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ENVIRONMENTAL ENGINEERS, INC.

REVISED

SOIL VAPOR WORKPLAN

Tower Mart #182
130 Pleasant Valley Road
Diamond Springs, CA 95619
El Dorado File #00077
RWQCB Case #090096

Prepared for:

Tower Energy Group
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Submitted to:

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May 2012

ACKNOWLEDGEMENTS

This report was prepared under authorization of our client; Tower Energy Group, and is intended for their exclusive use.

Environmental monitoring at the Tower Mart No. 182, Diamond Springs site is under jurisdiction of El Dorado County Environmental Management Department.

In the preparation of this Workplan, reliance was made on sub-surface evaluation completed by H2OGeol, a groundwater consultancy.

The Tower Mart No. 182 leaking underground tank site has been assigned the GeoTracker Global ID of T0601700077.

This Workplan was prepared by West & Associates Environmental Engineers, Inc. West & Associates is located at 630 Eubanks Court, Unit G, Vacaville, CA 95688; mailing address, PO Box 5891, Vacaville 95696; (707) 451-1360. Principal author is Mr. Brian W. West PE (Registered California Civil Engineer No. 32319 - expires 12/31/12).

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APPENDICES

1.0 INTRODUCTION

The former Cheaper No. 182 (now known as Tower Mart No. 182) is an active gas station/convenience store located at 130 Pleasant Valley Road in Diamond Springs (unincorporated El Dorado County). The Tower Mart No. 182 site location is illustrated on *Figure 1*. Historic fuel leakage at the site has resulted in gasoline contamination to both soil and groundwater.

Environmental remediation activities at the Tower Mart No. 182 site have been ongoing for over ten years. Contaminant concentrations in soil and groundwater have now been reduced to generally recognized closure levels. Accordingly, in December 2011, a No Further Action request was submitted to the El Dorado County Environmental Management Department.

In correspondence dated January 18, 2012, El Dorado County requested submittal of a Soil Vapor Intrusion Study Workplan to assess if residual subsurface soil vapor is a potential source of concern to human health. This Workplan is intended to comply with that directive.

1.1 Scope

The scope of this Workplan includes the following sub-tasks:

1. Customize the Site Conceptual Model (SCM) prepared by H_2OGEOL to provide design criteria for the Vapor Intrusion Study
2. Define initial Data Quality Objectives (DQO)
3. Identify and justify soil vapor collection locations
4. Describe proposed soil vapor sample methods, equipment and techniques
5. Specify the soil vapor sample analytical schedule
6. Determine appropriate minimum analytical reporting limits
6. Develop data set Quality Assurance/Quality Control measures
7. Weather monitoring
8. Data Interpretation
9. Reporting and recommendations for further action
10. Proper management of potentially contaminated Investigation Derived Wastes (IDWs)

This Workplan conforms to specifications presented in the DTSC document entitled "*Advisory - Active Soil Gas Investigations*" dated April 2012.

1.2 Generalized Site Description

The Site is located on the southeast corner of Pleasant Valley Road (Highway 49) and Patterson Road in the unincorporated community of Diamond Springs, California. It is currently an active Tower Mart gas station owned by Tower Energy Group and operating as Tower Mart #182. The three 12,000-gallon fiberglass USTs that were originally installed in 1982 were replaced in summer of 2010 with new, double-walled 12,000-gallon USTs. The Site also has two dispenser islands, a convenience store, and a large paved area on the triangular northeast section that is frequently used to park large trucks and recreational vehicles. The Site is bounded by vacant land in all directions, including an agricultural "stock pond" to the east and northeast.

Surface elevation at the Site ranges from 1,742 to 1,746 feet above mean sea level (amsl). The Site is located on a gently sloping lot with a gradient to the northeast and occupies 3 acres. *Figure 2* illustrates the Site study area, including the current layout of USTs, dispensers, and the convenience store.

A more detailed description of site geology, the contaminant profile and hydrogeologic conditions is presented in Section 2.0, Site Conceptual Model.

1.3 Summarized Project Background

The original unauthorized release at this location was discovered in June 1997 when routine product inventory measurements revealed that one of the USTs had lost a significant volume of gasoline. At that time, a 4-inch well was installed in the UST pit backfill material to facilitate removal of floating product by vacuum extraction. A total of 3,600 gallons of gasoline and water were removed immediately and another 220 gallons were pumped out two weeks later. A 6-inch thick floating product layer was reduced to just a sheen by pumping from this "tank well" during the first few weeks after the release was discovered.

In November 1999 a site investigation was initiated by installing three soil groundwater monitoring wells in the area surrounding the UST pit. These wells were reported to contain TPH-g at concentrations ranging up to 8,600 µg/L and MtBE at concentrations up to 89,000 µg/L.

Soil samples collected during the installation of these wells had very low concentrations of TPH-g, BTEX compounds, and MtBE. It was concluded that the fractured bedrock lithology prevented the accumulation of any significant contaminant mass in the vadose zone. Due to the low concentrations of gasoline compounds in soil, all active remedial efforts at the site have focused on groundwater contamination.

A sensitive receptor survey performed in December 2000 found only one domestic well and Lake Patterson within the study area. The domestic well was not in use at the time and has subsequently been removed. Lake Patterson, a man-made recreational lake, in not used as a source of potable water and has never been impacted by the release from this Site.

A total of 26 additional monitoring wells and two extraction wells were installed from 2001 to 2004. Groundwater in the vicinity of extraction well EW-1, located along the edge of the UST pit,, was found to contain 31,000 µg/L MtBE in December 2001. A step drawdown test on this well confirmed that it was capable of producing a sustained yield of only 1-2 gallons per minute (gpm), but even at this low flow rate all 12 monitoring wells installed at the time were within its capture zone.

The groundwater remediation program initiated in 2002 began with off-haul of extracted water to a regional treatment facility and progressed to on-site treatment once a discharge permit was obtained from the El Dorado Irrigation District (EID), the agency responsible for the sanitary sewer system. The treatment system was based on ozone oxidation of the extracted groundwater due to the high concentrations of MtBE present.

A second extraction well, EW-2, was installed 200 feet downgradient from EW-1 in 2004. This well produced a sustained yield of 3-4 gpm but had lower concentrations of MtBE, so the system was modified to use aqueous carbon adsorption for groundwater treatment. The EID permit only allowed discharge of pre-approved batches of treated water, so a Report of Waste Discharge (ROWD) was submitted to the RWQCB for evaluation. This ROWD was approved, and RWQCB issued a Notice of Applicability (NOA) permitting discharge in accordance with General Order #R5-2003-0044.

A small soil vapor extraction (SVE) system was installed and operated from July 2005 to December 2008. This system removed vapor-phase COCs from smear zone soils in the vicinity of EW-1 and EW-2.

Additional testing performed during the 1st quarter of 2009 confirmed that no significant contaminant mass remained in the impacted groundwater or surrounding soil, so the remediation system was turned off and and post-remediation monitoring initiated. The USTs were replaced with new, larger double-walled tanks in July 2010. Soil removed from the UST pit to accommodate the larger USTs (actually more rock than soil) contained very low concentrations of TPH-g and MtBE, confirming that no significant contaminant mass remained in the area immediately surrounding the initial release.

The initial response effort removed nearly 4,000 gallons of free product and groundwater from the tank well. The magnitude of the release remaining after this initial response has been estimated at nearly 1,000 pounds of TPH-g and MtBE, of which only 17 pounds were in soil. The total mass of TPH-g and MtBE initially dissolved in groundwater was estimated to be 981 pounds.

Estimates of the current mass of each COC remaining in soil and groundwater are as follows:

10 pounds TPH-g in soil, negligible amounts of BTEX compounds and MtBE in soil; 0.13 pounds TPH-g in groundwater, negligible amounts of BTEX compounds in groundwater and 0.27 pounds MtBE in groundwater.

In 2010 approval was granted to abandon seven monitoring wells determined to be unnecessary for the post remedial monitoring program. Each well was removed under permit from El Dorado County in August 2010. The locations of recently abandoned wells are indicated on *Figure 3*.

In summary, the Site has been determined to be a good candidate for case closure at this time. The lateral and vertical extent of groundwater contamination has been determined by installing and sampling a total of 32 groundwater monitoring and extraction wells. Groundwater remediation has been accomplished using a pump-and-treat program along with a small SVE system over a period of 6 years, reducing the average concentrations of dissolved COCs by more than 99%.

A few of the wells still have TPH-g and/or MtBE at concentrations that exceed water quality objectives (WQOs). The concentrations of MtBE these wells are decreasing at a rate that should allow WQOs to be reached in less than 25 years, without any impact to potential sensitive receptors. A Tier 1 Risk Assessment has confirmed that residual soil and groundwater concentrations do not pose a threat to human health or the environment.

2.0 CONCEPTUAL SITE MODEL

A thorough understanding of site geology, soils and geohydrologic conditions is a prerequisite for designing an effective soil vapor survey. In order to integrate our knowledge of subsurface conditions into a graphical format, a site conceptual model has been developed.

It is known that the Tower Mart No. 182 site is built entirely on imported fill material. Surface elevations decline 7-8 feet between the No. 182 property and the "stock pond" to the south, where no fill material has been placed. A cement block retaining wall separates the two properties and supports the fill on the No. 182 side.

The vacant lot on the west side of Patterson Drive is similarly comprised of fill soils. Some amount of fill continues westerly through the Lake Oaks Mobile Home Park all the way to Patterson Lake.

The original topography of the study area was a shallow ravine sloping east to west. The groundwater gradient direction has been found to follow the contours of the former ravine. It has been determined that groundwater contamination has migrated west from the release point, under Patterson Drive, to the abutting vacant lot. The leading edge of the groundwater plume has also migrated under the Lakes Oaks Mobile Home property. The extent and magnitude of groundwater contamination, as measured in January 2012, is illustrated on *Figure 4* for total petroleum hydrocarbons in the gasoline range (TPH-g) and on *Figure 5* for methyl tert butyl ethylene (MtBE).

A Site Conceptual Model (SCM) for the Tower Mart No. 182 study area, prepared by H_2OGEOL, is presented in *Figures 6 and 7*. Elements of the SCM for Tower Mart No. 182 specifically relevant to the proposed soil vapor intrusion study are presented in more detail in Section 3.1.

3.0 DATA QUALITY OBJECTIVES

The objectives of the soil vapor intrusion study are to:

1. Assess the health risk exposure of store employees
2. Evaluate the exposure risk for neighboring residents
3. Evaluate the exposure risk for future residents of vacant land with residential potential

The approach selected for achieving the objectives listed above is collection of representative soil vapor samples, analysis of selected soil vapor samples to accurately determine the contaminant concentrations and data input into appropriate screening models to calculate the health risk.

The most appropriate health risk screening model for the Tower Mart No. 182 site is the Risk-Integrated Software for Cleanup, version 4.05 (RISC). The RISC model can accommodate dermal, inhalation and ingestion pathways. The inhalation pathway will be emphasized for this study.

Site specific data inputs are required to successfully run the RISC model. For the inhalation pathway those inputs are predominantly related to the chemical compound and its soil vapor concentration. Proposed chemical compounds to be investigated and the minimum reporting limit for each compound are summarized in *Table 1*.

TABLE 1
DATA QUALITY OBJECTIVES
Tower Mart No. 182
130 Pleasant Valley Road, Diamond Springs

Chemical Compound	Reporting Limit (mg/m^3)
Benzene	0.2
Toluene	0.2
Ethylbenzene	0.2
Xylenes (Total)	0.4
TBA	2.0
EDB	0.2
1,2 DCA	0.2
MtBE	0.2
Napthalene	0.2
Gasoline Range Hydrocarbons	5.0
Isopropanol	0.5
	% by Volume
Carbon Dioxide	0.1
Oxygen (O_2)	0.5

The data quality objective for each input variable listed in *Table 1* has been assigned in order to achieve a final health risk assessment precision that would predict one cancer case per million persons.

3.1 Soil Vapor Sampling Locations

As stated in Section 3.0, the Soil Vapor Intrusion Study is intended to protect the health of onsite workers, offsite residents or nearby vacant property with the potential for residential use. Soil vapor sampling locations have been identified to meet data quality objectives for all three receptors.

Onsite Workers

Proposed soil vapor sample locations to determine the health exposure risk for onsite workers are indicated on *Figure 8*. A total of four soil vapor sample collection locations, labeled SV1 thru SV4, are proposed.

Two soil vapor sample collection locations (SV1 & SV2) are sited on the south side of the convenience store building. These sample locations are 10-12 feet from the edge of the building foundation. They are sited between the building and the area of greatest residual groundwater contamination. It is proposed to collect two soil vapor samples at each location, one at 5 feet BGS and one at 10 feet BGS.

Two soil vapor sample collection locations (SV3 & SV4) are sited on the west side of the convenience store building. Sited 10-12 feet from the edge of the store perimeter footing, SV3 and SV4 are between the building and the UST system. It is proposed to collect soil vapor samples at 5 feet BGS and 10 feet BGS in both SV3 & SV4.

The relationship of the proposed soil sample collection location SV1 (also typical for SV2) to the building foundation is illustrated in cross section on *Figure 9*. The relationship of proposed soil sample collection location SV3 (also typical of SV4) is illustrated in cross section on *Figure 10*.

Offsite Residents

Proposed soil vapor sample locations to assess the exposure risk to offsite residents are indicated on *Figure 11*. A total of two offsite sample locations, labeled as locations SV8 & SV9, are proposed, both immediately north of the Lake Oaks Mobile Home Park property line. Locations SV8 & SV9 are sited between the existing residents and the Tower No. 182 property. It is proposed to collect soil vapor samples from two depths at locations SV8 & SV9, 5 feet BGS and 10 feet BGS.

The relationship between proposed soil vapor sample location SV9 (also typical for SV8) and the closest residences is illustrated in cross section on *Figure 12*.

Nearby Vacant Property

A total of four offsite soil vapor sample collection locations are proposed on vacant parcels adjacent to the Tower No. 182 site. Proposed soil sample collection locations SV6 & SV7 are sited to intercept any soil vapor migrating south under Patterson Road. The locations of SV6 & SV7 are depicted on *Figure 11*.

It is proposed to collect two soil vapor samples at locations SV6 & SV7, one at 5 feet BGS and one at 10 feet BGS.

It is also proposed to collect soil vapor samples on the "stock pond" property south of the Tower Mart No. 182. Designated SV5 & SV6, the locations of those proposed soil sample locations is indicated on *Figure 8*.

Due to the expected occurrence of shallow groundwater, it is only proposed to collect soil vapor samples at one depth, 5 feet BGS, in both SV5 & SV6. The relationship between SV5 (also typical for SV6) and the Tower Mart No. 182 property is illustrated in cross section on *Figure 13.*

4.0 SOIL VAPOR SAMPLE COLLECTION EQUIPMENT AND METHODS

In this Section, proposed methods to collect representative soil vapor samples are described.

4.1 Soil Vapor Probe

It is proposed to utilize temporary soil vapor collection probes for the Tower Mart No. 182 Soil Vapor Intrusion Study. Specifically, the Post Run Tubing (PRT) method of soil vapor sample collection is proposed.

The PRT method is appropriate for the Tower Mart No. 182 site for the following reasons.

1. There is no anticipated need for future soil vapor sample collection efforts at the Tower No. 182 site. Consequently, temporary soil vapor sample points will satisfy the project data quality objectives.
2. There are no confining soil layers within the soil column to be studied. With the exception of SV5 & SV6, all soil vapor collection points are in non-native fill material. There are no confining layers or other soil characteristics which would interfere with the drive point method of placing a sample tip at the desired sample collection depths.

The Geoprobe Systems PRT system is considered to be applicable to the Tower Mart No. 182 Soil Vapor Intrusion Study. Details describing the Geoprobe PRT system are presented in the *Appendix*.

The Geoprobe PRT system utilizes a drive point pushed into the ground to the desired sample collection depth. Installation of drive points will be subcontracted to a specialized Contractor properly licensed for the work proposed. All field work, including drive point installation, will be directly supervised by a West & Associates licensed professional.

4.2 Soil Vapor Sample Collection

An equalization period will be observed between soil vapor probe placement and sample collection. For the Geoprobe PRT method, an equalization time of two hours is considered adequate.

Prior to purging the sample train of stagnant air, a shut-in test will be performed at each sample location. Specifications for the shut-in test are described below:

Shut-In Test

The shut-in test is conducted to determine if the above ground sample train is air tight. The sample train is isolated from the vapor collection probe by closing the shut-in test valve. Using a vacuum pump, the sample train is evacuated to –100 inches of water. A magnahelic gauge connected to the sample train is observed for several minutes to determine a vacuum loss, indicating a leak in the system. If a leak is detected, it will be corrected and the shut-in test repeated.

Stagnant air will be purged from the sample train prior to collecting each soil vapor sample. Prior to starting the purge activity, a leak test using a tracer gas will be used to determine if ambient air is communicating with the soil vapor probe. A detailed description of the leak test procedure is presented in Section 4.0, QA/QC.

Stagnant Air Purge

Properly purging stagnant air from the sample train is critical to obtaining a representative soil vapor sample. The purge process consists of three elements:

1. Calculating the volume of air to purge
2. Design of the purge apparatus
3. Careful purging of air from the sample train

Calculating the volume of purge air for the Geoprobe PRT method is straightforward. The total volume of the sample tubing, valves and fittings is determined. The volume, in milliliters, is then multiplied by three. For the PRT method, three purge volumes are considered optimum.

The configuration of the sample train is illustrated in *Figure 14*. The sample train will be fabricated from new, small diameter, Teflon tubing and Teflon fittings. Tubing lengths will be made as short as practical. The sample train design is equipped with an isolation valve which allows the purge pump to remain attached to the sample train during the sample collection process

A flowmeter will be attached to the outlet of the vacuum purge pump. The purge flowrate will be maintained between 100 – 200 ml/minute. The flowmeter will be used to measure the volume of stagnant air purged from the sample train.

After conducting the shut-in test, the sample train will not be disturbed until after the soil vapor sample has been collected. The purge activity will be carefully monitored to avoid excess purging.

Soil Vapor Sample Collection

When sample train purging is complete, the vacuum pump will be turned off and the isolation valve to the pump closed. The sample train is now completely filled with soil vapor and the Summa canister can be opened to draw in the sample. A flow limiting valve on the Summa canister restricts the flowrate to 200 ml/min. A vacuum gauge on the Summa indicates when the canister is filled, at which time the sample valve is closed.

The collected soil vapor sample will be labeled and entered on a chain of custody record. Filled Summa canisters will be placed in a secure location prior to transfer to the testing laboratory.

A standardized "Field Data Record Form" will be completed at each sample location. A copy of the form is attached to this Workplan.

4.3 Soil Vapor Sample Analysis

The soil vapor sample set, including QA/QC samples, will be hand carried to the testing laboratory. The testing laboratory will be certified by the State of California for the analyses performed.

Each soil sample collected at the Tower Mart No. 182 site will be tested identically. The chemical compounds to be tested and minimum laboratory detection limits are listed in *Table 2.*

TABLE 2
SOIL VAPOR INTRUSION STUDY
ANALYTICAL SCHEDULE
Tower Mart #182
130 Pleasant Valley Road, Diamond Springs

Chemical Compound	Method	Reporting Limit (mg/m^3)
Benzene	TO-3	0.2
Toluene	TO-3	0.2
Ethylbenzene	TO-3	0.2
Xylenes (Total)	TO-3	0.4
TBA	TO-15	2.0
EDB	TO-15	0.2
1,2 DCA	TO-15	0.2
MtBE	TO-15	0.2
Napthalene	TO-15	0.2
Gasoline Range Hydrocarbons	TO-3	5.0
Isopropanol	TO-15	0.5
		% by Volume
Carbon Dioxide	RSK	0.1
Oxygen (O_2)	RSK	0.5

5.0 QUALITY ASSURANCE AND QUALITY CONTROL

Quality assurance and quality control measures to protect the integrity of the Tower Mart No. 182 soil vapor data set are described in this Section.

5.1 Sample Collection QA/QC

All equipment and supplies will be thoroughly decontaminated between sample collection locations. New sacrificial vapor probe tips, Teflon tubing and fittings will be used at each sample location. The Summa canister rate limiting valve will be purged with laboratory supplied clean air between uses. Summa canisters will be laboratory supplied and evacuated.

A tracer gas will be used to detect any short circuiting to the atmosphere. Isopropanol soaked cloth will be placed at the surface of each sample location during the sample collection process, as indicated on *Figure 14*. Each vapor sample will be tested for the presence of isopropanol.

Trip blanks and method blanks will be included in the sample set. One Summa canister (trip blank) will be filled with clean ambient air at the West & Associates offices. The trip blank will accompany the sample set at all times. One summa canister (method blank) will be filled with ambient air at the Tower Mart No. 2 site.

One duplicate sample will be included in the sample set. In the field, one probe location will be selected at random to collect a duplicate sample.

The labeling on blank and duplicate samples will be sequential with the field samples to disguise them from the testing laboratory.

All samples included in the data set will be entered on a Chain of Custody record, which shall accompany the sample set at all times.

The Tower Mart No. 182 soil vapor sample set will be hand carried to the testing laboratory within 72 hours of collection.

5.2 Analytical QA/QC

The Tower Mart No. 182 soil vapor sample set will be chemically analyzed in a testing laboratory certified by the State of California for the analyses to be performed. All samples will be analyzed in the same testing laboratory at the same time. Only EPA approved testing methods will be employed. The original laboratory analytical report will include a detailed description of all internal laboratory QA/QC methods.

6.0 WEATHER MONITORING AND SAMPLE COLLECTION SCHEDULING

Local weather conditions will be monitored for 48 hours prior to conducting any soil vapor sample collection. No soil vapor samples will be collected within 72 hours after rainfall totaling 0.5 inches or greater.

Local weather information, as collected at Placerville, will be acquired from the Accuweather.com internet site. Recorded information including precipitation, outdoor temperature and barometric pressure for 72 hours preceding the soil vapor activity will be included in the project report.

Landscape watering at the Tower Mart No. 182 property is minimal, however arrangements will be made to discontinue landscape watering at least 24 hours prior to soil vapor sample collection.

7.0 DATA INTERPRETATION

Soil vapor sample analytical results will be evaluated to determine the health risk potential to humans. The health risk potential for both onsite employees and offsite residents will be evaluated.

Soil vapor analytical results from sample location SV1 thru SV4 will be used to evaluate the onsite (employee) human risk potential. Should any chemicals of concern be detected in soil vapor samples SV1 thru SV4 above the laboratory detection limit, the RISC model will be used to calculate the exposure risk. Also, the need for additional sampling under the store foundation slab will be evaluated. If no contaminant concentrations higher than the detection limits are reported, it will be considered prima facie evidence that the onsite human health risk is acceptable.

Soil vapor analytical results from sample locations SV5 thru SV10 will be used to evaluate the offsite human health risk exposure. If contaminant concentrations higher than the laboratory detection limit are found in any offsite soil vapor sample location, the need for a site specific human health risk assessment will be evaluated.

8.0 REPORTING AND RECOMMENDATIONS FOR FURTHER ACTION

A written "Soil Vapor Intrusion Report" will be submitted to the El Dorado County Environmental Management Department within 30 days of completing the soil vapor sampling activity. The Soil Vapor Intrusion Report will be signed and stamped by a California licensed civil engineer. The Report will also be uploaded to GeoTracker Domain T0601700077.

The Report will include:

- Executive Summary
- Description of field operations
- Deviations for the Workplan
- Summary table of analytical results
- Copies of original laboratory reports (including analytical methods)
- Data interpretation (including any inconsistencies)
- RISC model run results
- Recommendations

9.0 ELECTRONIC DATA SUBMITTAL COMPLIANCE

California Leaking Underground Tank Regulations require responsible parties to make electronic data submittals to the State Water Resources Control Board GeoTracker database. The Tower Mart #182 site in Diamond Springs is covered by these regulations and has a domain designated with Global ID #T0601700077. Confirmation of the electronic data upload is included in *Attachment B*. Data from the Tower Mart #182 Leaking Underground Tank site, including a copy of this report, can be accessed through www.geotracker.swrcb.ca.gov.

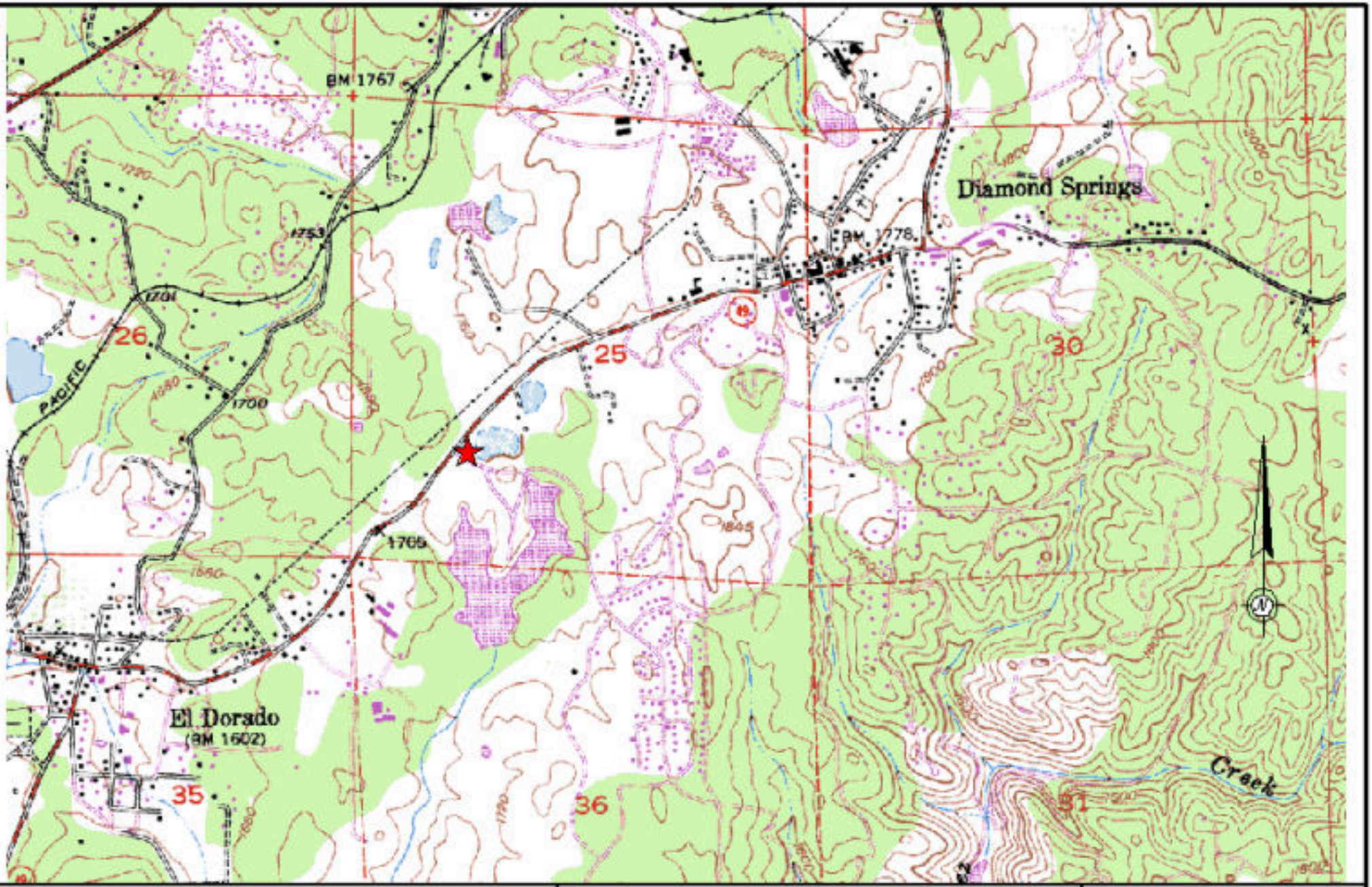
10.0 PROPER MANAGEMENT OF INVESTIGATION DERIVED WASTE (IDW)

Residues generated during the Tower Mart No. 182 Soil Vapor Intrusion Study will be properly managed to protect workers, the public and the environment.

Some decontaminated water will be generated during the project. Decontaminated water will be containerized in a 55 gallon drum. The decontaminated water drum will be stored on site until transport to InStrat in Rio Vista for recycling.

ATTACHMENT A

Figures



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Project Name: Former Cheaper! #182	Date: May 2012
Location: 130 Pleasant Valley Road, Diamond Springs	
Drawing By: DLG	Scale: None

Legend

★ Site Location

FIGURE 1
Site Location

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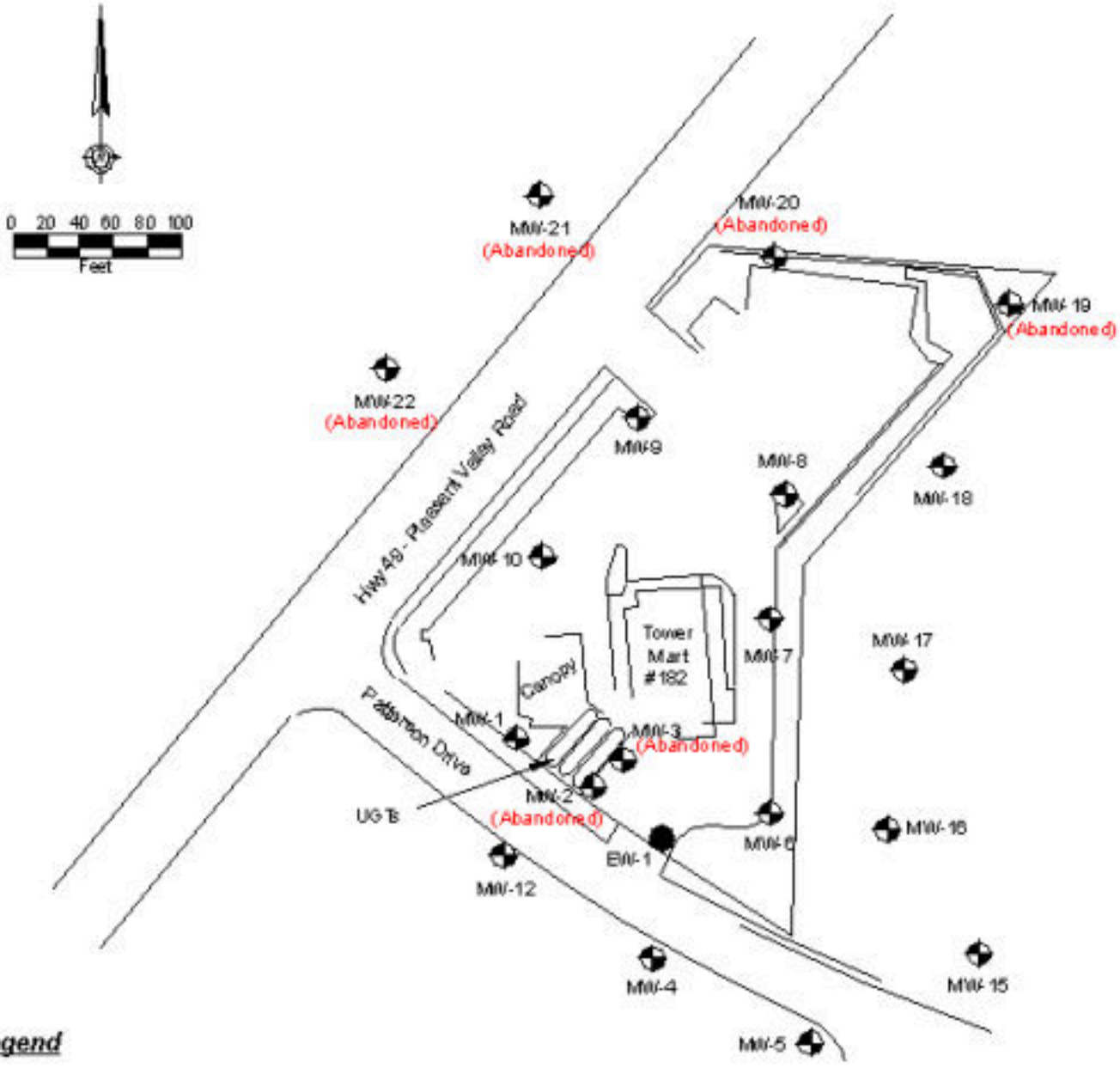
PO Box 5891, Vacaville, CA 95696

Project Name: Tower Mart #182	**Date:** May 2012
Location: 130 Pleasant Valley Road, Diamond Springs, El Dorado County	
Drawing By: DLG	**Scale:** NA

FIGURE 2
Site Layout



Base map adapted from H_2O Geol.

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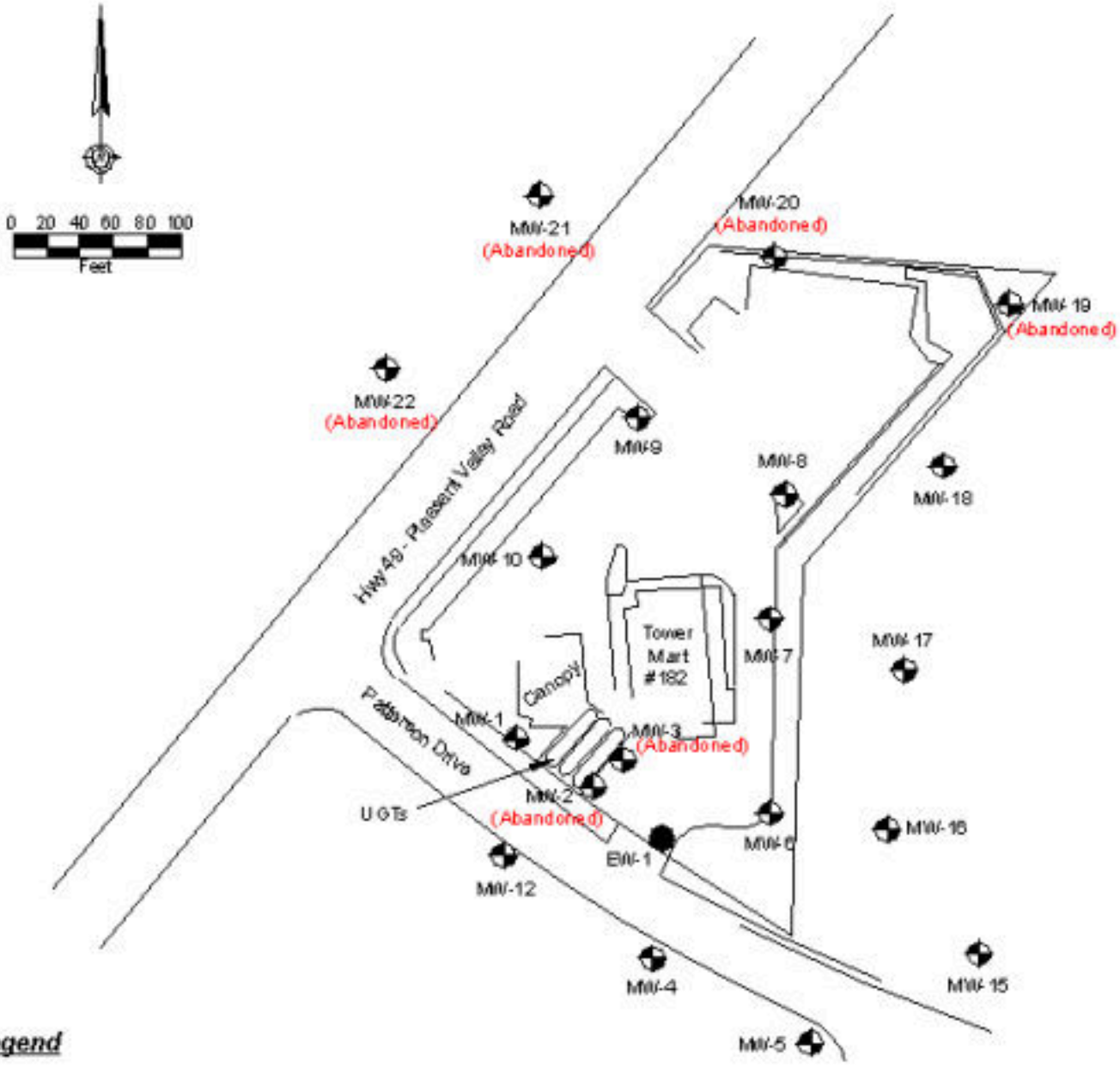
Location: 130 Pleasant Valley Road, Diamond Springs, El Dorado County	
Drawing By: DLG	**Scale:** NA

FIGURE 3
Abandoned Well Locations



Base map adapted from H_2O Geol.

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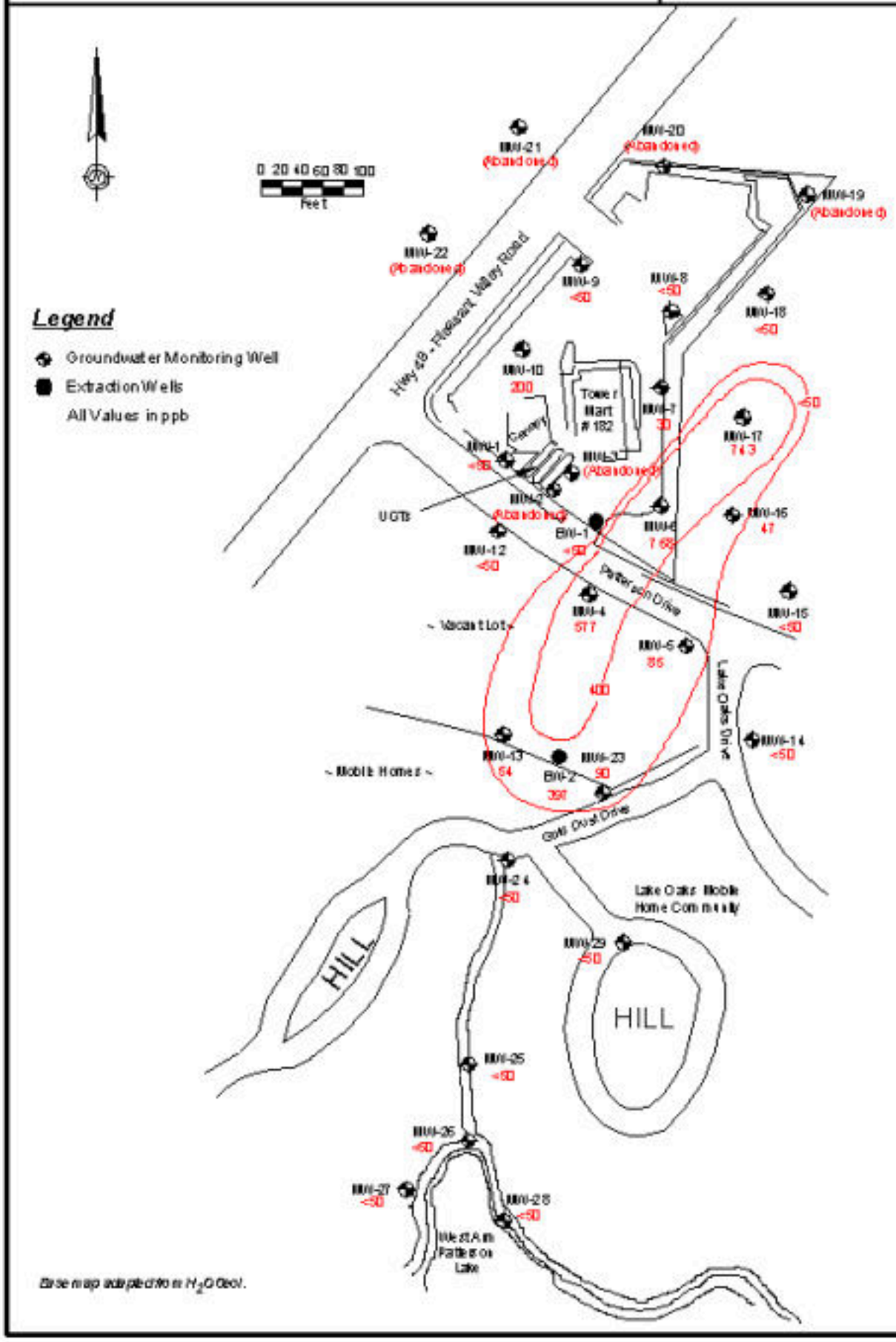
Location: 130 Pleasant Valley Road, Diamond Springs, El Dorado County	
Drawing By: DLG	**Scale:** NA

FIGURE 4
TPH-gas Concentrations in Groundwater 2012



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Project Name: Tower Mart #182	**Date:** May 2012
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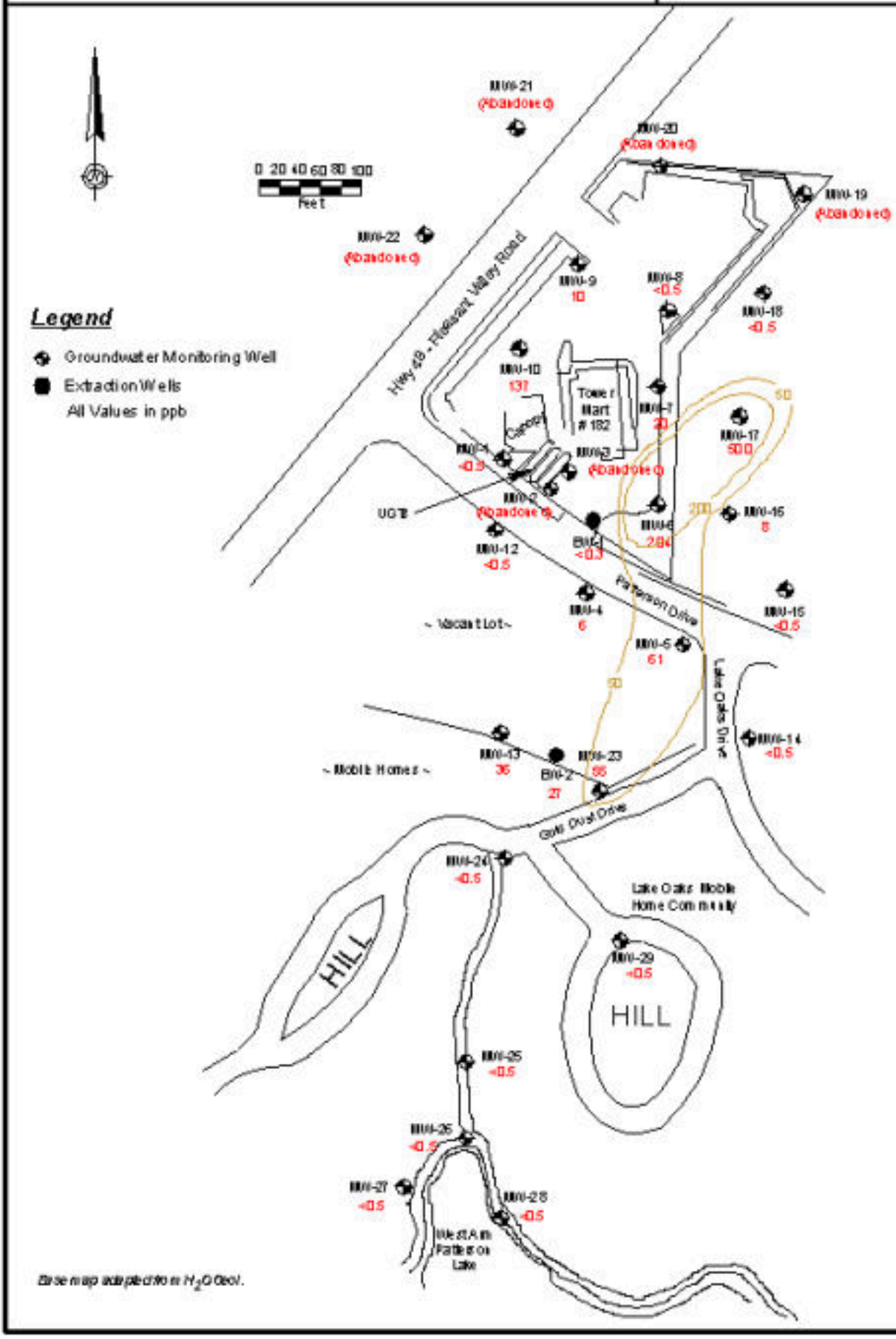
Drawing By: DLG	**Scale:** NA

FIGURE 5
MtBE Concentrations in Groundwater 2012



Base map adapted from H_2O Geol.

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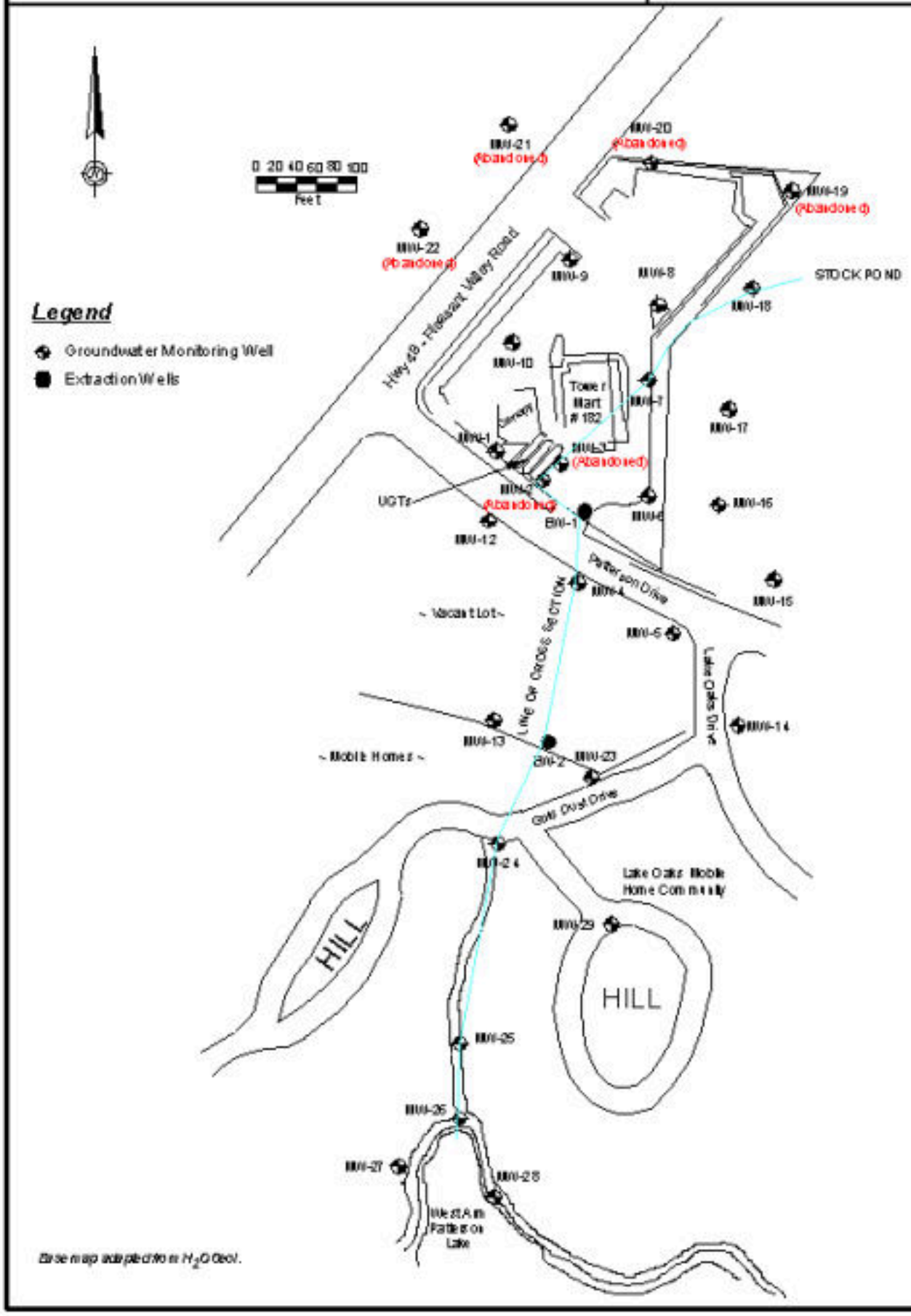
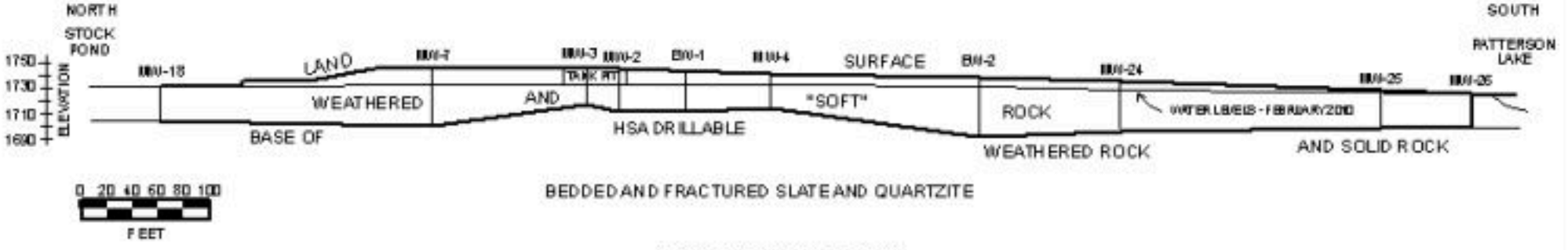
FIGURE 6
Site Conceptual Model
Plan View



Base map adapted from H_2O Geol.



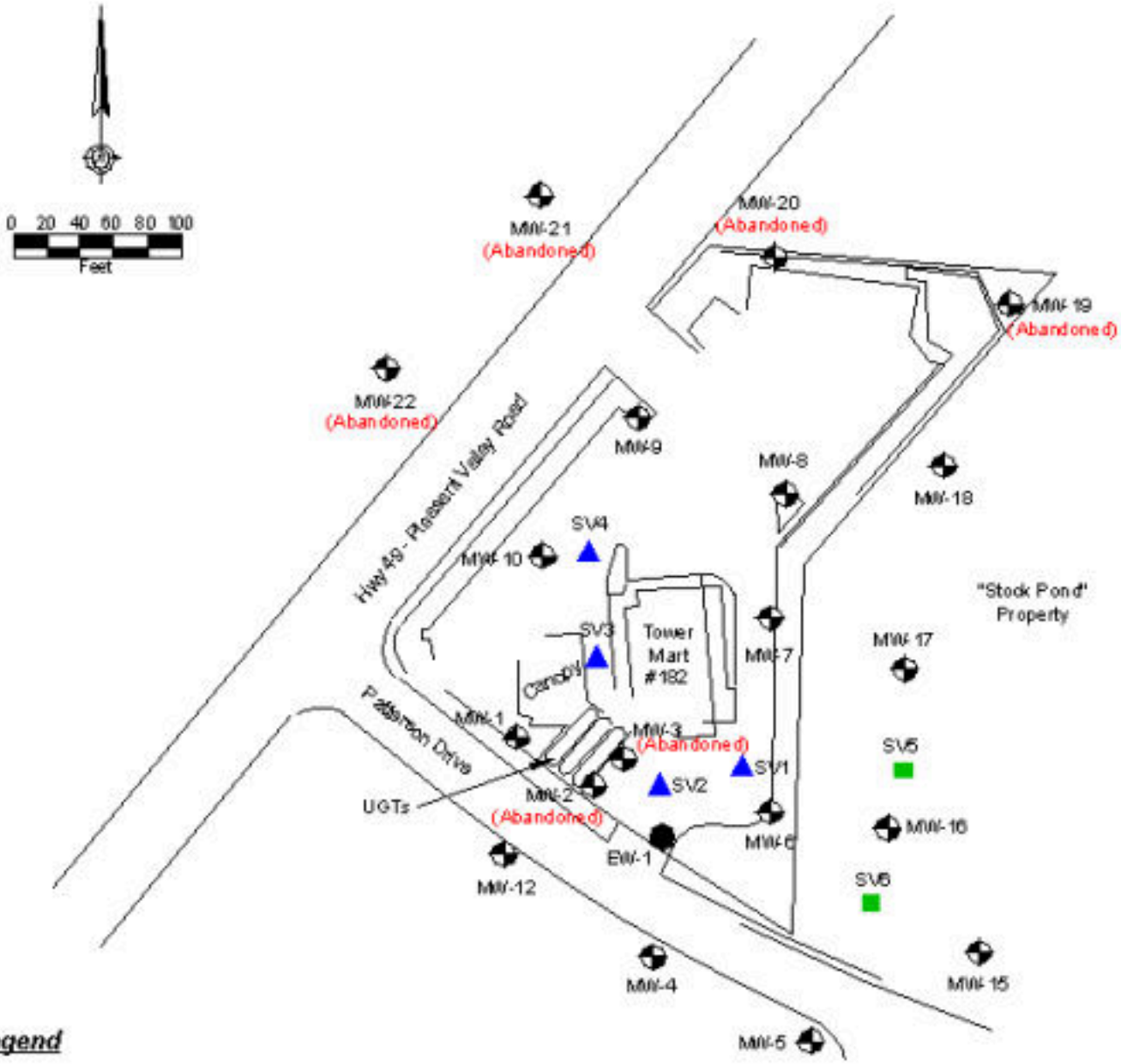
Base map adapte d from H_2 OGeol.

WEST & ASSOCIATES ENVIRONMENTAL ENGINEERS PO Box 5891, Vacaville, CA 95696	**LEGEND**	**FIGURE 7** **Conceptual Site Model Cross Section**
Project Name: Tower Mart #182 — Date: May 2012		
Location: 130 Pleasant Valley Road, Diamond Springs, CA		
Drawing By: DLG — Scale: NS		

WEST & ASSOCIATES ENVIRONMENTAL ENGINEERS
PO Box 5891, Vacaville, CA 95696

Project Name: Tower Mart #182	**Date:** May 2012
Location: 130 Pleasant Valley Road, Diamond Springs, El Dorado County	
Drawing By: DLG	**Scale:** NA

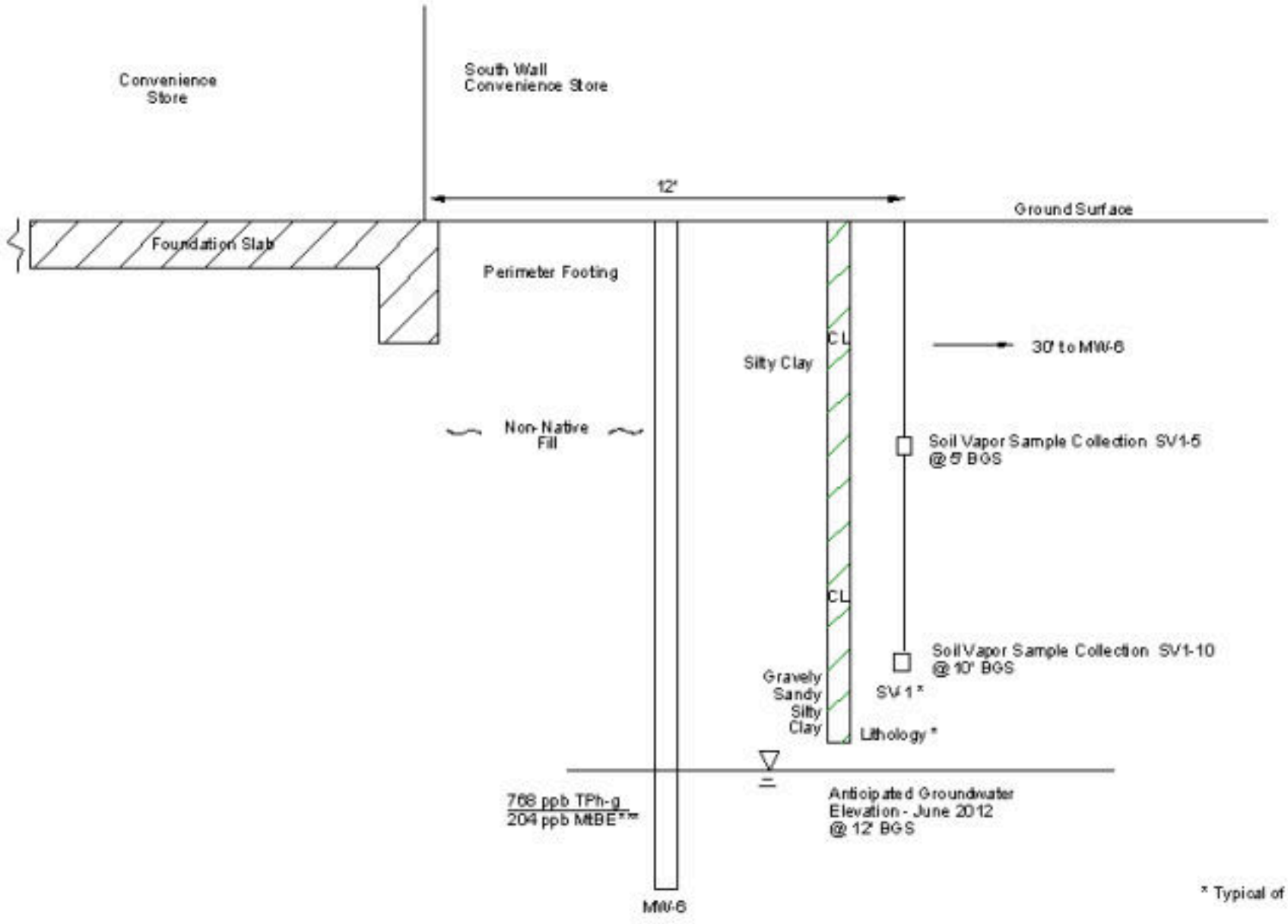
FIGURE 8
Proposed Soil Vapor Sample Locations (North East of Paterson Drive)



Legend

- Proposed Soil Vapor Sample Location 5' and 10' Collection Depths
- Proposed Soil Vapor Sample Location 5' Collection Depth
- Existing Groundwater Monitoring Well
- Existing Remediation Well

Base map adapted from H_2O Geol.



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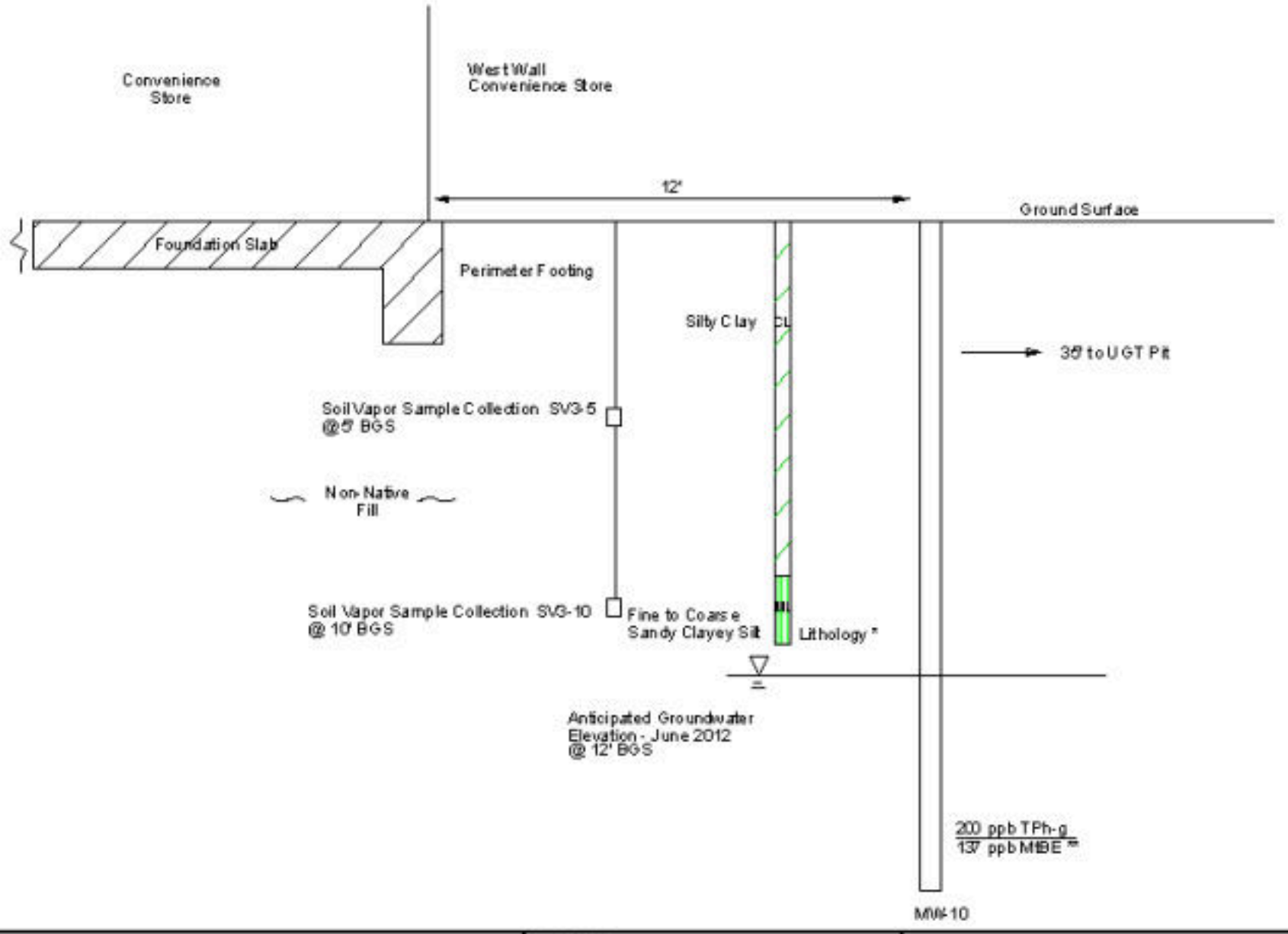
Project Name: Tower Mart #182	Date: May 2012
Location: 130 Pleasant Valley Road, Diamond Springs, CA	
Drawing By: DLG	No Scale

LEGEND

* From MW-6 Boring
** Typical for SV2
*** Groundwater Concentrations 2012

FIGURE 9

Soil Vapor Sample Collection Location SV1 Cross Section **



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Project Name: Tower Mart #182	Date: May 2012
Location: 130 Pleasant Valley Road, Diamond Springs, CA	
Drawing By: DLG	Scale: 1" = 3'

LEGEND

* From MW-10 Boring

** Groundwater Concentrations 2012

FIGURE 10

Soil Vapor Sample Collection Location SV3 Cross Section

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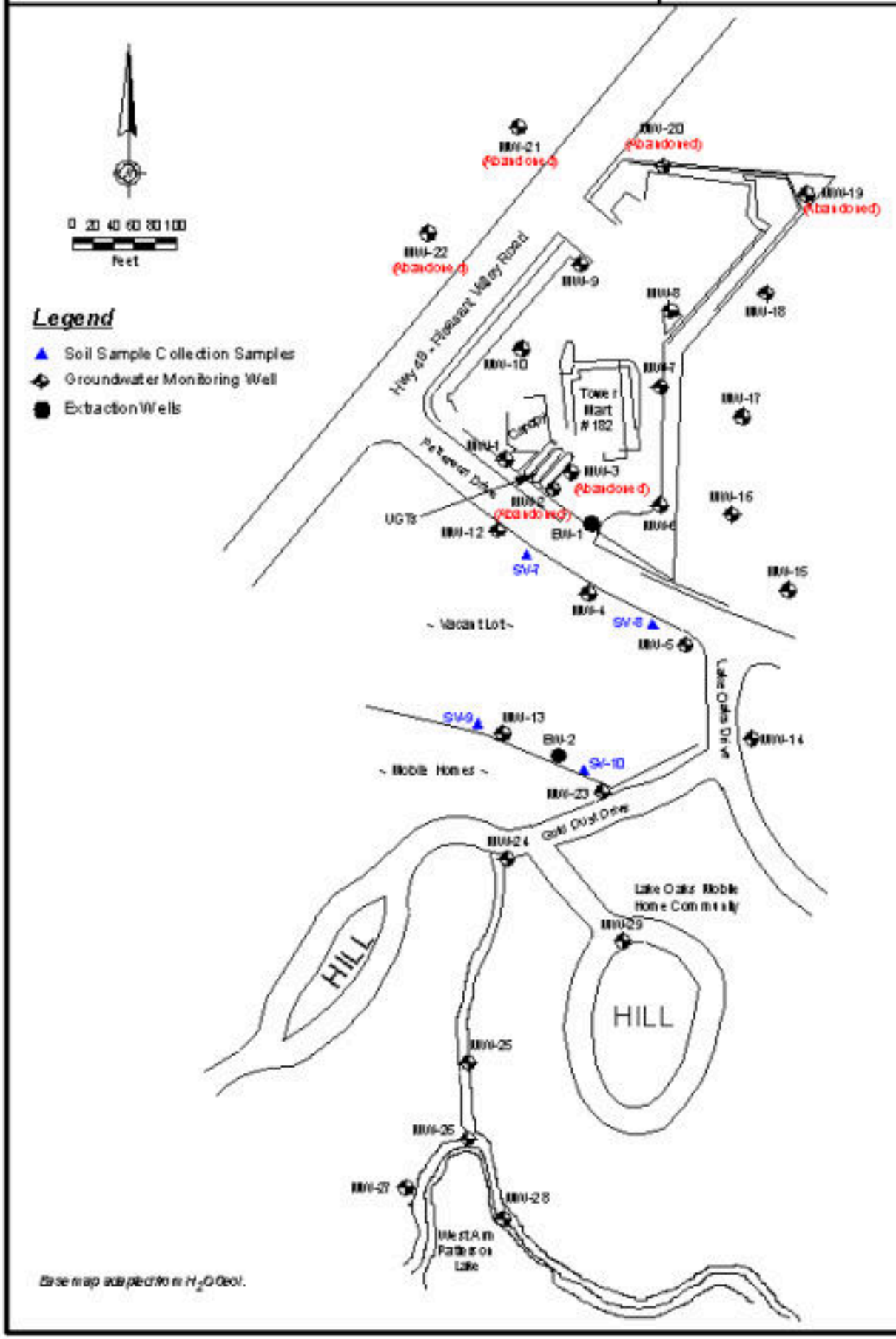
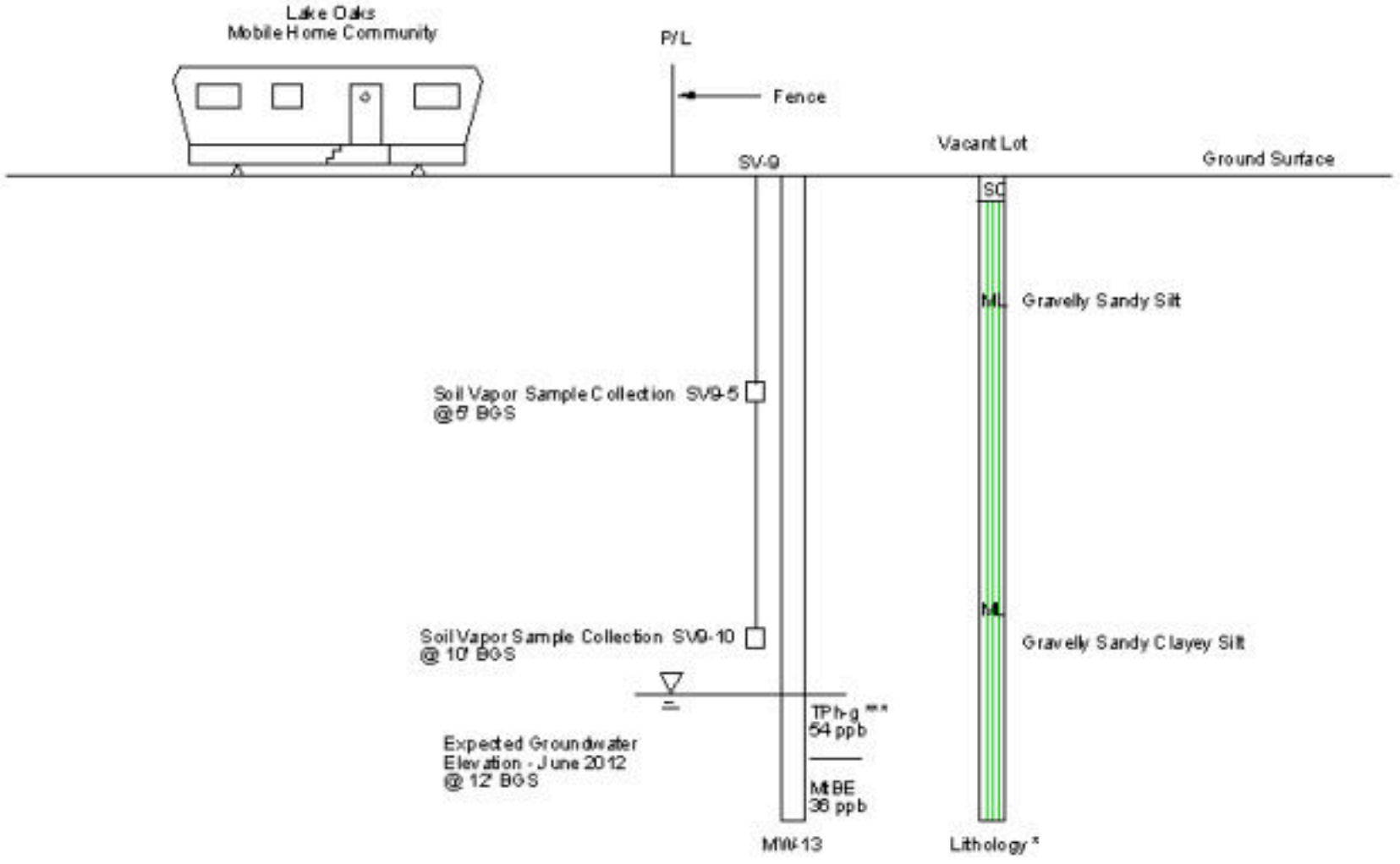
Project Name: Tower Mart #182	**Date:** May 2012
Location: 130 Pleasant Valley Road, Diamond Springs, El Dorado County	
Drawing By: DLG	**Scale:** NA

FIGURE 11
Proposed Soil Vapor Sample Collection Locations (South of Patterson Drive)





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PO Box 5891, Vacaville, CA 95696

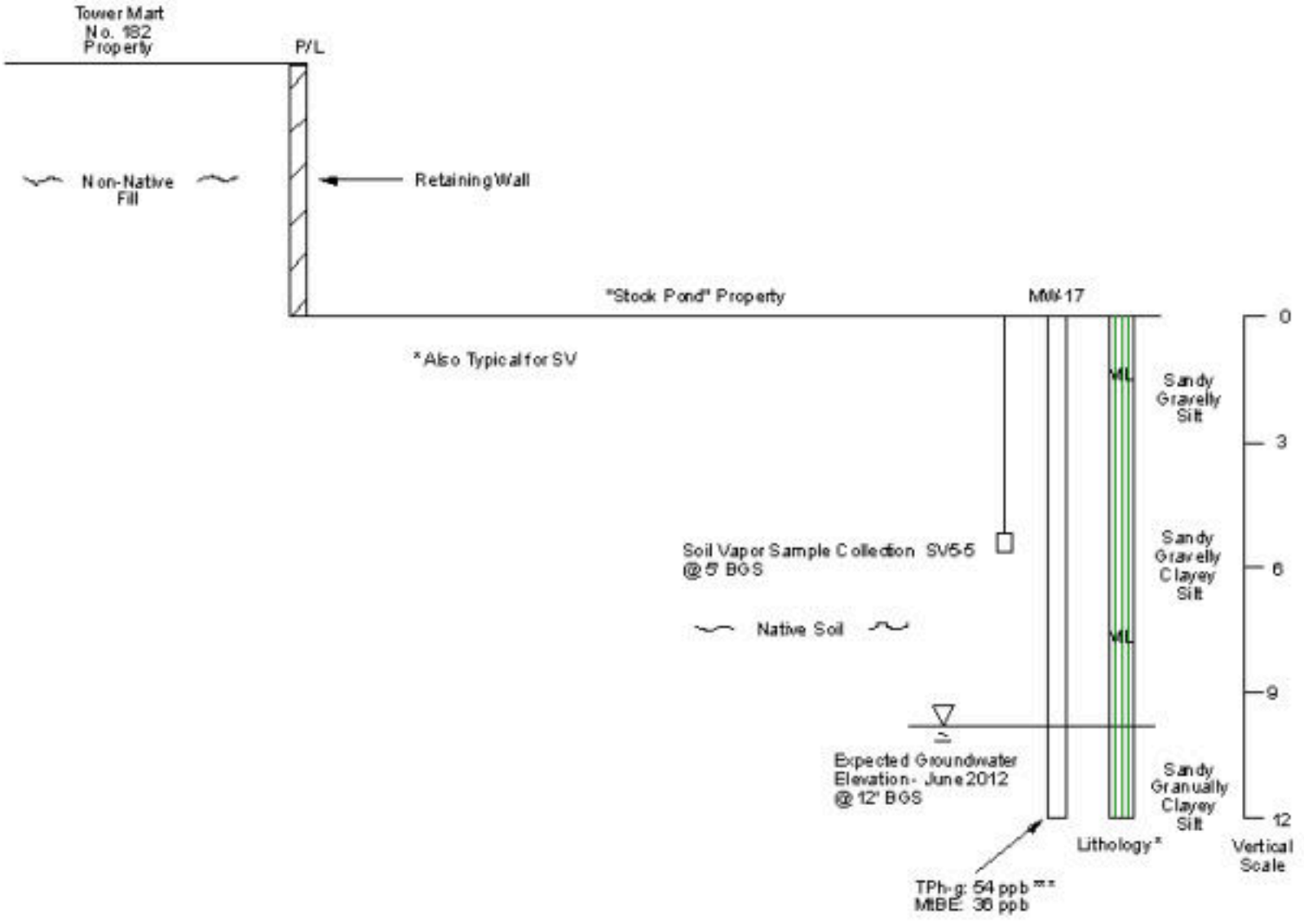
Project Name: Tower Mart #182	Date: May 2012
Location: 130 Pleasant Valley Road, Diamond Springs, CA	
Drawing By: DLG	No Scale

LEGEND

* From MW-13 Boring
** Typical for SV10
*** Groundwater Concentrations 2012

FIGURE 12

Soil Vapor Sample Collection Location
SV9 Cross Section **



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PO Box 5891, Vacaville, CA 95696

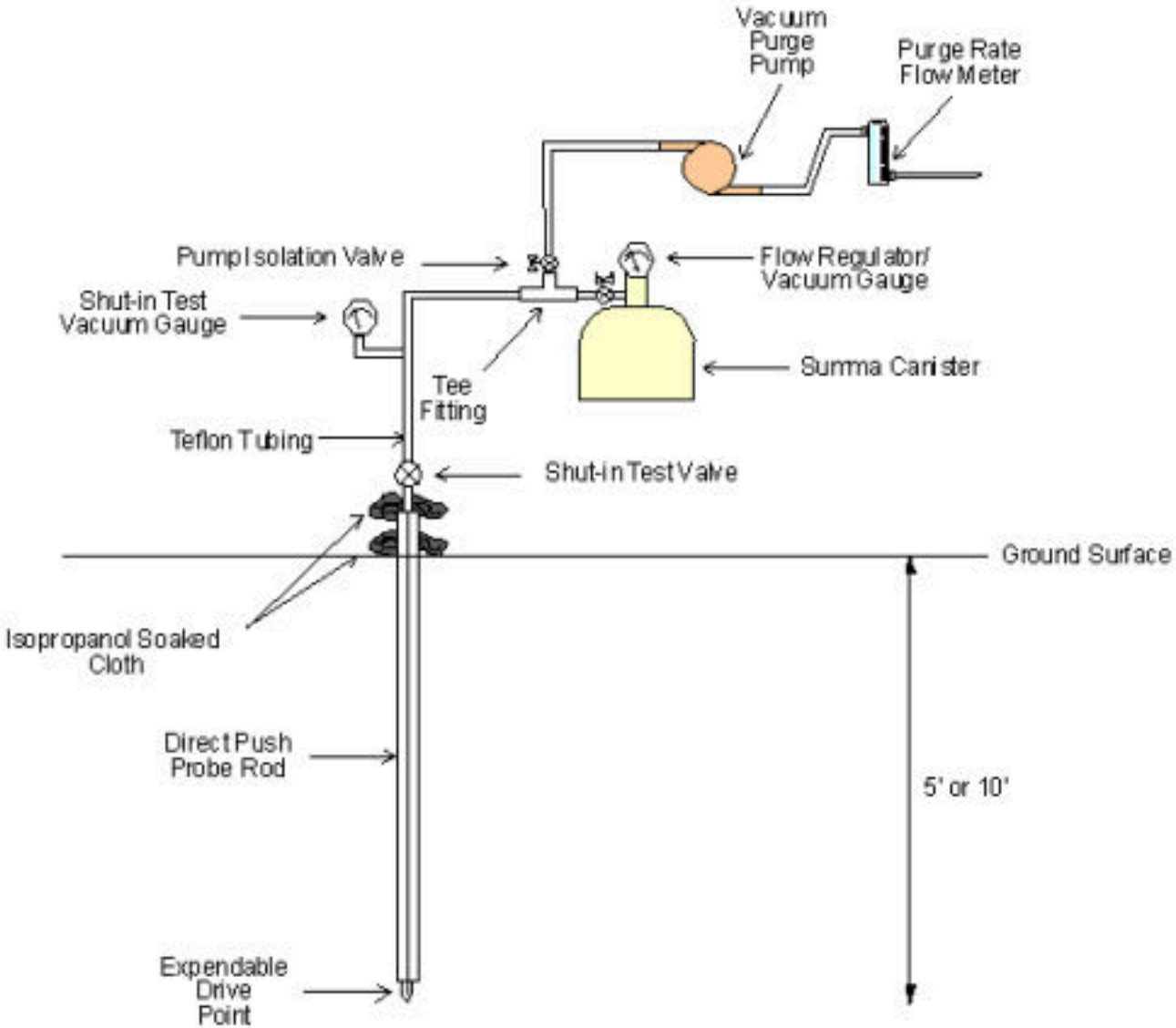
Project Name: Tower Mart #182	Date: May 2012
Location: 130 Pleasant Valley Road, Diamond Springs, CA	
Drawing By: DLG	No Scale

LEGEND

* From MW-17 Boring
** Typical for SV5
*** Groundwater Concentrations 2012

FIGURE 13

Soil Vapor Sample Collection Location
SV5 Cross Section **

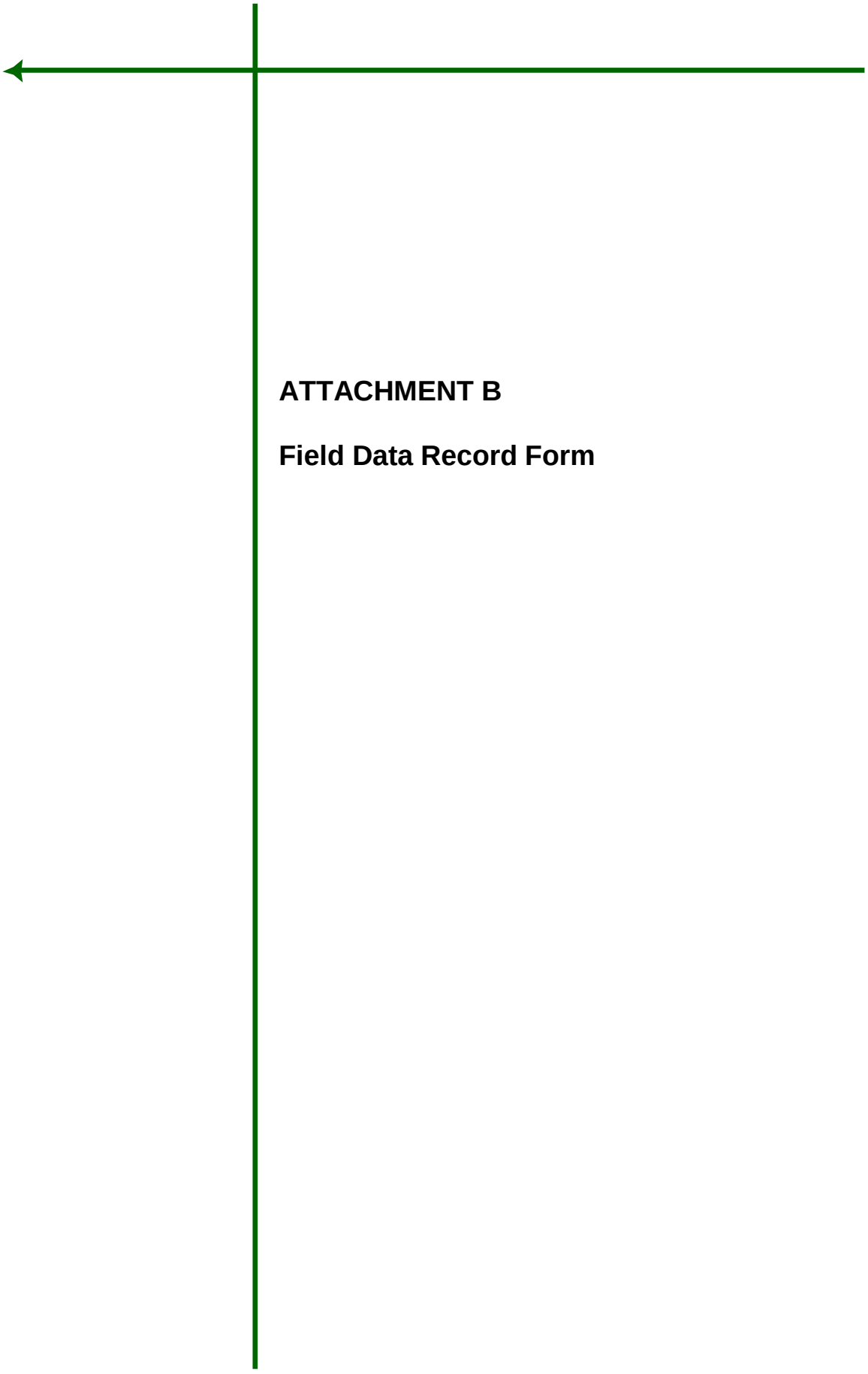


WEST & ASSOCIATES ENVIRONMENTAL ENGINEERS
PO Box 5891, Vacaville, CA 95696

Project Name: Tower Mart #182	Date: May 2012
Location: 130 Pleasant Valley Road, Diamond Springs, CA	
Drawing By: DLG	Scale: NS

LEGEND

FIGURE 14
Geoprobe PRT
Soil Vapor Sample Train



ATTACHMENT B

Field Data Record Form

WEST ASSOCIATES
ENVIRONMENTAL ENGINEERS, INC.

SOIL VAPOR SAMPLE DATA RECORD
Tower No. 182
130 Pleasant Valley Road, Diamond Springs

Date: _____ 2012 **Time**: _____ AM / PM **Initials**: _____

Sample Location: SV

Weather: _____

_____

Sample ID: _____ **Purge Start**: _____

Probe Tip Depth _____ ft **Purge End**: _____

Isopropanol Tracer: Y N **Purge Volume**: _____

Remarks: _____

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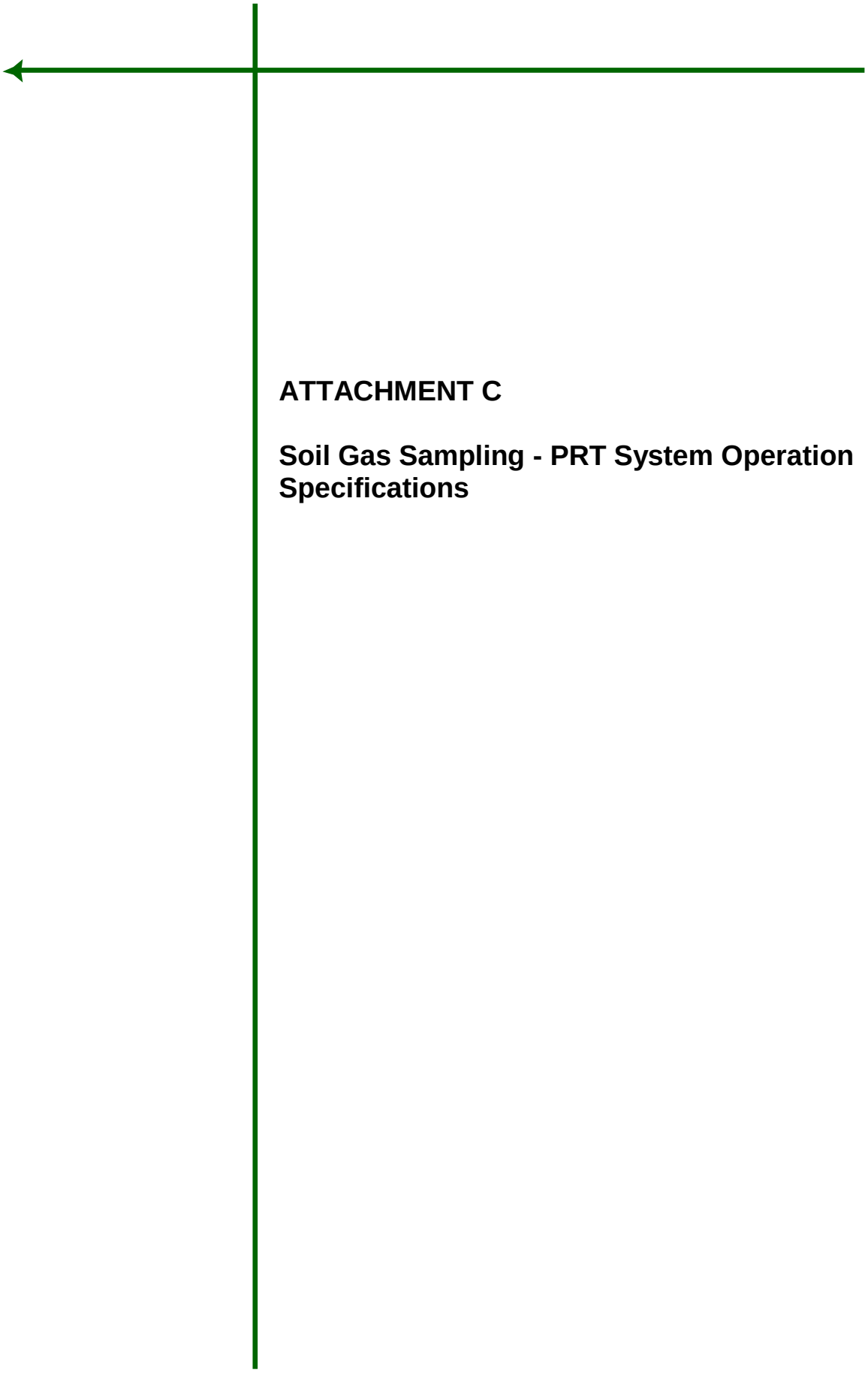


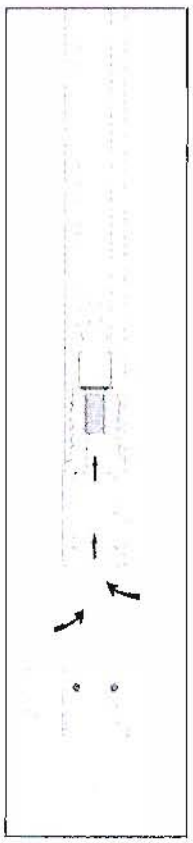
ATTACHMENT C

Soil Gas Sampling - PRT System Operation Specifications

Soil Gas Sampling – PRT System Operation

from Geoprobe Systems®

www.geoprobe.com
1-800-436-7762



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

Soil Gas Sampling — PRT System Operation

Basics

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

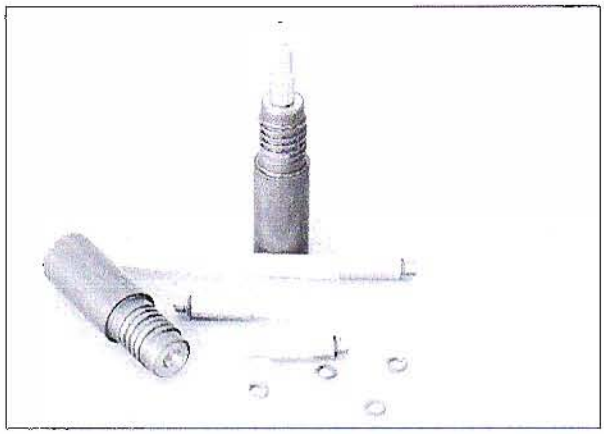
- PRT Expendable Point Holder
- PRT Adapter
- Selected PRT Tubing

Preparation

1. Clean all parts prior to use. Install O-rings on the PRT Expendable Point Holder and the PRT adapter.
2. Inspect the probe rods and clear them of all obstructions.
3. TEST FIT the adapter with the PRT fitting on the expendable point holder to assure that the threads are compatible and fit together smoothly.

   NOTE: PRT fittings are left-hand threaded.
4. Push the adapter into the end of the selected tubing. Tape may be used on the outside of the adapter and tubing to prevent the tubing from spinning freely around the adapter during connection – especially when using Teflon tubing **(Figure 1)**.

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



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

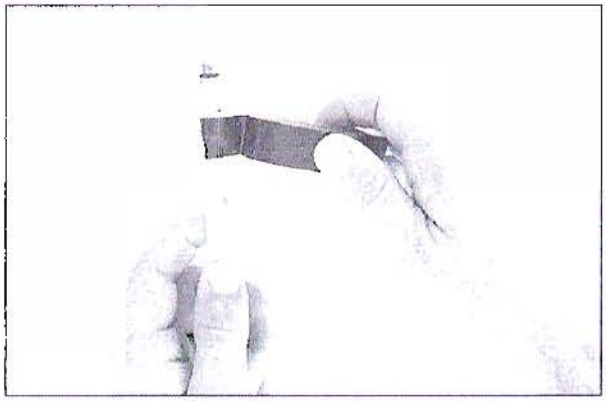


Figure 1. Securing adapter to tubing with tape. NOTE: Tape does not contact soil gas sample.

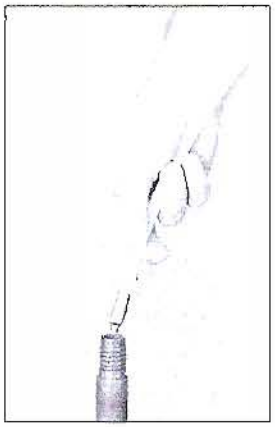


Figure 2. Insertion of tubing and PRT adapter.

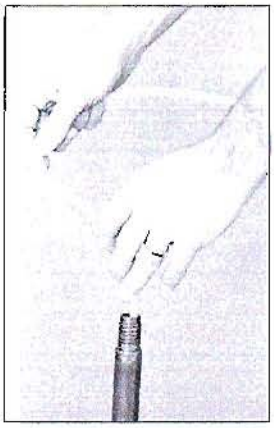
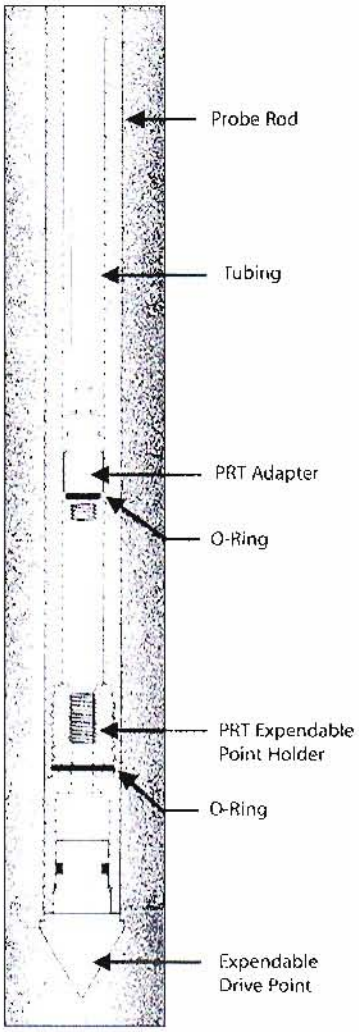


Figure 3. Engaging threads by rotating tubing.

Soil Gas Sampling — PRT System Operation



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

Probing

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

Connection

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

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

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

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

Soil Gas Sampling — PRT System Operation

Sampling

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

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

Removal

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

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

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

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

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

6. Prepare for the next sample.

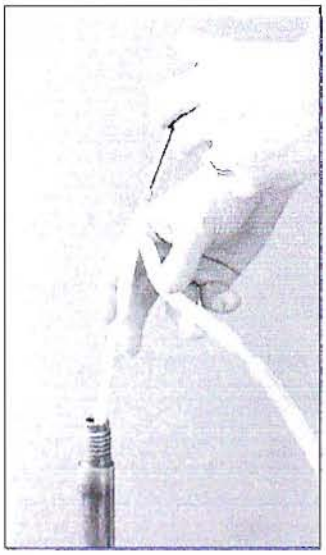


Figure 1. Taking a soil gas sample for direct injection into a GC with the PRT system.

ATTACHMENT D

Electronic Data Submittal Confirmation