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March 2, 2007

Mr. Jerry Wickham
Alameda County Department of
Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Project: 2840

Subject: Fuel Leak Case No. RO0002585, Wente Winery
Site Located at 5565 Tesla Road, Livermore, California

Dear Mr. Wickham:

SOMA's report entitled "Additional Site Investigation and Work Plan for Shallow Soil Excavation and Sampling" for the subject site has been uploaded to the State's GeoTracker database for your review.

Thank you for your time in reviewing our report. Please do not hesitate to call me at (925) 734-6400, if you have any questions or comments.

Sincerely,

Mansour Sepehr, Ph.D., P.E.
Principal Hydrogeologist

cc: Mr. Aris Krimetz w/report enclosure

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ADDITIONAL SITE INVESTIGATION AND WORK PLAN FOR SHALLOW SOIL EXCAVATION AND SAMPLING

Wente Winery
5565 Tesla Road, Livermore, California

March 2, 2007

Project 2840

Prepared for

Mr. Aris Krimetz
5565 Tesla Road
Livermore, California 94550

Prepared by

SOMA Environmental Engineering, Inc.
6620 Owens Drive, Suite A
Pleasanton, California 94588

CERTIFICATION

This report has been prepared by SOMA Environmental Engineering, Inc. (SOMA) on behalf of Wente Winery, which is located at 5565 Tesla Road, Livermore, California. This report details the results of the field investigation as requested by the Alameda County Environmental Health Division in a correspondence dated December 15, 2006.

Mansour Sepehr, Ph.D., P.E.
Principal Hydrogeologist

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1.0 INTRODUCTION

On behalf of Wente Winery, SOMA Environmental Engineering, Inc. (SOMA) has prepared this report documenting the additional shallow soil investigation activities and describing the proposed excavation and confirmation soil sampling procedures for the property located at 5565 Tesla Road, Livermore, California, hereby referred to as "the Site." This report was prepared pursuant to Alameda County Environmental Health's (ACEH's) request dated December 15, 2006 to conduct an investigation to delineate the extent of soil contamination and propose the remedial action in the area of the steam cleaning operations and welding shop.

1.1 Site Background

The Site is located between South Vasco Road and Mines Road in Livermore, California (Figure 1) and operates as a winery. There are three aboveground fuel storage tanks, with a total capacity of 4,000 gallons, located on the premises.

In 1987, two fuel underground storage tanks (USTs) were removed from the Site. However, there are no available records of the tank removal activities. As such, there is no information regarding the condition of the tanks, what date they were removed or evidence of possible leakage.

In 1990, the ACEH issued a notice of violation (NOV) for discharging waste sludge into an open ditch adjacent to a steam-cleaning bay, which was located at the south end of the steel storage and welding shed. The NOV required sampling of the ditch area and around a stained drum, along with remediation of the contaminated areas.

1.2 Previous Site Investigation Activities

On November 28, 1990 the ACEH, Hazardous Material Division, inspected the Site. During this inspection, several areas of stained soil around the maintenance shop were documented, where spillage had occurred. As per the ACEH's letter dated December 11, 1990, contamination was particularly evident around a group of unlabeled 55-gallon drums behind the shop. Another area of noticeable contamination was identified in the area of an unlined runoff ditch that was adjacent to the steam-cleaning pad, where the waste from the steam cleaning of vehicles and equipment were drained.

Following the inspection by the ACEH, Wente ceased all steam cleaning operations. These operations did not resume until an appropriate wastewater handling system, with closed loop operations, was installed. All necessary measures were implemented to prevent any accidental spill from occurring in the future. All hazardous wastes are now stored separately, in suitable buildings and/or provided with an acceptable secondary containment, in approved enclosed containers with appropriate labeling.

In November 2002, in accordance with Comerica Bank guidelines, the Clayton Group (Clayton) performed an ASTM D standard Phase I investigation to identify recognized environmental concerns (RECs). The Phase I study revealed the existence of the former USTs, the former waste discharge area, and a number of agricultural storage areas. This study indicated that agricultural chemicals were previously stored in Building S and in a detached garage. Clayton concluded that the identified areas constituted RECs and recommended sampling of these areas for relevant constituents of concern.

In 2003, Clayton performed a subsurface investigation at the Site to implement the recommendations of the Phase I report. Soil samples were analyzed for

pesticides, herbicides, petroleum hydrocarbons, volatile organic compounds (VOCs), and heavy metals. In the area of the steam-cleaning bay, which is located south/southwest of the former UST pit, no total petroleum hydrocarbon (TPH) or VOCs were detected in the soil. However, some metals were detected in the shallow soil (0.5 to 1- foot below ground surface (bgs)) at levels below or slightly above the Environmental Screening Levels (ESLs) set forth by the Regional Water Quality Control Board (RWQCB). Gasoline and motor oil-range petroleum hydrocarbons were detected in the groundwater at concentrations that were slightly above the Risk Based Screening Levels (RBSLs).

In 2004 Wente retained SOMA to review Clayton's report. SOMA subsequently submitted a Work Plan that included a vicinity well survey, a regional hydrogeologic study, and an additional site characterization. The site characterization included sampling and evaluating the water quality of the on-site water supply well, installing monitoring wells, and additional lithologic characterization to better define the shallow/perched water-bearing zone.

On June 24, 2005, SOMA oversaw Woodward drill two confirmatory boreholes (B-9 and B-10). The purpose of this investigation was to confirm the presence of petroleum hydrocarbons in the soil and groundwater next to the former USTs and to evaluate the current soil and groundwater conditions in close proximity of the steam cleaning area. Though the results of the laboratory analysis on the groundwater samples collected near the steam cleaning bay showed some presence of dissolved phase metal concentrations, the levels were not elevated as compared to the ESLs (groundwater in a current or potential source of drinking water). There were no detections of total petroleum hydrocarbons as gasoline (TPH-g), total petroleum hydrocarbons as diesel (TPH-d), total petroleum hydrocarbons as motor oil (TPH-mo), or organochlorine pesticides reported in the groundwater samples. The results of this investigation are presented in SOMA's report entitled "Phase I: Soil and Groundwater

Investigation, Wente Winery, 5565 Tesla Road, Livermore, California," dated July 25, 2005.

To further characterize the Site, on October 26 and 27, 2005, under SOMA's oversight, Gregg Drilling and Testing, Inc. (Gregg) conducted CPT drilling. The results of this site investigation revealed the presence of three water-bearing zones (WBZs) beneath the Site (Upper, Intermediate and Lower) that are separated by two confining layers. A negligible amount of petroleum hydrocarbons were detected in the area of the steam cleaning bay, in the Upper WBZ. The results of this investigation are presented in SOMA's report entitled "Additional Site Investigation to Evaluate the Extent of Groundwater Contamination, Wente Winery, 5565 Tesla Road, Livermore, California," dated December 6, 2005.

To further evaluate the extent of groundwater contamination in the area of the former steam cleaning operations, on October 5, 2006, under SOMA's oversight, Fisch Drilling (Fisch) conducted DPT drilling and collected two depth discrete groundwater samples. To further evaluate the extent of soil contamination, on October 9 and 10, 2006, under SOMA's oversight, Vironex advanced eleven shallow soil boreholes (HA-1 through HA-11) using a hand auger and soil core sampler. The results of this site investigation revealed elevated levels of TPH-d, TPH-mo, and some metals in the shallow soil around the perimeter (north, west, and south) of the steam cleaning areas. The results are presented in SOMA's report entitled "Additional Site Investigation in the Area of Steam Cleaning Operations, Wente Winery, 5565 Tesla Road, Livermore, California," dated November 15, 2006. Upon reviewing SOMA's report, the ACEH requested an additional investigation be conducted beneath the concrete pad and in the area north of the welding shop to completely delineate the soil contamination. This report describes the field procedures and results of this investigation.

2.0 SCOPE OF WORK

The following describes the tasks performed to accomplish the additional shallow soil investigation in the area of the former steam cleaning bay and welding shop:

Task 1: ***Permit Acquisition, Health and Safety Plan Preparation, and Subsurface Utility Clearance***

Task 2: ***Soil Investigation***

Task 3: ***Report Preparation***

2.1 Permit Acquisition, Health and Safety Plan Preparation, and Subsurface Utility Clearance

Prior to initiating field activities, SOMA obtained the necessary drilling permit from the Zone 7 Water Agency of Alameda County (permit no. 27025). The permit is attached as Appendix A.

Before conducting the field activities, a site-specific health and safety plan (HASP) was prepared by SOMA. The HASP was designed to address safety provisions during field activities and to protect the field crew from physical and chemical hazards resulting from drilling and sampling. The HASP established personnel responsibilities, general safe work practices, field procedures, personal protective equipment standards, decontamination procedures, and emergency action plans.

SOMA also contacted Underground Service Alert (USA) to clear the drilling areas of underground utilities. Following USA clearance, SOMA retained a private utility locator to survey the proposed drilling areas and locate any additional subsurface conduits.

2.2 Soil Investigation

In accordance with the ACEH's request to perform an additional investigation in the area north of the welding shop and beneath the concrete pad south of the steam cleaning area, on February 6, 2007, under SOMA's oversight, Vironex advanced seven shallow soil boreholes (HA-12 through HA-18), using a hand auger and soil core sampler. Figure 2 shows the additional shallow soil boreholes drilled on-site.

A hand auger was used to drill a small borehole; it was rotated so that the cutting blades dig into the soil and force the loosened matter up and into the auger bucket. A soil core sampler, which allows the recovery of an intact soil core from the bottom of the hand-augered hole, was then used. A sturdy push-tube was manually advanced into the targeted soil and driven with a slide hammer. An internal liner captured and held the recovered soil intact. After the soil sample was collected, the ends of the brass liner were secured with Teflon sheets and plastic end caps.

Two sets of samples were collected from each borehole: shallow samples were collected at a 1 to 1.5-foot sampling depth and deeper samples were collected at a 3 to 3.5-foot sampling depth. Upon collection, the soil samples were labeled, placed in an ice-filled cooler and submitted for analysis, under proper chain-of custody (COC) protocol, to Curtis & Tompkins, Ltd., a California Department of Health Services accredited environmental laboratory.

2.3 Summary of Soil Analytical Results

Soil samples collected at the 1 to 1.5-foot sampling depth were submitted for analysis, while the deeper samples collected at the 3 to 3.5-foot sampling depth were put "on hold" pending the results of the shallower samples.

Soil samples were analyzed for TPH-d and TPH-mo using EPA Method 8015B with silica gel cleanup, volatile organics using EPA Method 8260B (including tetrahydrofuran and chloroethane), and CAM 17 metals using EPA Methods 6010B and 7471A.

In order to reduce the already significant cost of the laboratory analysis, with the ACEH's approval, a site-specific guideline aiding in determining the necessity of analysis for the deeper zone samples was developed. For all the constituents, except CAM 17 metals, deeper samples were analyzed if the field observations indicated any evidence of contamination such as staining, odor, elevated photo-ionization detector (PID) readings, or when the laboratory analysis on the shallow depth interval (1 to 1.5 feet bgs) showed considerable concentrations above the laboratory detection limit. Exceptions were made when concentrations of the constituents were slightly above the laboratory detection limit, and significantly lower than the official ESL levels.

The deeper zone samples (3 to 3.5 feet bgs) previously put "on-hold" pending the results of the shallower zone samples (1 to 1.5 bgs) were analyzed for all metals on the CAM 17 list when any of the metals in the corresponding shallow sample from the target location exceeded the State Water Board's ESLs. Exceptions were made for the metals that are known to have elevated ambient concentrations in the Bay Area region, like arsenic, chromium, and cobalt. (Appendix B contains Kearney Foundation Special Report, *Background Concentrations of Trace and Major Elements in California Soils*).

Please note that the screening values for shallow depths (<=3m bgs) for both residential and commercial land use scenarios, assuming that the water is a possible or current groundwater drinking source, were utilized in determining the potential for adverse health effects. The combination of ESL, Preliminary Remediation Goals (PRGs) and California Human Health Risk Screening Levels

(CHHSL), along with the background concentrations levels published by Kearney Foundation were used in assessing the impact of the heavy metal contamination at the Site.

The results of the soil analytical analysis are as follows:

1) ***Petroleum Hydrocarbons*** *using EPA Method 8015B*

As Table 1 shows, TPH-d and TPH-mo were below their respective ESLs (residential exposure scenario) at the 1 to 1.5-foot sampling interval in all of the collected soil samples (borings HA-12 through HA-18). The maximum TPH-d and TPH-mo concentrations, which were slightly above the laboratory reporting limit, were detected in HA-12 at 2.6 and 11 milligrams per Kilogram (mg/Kg), respectively. Based on the very low concentration levels, no samples from the deeper sampling interval were analyzed for petroleum hydrocarbons. Figures 3 and 4 show the contour maps of TPH-mo and TPH-d, respectively. The soil analytical laboratory report is included as Appendix C.

2) ***Volatile Organics*** *using EPA Method 8260B (including Tetrahydrofuran and Chloroethane)*

Samples from soil borings HA-12 through HA-14 at the 1 to 1.5-foot sampling interval were analyzed for volatile organics (VOCs). As Table 2 shows, none of the analytes at the 1 to 1.5-foot sampling interval were detected at or above the laboratory reporting limits. Therefore samples from the 3 to 3.5-foot sampling interval, originally put on hold, were not analyzed for VOC's.

3) ***CAM 17 Metals*** *using EPA Methods 6010B and 7471A*

Since at least one of the CAM 17 metals was present in each of the shallow samples collected from soil borings HA-15 through HA-18, at concentrations exceeding the State Water Board's ESLs (and/or the background concentrations), samples collected from the shallow as well as deeper interval were analyzed for all CAM 17 Metals.

As Table 3 shows, at the 1 to 1.5-foot sampling interval, cobalt and nickel were detected at concentrations slightly above their respective ESLs (residential exposure scenario) and published background concentrations in soil borings HA-15, HA-17, and HA-18. Figure 5 shows the spatial distribution of the above metals in samples from previous, as well as the current investigation, at the 1 to 1.5-foot sampling interval. As shown in Table 3, lead, a contaminant of concern, was not detected at levels exceeding the ESLs for the residential or industrial exposure scenarios.

Even though at the 3 to 3.5-foot sampling interval, chromium, cobalt, and nickel were detected at concentrations slightly above their respective ESLs (residential exposure scenario) and published background concentrations, they were significantly below their CHHSL and PRG screening levels. Figure 6 shows the spatial distribution of the above metals in samples from previous, as well as the current, investigation at the 3 to 3.5-foot sampling interval.

Table 3 compares the soil analytical results for CAM 17 Metals with the ESLs as set forth by the RWQCB, as well as the PRGs set forth by EPA Region 9 and the CHHSLs set forth by CalEPA in January 2005.

2.4 Potential Sources of Diesel Fuel in On-Site Water Supply Well

In response to concerns raised by the ACEH in their letter dated December 15, 2006, regarding the potential sources of diesel "located upgradient of both fuel release from the former USTs and the steam cleaning areas," SOMA conducted preliminary research, the results of which are documented below.

The highest TPH-d concentrations observed in the on and off-site water supply wells were recorded during the Fourth Quarter 2005 groundwater monitoring event (November 22, 2005), with levels at or slightly exceeding the ESLs (100 ug/L) considering groundwater as a current or potential drinking water source. The TPH-d concentrations in the groundwater in the on and off-site water supply wells during the Fourth Quarter 2005 were 100 ug/L and 120 ug/L, respectively.

On February 27, 2007, SOMA's representative conducted a phone interview with Mr. Aris Krimetz, director of engineering for Wente Winery. Mr. Krimetz indicated that to the best of his knowledge no additional diesel fuel storage areas exist now or existed in the past on the subject site. It was also suggested that since some portions of the Site are unpaved, it is possible that if any incidental leak(s) occurred in the past from the parked equipment they may be accountable for the impacted groundwater beneath the Site; Figure 1 is an aerial map pinpointing the general vicinity of the temporary parking area for the Site's equipment.

Available historical aerial photographs and topographic maps were reviewed for any indications of fuel storage and areas where it could potentially be discharged to the surface or subsurface. The results of the historical documentation review did not support a hypothesis that diesel fuel concentrations detected in the water supply wells came from the on-site areas of permanent fuel storage previously not disclosed to the ACEH.

In addition, a review of the Phase I assessment report prepared by Clayton Group Services (dated November 8, 2002), identified the existence of portable diesel tanks on the property at the time of the assessment. Appendix D is an excerpt from the photographic documentation presented in the Phase I report. Plate 33 is captioned as the “Northern view of the yard area. Portable electric generator with portable diesel tanks and electric transformer at left.” Reportedly, the portable diesel fuel tanks were used to fuel an electric generator located in the northern portion of the central yard area. According to the Phase I report, “All equipment appeared to be well maintained and no stains, spills, or miss use of chemicals was observed in [the above] area.”

3.0 PROPOSED SHALLOW SOIL EXCAVATION AND CONFIRMATION SAMPLING

The following sections describe the tasks needed to facilitate SOMA’s remedial action plan via soil excavation in the area of the former steam cleaning bay and welding shop:

Task 1: ***Permit Acquisition, Health and Safety Plan Preparation, and Subsurface Utility Clearance***

Task 2: ***Soil Excavation and Confirmation Sampling***

Task 3: ***Report Preparation***

3.1 Extent of Shallow Soil Excavation

Based on the results of previous site investigations in the area of the steam cleaning bay in conjunction with the current analytical data, SOMA proposes remedial action via soil excavation to address the shallow contamination at the subject site. Historical soil and groundwater analytical data is summarized as Appendix E. Figures 3 through 6 summarize the results of the soil analytical data for current and previous site investigations. As shown on the above figures, the

main bulk of the contamination is located south of the former steam cleaning bay in the area of the former unlined drainage ditch, around borings HA-3 and HA-4.

The results of an additional soil investigation north of the steam cleaning area, around HA-10 and south under the concrete pad, did not reveal any considerable petroleum hydrocarbon or VOC contamination. Although the results of the heavy metal analysis did reveal detectable concentrations of chromium, cobalt and nickel beneath the concrete pad, they were at levels below or slightly above their respective ESL levels; the concentrations were significantly below the CHHSL or PRG levels for the residential exposure scenario. Due to this fact, in our opinion the removal of the concrete pad in an attempt to expand the excavation area northward of the former unlined drainage ditch is an unnecessary and costly effort. Therefore, based on the new and existing shallow soil analytical data in the target area, as well as the ACEH's recommendations, SOMA proposes hot-spot removal of all the above-ground debris and excavation of approximately 40-50 cubic yards of impacted soil at the Site.

The proposed extent of the shallow soil excavation areas (one through four) are shown in Figure 7. The following table summarizes the estimated areas and volumes of major excavation areas based on the anticipated target depths.

Area ID	**Area**	**Average depth**	**Volume**	
	Ft^2	**Ft**	**Ft^3**	**$Yard^3$**
1	*340*	*2.5*	*850*	*31.48*
2	*20*	*1.5*	*30*	*1.11*
3	*20*	*1.5*	*30*	*1.11*
4	*120*	*1.5*	*180*	*6.67*
		Total:	***1,090***	***40.36***

3.2 Soil Excavation and Confirmation Sampling Procedures

This section of the work plan describes the general procedures required to implement the recommended cleanup action presented above. If site-specific conditions identified by the contractors recommend a variance from this plan, the field related activities will be modified to address those changes.

The selected remedial action entails excavating and off-site disposal of the petroleum and heavy metal contaminated soil followed by backfilling with clean fill. SOMA has determined that the removal of soil containing TPH-d, TPH-mo and total lead concentration above their respective ESLs will protect human health and the environment.

The target excavation depths will range from approximately 1 to 3.5 feet bgs. The target depths were determined based on the historical soil analytical data with respect to TPH-d, TPH-mo, and total lead. Figure 7 shows the proposed excavating areas as well as their respective target depths.

3.2.1 Preparation of a Site-specific Health and Safety Plan (HASP) and Utility Clearance

The site-specific Health and Safety Plan (HASP) will be prepared prior to commencing the excavation activities at the Site. The HASP will address safety provisions during field activities and provide procedures to protect the field crew from physical and chemical hazards resulting from drilling and sampling. The HASP will establish personnel responsibilities, general safe work practices, field procedures, personal protective equipment standards, decontamination procedures, and emergency action plans.

To comply with the HASP, SOMA will also contact Underground Service Alert (USA) to clear the proposed excavation areas of underground utilities and subsurface conduits, if any.

3.2.2 Permitting

Written notification to the Bay Area Air Quality Management District (BAAQMD), ACEH, and Occupational Safety and Health Association (OSHA) may be required. In addition, the City of Livermore Building and Safety Department requires a notification of excavation and grading. Since soil excavation is not anticipated to go beyond 4 feet bgs, a grading permit from the City of Livermore will not be required at this time.

SOMA will also notify the ACEH at least one week prior to beginning the field excavation and soil sampling activities, so, if desired, their representative can be present to observe the field activities.

3.2.3 Excavation and Backfill Activities

Prior to initiating field activities, SOMA will visit the Site and mark each excavation area with white paint and flags, if feasible. SOMA will contact a waste disposal facility and present the existing soil data to obtain their acceptance of the excavated soils.

SOMA will subcontract a state-licensed hazardous materials contractor and transporter to perform the soil excavation, transportation, and disposal. The initial excavation estimate is that approximately 40 cubic yards of in-place soil to be removed from the Site, as detailed in the Section 3.1. However, this estimate was rounded to 40-50 cubic yards to include any possible debris, or any changes in the extent of the excavation area influenced by the results of the confirmation sampling. It is not anticipated that any structures or vegetation will obstruct the excavation areas; however, the excavation will have to proceed with extreme caution due to its proximity to nearby buildings. The subcontractor will be notified

regarding the Site's conditions to allow any appropriate equipment arrangements to be made.

The subcontractor will excavate the specified areas using a backhoe and temporarily stockpile the excavated soil. The excavated soil will be transported to the appropriate disposal facility. The trucks will be inspected and covered with tarps prior to leaving the Site to prevent contaminated materials from being blown out of the trucks during transport. Trucks will be weighed before and after loading. The technical report following the excavation activities will include weight tickets, manifests, and disposal facility waste forms.

Excavated areas will be backfilled with clean fill material brought on-site and re-compacted. SOMA will observe the excavation and backfilling activities performed by the subcontractor to insure compliance with the HASP and this work plan.

3.2.4 Confirmation Soil Sampling

When the proposed final excavation limits have been reached, confirmatory soil samples will be collected for analysis at a state-licensed off-site laboratory.

At a minimum, confirmation samples will be collected at the density of one per 400 square feet, or one sample per 20-foot by 20-foot area. In addition, samples will be collected from the sidewalls of the excavated area to confirm that the lateral extent of the contaminated soil has been removed. The number of samples will be determined by SOMA's senior field geologist, at the time of excavating activities, and will be based on field observations and the overall area and geometry of the soil excavation pit. The soil samples will be collected using a sturdy push-tube manually advanced into the targeted soil. An internal liner will capture and hold the recovered soil intact. After the soil samples are collected, the ends of the brass liner will be secured with Teflon sheets and plastic end

caps. The samples will be labeled and placed in a chilled ice-chest, pending delivery under COC protocol, to the laboratory.

Samples will be analyzed for TPH-d and TPH-mo using EPA Method 8015B with silica gel cleanup, volatile organics using EPA Method 8260B (including tetrahydrofuran and chloroethane), and CAM 17 metals using EPA Methods 6010B and 7471A. The analytical results will be used to verify that the cleanup goal for the former steam cleaning area has been reached.

3.2.5 Stockpiling and Dust Control

Excavated soil will be stockpiled temporarily on-site while the excavation activities take place and soil samples are being analyzed for waste profiling. The stockpiled soil will be placed on plastic sheeting, with a minimum of 12 inches of plastic sheeting on all sides to be rolled up against the soil and held in place with weighted objects (e.g. sand bags). The stockpiles that were not off-hauled from the Site the same day will be covered at the end of each workday, or immediately in the event of rain, suspicious odors, or if visible dust is being generated from the stockpiles. A PID reading will be taken periodically to ensure stockpiles meet the City of Livermore's regulations on VOC emissions. Debris (brick, rubble, etc.) encountered during excavation, as well as the concrete and/or asphalt cuttings, if any, will be separated from the excavated soil and disposed of as non-hazardous waste.

A sign with a contact phone number will be visibly placed in front of the property to accommodate any inquiries from the neighboring property owners during the excavating activities.

Dust control measures during excavation, backfilling, and handling of contaminated soil will consist of spraying the minimum amount of water needed to suppress the dust onto the soil and work area. The dust-monitoring plan will

consist primarily of direct-reading instrumentation to measure total particulate levels in the work area throughout the daytime operation hours.

3.2.6 Waste Profiling

The excavated soil will be sent to a Class II or other appropriate landfill, depending on the results of the waste characterization. For disposal at a Class II landfill, waste profiling will be required before acceptance. Waste profiling samples will be collected during the excavation activities, and will based on the guidelines summarized in the table below, and at a minimum, be analyzed for STLC Lead and Chromium using a state-certified laboratory.

Stockpile Size	Minimum Number of Samples
Less than 10 $Yard^3$	2
10 to 20 $Yard^3$	3
20 to 100 $Yard^3$	4
100 to 500 $Yard^3$	1 sample for each 25 $Yard^3$

SOMA will subcontract a state-licensed hazardous materials contractor and transporter to perform the soil excavation, transportation, and disposal.

3.2.7 Transportation Route

The contaminated soil will be transported by truck from the project site located at 5565 Tesla Road, Livermore, California, to the appropriate disposal facility. Pending the results of the waste profiling, the preferred waste disposal facility is Altamont Landfill, which is located at 10840 Altamont Pass Road, Livermore, California.

The proposed traffic route from the Site starting on Tesla Road to the disposal facility is as follows:

1	Start out going EAST on TESLA RD / CR-J2 toward S VASCO RD.	0.2 miles
2	Turn LEFT onto S VASCO RD.	3.3 miles
3	Turn RIGHT onto NORTHFRONT RD.	1.3 miles
4	NORTHFRONT RD becomes ALTAMONT PASS RD.	1.3 miles
5	End at **10840 Altamont Pass Rd Livermore, CA 94551-9722, US**	
	Total Est. Time: *10 minutes* ***Total Est. Distance:*** *6.31 miles*	

Trucks carrying clean backfill and other materials needed at the Site will backtrack on the above route from the Interstate 580, Vasco Road exit, in the direction of Lawrence Livermore Lab / Sandia Lab, towards the subject Site.

3.3 Technical Report Preparation

Upon completing the proposed scope of work, a technical report will be prepared to document the soil excavation and confirmation sampling activities. This report will provide a detailed description of the Site's conditions with respect to the shallow soil contamination, field excavating, and soil sampling procedures. Furthermore, it will be submitted to the ACEH along with our recommendations for a no further action, and ultimate site closure, if warranted.

4.0 REFERENCES

Kearney Foundation of Soil Science Division of Agriculture and Natural Resources. University of California. March 1996. “Background Concentrations of Trace and Major Elements in California Soils”.

Clayton Group Services, November 8, 2002. “Phase I Environmental Site Assessment”.

SOMA Environmental Engineering Inc. September 9, 2004. “Revised Workplan to Conduct an Additional Soil and Groundwater Investigation”.

SOMA Environmental Engineering Inc. July 25, 2005. “Phase I: Soil and Groundwater Investigation. Wente Winery, 5565 Tesla Road, Livermore, California”.

SOMA Environmental Engineering Inc. December 6, 2005. “Additional Site Investigation to Evaluate the Extent of Groundwater Contamination. Wente Winery, 5565 Tesla Road, Livermore, California”.

SOMA Environmental Engineering Inc. November 15, 2006. “Additional Site Investigation in the Area of Steam Cleaning Operations, Wente Winery, 5565 Tesla Road, Livermore, California”.

Tables

Table 1
Soil Analytical Results (TPH)
Wente Vineyards
5565 Tesla Road, Livermore, California

Sample ID	Sampling Depth (ft bgs)	Date	TPH-d mg/kg	TPH-mo mg/kg
HA-12 @ 1-1.5	1-1.5'	2/6/2007	2.6 HY	11
HA-13 @ 1-1.5	1-1.5'	2/6/2007	1.8 HY	6.2
HA-14 @ 1-1.5	3-3.5'	2/6/2007	<1	<5
HA-15 @ 1-1.5	1-1.5'	2/6/2007	1.3 HY	<5
HA-16 @ 1-1.5	3-3.5'	2/6/2007	2.4 HY	7.5
HA-17 @ 1-1.5	1-1.5'	2/6/2007	2.1 HY	<5
HA-18 @ 1-1.5	3-3.5'	2/6/2007	1.4 HY	<5
ESL (Commercial/Industrial)	-	-	100	1,000
ESL (Residential)	-	-	100	500

Notes:

H: Heavier hydrocarbons contributed to the quantitation

Y= Sample exhibits chromatographic pattern which does not resemble standard

ESL- Environmental Screening Levels (Groundwater is current or potential drinking water source, shallow soils <= 3m bgs), California Regional Water Quality Control Board SF Region, February 2005

< Less than Laboratory Reporting Limit

Table 2
Soil Analytical Results (Volatile Organics)
Wente Vineyards
5565 Tesla Road, Livermore, California

Sample ID	Sampling Depth (ft bgs)	MTBE ug/kg	Benzene ug/kg	Toluene ug/kg	Ethylbenzene ug/kg	m,p-Xylenes ug/kg	o-Xylene ug/kg	Tetrahydrofuran ug/kg	Chloroethane ug/kg
HA-12	1-1.5'	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<47	<9.4
HA-13	1-1.5'	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<49	<9.8
HA-14	1-1.5'	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<46	<9.3
ESL *(Commercial/Industrial)*		23	44	2,900	3,300	2,300	2,300	NL*/ (PRG=21,000)	850
ESL *(Residential)*		23	44	2,900	3,300	2,300	2,300	NL*/ (PRG=9,400)	630

Notes:

ESL- Environmental Screening Levels (Groundwater is current or potential drinking water source, shallow soils <= 3m bgs), California Regional Water Quality Control Board SF Region, February 2005

NL*- ESL not available

< Less than Laboratory Reporting Limit

Table 3
Soil Analytical Results (Metals CAM 17)
Wente Vineyards
5565 Tesla Road, Livermore, California

Sample ID	Sampling Depth (ft bgs)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
HA-15	1-1.5'	0.86	3.6	240	0.34	<0.25	64	18	35	7.5	0.042	<0.25	150	<0.5	0.35	<0.5	32	49
HA-15	3-3.5'	<0.5	5.3	210	0.32	<0.27	73	18	36	6.4	0.066	0.48	170	0.69	0.63	<0.5	29	43
HA-16	1-1.5'	0.89	3.4	200	0.32	<0.25	54	18	30	8.5	0.037	0.43	120	<0.5	<0.25	<0.5	31	46
HA-16	3-3.5'	<0.5	3.9	160	0.32	<0.25	68	17	30	6.3	0.054	0.36	170	<0.5	<0.25	<0.5	23	42
HA-17	1-1.5'	1.1	3.4	270	0.36	<0.26	67	19	34	7.7	0.033	<0.26	160	<0.5	<0.26	<0.5	34	50
HA-17	3-3.5'	<0.5	5.4	280	0.39	<0.25	78	21	36	7.5	0.04	0.64	210	<0.5	<0.25	<0.5	30	49
HA-18	1-1.5'	1	2.9	270	0.32	<0.25	59	16	31	7.1	0.029	<0.25	150	<0.5	<0.25	<0.5	29	45
HA-18	3-3.5'	<0.5	4.6	210	0.34	<0.25	68	19	31	6.8	0.037	0.45	180	<0.5	<0.25	<0.5	24	43
Ambient Levels*		NA	9.6	NA	NA	NA	73	15.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ESL (Commercial/Industrial)		40	5.5	1,500	8	7.4	58	10	230	750	10	40	150	10	40	13	200	600
ESL (Residential)		6.1	5.5	750	4	1.7	58	10	230	150	3.7	40	150	10	20	1	110	600
CHHSLs (Commercial/ Industrial)		380	0.24	63,000	1,700	7.5	NL	3,200	38,000	3,500	180	4,800	16,000	4,800	4,800	63	6,700	100,000
CHHSLs (Residential)		30	0.07	5,200	150	1.7	NL	660	3,000	150	18	380	1,600	380	380	5	530	23,000
PRGs (Commercial/Industrial-Direct Contact)		410	1.6	67,000	1,900	450	450	1,900	41,000	800	62	5,100	20,000	5,100	5,100	67	1,000	100,000
PRGs (Residential-Direct Contact)		31	0.39	5,400	150	37	210	900	3,100	150	6.1	390	1,600	390	390	5.2	78	23,000

Table 3
Soil Analytical Results (Metals CAM 17)
Wente Vineyards
5565 Tesla Road, Livermore, California

Sample ID	Sampling Depth (ft bgs)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)

Notes:

ESL- Environmental Screening Levels (Groundwater is current or potential drinking water source, shallow soils <= 3m bgs), California Regional Water Quality Control Board SF Region, February 2005

PRG- Preliminary Remediation Goal (EPA Region 9)

CHHSLs- California Human Health Screening Levels, CalEPA January 2005

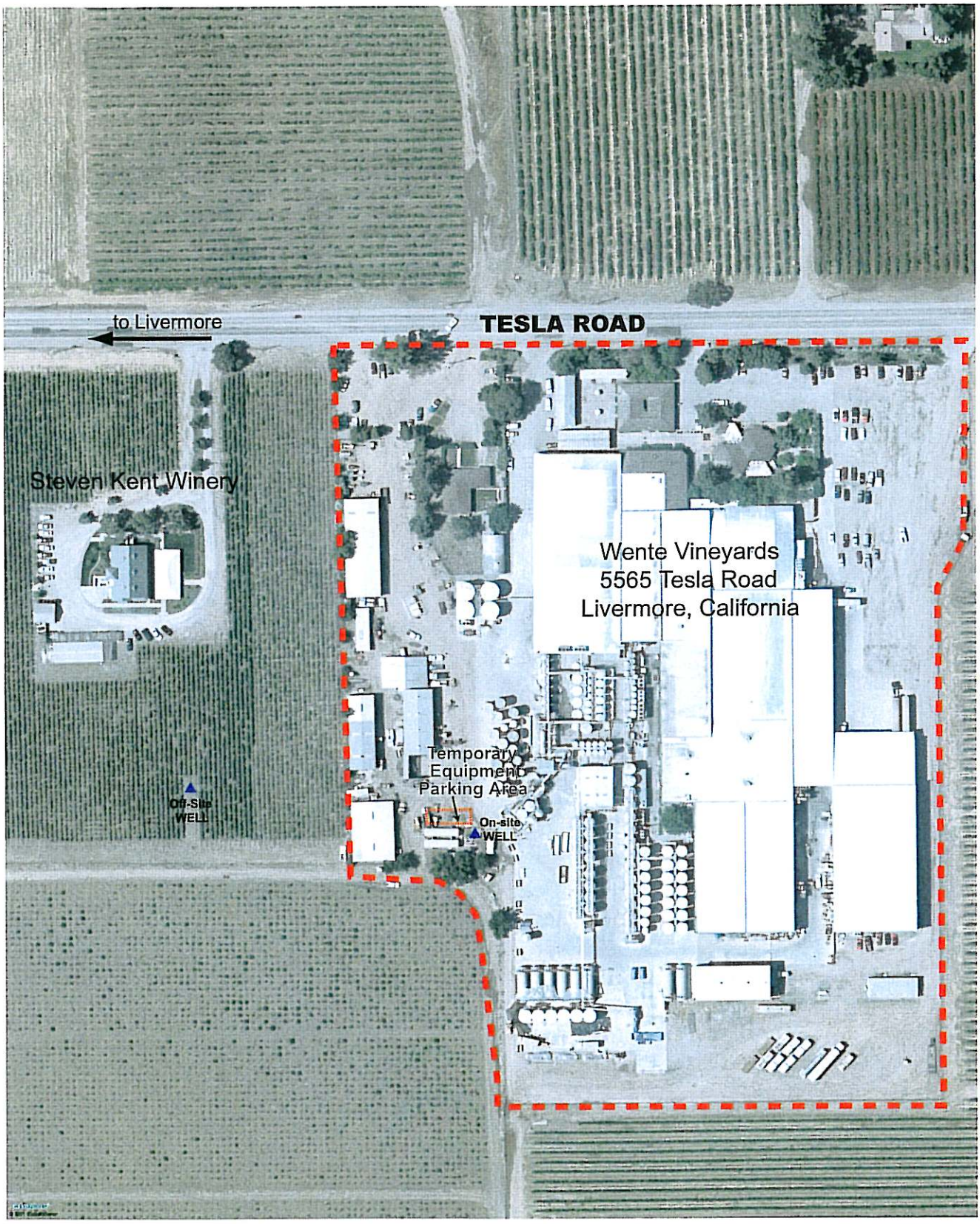
NA- Not analyzed

< Less than Laboratory Reporting Limit

* Kearney Foundation Special Report

NA- Not aplicable

Figures



N

approximate scale in feet

0 80 160

Figure 1: Site vicinity map.

SOMA
ENVIRONMENTAL ENGINEERING, INC.
SAN RAMON CA (925) 244 6600

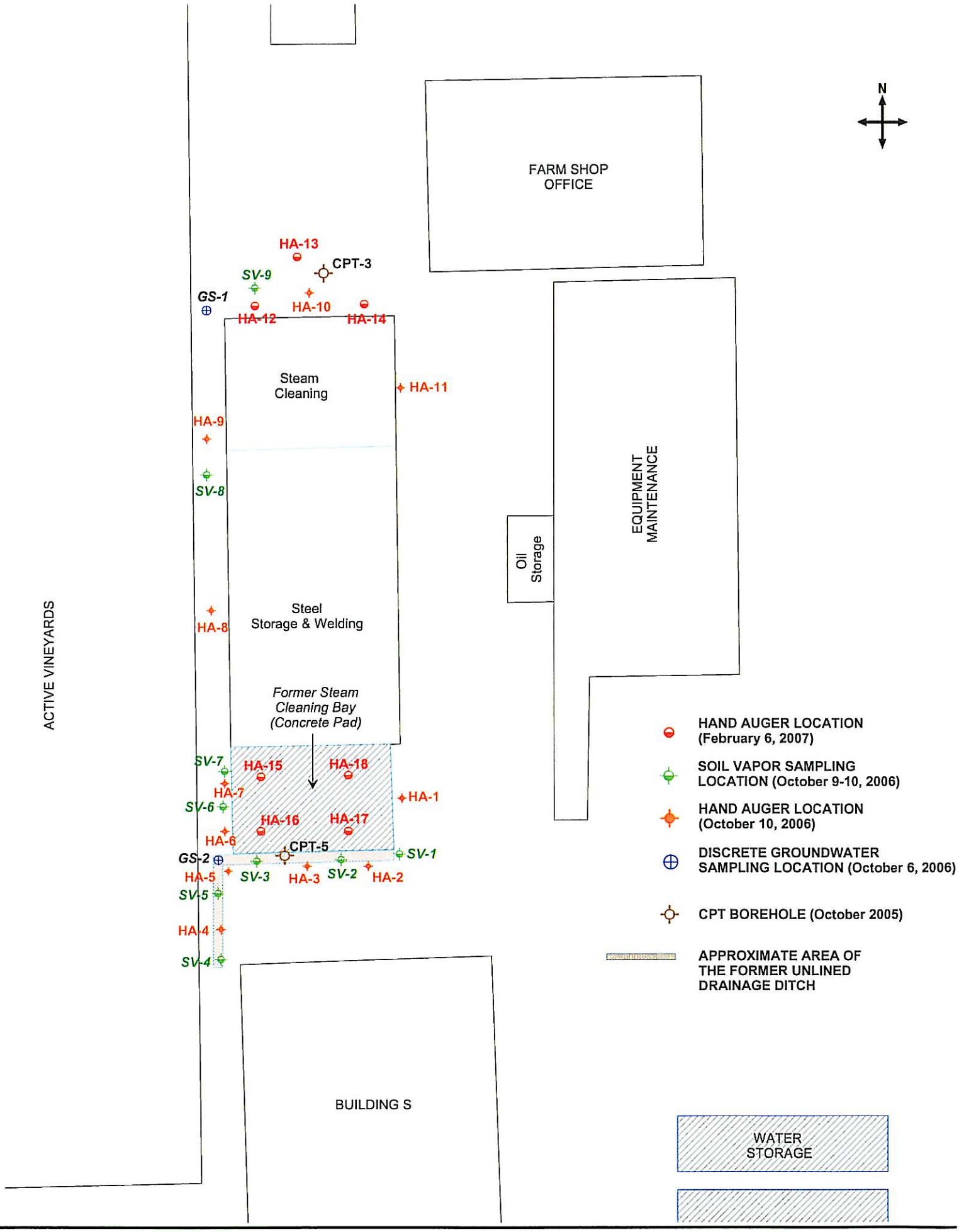


Figure 2: Site Map Showing Locations of Hand Auger, Soil Vapor, and Discrete Groundwater Sampling Boreholes

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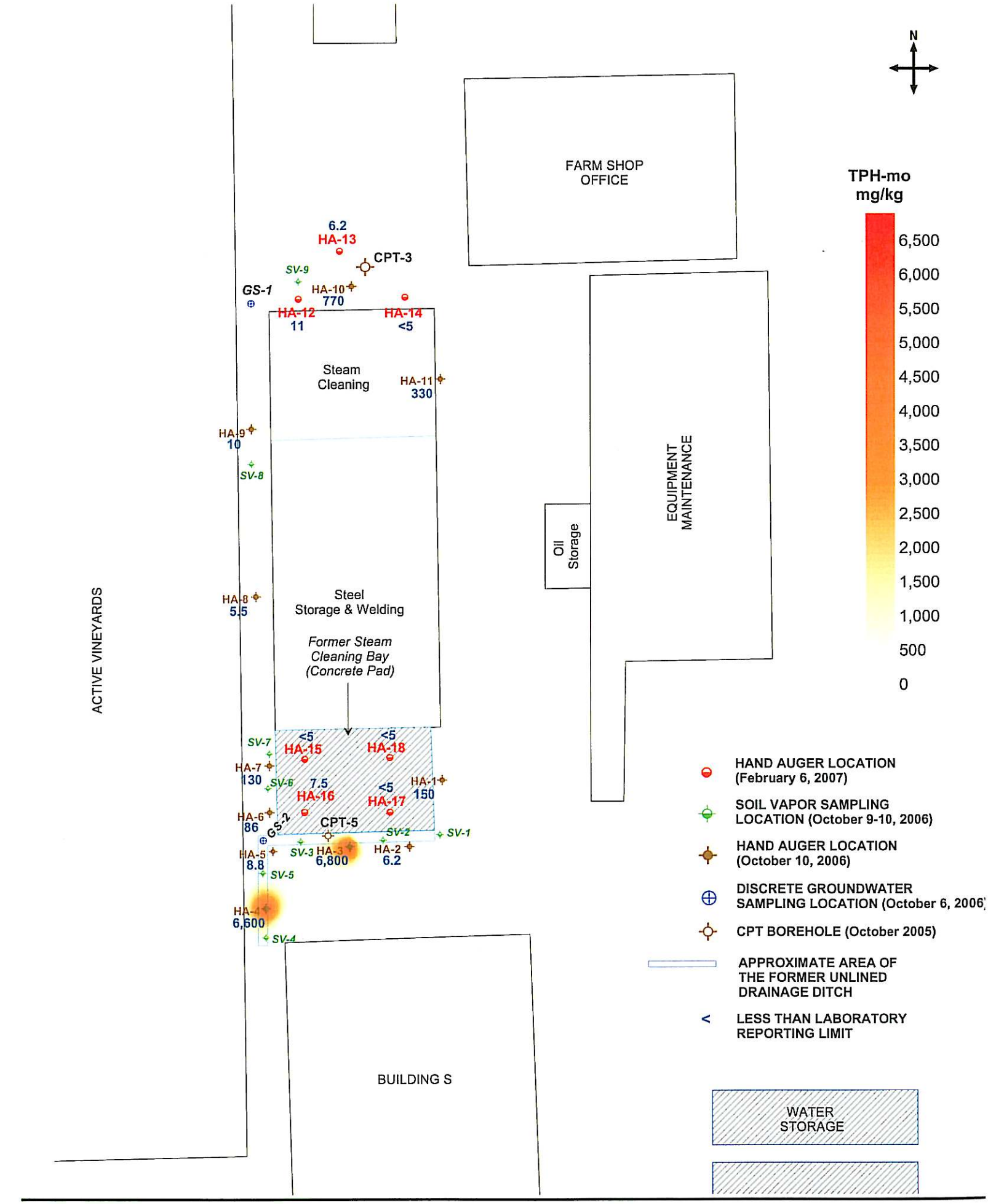

Figure 3: Contour Map Showing Soil Concentration of TPH-mo at 1- to 1.5' bgs

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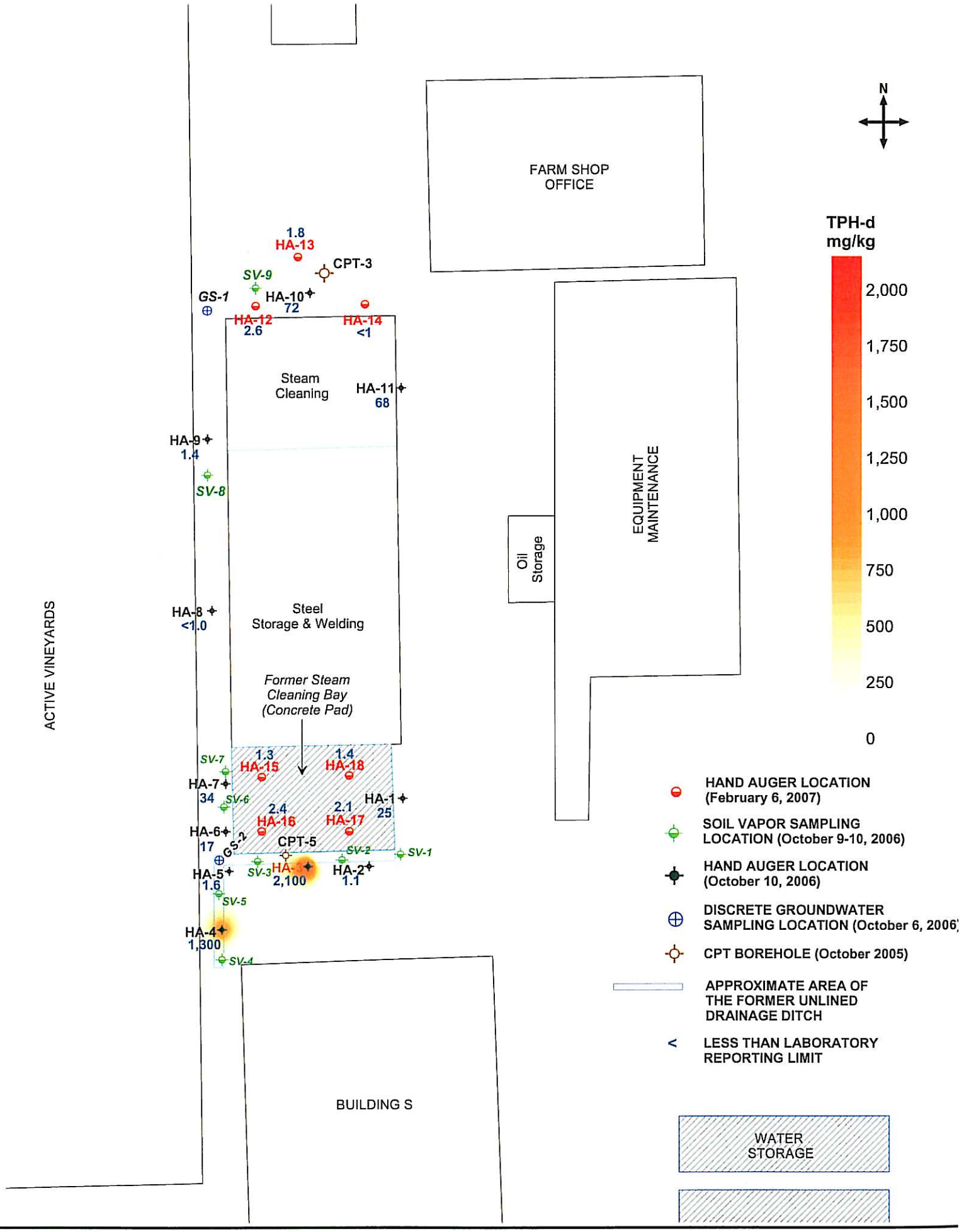

Figure 4: Contour Map Showing Soil Concentration of TPH-d at 1- to 1.5' bgs

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Element	ESL (Commercial/Industrial)	ESL (Residential)	Ambient Levels
Cadmium	7.4	1.7	NA
Chromium	58	58	73
Cobalt	10	10	15.9
Lead	750	150	NA
Nickel	150	150	NA

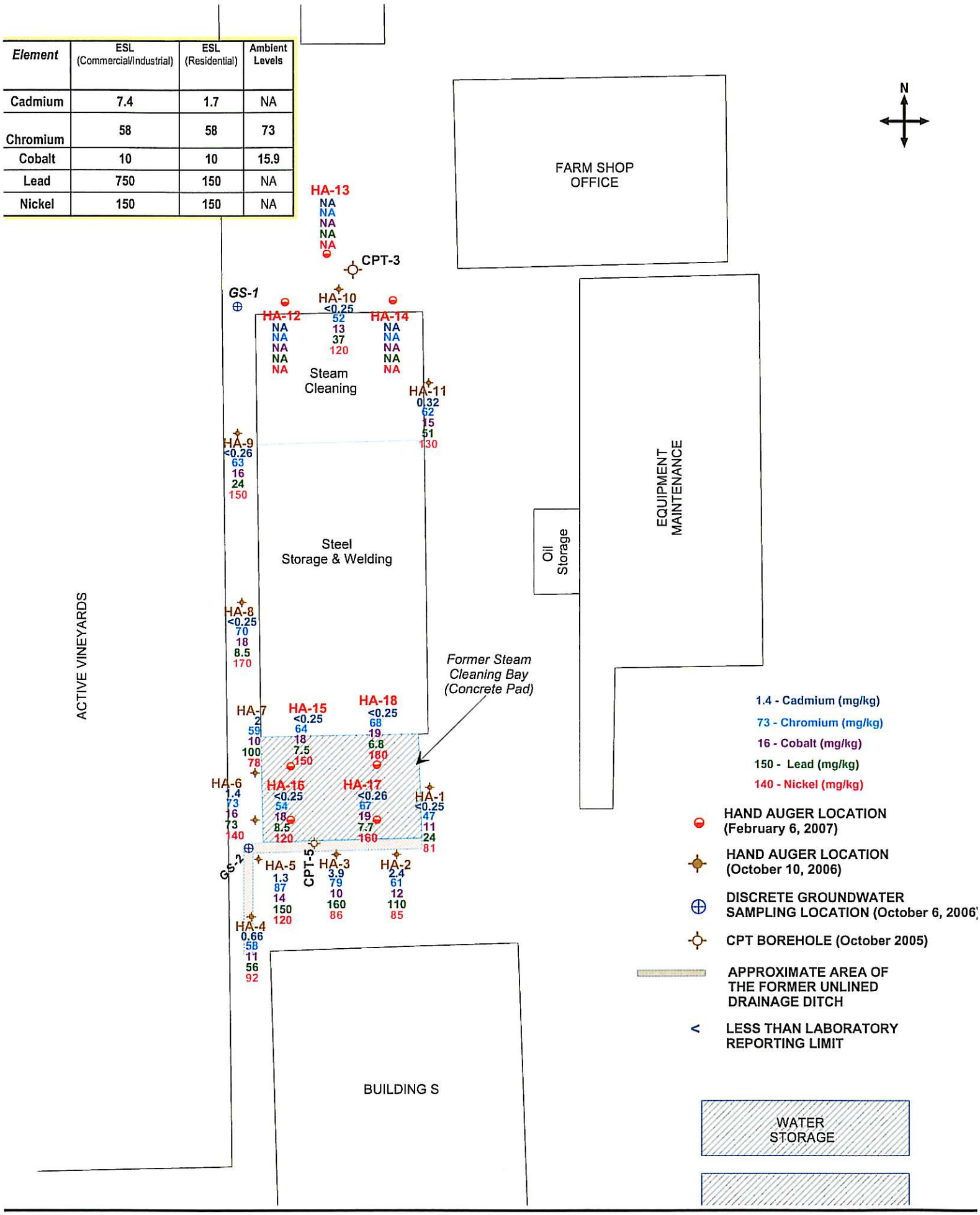


Figure 5: Map Showing Soil Concentration of Metals at 1- to 1.5' bgs

SOMA ENVIRONMENTAL ENGINEERING, INC. SAN RAMON CA (925) 344 6000

Element	ESL (Commercial/Industrial)	ESL (Residential)	Ambient Levels
Cadmium	7.4	1.7	NA
Chromium	58	58	73
Cobalt	10	10	15.9
Lead	750	150	NA
Nickel	150	150	NA

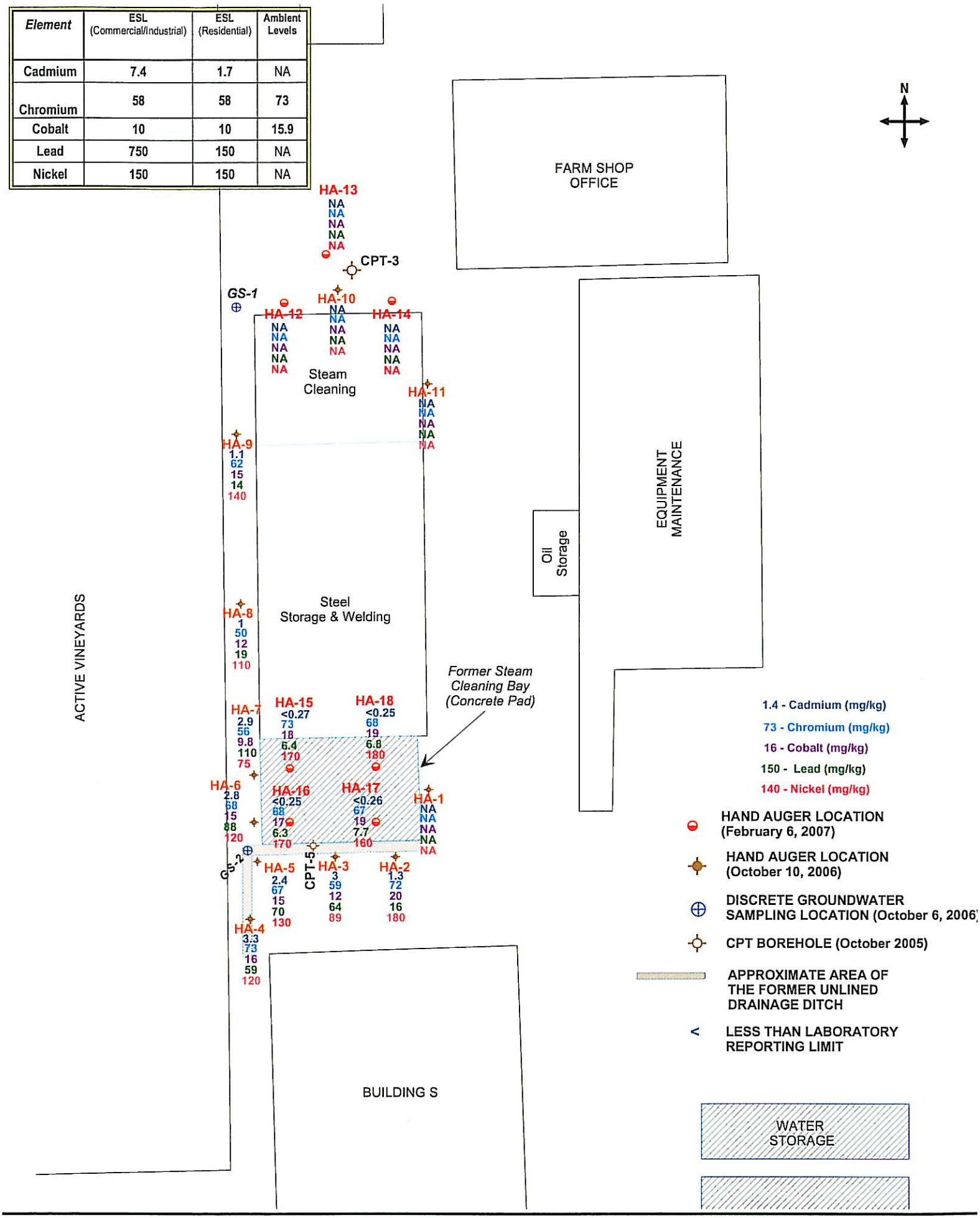
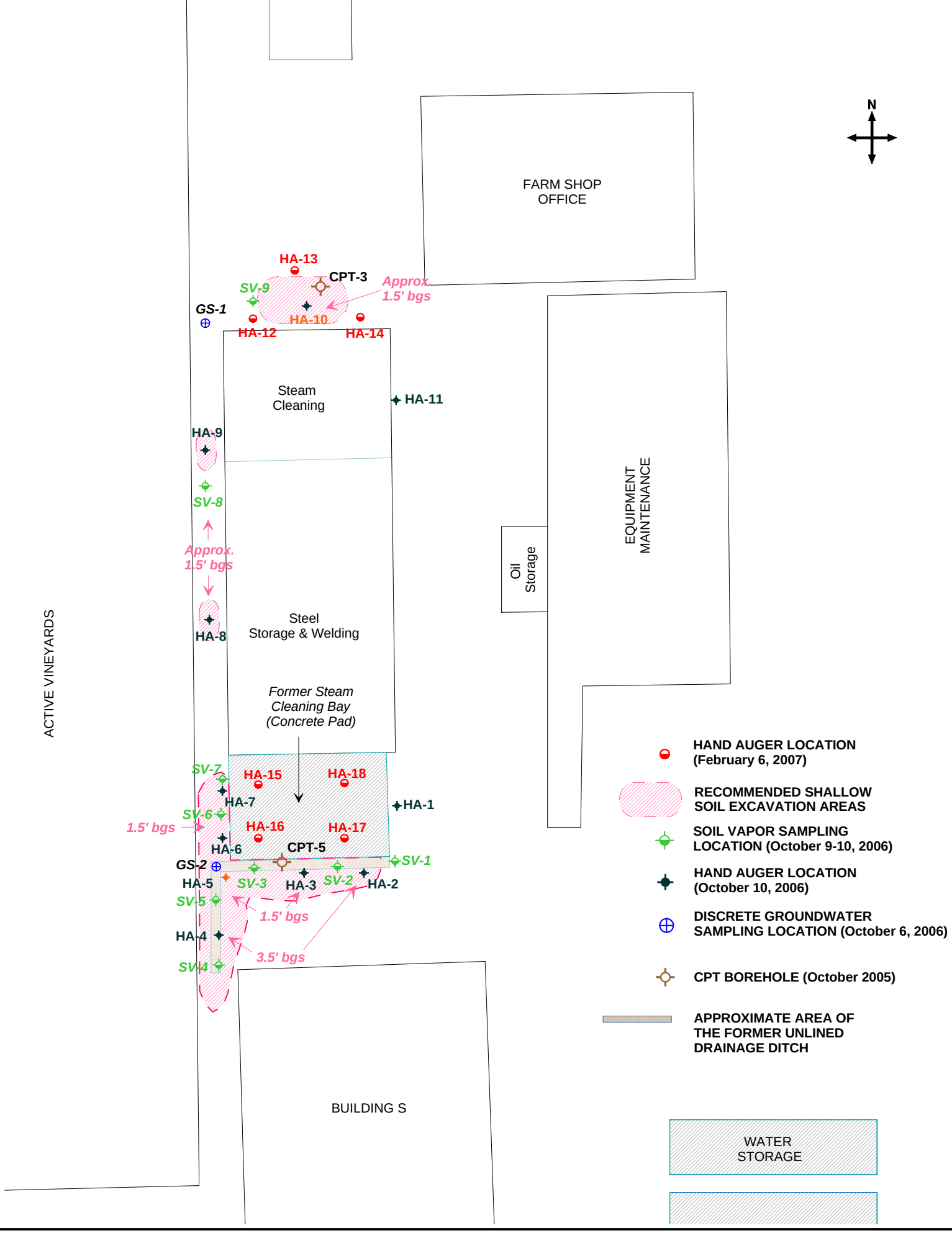


Figure 6: Contour Map Showing Soil Concentration of Metals at 3- to 3.5' bgs

SOMA ENVIRONMENTAL ENGINEERING, INC. SAN RAMON CA (925) 344 6600



approximate scale in feet

0 20 40

Figure 7: Recommended Shallow Soil Excavation Areas

SOMA
ENVIRONMENTAL ENGINEERING, INC.
SAN RAMON CA (925) 244 6600

Appendix A

Drilling Permits

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

100 NORTH CANYONS PARKWAY, LIVERMORE, CA 94551-9486 PHONE (925) 454-5000

January 30, 2007

Mr. Matt Spielmann
SOMA Environmental Engineering
6620 Owens Drive, Suite A
Pleasanton, CA 94588-3334

Dear Mr. Spielmann:

Enclosed is drilling permit 27025 for a contamination investigation at 5565 Tesla Road in Livermore for Wente Winery. Also enclosed is a current drilling permit application for your files. Drilling permit applications for future projects can also be downloaded from our web site at www.zone7water.com.

Please note that permit conditions A-2 and G requires that a report be submitted after completion of the work. The report should include drilling and completion logs, location sketch, permit number and any analysis of the soil and water samples. Please submit the original of your completion report. We will forward your submittal to the California Department of Water Resources.

If you have any questions, please contact me at extension 5056 or Matt Katen at extension 5071.

Sincerely,

Wyman Hong

Wyman Hong
Water Resources Specialist

Enc.

ZONE 7 WATER AGENCY

100 NORTH CANYONS PARKWAY, LIVERMORE, CALIFORNIA 94551 VOICE (925) 454-5000 FAX (925) 454-5728

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 5565 Tesla Road
Livermore, Ca. 94550

California Coordinates Source _____ ft. Accuracy _____ ft.
CCN _____ ft. CCE _____ ft.
APN 99-850-2-2

CLIENT
Name Avis Kvivuetz
Address 5565 Tesla Road Phone (925) 456-2300
City Livermore Zip 94550

APPLICANT
Name Soma Environmental Engineering
Fax (925) 734-6401
Address 6620 Owens Drive 1A Phone (925) 734-6400
City Pleasanton Zip 94558

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	••	General	••
Water Supply	••	Contamination	X
Monitoring	••	Well Destruction	••

PROPOSED WELL USE

New Domestic	••	Irrigation	••
Municipal	••	Remediation	••
Industrial	••	Groundwater Monitoring	••
Dewatering	••	Other	••••

DRILLING METHOD:

Mud Rotary	••	Air Rotary	••	Hollow Stem Auger	••
Cable Tool	••	Direct Push	X	Other	••••

DRILLING COMPANY Vironex Environmental Field Services
DRILLER'S LICENSE NO. 705927

WELL PROJECTS
Drill Hole Diameter _____ in. Maximum
Casing Diameter _____ in. Depth _____ ft.
Surface Seal Depth _____ ft. Number _____

SOIL BORINGS
Number of Borings 7 Maximum
Hole Diameter _____ in. Depth 5 ft.

ESTIMATED STARTING DATE 2/5/07
ESTIMATED COMPLETION DATE 2/5/07

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.
APPLICANT'S SIGNATURE _____ Date 1/19/07
Matt Spielmann

ATTACH SITE PLAN OR SKETCH

PERMIT NUMBER 27025
WELL NUMBER _____
APN 099-0850-002-02

PERMIT CONDITIONS

(Circled Permit Requirements Apply)

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.
3. An access port at least 0.5 inches in diameter is required on the wellhead for water level measurements.
4. A sample port is required on the discharge pipe near the wellhead.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

(D.) GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

E. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

F. WELL DESTRUCTION. See attached.

(G.) SPECIAL CONDITIONS. Submit to Zone 7 within 60 days after the completion of permitted work the well installation report including all soil and water laboratory analysis results.

Approved Wyman Hong Date 1/30/07
Wyman Hong

Revised: April 27, 2005

Appendix B

Background Concentrations of Trace and Major Elements

KEARNEY FOUNDATION SPECIAL REPORT

Background Concentrations of Trace and Major Elements in California Soils

KEARNEY FOUNDATION OF SOIL SCIENCE
DIVISION OF AGRICULTURE AND NATURAL RESOURCES
UNIVERSITY OF CALIFORNIA

MARCH 1996

Table of Contents:

Figure 2. Distribution frequency of elements in California benchmark soils graphs available as Adobe Acrobat files at
http://envisci.ucr.edu/faculty/acchang/kearney/Kearney_text.htm

Editor: Deborah Silva
Design: UCR Publications
Graphics: Peggy Resketo, Department of Environmental Sciences, UCR
UCR Publications
Printing: UCR Printing & Reprographics

Contact: Dr. Andrew C. Chang, Department of Environmental Sciences
University of CA, Riverside, CA 92521

Background Concentrations of Trace and Major Elements in California Soils

G. R. Bradford[1], A. C. Chang[1], A. L. Page[1], D. Bakhtar[1], J. A. Frampton[2], and H. Wright[1]

[1]*Department of Soil and Environmental Sciences, University of California, Riverside*
[2]*Department of Toxic Substances Control, California Environmental Protection Agency, Sacramento, CA*

Summary

The first comprehensive, scientific database on background concentrations of trace and major elements in California soils has been developed. Background total concentrations of 46 trace and major elements have been determined in 50 benchmark soils selected from throughout the state. The authors have received numerous requests from industries and public agencies to disseminate this information because it is necessary for environmental monitoring, remediation of contaminated soils, land use planning, and ecological evaluations. Reliable, comprehensive information about background levels of trace and major elements in California soils wilt facilitate accurate interpretations of experimental and field data and wilt facilitate scientifically defensible decisions by industries and policy makers.

Dissolution of soil samples with $HN0_3$-HCI-HF was followed by analysis with inductively coupled plasma optical emission spectrometry (ICP-OES) and mass spectrometry (lCP-MS). Statistical analyses of the data show that background concentrations of the elements vary by a factor of 3 to 150 times. Ranges in concentrations compare favorably with values reported in the scientific literature. Most elements show distinctly positively-skewed frequency distributions or concentrations less than median values. Highly significant ($p < 0.01$) positive correlation coefficients occur between several elements: Ce-La (r=0.96), Ni-Cr (r=0.95), Fe-V (r=0.92), Fe-Sc (r=0.92), Mo-U (r=0.82), V-Sc (r=0.86), Cu-Co (r=0.81), Co-Mg (r=0.63), Ni-Mg (r=0.71), Cr-Mg (r=0.65). These results suggest that chemical and physical factors control element associations in parent material and soil forming processes and that chemical and physical factors may be important in the distribution of elements in the soil. Coefficients of variation are greatest for Ag, Cr, Mo, Ni, Se, and W, and least for Zn, Al and Si.

This database is essential to systematic, accurate assessments of anthropogenic and natural causes of elevated trace element concentrations and should be particularly useful to industries attempting to monitor their own effects on trace element levels in soils and to public agencies charged with assessing the severity of trace element pollution problems.

Introduction

The term "trace element" is rather loosely used in the scientific literature to designate a number of elements that occur in natural systems in small concentrations (Page, 1974). As defined in many dictionaries, trace elements are those chemical elements, especially metals, used by organisms in minute quantities but believed essential to their physiology. However, the term is and has been used to designate elements with no known physiological function which, when present in sufficient concentrations, may be toxic to living systems.

Other terms that have been used, and which for all practical purposes can be considered synonyms for the term "trace elements," are "trace metals", "trace inorganics", "heavy metals", "micronutrients", and "microelements". The use of the term "micronutrient" usually has been restricted to those trace elements known to be essential for the growth of higher plants, e.g., Cu, Zn, Mo, B, Mn, Fe, CI, and Ni (Asher, 1991).The use of the term "heavy metals" in the scientific literature is usually, but not always, restricted to those metals that have densities greater than 5.0 g cm^{-3}. Trace elements are defined herein as those elements having less than 0.1 % average abundance in the earth's crust (Mitchell, 1964). Using this definition the elements AI, Ca, Fe, Mg, K, Na, Si and Ti are considered "major" elements in this manuscript.

Trace elements are ubiquitous in the earth's crust. Their natural levels in soil vary widely, depending largely on the nature of parent materials from which soils form and also on soil-forming processes (Adriano, 1986; Kubota, 1981; Lund et al., 1981; Heil and Mahmoud, 1978). Natural distribution patterns of trace elements in soil have been affected by a variety of anthropogenic activities, including mining, smelting, agriculture, energy generation, manufacturing, waste disposal, and transportation (Adriano, 1986; Munro, 1983; Page, 1974). Industrial effects are relatively well-documented and may be either largely concentrated on-site (e.g., mine tailings) or dispersed over large areas (e.g., stack emissions).

Adriano (1986) identified two major routes for input of trace elements into agro-ecosystems: aerial (e.g., aerosols, particulate matter, resuspended and airborne dusts, etc.), and land (fertilizers, pesticides, solid wastes, other soil amendments, etc.). The output pathways can be represented primarily by losses through plant tissue removal for food, feedstuff, and fiber, and by leaching and erosion. Both input and output fluxes are constancy changing whether soils are in agricultural production or not; therefore, the background concentrations of trace elements in soils are probably not significantly altered by short-term agricultural use. Harmason and de Haan (1980) calculated that it would take three centuries of phosphate fertilization at 100 kg P_2O_5 per hectare per year to enrich the top 20 cm of soil by 1 mg/kg U, if the P_2O_5 fertilizer contained 100 mg/kg U.

Most management activities that affect soil trace elements are very poorly documented; therefore, it is usually difficult or impossible to determine the anthropogenic influences on any specific site. Compounding this problem is a general lack of background data on natural trace element distribution patterns in soils.

Shacklette and Boemgen (1984) published results of an extensive sampling (1,218 samples) and analyses (35+ elements) in surficial materials in the United States as a whole. The samples were collected by U.S. Geological Survey personnel along their travel routes to other field studies or within their project areas. A sample site was selected about every 50 miles. Cultivated fields were included and congested areas avoided. They concluded that sampling to a depth of 20 cm may have avoided the effects of surface contamination. No gross contamination of samples was expected by a variety of methods. About 74 samples were collected in California.

When environmental problems related to high trace element levels in soils or groundwater are discovered, there has been a tendency for the public to blame the most visible industry first without proper technical assessment of other possible anthropogenic or natural causes (Letey et al., 1986).

By providing the first comprehensive, scientific database on background concentrations of trace and major elements in benchmark California soils, this study addresses serious shortcomings in assessment technology, to date. Previously, comparative data were not available because information compiled from different sources was incomplete and the methodologies used for soil sampling and analysis were incompatible. The results reported herein are the first cohesive data set available on background levels of trace and major elements in California. Such a database is essential to any systematic, accurate assessment of anthropogenic effects and natural causes of elevated or reduced levels of trace and major elements in California.

Materials and Methods

Sample Collection

Benchmark soil series sample locations for this study were selected from an extensive file of soil profile sample locations in the Department of Soils and Plant Nutrition, University of California; Berkeley (now known as the Department of Environmental Science, Policy and Management). These samples were accumulated by cooperative efforts of the University of California Division of Agriculture and Natural Resources and the U.S. Department of Agriculture soil survey teams during more than 50 years of soil survey work in California. A detailed discussion of the series is given by Stone and Weir (1953). R. J. Arkley, University of California, Berkeley, selected the 22 series for this and earlier studies (Bradford et al., 1967, 1971) as most representative of California soils. The series concept has changed since 1953, so current designations may be different. Contemporary methods have been used to determine total and

water-soluble elements in soil profile samples from the Berkeley file and from separate collections in past studies (Bradford et al., 1967, 1971).

The 50 benchmark soil samples representing 22 soil series analyzed for this report were collected in 1967 (Bradford et al., 1967). The sampling sites (selected from the Berkeley file) were mostly from agricultural fields distant from known point sources of contamination; therefore, the trace element concentrations should be representative of background levels.

A 20-gallon soil sample was collected from the surface to 50 cm depth, excluding the organic debris at the surface. The soil was shoveled from the site onto a 10-mesh plastic fabric screen and sieved to exclude large rocks, etc. A plastic screen was used to avoid metallic contamination. The soil samples were air-dried, mixed and stored in 20-gallon plastic containers.

Soil series and their locations (longitude, latitude and county) are presented in Tables 1 A and 1 B. Soil family designations are not listed because of changes since 1953. Locations are also shown on a California map (Fig. 1). The authors emphasize that by identifying the soil samples as to a series designation in no way implies an attempt to correlate element concentrations within a series. Two or three samples of each series are too few to make such a study feasible. Furthermore, Bradford et al. (1967) concluded from a more extensive analysis of soil horizons from many of the same series studied in this report that there was no marked association of total essential trace element content with the series designation.

Sample Analyses

A 10-g subsample was ground with an agate mortar and pestle to pass a 60-mesh plastic screen. A 1-g portion was weighed into a 50-ml Teflon screw-cap centrifuge tube and treated with $HN0_3$, repeated portions of 6 N HCI and then dilute HF. Replicate analyses were not considered necessary because of low standard deviation values reported for 4 replicate analyses by the method used (Bakhtar et al., 1989). One in 500 (weight/volume) dilutions were analyzed with inductively coupled plasma optical emission spectrometry (ICP-OES) and mass spectrometry (ICP-MS). To avoid interferences from polyatomic chloride complexes in ICP-MS analyses, aliquots of dissolved sample solution in HCI were evaporated to dryness at a low temperature followed by redissolution in 1% $HN0_3$. Analyses were made with a VG Plasma Quad by following the manufacturer's recommended procedure with multielement calibration and scan acquisition of data.

In most cases, low concentration elements in the high atomic mass range were measured with ICP-MS and high-concentration elements in the low atomic mass range were measured with ICP-OES to minimize interferences. Gray (1986) estimated detection limits for multielement analyses using ICP-MS as shown in Table 2. Methods

used for each element are shown in Table 3. Concentrations in Table 2 were set equal to one-half the detection limit in samples containing less than detectable levels of an element to permit statistical analyses (Gilbert, 1987).

Estimated detection limit for ICP-OES analyses is defined in this study as the concentration equivalent to a signal due to the analyte which is equal to three times the standard deviation of a series of 10 replicate measurements of a zero calibration blank.

Results and Discussion

Levels of trace elements in benchmark soils are the result of a combination of complex factors, including soil parent material, topography, climate, vegetation, management and time. High Cd has been identified with certain coastal marine sediments (Lund et al., 1981). High levels of oxyanions of U, V and Mo have been identified with evaporates in soils of the west side of the San Joaquin Valley and probably originate from West Side alluvial deposits (Bradford et al., 1990).

Table 2 shows total concentrations of 46 elements in each of 50 benchmark soils from California. Table 2 also lists the ranges in concentration for each element. Precision and accuracy are discussed in a published report of the method used (Bakhtar et al., 1989). In general, background elemental concentrations for these soils vary by factors ranging from about 150 times (P, W), about 80 times (B and Mo), about 60 times (Cr, Ni), about 15 times (Co), about 5 times (Pb, V) to about 3 times (Al, Ga, Zn). Summary statistics, which include the coefficients of variation (CV) for each element, are listed in Table 3. Coefficients of variation are greatest for Ag, Cr, Mo, Ni, Se, and W, and least for Zn, Al and Si. Ranges in concentrations compare favorably with those reported by Shacklette and Boerngen (1984), Kabata-Pendias and Pendias (1992) and Rose et al. (1979).

Correlation coefficients shown in Table 4 are significant at the probability level of 0.01. Examples of elements with high r values are Ce-La ($r = 0.96$), Ni-Cr ($r = 0.95$), FeV ($r = 0.92$), Fe-Sc ($r = 0.92$), Mo-U ($r = 0.82$), V-Sc ($r = 0.86$), Cu-Co ($r = 0.81$), Co-Mg ($r=0.63$), Ni-Mg ($r=0.71$), Cr-Mg ($r=0.65$). These high r values suggest that chemical and physical factors control element associations in parent material and soil forming processes. Data from analyses of other soil profile and topographic sequence samples from California also showed high r values between Ni-Cr, V-Sc, and Cu-Co (Marrett et al., 1992). The only significant negative r values observed were between Co-Th ($r=0.39$) and V-Th ($r=-0.37$).

Both our data and that from Shacklette and Boerngen (1984) show that samples from northern California often contain higher concentrations of Cr, Co, Cu, Ni, Fe and V compared to samples from southern California. An examination of a Geologic Map of California (Jennings, 1977) shows a predominance of volcanic and ultramafic

rocks in northern California. Isolated areas of ultramafic rocks are also shown east of Porterville and in the Idria area to the west of the San Joaquin Valley. Ultramafic rocks are mostly serpentine, a magnesium silicate with associated Ni, Cr, etc. (Jennings, 1977). Soils formed from ultramafic parent material would likely show high r values between Mg and Ni and Cr as shown in Table 4. High concentrations of Cr, Co, Cu, Ni, Fe and V in northern California soils probably originate from high levels of these elements in the ultramafic and volcanic rocks in the area. Note that the concentrations of Ni, Cr, and Mg (Table 2) tend to be elevated in soil sample nos. 25 (Porterville area) and 48 (east of Idria).

Soil samples within a series (Table 2) most often show diverse concentrations of elements. Imperial clay loam samples (nos. 18, 19 and 20) are an exception. Concentration of most elements in the three samples of this series are closely grouped, suggesting thorough mixing of sediment imported by the Colorado River.

The above results emphasize the importance of parent material composition and soil forming processes on background concentrations of trace and major elements in soils. Bradford et al. (1967) observed in an earlier study that in general the distribution of trace element content of benchmark soils is reasonably consistent within groupings based on soil parent material. Frequency distributions are illustrated for each element in Fig. 2.

Moment coefficients of skewness and kurtosis express how the shapes of sample frequency distribution curves differ from ideal Gaussian (normal) curves. Skewness refers to asymmetry of the upper and lower halves of the curve around the mean. Kurtosis refers to deviations towards unusual flatness or pointedness of the curve peak. Perfect Gaussian (normal) curves have moment coefficients of skewness and kurtosis of 0 and 3, respectively. Log transformations (calculated but not shown) generally improve the data for most trace elements by helping to correct positive skew and stabilizing variance (which is proportional to the mean in untransformed data).

Analyses and reports were created by SAS software. Univariate statistics are summarized in Table 3. Distributions for each element were tested for normality using the W test (Shapiro and Wilk, 1965). Results of the W test for both untransformed and natural log-transformed data are given in Table 3. The W test produces a statistic for the null hypothesis such that the input data values are a random sample from a normal distribution. W must be greater than zero and less than or equal to one, with small values of W leading to rejection of the null hypothesis. The probability for testing the hypothesis that the data come from a normal distribution is given as PROB < W.

The hypothesis of normality (null hypothesis) is rejected at the a significance level if W is less than the a quartile, where, for example, the a quartile is 0.974 for a = 0.50 and n = 50. The significance level of a = 0.50 is the accepted level for testing the

hypothesis of normality (Shapiro and Wilk, 1965). Tests for skewness, kurtosis, the W test and the related probability are also shown for the untransformed data in Fig. 2.

High concentrations of B, Mo and U observed in sample number 8, a Fresno Series from the Tulare Lake bed, led us to prepare and analyze a one-to-one soil-to-water extract. The water extract was high in Na (7,000 mg/L) and alkalinity (47.6 meq/L), and low in Ca and Mg. These chemical parameters favor high solubility of the oxyanions (Drever, 1988). Oxyanion analyses of sample number 8 showed P (21 mg/L), B (15 mg/L), V (8 mg/L), Mo (9 mg/L), U (1.8 mg/L) and As (1.8 mg/L). These high water-soluble concentrations of several toxic elements emphasize the importance of analyzing water extracts of soils in addition to total analyses for full and complete assessment of trace element impacts on the environment.

The principal objective of this study, to determine background concentrations of trace and major elements in benchmark soils from California, has been accomplished. Parent material and soil forming processes have a major effect on the chemical composition of soils. The data may have application to the identification of areas suspected of essential element deficiencies and/or trace element toxicity for plant growth and may also be useful in soil genesis studies.

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Table 1 A

Series and Location of Benchmark Soils'

Soil Series and Texture Phase	Soil No.	County	Longitude	North Latitude	Soil Taxonomy
Aiken scl	4	El Dorado	120°50'	38°39'	Clayey, oxidic, mesic, Xeric Haplohumufts
Aiken cl	5	El Dorado	120°57'	38°15'	
Aiken cl	6	Tehama	121°43'	40°26'	
Altamont cl	1	San Diego	117°13'	32°54'	Fine, montmorillonitic, thermic Typic Chromoxererts
Altamont cl	2	Glenn	122°22'	39°34'	
Altamont cl	3	Tehama	122°41'	40°14'	
Cajon fs	28	San Bernardino	117°40'	34°46'	Mixed, thermic, Typic Torripsamments
Coachella fs	7	Riverside	116°12'	33°42'	Sandy, mixed, hyperthermic Typic Torrifluvents
Fresno l	8	Kern	119°23'	35°23'	Fine-loamy, mixed, thermic Natric Durixeraffs
Fresno l	10	Merced	120°29'	37°10'	
Hanford sl	12	San Diego	116°47'	32°49'	Coarse-loamy, mixed, nonacid, thermic Typic Xerorthents
Hanford sl	11	San Joaquin	121°14'	38°11'	
Holland ls	14	El Dorado	120°41'	38°36'	Fine-loamy, mixed, mesic
Holland l	13	Fresno	119°22'	37°04'	
Holland ls	15	El Dorado	120°54'	38°49'	
Holtville sl	50	Imperial	115°23'	32°46'	Clayey over loamy, montmorillonitic (calcareous) hyperthermic Typic Torrifluvents
Hugo cl	17	Solano	122°00'	38°22'	Fine-loamy, mixed mesic dysrtic xerochrepts
Hugo cl	16	Humboldt	123°54'	40°45'	
Imperial cl	18	Imperial	115°34'	32°42'	Fine, montmorillonitic (calcareous), hyperthermic
Imperial cl	19	Riverside	114°36'	33°38'	
Imperial cl	20	Imperial	115°31'	32°56'	Vertic Torrifluvents
Kettlemen sl	21	Fresno	120°40'	36°35'	Fine-loamy, mixed (calcareous), Thermic Typic Torriorthents
Kettlemen sl	23	Fresno	120°20'	36°19'	
Kettlemen cl	22	Kern	119°22'	34°58'	

Soil Series and Texture Phase	Soil No.	County	Longitude	North Latitude	Soil Taxonomy
Lassen c	25	Tulare	119°00'	36°06'	Fine, montmorillonitic, mesic Typic Chromoxererts
Lassen c	24	Modoc	120°27'	41°32'	
Los Osos c	27	Santa Barbara	120°28'	34°35'	Fine, montmorillonitic, thermic, Typic Argixerolls
Los Osos cl	26	Lake	122°30'	38°53'	
Maymen sl	30	Lake	122°54'	39°16'	Loamy, mixed, mesic dystric Lithic Xerochrepts
Maymen sl	31	Tehama	122°41'	40°09'	
Maymen sl	29	Glenn	122°36'	39°34'	
Merced sl	9	San Joaquin	121°22'	38°05'	Fine, montmorillonitic, thermic Patchic Haploxerolls
Merced c	33	Fresno	120°12'	36°35'	
Merced cl	34	Merced	120°19'	37°28'	
Merced c	32	Kern	119°13'	35°12'	
Mojave l	36	San Bernardino	117°12'	34°32'	Not available
Mojave sl	35	San Bernardino	116°41'	34°58'	
Panoche cl	48	Fresno	Not available		Fine-loamy, mixed (calcareous), thermic Typic Torriorthents
Ramona sl	37	San Diego	116°54'	32°43'	Fine-loamy, mixed, thermic, Typic Haploxeraffs
Ramona sl	38	San Joaquin	121°13'	38°14'	
Redding cl	40	Tehama	122°12'	40°04'	Fine, mixed, thermic Abruptic Durixeralfs
Redding cl	39	Glenn	122°15'	39°41'	
San Joaquin sl	41	Merced	120°11'	37°10'	Not available
San Joaquin l	42	Tulare	119°05'	36°02'	
Venice	49	San Joaquin	121°31'	37°40'	Eric, thermic Typic Medihemists
Watsonville l	45	Santa Cruz	122°03'	36°57'	Fine, montmorillonitic, thermic Xeric Argialbolls
Watsonville l	43	Santa Barbara	120°27'	34°29'	
Watsonville l	44	Santa Cruz	121°42'	36°56'	
Yolo cl	46	Solano	121°47'	38°26'	Fine-silty, mixed, nonacid, thermic Typic Xerorthent
Yolo cl	47	Tehama	122°15'	40°03'	

[1]Table 1 A is alphabetical by soil series. Table 1 B is in numerical order by soil number.
[2]Texture phase abbreviations: l = loam, sl = sandy loam, ls = loamy sand, fs = fine sand, cl = clay loam, scl = sandy clay loam, c = clay (USDA-SCS classification scheme)

Table 1 B
Series and Location of Benchmark Soils[1]

Soil Series and Texture Phase	Soil No.	County	Longitude	North Latitude	Soil Taxonomy
Altamont cl	1	San Diego	117°13'	32°54'	Fine, montmorillonitic, thermic Typic Chromoxererts
Attamont cl	2	Glenn	122°22'	39°34'	
Alfamont cl	3	Tehama	122°41'	40°14'	
Aiken scl	4	El Dorado	120°50'	38°39'	Clayey, oxidic, mesic, Xeric HaplohumuRs
Aiken ci	5	El Dorado	120°57	38°15'	
Aiken ci	6	Tehama	121°43'	40°26'	
Coachella fs	7	Riverside	116°12'	33°42'	Sandy, mixed, hyperthermic Typic Torrifluvents
Fresno l	8	Kern	119°23'	35°23'	Fine-loamy, mixed, thermic Natric Durixeralfs
Merced sl	9	San Joaquin	121°22'	38°05'	Fine, montmorillonitic, thermic Pachic Haploxerolls
Fresno l	10	Merced	120°29'	37°10'	Fine-loamy, mixed, thermic Natric Durixeralfs
Hanford sl	11	San Joaquin	121°14'	38°11'	Coarse-loamy, mixed, nonacid, themnic Typic Xerorthents
Hardord sl	12	San Diego	116°47	32°49'	
Holland l	13	Fresno	119°22'	37°04'	Fine-loamy, mixed, mesic Ultic Haploxeralfs
Holland ls	14	El Dorado	120°41'	38°36'	
Holland ls	15	El Dorado	120°54'	38°49'	
Hugo cl	16	Humboldt	123°54'	40°45'	Fine-loamy, mixed mesic Dystric Xerochrepts
Hugo cl	17	Solano	122°00'	38°22'	
Imperial cl	18	Imperial	115°34'	32°42'	Fine, montmorillonitic (calcareous), hyperthermic
Imperial cl	19	Riverside	114°36'	33°38'	
imperial cl	20	Imperial	115°31'	32°56'	Vertic Torrifluvents
Kettlemen sl	21	Fresno	120°40'	36°35'	Fine-loamy, mixed (calcareous), thermic Typic Torriorthents
Kettlemen cl	22	Kern	119°22'	34°58'	
Kettlemen sl	23	Fresno	120°20'	36°19'	
Lassen c	24	Modoc	120°27	41°32'	Fine, montmorillonitic, mesic Typic Chromoxererts
Lassen c	25	Tulare	119°00'	36°06'	
Los Osos cl	26	Lake	122°30'	38°53'	Fine, montmorillonitic, thermic, Typic Argixerolls
Los Osos c	27	Santa Barbara	120°28'	34°35'	
Cajon fs	28	San Bernardino	117°40'	34°46'	Mixed, thermic, Typic Torripsamments
Maymen sl	29	Glenn	122°36'	39°34'	Loamy, mixed, mesic Dystric Lithic Xerochrepts
Maymen sl	30	Lake	122°54'	39°16'	
Maymen sl	31	Tehama	122°41'	40°09'	

Merced c	32	Kern	119°13'	35°12'	Fine, montmoriilonitic, thermic Pachic Haploxerolls
Merced c	33	Fresno	120°12'	36°35'	
Merced cl	34	Merced	120°19'	37°28'	
Mojave sl	35	San Bernardino	116°41'	34°58'	Fine-loamy, mixed, thermic Typic Haplargids
Mojave l	36	San Bernardino	117°12'	34°32	
Ramona sl	37	San Diego	116°54'	32°43'	Fine-loamy, mixed, thermic, Typic Haploxeraffs
Ramona sl	38	San Joaquin	121°13'	38°14'	
Redding cl	39	Glenn	122°15'	39°41'	Fine, mixed, thermic Abruptic Durixeralfs
Redding cl	40	Tehama	122°12'	40°04'	
San Joaquin sl	41	Merced	120°11'	37°10'	Fine, mixed, thermic Abruptic Durixeraffs
San Joaquin l	42	Tulare	119°05'	36°02'	
Watsonville l	43	Santa Barbara	120°27'	34°29'	Fine, montmorillonitic, thermic Xeric Argialbolls
Watsonville l	44	Santa Cruz	121°42'	36°56'	
Watsonville l	45	Santa Cruz	122°03'	36°57'	
Yolo cl	46	Solano	121°47'	38°26'	Fine-silty, mixed, nonacid, thermic Typic Xerorthent
Yolo cl	47	Tehama	122°15'	40°03'	
Panoche cl	48	Fresno	Not available		Fine-loamy, mixed (calcareous), thermic Typic Torriorthents
Venice	49	San Joaquin	121°31'	37°40'	Eric, thermic Typic Medihemists
Holtville sl	50	Imperial	115°23'	32°46'	Clayey over loamy, montmorillonitic (calcareous) hyperthermic Typic Torrifluvents

[1]Table 1 B is in numerical order by soil number. Table 1 A is alphabetical by soil series. [2]Texture phase abbreviations: I = loam, sl = sandy loam, Is = loamy sand, fs = fine sand, cl = clay loam, scl = sandy clay loam, c = clay (USDA-SCS classification scheme)

Table 2
Total Concentrations of Elements in Benchmark Soils

Soil No.	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr
	Mg/Kg	%	----------	----------	----------	----------	Mg/Kg	----------	----------	----------	----------	----------
1	0.21	8.3	11.0	23	738	2.19	0.80	7360	0.11	305	8.8	36
2	0.37	8.1	8.3	17	654	1.20	0.38	5680	0.18	138	15.0	47
3	0.27	9.9	8.0	45	764	1.90	0.42	6948	0.44	121	24.1	110
4	0.37	9.7	3.9	16	659	1.90	0.25	6758	0.25	177	34.8	115
5	0.22	7.1	3.9	7	438	1.90	0.27	3782	0.95	217	38.8	242
6	0.22	9.6	1.2	1	260	1.10	0.24	6795	0.19	94	13.1	45
7	0.12	6.3	1.2	2	533	0.80	0.21	25090	0.16	292	6.9	35
8	0.28	7.6	4.2	74	526	1.25	0.39	22035	0.52	213	9.3	42
9	0.41	6.6	0.8	5	379	0.64	0.37	9587	0.05	161	4.3	26
10	0.80	6.3	1.1	13	517	1.38	0.29	17967	0.40	141	7.1	89
11	0.52	9.0	1.2	4	472	1.51	0.33	11081	0.31	184	7.6	27
12	4.30	8.3	0.6	10	250	0.60	0.24	24524	0.13	122	15.8	29
13	0.40	9.5	2.1	2	625	1.53	0.20	8592	0.36	208	10.8	26
14	3.30	8.7	6.9	34	358	1.43	0.34	16494	0.36	167	22.7	108
15	0.48	7.6	1.2	19	258	1.45	0.19	16658	0.56	85	18.3	107
16	0.42	6.8	5.7	27	375	1.70	0.39	2903	0.15	133	29.9	214
17	2.60	8.0	9.6	26	796	0.93	0.37	6488	0.20	173	15.9	73
18	0.16	6.4	5.2	36	371	1.48	0.45	36400	0.58	189	11.3	40
19	0.37	6.7	4.7	44	392	2.26	0.52	45577	0.43	216	10.0	52
20	0.43	5.9	5.4	33	385	1.76	0.41	41649	0.62	188	8.3	45
21	0.55	6.1	1.8	28	1400	1.14	0.34	15295	0.30	140	10.1	86
22	0.34	6.8	4.0	19	556	0.77	0.25	8243	1.70	115	8.1	50
23	8.30	6.9	4.4	19	677	0.83	0.31	20015	1.00	147	11.9	129
24	0.49	9.9	1.4	4	403	1.78	0.29	17812	1.10	154	26.6	92
25	0.18	8.5	1.7	5	248	0.66	0.28	24070	0.29	119	46.9	1579
26	0.22	10.6	1.4	3	525	1.17	0.33	9408	0.05	127	14.5	51
27	0.44	8.8	4.5	25	720	2.70	0.65	4559	0.44	240	14.2	102
28	0.28	5.8	1.0	5	576	0.68	0.60	15054	0.32	214	11.6	67
29	0.42	8.0	6.3	46	434	1.84	0.39	2777	0.31	153	26.4	181

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr
	Mg/Kg	%	Mg/Kg									
30	0.16	7.1	3.2	16	461	1.49	0.39	2451	0.13	107	12.9	70
31	3.80	7.7	6.8	30	440	1.47	0.30	2495	0.16	141	26.0	190
32	0.39	7.8	6.7	44	493	1.75	0.52	24853	0.14	234	8.7	38
33	0.27	8.3	3.9	26	552	1.45	0.58	11610	0.14	173	11.6	88
34	0.40	8.4	2.1	20	684	1.51	0.37	16160	0.05	158	16.0	68
35	0.12	6.9	3.8	11	571	1.10	0.39	16311	0.05	243	8.7	23
36	0.16	4.0	2.4	9	710	1.91	0.38	11229	0.14	239	8.0	47
37	2.50	10.4	1.7	17	221	0.86	0.64	29095	0.45	114	18.8	36
38	0.22	6.9	1.0	5	730	1.13	0.14	7653	0.05	155	7.9	49
39	0.63	5.0	2.1	8	158	0.92	0.25	2762	0.30	88	12.0	221
40	0.80	3.0	2.4	5	133	0.25	0.23	3422	0.11	83	8.8	102
41	0.13	7.0	1.4	8	531	0.50	0.29	14362	0.26	122	9.6	47
42	0.35	8.0	1.8	9	540	1.25	0.28	14131	0.24	167	10.8	50
43	0.16	5.2	1.4	7	571	1.42	0.35	3763	0.39	182	8.4	121
44	0.63	5.3	1.9	15	767	1.28	0.25	2570	0.18	148	9.2	129
45	0.22	4.9	1.1	9	565	0.68	0.11	6600	0.71	113	2.7	87
46	0.53	7.5	4.5	23	511	1.30	0.33	6076	0.21	114	22.1	397
47	0.58	7.5	3.0	22	361	1.03	0.20	10770	0.18	117	26.1	271
48	0.10	7.5	6.0	49	522	1.23	0.44	12531	0.18	139	17.8	147
49	0.20	3.5	4.7	25	324	0.25	0.34	24175	0.73	78	8.8	49
50	0.35	4.4	2.2	18	328	1.18	0.25	26824	0.58	121	4.3	29
AVG	0.80	7.3	3.5	19	509	1.28	0.35	14466	0.36	159	14.9	122
GEOM MEAN	0.41	7.1	2.8	14	468	1.14	0.33	10849	0.26	151	12.6	76
MAX	8.30	10.6	11.0	74	1400	2.70	0.80	45577	1.70	305	46.9	1579
MIN	0.10	3.0	0.6	1	133	0.25	0.11	2451	0.05	78	2.7	23
RANGE	8.20	7.6	10.4	73	1267	2.45	0.69	43126	1.65	227	44.2	1556
ESt.D.LiM.[1]	0.015	0.001	0.2	2	1	0.5	0.1	25	0.10	0.15	2.5	1

[1]Est.D.Lim. denotes the estimated detection limit for each element. In this table, concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim. Descriptive statistics are calculated accordingly.

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Cs	Cu	Fe	Ga	Ge	Hg	I	K	La	Li	Mg	Mn
	-----mg/Kg-----		%	----------mg/Kg----------				%	----------mg/Kg----------			
1	7.3	36.6	3.2	22.0	1.6	0.90	1.24	3.00	38.5	33	7407	501
2	3.0	44.2	3.7	19.6	3.0	0.10	0.91	2.36	16.4	27	4913	549
3	4.5	66.9	5.7	27.6	3.5	0.70	0.94	1.48	13.0	90	11067	527
4	3.1	96.4	6.8	27.9	5.6	0.27	0.93	2.13	18.3	20	8745	1186
5	2.8	85.7	7.6	26.8	5.8	0.61	0.91	1.21	21.6	23	9586	1687
6	1.8	21.9	3.6	16.5	1.6	0.10	0.60	0.75	14.0	13	5888	618
7	1.8	14.8	2.9	18.0	2.0	0.10	0.72	2.48	39.3	21	11613	587
8	5.1	18.3	3.2	20.3	2.3	0.40	0.60	2.40	28.3	42	12928	682
9	1.5	13.7	2.0	11.5	1.9	0.27	0.49	1.78	20.4	11	5631	449
10	2.1	17.5	3.0	16.5	2.0	0.49	0.54	1.53	17.8	15	11000	598
11	1.9	24.4	3.0	14.3	2.8	0.10	0.49	2.91	24.6	13	6442	599
12	1.7	14.2	6.6	14.6	2.9	0.26	0.50	1.09	11.4	11	14345	1051
13	4.4	13.7	3.7	23.1	2.4	0.10	0.44	1.87	27.6	35	7920	911
14	3.2	21.6	5.3	18.7	2.5	0.22	0.43	1.51	18.6	50	12027	726
15	1.0	22.5	3.7	14.9	2.7	0.21	0.36	1.37	9.8	9	11364	584
16	2.8	34.5	4.0	15.0	1.9	0.10	0.33	1.03	18.2	40	15538	810
17	4.5	34.2	3.7	21.0	2.2	0.10	0.43	2.50	23.0	32	7147	574
18	5.5	16.5	2.6	15.4	2.2	0.10	0.34	2.38	25.6	23	12014	426
19	6.2	17.8	2.7	17.0	1.9	0.10	0.27	2.45	29.5	24	14305	480
20	5.1	17.7	2.3	15.3	3.0	0.10	0.33	2.16	25.4	18	12163	421
21	3.4	18.7	2.6	24.7	2.5	0.25	0.22	2.06	19.6	16	9628	456
22	2.6	11.8	1.8	13.7	2.6	0.29	0.25	2.25	16.3	7	4710	259
23	2.4	17.7	3.3	16.3	1.0	0.22	0.24	2.12	20.4	11	12036	542
24	2.1	45.2	5.8	19.3	3.7	0.10	0.27	0.57	16.5	8	11822	1217
25	2.2	52.7	4.5	13.3	2.1	0.57	0.26	1.05	15.5	8	32378	809
26	4.1	58.4	4.5	21.0	2.4	0.10	0.27	1.90	13.8	7	12014	768
27	8.7	28.7	4.3	24.5	3.9	0.39	0.25	2.93	32.3	14	9873	454
28	1.2	13.3	3.1	15.7	3.1	0.10	0.16	2.25	28.0	4	9678	470
29	3.5	50.3	5.0	20.0	4.8	0.75	0.28	1.72	17.3	13	12581	858

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Cs	Cu	Fe	Ga	Ge	Hg	I	K	La	Ll	Mg	Mn
	-----mg/Kg-----		%	----------mg/Kg----------				%	----------mg/Kg----------			
30	3.2	29.0	2.6	18.2	1.5	0.22	0.26	0.84	16.7	8	7497	961
31	2.5	55.6	5.1	19.2	5.1	0.10	0.23	1.33	16.0	32	12381	824
32	4.3	22.3	3.4	19.1	2.5	0.10	0.23	2.15	33.4	51	8370	285
33	3.9	23.6	3.5	18.9	2.6	0.45	0.23	1.74	23.4	33	8238	260
34	3.4	24.8	4.4	20.4	2.5	0.66	0.28	2.08	21.7	61	15918	768
35	2.4	11.3	2.5	16.5	2.2	0.32	0.20	2.47	31.8	32	7861	433
36	2.0	15.1	3.1	17.9	2.8	0.10	0.22	1.69	33.8	25	7410	439
37	1.6	35.6	8.7	20.9	5.2	0.10	0.27	0.51	10.9	11	13725	1205
38	1.6	16.1	3.3	15.3	2.1	0.10	0.20	2.49	20.1	9	3664	890
39	1.0	20.7	2.5	8.3	3.5	0.10	0.17	0.36	10.1	15	3003	480
40	1.0	20.0	2.1	8.5	4.1	0.10	0.15	0.21	9.7	9	2402	382
41	1.3	10.6	2.3	14.0	0.3	0.10	0.19	1.63	14.2	8	5436	638
42	3.9	18.6	3.5	18.5	3.8	0.10	0.27	2.06	21.5	20	8396	736
43	2.3	11.4	1.3	12.7	2.2	0.63	0.62	1.56	23.8	7	1970	445
44	2.1	16.6	2.0	17.7	1.5	0.10	0.42	1.99	20.4	10	2384	593
45	2.4	9.5	1.0	12.8	1.5	0.10	0.43	1.67	15.0	5	1456	268
46	3.3	41.5	4.5	18.3	4.4	0.34	0.32	1.66	13.3	27	15324	674
47	2.6	51.3	5.2	18.5	3.8	0.57	0.24	1.03	13.4	28	20568	720
48	4.1	37.6	4.2	20.8	3.3	0.10	0.35	2.01	18.8	52	18414	535
49	1.5	24.4	2.4	10.4	2.4	0.25	0.67	0.42	9.9	27	7393	436
50	2.8	9.1	1.4	10.7	1.2	0.10	0.27	1.57	16.0	20	7616	253
AVG	3.1	28.7	3.7	17.6	2.8	0.26	0.40	1.73	20.3	23	9923	646
GEOM MEAN	2.7	24.0	3.4	17.1	2.5	0.20	0.35	1.54	19.0	18	8492	592
MAX	8.7	96.4	8.7	27.9	5.8	0.90	1.24	3.00	39.3	90	32378	1687
MIN	1.0	9.1	1.0	8.3	0.3	0.10	0.15	0.21	9.7	4	1456	253
RANGE	7.7	87.3	7.7	19.6	5.6	0.80	1.09	2.79	29.6	86	30922	1434
Est.D.Lim.[1]	0.25	0.25	.00025	0.15	0.5	0.2	0.15	0.05	0.15	2	10	2.5

[1]Est.D.Lim. denotes the estimated detection limit for each element. In this table, concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim. Descriptive statistics are calculated accordingly.

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Mo	Na	Nb	Ni	P	Pb	Rb	Sb	Sc	Se	Si	Sn
	----------	----------	----------	----------	mg/Kg	----------	----------	----------	----------	----------	%	Mg/Kg
1	1.4	14710	1.3	20	94	57.1	84.5	1.95	11.9	0.015	26.7	1.20
2	1.2	15620	0.9	25	231	29.7	48.0	1.46	11.6	0.015	31.0	1.25
3	0.4	8960	0.3	77	82	26.9	52.2	0.78	21.0	0.030	27.2	0.89
4	1.2	11790	0.8	51	359	22.4	53.1	1.15	18.0	0.015	23.7	0.75
5	0.7	10010	1.8	140	972	34.3	51.9	0.45	22.0	0.070	26.6	1.26
6	0.8	14400	1.3	25	13	15.6	19.5	0.29	12.0	0.015	22.4	1.13
7	2.4	16610	2.3	19	772	14.2	70.0	0.33	9.0	0.150	26.5	0.77
8	9.6	29000	3.4	21	807	18.4	81.5	0.73	7.5	0.015	27.0	1.38
9	0.6	15050	1.5	12	213	21.3	39.8	0.36	4.9	0.015	32.4	0.82
10	1.2	15270	1.3	26	107	14.8	43.2	0.32	7.6	0.015	28.9	0.86
11	0.5	22240	1.0	13	515	22.7	42.8	0.38	6.1	0.015	34.0	0.98
12	0.7	19560	1.1	10	74	15.6	31.9	0.26	20.0	0.015	24.3	1.38
13	1.4	73400	4.0	16	1150	97.1	86.0	0.47	5.7	0.015	24.4	2.16
14	0.6	18800	0.5	64	378	22.1	53.7	0.25	11.4	0.015	28.3	0.58
15	0.2	17400	0.5	49	142	12.4	25.9	0.35	9.5	0.015	30.1	1.14
16	0.7	13970	1.9	142	697	34.0	46.5	0.46	8.5	0 015	28.3	1.46
17	0.6	16230	0.8	40	539	30.9	54.7	1.03	10.5	0.050	31.2	1.01
18	0.8	9870	1.9	21	740	44.3	59.8	0.73	4.7	0.190	28.8	1.46
19	1.3	9490	2.1	25	873	37.0	66.8	0.77	5.9	0.220	26.3	1.12
20	0.8	10690	2.0	22	736	33.8	55.9	0.68	5.2	0.180	29.9	1.47
21	1.4	14620	1.0	53	342	19.7	53.5	0.66	5.6	0.170	32.6	0.57
22	3.7	10980	2.1	27	509	14.6	48.4	0.45	2.8	0.180	30.3	1.07
23	0.9	18380	1.0	62	560	22.5	41.7	1.50	5.1	0.160	32.1	1.00
24	0.4	14370	3.4	57	252	16.7	18.9	0.44	15.5	0.015	23.9	0.68
25	1.3	11340	1.8	509	41	17.9	33.4	0.73	11.7	0.015	25.2	1.91
26	0.8	11970	0.5	27	385	24.1	47.7	0.73	17.0	0.015	26.0	0.53
27	1.3	20970	3.5	52	293	39.1	107.9	1.52	7.8	0.430	30.0	1.85
28	0.1	15650	1.3	30	657	13.2	43.0	0.16	6.7	0.015	30.0	0.94
29	1.1	15580	0.5	116	664	23.9	57.2	0.75	12.8	0.230	30.2	0.85

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Mo	Na	Nb	Ni	P	Pb	Rb	Sb	Sc	Se	Si	Sn
	mg/Kg										%	Mg/Kg
30	0.6	15620	1.8	47	610	20.6	57.6	0.28	7.3	0.015	34.0	0.77
31	0.6	14270	0.7	104	487	18.1	41.7	0.59	17.1	0.040	32.8	0.85
32	4.5	15110	4.3	21	407	22.4	68.5	1.40	8.5	0.015	26.3	1.91
33	2.4	15650	2.7	56	63	24.5	61.4	0.68	7.9	0.015	28.8	1.35
34	1.7	16830	3.1	29	463	17.5	67.4	0.46	10.0	0.015	25.9	1.19
35	0.9	17260	1.3	12	301	21.3	55.1	0.33	5.3	0.015	30.4	1.22
36	1.0	7580	1.8	23	314	26.7	61.8	0.32	6.0	0.015	35.6	1.01
37	0.5	19540	1.4	15	33	17.0	28.5	0.42	24.0	0.015	27.9	1.38
38	0.5	13800	1.1	23	257	21.3	42.1	0.37	5.0	0.015	35.9	0.25
39	0.4	15550	0.8	50	194	12.7	16.3	0.24	5.0	0.015	39.4	0.64
40	0.7	6630	0.6	30	124	14.0	14.3	0.16	5.0	0.015	37.1	1.04
41	0.3	17410	0.9	17	65	14.2	30.2	0.15	6.8	0.015	33.5	0.99
42	1.0	13800	0.8	22	107	17.8	61.3	0.60	8.8	0.015	32.7	0.92
43	1.7	13570	4.9	20	387	13.4	41.7	0.50	2.5	0.110	36.7	2.44
44	3.1	10230	1.4	27	309	19.7	43.5	0.57	4.2	0.015	27.3	1.32
45	2.6	12290	2.9	9	360	16.0	28.9	0.48	2.6	0.015	34.7	1.77
46	0.7	17040	1.5	212	467	18.9	40.5	0.50	11.0	0.015	27.2	1.05
47	0.7	17890	0.6	196	351	14.9	34.4	0.40	15.3	0.015	28.1	0.65
48	1.5	19290	1.3	113	357	23.1	55.8	0.60	13.5	0.015	28.8	0.81
49	2.2	5580	1.7	41	1210	27.4	21.1	0.42	4.2	0.140	13.2	1.04
50	0.3	10010	0.9	12	524	16.8	31.9	0.31	0.8	0.015	35.6	1.35
AVG	1.3	15838	1.7	57	412	23.9	48.5	0.60	9.5	0.058	29.4	1.11
GEO. MEAN	0.9	14500	1.4	36	290	21.7	44.6	0.50	8.2	0.028	29.0	1.03
MAX	9.6	73400	4.9	509	1210	97.1	107.9	1.95	24.0	0.430	39.4	2.44
MIN	0.1	5580	0.3	9	13	12.4	14.3	0.15	0.8	0.015	13.2	0.25
RANGE	9.5	67820	4.6	500	1197	84.7	93.6	1.80	23.2	0.415	26.2	2.19
Est.D.Lim.[1]	0.025	100	0.25	5	25	1	0.15	0.15	0.2	0.03	0.0005	0.5

[1] Est.D.Lim. denotes the estimated detection limit for each element. In this table, concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim Descriptive statistics are calculated accordingly.

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Sr	Th	Ti	TL	U	V	W	Y	Zn	Zr
	mg/Kg									
1	84	36.2	4640	1.10	8.2	74	1.10	30.6	172	610
2	166	13.9	6463	0.62	5.7	134	0.22	22.6	165	232
3	38	10.1	6218	0.74	2.7	187	0.10	15.0	204	134
4	194	10.8	7337	0.85	3.8	236	0.16	31.2	149	151
5	47	8.8	12890	0.70	3.1	191	0.28	29.2	162.	230
6	155	9.8	5918	0.46	3.2	123	0.40	19.1	139	88
7	236	27.5	4351	0.62	8.5	60	0.36	43.2	170	32
8	210	25.4	4780	0.68	21.3	83	1.60	39.1	180	57
9	152	20.2	2885	0.34	4.6	55	0.33	29.4	182	51
10	151	12.8	4466	0.48	3.1	93	0.45	29.4	153	67
11	198	23.9	3864	0.41	5.1	80	0.28	26.6	97	56
12	92	11.0	5373	0.52	2.4	220	0.31	31.9	123	52
13	118	32.4	4650	0.87	10.7	89	0.74	23.4	236	53
14	84	18.0	5662	0.49	5.7	170	0.15	30.7	104	90
15	156	5.3	3590	0.29	1.9	123	0.19	26.8	141	29
16	68	8.1	4566	0.59	1.8	125	0.97	11.8	177	108
17	102	13.3	5225	0.57	3.2	133	0.42	22.8	193	99
18	169	15.8	3657	0.73	4.2	69	0.76	27.5	172	130
19	193	18.6	4778	0.75	4.4	84	0.73	31.8	179	180
20	197	15.9	3949	0.57	3.9	74	0.71	28.6	168	178
21	106	16.0	3740	0.42	3.4	92	0.60	25.3	165	81
22	176	13.7	2453	0.47	5.6	58	0.54	21.6	152	50
23	187	14.2	3963	0.47	2.9	113	0.47	25.0	107	92
24	182	8.2	6957	0.45	1.5	139	0.65	33:3	149	107
25	86	13.3	2757	0.36	4.3	77	0.95	16.8	133	45
26	231	9.8	3997	0.67	2.8	117	0.05	19.5	183	38
27	134	25.5	5683	0.90	5.8	133	1.20	24.8	144	105
28	116	19.5	3705	0.38	2.4	85	0.10	32.6	92	20
29	33	9.4	7096	0.69	1.6	185	0.22	15.6	157	164

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Sr	Th	Ti	TL	U	V	W	Y	Zn	Zr
	mg/Kg									
30	20	10.8	4814	0.63	3.0	102	0.44	8.5	144	68
31	24	7.3	7875	0.42	1.5	181	0.17	12.9	189	136
32	229	30.1	3499	0.79	17.3	77	6.50	36.9	164	43
33	172	23.1	3739	0.75	14.5	126	6.90	21.5	157	60
34	264	17.3	5178	0.68	6.4	115	1.20	33.9	176	48
35	179	25.1	3790	0.61	4.9	74	0.64	35.7	154	35
36	90	25.8	2950	0.77	3.9	75	0.72	30.6	94	19
37	158	5.9	7771	0.45	1.7	288	0.47	32.9	154	34
38	83	16.1	3644	0.42	3.4	96	0.28	20.9	91	58
39	23	6.0	4990	0.20	1.2	92	0.25	9.5	88	92
40	27	5.6	2388	0.17	1.2	76	0.24	10.8	136	24
41	65	10.4	3857	0.33	2.6	68	0.28	17.9	138	56
42	84	32.9	4565	0.81	6.7	94	0.28	24.4	155	60
43	87	17.3	4233	0.44	3.8	54	1.10	15.7	133	63
44	49	13.3	3454	0.58	4.3	88	0.50	15.6	100	56
45	69	11.3	2629	0.50	5.6	48	0.50	18.0	135	41
46	83	9.1	5539	0.50	2.1	139	0.48	16.4	119	100
47	74	7.2	6099	0.33	1.6	175	0.27	18.1	165	98
48	180	14.0	4913	0.59	4.0	138	0.37	25.7	132	111
49	271	9.8	2239	0.28	6.3	58	1.30	25.6	122	34
50	123	9.5	2012	0.49	2.5	39	0.36	18.1	150	95
AVG	128	15.7	4716	0.56	4.7	112	0.77	24.3	149	93
GEOM. MEAN	107	13.8	4419	0.52	3.8	101	0.45	22.9	145	72
MAX	271	36.2	12890	1.10	21.3	288	6.90	43.2	236	610
MIN	20	5.3	2012	0.17	1.2	39	0.05	8.5	88	19
RANGE	251	30.9	10878	0.93	20.1	249	6.85	34.7	148	591
Est.D.Lim.[1]	4	0.1	5	0.15	0.05	5	0.1	0.15	2.5	0.25

[1]Est.D.Lim. denotes the estimated detection limit for each element. In this table, concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim. Descriptive statistics are calculated accordingly**.**

Table 3

Ranges In Concentration and Summary Statistics of 46 Elements in 50 Benchmark California Soils[a]

Parameter	Ag	Al	As	B	Ba	Be	Bl	Ca	Cd	Ce
Mean	0.80	7.3	3.5	19	509	1.28	0.35	14466	0.36	159
Standard Deviation	1.43	1.7	2.5	15	210	0.52	0.14	10703	0.31	52
Coefficient of Variation (CV) (%)	178	24	71	79	41	41	39	74	88	33
Geometric Mean	0.41	7.1	2.8	14	468	1.14	0.33	10849	0.26	151
Geometric Deviation	2.64	1.3	2.1	2.6	1.54	1.79	1.46	2.25	2.27	1.38
Geometric CV (%)	636	19	76	19	0.30	157	448	0.02	876	0.9
Minimum	0.10	3.0	0.6	1	133	0.25	0.11	2451	0.05	78
Lower Quartile	0.22	6.3	1.4	7	375	0.92	0.25	6600	0.15	121
Median	0.37	7.5	2.7	17	519.5	1.265	0.335	11420	0.275	150.5
Upper Quartile	0.53	8.3	4.7	26	625	1.53	0.39	20015	0.44	188
Maximum	8.30	10.6	11.0	74	1400	2.70	0.80	45577	1.70	305
W:Normal[b]	0.4864	0.9761	0.8865	0.8935	0.9161	0.9883	0.9248	0.8848	0.7977	0.9426
Prob<W[c]	0.0001	0.5824	0.0001	0.0001	0.0015	0.9591	0.0039	0.0001	0.0001	0.0268
W:Ln Normal[d]	0.8708	0.9218	0.9556	0.9566	0.9562	0.8305	0.9816	0.9505	0.9764	0.9781
Prob<W	0.0001	0.0028	0.1021	0.1129	0.1082	0.0001	0.7863	0.061	0.5961	0.6564
Methods Reported[e]	1	2	3	2	2	1	1	2	1	1

[a]Please refer to Table 2 for concentration units for each element. Concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim. Descriptive statistics are calculated accordingly.

[b]w:Normal: Normal test statistic
[c]Prob<W: Associated probability for testing the hypothesis that the data come from a normal distribution
[d]W:Ln Normal: Normal test statistic for Ln transformed data

[e]Methods Reported
1 = ICP-MS (Inductively Coupled Plasma-Mass Spectroscopy)
2 = ICP-OES (ICP-Optical Emission Spectroscopy)
3 - ICP-OES Hydride

Table 3 (continued)
Ranges in Concentration and Summary Statistics of 46 Elements in 50 Benchmark California Soils[a]

Parameter	Co	Cr	Cs	Cu	Fe	Ga	Ge	Hg	I
Mean	14.9	122	3.1	28.7	3.7	17.6	2.8	0.26	0.40
Standard Deviation	9.2	223	1.6	19.3	1.6	4.5	1.2	0.21	0.24
Coefficient of Variation (CV) (%)	62	183	53	67	43	25	43	80	60
Geometric Mean	12.6	76	2.7	24.0	3.4	17.1	2.5	0.20	0.35
Geometric Deviation	1.79	2.27	1.7	1.8	1.6	1.3	1.6	2.12	1.67
Geometric CV (%)	14	3	62	7	46	7	64	1059	476
Minimum	2.7	23	1.0	9.1	1.0	8.3	0.4	0.05	0.15
Lower Quartile	8.7	45	1.9	16.1	2.6	14.9	2.0	0.10	0.24
Median	11.6	69	2.6	21.6	3.3	17.9	2.5	0.19	0.30
Upper Quartile	18.3	115	3.9	36.6	4.5	20.3	3.5	0.34	0.49
Maximum	46.9	1579	8.7	96.4	8.7	27.9	5.8	0.90	1.24
W:Normal[b]	0.8510	0.3834	0.9001	0.8169	0.9396	0.9758	0.9410	0.8133	0.8138
Prob<W[c]	0.0001	0.0001	0.0003	0.0001	0.0194	0.5721	0.0226	0.0001	0.0001
W:Ln Normal[d]	0.9727	0.9265	0.9815	0.9544	0.9846	0.96	0.9379	0.9212	0.9372
Prob<W	0.4631	0.0047	0.783	0.0903	0.8799	0.1563	0.0162	0.0026	0.015
Methods Reported[e]	2	2	1	1	2	1	1	1	1

[a]Please refer to Table 2 for concentration units for each element. Concentrations less than the Est. D. Lim. are reported as one-half of the Est.D.Lim. Descriptive statistics are calculated accordingly.

[b]w:Normal: Normal test statistic
[c]Prob<W: Associated probability for testing the hypothesis that the data come from a normal distribution
[d]W:Ln Normal: Normal test statistic for Ln transformed data

[e]Methods Reported
1 = ICP-MS (Inductively Coupled Plasma-Mass Spectroscopy)
2 = ICP-OES (ICP-Optical Emission Spectroscopy)
3 = ICP-OES Hydride

Table 3 (continued)
Ranges in Concentration and Summary Statistics of 46 Elements in 50 Benchmark California Soils[a]

Parameter	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni
Mean	1.73	20.3	23	9923	646	1.3	15838	1.7	57
Standard Deviation	0.69	7.5	17	5356	285	1.5	9309	1.1	80
Coefficient of Variation (CV) (%)	40	37	75	54	44	113	59	65	141
Geometric Mean	1.54	19.0	18	8492	592	0.9	14500	1.4	36
Geometric Deviation	1.77	1.4	2.0	1.80	1.5	2.23	1.5	1.9	2.4
Geometric CV (%)	115	7.5	11	0.02	0.3	239	0.01	141	7
Minimum	0.21	9.7	4	1456	253	0.1	5580	0.3	9
Lower quartile	1.33	15.0	10	6442	449	0.6	11790	0.9	21
Median	1.76	18.7	19	9166	590	0.85	15080	1.3	27
Upper Quartile	2.25	24.6	32	12036	809	1.4	17260	2	56
Maximum	3.00	39.3	90	32378	1687	9.6	73400	4.9	509
W:Normal[b]	0.9610	0.9350	0.8442	0.8978	0.9104	0.6126	0.5514	0.8747	0.5508
Prob<W[c]	0.1722	0.0118	0.0001	0.0002	0.0008	0.0001	0.0001	0.0001	0.0001
W:Ln Normal[d]	0.8352	0.9696	0.9776	0.92	0.9732	0.9849	0.904	0.9806	0.9388
Prob<W	0.0001	0.3634	0.6377	0.0023	0.4807	0.8873	0.0004	0.749	0.0178
Methods Reported[e]	2	1	2	2	2	1	2	1	2

[a]Please refer to Table 2 for concentration units for each element. Concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim. Descriptive statistics are calculated accordingly.

[b]w:Normal: Normal test statistic
[c]Prob<W: Associated probability for testing the hypothesis that the data come from a normal distribution
[d]W:Ln Normal: Normal test statistic for Ln transformed data

[e]Methods Reported
1 = ICP-MS (Inductively Coupled Plasma-Mass Spectroscopy)
2 = ICP-OES (ICP-Optical Emission Spectroscopy)
3 = ICP-OES Hydride

Table 3 (continued)
Ranges in Concentration and Summary Statistics of 46 Elements in 50 Benchmark California Soils[a]

Parameter	P	Pb	Rb	Sb	Sc	Se	Si	Sn	Sr
Mean	412	23.9	48.5	0.60	9.5	0.058	29.4	1.11	128
Standard Deviation	290	13.8	19.0	0.39	5.3	0.084	4.6	0.42	67.62
Coefficient of Variation (CV) (%)	70	58	39	66	55	147	16	38.	53
Geometric Mean	290	21.7	44.6	0.50	8.2	0.028	29.0	1.03	107
Geometric Dev	3	1.5	1.5	1.80	1.7	2.89	1.2	1.48	1.97
Geometric CV (%)	0.9	7	3	360	21	10149	4	143	2
Minimum	13	12.4	14.3	0.15	0.8	0.015	13.2	0.25	20
Lower Quartile	194	16	34.4	0.33	5.3	0.015	26.6	0.85	83
Median	360	20.6	47.9	0.47	8.0	0.015	28.8	1.04	121
Upper Quartile	560	26.7	57.6	0.73	11.9	0.050	32.6	1.35	180
Maximum	1210	97.1	107.9	1.95	24.0	0.430	39.4	2.44	271
W:Normal[b]	0.9330	0.6712	0.9680	0.8210	0.8966	0.5860	0.9662	0.9444	0.9501
Prob<W[c]	0.0950	0.0001	0.3202	0.0001	0.0002	0.0001	0.2500	0.0322	0.0587
W:Ln Normal[d]	0.9101	0.9118	0.9538	0.9704	0.9712	0.626	0.7089	0.9708	0.9045
Prob<W[e]	0.0008	0.0009	0.0849	0.39	0.415	0.0001	0.0001	0.4015	0.0004
Methods Reported	2	1	1	1	2	3	2	1	2

[a]Please refer to Table 2 for concentration units for each element. Concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim. Descriptive statistics are calculated accordingly.

[b]w:Normal: Normal test statistic
[c]Prob<W: Associated probability for testing the hypothesis that the data come from a normal distribution
[d]W:Ln Normal: Normal test statistic for Ln transformed data

[e]Methods Reported
1 = ICP-MS (Inductively Coupled Plasma-Mass Spectroscopy)
2 = ICP-OES (ICP-Optical Emission Spectroscopy)
3 = ICP-OES Hydride

Table 3 (continued)
Ranges in Concentration and Summary Statistics of 46 Elements In 50 Benchmark California Soils[a]

Parameter	Th	Ti	Tl	U	V	W	Y	Zn	Zr
Mean	15.7	4716	0.56	4.7	112	0.77	24.3	149	93
Standard Deviation	7.6	185	0.19	3.9	53	1.27	8.1	32	90
Coefficient of Variation (CV) (%)	49	39	34	83	47	166	33	21	97
Geometric Mean	13.8	4419	0.52	3.8	101	0.45	22.9	145	72
Geometric Deviation	1.6	1	1.46	1.9	2	2.51	1.45	1	2
Geometric CV (%)	12	0.03	280	51	2	553	6	0.9	3
Minimum	5.3	2012	0.17	1.2	39	0.05	8.5	88	19
Lower Quartile	9.8	3657	0.42	2.5	75	0.28	18.0	133	48
Median	13.5	4516	0.54	3.8	94	0.45	24.9	153	63
Upper Quartile	19.5	5539	0.69	5.6	134	0.73	30.6	170	107
Maximum	36.2	12890	1.10	21.3	288	6.90	43.2	236	610
W:Normal[b]	0.9028	0.8778	0.9846	0.7174	0.8974	0.4405	0.9793	0.9696	0.6261
Prob<W[c]	0.0004	0.0001	0.8775	0.0001	0.0002	0.0001	0.7026	0.3657	0.0001
W:Ln Normal[d]	0.9611	0.9843	0.9633	0.9657	0.9809	0.9589	0.9467	0.9401	0.9497
Prob<W	0.1731	0.8699	0.212	0.2633	0.7619	0.1415	0.041	0.0205	0.0561
Methods Reported[e]	1	2	1	1	2	1	1	2	2

[a]Please refer to Table 2 for concentration units for each element. Concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim. Descriptive statistics are calculated accordingly.

[b]w:Normal: Normal test statistic

[c]Prob<W: Associated probability for testing the hypothesis that the data come from a normal distribution

[d]W:Ln Normal: Normal test statistic for Ln transformed data

[e]Methods Reported

1 = ICP-MS (Inductively Coupled Plasma-Mass Spectroscopy)

2 = ICP-OES (ICP-Optical Emission Spectroscopy)

3 = ICP-OES Hydride

Table 4

Correlation Coefficients between Elements in California Benchmark Soils[1]

	Ag	Mo	Be	P	Si	Se
B	-	0.51	-	-	-	-
K	-	-	0.38	-	0.43	-
Pb	-	-	0.43	0.45	-	-
Zr	-	-	0.48	-	-	-
Rb	-	0.37	0.64	-	-	0.41
Nb	-	0.50	-	-	-	-
Cs	-	-	0.68	-	-	-
Sb	-	-	0.46	-	-	-
Bi	-	-	0.43	-	-	-
W	-	0.43	-	-	-	-
La	-	-	0.47	-	-	-
Tl	-	0.51	0.37	-	-	-
Ga	-	0.51	0.60	-	-	-
Cd	-	0.51	-	-	-	0.36
As	-	-	0.39	-	-	-
U	-	0.82	-	-	-	-
Al	-	-	0.36	-	-	-
Ti	-	-	0.41	-	-	-
Ce	-	-	0.51	-	-	-

[1]Correlation significant at $p < 0.01$ if $r > 0.36$

	Ga	Sc	Hg	Ge	Ca
Sc	0.58	1.0	-	-	-
Ge	0.42	0.61	-	1.0	-
Cu	0.62	0.76	-	0.66	-
As	0.38	-	-	-	
Al	0.63	0.65	-	-	-
Fe	0.61	0.92	-	0.69	-
Mn	0.47	0.69	-	0.69	-
Ti	0.63	0.75	-	0.69	-
Mg	-	0.39	-	-	-
I	0.38	-	0.44	-	-
Ce	0.38	-	-	-	-
Sr	-	-	-	-	0.49

[1]Correlation significant at $p < 0.01$ if $r > 0.36$

Table 4 (continued)
Correlation Coefficients between Elements in California Benchmark Soils[1]

	B	Li	K	V	Co	Ni	Cr
Li	0.59	1.0	-	-	-	-	-
CO	-	-	-	0.63	1.0	-	-
Ni	-	-	-	-	0.76	1.0	-
Cr	-	-	-	-	0.65	0.95	1.0
Rb	0.41	0.39	0.71	-	-	-	-
Cs	0.55	0.38	0.56	-	-	-	-
Sb	-	-	0.52	-	-	-	-
Bi	0.39	-	-	-	-	-	-
Y	-	-	0.42	-	-	-	-
La	-	-	0.72	-	-	-	-
Zn	-	0.41	-	-	-	-	-
Ba	-	-	0.59	-	-	-	-
Tl	-	0.39	0.42	-	-	-	-
Ga	-	0.45	-	0.56	0.40	-	-
Sc	-	-	-	0.86	0.67	-	-
Ge	-	-	-	0.69	0.55	-	-
Cu	-	-	-	0.66	0.81	0.46	-
As	0.62	0.59	-	-	-	-	-
Th	-	-	0.65	-0.37	-0.39	-	-
U	0.41	-	0.39	-	-	-	-
Al	-	-	-	0.60	0.45	-	-
Fe	-	-	-	0.92	0.72	-	-
Mn	-	-	-	0.68	0.66	-	-
Ti	-	-	-	0.76	0.62	-	-
Mg	-	-	-	-	0.63	0.71	0.65
Ce	-	-	0.69	-	-	-	-

[1]Correlation significant at $p < 0.01$ if $r > 0.36$

	Bi	W	Y	La	Zn	Ba	Tl
W	0.38	1.0	-	-	-	-	-
La	0.47	-	0.58	1.0	-	-	-
Ba	-	-	-	0.39	-	1.0	
Tl	-	-	-	0.48	0.43	-	1.0
Ga	-	-	-	-	0.45	0.55	0.39
As	0.49	-	-	-	-	-	-
Th	0.42	0.47	0.49	0.83	-	0.37	0.55
U	-	0.69	0.45	0.53	-	-	0.39
Al	-	-	-	-	0.37	-	-
Ca	-	-	0.47	-	-	-	-
Ce	0.47	-	0.63	0.96	-	-	0.47
Sr	-	-	0.67	-	-	-	-

[1]Correlation significant at $P < 0.01$ if $r > 0.36$

Table 4 (continued)
Correlation Coefficients between Elements in California Benchmark Soils

	Pb	Zr	Rb	Nb	Cs	Sn	Sb
Zr	0.42	1.0	-	-	-	-	-
Rb	0.57	-	1.0	-	-	-	-
Nb	-	-	0.40	1.0	-	-	-
Cs	0.57	0.53	0.81	-	1.0	-	1.0
Sn	-	-	-	0.63	-	1.0	-
Sb	0.38	0.62	0.53	-	0.68	-	1.0
Bi	-	0.45	0.50	-	0.59	-	0.51
W	-	-	-	0.52	-	0.36	-
Y	-	-	0.38	-	-	-	-
La	0.41	-	0.78	0.46	0.51	-	0.39
Zn	0.50	-	0.42	-	0.48	-	-
Ba	-	-	0.48	-	-	-	0.39
TI	0.40	-	0.52	-	0.40	-	0.36
Ga	0.36	-	0.59	_	0.53	-	0.46
Hg	-	0.46	-	-	-	-	-
As	0.37	0.65	0.40	-	0.59	-	0.66
Th	0.44	-	0.74	0.44	0.47	-	-
U	-	-	0.57	0.57	0.38	-	-
Ca	-	-	-	-	-	0.38	-
Mg	-	-	-	-	-	-	-
Na	0.63	-	0.37	-	-	-	-
I	-	0.61	-	-	-	-	0.39
Ce	0.42	0.37	0.76	0.39	0.51	-	0.40

[1]Correlation significant at $p < 0.01$ if $r > 0.36$

	As	Th	U	Al	Fe	Mn	Ti
U	-	0.71	1.0		-	-	-
Fe	-	-	-	0.67	1.0	-	-
Mn	-	-	-	0.50	0.78	1.0	-
Ti	-	-	-	0.49	0.79	0.77	1.0
Mg	-	-	-	_	0.47	-	-
Na	-	0.36	-	-	-	_	-
I	0.38	-	-	-	-	-	-
Ce	-	0.78	0.47	-	-	-	-
Sr	-	-	0.43	-	-	-	-

[1]Correlation significant at $p < 0.01$ if $r > 0.36$

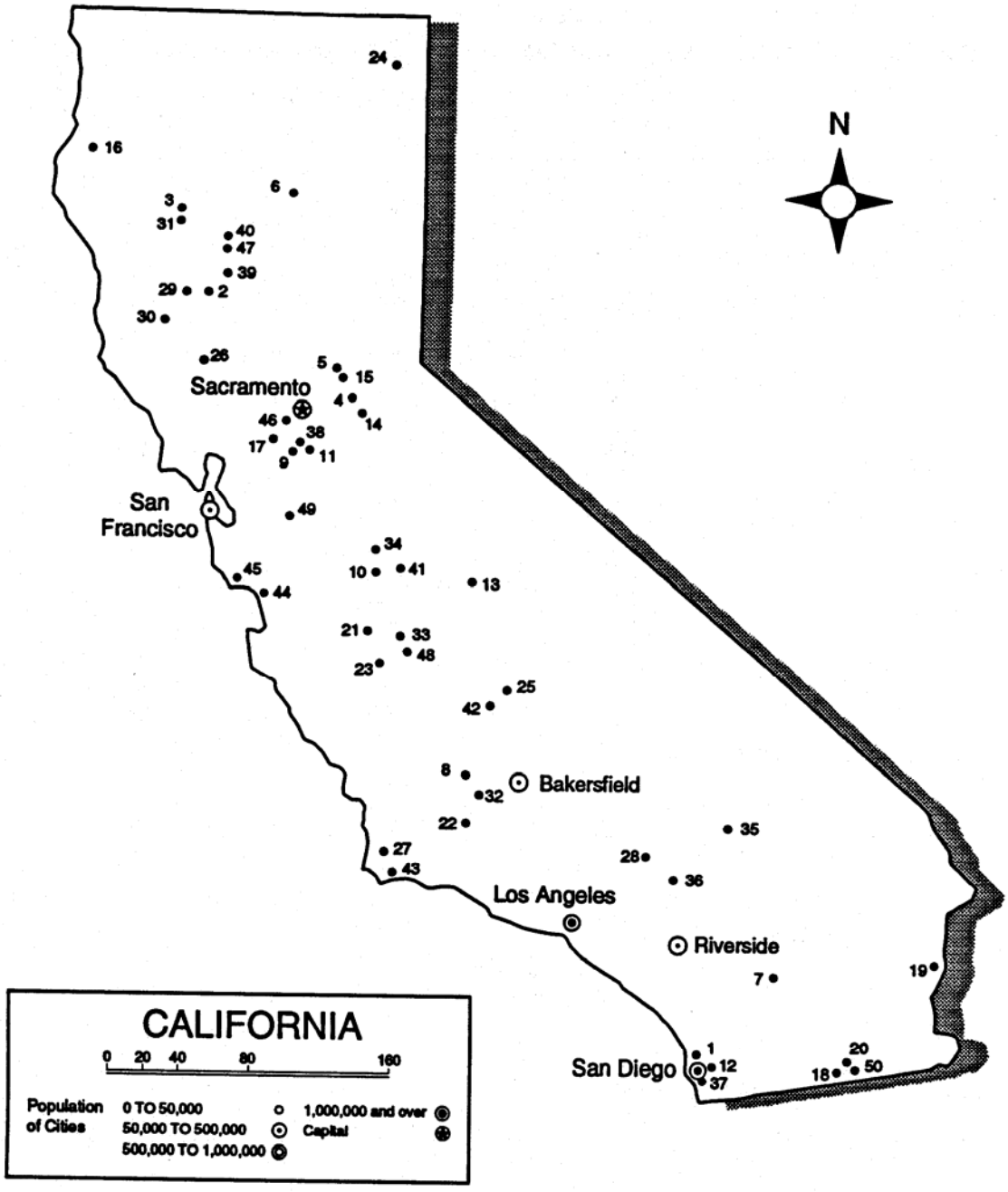

Figure 1. Soil sample numbers keyed to map of California

Appendix C

Soil Laboratory Report

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900 Phone
(510) 486-0532 Fax

CHAIN OF CUSTODY

C & T LOGIN #: 192517

mspielmann@somaenv.com

Sampler: M. Spielmann

Report To: M. Spielmann

Company: SOMA Env. Engr. Inc.

Telephone: 925-734-6400

Fax: 925-734-6401

Project No.: 2842

Project Name: 5565 Tesla Road Livermore CA.

Project P.O.: 2842

Turnaround Time: Normal/Standard

Lab No.	Sample ID.	Sampling Date Time	Matrix: Soil	Water	Waste	# of Containers	Preservative: HCL	H_2SO_4	HNO_3	ICE	Analysis: TPHd/TPHmo 8015m w/silica gel cleanup	CAM17 metals 6010B and 7471A	VOC's 8260B
-1	HA-12; 1-1.5	2/5/07 0845	X			1				X	X		X
-2	HA-12; 3-3.5 HOLD	2/5/07 0845	X			1				X	X		X
-3	HA-13; 1-1.5	2/5/07 0857	X			1				X	X		X
-4	HA-13; 3-3.5 HOLD	2/5/07 0857	X			1				X	X		X
-5	HA-14; 1-1.5	2/5/07 0905	X			1				X	X		X
-6	HA-14; 3-3.5 HOLD	2/5/07 0905	X			1				X	X		X
-7	HA-15; 1-1.5	2/5/07 0915	X			1				X	X	X	
-8	HA-15; 3-3.5 HOLD	2/5/07 0915	X			1				X	X	X	
-9	HA-16; 1-1.5	2/5/07 0925	X			1				X	X	X	
-10	HA-16; 3-3.5 HOLD	2/5/07 0925	X			1				X	X	X	
-11	HA-17; 1-1.5	2/5/07 0935	X			1				X	X	X	
-12	HA-17; 3-3.5 HOLD	2/5/07 0935	X			1				X	X	X	

Notes:
Edd Required

SAMPLE RECEIPT
☒ Intact ☒ Cold
☒ On Ice ☐ Ambient
Preservative Correct?
☐ Yes ☐ No ☐ N/A

RELINQUISHED BY:
Matthew Spielmann 2-6-07 1130 DATE / TIME
DATE / TIME
DATE / TIME

RECEIVED BY:
2.6.07 1130 DATE / TIME
DATE / TIME
DATE / TIME

SIGNATURE

Samples Cold & Intact

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900 Phone
(510) 486-0532 Fax

CHAIN OF CUSTODY

C & T LOGIN #: 192517

mspielmann@sonaew.com

Sampler: M. Spielmann

Project No.: 2842

Report To: M. Spielmann

Project Name: 5565 Tesla Road Livermore, CA.

Company: SOMA Env. Engr. Inc.

Project P.O.: 2842

Telephone: 925-734-6400

Turnaround Time: Normal/Standard

Fax: 925-734-6401

Lab No.	Sample ID.	Sampling Date Time	Matrix: Soil	Water	Waste		# of Containers	Preservative: HCL	H_2SO_4	HNO_3	ICE		Analysis: TPHd/TPHmo 8015 w/silicagel cleanup	Cam.17 Metals 6010B and 7471A	VOC's 8260B											
-13	HA-1B; 1-1.5	2/5/07 0942	X				1				X		X	X												
-14	HA-1B; 3-3.5 Hold	2/5/06 0942	X				1				X		X	X												

Notes:

EDD Required

SAMPLE RECEIPT
Intact Cold
On Ice Ambient
Preservative Correct?
Yes No N/A

RELINQUISHED BY:

Matthew K Spiel — 2-6-07 1130 DATE / TIME

DATE / TIME

DATE / TIME

RECEIVED BY:

A Clement — 2.6.07 1130 DATE / TIME

DATE / TIME

DATE / TIME

SIGNATURE

Samples Cold & Intact

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Total Extractable Hydrocarbons

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	SHAKER TABLE
Project#:	2842	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	121940
Units:	mg/Kg	Sampled:	02/05/07
Basis:	as received	Received:	02/06/07
Diln Fac:	1.000	Prepared:	02/08/07

Field ID: HA-12; 1-1.5
Type: SAMPLE
Lab ID: 192517-001
Analyzed: 02/09/07
Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	2.6 H Y	1.0
Motor Oil C24-C36	11	5.0

Surrogate	%REC	Limits
Hexacosane	82	48-130

Field ID: HA-13; 1-1.5
Type: SAMPLE
Lab ID: 192517-003
Analyzed: 02/09/07
Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	1.8 H Y	1.0
Motor Oil C24-C36	6.2	5.0

Surrogate	%REC	Limits
Hexacosane	76	48-130

Field ID: HA-14; 1-1.5
Type: SAMPLE
Lab ID: 192517-005
Analyzed: 02/09/07
Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
Hexacosane	84	48-130

Field ID: HA-15; 1-1.5
Type: SAMPLE
Lab ID: 192517-007
Analyzed: 02/10/07
Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	1.3 H Y	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
Hexacosane	71	48-130

H= Heavier hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Total Extractable Hydrocarbons

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	SHAKER TABLE
Project#:	2842	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	121940
Units:	mg/Kg	Sampled:	02/05/07
Basis:	as received	Received:	02/06/07
Diln Fac:	1.000	Prepared:	02/08/07

Field ID: HA-16; 1-1.5 Analyzed: 02/10/07
Type: SAMPLE Cleanup Method: EPA 3630C
Lab ID: 192517-009

Analyte	Result	RL
Diesel C10-C24	2.4 H Y	1.0
Motor Oil C24-C36	7.5	5.0

Surrogate	%REC	Limits
Hexacosane	89	48-130

Field ID: HA-17; 1-1.5 Analyzed: 02/10/07
Type: SAMPLE Cleanup Method: EPA 3630C
Lab ID: 192517-011

Analyte	Result	RL
Diesel C10-C24	2.1 H Y	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
Hexacosane	102	48-130

Field ID: HA-18; 1-1.5 Analyzed: 02/09/07
Type: SAMPLE Cleanup Method: EPA 3630C
Lab ID: 192517-013

Analyte	Result	RL
Diesel C10-C24	1.4 H Y	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
Hexacosane	87	48-130

Type: BLANK Analyzed: 02/09/07
Lab ID: QC374539 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
Hexacosane	89	48-130

H= Heavier hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
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Batch QC Report

Total Extractable Hydrocarbons

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	SHAKER TABLE
Project#:	2842	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC374540	Batch#:	121940
Matrix:	Soil	Prepared:	02/08/07
Units:	mg/Kg	Analyzed:	02/09/07
Basis:	as received		

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	50.18	41.14	82	59-133

Surrogate	%REC	Limits
Hexacosane	77	48-130

Curtis & Tompkins, Ltd.
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Batch QC Report

Total Extractable Hydrocarbons

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	SHAKER TABLE
Project#:	2842	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	121940
MSS Lab ID:	192564-006	Sampled:	02/06/07
Matrix:	Soil	Received:	02/07/07
Units:	mg/Kg	Prepared:	02/08/07
Basis:	as received	Analyzed:	02/09/07
Diln Fac:	1.000		

Type: MS Cleanup Method: EPA 3630C
Lab ID: QC374541

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	0.1857	50.21	44.60	88	37-153

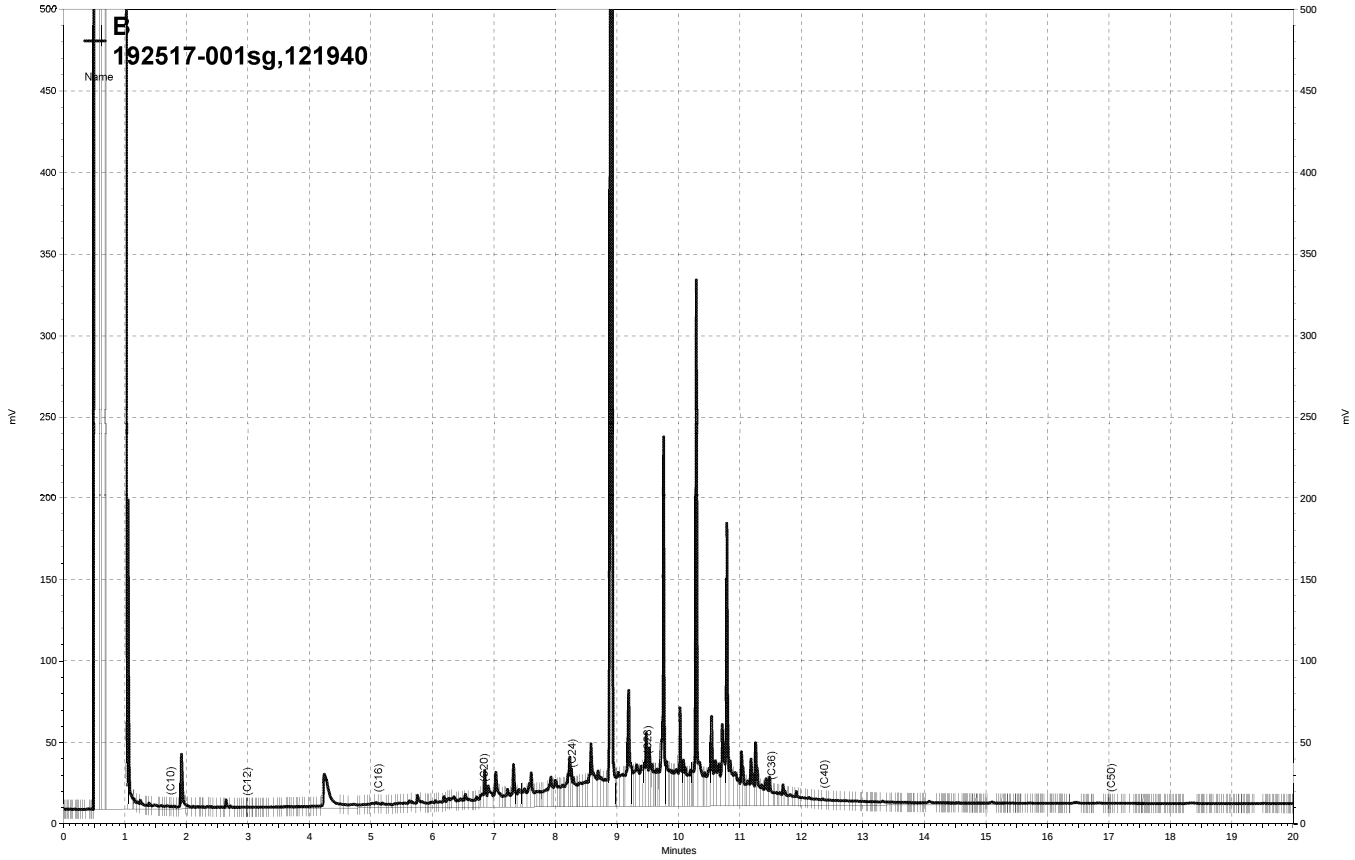
Surrogate	%REC	Limits
Hexacosane	82	48-130

Type: MSD Cleanup Method: EPA 3630C
Lab ID: QC374542

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	49.92	42.55	85	37-153	4	43

Surrogate	%REC	Limits
Hexacosane	79	48-130

RPD= Relative Percent Difference



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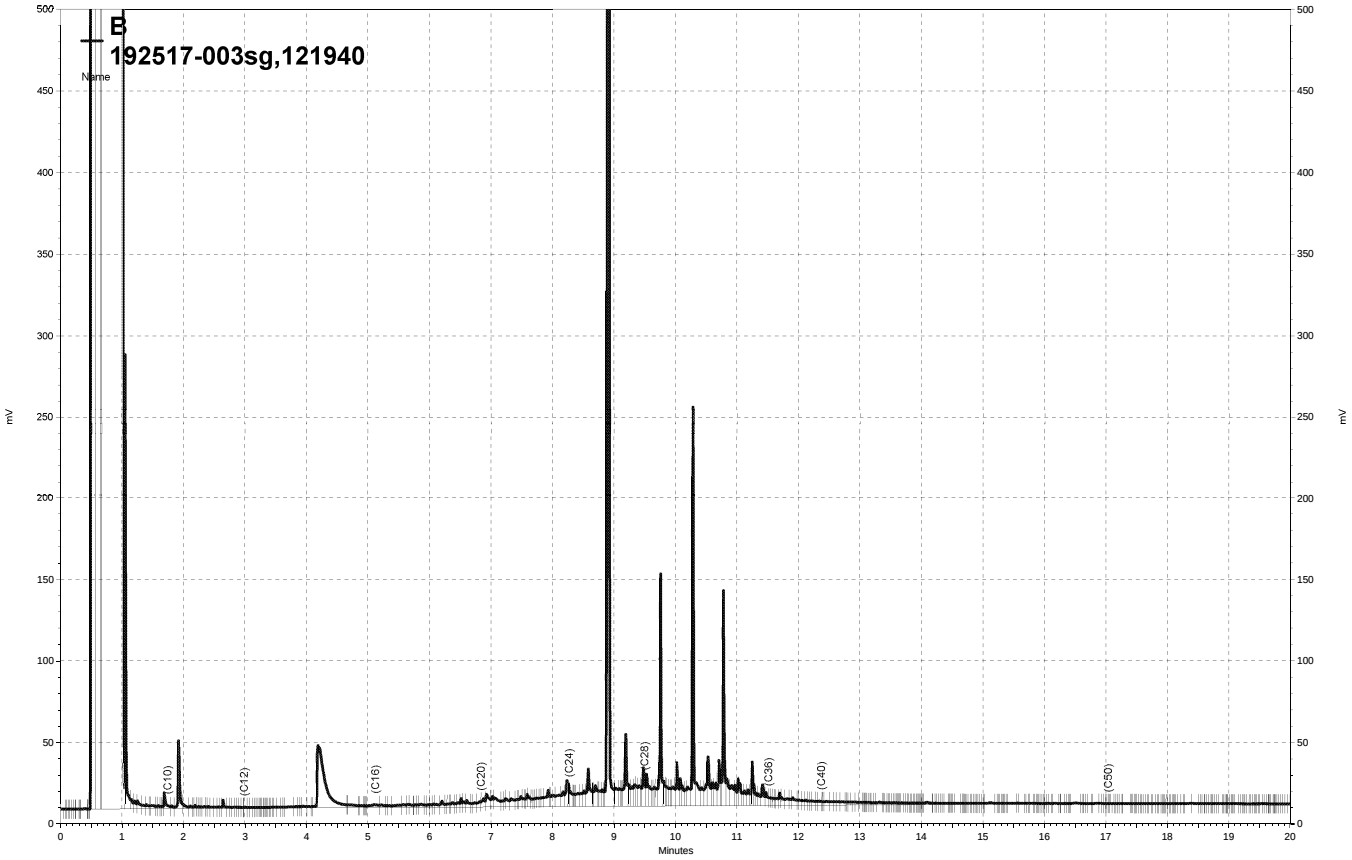

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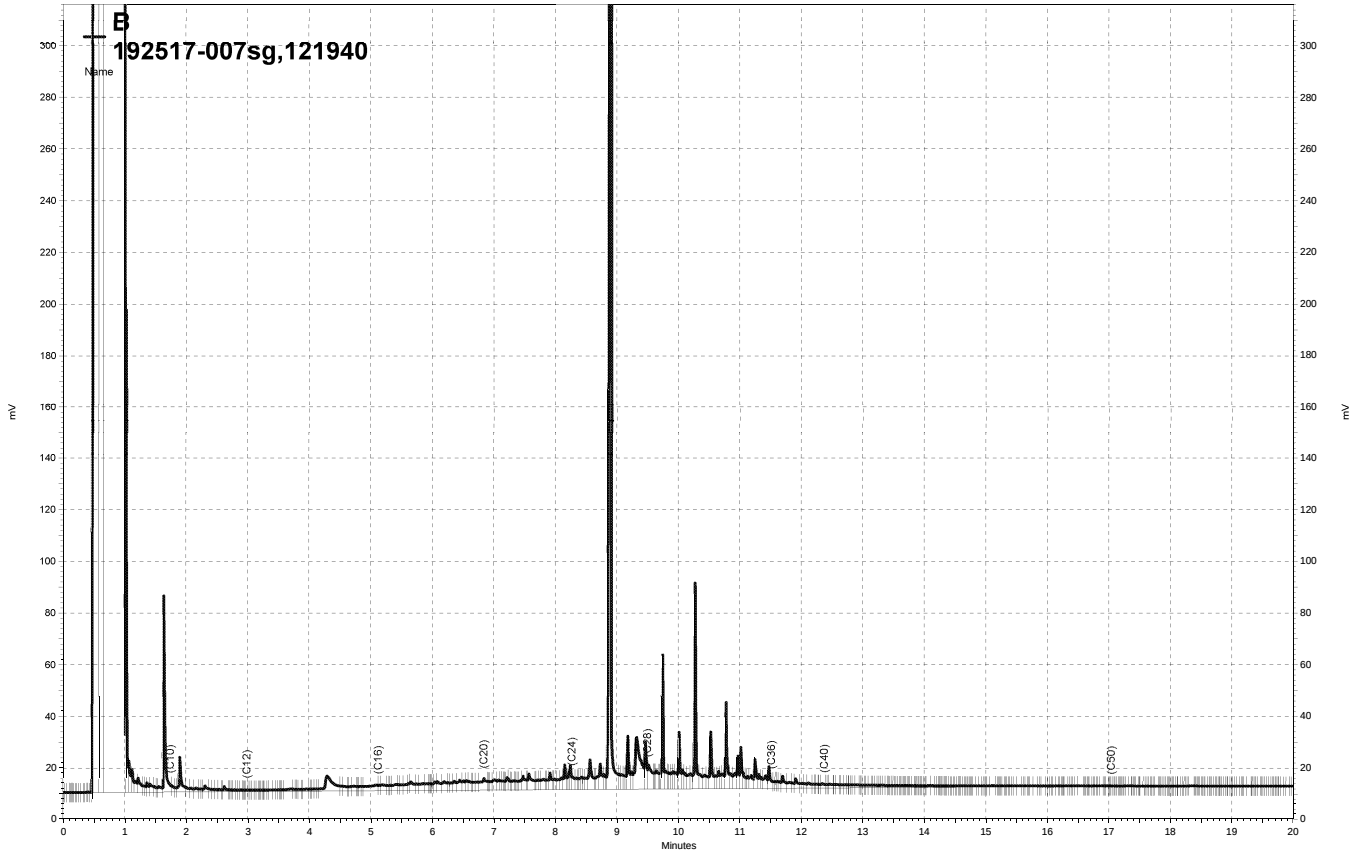

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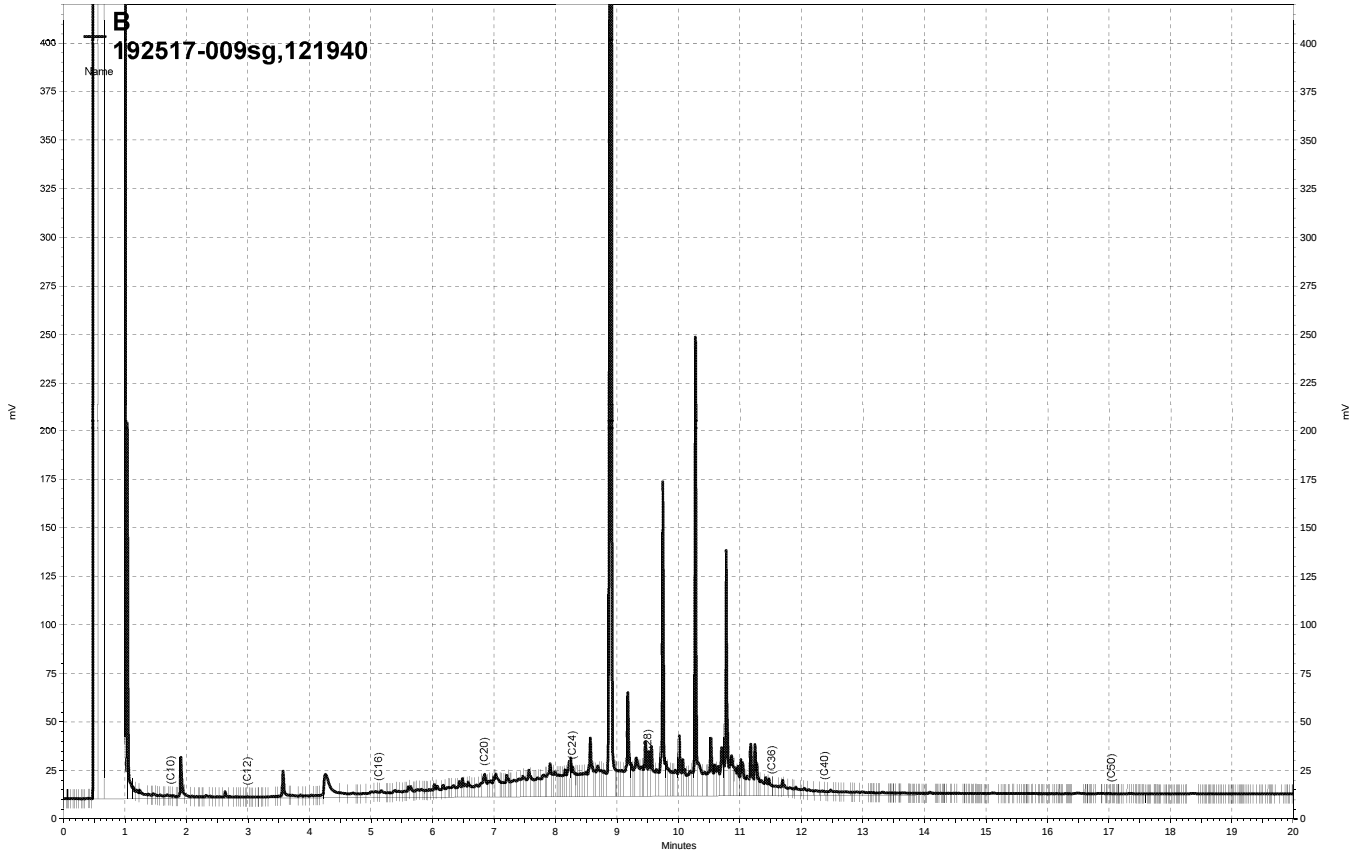

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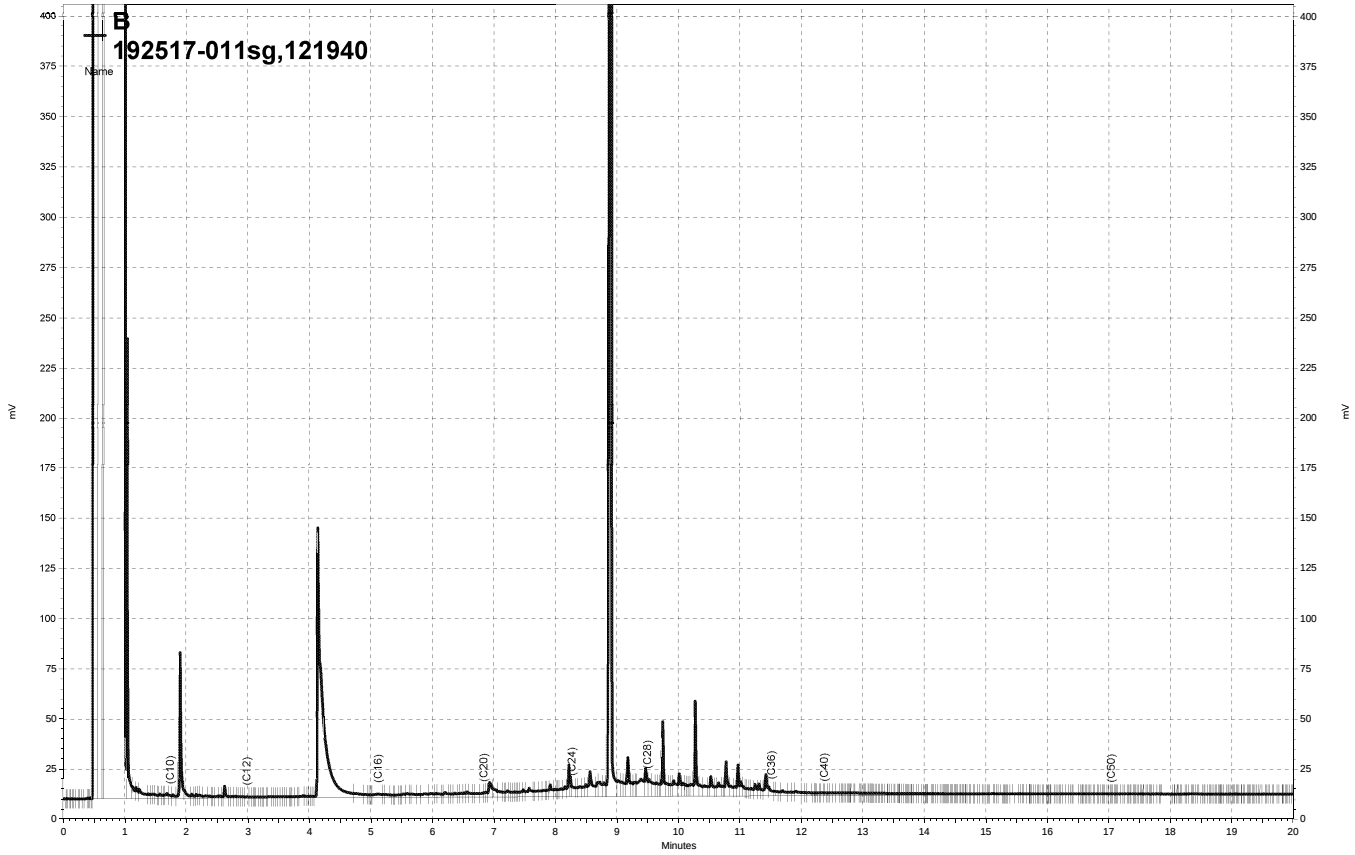

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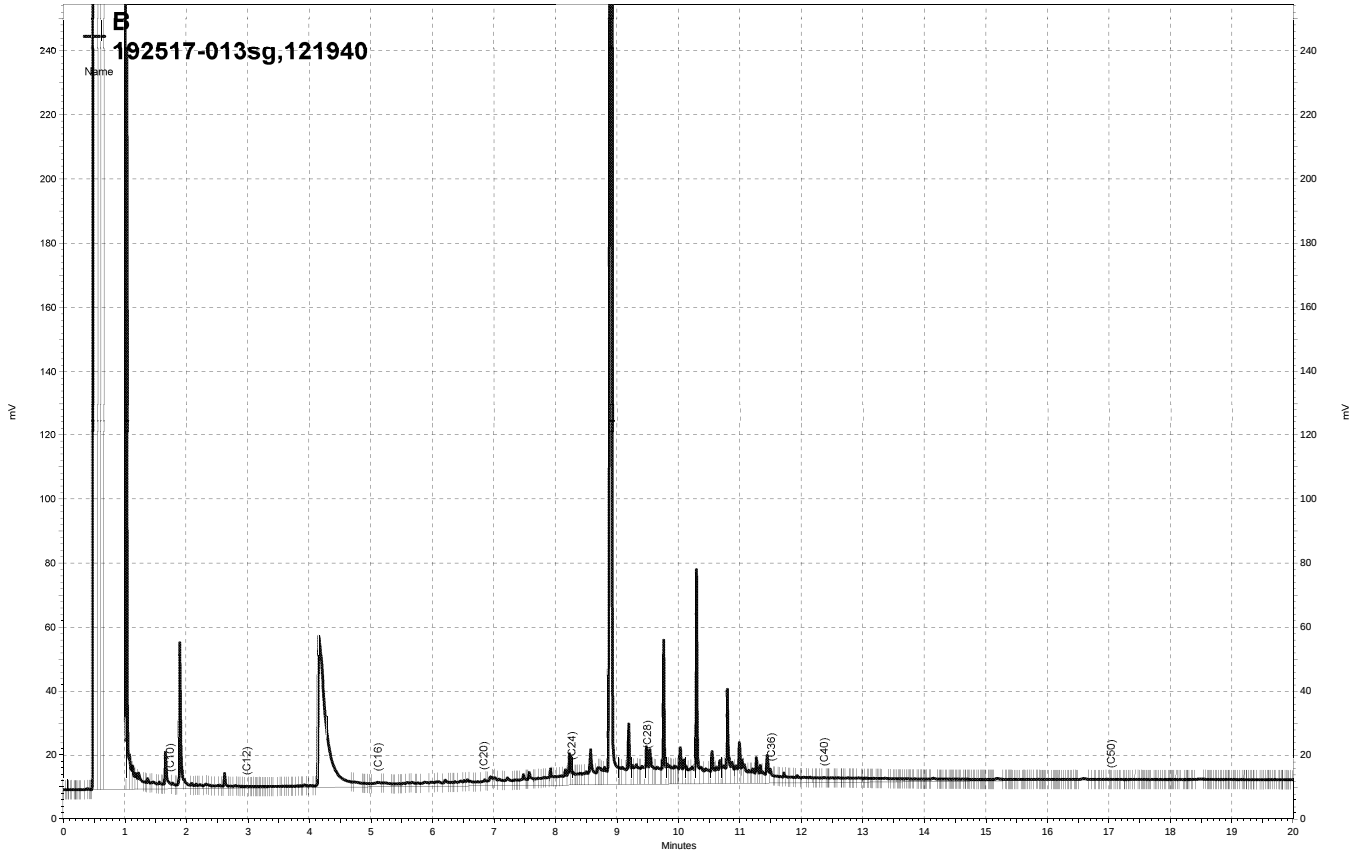

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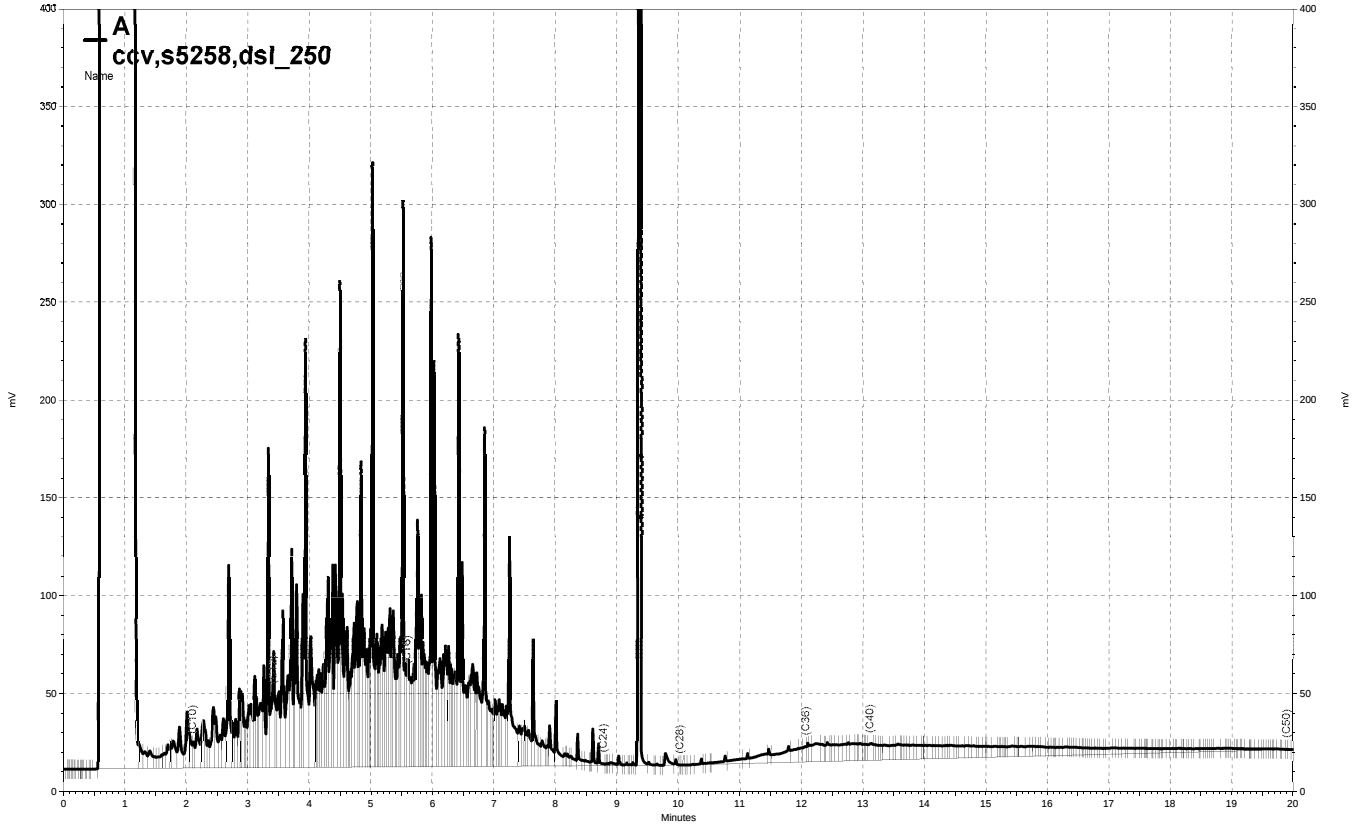

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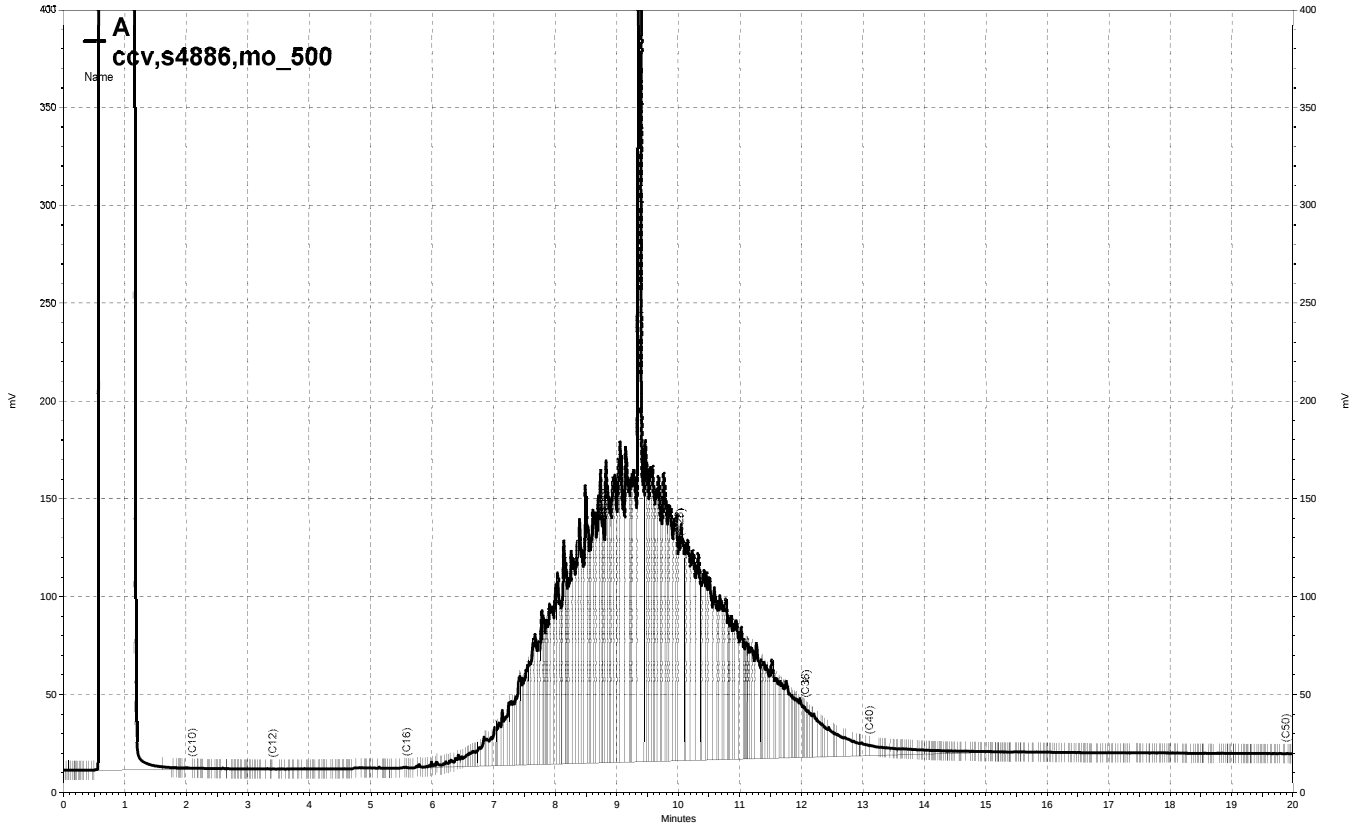

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Purgeable Organics by GC/MS

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2842	Analysis:	EPA 8260B
Field ID:	HA-12; 1-1.5	Diln Fac:	0.9434
Lab ID:	192517-001	Batch#:	121899
Matrix:	Soil	Sampled:	02/05/07
Units:	ug/Kg	Received:	02/06/07
Basis:	as received	Analyzed:	02/07/07

Analyte	Result	RL
Freon 12	ND	9.4
Chloromethane	ND	9.4
Vinyl Chloride	ND	9.4
Bromomethane	ND	9.4
Chloroethane	ND	9.4
Trichlorofluoromethane	ND	4.7
Acetone	ND	24
Freon 113	ND	4.7
1,1-Dichloroethene	ND	4.7
Carbon Disulfide	ND	4.7
MTBE	ND	4.7
trans-1,2-Dichloroethene	ND	4.7
Vinyl Acetate	ND	47
1,1-Dichloroethane	ND	4.7
2-Butanone	ND	9.4
cis-1,2-Dichloroethene	ND	4.7
2,2-Dichloropropane	ND	4.7
Chloroform	ND	4.7
Bromochloromethane	ND	4.7
1,1,1-Trichloroethane	ND	4.7
1,1-Dichloropropene	ND	4.7
Carbon Tetrachloride	ND	4.7
1,2-Dichloroethane	ND	4.7
Benzene	ND	4.7
Trichloroethene	ND	4.7
1,2-Dichloropropane	ND	4.7
Bromodichloromethane	ND	4.7
Dibromomethane	ND	4.7
4-Methyl-2-Pentanone	ND	9.4
cis-1,3-Dichloropropene	ND	4.7
Toluene	ND	4.7
trans-1,3-Dichloropropene	ND	4.7
1,1,2-Trichloroethane	ND	4.7
2-Hexanone	ND	9.4
1,3-Dichloropropane	ND	4.7
Tetrachloroethene	ND	4.7
Dibromochloromethane	ND	4.7

ND= Not Detected
RL= Reporting Limit

Purgeable Organics by GC/MS

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2842	Analysis:	EPA 8260B
Field ID:	HA-12; 1-1.5	Diln Fac:	0.9434
Lab ID:	192517-001	Batch#:	121899
Matrix:	Soil	Sampled:	02/05/07
Units:	ug/Kg	Received:	02/06/07
Basis:	as received	Analyzed:	02/07/07

Analyte	Result	RL
1,2-Dibromoethane	ND	4.7
Chlorobenzene	ND	4.7
1,1,1,2-Tetrachloroethane	ND	4.7
Ethylbenzene	ND	4.7
m,p-Xylenes	ND	4.7
o-Xylene	ND	4.7
Styrene	ND	4.7
Bromoform	ND	4.7
Isopropylbenzene	ND	4.7
1,1,2,2-Tetrachloroethane	ND	4.7
1,2,3-Trichloropropane	ND	4.7
Propylbenzene	ND	4.7
Bromobenzene	ND	4.7
1,3,5-Trimethylbenzene	ND	4.7
2-Chlorotoluene	ND	4.7
4-Chlorotoluene	ND	4.7
tert-Butylbenzene	ND	4.7
1,2,4-Trimethylbenzene	ND	4.7
sec-Butylbenzene	ND	4.7
para-Isopropyl Toluene	ND	4.7
1,3-Dichlorobenzene	ND	4.7
1,4-Dichlorobenzene	ND	4.7
n-Butylbenzene	ND	4.7
1,2-Dichlorobenzene	ND	4.7
1,2-Dibromo-3-Chloropropane	ND	4.7
1,2,4-Trichlorobenzene	ND	4.7
Hexachlorobutadiene	ND	4.7
Naphthalene	ND	4.7
1,2,3-Trichlorobenzene	ND	4.7
Tetrahydrofuran	ND	47

Surrogate	%REC	Limits
Dibromofluoromethane	105	79-120
1,2-Dichloroethane-d4	115	76-130
Toluene-d8	97	80-120
Bromofluorobenzene	106	80-126

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
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Purgeable Organics by GC/MS

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2842	Analysis:	EPA 8260B
Field ID:	HA-13; 1-1.5	Diln Fac:	0.9804
Lab ID:	192517-003	Batch#:	121899
Matrix:	Soil	Sampled:	02/05/07
Units:	ug/Kg	Received:	02/06/07
Basis:	as received	Analyzed:	02/07/07

Analyte	Result	RL
Freon 12	ND	9.8
Chloromethane	ND	9.8
Vinyl Chloride	ND	9.8
Bromomethane	ND	9.8
Chloroethane	ND	9.8
Trichlorofluoromethane	ND	4.9
Acetone	ND	25
Freon 113	ND	4.9
1,1-Dichloroethene	ND	4.9
Carbon Disulfide	ND	4.9
MTBE	ND	4.9
trans-1,2-Dichloroethene	ND	4.9
Vinyl Acetate	ND	49
1,1-Dichloroethane	ND	4.9
2-Butanone	ND	9.8
cis-1,2-Dichloroethene	ND	4.9
2,2-Dichloropropane	ND	4.9
Chloroform	ND	4.9
Bromochloromethane	ND	4.9
1,1,1-Trichloroethane	ND	4.9
1,1-Dichloropropene	ND	4.9
Carbon Tetrachloride	ND	4.9
1,2-Dichloroethane	ND	4.9
Benzene	ND	4.9
Trichloroethene	ND	4.9
1,2-Dichloropropane	ND	4.9
Bromodichloromethane	ND	4.9
Dibromomethane	ND	4.9
4-Methyl-2-Pentanone	ND	9.8
cis-1,3-Dichloropropene	ND	4.9
Toluene	ND	4.9
trans-1,3-Dichloropropene	ND	4.9
1,1,2-Trichloroethane	ND	4.9
2-Hexanone	ND	9.8
1,3-Dichloropropane	ND	4.9
Tetrachloroethene	ND	4.9
Dibromochloromethane	ND	4.9

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
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Purgeable Organics by GC/MS

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2842	Analysis:	EPA 8260B
Field ID:	HA-13; 1-1.5	Diln Fac:	0.9804
Lab ID:	192517-003	Batch#:	121899
Matrix:	Soil	Sampled:	02/05/07
Units:	ug/Kg	Received:	02/06/07
Basis:	as received	Analyzed:	02/07/07

Analyte	Result	RL
1,2-Dibromoethane	ND	4.9
Chlorobenzene	ND	4.9
1,1,1,2-Tetrachloroethane	ND	4.9
Ethylbenzene	ND	4.9
m,p-Xylenes	ND	4.9
o-Xylene	ND	4.9
Styrene	ND	4.9
Bromoform	ND	4.9
Isopropylbenzene	ND	4.9
1,1,2,2-Tetrachloroethane	ND	4.9
1,2,3-Trichloropropane	ND	4.9
Propylbenzene	ND	4.9
Bromobenzene	ND	4.9
1,3,5-Trimethylbenzene	ND	4.9
2-Chlorotoluene	ND	4.9
4-Chlorotoluene	ND	4.9
tert-Butylbenzene	ND	4.9
1,2,4-Trimethylbenzene	ND	4.9
sec-Butylbenzene	ND	4.9
para-Isopropyl Toluene	ND	4.9
1,3-Dichlorobenzene	ND	4.9
1,4-Dichlorobenzene	ND	4.9
n-Butylbenzene	ND	4.9
1,2-Dichlorobenzene	ND	4.9
1,2-Dibromo-3-Chloropropane	ND	4.9
1,2,4-Trichlorobenzene	ND	4.9
Hexachlorobutadiene	ND	4.9
Naphthalene	ND	4.9
1,2,3-Trichlorobenzene	ND	4.9
Tetrahydrofuran	ND	49

Surrogate	%REC	Limits
Dibromofluoromethane	108	79-120
1,2-Dichloroethane-d4	111	76-130
Toluene-d8	89	80-120
Bromofluorobenzene	104	80-126

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
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Purgeable Organics by GC/MS

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2842	Analysis:	EPA 8260B
Field ID:	HA-14; 1-1.5	Diln Fac:	0.9259
Lab ID:	192517-005	Batch#:	121899
Matrix:	Soil	Sampled:	02/05/07
Units:	ug/Kg	Received:	02/06/07
Basis:	as received	Analyzed:	02/07/07

Analyte	Result	RL
Freon 12	ND	9.3
Chloromethane	ND	9.3
Vinyl Chloride	ND	9.3
Bromomethane	ND	9.3
Chloroethane	ND	9.3
Trichlorofluoromethane	ND	4.6
Acetone	ND	23
Freon 113	ND	4.6
1,1-Dichloroethene	ND	4.6
Carbon Disulfide	ND	4.6
MTBE	ND	4.6
trans-1,2-Dichloroethene	ND	4.6
Vinyl Acetate	ND	46
1,1-Dichloroethane	ND	4.6
2-Butanone	ND	9.3
cis-1,2-Dichloroethene	ND	4.6
2,2-Dichloropropane	ND	4.6
Chloroform	ND	4.6
Bromochloromethane	ND	4.6
1,1,1-Trichloroethane	ND	4.6
1,1-Dichloropropene	ND	4.6
Carbon Tetrachloride	ND	4.6
1,2-Dichloroethane	ND	4.6
Benzene	ND	4.6
Trichloroethene	ND	4.6
1,2-Dichloropropane	ND	4.6
Bromodichloromethane	ND	4.6
Dibromomethane	ND	4.6
4-Methyl-2-Pentanone	ND	9.3
cis-1,3-Dichloropropene	ND	4.6
Toluene	ND	4.6
trans-1,3-Dichloropropene	ND	4.6
1,1,2-Trichloroethane	ND	4.6
2-Hexanone	ND	9.3
1,3-Dichloropropane	ND	4.6
Tetrachloroethene	ND	4.6
Dibromochloromethane	ND	4.6

ND= Not Detected
RL= Reporting Limit

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Purgeable Organics by GC/MS

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2842	Analysis:	EPA 8260B
Field ID:	HA-14; 1-1.5	Diln Fac:	0.9259
Lab ID:	192517-005	Batch#:	121899
Matrix:	Soil	Sampled:	02/05/07
Units:	ug/Kg	Received:	02/06/07
Basis:	as received	Analyzed:	02/07/07

Analyte	Result	RL
1,2-Dibromoethane	ND	4.6
Chlorobenzene	ND	4.6
1,1,1,2-Tetrachloroethane	ND	4.6
Ethylbenzene	ND	4.6
m,p-Xylenes	ND	4.6
o-Xylene	ND	4.6
Styrene	ND	4.6
Bromoform	ND	4.6
Isopropylbenzene	ND	4.6
1,1,2,2-Tetrachloroethane	ND	4.6
1,2,3-Trichloropropane	ND	4.6
Propylbenzene	ND	4.6
Bromobenzene	ND	4.6
1,3,5-Trimethylbenzene	ND	4.6
2-Chlorotoluene	ND	4.6
4-Chlorotoluene	ND	4.6
tert-Butylbenzene	ND	4.6
1,2,4-Trimethylbenzene	ND	4.6
sec-Butylbenzene	ND	4.6
para-Isopropyl Toluene	ND	4.6
1,3-Dichlorobenzene	ND	4.6
1,4-Dichlorobenzene	ND	4.6
n-Butylbenzene	ND	4.6
1,2-Dichlorobenzene	ND	4.6
1,2-Dibromo-3-Chloropropane	ND	4.6
1,2,4-Trichlorobenzene	ND	4.6
Hexachlorobutadiene	ND	4.6
Naphthalene	ND	4.6
1,2,3-Trichlorobenzene	ND	4.6
Tetrahydrofuran	ND	46

Surrogate	%REC	Limits
Dibromofluoromethane	108	79-120
1,2-Dichloroethane-d4	125	76-130
Toluene-d8	100	80-120
Bromofluorobenzene	102	80-126

ND= Not Detected
RL= Reporting Limit

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Batch QC Report

Purgeable Organics by GC/MS

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2842	Analysis:	EPA 8260B
Type:	LCS	Basis:	as received
Lab ID:	QC374386	Diln Fac:	1.000
Matrix:	Soil	Batch#:	121899
Units:	ug/Kg	Analyzed:	02/07/07

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	25.00	27.46	110	79-132
Benzene	25.00	25.81	103	80-120
Trichloroethene	25.00	25.53	102	80-121
Toluene	25.00	25.97	104	80-120
Chlorobenzene	25.00	25.95	104	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	104	79-120
1,2-Dichloroethane-d4	112	76-130
Toluene-d8	102	80-120
Bromofluorobenzene	99	80-126

Curtis & Tompkins, Ltd.
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Batch QC Report

Purgeable Organics by GC/MS

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2842	Analysis:	EPA 8260B
Type:	BLANK	Basis:	as received
Lab ID:	QC374388	Diln Fac:	1.000
Matrix:	Soil	Batch#:	121899
Units:	ug/Kg	Analyzed:	02/07/07

Analyte	Result	RL
Freon 12	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Trichlorofluoromethane	ND	5.0
Acetone	ND	25
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	5.0
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	10
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0
Dibromochloromethane	ND	5.0

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
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Batch QC Report

Purgeable Organics by GC/MS

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2842	Analysis:	EPA 8260B
Type:	BLANK	Basis:	as received
Lab ID:	QC374388	Diln Fac:	1.000
Matrix:	Soil	Batch#:	121899
Units:	ug/Kg	Analyzed:	02/07/07

Analyte	Result	RL
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	ND	5.0
1,2,3-Trichlorobenzene	ND	5.0
Tetrahydrofuran	ND	50

Surrogate	%REC	Limits
Dibromofluoromethane	108	79-120
1,2-Dichloroethane-d4	116	76-130
Toluene-d8	99	80-120
Bromofluorobenzene	104	80-126

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2842	Analysis:	EPA 8260B
Field ID:	HA-12; 1-1.5	Diln Fac:	0.9434
MSS Lab ID:	192517-001	Batch#:	121899
Matrix:	Soil	Sampled:	02/05/07
Units:	ug/Kg	Received:	02/06/07
Basis:	as received	Analyzed:	02/07/07

Type: MS Lab ID: QC374400

Analyte	MSS Result	Spiked	Result	%REC	Limits
1,1-Dichloroethene	<0.5398	47.17	54.82	116	72-135
Benzene	<0.1300	47.17	45.93	97	67-120
Trichloroethene	<0.3087	47.17	45.19	96	65-131
Toluene	<0.5213	47.17	45.36	96	62-120
Chlorobenzene	<0.4878	47.17	42.90	91	59-120

Surrogate	%REC	Limits
Dibromofluoromethane	101	79-120
1,2-Dichloroethane-d4	100	76-130
Toluene-d8	99	80-120
Bromofluorobenzene	101	80-126

Type: MSD Lab ID: QC374401

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	47.17	55.11	117	72-135	1	22
Benzene	47.17	46.16	98	67-120	0	20
Trichloroethene	47.17	45.33	96	65-131	0	20
Toluene	47.17	45.43	96	62-120	0	20
Chlorobenzene	47.17	44.89	95	59-120	5	21

Surrogate	%REC	Limits
Dibromofluoromethane	98	79-120
1,2-Dichloroethane-d4	97	76-130
Toluene-d8	99	80-120
Bromofluorobenzene	101	80-126

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

California Title 26 Metals

Lab #:	192517	Project#:	2842
Client:	SOMA Environmental Engineering Inc.	Location:	5565 Tesla Road Livermore, CA.
Field ID:	HA-15; 1-1.5	Diln Fac:	1.000
Lab ID:	192517-007	Sampled:	02/05/07
Matrix:	Soil	Received:	02/06/07
Units:	mg/Kg	Analyzed:	02/07/07
Basis:	as received		

Analyte	Result	RL	Batch#	Prepared	Prep	Analysis
Antimony	0.86	0.50	121888	02/06/07	EPA 3050B	EPA 6010B
Arsenic	3.6	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Barium	240	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Beryllium	0.34	0.10	121888	02/06/07	EPA 3050B	EPA 6010B
Cadmium	ND	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Chromium	64	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Cobalt	18	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Copper	35	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Lead	7.5	0.15	121888	02/06/07	EPA 3050B	EPA 6010B
Mercury	0.042	0.020	121923	02/07/07	METHOD	EPA 7471A
Molybdenum	ND	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Nickel	150	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Selenium	ND	0.50	121888	02/06/07	EPA 3050B	EPA 6010B
Silver	0.35	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Thallium	ND	0.50	121888	02/06/07	EPA 3050B	EPA 6010B
Vanadium	32	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Zinc	49	1.0	121888	02/06/07	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

California Title 26 Metals

Lab #:	192517	Project#:	2842
Client:	SOMA Environmental Engineering Inc.	Location:	5565 Tesla Road Livermore, CA.
Field ID:	HA-15; 3-3.5	Basis:	as received
Lab ID:	192517-008	Diln Fac:	1.000
Matrix:	Soil	Sampled:	02/05/07
Units:	mg/Kg	Received:	02/06/07

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Antimony	ND	0.50	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Arsenic	5.3	0.27	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Barium	210	0.27	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Beryllium	0.32	0.11	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Cadmium	ND	0.27	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Chromium	73	0.27	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Cobalt	18	0.27	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Copper	36	0.27	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Lead	6.4	0.16	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Mercury	0.066	0.020	122283	02/20/07	02/20/07	METHOD	EPA 7471A
Molybdenum	0.48	0.27	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Nickel	170	0.27	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Selenium	0.69	0.50	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Silver	0.63	0.27	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Thallium	ND	0.50	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Vanadium	29	0.27	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Zinc	43	1.1	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

California Title 26 Metals

Lab #:	192517	Project#:	2842
Client:	SOMA Environmental Engineering Inc.	Location:	5565 Tesla Road Livermore, CA.
Field ID:	HA-16; 1-1.5	Diln Fac:	1.000
Lab ID:	192517-009	Sampled:	02/05/07
Matrix:	Soil	Received:	02/06/07
Units:	mg/Kg	Analyzed:	02/07/07
Basis:	as received		

Analyte	Result	RL	Batch#	Prepared	Prep	Analysis
Antimony	0.89	0.50	121888	02/06/07	EPA 3050B	EPA 6010B
Arsenic	3.4	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Barium	200	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Beryllium	0.32	0.10	121888	02/06/07	EPA 3050B	EPA 6010B
Cadmium	ND	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Chromium	54	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Cobalt	18	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Copper	30	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Lead	8.5	0.15	121888	02/06/07	EPA 3050B	EPA 6010B
Mercury	0.037	0.021	121923	02/07/07	METHOD	EPA 7471A
Molybdenum	0.43	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Nickel	120	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Selenium	ND	0.50	121888	02/06/07	EPA 3050B	EPA 6010B
Silver	ND	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Thallium	ND	0.50	121888	02/06/07	EPA 3050B	EPA 6010B
Vanadium	31	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Zinc	46	1.0	121888	02/06/07	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

California Title 26 Metals

Lab #:	192517	Project#:	2842
Client:	SOMA Environmental Engineering Inc.	Location:	5565 Tesla Road Livermore, CA.
Field ID:	HA-16; 3-3.5	Basis:	as received
Lab ID:	192517-010	Diln Fac:	1.000
Matrix:	Soil	Sampled:	02/05/07
Units:	mg/Kg	Received:	02/06/07

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Antimony	ND	0.50	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Arsenic	3.9	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Barium	160	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Beryllium	0.32	0.10	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Cadmium	ND	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Chromium	68	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Cobalt	17	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Copper	30	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Lead	6.3	0.15	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Mercury	0.054	0.020	122283	02/20/07	02/20/07	METHOD	EPA 7471A
Molybdenum	0.36	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Nickel	170	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Selenium	ND	0.50	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Silver	ND	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Thallium	ND	0.50	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Vanadium	23	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Zinc	42	1.0	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

California Title 26 Metals

Lab #:	192517	Project#:	2842
Client:	SOMA Environmental Engineering Inc.	Location:	5565 Tesla Road Livermore, CA.
Field ID:	HA-17; 1-1.5	Diln Fac:	1.000
Lab ID:	192517-011	Sampled:	02/05/07
Matrix:	Soil	Received:	02/06/07
Units:	mg/Kg	Analyzed:	02/07/07
Basis:	as received		

Analyte	Result	RL	Batch#	Prepared	Prep	Analysis
Antimony	1.1	0.50	121888	02/06/07	EPA 3050B	EPA 6010B
Arsenic	3.4	0.26	121888	02/06/07	EPA 3050B	EPA 6010B
Barium	270	0.26	121888	02/06/07	EPA 3050B	EPA 6010B
Beryllium	0.36	0.10	121888	02/06/07	EPA 3050B	EPA 6010B
Cadmium	ND	0.26	121888	02/06/07	EPA 3050B	EPA 6010B
Chromium	67	0.26	121888	02/06/07	EPA 3050B	EPA 6010B
Cobalt	19	0.26	121888	02/06/07	EPA 3050B	EPA 6010B
Copper	34	0.26	121888	02/06/07	EPA 3050B	EPA 6010B
Lead	7.7	0.16	121888	02/06/07	EPA 3050B	EPA 6010B
Mercury	0.033	0.020	121923	02/07/07	METHOD	EPA 7471A
Molybdenum	ND	0.26	121888	02/06/07	EPA 3050B	EPA 6010B
Nickel	160	0.26	121888	02/06/07	EPA 3050B	EPA 6010B
Selenium	ND	0.50	121888	02/06/07	EPA 3050B	EPA 6010B
Silver	ND	0.26	121888	02/06/07	EPA 3050B	EPA 6010B
Thallium	ND	0.50	121888	02/06/07	EPA 3050B	EPA 6010B
Vanadium	34	0.26	121888	02/06/07	EPA 3050B	EPA 6010B
Zinc	50	1.0	121888	02/06/07	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

California Title 26 Metals

Lab #:	192517	Project#:	2842
Client:	SOMA Environmental Engineering Inc.	Location:	5565 Tesla Road Livermore, CA.
Field ID:	HA-17; 3-3.5	Basis:	as received
Lab ID:	192517-012	Diln Fac:	1.000
Matrix:	Soil	Sampled:	02/05/07
Units:	mg/Kg	Received:	02/06/07

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Antimony	ND	0.50	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Arsenic	5.4	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Barium	280	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Beryllium	0.39	0.10	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Cadmium	ND	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Chromium	78	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Cobalt	21	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Copper	36	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Lead	7.5	0.15	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Mercury	0.040	0.021	122283	02/20/07	02/20/07	METHOD	EPA 7471A
Molybdenum	0.64	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Nickel	210	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Selenium	ND	0.50	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Silver	ND	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Thallium	ND	0.50	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Vanadium	30	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Zinc	49	1.0	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

California Title 26 Metals

Lab #:	192517	Project#:	2842
Client:	SOMA Environmental Engineering Inc.	Location:	5565 Tesla Road Livermore, CA.
Field ID:	HA-18; 1-1.5	Diln Fac:	1.000
Lab ID:	192517-013	Sampled:	02/05/07
Matrix:	Soil	Received:	02/06/07
Units:	mg/Kg	Analyzed:	02/07/07
Basis:	as received		

Analyte	Result	RL	Batch#	Prepared	Prep	Analysis
Antimony	1.0	0.50	121888	02/06/07	EPA 3050B	EPA 6010B
Arsenic	2.9	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Barium	270	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Beryllium	0.32	0.10	121888	02/06/07	EPA 3050B	EPA 6010B
Cadmium	ND	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Chromium	59	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Cobalt	16	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Copper	31	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Lead	7.1	0.15	121888	02/06/07	EPA 3050B	EPA 6010B
Mercury	0.029	0.020	121923	02/07/07	METHOD	EPA 7471A
Molybdenum	ND	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Nickel	150	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Selenium	ND	0.50	121888	02/06/07	EPA 3050B	EPA 6010B
Silver	ND	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Thallium	ND	0.50	121888	02/06/07	EPA 3050B	EPA 6010B
Vanadium	29	0.25	121888	02/06/07	EPA 3050B	EPA 6010B
Zinc	45	1.0	121888	02/06/07	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

California Title 26 Metals

Lab #:	192517	Project#:	2842
Client:	SOMA Environmental Engineering Inc.	Location:	5565 Tesla Road Livermore, CA.
Field ID:	HA-18; 3-3.5	Basis:	as received
Lab ID:	192517-014	Diln Fac:	1.000
Matrix:	Soil	Sampled:	02/05/07
Units:	mg/Kg	Received:	02/06/07

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Antimony	ND	0.50	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Arsenic	4.6	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Barium	210	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Beryllium	0.34	0.10	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Cadmium	ND	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Chromium	68	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Cobalt	19	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Copper	31	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Lead	6.8	0.15	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Mercury	0.037	0.020	122283	02/20/07	02/20/07	METHOD	EPA 7471A
Molybdenum	0.45	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Nickel	180	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Selenium	ND	0.50	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Silver	ND	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Thallium	ND	0.50	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Vanadium	24	0.25	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B
Zinc	43	1.0	122221	02/16/07	02/16/07	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

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Analytical Laboratories, Since 1878

Batch QC Report

California Title 26 Metals

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3050B
Project#:	2842	Analysis:	EPA 6010B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC374356	Batch#:	121888
Matrix:	Soil	Prepared:	02/06/07
Units:	mg/Kg	Analyzed:	02/07/07
Basis:	as received		

Analyte	Result	RL
Antimony	ND	0.50
Arsenic	ND	0.25
Barium	ND	0.25
Beryllium	ND	0.10
Cadmium	ND	0.25
Chromium	ND	0.25
Cobalt	ND	0.25
Copper	ND	0.25
Lead	ND	0.15
Molybdenum	ND	0.25
Nickel	ND	0.25
Selenium	ND	0.50
Silver	ND	0.25
Thallium	ND	0.50
Vanadium	ND	0.25
Zinc	ND	1.0

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

California Title 26 Metals

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3050B
Project#:	2842	Analysis:	EPA 6010B
Matrix:	Soil	Batch#:	121888
Units:	mg/Kg	Prepared:	02/06/07
Basis:	as received	Analyzed:	02/07/07
Diln Fac:	1.000		

Type: BS Lab ID: QC374357

Analyte	Spiked	Result	%REC	Limits
Antimony	100.0	91.71	92	80-120
Arsenic	50.00	48.32	97	80-120
Barium	100.0	97.21	97	80-120
Beryllium	2.500	2.354	94	80-120
Cadmium	10.00	9.719	97	80-120
Chromium	100.0	95.68	96	80-120
Cobalt	25.00	23.21	93	80-120
Copper	12.50	11.72	94	80-120
Lead	100.0	93.70	94	80-120
Molybdenum	20.00	20.94	105	80-120
Nickel	25.00	23.57	94	80-120
Selenium	50.00	48.15	96	80-120
Silver	10.00	9.133	91	80-120
Thallium	50.00	47.24	94	80-120
Vanadium	25.00	23.39	94	80-120
Zinc	25.00	24.47	98	80-120

Type: BSD Lab ID: QC374358

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Antimony	100.0	104.0	104	80-120	13	20
Arsenic	50.00	53.95	108	80-120	11	20
Barium	100.0	106.4	106	80-120	9	20
Beryllium	2.500	2.582	103	80-120	9	20
Cadmium	10.00	10.92	109	80-120	12	20
Chromium	100.0	104.7	105	80-120	9	20
Cobalt	25.00	25.98	104	80-120	11	20
Copper	12.50	12.86	103	80-120	9	20
Lead	100.0	106.2	106	80-120	12	20
Molybdenum	20.00	23.71	119	80-120	12	20
Nickel	25.00	26.40	106	80-120	11	20
Selenium	50.00	54.50	109	80-120	12	20
Silver	10.00	10.17	102	80-120	11	20
Thallium	50.00	53.01	106	80-120	12	20
Vanadium	25.00	26.19	105	80-120	11	20
Zinc	25.00	26.76	107	80-120	9	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

California Title 26 Metals

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3050B
Project#:	2842	Analysis:	EPA 6010B
Field ID:	ZZZZZZZZZZ	Batch#:	121888
MSS Lab ID:	192510-006	Sampled:	01/24/07
Matrix:	Soil	Received:	02/06/07
Units:	mg/Kg	Prepared:	02/06/07
Basis:	as received	Analyzed:	02/07/07
Diln Fac:	1.000		

Type: MS Lab ID: QC374359

Analyte	MSS Result	Spiked	Result	%REC	Limits
Antimony	2.078	96.15	49.83	50	1-126
Arsenic	3.830	48.08	46.24	88	74-120
Barium	88.36	96.15	188.1	104	53-134
Beryllium	0.3507	2.404	2.592	93	78-120
Cadmium	<0.002598	9.615	8.948	93	71-120
Chromium	52.74	96.15	139.1	90	64-120
Cobalt	4.688	24.04	26.89	92	64-120
Copper	66.94	12.02	77.52	88 NM	56-139
Lead	82.92	96.15	130.3	49 *	57-120
Molybdenum	0.2681	19.23	18.26	94	68-120
Nickel	27.75	24.04	53.48	107	48-132
Selenium	0.4351	48.08	41.68	86	72-120
Silver	0.3969	9.615	9.546	95	67-120
Thallium	0.5097	48.08	41.86	86	69-120
Vanadium	111.1	24.04	136.4	105 NM	55-134
Zinc	25.41	24.04	50.61	105	46-133

Type: MSD Lab ID: QC374360

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Antimony	100.0	48.47	46	1-126	7	21
Arsenic	50.00	43.38	79	74-120	10	20
Barium	100.0	181.0	93	53-134	6	20
Beryllium	2.500	2.413	82	78-120	11	20
Cadmium	10.00	8.313	83	71-120	11	20
Chromium	100.0	130.6	78	64-120	9	20
Cobalt	25.00	25.60	84	64-120	8	20
Copper	12.50	70.31	27 NM	56-139	10	20
Lead	100.0	116.8	34 *	57-120	13	20
Molybdenum	20.00	17.69	87	68-120	7	20
Nickel	25.00	49.05	85	48-132	10	20
Selenium	50.00	40.30	80	72-120	7	20
Silver	10.00	8.824	84	67-120	12	20
Thallium	50.00	39.97	79	69-120	8	20
Vanadium	25.00	122.9	47 NM	55-134	11	20
Zinc	25.00	44.76	77	46-133	14	20

*= Value outside of QC limits; see narrative
NM= Not Meaningful: Sample concentration > 4X spike concentration
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

California Title 26 Metals

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	2842	Analysis:	EPA 7471A
Analyte:	Mercury	Basis:	as received
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC374477	Batch#:	121923
Matrix:	Soil	Prepared:	02/07/07
Units:	mg/Kg	Analyzed:	02/07/07

Result	RL
ND	0.020

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

California Title 26 Metals

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	2842	Analysis:	EPA 7471A
Analyte:	Mercury	Diln Fac:	1.000
Matrix:	Soil	Batch#:	121923
Units:	mg/Kg	Prepared:	02/07/07
Basis:	as received	Analyzed:	02/07/07

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC374478	0.5000	0.5240	105	80-120		
BSD	QC374479	0.5000	0.5140	103	80-120	2	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

California Title 26 Metals

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	2842	Analysis:	EPA 7471A
Analyte:	Mercury	Diln Fac:	1.000
Field ID:	ZZZZZZZZZZ	Batch#:	121923
MSS Lab ID:	192510-006	Sampled:	01/24/07
Matrix:	Soil	Received:	02/06/07
Units:	mg/Kg	Prepared:	02/07/07
Basis:	as received	Analyzed:	02/07/07

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC374481	0.1290	0.5102	0.6408	100	54-154		
MSD	QC374482		0.5000	0.6950	113	54-154	10	28

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

California Title 26 Metals

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	2842	Analysis:	EPA 7471A
Analyte:	Mercury	Basis:	as received
Field ID:	ZZZZZZZZZZ	Diln Fac:	20.00
Type:	SDUP	Batch#:	121923
MSS Lab ID:	192441-001	Sampled:	02/02/07
Lab ID:	QC374484	Received:	02/02/07
Matrix:	Soil	Prepared:	02/07/07
Units:	mg/Kg	Analyzed:	02/07/07

MSS Result	Result	RL	RPD	Lim
9.574	9.611	0.3704	0	28

RL= Reporting Limit
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

California Title 26 Metals

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3050B
Project#:	2842	Analysis:	EPA 6010B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC375599	Batch#:	122221
Matrix:	Soil	Prepared:	02/16/07
Units:	mg/Kg	Analyzed:	02/16/07
Basis:	as received		

Analyte	Result	RL
Antimony	ND	0.50
Arsenic	ND	0.25
Barium	ND	0.25
Beryllium	ND	0.10
Cadmium	ND	0.25
Chromium	ND	0.25
Cobalt	ND	0.25
Copper	ND	0.25
Lead	ND	0.15
Molybdenum	ND	0.25
Nickel	ND	0.25
Selenium	ND	0.50
Silver	ND	0.25
Thallium	ND	0.50
Vanadium	ND	0.25
Zinc	ND	1.0

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

California Title 26 Metals

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3050B
Project#:	2842	Analysis:	EPA 6010B
Matrix:	Soil	Batch#:	122221
Units:	mg/Kg	Prepared:	02/16/07
Basis:	as received	Analyzed:	02/16/07
Diln Fac:	1.000		

Type: BS Lab ID: QC375600

Analyte	Spiked	Result	%REC	Limits
Antimony	100.0	100.3	100	80-120
Arsenic	50.00	53.21	106	80-120
Barium	100.0	105.8	106	80-120
Beryllium	2.500	2.649	106	80-120
Cadmium	10.00	10.67	107	80-120
Chromium	100.0	105.1	105	80-120
Cobalt	25.00	26.06	104	80-120
Copper	12.50	12.92	103	80-120
Lead	100.0	105.6	106	80-120
Molybdenum	20.00	22.48	112	80-120
Nickel	25.00	25.86	103	80-120
Selenium	50.00	53.66	107	80-120
Silver	10.00	9.947	99	80-120
Thallium	50.00	52.98	106	80-120
Vanadium	25.00	26.08	104	80-120
Zinc	25.00	26.60	106	80-120

Type: BSD Lab ID: QC375601

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Antimony	100.0	92.46	92	80-120	8	20
Arsenic	50.00	48.84	98	80-120	9	20
Barium	100.0	98.39	98	80-120	7	20
Beryllium	2.500	2.457	98	80-120	8	20
Cadmium	10.00	9.588	96	80-120	11	20
Chromium	100.0	97.53	98	80-120	7	20
Cobalt	25.00	23.45	94	80-120	11	20
Copper	12.50	11.90	95	80-120	8	20
Lead	100.0	95.63	96	80-120	10	20
Molybdenum	20.00	20.40	102	80-120	10	20
Nickel	25.00	23.33	93	80-120	10	20
Selenium	50.00	48.79	98	80-120	10	20
Silver	10.00	9.240	92	80-120	7	20
Thallium	50.00	48.12	96	80-120	10	20
Vanadium	25.00	24.22	97	80-120	7	20
Zinc	25.00	24.78	99	80-120	7	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

California Title 26 Metals

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3050B
Project#:	2842	Analysis:	EPA 6010B
Field ID:	ZZZZZZZZZZ	Batch#:	122221
MSS Lab ID:	192754-005	Sampled:	02/15/07
Matrix:	Soil	Received:	02/15/07
Units:	mg/Kg	Prepared:	02/16/07
Basis:	as received	Analyzed:	02/16/07
Diln Fac:	1.000		

Type: MS Lab ID: QC375602

Analyte	MSS Result	Spiked	Result	%REC	Limits
Antimony	1.036	94.34	54.53	57	1-126
Arsenic	3.523	47.17	53.62	106	74-120
Barium	35.54	94.34	126.3	96	53-134
Beryllium	0.1414	2.358	2.575	103	78-120
Cadmium	0.04652	9.434	9.246	98	71-120
Chromium	37.34	94.34	127.1	95	64-120
Cobalt	6.154	23.58	28.30	94	64-120
Copper	6.816	11.79	20.54	116	56-139
Lead	19.65	94.34	111.9	98	57-120
Molybdenum	0.3444	18.87	19.54	102	68-120
Nickel	49.02	23.58	63.69	62	48-132
Selenium	0.2032	47.17	49.10	104	72-120
Silver	<0.06017	9.434	9.399	100	67-120
Thallium	<0.09011	47.17	45.60	97	69-120
Vanadium	21.00	23.58	47.61	113	55-134
Zinc	32.32	23.58	55.71	99	46-133

Type: MSD Lab ID: QC375603

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Antimony	91.74	55.33	59	1-126	4	21
Arsenic	45.87	50.60	103	74-120	3	20
Barium	91.74	124.9	97	53-134	1	20
Beryllium	2.294	2.503	103	78-120	0	20
Cadmium	9.174	9.176	100	71-120	2	20
Chromium	91.74	137.1	109	64-120	10	20
Cobalt	22.94	28.53	98	64-120	3	20
Copper	11.47	19.41	110	56-139	4	20
Lead	91.74	111.3	100	57-120	2	20
Molybdenum	18.35	19.31	103	68-120	2	20
Nickel	22.94	71.93	100	48-132	13	20
Selenium	45.87	47.56	103	72-120	0	20
Silver	9.174	9.103	99	67-120	0	20
Thallium	45.87	45.10	98	69-120	2	20
Vanadium	22.94	44.58	103	55-134	5	20
Zinc	22.94	56.52	106	46-133	3	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

California Title 26 Metals

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	2842	Analysis:	EPA 7471A
Analyte:	Mercury	Basis:	as received
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC375820	Batch#:	122283
Matrix:	Soil	Prepared:	02/20/07
Units:	mg/Kg	Analyzed:	02/20/07

Result	RL
ND	0.020

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

California Title 26 Metals

Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	2842	Analysis:	EPA 7471A
Analyte:	Mercury	Diln Fac:	1.000
Matrix:	Soil	Batch#:	122283
Units:	mg/Kg	Prepared:	02/20/07
Basis:	as received	Analyzed:	02/20/07

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC375821	0.5000	0.5360	107	80-120		
BSD	QC375822	0.5000	0.5300	106	80-120	1	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Batch QC Report

California Title 26 Metals

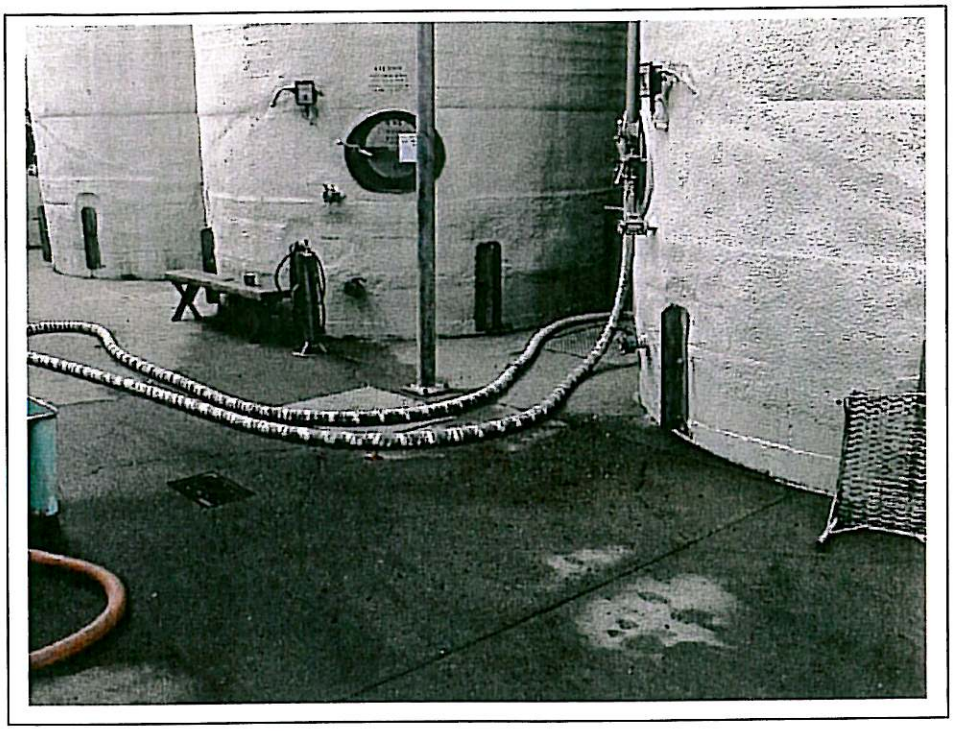
Lab #:	192517	Location:	5565 Tesla Road Livermore, CA.
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	2842	Analysis:	EPA 7471A
Analyte:	Mercury	Diln Fac:	1.000
Field ID:	ZZZZZZZZZZ	Batch#:	122283
MSS Lab ID:	192691-002	Sampled:	02/02/07
Matrix:	Soil	Received:	02/05/07
Units:	mg/Kg	Prepared:	02/20/07
Basis:	as received	Analyzed:	02/20/07

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC375823	0.008367	0.4902	0.5088	102	54-154		
MSD	QC375824		0.5000	0.5200	102	54-154	0	28

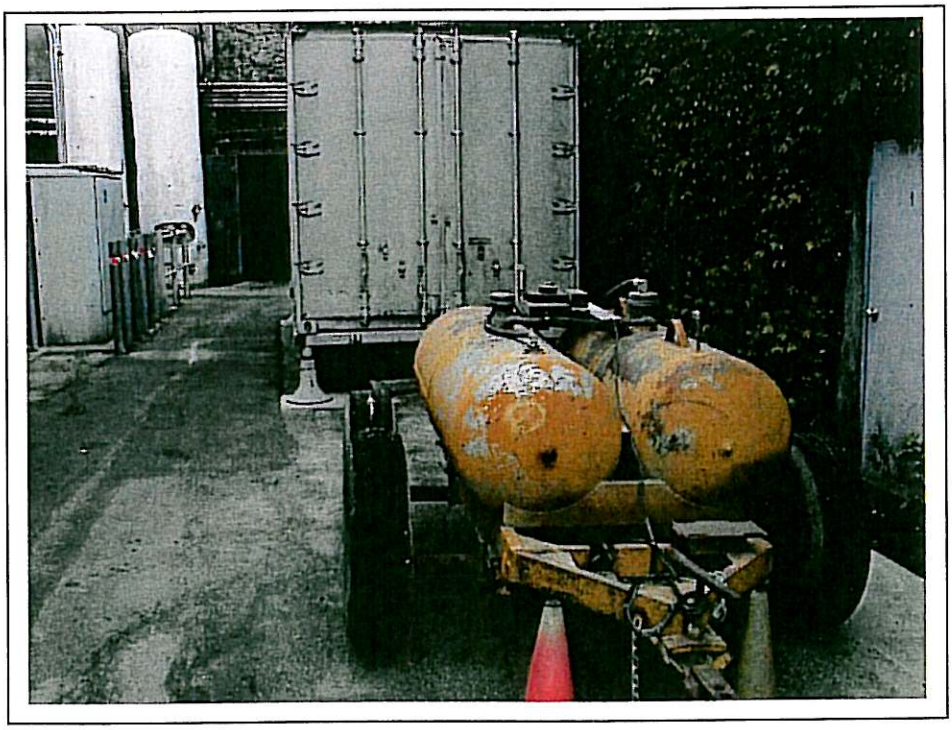
RPD= Relative Percent Difference

Appendix D

Photo Documentation



Clayton Project No. 70-03412.00	Description	View of septic tank location between tanks in south-central yard area	32
	Site Name	Wente Winery, 5489-5565 Tesla Road, Livermore, California	Photo Date September 27, 2002



Clayton Project No. 70-03412.00	Description	Northern view of yard area. Portable electric generator with portable diesel tanks and electric transformer at left.	33
	Site Name	Wente Winery, 5489-5565 Tesla Road, Livermore, California	Photo Date September 27, 2002

Appendix E

Historical Soil and Groundwater Analytical Data

Table 1
Groundwater Analytical Results
Wente Vineyards
5565 Tesla Road, Livermore, California

Sample ID	Sampling Depth (ft bgs)	TPH-g ug/L	Benzene ug/L	Toluene ug/L	Ethyl-benzene ug/L	Total Xylenes ug/L	MtBE ug/L	Chlotoethane ug/L	Tetrahydrofuran ug/L
GS-1B	40-44'	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<50
GS-1C	59-63'	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<50
GS-2A	12-16'	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<50
GS-2B	40-44'	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<50
GS-2C	59-63'	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<50

Notes:

NA- Not Analyzed (Upper water bearing zone didn't yield enough water to complete the analysis)

< Less than Laboratory Reporting Limit

Table 2
Soil Analytical Results (TPH)
Wente Vineyards
5565 Tesla Road, Livermore, California

Sample ID	Sampling Depth (ft bgs)	TPH-g mg/kg	TPH-d mg/kg	TPH-mo mg/kg
HA-1A	1-1.5'	<0.96	25 HY	150 H
HA-1B	3-3.5'	NA	7.0 HY	43
HA-2A	1-1.5'	<1	1.1 HY	6.2
HA-2B	3-3.5'	NA	NA	NA
HA-3A	1-1.5'	<0.99	**2,100 HY**	**6,800 H**
HA-3B	3-3.5'	NA	<1.0	<5.0
HA-4A	1-1.5'	<1.1	**1,300 HY**	**6,600 H**
HA-4B	3-3.5'	NA	50 HY	250
HA-5A	1-1.5'	<1	1.6 HY	8.8
HA-5B	3-3.5'	NA	NA	NA
HA-6A	1-1.5'	<1	17 HY	86 H
HA-6B	3-3.5'	NA	2.7 HY	19
HA-7A	1-1.5'	<1	34 HY	130 H
HA-7B	3-3.5'	NA	85 HY	320
HA-8A	1-1.5'	<1	<1.0	5.5
HA-8B	3-3.5'	NA	NA	NA
HA-9A	1-1.5'	<1	1.4 HY	10
HA-9B	3-3.5'	NA	NA	NA
HA-10A	1-1.5'	<1	72 HY	**770 H**
HA-10B	3-3.5'	NA	<1.0	<5.0
HA -11A	1-1.5'	<0.94	68 HY	330 H
HA -11B	3-3.5'	NA	4.2 HY	27
HA-11D(A)*	1-1.5'	<0.94	42 HY	230 H
HA-11D(B)*	3-3.5'	NA	<0.99	5.5
ESL (Commercial/Industrial)		**100**	**100**	**1,000**
ESL (Residential)		**100**	**100**	**500**

Notes:

H: Heavier hydrocarbons contributed to the quantitation

Y= Sample exhibits chromatographic pattern which does not resemble standard

ESL- Environmental Screening Levels (Groundwater is current or potential drinking water source, shallow soils <= 3m bgs), California Regional Water Quality Control Board SF Region, February 2005

< Less than Laboratory Reporting Limit

"A" Samples- Collected at 1- to 1.5 ft sampling depth

"B" Samples- Collected at 3- to 3.5- sampling depth

* Samples HA-11D(A) and HA-11D(B) are duplicate samples collected at the location of soil boring HA-11

Table 3
Soil Analytical Results (Volatile Organics)
Wente Vineyards
5565 Tesla Road, Livermore, California

Sample ID	Sampling Depth (ft bgs)	MTBE ug/kg	Benzene ug/kg	Toluene ug/kg	Ethylbenzene ug/kg	m,p-Xylenes ug/kg	o-Xylene ug/kg	Tetrahydrofuran ug/kg	Chloroethane ug/kg
HA-1A	1-1.5'	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<49	<9.8
HA-2A	1-1.5'	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5	<45	<9.1
HA-3A	1-1.5'	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<47	<9.4
HA-4A	1-1.5'	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<49	<9.8
HA-5A	1-1.5'	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5	<45	<8.9
HA-6A	1-1.5'	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<49	<9.8
HA-7A	1-1.5'	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<10
HA-8A	1-1.5'	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<46	<9.3
HA-9A	1-1.5'	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<47	<9.4
HA-10A	1-1.5'	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<46	<9.3
HA-10B	3-3.5'	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5	<45	<9.1
HA -11A	1-1.5'	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5	<45	<9.1
HA-11D(A)	1-1.5'	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<46	<9.3
ESL *(Commercial/Industrial)*		23	44	2,900	3,300	2,300	2,300	NL*/ (PRG=21,000)	850
ESL *(Residential)*		23	44	2,900	3,300	2,300	2,300	NL*/ (PRG=9,400)	630

Notes:

ESL- Environmental Screening Levels (Groundwater is current or potential drinking water source, shallow soils <= 3m bgs), California Regional Water Quality Control Board SF Region, February 2005

PRG- Preliminary Remediation Goal (EPA Region 9)

NL*- ESL not available

< Less than Laboratory Reporting Limit

"A" Samples- Collected at 1- to 1.5 ft sampling depth

"B" Samples- Collected at 3- to 3.5- sampling depth

Table 4
Soil Analytical Results (Metals CAM 17)
Wente Vineyards
5565 Tesla Road, Livermore, California

Sample ID	Sampling Depth (ft bgs)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
ESL (Commercial/Industrial)		40	5.5	1,500	8	7.4	58	10	230	750	10	40	150	10	40	13	200	600
ESL (Residential)		6.1	5.5	750	4	1.7	58	10	230	150	3.7	40	150	10	20	1	110	600
Ambient Levels*		NA	9.6	NA	NA	NA	73	15.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HA-1A	1-1.5'	<3	4.6	140	0.21	<0.25	47	11	28	24	0.04	1.2	81	<0.25	<0.25	<0.25	24	68
HA-1B	3-3.5'	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.023	NA	NA	NA	NA	NA	NA	NA
HA-2A	1-1.5'	<3	4.1	180	0.25	2.4	61	12	62	110	0.098	5	85	<0.25	<0.25	<0.25	31	160
HA-2B	3-3.5'	<3	3.3	230	0.38	1.3	72	20	37	16	0.034	<1	180	<0.26	<0.26	<0.26	33	57
HA-3A	1-1.5'	<3	3.6	170	0.23	3.9	79	10	77	160	0.14	12	86	<0.25	<0.25	<0.25	24	220
HA-3B	3-3.5'	<3	3.1	170	0.23	3	59	12	62	64	0.071	7.1	89	<0.25	0.25	<0.25	32	150
HA-4A	1-1.5'	<3	3.7	170	0.25	0.66	58	11	38	56	0.083	2	92	<0.25	<0.25	<0.25	26	130
HA-4B	3-3.5'	<3	4.9	230	0.38	3.3	73	16	82	59	0.084	6.1	120	<0.25	0.33	<0.25	38	290
HA-5A	1-1.5'	<3	3.8	190	0.3	1.3	87	14	49	150	0.09	1.9	120	<0.25	<0.25	<0.25	29	130
HA-5B	3-3.5'	<3	3.9	170	0.28	2.4	67	15	50	70	0.063	1.9	130	<0.25	<0.25	<0.25	31	130
HA-6A	1-1.5'	<3	5.1	340	0.33	1.4	73	16	57	73	0.046	2.2	140	<0.25	<0.25	<0.25	30	180
HA-6B	3-3.5'	<3	5.4	370	0.31	2.8	68	15	65	88	0.058	2.9	120	<0.25	<0.25	<0.25	33	220
HA-7A	1-1.5'	<3	7.4	200	0.25	2	59	10	57	100	0.051	6.2	78	<0.25	<0.25	<0.25	24	210
HA-7B	3-3.5'	<3	6.6	300	0.23	2.9	56	9.8	87	110	0.049	5.3	75	<0.25	<0.25	<0.25	26	210
HA-8A	1-1.5'	<3	3.3	240	0.36	<0.25	70	18	32	8.5	0.034	<1	170	<0.25	<0.25	<0.25	30	63
HA-8B	3-3.5'	<3	3.3	120	0.2	1	50	12	31	19	0.075	<1	110	<0.25	<0.25	<0.25	26	490
HA-9A	1-1.5'	<3	3.3	240	0.3	<0.26	63	16	35	24	0.054	1.1	150	<0.26	<0.26	<0.26	27	120

Table 4
Soil Analytical Results (Metals CAM 17)
Wente Vineyards
5565 Tesla Road, Livermore, California

Sample ID	Sampling Depth (ft bgs)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
HA-9B	3-3.5'	<3	3.6	210	0.26	1.1	62	15	32	14	0.097	<1	140	<0.25	<0.25	<0.25	29	100
HA -10A	1-1.5'	<3	2.9	140	0.23	<0.25	52	13	39	37	0.059	1.2	120	<0.25	<0.25	<0.25	24	82
HA -10B	3-3.5'	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.038	NA	NA	NA	NA	NA	NA	NA
HA -11A	1-1.5'	<3	3.3	210	0.27	0.33	60	12	49	41	0.045	2.4	100	<0.25	<0.25	<0.25	29	97
HA -11B	3-3.5'	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.053	NA	NA	NA	NA	NA	NA	NA
HA-11D(A)	1-1.5'	<3	3.1	250	0.26	0.32	62	15	51	51	0.042	2.2	130	<0.26	<0.26	<0.26	26	99
HA-11D(B)	3-3.5'	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.048	NA	NA	NA	NA	NA	NA	NA
ESL (Commercial/Industrial)		40	5.5	1,500	8	7.4	58	10	230	750	10	40	150	10	40	13	200	600
ESL (Residential)		6.1	5.5	750	4	1.7	58	10	230	150	3.7	40	150	10	20	1	110	600
CHHSLs (Commercial/ Industrial)		380	0.24	63,000	1,700	7.5	NL	3,200	38,000	3,500	180	4,800	16,000	4,800	4,800	63	6,700	100,000
CHHSLs (Residential)		30	0.07	5,200	150	1.7	NL	660	3,000	150	18	380	1,600	380	380	5	530	23,000
PRGs (Commercial/Industrial-Direct Contact)		410	1.6	67,000	1,900	450	450	1,900	41,000	800	62	5,100	20,000	5,100	5,100	67	1,000	100,000
PRGs (Residential-Direct Contact)		31	0.39	5,400	150	37	210	900	3,100	150	6.1	390	1,600	390	390	5.2	78	23,000

Notes:

ESL- Environmental Screening Levels (Groundwater is current or potential drinking water source, shallow soils <= 3m bgs), California Regional Water Quality Control Board SF Region, February 2005

PRG- Preliminary Remediation Goal (EPA Region 9)

CHHSLs- California Human Health Screening Levels, CalEPA January 2005

NA- Not analyzed

Table 4
Soil Analytical Results (Metals CAM 17)
Wente Vineyards
5565 Tesla Road, Livermore, California

Sample ID	Sampling Depth (ft bgs)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)

< Less than Laboratory Reporting Limit

* Kearney Foundation Special Report

NA- Not aplicable

"A" Samples- Collected at 1- to 1.5 ft sampling depth

"B" Samples- Collected at 3- to 3.5- sampling depth

Table 5
Soil Analytical Results (Pesticides and PCBs)
Wente Vineyards
5565 Tesla Road, Livermore, California

Sample ID	Sampling Depth (ft bgs)	Organochlorine Pesticides					Polychlorinated Biphenyls (PCBs)
		Delta-BHC ug/kg	4,4'-DDE ug/kg	4,4'-DDD ug/kg	4,4'-DDT ug/kg	Alpha-Chlordane ug/kg	Aroclor-1260 [1] ug/kg
HA-1A	1-1.5'	<1.7	<3.3	<3.3	<3.3	<1.7	<9.6
HA-2A	1-1.5'	<1.7	<3.3	<3.3	<3.3	<1.7	<9.5
HA-3A	1-1.5'	<8.6	<17	<3.3	<17 #	<8.6	<9.7
HA-4A	1-1.5'	<8.4	<16	<3.3	<16 #	<8.4	46
HA-5A	1-1.5'	<1.7	<3.3	<3.3	<3.3	<1.7	<9.6
HA-6A	1-1.5'	<5.1	<10	<17	<10 #	6.1 C	18
HA-7A	1-1.5'	6.1 C	<3.3	<16	<3.3	<1.7	<9.6
HA-7B	3-3.5'	<5.1	<9.9	<3.3	<9.9 #	<5.1	NA
HA-8A	1-1.5'	<1.7	<3.3	<10	<3.3	<1.7	<9.6
HA-9A	1-1.5'	<1.7	<3.3	<3.3	<3.3	<1.7	<9.7
HA -10A	1-1.5'	<1.7	3.9	<9.9	14	<1.7	<9.6
HA -11A	1-1.5'	<1.7	<3.3	<3.3	<3.3	<1.7	<9.5
HA-11D(A)	1-1.5'	<1.7	40 C	<3.3	12	<1.7	<9.5
ESL *(Commercial/Industrial)*		NL*	4,000	9,000	4,000	1,700	740
ESL *(Residential)*		NL**	1,600	2,300	1,600	440	220

Notes:

ESL- Environmental Screening Levels (Groundwater is current or potential drinking water source, shallow soils <= 3m bgs), California Regional Water Quality Control Board SF Region, February 2005

* ESL for Gamma-BHC (Hexachlorocyclohexane, Lindane)= **49 ug/kg**

** ESL for Gamma-BHC (Hexachlorocyclohexane, Lindane)= **49 ug/kg**

C= Presence confirmed, but RPD between columns exceeds 40%

CCV drift outside limits; average CCV drift within limits per method requirements

[1] ESL level available for Polychlorinated Biphenyls (PCBs)

< Less than Laboratory Reporting Limit

"A" Samples- Collected at 1- to 1.5 ft sampling depth

"B" Samples- Collected at 3- to 3.5- sampling depth

Table 6
Soil Analytical Results (Polynuclear Aromatics)
Wente Vineyards
5565 Tesla Road, Livermore, California

Sample ID	Sampling Depth (ft bgs)	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo (a) anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene
		(ug/kg)															
HA-1A	1-1.5'	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67
HA-2A	1-1.5'	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67
HA-3A	1-1.5'	<6700	<6700	<6700	<6700	<6700	<6700	<6700	<6700	<6700	<6700	<6700	<6700	<6700	<6700	<6700	<6700
HA-4A	1-1.5'	<340	<340	<340	<340	<340	<340	<340	<340	<340	<340	<340	<340	<340	<340	<340	<340
HA-5A	1-1.5'	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67
HA-6A	1-1.5'	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67
HA-7A	1-1.5'	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66
HA-8A	1-1.5'	<68	<68	<68	<68	<68	<68	<68	<68	<68	<68	<68	<68	<68	<68	<68	<68
HA-9A	1-1.5'	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67
HA-10A	1-1.5'	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130
HA -11A	1-1.5'	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66	<66
HA-11D(A)	1-1.5'	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67	<67

Notes:

ESL- Environmental Screening Levels (Groundwater is current or potential drinking water source, shallow soils <= 3m bgs), California Regional Water Quality Control Board SF Region, February 2005

PRG- Preliminary Remediation Goal (EPA Region 9)

NL*- ESL not available

In soil Borings HA-3A, HA-4A, and HA-10A Laboratory reported a dilution factor of 50, 5, and 2, respectively

< Less than Laboratory Reporting Limit

Table 7
Soil Vapor Field Data
Wente Vineyards
5565 Tesla Road, Livermore, California

Cannister #	Sample Location	Initial Vacuum ("Hg)	Purging			Sampling		
			Start Time	End Time	Volume Purged (mL)	Start Time	End Time	Final Vacuum ("Hg)
34430	**Purge Cannister**	29	N/A	N/A	N/A	N/A	N/A	ND
30824	**SV-9**	25	10:00:50	10:02:13	276	10:02	10:12	5
2218	**SV-4**	30	11:29:55	11:31:18	276	11:32	11:37	5
2211	**SV-5**	30	12:13:20	12:14:43	276	12:14	12:20	5
1463	**SV-6**	29	13:40:47	13:42:10	276	13:42	13:52	5
11829	**SV-6D** (Field Duplicate of SV-6)*	28.5	14:10:20	14:11:43	276	14:11	14:20	5
31795	**SV-7**	29.5	14:46:07	14:47:30	276	14:48	14:55	5
2079	**SV-3**	30	15:32:55	15:34:18	276	15:34	15:40	5
1477	**SV-1**	29	16:03:25	16:04:53	276	16:05	16:37	5
1472	**SV-8**	29	10:15:33	10:16:56	276	10:16	10:25	5
34601	**SV-2**	29	10:44:48	10:46:11	276	10:46	10:52	5

Note:

** Though laboratory sample ID for the field duplicate sample collected at soil vapor borehole SV-6 is SV-10, the sample ID used in the report for the above sample is SV-6D.*

Table 8
Soil Vapor Analytical Results
Wente Vineyards
5565 Tesla Road, Livermore, California

Compound	Sample ID											Shallow Soil Gas Screening Levels	
	SV-1	SV-2	SV-3	SVE-4	SV-5	SV-6	SV-6D Field Duplicate of SV-6*	SV-7	SV-8	SV-8 Lab Duplicate	SVE-9	Commersial/ Industrial	Residential
	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)
Freon 12	<6.4	<6.1	<5	<6.2	<6.6	<6.8	<6.8	<6.2	<5.1	<5.1	<5.3	NA	NA
Freon 114	<9	<8.6	<7.1	<8.8	<9.4	<9.6	<9.6	<8.8	<7.2	<7.2	<7.6	NA	NA
Chloromethane	<11	<10	<8.3	<10	<11	<11	<11	<10	<8.5	<8.5	<8.9	NA	NA
Vinyl Chloride	<3.3	<3.2	<2.6	<3.2	<3.4	<3.5	<3.5	<3.2	<2.6	<2.6	<2.8	NA	NA
1,3-Butadiene	**150**	**28**	**16**	**330**	**130**	**79**	**31**	**140**	<2.3	<2.3	**610**	**NL**	**NL**
Bromomethane	<5	<4.8	<3.9	<4.9	<5.2	<5.4	<5.4	<4.9	<4	<4	<4.2	NA	NA
Chloroethane	<3.4	<3.2	<2.7	<3.3	<3.5	<3.6	<3.6	<3.3	<2.7	<2.7	<2.8	NA	NA
Freon 11	<7.2	<6.9	**10**	**7.0 J**	**18**	<7.8	<7.8	<7.1	<5.8	<5.8	<6.1	**NL**	**NL**
Ethanol	**28**	**50**	**13**	**34**	**16**	**55**	**16**	**43**	<7.7	<7.7	**74**	**38,000,000**	**19,000,000**
Freon 113	<9.9	<9.5	<7.7	<9.7	<10	<10	<10	<9.7	<7.8	<7.8	<8.3	NA	NA
1,1-Dichloroethene	<5.1	<4.9	<4	<5	<5.3	<5.5	<5.5	<5	<4.1	<4.1	<4.3	NA	NA
Acetone	**400**	**570**	**100**	**330**	**170**	**820**	**310**	**990**	**23**	**23**	**280**	**1,800,000**	**660,000**
2-Propanol	**21**	**18**	<9.9	**43**	**19**	**150**	**16**	**24**	<10	<10	**12**	**NL**	**NL**
Carbon Disulfide	**19**	**12**	**4.8**	**18**	**19**	**13**	**7**	**17**	<3.2	<3.2	**320**	**NL**	**NL**
3-Chloropropene	<16	<15	<13	<16	<17	<17	<17	<16	<13	<13	<14	NA	NA
Methylene Chloride	<4.5	<4.3	**4.4**	<4.4	<4.7	<4.8	<4.8	<4.4	<3.6	<3.6	<3.8	**NL**	**NL**
MIBE	<4.6	<4.4	<3.6	<4.6	<4.8	<5	<5	<4.6	<3.7	<3.7	<3.9	NA	NA
trans-1,2-Dichloroethene	<5.1	<4.9	<4	<5	<5.3	<5.5	<5.5	<5	<4.1	<4.1	<4.3	NA	NA
Hexane	**61**	**19**	**16**	**160**	**82**	**44**	**18**	**76**	<3.6	<3.6	**84**	**NL**	**NL**
1,1-Dichloroethane	<5.2	<5	<4.1	<5.1	<5.4	<5.6	<5.6	<5.1	<4.1	<4.1	<4.4	**NL**	**NL**
2-Butanone (Methyl Ethyl Ketone)	**73**	**77**	**15**	**92**	**44**	**180**	**170**	**210**	**4.2**	**4.3**	**61**	**590,000**	**210,000**
cis-1,2-Dichloroethene	<5.1	<4.9	<4	<5	<5.3	<5.5	<5.5	<5	<4.1	<4.1	<4.3	NA	NA
Tetrahydrofuran	**6.5**	**4.6**	<3	**8.5**	**4.5**	**6.9**	**50**	**5.2**	<3	<3	**7**	**NL**	**NL**
Chloroform	<6.3	<6	<4.9	<6.2	<6.6	<6.7	<6.7	**9.2**	<5	<5	<5.3	**1,500**	**450**
1,1,1- Trichloroethane	<7	<6.7	<5.5	<6.9	<7.3	<7.5	<7.5	<6.9	<5.6	<5.6	<5.9	NA	NA
Cyclohexane	**14**	<4.2	**4.7**	**46**	**36**	**7.9**	**4.8**	**18**	<3.5	<3.5	**56**	**NL**	**NL**
Carbon Tetrachloride	<8.1	<7.8	<6.4	<8	<8.5	<8.7	<8.7	<8	<6.4	<6.4	<6.8	NA	NA
2,2,4- Trimethylpentane	<6	<5.8	<4.7	**7.1**	<6.3	7.8	<6.4	<5.9	<4.8	<4.8	**19**	**NL**	**NL**
Benzene	**45**	**18**	**8**	**170**	**51**	**44**	**16**	**64**	<3.3	<3.3	**63**	**290**	**85**
1,2-Dichloroethane	<5.2	<5	<4.1	<5.1	<5.4	<5.6	<5.6	<5.1	<4.1	<4.1	<4.4	NA	NA
Heptane	**30**	**10**	**7.2**	**71**	**36**	**20**	**10**	**32**	<4.2	<4.2	**41**	**NL**	**NL**
Trichloroethene	<6.9	<6.6	<5.4	<6.8	<7.2	**74**	**16**	<6.8	<5.5	<5.5	<5.8	**4,100**	**1,200**
1,2-Dichloropropane	<6	<5.7	<4.7	<5.8	<6.2	<6.4	<6.4	<5.8	<4.7	<4.7	<5	NA	NA
1,4-Dioxane	<18	<18	<14	<18	<19	<20	<20	<18	<15	<15	<16	NA	NA

Table 8
Soil Vapor Analytical Results
Wente Vineyards
5565 Tesla Road, Livermore, California

Compound	Sample ID											Shallow Soil Gas Screening Levels	
	SV-1	SV-2	SV-3	SVE-4	SV-5	SV-6	SV-6D Field Duplicate of SV-6*	SV-7	SV-8	SV-8 Lab Duplicate	SVE-9	Commersial/ Industrial	Residential
	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)
Bromodichloromethane	<8.6	<8.3	<6.8	<8.5	<9	<9.2	<9.2	<8.5	<6.9	<6.9	<7.2	NA	NA
cis-1,3-Dichloropropene	<5.8	<5.6	<4.6	<5.7	<6.1	<6.3	<6.3	<5.7	<4.6	<4.6	<4.9	NA	NA
4-Methyl-2-pentanone	<5.3	9.7	<4.1	**14**	**8.6**	**14**	**5.8**	**19**	<4.2	<4.2	**5.6**	**NL**	**NL**
Toluene	**42**	**52**	**34**	**300**	**130**	**110**	**60**	**160**	**8.2**	**8.9**	**95**	**180,000**	**63,000**
trans-1,3-Dichloropropene	<5.8	<5.6	<4.6	<5.7	<6.1	<6.3	<6.3	<5.7	<4.6	<4.6	<4.9	NA	NA
1,1,2- Trichloroethane	<7	<6.7	<5.5	<6.9	<7.3	<7.5	<7.5	<6.9	<5.6	<5.6	<5.9	NA	NA
Tetrachloroethene	**14**	<8.4	**58**	<8.6	<9.1	<9.4	<9.4	**41**	**110**	**100**	**240**	**1,400**	**410**
2-Hexanone	<21	<20	<16	<21	<22	<23	<23	<21	<17	<17	<18	NA	NA
Dibromochloromethane	<11	<10	<8.6	<11	<11	<12	<12	<11	<8.7	<8.7	<9.2	NA	NA
1 ,2-Dibromoethane (EDB)	<9.9	<9.5	<7.8	<9.7	<10	<11	<11	<9.7	<7.9	<7.9	<8.3	NA	NA
Chlorobenzene	<5.9	<5.7	<4.6	<5.8	<6.2	<6.4	<6.4	<5.8	<4.7	<4.7	<5	NA	NA
Ethyl Benzene	**7**	**10**	**9**	**37**	**11**	**20**	**9.6**	**35**	<4.4	<4.4	**15**	**1,200,000**	**420,000**
m,p-Xylene	**12**	**31**	**35**	**54**	**15**	**34**	**22**	**77**	<4.4	<4.4	**42**	**410,000**	**150,000**
o-Xylene	<5.6	**13**	**14**	**22**	**8**	**16**	**8.1**	**28**	<4.4	<4.4	**16**	**410,000**	**150,000**
Styrene	<5.5	**5.5**	<4.3	**15**	**7.9**	**16**	**7**	**26**	<4.4	<4.4	**8.4**	**590,000**	**210,000**
Bromoform	<13	<13	<10	<13	<14	<14	<14	<13	<10	<10	<11	NA	NA
Cumene	<6.3	<6.1	<5	**9.6**	<6.6	<6.8	<6.8	<6.2	<5	<5	<5.3	**NL**	**NL**
1,1,2,2-Tetrachloroethane	<8.8	<8.5	<6.9	<8.7	<9.2	<9.5	<9.5	<8.7	<7	<7	<7.4	NA	NA
Propylbenzene	<6.3	**12**	<5	**7**	<6.6	<6.8	<6.8	**7.6**	<5	<5	<5.3	**NL**	**NL**
4-Ethyltoluene	<6.3	**35**	<5	**20**	<6.6	**12**	<6.8	**23**	<5	<5	**15**	**NL**	**NL**
1,3,5- Trimethylbenzene	<6.3	**26**	<5	**6.4**	<6.6	<6.8	<6.8	**6.5**	<5	<5	**5.5**	**NL**	**NL**
1,2,4- Trimethylbenzene	<6.3	**87**	<5	**26**	<6.6	**14**	**7**	**27**	<5	<5	**25**	**NL**	**NL**
1,3-Dichlorobenzene	<7.8	<7.4	<6.1	<7.6	<8.1	<8.3	<8.3	<7.6	<6.2	<6.2	<6.5	NA	NA
1,4-Dichlorobenzene	<7.8	<7.4	<6.1	<7.6	<8.1	<8.3	<8.3	<7.6	<6.2	<6.2	<6.5	NA	NA
alpha-Chlorotoluene	<6.7	<6.4	<5.2	<6.5	<7	<7.1	<7.1	<6.5	<5.3	<5.3	<5.6	NA	NA
1,2-Dichlorobenzene	<7.8	<7.4	<6.1	<7.6	<8.1	<8.3	<8.3	<7.6	<6.2	<6.2	<6.5	NA	NA
1,2,4- Trichlorobenzene	<38	<37	<30	<38	<40	<41	<41	<38	<30	<30	<32	NA	NA
Hexachlorobutadiene	<55	<53	<43	<54	<57	<59	<59	<54	<44	<44	<46	**NL**	**NL**

Laboratory Note:

J- Estimated Value

Note

NA- Not Aplicable

NL- Not Listed

< - Less Than Laboratory Reporting lLimit

* *Laboratory sample ID for the field duplicate sample collected from the soil vapor borehole SV-6 is SV-10, however the sample ID used in the report is for the above sample is SV-6D.*