RECEIVED

3:55 pm, Sep 02, 2011

Alameda County
Environmental Health

Ms. Barbara Jakub, P.G.
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Grimit Auto Repair and Service, 1970 Seminary Boulevard, Oakland, California (Fuel Leak Case No. RO0000413)

Dear Ms. Jakub:

Stratus Environmental, Inc. (Stratus) has recently prepared a report entitled *Revised Interim Remedial Action Plan and Work Plan Addendum* on my behalf. The report was prepared in regards to Alameda County Fuel Leak Case No. RO0000413, for Grimit Auto Repair and Service, 1970 Seminary Boulevard, Oakland, California.

I have reviewed a copy of this report, sent to me by representatives of Stratus, and "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".

If you have any questions, please contact me via electronic mail at peggy.h.garcia@sbcglobal.net, or my daughter Angel LaMarca at angelcpt@gmail.com.

Sincerely,

Ms. Peggy Garcia, Trustee, Grimit Family Trust

Cc: Angel LaMarca

STRATUS
ENVIRONMENTAL, INC.

3330 Cameron Park Drive, Ste 550
Cameron Park, California 95682
(530) 676-6004 ~ Fax: (530) 676-6005

August 22, 2010
Project No. 2090-1970-01

Ms. Barbara Jakub, P.G.
Alameda County Environmental Health Department
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(via Geotracker & Alameda County FTP site)

Re: Revised Interim Remedial Action Plan and Work Plan Addendum, Former Grimit Auto Repair and Service, 1970 Seminary Boulevard, Oakland, California (Fuel Leak Case No. RO0000413)

Dear Ms. Jakub:

On behalf of the Grimit Family Trust, Stratus Environmental, Inc. (Stratus) has prepared this report for the Grimit Auto Repair and Service underground storage tank (UST) fuel leak case (the Site), located at 1970 Seminary Boulevard, Oakland, California (see Figures 1 through 3). Alameda County Environmental Health Department (ACEHD) currently oversees an environmental case at the subject property relating to the historical release of petroleum hydrocarbons to the subsurface. In a letter dated October 1, 2010, ACEHD requested that the lateral extent of free phase petroleum hydrocarbons (free product) present in one area of the site be further assessed, and that interim remediation of free product be initiated. ACEHD has also requested that the lateral extent of petroleum hydrocarbon impact be further investigated, particularly by advancing offsite borings in transects adjacent to the subject property. On November 16, 2010, Stratus prepared and submitted a report which included a proposal to install wells for lateral delineation of free product thickness. The November 16, 2010 document also proposed offsite boring locations in transects, and provided a procedure for conducting a soil gas survey at the site.

On July 28, 2011, Stratus, representatives of the Grimit Family Trust, and ACEHD met to discuss implementation of interim remedial efforts and the requested subsurface site assessment work on the project. ACEHD verbally directed that interim remedial action by manual bailing be promptly implemented; Stratus has already begun completing weekly gauging and bailing of free product from one well (MW-1). ACEHD also verbally directed that the lateral extent of free product be assessed using geophysical methods, such as laser induced fluorescence (LIF) or membrane interface probe (MIP), instead of by well installation and periodic monitoring of these wells for the presence of free product. It was also requested that the spacing between offsite transect soil borings proposed in the November 16, 2010 document be shortened, thus increasing the number of borings and enabling a more thorough characterization of offsite contaminant impact to the subsurface.

Based on the recent discussions with ACEHD, Stratus has developed a revised scope of work to assess free product distribution within the subsurface and the offsite extent of impacted soil and groundwater adjacent to the site. This document proposes to conduct three onsite cone penetrometer test (CPT) borings, which will include LIF assessment. One of the borings will be advanced immediately adjacent to well MW-1, which is an area known to contain free product. The other two CPT borings will be advanced approximately 10 to 15 feet away from the first CPT boring and MW-1; LIF instrument response from these two CPT borings will subsequently be compared with the LIF results from the boring near MW-1 to allow for an interpretation of the possible presence of free product in these areas. Stratus is also proposing to advance 14 offsite direct push soil borings, mostly in transects at a boring spacing of approximately 20 to 25 feet. Stratus has also proposed revisions to the soil gas survey in this document, based on discussions from the July 2011 meeting. A description of the proposed soil gas survey tasks, and site investigation and interim remedial action work activity tasks, are described in the following subsections of this report.

INTERIM REMEDIAL ACTION

Free Product Gauging and Removal

As requested by ACEHD, Stratus will visit the site on an approximate weekly basis in order to gauge free product thicknesses in well MW-1. Following this work, Stratus will bail a free product and groundwater mixture from the well until product is not visible in the bailer. Free product will be stored onsite in a DOT-approved 55-gallon steel drum and properly labeled. The schedule for conducting gauging and removal of free product may be modified as interim remedial efforts progress.

REVISIONS TO SUBSURFACE SITE INVESTIGATION AND SOIL GAS SURVEY

The proposed scope of work has been subdivided into separate tasks, as outlined below. Details are provided for the activities associated with each task. All geologic work will be conducted under the direct supervision of a State of California Professional Geologist or Engineer and will be conducted in accordance with standards established by the *Tri-Regional Board Recommendations for Investigation and Evaluation of Underground Tank Sites* (April 2004) and ACEHD guidelines. A California-licensed C-57 well driller will perform all drilling and well construction activities.

CPT Borings

Stratus will retain Gregg In-Situ, Inc. (Gregg) of Martinez (C-57 # 656407) to advance the CPT borings. Gregg was selected to complete this work because of their capability to advance a CPT boring using a track-mounted limited access rig that should be sufficiently mobile and small enough to be able to access the property and the proposed boring locations. In addition, Gregg utilizes a CPT tool that is capable of conducting both soil lithologic profiling and LIF. Once this boring is complete, Stratus will be able to evaluate contaminant distribution detected by LIF relative to soil lithology.

CPT consists of advancing a cone-tipped cylindrical probe (1.7 inches in diameter) into the ground while simultaneously measuring the resulting resistance to penetration. A computer generated CPT log is plotted in the field, providing a continuous log of site lithology. LIF is performed simultaneously with CPT, and data from the LIF can then be compared with the soil lithologic log in order to assess contaminant distribution patterns. Select information regarding the CPT/LIF instrument provided by Gregg Drilling, and also from the manufacturer of this equipment (Dakota Technologies), is provided in Appendix A. Upon completion of CPT/LIF profiling, each of the boreholes will be pressure grouted from the bottom of the borehole up to surface grade. The approximate locations of these three proposed borings are depicted on Figures 2 and 3.

In addition to evaluating the area around well MW-1 for the presence of free product, ACEHD has also requested that the vertical extent of petroleum hydrocarbon impact to the subsurface be assessed. Onsite, Stratus will use the CPT/LIF rig to complete this work at borings CPT-1 through CPT-3. Our intention is to advance each of these borings to a depth of approximately 60 feet below ground surface (bgs).

Once the CPT/LIF profiling has been performed at CPT-1 through CPT-3, Stratus will select one of the boring locations for collection of depth discrete soil and groundwater samples. Given the close proximity of the borings to one another, we expect that the vertical extent of impact will be similar at all three of the locations. However, if the LIF preferentially detects contaminants at one boring location relative to the others, this boring area will be targeted for soil and groundwater sampling. In general, soil sampling will target finer grained strata and groundwater sampling will be conducted in coarser grained strata. However, Stratus will use the LIF data onsite to assist in the selection of soil and groundwater sampling depths. Soil and groundwater samples will be collected from different borings, as Gregg's soil sampling tooling uses different size rods for boring advancement than the larger rods required for groundwater sampling.

Hydropunch™ sampling equipment will be used to collect the groundwater samples at the desired depth intervals. The Hydropunch™ sampler will be pushed to the bottom of the sampling interval using 2-inch diameter steel rods. The steel rods are then retracted approximately four feet, exposing the screen, allowing for the collection of depth-discrete groundwater samples. The groundwater samples will be collected using a clean bailer, transferred to laboratory-supplied glass vials, properly labeled, and placed in an ice-chilled cooler. The groundwater samples will be transported under strict chain-of-custody protocol to a California-certified analytical laboratory for chemical analysis.

Upon completion of groundwater sampling, the sampling borehole will be pressure grouted from the bottom of the borehole up to surface grade.

Soil samples will be collected within clean 1.25-inch diameter brass or stainless steel sleeves situated inside of a 12-inch length piston sampler. Once the soil samples have been retained, the ends of the lowermost sampling sleeve will be covered with Teflon sheets, capped, labeled, and placed in an ice-chilled cooler. The soil samples will be transported under strict chain-of-custody protocol to a California-certified analytical laboratory for chemical analysis. Upon completion of soil sampling, the sampling borehole will be pressure grouted from the bottom of the borehole up to surface grade.

Offsite Soil Borings and Locations

In order to assess the lateral and vertical extent of contaminants offsite, Stratus is proposing to advance direct push borings at 14 offsite locations (see Figure 3, borings DP-1 through DP-14). Ten of the 14 borings will be advanced in transects northwest or northeast of the site, across seminary avenue or Harmon Avenue. At each location, soil will be continuously recovered within acrylic liners to allow for detailed logging of soil types and collection of samples. Once the soil types have been evaluated, a separate boring will be advanced to enable collection of hydropunch groundwater samples. Stratus anticipates advancing the direct push borings to a depth of approximately 60 feet bgs; however, this may be adjusted based on the findings of the CPT/LIF work at the site.

Soil Gas Survey and Laboratory Analyses

In the November 2010 report, Stratus recommended collecting a single soil gas sample at each of three onsite and five offsite soil gas sampling locations. Stratus proposed to collect these samples at a depth of approximately 6 feet bgs, as ACEHD has directed that samples were to be collected deeper than 5 feet bgs. Given the requirement for collection of samples from multiple depths at each location, Stratus is proposing to collect soil gas samples from depths of approximately 5.5 and 9 feet bgs. If moist-damp soil conditions are encountered near 9 feet bgs, the actual depth of the deeper well(s) may need to be adjusted in order to avoid potential problems with moisture during sampling of the deeper soil gas well(s).

Based on discussions with ACEHD on July 28, 2011, Stratus has adjusted the locations of the three onsite soil gas sampling well clusters (SV-1A/B through SV-3A/B). These revised sampling locations are depicted on Figure 2 and Figure 3. A previously proposed soil gas sampling location situated inside of the onsite building was relocated to an area immediately adjacent to the outside wall of the facility. Stratus is concerned that by core drilling holes in the concrete slab of the building for soil gas well construction, the risk for intrusion of petroleum hydrocarbon vapors into the building will be greatly increased, in particular with the deeper soil gas sample located immediately above impacted groundwater. ACEHD noted that an alternative sampling method could be used to collect 'one time' samples inside of the building, which would allow for re-patching of the concrete slab after sample collection. However, given that the building is fully occupied by equipment used by the occupant for an auto repair business, access for equipment needed to collect a one-time sample (i.e. a smaller sized direct push rig) would be very difficult and impractical.

In order to complete the soil gas survey, Stratus is proposing to install soil gas implants into the subsurface, using hand tools (hand auger, post hole digger, etc.), and then return to the site a few weeks after installation to collect soil gas samples at each location. Completing sampling a few weeks after installation of the soil gas implants should allow for equilibration of soil gas conditions that will be affected by the digging work used to install the soil gas implants. The soil gas survey will be performed in general accordance with standards established by the Department of Toxic Substances Control (DTSC) and the California Regional Water Quality Control Board (Los Angeles Region, [LARWQCB]).

After advancing the hand-augered soil borings to 5.5 or 9 feet bgs, as appropriate, the drilling contractor will then install a polyethylene soil vapor implant (Environmental Service Products Part No. SVPT-91, or similar) attached to 0.25-inch diameter Teflon tubing, or similar, near the base of the borehole. A filter pack of graded sand will be placed around the soil vapor implant. Granular bentonite will be placed within the annular space of the borehole, up to a depth of about 1.5 feet bgs (the shallow wells) or 4 feet bgs (the deeper wells). The remaining annular space will be backfilled to surface grade with neat cement. A protective manhole cover will then be placed over the top of each soil gas implant.

Stratus will remobilize to the site to collect the soil gas samples. Prior to sampling, the approximate air volume situated inside of the Teflon tubing and the filter pack sand surrounding the soil vapor implant will be calculated. Stratus will then use an expendable Summa Canister to purge this ambient air. Following purging of the ambient air, a separate Summa Canister will be used to collect each soil gas sample. During filling of the canisters, the flowrate will be regulated to fill at a rate between 100 and 200 milliliters per minute (ml/min). A tracer gas leak check (using 1,1-difluoroethane [1,1-DFA]) will be used to assess potential leakage within the sampling train. Leak detection will be evaluated by periodically spraying the outside of the sample train assembly with 1,1-DFA during filling of the Summa Canisters.

Air samples will be forwarded to a California state-certified laboratory for chemical analysis under strict chain-of-custody procedures. The soil gas samples will be analyzed for gasoline range organics (GRO), benzene, toluene, ethylbenzene, and total xylenes, (BTEX), methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), di-isopropyl ether (DIPE), tertiary butyl alcohol (TBA), 1,2-dibromoethane (EDB), 1,2-dichloroethane (1,2-DCA), naphthalene, the EPA Standard List Volatile Organic Compounds (VOCs), and for the leak detection tracer gas (1,1-DFA) using USEPA Method TO-15. In addition, the samples will be analyzed for oxygen, carbon dioxide, and methane using American Society for Testing and Materials (ASTM) Method D1946.

SCHEDULE

Upon approval of this document, Stratus will forward an encroachment permit application to the City of Oakland for review. Once the encroachment permit has been obtained, a drilling permit application will be submitted to Alameda County Public Works Department for approval, and the work will be scheduled. Approximately 3 to 4 weeks will likely be necessary for Gregg to become available. A report will be prepared to document work activities within about 5 weeks of receiving all analytical results.

In October 2010, ACEHD personnel approved the collection of soil gas samples southwest of the site at 5900 Holway Street (SV-4A/B and SV-5 A/B), and the collection of soil gas samples (SV-6A/B through SV-8A/B) and completion of a soil boring (DP-11) at 5909 Harmon Avenue, east of the site. In November 2010, Stratus began attempting to obtain access agreements from these property owners; however, to date, these efforts have been unsuccessful. Stratus has notified ACEHD regarding this situation, and Stratus has requested agency assistance in obtaining these agreements. If the agreements can be obtained in a timely manner, Stratus will collect samples from these property(ies) at the same time that the other assessment work is performed.

In October 2010, ACEHD also requested that an irrigation well reportedly located at 1955 Seminary Avenue be located and sampled. Stratus has attempted to obtain access to this property, but these efforts have also been unsuccessful. This requested work will be performed promptly if access can be obtained; ACEHD assistance appears necessary in order to conduct this work.

LIMITATIONS

This report was prepared in general accordance with accepted standards of care that existed at the time this work was performed. No other warranty, expressed or implied, is made. Conclusions and recommendations are based on field observations and data obtained from this work and previous investigations. It should be recognized that definition and evaluation of geologic conditions is a difficult and somewhat inexact science. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the subsurface conditions present. More extensive studies may be performed to reduce uncertainties. This report is solely for the use and information of our client unless otherwise noted.

Please contact Scott Bittinger at (530) 676-2062, or via electronic mail at sbittinger@stratusinc.net, if you have any questions regarding this document or the project in general.

Sincerely,

STRATUS ENVIRONMENTAL, INC.

REGISTERED GEOLOGIST
Scott G. Bittinger
No. 7477
STATE OF CALIFORNIA

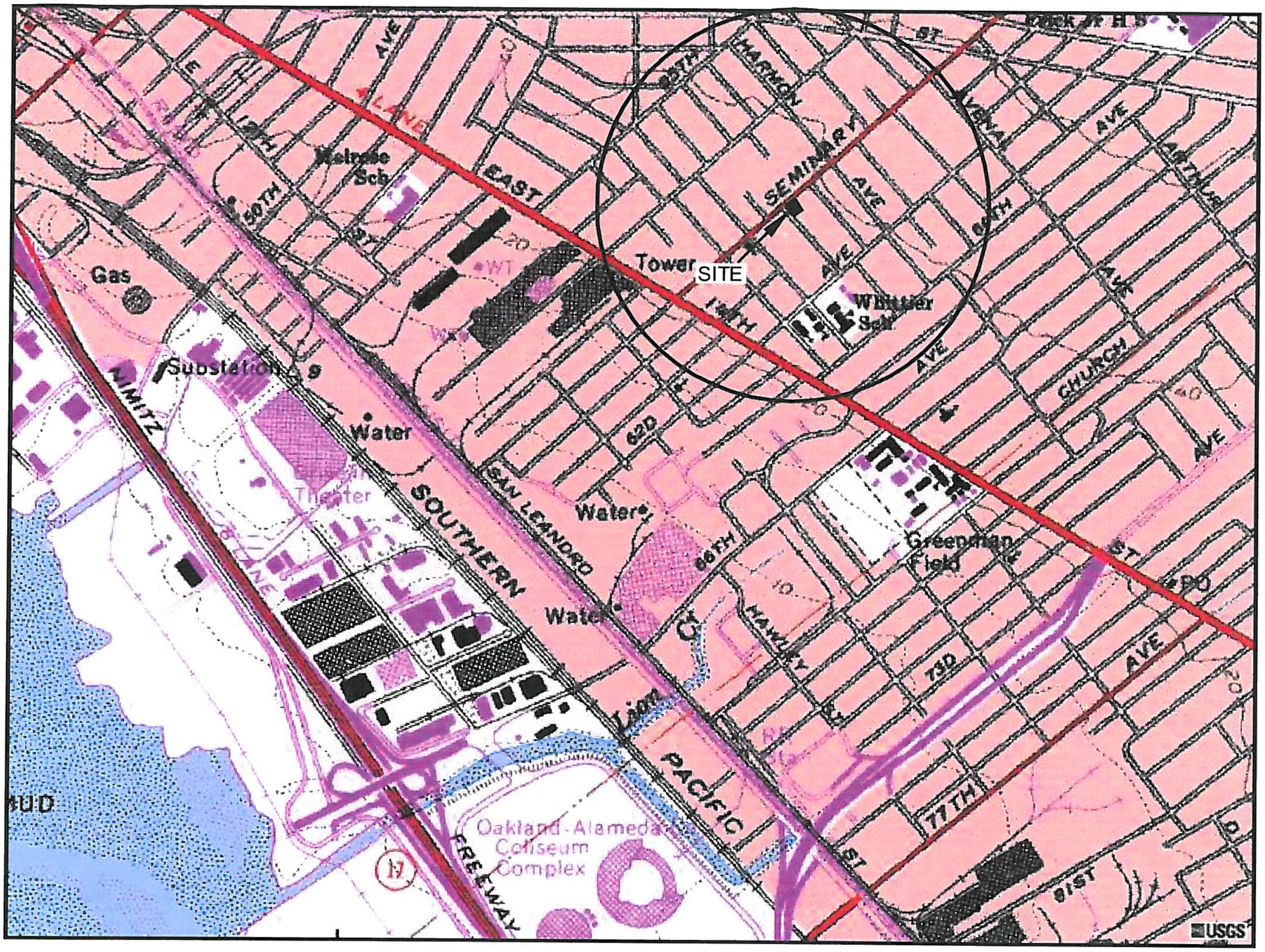
Scott G. Bittinger, P.G.
Project Manager

Gowri S. Kowtha, P.E.
Principal Engineer

Attachments:

Figure 1	Site Location Map
Figure 2	Site Plan
Figure 3	Site Vicinity Map
Appendix A	Select Data Regarding Laser Induced Fluorescence

cc: Ms. Angel LaMarca and Ms. Peggy Garcia, Trustee, Grimit Family Trust



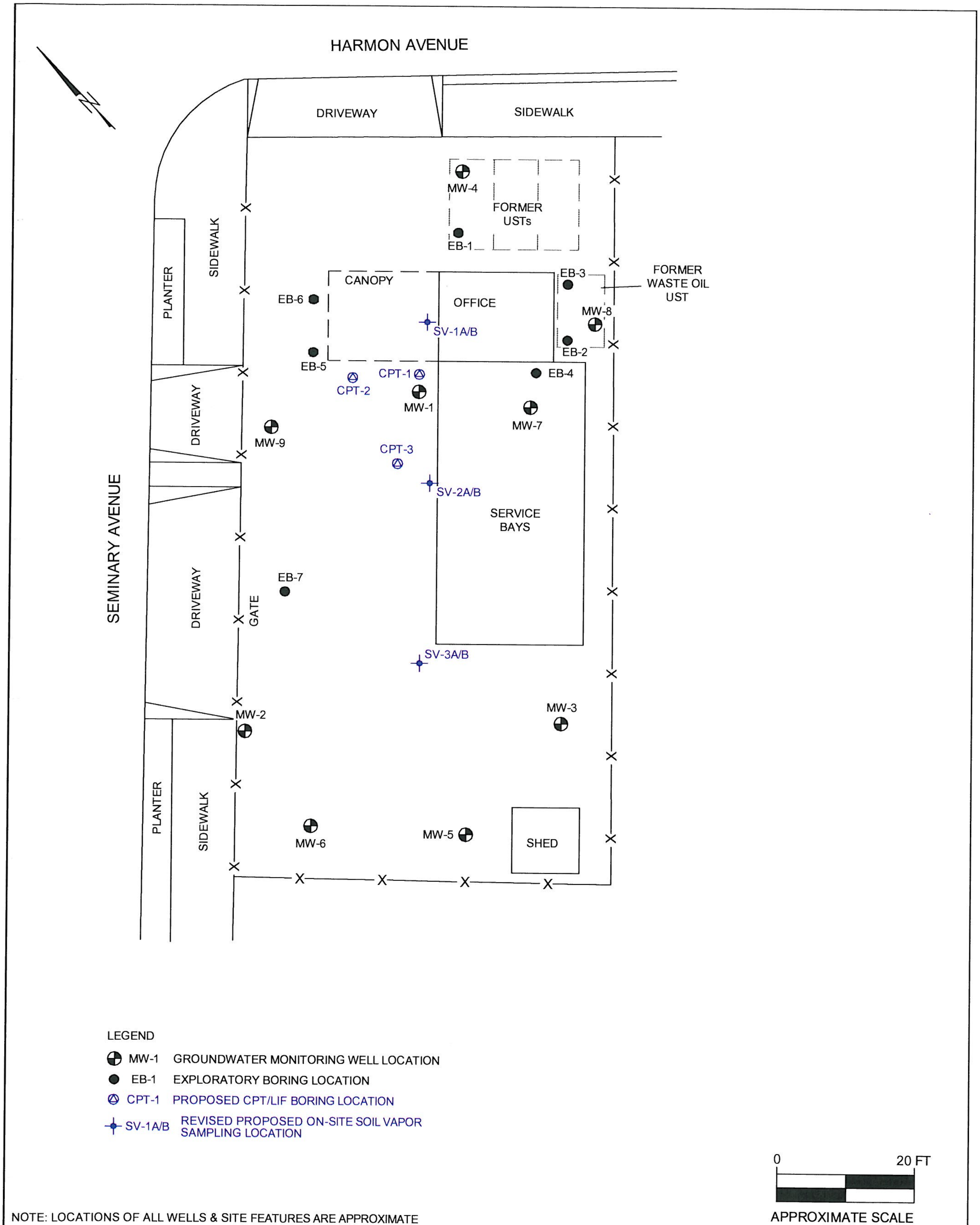
GENERAL NOTES:
BASE MAP FROM U.S.G.S.
OAKLAND, CA.
7.5 MINUTE TOPOGRAPHIC
PHOTOREVISED 1996

QUADRANGLE LOCATION

0 1800 FT

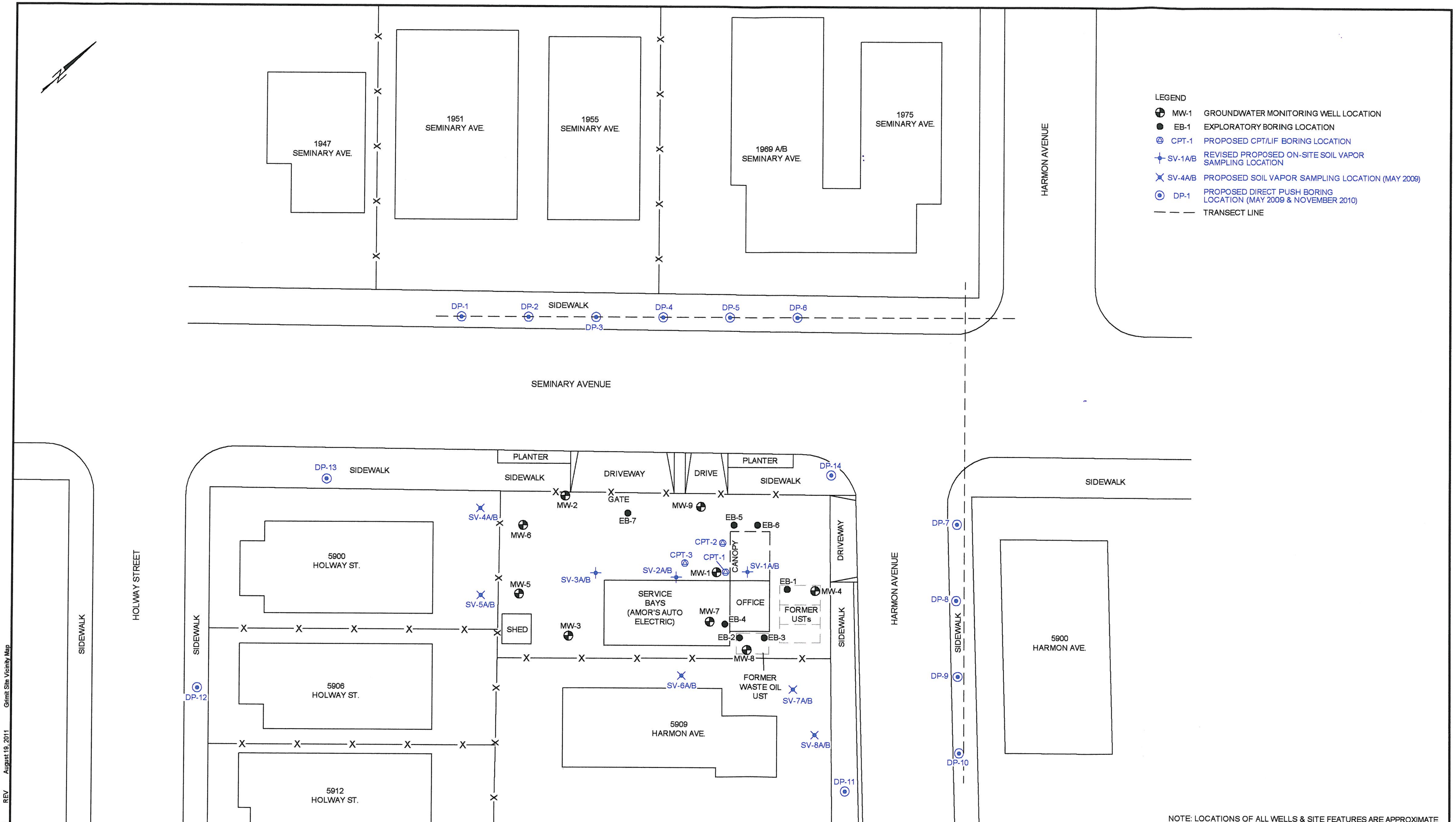
APPROXIMATE SCALE

STRATUS ENVIRONMENTAL, INC.	FORMER GRIMIT AUTO 1970 SEMINARY AVENUE OAKLAND, CALIFORNIA SITE LOCATION MAP	FIGURE 1 PROJECT NO. 2090-1970-01



NOTE: LOCATIONS OF ALL WELLS & SITE FEATURES ARE APPROXIMATE

STRATUS ENVIRONMENTAL, INC.	FORMER GRIMIT AUTO 1970 SEMINARY AVENUE OAKLAND, CALIFORNIA SITE PLAN	FIGURE 2 PROJECT NO. 2090-1970-1



Grimit AutoWorkplan JMP REV August 19, 2011 Grimit Site Vicinity Map

STRATUS ENVIRONMENTAL, INC.

0 30 FT

APPROXIMATE SCALE

FORMER GRIMIT AUTO
1970 SEMINARY AVENUE
OAKLAND, CALIFORNIA

SITE VICINITY MAP

FIGURE 3

PROJECT NO. 2090-1970-1

APPENDIX A

SELECT DATA REGARDING LASER INDUCED FLUORESCENCE

Close Page

GREGG

Home Page

CONE PENETRATION TESTING EQUIPMENT

LASER INDUCED FLUORESCENCE (UVOST)

Gregg Drilling & Testing, Inc. conducts Laser Induced Fluorescence (LIF) cone penetration tests using an Ultra-Violet Optical Screening Tool (UVOST) module that is located behind the standard piezocone, Figure UVOST. The UVOST works on the principle that polycyclic aromatic hydrocarbons (PAH's), located in soil and/or groundwater fluoresce when irradiated by ultra violet light. Different types of PAHs will fluoresce at different wave lengths leaving a characteristic fluorescence signature. Measuring the intensity and wavelength of the fluoresced PAH allows one to assess the type and relative concentration of PAH present in the CPT-UVOST sounding.

Performing CPT-UVOST soundings at multiple locations across a site allows for an accurate determination of the site stratigraphy and piezometric profile along with the location of the residual phase NAPL present at the site. These data can be used to select appropriate boring, sampling and monitoring well locations which allows for a more rapid, accurate and cost effective site assessment and remediation program when compared with the traditional multiphase drilling and sampling program.

The UVOST (Ultra-Violet Optical Screening Tool) module in conjuction with Cone Penetration Testing (CPT) can provide detailed stratigraphic logging plus hydrocarbon contaminant screening.

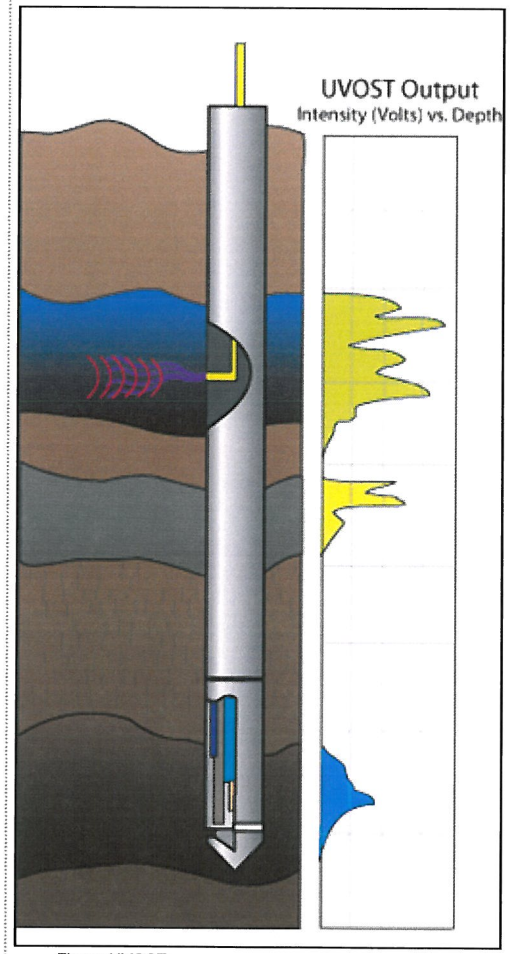


Figure UVOST:
UVOST system deployed with the CPT

How it works:

- UV light from a laser is emitted through a window in the cone causing hydrocarbon molecules to fluoresce.
- Fiber optic cables transmit fluorescence to the surface where intensity and decay are recorded every 2 inches.
- Decay signatures determine the type of hydrocarbon contaminant and signal intensity determines the location.

Benefits:

- Capability to push up to 600 feet per day.
- Cost effective method to determine extent, location and type of contaminant.
- Color coded logs offer qualitative information and can be produced in the field for real-time decision making.
- No samples or cuttings and significant time savings over traditional drilling and sampling.
- Minimal site and environmental impact.

ADDITIONAL INFORMATION

View/Print::
UVOST Datasheet

See Also:
Technical Methodology

2726 Walnut Avenue; Signal Hill, CA 90755 • Email: info@greggdrilling.com

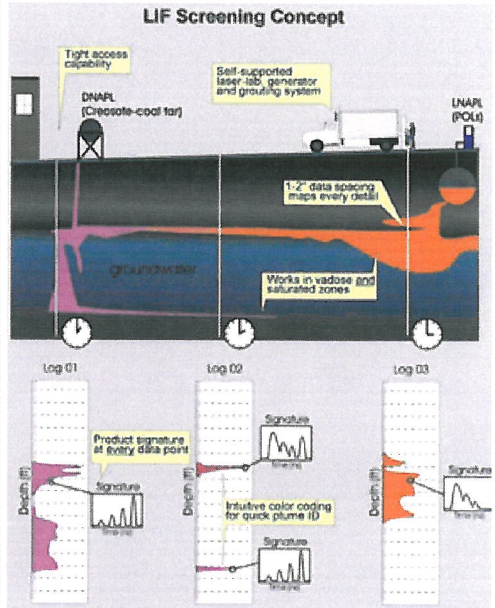


Figure Concept *(figure courtesy of Dakota Technologies)*

Dakota Technologies

Home Products Services Contact Us search...

Home ▸ Resources ▸ LIF Introduction

Main Menu

- **Home**
- **Products**
  - NAPL - UVOST®
  - Soil Color - SCOST™
  - Electrical Conductivity
  - Hammer Rate
  - OST Software
- **Services**
  - NAPL - TarGOST®
  - 3D Visualization
  - Sediment PAH - Darts
  - Contract Research
- **Resources**
  - LIF Introduction
  - Catalogs
  - International
  - Distributors
  - Relevant Links
- **About Us**
- **News**
- **Search**

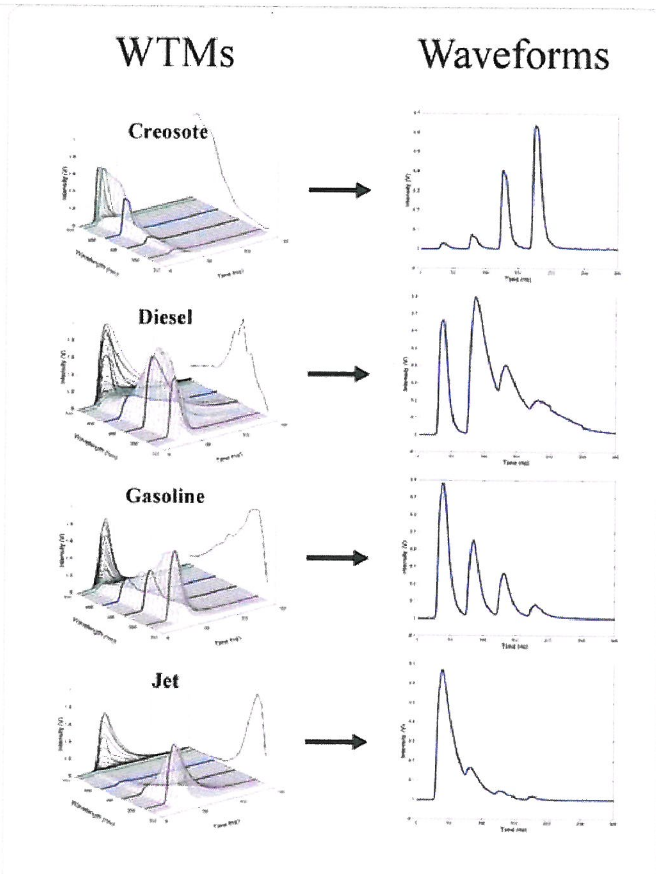
Contact Us

Headquarters
2201-A 12th St N
Fargo, ND 58102
701-237-4908

LIF Introduction

Fluorescence is a property of some compounds where absorbed light stimulates the release of photons (light) of a longer wavelength. Fluorescence, a property of many aromatic hydrocarbons, can be used to detect small amounts of substance in/on a much larger matrix. Here we will discuss the use of Laser Induced Fluorescence (LIF) for purposes of site investigation.

The fluorescence of PAHs has both a spectral and temporal component. Real-world environmental samples typically contain at least several (if not dozens) of different PAHs along with other fluorophores, and the PAH fluorescence spectra overlap to form broad and fairly featureless spectral and temporal emission (compared to pure PAH spectra). If we were to record the temporal decay waveforms across the entire spectrum we would record what is called a wavelength-time matrix (WTM) that would describe the fluorescence emission completely. Dakota's LIF systems monitor four unique bands of this emission in real-time.



WTM's of common fuels

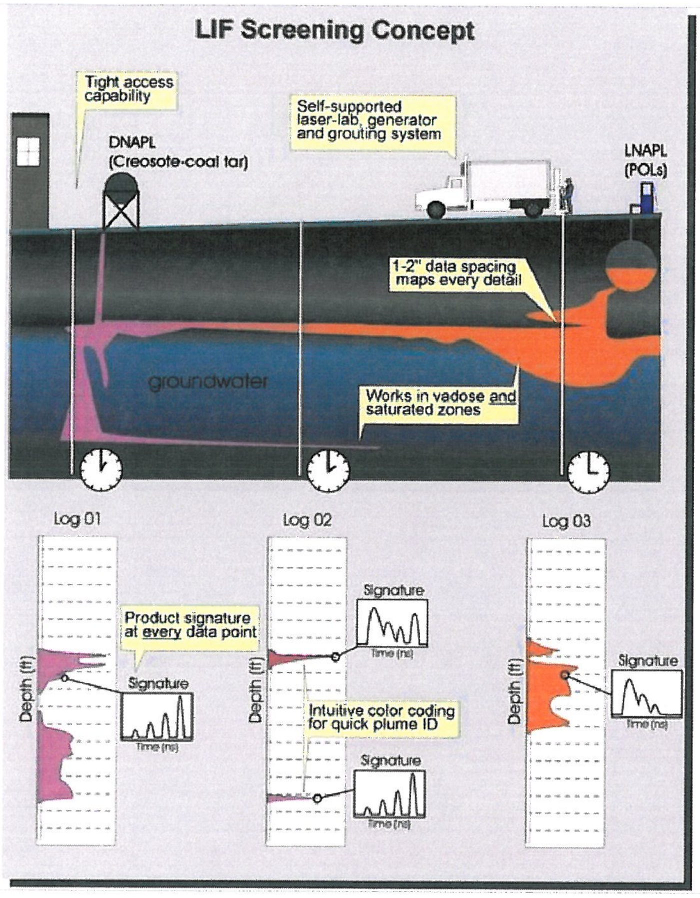
How It Works

The system developed by Dakota sends excitation light through fiber optic cable strung within rods. The light exits through a window in the side of the probe. As the probe is advanced the soil is exposed to the excitation light. If fluorescent compounds exist (i.e. contaminants) light is emitted. The "signal" light is transmitted through a fiber, back up hole to be analyzed. Responses are indicated in real-time on a graph of signal vs. depth. The graph can also display color logs and waveforms to aid in identification of the contaminant present.

Benefits of LIF

- Production rate - 200 to 400 ft. per day depending on soil conditions and grouting methods.
- No samples - LIF collects and displays data in real time. Therefore no samples are collected.
- Decontamination - With a special rod wiper and no sampling equipment, decontamination is virtually eliminated.

- Quick results - Results can be printed out before the rods can be extracted from the ground. Providing real-time decision making and results in a true seek-and-find style of site characterization.



LIF screening concept

Publications

"In situ Characterization of NAPL with TarGOST® at MGP Sites" (external link, valid 2006-07): R. St. Germain, S. Adamek and T. Rudolph, Land Contamination & Reclamation, 14(2), 573-578(6) (2006)

"Case study: confirmation of TarGOST laser-induced fluorescence DNAPL delineation with soil boring data" (external link, valid 2006-07): M. B. Okin, S. M. Carroll, W. R. Fisher, and R. W. St. Germain, Land Contamination & Reclamation, 14(2), 573-578(6) (2006)

"Demonstration of a Method for the Direct Determination of PAHs in Submerged Sediments" (external link, valid 2006-07): T. Grundl, J. Aldstadt, J. Harb, R. St. Germain, and R. Scheweitzer, Environ. Sci. Technol., 14(2), 37(6), 1189-1197 (2003)

"An In-Situ Laser-Induced Fluorescence System for Polycylic Aromatic Hydrocarbon-Contaminated Sediment" (external link, valid 2006-07): J. Aldstadt, R. St. Germain, T. Grundl, and R. Scheweitzer, United States Environmental Protection Agency, Great Lakes National Program Office (2002)

"Chemometric treatment of multimode laser-induced fluorescence (LIF) data of fuel-spiked soils" (external link, valid 2006-07): M. H. Van Benthem, B. C. Mitchell, G. D. Gillispie, and R. W. St. Germain, Advanced Technologies for Environmental Monitoring and Remediation, Tuan Vo-Dinh, Editor, Proc. SPIE, 2835, 167-179 (1996)

< Prev Next >

[Back]