005	300	*NA*	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S8	S8-4	4	11/16/2005	92	*NA*	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S9	S9.4.0	4	11/15/2006	7,500	*NA*	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S10	S10.4.0	4	11/15/2006	930	*NA*	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S11	S11.4.0	4	11/15/2006	21	*NA*	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S12	B12-18	18	11/28/2011	8.6 [E]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S13	B13-11	11	11/28/2011	740	7.0	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S13	B13-14	14	11/28/2011	1,900	65	<0.025	<0.025	<0.025	<0.025	NA[D]	NA	NA
S13	B13-19	19	11/28/2011	4.4 [E]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S13	B13-23.5	23.5	11/28/2011	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
S14	B14-19	19	11/28/2011	1.0 [E]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	NA[D]	NA	NA
CS-1	CS-1	2.5	10/16/2012	730 [F]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.015 [G]	0.072 [F]
CS-2	CS-2	2	10/16/2012	14,000 [F]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050 [G]	<0.0050 [F]
CS-3	CS-3	1	10/16/2012	7,600 [F]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0067 [G]	0.042 [F]
CS-4	CS-4	0.5	10/16/2012	9,800 [F]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050 [G]	<0.0050 [F]
CS-5	CS-5	0.5	10/16/2012	8,000 [F]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050 [G]	<0.0050 [F]
CS-6	CS-6-Comp 3 Drums	0 [H]	10/16/2012	7,400 [F]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050 [G]	0.0074 [F]

Notes:

TPH-d	Total petroleum hydrocarbons as diesel using EPA Method 8015/8020 (modified)
TPH-g	Total petroleum hydrocarbons as gasoline using EPA Method 8260B
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes using EPA Method 8015/8020 (modified)
MTBE	Methyl tertiary-butyl ether using EPA Method 8260
1,2,4-TMB	1,2,4-Trimethylbezene using EPA Method 8260
mg/kg	Milligrams per kilogram (approximately equal to parts per million)
ND	Not detected above laboratory reporting limits
NA	Not analyzed
<0.0050	Not detected in concentrations exceeding the indicated laboratory reporting limit
bgs	Below ground surface
bold	Contamination in the sample exceeded Low Threat Closure thresholds.
--	Thresholds not listed in Low Threat Closure guidelines.
Footnote A	Low Threat Closure Thresholds are residential (commercial values in parentheses) fromTable 1 (page 8) of *Water Quality Control Policy for Low-Threat Underground Storage Tank Case Closure*, August 17, 2012.
Footnote B	In order to qualify for Low Threat Closure, a site must meet all of the following requirements: a. The unauthorized release is located within the service area of a public water system; b. The unauthorized release consists only of petroleum; c. The unauthorized ("primary") release from the UST system has been stopped; d. Free product has been removed to the maximum extent practicable; e. A conceptual site model that assesses the nature, extent, and mobility of the release has been developed; f. Secondary source removal has been addressed removed to the extent practicable; g. Soil or groundwater has been tested for methyl tert-butyl ether (MTBE) and results reported in accordance with Health and Safety Code section 25296.15; and h. Nuisance as defined by Water Code section 13050 does not exist at the site. The Site does not meet assumption "e" or assumption "f".
Footnote C	Analysis not performed due to lack of sample volume.
Footnote D	Analysis of MTBE not required by ACEH.
Footnote E	Laboratory Notes: Discrete peaks in Diesel range, atypical for Diesel Fuel.
Footnote F	Laboratory Note: Concentration reported is atypical for diesel, these hydrocarbons have a higher boiling point
Footnote F	Laboratory Note: Matrix Spike/Matrix Spike Duplicate results were affected by the analyte concentrations already present in the un-spiked sample.
Footnote G	Laboratory Note: Matrix Spike/Matrix Spike Duplicate results were outside of control limits. This may indicate a bias for the sample that was spiked. Since LCS recoveries were within control limits, no data are
Footnote H	Composite sample collected from disposal materials.

Analytical results reported in italics are from the December 31, 2001 *Subsurface Exploration Report* prepared by Environmental Bio-Systems.

Table 4 - Potential Abandoned Wells in 2000' Radius

Street	Street Address
20th Ave	(1200)
22nd Ave	(1050)
22nd Ave	1217
22nd Ave	Brick/Cement
23rd Ave Pl	958
23rd Ave Pl	1043
23rd/Park Ave	337
23rd/Park Ave	419
23rd/Park Ave	480
23rd/Park Ave	(527)
23rd/Park Ave	(534)
23rd/Park Ave	572
23rd/Park Ave	954
23rd/Park Ave	958
23rd/Park Ave	1225
23rd/Park Ave	1275
25th Ave	1035
25th Ave	1198
25th Ave	1515
25th Ave	2066
26th Ave	1125
Calcot Place	1042
Calcot Place	1091
E 10th St	1325
E 10th St	1402
E 10th St	2725
E 10th St	2745
E 11th St	1260
E 11th St	1325
E 11th St	1361
E 11th St	1363
E 11th St	1367
E 11th St	1400
E 11th St	2733
E 11th St	2744
E 12th St	2026
E 12th St	2032
E 12th St	2061
E 12th St	2142
E 12th St	(2200)
E 12th St	(2250)
E 12th St	(2301)
E 12th St	(x 22nd Ave)
E 14th St	1113

Table 4 - Potential Abandoned Wells in 2000' Radius

Street	Street Address
E 14th St	1126
E 14th St	1189
E 14th St	1251
E 14th St	1275
E 14th St	1295
E 14th St	1315
E 14th St	(2200)
E 14th St	(2345)
E 14th St	2509
E 14th St	(2530)
E 14th St	x 25th Ave
E 14th St	x 27th Ave
E 15th St	1077
E 15th St	1157
E 15th St	1161
E 16th St	1077
E 16th St	1139
E 16th St	1149
E 16th St	1173
E 16th St	1270
E 16th St	1309
E 16th St	2554
E 19th St	1000
E 19th St	1924
E 9th St	1337
E 9th St	1407
E 9th St	1421
E 9th St	1428
E 9th St	2639
E Valdez St	603
E Valdez St	607
E Valdez St	609
E Valdez St	613
E Valdez St	636
Embarcadero (19th)	1000
Embarcadero (19th)	1059
Embarcadero (19th)	1060
Embarcadero (19th)	(1899)
Embarcadero (19th)	2000
Embarcadero (19th)	x Dennison
Foothill Blvd	1203
Foothill Blvd	1229
Frederick St	2235

Table 4 - Potential Abandoned Wells in 2000' Radius

Street	Street Address
Kennedy St	401
Kennedy St	569
Kennedy St	570
Kennedy St	572
Kennedy St	585
Kennedy St	625
Kennedy St	(646)
Kennedy St	659
Kennedy St	(727)
Kennedy St	800
Kennedy St	(955)
King St	2171
Lisbon	1012
Lisbon	1013
Lisbon	1014
Lisbon	1015
Lisbon	1016
Lisbon	1017
Livingston St	(2100)
Railroad	21
Railroad	2026
Railroad	2124

Note - Street Address #s in parentheses reflect that wells are likely to be monitoring wells and not supply wells.

Note - Some addresses, since they derive from Sanborn Fire Insurance maps, reflect antiquated reference points, i.e., streets which no longer exist. The addresses in this list have not been upgraded to current physical addresses.

APPENDICES

APPENDIX A

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

March 26, 2013

Mr. John Protopappas
P&D 23rd Avenue Associates LLC
P.O. Box 687
Oakland, CA 94604
(*Sent via E-mail to: John@MPFCorp.com*)

Subject: Case File Review for Fuel Leak Case No. RO0000294 and GeoTracker Global ID T0600177455, 23rd Avenue Partners, 1125 Miller Avenue, Oakland, CA 94601

Dear Mr. Protopappas:

Alameda County Environmental Health (ACEH) staff has reviewed the fuel leak case file for the above-referenced site including the most recently submitted document entitled, *"2000-Foot Radius Well Search Report,"* dated February 21, 2013. The Well Search Report, which was prepared on your behalf by Clearwater Group, presents results from a well search conducted using Alameda County Public Works Agency and California Department of Water Resources databases. The Well Search Report was submitted in response to the technical comments in ACEH correspondence dated December 5, 2012, which is attached for reference. However, ACEH's correspondence requested a Work Plan to address six technical comments. The Well Search Report addresses only one of the six technical comments in ACEH's December 5, 2012 correspondence.

The Well Search Report recommends that the site be considered for low-risk case closure but does not evaluate site conditions against the general and media-specific criteria in the State Water Resources Control Board Low-Threat Closure Policy (LTCP). Due to the presence of volatile organic compounds (VOCs) in soil vapor, the site does not appear to meet general criteria b of the LTCP, which requires that the unauthorized release consists only of petroleum.

The site may be evaluated for case closure under the LTCP in the future if the extent of VOCs is evaluated and the VOCs do not pose a risk to human health or the environment. In order to complete this evaluation, we request that you submit a Work Plan that addresses the technical comments below, most of which were previously requested in our December 5, 2012 correspondence.

TECHNICAL COMMENTS

1. **Volatile Organic Compounds in Sub-slab Soil Vapor**. Review of the *"Update of the Soil Vapor Sample Analytical Report Presented in Sub-Slab Soil Vapor Sampling Report,"* dated October 9, 2012 indicates that tetrachloroethene (PCE) was detected in 3 of 10 sub-slab vapor samples collected on December 9, 2011 at concentrations ranging from 5.7 to 240 micrograms per cubic meter ($\mu g/m^3$). The Analytical Report states that all volatile organic compound (VOCs) concentrations are well below the residential CHHLs. This statement is not accurate since the maximum PCE concentration of 240 $\mu g/m^3$ exceeds the residential CHHSL

of 180 µg/m^3. However, the maximum concentration of PCE does not exceed the San Francisco Bay Regional Water Quality Control Board Environmental Screening Level (ESL) for commercial land use of 2,100 µg/m^3. The detections of PCE were not evaluated or discussed in any recently submitted reports or during a November 14, 2012 meeting. In the Work Plan requested below, we request that you include an evaluation of whether the VOCs in sub-slab vapor represent a human health threat for vapor intrusion or propose additional data collection to compete this evaluation.

2. **Volatile Organic Compounds in Groundwater.** Further review of the case file indicates that groundwater does not appear to have been analyzed for VOCs other than petroleum hydrocarbon constituents. Due to the detections of PCE in sub-slab soil vapor, PCE is a chemical of concern for the site. The absence of VOC data for groundwater may represent a data gap for the site. Vapor intrusion assessments are generally conducted using multiple lines of evidence. VOC data for groundwater would provide an additional line of evidence to evaluate the PCE detected in sub-slab vapor discussed in technical comment 2. Therefore, the collection of a limited number of groundwater samples for VOC analysis is to be included in the Work Plan requested below.

3. **Residual Diesel Contamination.** Hand excavation was conducted inside the western end of the building in the area of a former fuel dispenser. The excavation was stopped at a depth of 2.5 feet below grade. However, soil containing elevated concentrations of total petroleum hydrocarbons as diesel remains in place beneath the western end of the building as indicated by elevated concentrations of TPH as diesel (TPHd) in confirmation soil samples. The TPHd does not appear to pose a human health risk for vapor intrusion to the western end of the building. Napthalene was not detected at concentrations exceeding the LTCP criteria of 93 µg/m^3 in sub-slab soil vapor samples collected beneath the building. As discussed during the November 14, 2012 meeting, the residual TPHd although not an apparent health risk based on comparison to LTCP criteria, may represent an odor or nuisance condition. A method for sealing the floor in this area of the building to mitigate possible nuisance conditions was proposed by Clearwater Group and was discussed during the meeting. However, you may wish to delay presenting plans for mitigation of possible nuisance vapor conditions in the western portion of the building pending completion of an evaluation of the VOC issue discussed in technical comments 1 and 2.

4. **Delineation of TPHd Plume.** A total of an additional ten soil borings was proposed for soil and groundwater sampling in the document entitled, "*Soil and Groundwater Investigation Results*," dated February 29, 2012. The purpose of the proposed borings was to define the lateral and vertical definition of diesel impacts. As discussed during the November 14, 2012 meeting, the results of a detailed well survey will be reviewed to determine whether additional delineation is necessary for the TPHd plume. However, as requested in technical comment 2, the collection of a limited number of groundwater samples for VOC analysis is to be included in the Work Plan requested below. Depending upon their locations, these additional groundwater samples could also provide further delineation of TPHd in groundwater.

5. **Well Search Report**. Based on the results of the well search, the nearest water supply well appears to be a 345 feet deep well located approximately 450 feet west northwest of the site. The nearest well is described as abandoned but not destroyed through a permitted process. Table 4 of the Well Search, which is entitled, "*Well and Tank Locations Identified in Sanborn*

Map Well Search," presents a detailed list of water tank and wind mill locations. Figure 4 provides a detailed map of the water tank locations, which show two water tank locations immediately west of the site. The Well Search Report includes no discussion, conclusions, or recommendations regarding the water tank locations. In the Work Plan requested below, please include some evaluation of these data along with plans to conduct a door to door well survey to verify that no water supply wells are present at these locations.

TECHNICAL REPORT REQUEST

Please upload technical reports to the ACEH ftp site (Attention: Jerry Wickham), and to the State Water Resources Control Board's GeoTracker website according to the following schedule and file-naming convention:

- **May 28, 2013** – Work Plan
  File to be named: WP_R_yyyy-mm-dd RO294

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

If you have any questions, please call me at (510) 567-6791 or send me an electronic mail message at jerry.wickham@acgov.org.

Sincerely,

Digitally signed by Jerry Wickham
DN: cn=Jerry Wickham, o=Alameda County Environmental Health, ou, email=jerry.wickham@acgov.org, c=US
Date: 2013.03.26 17:50:42 -07'00'

Jerry Wickham, California PG 3766, CEG 1177, and CHG 297
Senior Hazardous Materials Specialist

Attachment: ACEH Correspondence dated December 5, 2012
Responsible Party(ies) Legal Requirements/Obligations

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Leroy Griffin, Oakland Fire Department, 250 Frank H. Ogawa Plaza, Ste. 3341, Oakland, CA 94612-2032 2032 (*Sent via E-mail to: lgriffin@oaklandnet.com*)

Robert Nelson, Clearwater Group, 229 Tewksbury Avenue, Pt. Richmond, CA 94801 (*Sent via E-mail to: RNelson@clearwatergroup.com*)

Olivia Jacobs, Clearwater Group, 229 Tewksbury Avenue, Pt. Richmond, CA 94801 (*Sent via E-mail to: OJacobs@clearwatergroup.com*)

James Jacobs, Clearwater Group, 229 Tewksbury Avenue, Pt. Richmond, CA 94801 (*Sent via E-mail to: augerpro@sbcglobal.net*)

Donna Drogos, ACEH (*Sent via E-mail to: donna.drogos@acgov.org*)
Jerry Wickham, ACEH (*Sent via E-mail to: jerry.wickham@acgov.org*)

GeoTracker, File

Attachment 1

Responsible Party(ies) Legal Requirements/Obligations

REPORT/DATA REQUESTS

These reports/data are being requested pursuant to Division 7 of the California Water Code (Water Quality), Chapter 6.7 of Division 20 of the California Health and Safety Code (Underground Storage of Hazardous Substances), and Chapter 16 of Division 3 of Title 23 of the California Code of Regulations (Underground Storage Tank Regulations).

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (Local Oversight Program [LOP] for unauthorized releases from petroleum Underground Storage Tanks [USTs], and Site Cleanup Program [SCP] for unauthorized releases of non-petroleum hazardous substances) require submission of reports in electronic format pursuant to Chapter 3 of Division 7, Sections 13195 and 13197.5 of the California Water Code, and Chapter 30, Articles 1 and 2, Sections 3890 to 3895 of Division 3 of Title 23 of the California Code of Regulations (23 CCR). Instructions for submission of electronic documents to the ACEH FTP site are provided on the attached "Electronic Report Upload Instructions."

Submission of reports to the ACEH FTP site is in addition to requirements for electronic submittal of information (ESI) to the State Water Resources Control Board's (SWRCB) Geotracker website. In April 2001, the SWRCB adopted 23 CCR, Division 3, Chapter 16, Article 12, Sections 2729 and 2729.1 (Electronic Submission of Laboratory Data for UST Reports). Article 12 required electronic submittal of analytical laboratory data submitted in a report to a regulatory agency (effective September 1, 2001), and surveyed locations (latitude, longitude and elevation) of groundwater monitoring wells (effective January 1, 2002) in Electronic Deliverable Format (EDF) to Geotracker. Article 12 was subsequently repealed in 2004 and replaced with Article 30 (Electronic Submittal of Information) which expanded the ESI requirements to include electronic submittal of any report or data required by a regulatory agency from a cleanup site. The expanded ESI submittal requirements for petroleum UST sites subject to the requirements of 23 CCR, Division, 3, Chapter 16, Article 11, became effective December 16, 2004. All other electronic submittals required pursuant to Chapter 30 became effective January 1, 2005. Please visit the SWRCB website for more information on these requirements. (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/)

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 7835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, late reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.

Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)	**REVISION DATE:** July 25, 2012
	ISSUE DATE: July 5, 2005
	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010
SECTION: Miscellaneous Administrative Topics & Procedures	**SUBJECT:** Electronic Report Upload (ftp) Instructions

The Alameda County Environmental Cleanup Oversight Programs (petroleum UST and SCP) require submission of all reports in electronic form to the county's FTP site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities.

REQUIREMENTS

- **Please do not submit reports as attachments to electronic mail.**
- Entire report including cover letter must be submitted to the ftp site as **a single Portable Document Format (PDF) with no password protection**.
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- **Signature pages and perjury statements must be included and have either original or electronic signature.**
- **Do not password protect the document**. Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted**.
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:

  RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Submission Instructions

1) Obtain User Name and Password
   a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
      i) Send an e-mail to .loptoxic@acgov.org
   b) In the subject line of your request, be sure to include **"ftp PASSWORD REQUEST"** and in the body of your request, include the **Contact Information, Site Addresses**, and the **Case Numbers (RO# available in Geotracker) you will be posting for**.

2) Upload Files to the ftp Site
   a) Using Internet Explorer (IE4+), go to ://alcoftp1.acgov.org
      (i) Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
   b) Click on Page located on the Command bar on upper right side of window, and then scroll down to Open FTP Site in Windows Explorer.
   c) Enter your User Name and Password. (Note: Both are Case Sensitive.)
   d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
   e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.

3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
   a) Send email to .loptoxic@acgov.org notify us that you have placed a report on our ftp site.
   b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name @acgov.org. (e.g., firstname.lastname@acgov.org)
   c) The subject line of the e-mail must start with the RO# followed by **Report Upload**. (e.g., Subject: RO1234 Report Upload) If site is a new case without an RO#, use the street address instead.
   d) If your document meets the above requirements and you follow the submission instructions, you will receive a notification by email indicating that your document was successfully uploaded to the ftp site.

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

December 5, 2012

Mr. John Protopappas
P&D 23rd Avenue Associates LLC
P.O. Box 687
Oakland, CA 94604
(*Sent via E-mail to: John@MPFCorp.com*)

Subject: Case File Review for Fuel Leak Case No. RO0000294 and GeoTracker Global ID T0600177455, 23rd Avenue Partners, 1125 Miller Avenue, Oakland, CA 94601

Dear Mr. Protopappas:

Alameda County Environmental Health (ACEH) staff has reviewed the fuel leak case file for the above-referenced site including the most recently submitted documents entitled, *"Update of the Soil Vapor Sample Analytical Report Presented in Sub-Slab Soil Vapor Sampling Report,"* dated October 9, 2012 (Analytical Report) and *"Sub-Slab Excavation Report,"* dated November 8, 2012 (Excavation Report) and received by ACEH on November 14, 2012. Both reports were prepared on your behalf by Clearwater Group.

The Analytical Report presents laboratory analytical reports for Modified TO-14A/15 analyses performed on sub-slab soil vapor samples. The Excavation Report documents the results of removal of vent and supply lines and limited removal of contaminated soil beneath a former dispenser inside the western corner of the building. This site was also discussed during a meeting conducted on November 14, 2012 between Mr. John Protopappas of Madison Park Financial Corporation, James Jacobs of Clearwater Group, Robert Nelson of Clearwater Group, Olivia Jacobs of Clearwater Group, and Jerry Wickham of ACEH.

Based on our review of the case file, we request that you submit a Work Plan that addresses the technical comments below.

TECHNICAL COMMENTS

1. **Soil Vapor Screening Values.** Table 2 of the October 9, 2012 Analytical Report uses soil vapor screening values that do not appear to be designated properly. The title of Table 2 indicates that soil vapor sample results are compared to screening values from the Low-Threat Closure Policy (LTCP) with no bioattenuation zone. However, the screening values shown are for sites with a bioattenuation zone and are three orders of magnitude higher than screening values with no bioattenuation zone. We note these values were corrected in meeting handouts; please make this correction in future documents. The header of Table 2 describes CHHSLs commercial; however, the screening values shown appear to be CHHSLs for residential land use. Please correct the header and/or screening values in future documents.

2. **Volatile Organic Compounds in Sub-slab Soil Vapor**. Review of the October 9, 2012 Analytical Report indicates that tetrachloroethene (PCE) was detected in 3 of 10 sub-slab vapor samples collected on December 9, 2011 at concentrations ranging from 5.7 to 240 micrograms per cubic meter (µg/m^3). The Analytical Report states that all volatile organic compound (VOCs) concentrations are well below the residential CHHLs. This statement is not accurate since the maximum PCE concentration of 240 µg/m^3 exceeds the residential CHHSL of 180 µg/m^3. However, the maximum concentration of PCE does not exceed the San Francisco Bay Regional Water Quality Control Board Environmental Screening Level (ESL) for residential land use of 410 µg/m^3. The detections of PCE were not evaluated or discussed in either of the recently submitted reports or during the November 14, 2012 meeting. In the Work Plan requested below, we request that you include an evaluation of whether the VOCs in sub-slab vapor represent a human health threat for vapor intrusion or propose additional data collection to compete this evaluation.

3. **Volatile Organic Compounds in Groundwater.** Further review of the case file indicates that groundwater does not appear to have been analyzed for VOCs other than petroleum hydrocarbon constituents. Due to the detections of PCE in sub-slab soil vapor, PCE is a chemical of concern for the site. The absence of VOC data for groundwater may represent a data gap for the site. Vapor intrusion assessments are generally conducted using multiple lines of evidence. VOC data for groundwater would provide an additional line of evidence to evaluate the PCE detected in sub-slab vapor discussed in technical comment 2. Therefore, the collection of a limited number of groundwater samples for VOC analysis is to be included in the Work Plan requested below.

4. **Residual Diesel Contamination.** Hand excavation was conducted inside the western end of the building in the area of a former fuel dispenser. The excavation was stopped at a depth of 2.5 feet below grade. However, soil containing elevated concentrations of total petroleum hydrocarbons as diesel remains in place beneath the western end of the building as indicated by elevated concentrations of TPH as diesel (TPHd) in confirmation soil samples. The TPHd does not appear to pose a human health risk for vapor intrusion to the western end of the building. Napthalene was not detected at concentrations exceeding the LTCP criteria of 93 µg/m^3 in sub-slab soil vapor samples collected beneath the building. As discussed during the November 14, 2012 meeting, the residual TPHd although not an apparent health risk based on comparison to LTCP criteria, may represent an odor or nuisance condition. A method for sealing the floor in this area of the building to mitigate possible nuisance conditions was proposed by Clearwater Group and was discussed during the meeting. However, you may wish to delay presenting plans for mitigation of possible nuisance vapor conditions in the western portion of the building pending completion of an evaluation of the VOC issue discussed in technical comment 2.

5. **Delineation of TPHd Plume.** A total of an additional ten soil borings was proposed for soil and groundwater sampling in the document entitled, "*Soil and Groundwater Investigation Results*," dated February 29, 2012. The purpose of the proposed borings was to define the lateral and vertical definition of diesel impacts. As discussed during the November 14, 2012 meeting, the results of a detailed well survey will be reviewed to determine whether additional delineation is necessary for the TPHd plume. However, as requested in technical comment 3, the collection of a limited number of groundwater samples for VOC analysis is to be

included in the Work Plan requested below. Depending upon their locations, these additional groundwater samples could also provide further delineation of TPHd in groundwater.

6. **Well Survey**. As discussed during the November 14, 2012 meeting, we request that you complete a well survey to identify all water supply wells within 2,000 feet of the site. We recommend that you obtain well information from both the Alameda County Public Works Agency and the State of California Department of Water Resources. Submittal of maps showing the location of all wells identified in your study, and the use of tables to report the data collected as part of your survey are required. Please provide a table that includes the well designation, location, total depth, diameter, screen interval, date of well installation, current status, historic use, and owner of the wells. In addition, please provide well logs and completion records for wells downgradient from the site that are potential receptors. Results of the detailed well survey are to be included in the Work Plan requested below. Please also include plans to conduct a door to door well survey.

TECHNICAL REPORT REQUEST

Please upload technical reports to the ACEH ftp site (Attention: Jerry Wickham), and to the State Water Resources Control Board's GeoTracker website according to the following schedule and file-naming convention:

- **February 21, 2013** – Work Plan
  File to be named: WP_R_yyyy-mm-dd RO294

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

If you have any questions, please call me at (510) 567-6791 or send me an electronic mail message at jerry.wickham@acgov.org.

Sincerely,

Jerry Wickham

Digitally signed by Jerry Wickham
DN: cn=Jerry Wickham, o=Environmental Health, ou=Alameda County, email=jerry.wickham@acgov.org, c=US
Date: 2012.12.05 14:35:06 -08'00'

Jerry Wickham, California PG 3766, CEG 1177, and CHG 297
Senior Hazardous Materials Specialist

Attachment: Responsible Party(ies) Legal Requirements/Obligations

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Leroy Griffin, Oakland Fire Department, 250 Frank H. Ogawa Plaza, Ste. 3341, Oakland, CA 94612-2032 2032 (*Sent via E-mail to: lgriffin@oaklandnet.com*)

Robert Nelson, Clearwater Group, 229 Tewksbury Avenue, Pt. Richmond, CA 94801 (*Sent via E-mail to: RNelson@clearwatergroup.com*)

Olivia Jacobs, Clearwater Group, 229 Tewksbury Avenue, Pt. Richmond, CA 94801 (*Sent via E-mail to: OJacobs@clearwatergroup.com*)

James Jacobs, Clearwater Group, 229 Tewksbury Avenue, Pt. Richmond, CA 94801 (*Sent via E-mail to: augerpro@sbcglobal.net*)

Donna Drogos, ACEH (*Sent via E-mail to: donna.drogos@acgov.org*)
Jerry Wickham, ACEH (*Sent via E-mail to: jerry.wickham@acgov.org*)

GeoTracker, File

Attachment 1

Responsible Party(ies) Legal Requirements/Obligations

REPORT/DATA REQUESTS

These reports/data are being requested pursuant to Division 7 of the California Water Code (Water Quality), Chapter 6.7 of Division 20 of the California Health and Safety Code (Underground Storage of Hazardous Substances), and Chapter 16 of Division 3 of Title 23 of the California Code of Regulations (Underground Storage Tank Regulations).

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (Local Oversight Program [LOP] for unauthorized releases from petroleum Underground Storage Tanks [USTs], and Site Cleanup Program [SCP] for unauthorized releases of non-petroleum hazardous substances) require submission of reports in electronic format pursuant to Chapter 3 of Division 7, Sections 13195 and 13197.5 of the California Water Code, and Chapter 30, Articles 1 and 2, Sections 3890 to 3895 of Division 3 of Title 23 of the California Code of Regulations (23 CCR). Instructions for submission of electronic documents to the ACEH FTP site are provided on the attached "Electronic Report Upload Instructions."

Submission of reports to the ACEH FTP site is in addition to requirements for electronic submittal of information (ESI) to the State Water Resources Control Board's (SWRCB) Geotracker website. In April 2001, the SWRCB adopted 23 CCR, Division 3, Chapter 16, Article 12, Sections 2729 and 2729.1 (Electronic Submission of Laboratory Data for UST Reports). Article 12 required electronic submittal of analytical laboratory data submitted in a report to a regulatory agency (effective September 1, 2001), and surveyed locations (latitude, longitude and elevation) of groundwater monitoring wells (effective January 1, 2002) in Electronic Deliverable Format (EDF) to Geotracker. Article 12 was subsequently repealed in 2004 and replaced with Article 30 (Electronic Submittal of Information) which expanded the ESI requirements to include electronic submittal of any report or data required by a regulatory agency from a cleanup site. The expanded ESI submittal requirements for petroleum UST sites subject to the requirements of 23 CCR, Division, 3, Chapter 16, Article 11, became effective December 16, 2004. All other electronic submittals required pursuant to Chapter 30 became effective January 1, 2005. Please visit the SWRCB website for more information on these requirements. (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/)

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 7835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, late reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.

Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)	**REVISION DATE:** July 25, 2012
	ISSUE DATE: July 5, 2005
	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010
SECTION: Miscellaneous Administrative Topics & Procedures	**SUBJECT:** Electronic Report Upload (ftp) Instructions

The Alameda County Environmental Cleanup Oversight Programs (petroleum UST and SCP) require submission of all reports in electronic form to the county's FTP site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities.

REQUIREMENTS

- **Please do not submit reports as attachments to electronic mail.**
- Entire report including cover letter must be submitted to the ftp site as **a single Portable Document Format (PDF) with no password protection**.
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- **Signature pages and perjury statements must be included and have either original or electronic signature.**
- **Do not password protect the document**. Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted**.
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:

  RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Submission Instructions

1) Obtain User Name and Password
   a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
      i) Send an e-mail to .loptoxic@acgov.org
   b) In the subject line of your request, be sure to include **"ftp PASSWORD REQUEST"** and in the body of your request, include the **Contact Information, Site Addresses**, and the **Case Numbers (RO# available in Geotracker) you will be posting for**.

2) Upload Files to the ftp Site
   a) Using Internet Explorer (IE4+), go to ://alcoftp1.acgov.org
      (i) Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
   b) Click on Page located on the Command bar on upper right side of window, and then scroll down to Open FTP Site in Windows Explorer.
   c) Enter your User Name and Password. (Note: Both are Case Sensitive.)
   d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
   e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.

3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
   a) Send email to .loptoxic@acgov.org notify us that you have placed a report on our ftp site.
   b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name @acgov.org. (e.g., firstname.lastname@acgov.org)
   c) The subject line of the e-mail must start with the RO# followed by **Report Upload**. (e.g., Subject: RO1234 Report Upload) If site is a new case without an RO#, use the street address instead.
   d) If your document meets the above requirements and you follow the submission instructions, you will receive a notification by email indicating that your document was successfully uploaded to the ftp site.

APPENDIX B


Land Science™
Technologies
Geo-Seal™
Advanced Vapor Management Technology
www.landsciencetech.com

HISTORY

Land Science™ Technologies

***Land Science Technologies* (LST) ™** is dedicated to providing advanced technologies for sustainable land development. A goal of LST is to provide innovative and technically sound development solutions for underutilized environmentally impaired properties, commonly referred to as Brownfields.

LST's cost-effective, industry leading technologies offer engineering firms and real estate developers solutions to issues facing the development of Brownfields today. LST is a division of ***Regenesis, Inc.***, a global leader in groundwater and soil remediation technologies since 1994.

REGENESIS

www.regenesis.com

Geo-Seal™

Geo-Seal™ is an advanced composite gas vapor management technology (patent pending) designed to eliminate potential indoor air quality health risks associated with subsurface contaminant vapor intrusion.

Geo-Seal is an ideal gas vapor management technology designed for use on Brownfields or any type of environmentally impaired site, i.e. manufacturing facilities, dry cleaners, gasoline service stations, landfills, etc. ***Geo-Seal*** is placed between the foundation of the building and the soil pad to eliminate vapor exposure pathways and stop contaminated vapors from permeating through the slab. Vapor management systems incorporating both ***Geo-Seal*** vapor barrier and *Vapor-Vent* ventilation provide industry leading sub-foundation vapor mitigation technology. By deploying these systems developers ensure a healthy indoor environment while reducing the cost of site remediation and expediting site construction.

Triple-Layer Protection

The triple-layer system used in ***Geo-Seal*** provides maximum redundancy and protection against the formation of vapor pathways both during and after installation. Such pathways can result from chemically induced materials breakdown, punctures, and seam weaknesses resulting from poor detail work and/or application installation imperfections around penetrations. ***Geo-Seal*** also provides unmatched protection from a range of contaminant vapors including those from petroleum-based products and chlorinated hydrocarbons.

Field-Proven Technology

Geo-Seal is manufactured in partnership with E-Pro™ Systems which has over 20 years experience in the building products industry and a leading track record in barrier systems for vapor and waterproofing applications.

FEATURES

Geo-Seal™ Triple-Layer System
(2 Chemical Resistant Layers + 1 Spray Applied Core Layer)

Dual Chemical Resistant Layers
The ***BASE*** layer (bottom) and the ***BOND*** layer (top) are composed of a high-density polyethylene material bonded to a geo-textile on the out-facing side. High density polyethylene is known for chemical resistance, high tensile strength, excellent stress-crack resistance and for highly reliable subsurface containment. The geo-textile which is physically bonded to the chemical resistant layer accomplishes two goals; it allows the BOND layer to adhere to slab, and provides a friction course between the BASE layer and the soil.

Spray Applied CORE Layer
The CORE layer is composed of a unique, elastic co-polymer modified asphaltic membrane which also provides additional protection against vapor transmission. This layer creates a highly-effective seal around slab penetrations and eliminates the need for mechanical fastening at termination points.

Chemical Resistance
The dual chemical resistant layers combined with the spray CORE form a barrier resistant to the most concentrated chemical pollutant vapors.

Enhanced Curing
Geo-Seal is “construction friendly” as the reduced curing time of the ***Geo-Seal*** CORE layer and the ability to apply it in cooler temperatures ensures quick installation and minimizes the impact on construction schedules.

Puncture Resistance
Geo-Seal forms a highly puncture resistant barrier that greatly reduces the chance of damage occurring after installation and prior to the placement of concrete.

Removing Contained Vapors
Vapor-Vent can be used in conjunction with ***Geo-Seal*** to alleviate the buildup of vapors beneath structures as a result of vapor barrier implementation. ***Vapor-Vent*** can be utilized as an active or passive ventilation system depending on the requirements of the design engineer.

Certified Applicator Network
The application of ***Geo-Seal*** and ***Vapor-Vent*** can be performed by any one of many certified applicators throughout the country.

Service and Support
Geo-Seal representatives are available to provide job and site specific assistance. A local representative can ensure ***Geo-Seal*** and ***Vapor-Vent*** is installed as per the specification.

DIAGRAM

Geo-Seal™

Application Diagram

Diagram Labels

1. **Geo-Seal BASE** is the foundational, chemical resistant, bottom layer that is rolled out onto the exposed soil surface. This layer is applied with a geo-textile side facing down to provide greater friction with the soil surface. The Geo-Seal BASE Layer is a high-quality substrate and enables the second, spray-applied CORE Layer to be free of shadowing and pinholes.

2. **Geo-Seal CORE** is the spray-applied, middle layer of the Geo-Seal barrier that ensures proper sealing of potential vapor pathways. Problematic pipe penetrations and effective seals at termination points are easily detailed and sealed with the utilization of the CORE Layer.

3. **Geo-Seal BOND** is the proprietary top layer that completes the triple layered Geo-Seal barrier. The BOND layer serves two purposes; it helps protect the system from getting punctured after installation and provides the final layer of chemical resistance.

4. **Vapor-Vent:**
   - When used with Geo-Seal provides maximum protection against contaminated vapor
   - Eliminates the need for trenching
   - Cost-effective compared to pipe and gravel systems
   - Eliminates long-term costs when configured as a passive system
   - Allows for rapid installation

Land Science™
Technologies

Land Science Technologies
1011 Calle Sombra
Suite 110
San Clemente, CA 92673
Ph. 949-366-8000
Fax. 949-366-8090
www.landsciencetech.com

FSC Mixed Sources
Product group from well-managed forests, controlled sources and recycled wood or fiber
www.fsc.org Cert no. SW-COC-1851
© 1996 Forest Stewardship Council
25%
Printed on recycled paper using soy inks

Vapor Intrusion Coating System for Existing Structures

Product Description

The **Retro-Coat™ (patent pending)** Vapor Intrusion Coating System is a complete product line that consists of chemically resistant materials to properly protect existing structures from the threat of contaminant vapor intrusion without the need for additional concrete protection. Developed by the R&D team of Land Science Technologies™, the Retro-Coat system has been subjected to rigorous testing procedures to prove its ability to combat the most aggressive chemical vapors. The main component of the Retro-Coat system is the **Retro-Coat** coating which is a two part, odorless, no VOC, 100% solids coating.

Retro-Coat finishes to a high gloss, easy-to-clean surface that is impervious to vapor and moisture transmission. Available in a variety of colors, **Retro-Coat** can be applied on damp as well as dry concrete, concrete masonry units, tile, brick and metal. For enhanced slip resistance, a suitable aggregate can be added. In addition, other additives or materials can be utilized to achieve a desired performance or aesthetic look.

Typical Application

Retro-Coat is suitable as a barrier to block contaminated vapors from entering existing structures. Particular uses include coating the horizontal surfaces of existing structures where contamination under, or adjacent to, a structure can potentially migrate inside the structure and create a vapor encroachment condition. This condition is most commonly found when the existing structure was operated as a dry cleaner, gas station, manufacturing facility or located in close proximity to any structure where carcinogenic chemicals were utilized.

A typical application consists of a minimum 20 mil thick system; consisting of two 10 mil coats of **Retro-Coat** at 160 SF/gallon per coat and is recommended along with a 6 mil coat of **Retro-Coat PRIMER.** The typical 20 mil application can withstand forklift traffic, other machinery and even act as secondary containment. However, if **Retro-Coat** may be exposed to more harsh conditions over a longer period of time, thicker applications ranging from 60 mil to ¼ -inch may be more suitable.

In either application, **Retro-Coat** is a traffic bearing surface and does not need a protective course placed over it.

Retro-Coat Advantages

- ***Our R&D team developed all of the Retro-Coat system components specifically for vapor intrusion protection in existing structures***
- ***Retro-Coat is resistant to both TCE and PCE, the vast majority of coatings cringe at such aggressive chemicals***
- ***Retro-Coat is a wearing surface, meaning no additional concrete protection is necessary***
- ***No odor and fast cure time reduce building downtime***
- ***Carpet, tile, linoleum or other floor coverings can be applied directly over Retro-Coat, if desired***
- ***Eliminates the need to remove the existing slab and when combined with in-situ treatment, lowers overall remediation cost***
- ***Retro-Coat can increase the performance of an existing active sub-slab depressurization system***
- ***Retro-Coat can aid in the retiring of existing active systems***
- ***Available and installed by Land Science Technologies certified contractors***

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Completed surface preparation consisting of shot blasting, Retro-Coat PREP to fill joints and cracks and a 6 mil application of Retro-Coat PRIMER

Application of Retro-Coat SEALANT to a 20 mil total thickness

Installation

Particular care must be taken to follow those instructions precisely to assure proper installation. These instructions pertain to a standard 20 mil application; please contact us if the desired application is different.

1. New concrete should be allowed to cure a minimum of 28 days and/or be checked with a rubber mat or plastic sheet to ensure adequate curing time has occurred.
2. All surfaces to be covered should be power washed, shot blasted, acid etched, scarified or sanded to present a clean, sound substrate to which to bond to. The prepared surface should have a ph of 7.
3. Any bugholes and cracks wider than 1/8" should be filled with **Retro-Coat PREP** and allowed to dry before coating. More severely damaged concrete or other special conditions will require the proper **Retro-Coat** product.
4. When installing the standard 20 mil application of **Retro-Coat**, apply a 6 mil coat of **Retro-Coat PRIMER** and allow to dry prior to applying the initial coat of **Retro-Coat**. Priming may not be necessary when **Retro-Coat** is applied to a thickness greater than 20 mils. On new concrete or old concrete with an open porosity and on wood surfaces apply **Retro-Coat PRIMER** and allow to dry.
5. The two **Retro-Coat** ingredients should be mixed in the prescribed ratios, using a low speed "jiffy-style" mixer, (maximum 750 rpm). Mix Part A for about 1 minute then, add Part B and mix until uniform in color and consistency (at least one additional minute.)
6. Do not mix less than the prescribed amount of any ingredient or add any solvent to the mix.
7. Apply the mixed **Retro-Coat** material with a short nap roller, a squeegee or a brush. Apply approximately 160 SF per gallon per coat to achieve 10 mils of coating.
8. Apply a second coat while the first coat is still tacky if using spike shoes or dry enough to walk on, but before 7 hours at 75^{o}F. If the first coat has set and is no longer tacky then the first coat should be sanded before recoating.
9. A suitable aggregate may be broadcast onto the surface after backrolling to provide more anti-slip profile to the finished surface. It is advisable to test various types and sizes of aggregate to achieve the desired finished profile.

Product Specification

The specified area shall receive an application of **Retro-Coat** as manufactured by **Land Science Technologies, San Clemente, California.** The material shall be installed by precisely following the manufacturer's published recommendations pertaining to surface preparation, mixing and application. The material shall be a low odor, two part, solvent free 100% solids, high gloss flexibilized system with good resilience to resist thermal and mechanical shock. It should be able to be roller applied at a minimum of 10 mils thickness per coat on vertical surfaces without sagging (at ambient conditions). The system must adhere to damp as well as dry concrete, wood, metal tile, terrazzo and sound existing epoxy and urethane coatings. It shall have tensile elongation of at least 6.0% when tested under ASTM-638. Its bond strength to quarry tile shall exceed 1000 psi when tested with an Elcometer pull test. Its hardness shall not exceed 83, as measured on the Shore D scale. The system shall be unaffected by oils and greases and shall withstand chemical attack for at least 72 hours against 98% sulfuric, 50% hydrofluoric acid, glacial acetic acid and acrylonitrile.

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Precautions

1. **This is a fast reacting product; immediately pour onto floor after mixing and spread with notched squeegee. Recoat window without sanding at 70°F: 8 hours**
2. **A severe skin and eye irritant; check MSDS before use**
3. **Do not apply below 50°F**

Note: Failure to follow the above instruction, unless expressly authorized by a Land Science Technologies Representative, will void our material warranty.

Chemical Resistance

Retro-Coat™ is considered chemically resistant to neat concentrated acids, caustics and solvents. For permeation or diffusion coefficients please contact Land Science Technologies.

Physical Properties

Tensile Strength	(ASTM D-638)	: 9800 psi	Bond Strength to Quarry Tile	: >1000 psi
Tensile Elongation	(D-638)	: 6.0%	Vapor Transmission Rate (E-96)	: .027 perms
Flexural Strength	(D-790)	: 7035 psi	Water Absorption (D-570)	: 0.2% in 24hrs.
Hardness, Shore D	(D-2240)	: 83	Taber Abrasion (D-1044)	: 86 mg loss.
Gardner Impact Strength	(D-2794)	: 80 in. lbs.	60° Gloss	: 100

Physical Characteristics

Density, lbs/gal.
Pt. A : 11.0
Pt. B : 8.9
A&B Mixed : 9.3

Viscosity @ 77°F, cps
Pt. A : 18,400
Pt. B : 500
A&B Mixed : 4800

Mixing Ratios — **By Volume** — **By Weight**
Pt. A : Pt. B — **2:1** — **2.3:1**

Curing Times @	**50° F**	**77°F**	**90°F**
Pot Life	35 min.	30 min.	20 min.
Working Times	20 min.	20 min.	15 min.
Hard, Foot Traffic	14 hrs.	7 hrs.	3 ½ hrs.

Maximum hardness and chemical resistance are achieved after 7 days at 77°F

Color Availability

Standard colors: beige, black, blue, dark gray, green, gray, red, white, yellow

Shelf Life: 1 Year at 77°F in unopened containers

Packaging and Coverage Rates *(for 20 mil coverage)*

4 Gallon Kit	:	320 SF
20 Gallon Kit	:	1600 SF
100 Gallon Kit	:	8,000 SF

The data, statements and recommendations set forth in this product information sheet are based on testing, research and other development work which has been carefully conducted by Land Science Technologies, and we believe such data, statements and recommendations will serve as reliable guidelines. However, this product is subject to numerable uses under varying conditions over which we have no control, and accordingly, we do NOT warrant that this product is suitable for any particular use. Users are advised to test the product in advance to make certain it is suitable for their particular production conditions and particular use or uses.

WARRANTY – All products manufactured by us are warranted to be first class material and free from defects in material and workmanship.

Liability under this warranty is limited to the net purchase price of any such products proven defective or, at our option, to the repair or replacement of said products upon their return to us transportation prepaid. All claims hereunder on defective products must be made in writing within 30 days after the receipt of such products in your plant and prior to further processing or combining with other materials and products. WE MAKE NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE SUITABILITY OF ANY OF OUR PRODUCTS FOR ANY PARTICULAR USE, AND WE SHALL NOT BE SUBJECT TO LIABILITY FROM ANY DAMAGES RESULTING FROM THEIR USE IN OPERATIONS NOT UNDER OUR DIRECT CONTROL.

THIS WARRANTY IS EXCLUSIVE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND NO REPRESENTATIVE OF OURS OR ANY OTHER PERSON IS AUTHORIZED TO ASSUME FOR US ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF OUR PRODUCTS.

APPENDIX C

CLEARWATER GROUP

Monitoring Well Installation Development and Destruction
Field Procedures

Drilling and Soil Sampling

Permits, Site Safety Plan, Utility Clearance

All required permits are obtained, unless otherwise contractually directed. A site specific Site Safety Plan is prepared detailing site hazards, site safety and control, decontamination procedures, and emergency response procedures to be employed throughout the work. At least 48 hours prior to drilling, Underground Service Alert (USA) or an equivalent agency is notified of the planned work. Clearwater attempts to locate all underground and aboveground utilities by site inspection in conjunction with its subcontractors and knowledgeable site managers (if available), and review of site as-built drawings. Clearwater may contract with a professional utility locator to refine the site utility inspection. All Clearwater drilling and sampling methods are consistent with ASTM Method D-1452-80, and local, state, and federal regulations.

Drilling Equipment

All well boreholes are drilled using a truck-mounted hollow-stem auger drill rig, unless site conditions warrant a different drilling method. All drilling equipment is inspected daily and maintained in safe working condition by the operator. All down-hole drilling equipment is steam cleaned prior to arriving on site. Working components of the drill rig near the borehole, as well as augers and drill rods, are thoroughly steam cleaned between each boring location.

Soil Sampling and Lithologic Description

Whenever possible, the first Clearwater boring to be drilled at a site is continuously cored to obtain a complete lithologic description. Subsurface conditions permitting, the first five feet of each boring are advanced using a hand-auger or post-hole digger. Otherwise, soil samples are typically collected every 5 feet to the total depth explored, using stainless steel tubes fitted in a California-modified split spoon sampler. Additional soil samples may be collected on the basis of significant changes in lithology or in areas of obvious soil contamination. During soil sample collection, the split spoon sampler is driven 18 to 24 inches past the lead auger by a 140-pound hammer falling 30 inches. The number of blows necessary to drive the sampler every 6 inches ("blow count") and the amount of soil recovered are recorded on the Field Exploratory Soil Boring Log. The type, diameter, and length of the sampler will be noted on the boring log. The soil sampler and liners are cleaned with an Alconox® solution and rinsed with tap water prior to each sampling event. Pre-cleaned liners are used whenever a soil sample may be retained for laboratory analysis.

Well Installation

Well Casing, Screen and Filter Pack Construction

Monitoring wells are constructed with a threaded, schedule 40, polyvinyl chloride (PVC) casing unless site geochemistry or contamination necessitates an alternative material. Monitoring wells are typically constructed using a 2-inch or 4-inch diameter casing, with a factory-slotted screen and threaded end cap.

The well screen slot size is the maximum size capable of retaining 90% of the filter pack. Typically, 0.010-inch diameter slotted screen is used where the formation is predominantly clay and/or silt or fine sand and 0.020-inch screen is used where the formation is predominantly medium to coarse sand and/or gravel.

A sand filter pack is placed in the annular space across the screened interval and extended approximately two feet above the screen, as site conditions permit. The filter pack grade (mean grain size) is selected according to native sediment type as follows: a) for poorly graded fine sand or silt/clay - 4 times the 70% retained grain size of the

formation; b) for medium to coarse sand, gravel or well graded sediments - 6 times the 70% retained grain size. The retained grain size is determined by a particle size analysis, to determine a sieve screen opening size, where 70% of the soil particles are retained on the sieve screen and 30% of the soil particles pass through the sieve screen. Since results of particle size analysis are not always available, Clearwater often selects screen size and filter pack on the basis of the site lithology, usually the finest grained significantly thick layer of sediment to be screened. Commonly selected grades of filter pack sand are Lone Star® #3 or #2/12 with 0.020-inch slotted screen and Lone Star® #2/16 with 0.010-inch slotted screen.

Well Seal and Completion

A minimum two-foot thick seal of bentonite pellets is placed above the sand pack. The bentonite seal is hydrated by either formation water or potable water. Neat cement or a cement/bentonite grout mixture seals the remaining annular space to the surface. If bentonite is used in the grout mixture, it does not exceed 5% by weight. The grout is placed using a tremie pipe, if the top of the bentonite is more than 20 feet below grade, or if water is present in the boring above the bentonite seal. A watertight locking cap and protective traffic-rated vault box is installed on top of each well casing. A water-tight, traffic-rated, well box is installed, in concrete, over the top of the well to protect the well from weather and to prevent unauthorized entry into the well. The top of the box is set approximately 1/8-inch to ¼-inch above the surrounding surface to minimize surface water intrusion. Well construction details are presented on the Field Exploratory Soil Boring Log. Following completion of a well, Clearwater completes and submits, or ensures that the driller has sufficient information to complete and submit, California Department of Water Resources Well Completion Reports (DWR Form 188).

Well Development

Well development alters the characteristics of the aquifer near the well so that water will flow more freely to the well. Well development is confined mainly to a zone immediately adjacent to the well, where the soil has been disturbed by well construction procedures. The well is pumped, or bailed, of several well volumes to remove turbid water and to draw sediment that is finer than the slotted screen opening through the well screen. Then the well is swabbed with a surge block for approximately ten minutes to further remove loose sediment. Finally, the well is pumped, or bailed, to remove the turbid water and sediment from the well. Typically, greater than ten well volumes of groundwater will be removed from a well during development. Development is stopped once the purged water is largely free of sediment.

Soil Boring Abandonment

Soil borings not converted into monitoring wells are sealed to the ground surface using neat cement or sand-cement slurry in accordance with federal, state, and local regulations. Native soil may be used to fill the top two to three feet of the borehole, as permitted.

Investigation Derived Waste

Soil cuttings and well development water are typically stored separately, in 55-gallon, steel, Department of Transportation approved drums. The drums are labeled and secured, pending proper waste profiling, transportation and appropriate disposal at an approved disposal facility. The disposal facility provides Clearwater documentation of the waste's disposal.

Surveying

The newly installed wells are surveyed by a licensed surveyor. The top of casing elevations are surveyed to 1/100 of a foot and are referenced to mean sea level. If there are preexisting wells onsite, the survey will be tied into the survey of the preexisting wells.