REVISED
DRAFT

WORK PLAN

GROUNDWATER SAMPLING
WELL M-1

LOCATED NEAR
AHMANSON RANCH
VENTURA COUNTY, CALIFORNIA
(Revised February 2003)

Prepared For:

California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Prepared By:

PSOMAS
3187 Red Hill Avenue, Suite 250
Costa Mesa, CA 92886
Contacts: John Thornton (714) 751-7373

REVISED
DRAFT

WORK PLAN

GROUNDWATER SAMPLING
WELL M-1

(Revised February 2003)

The "Groundwater Sampling Well M-1" work and work performed under this work plan is and will be performed under the supervision of John R. Thornton, P. E.

TABLE OF CONTENTS

1.0 INTRODUCTION

This revised Work Plan (Plan) has been prepared to describe the sampling and analysis procedures to be utilized in obtaining groundwater samples from an inactive, flowing artesian agricultural well designated M-1. The well is located in unincorporated Ventura County, California, on property adjacent to Las Virgenes Creek (Figure 1) that was formerly owned by Ahmanson Land Company, but currently owned by the Mountains Recreation and Conservation Authority (MRCA).

This Plan has been prepared in response to a letter from the California Regional Water Quality Control Board – Los Angeles Region (LARWQCB) dated December 23, 2002 and addressed to Mr. Guy Gniadek, Vice President of Ahmanson Land Company. Subsequently, a meeting was convened by the LARWQCB on February 20, 2003 with representatives from the USEPA, DTSC, DHS, Boeing, Psomas, Ahmanson Land Company, Weston Benshoof, et al., and others participating either through attendance or by teleconferencing. The purpose of this meeting was to review the first draft of this Plan, and to develop a cooperative sampling program for Well M-1 by the various agencies. Recommendations resulting from the meeting have been incorporated into this revised Plan.

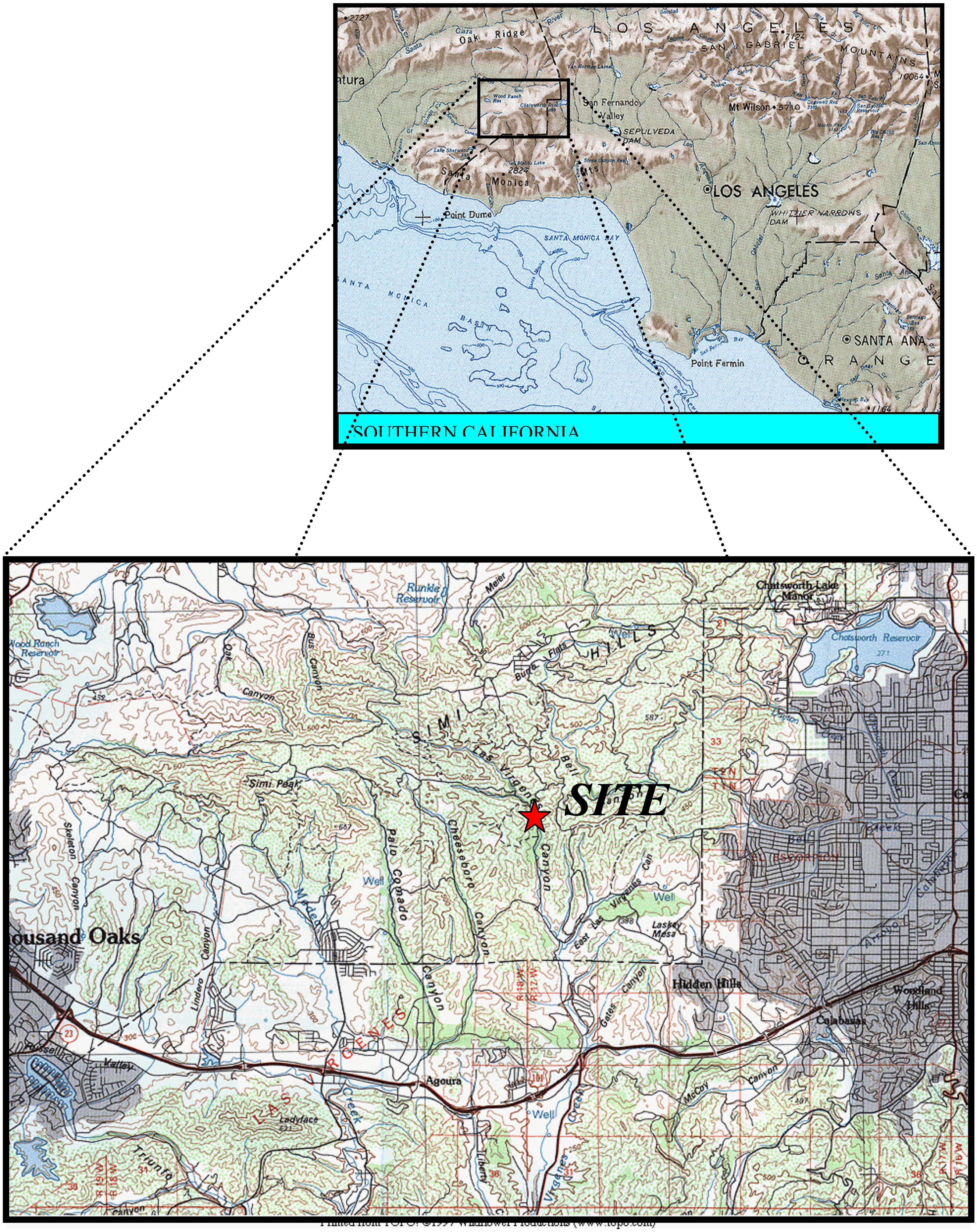
It is important to note that the proposed focused groundwater sampling and analysis program for well M-1 described herein is in addition to Ahmanson's ongoing hydrogeologic monitoring program. This continuing hydrogeologic monitoring program was implemented more than two years ago and includes:

- Monthly measurement of static water level and basic water quality parameters including temperature, electrical conductivity and pH in six shallow groundwater monitoring wells and well M-1;
- Monthly measurement of streamflow and basic water quality parameters including temperature, electrical conductivity and pH at six gaging points along Las Virgenes and East Las Virgenes Creeks;
- Quarterly analytical laboratory sampling of the six monitoring wells, well M-1 (from samples obtained near the well surface), and six stream gaging locations for a variety of constituents (including general minerals, metals, organochlorine pesticides, chlorinated herbicides, PCB's VOC's and perchlorate, and;
- Preparation of a quarterly groundwater monitoring report.

1.1 Project Background

The Ahmanson Ranch Project is a master planned community that will include over 3,000 homes, two golf courses, commercial uses and public facilities to be constructed on approximately 1,900 acres, in Ventura County, California. The project is situated along the Las Virgenes and East Las Virgenes drainages. The site vicinity includes undeveloped land and the

residential community of Bell Canyon to the north, undeveloped land to the west, and residential properties to the south and east. U.S. Highway 101 is located approximately 1.5 miles to the south, the Simi Hills are approximately 3.5 miles to the north, Palo Comado Canyon is 2 miles to the west, and the San Fernando Valley extends to within approximately 1 mile to the east of the project.


SOUTHERN CALIFORNIA
LOS ANGELES
SAN GABRIEL
MOUNTAINS
Oak Ridge
San Fernando Valley
SEPULVEDA DAM
Mt Wilson 5710
Santa Monica Mts
Point Dume
SANTA MONICA BAY
SANTA MONICA BASIN
WHITTIER NARROWS DAM
Point Fermin
SANTA ANA
ORANGE
SITE
Runkle Reservoir
Wood Ranch Reservoir
Chatsworth Lake Manor
Chatsworth Reservoir
SIMI HILLS
Simi Peak
Las Virgenes Canyon
Cheseboro Canyon
Palo Comado Canyon
Lasky Mesa
Hidden Hills
Calabasas
Woodland Hills
Agoura
Ladyface
LAS VIRGENES

1.2 Previous M-1 Groundwater Sampling and Analysis

Well M-1 has been previously tested for perchlorate on July 3, 2002 (by Psomas) and on August 1, 2002 (by Psomas and by Rincon Consultants, Inc., concurrently) as briefly described in the following subsections.

1.2.1 *Perchlorate Sampling - July 3, 2002*

On July 3, 2002, Psomas obtained groundwater samples from an approximate depth of 550 feet in well M-1 utilizing a stainless steel discrete interval sampling device or "bomb" which was triggered from the surface with a secondary cable once the target sampling depth (550 feet below the ground surface) was achieved. The samples were placed in a cooler and transported to Del Mar Analytical Laboratory following strict Chain-of Custody procedures. Perchlorate was not detected above the reporting limit of 4 ppb.

1.2.2 Perchlorate Sampling - August 1, 2002

At the direction of the Ventura County Environmental Report Review Committee, water samples were collected from well M-1 on August 1, 2002. This sampling program was a collaborative effort between the Ahmanson Land Company and its consultants (Psomas), and the County of Ventura and its consultant (Rincon Consultants, Inc. of Ventura, California). Rincon and Psomas each obtained duplicate sets of groundwater samples from each of the 4 depth-intervals for subsequent independent laboratory analysis. Water samples were collected at three depths within well M-1 as summarized in Table 1 below.

TABLE 1

WELL M-1
AUGUST 1, 2002
WATER SAMPLE DEPTHS

Sample Name	Sample Depth (feet BGS)	Sampled by Psomas	Sampled by Rincon
P1	50	X	X
P2	50	X	X
P3	450	X	X
P4	550	X	X

The sampling program (developed by Rincon) included a complete duplicate set of samples to be pulled at the 50-foot depth interval (for quality control purposes). Thus, sample sets P-1 and P-2 were essentially obtained from the same depth in well M-1 on the same day. Although the total well depth is reported to be approximately 1000 feet BGS, groundwater could not be obtained from lower depths in the well due to an obstruction encountered at 576 feet BGS.

Despite repeated attempts the wireline/sampler could not be lowered beyond this point in the well.

Perchlorate concentrations were below the reporting limit of 4 ppb in all four groundwater samples collected from M-1 by Psomas from depths of 50, 50, 450 and 550 feet BGS. Perchlorate concentrations were also below reporting limits in the three groundwater samples collected from the 50, 50 and 450 depth intervals in M-1 by Rincon. Only the sample collected at a depth of 550 feet BGS was reported to contain perchlorate at a concentration of 28 ppb.

In summary, to date nine (9) groundwater samples have been obtained from well M-1 from depths ranging from 50 feet to 550 feet BGS for analysis of perchlorate concentrations. Perchlorate was only detected in one (1) of these nine samples at a concentration of 28 ppb. In other words, no perchlorate was detected in eight of the nine samples from the well.

2.0 PURPOSE

The purpose of this work plan is to describe proposed sampling and analysis procedures and methodology to be followed in obtaining groundwater samples from Ahmanson Well M-1 for subsequent analysis of volatile organic compounds (VOC's) by EPA Method 8260 B, perchlorate by EPA Method 314.0, N-Nitrosodimethylamine (NDMA) by Method 1625C, and general mineral analysis (including major anions, cations, electrical conductivity, total dissolved solids, and pH).

3.0 TECHNICAL APPROACH

In developing this work plan, our approach has been to utilize the same sampling methodology and procedures as during our joint sampling of the well on August 1, 2002. Our approach is to perform the sampling program in accordance with U.S. Environmental Protection Agency (USEPA) protocols.

4.0 SITE CONDITIONS

Well M-1 is located in a remote, riparian area adjacent to Las Virgenes Creek. The well is located on the opposite side of the creek from the dirt access road through the area (approximately 100 yards from the roadway). To minimize any adverse environmental impacts to the riparian corridor along the creek, all sampling equipment must be hand-carried to the site. This limitation precludes the direct use of truck or trailer mounted purging and sampling equipment.

4.1 Well M-1 Information

Ahmanson well M-1 has been assigned California State Well No. 01N/17W-07D. Based on a review of the California Department of Water Resources (CDWR) water well drillers report,

well M-1 was drilled and installed between May 29 and August 17, 1967 by the Midway Drilling and Pump Company, Saticoy, California. The 20-inch diameter borehole was initially drilled to a total depth of 1,945 feet below the ground surface (BGS). Subsequently, the borehole was reamed and the well was completed to a depth of 1,000 feet below the ground surface (BGS) and constructed of 12-inch diameter 5/16-inch wall thickness metal casing. The well was equipped with 1/8-inch louvered well screen at the 380–510 feet BGS and 680-980 feet BGS depth intervals.

The well flowed at the ground surface under artesian pressure at the time of completion, and continues to do so today. The well originally provided irrigation water for a tree farm located downgradient from the well along Las Virgenes Creek; however, the well has been idle for many years (since at least the mid-1980's).

4.1.1 Present Condition of Well M-1

A video survey of the well conducted on June 22, 1989 revealed the well to be in very poor condition (Staal, Gardner & Dunne, Inc., 1989). At the time of the video survey, there was no evidence of casing in the upper 100 feet of the well (it had been completely consumed by corrosion), and at several locations beneath this depth, incrustations had begun to completely occlude the casing bore. The well has continued to deteriorate in the ensuing years since the video log was performed. Today, the conductor casing and sanitary surface seal have also begun to fail, resulting in casing leakage at the ground surface. During the August 1 2002 sampling an obstruction (or collapsed section of casing) was encountered at a depth of approximately 576 feet BGS. Despite repeated attempts the wireline/SDS could not be lowered beyond this point.

5.0 GROUNDWATER SAMPLING PROGRAM

This groundwater sampling and analysis program will be conducted under the direct supervision of Mr. John Thornton, P.E. Psomas has prepared this work plan with the following key elements:

5.1 Mobilization

Mobilization will not proceed until receiving approval of this revised work plan from the LARWQCB. All work will be performed in accordance with our site-specific Health and Safety Plan (see Appendix C).

5.2 Well Purging

In 1989, well M-1 flowed at an estimated rate of 60 gpm and the well continues to flow today, although the current rate is estimated to be several gallons per minute. Rincon Consultants, Inc. purged the well prior to the August 1, 2002 sampling. A small submersible pump pumped approximately 19,800 gallons to a nearby Baker tank at the rate of 11 to 12 gallons per minute (gpm). Due to the poor condition of the well casing and the remote location of the well (and

inability to get heavy equipment to the site) the pump and discharge pipe had to be manually installed and could not be set any lower than 50 below the ground surface. The pumped rate was only slightly higher that the natural artesian flow rate. This attempt had little effect at purging the groundwater at the lower depths. However, there is a great concern that any attempt to pump from the lower zones in the well or other artificial disturbance of the well may cause the remaining casing to fail and the well to collapse.

Several alternatives were considered which might facilitate purging of the well at depth, such as placing packers and a smaller sample discharge pipe at the target depth of 550 feet and purging and sampling from a small discreet interval was also considered, but the poor condition of the well screen (video logs over ten years ago indicated the complete degradation or absence of casing in some portion of the well) precluded installation of permanent or temporary packers. Since M-1 is a flowing artesian well, it is essentially continually self-purging.

During the meeting conducted on February 20, 2003 by the LARWQCB to review the first draft of this Work Plan, attendees (including USEPA, DTSC, DHS, the LARWQCB and other parties) had a comprehensive discussion regarding whether or not to purge the well prior to sampling. Ultimately, consensus among the meeting participants was reached that the well would not be purged, for the following reasons:

- The previous well purging effort (by Rincon Consultants on August 1, 2002) when the well was last sampled had the purge inlet at 50 feet below grade, with a flow rate of about 12 gallons per minute, and this most likely did not significantly influence flow much below that depth.

- The purging conducted when the well was last sampled only minimally exceeded the artesian flow rate of the well and did not significantly alter the condition of the samples collected at 450 and 550 feet below the ground surface.

- Selectively purging at 450 and 550 feet below grade would create conditions unlike past sampling events.

- With the casing largely decayed in this well it is not possible to readily determine the source of flow to the borehole, making it difficult to select an ideal location for the inlet of a purge device.

- There is risk of further well damage by lowering a purging device or other unnecessary equipment into the borehole.

- If perchlorate is present it will be detected without well purging. If perchlorate is detected, sampling and purging methods will be modified, as needed, to further optimize sample collection.

5.3 Well Sampling Procedures

Specialized groundwater sampling equipment provided by *Pacific Surveys LLC* (a geophysical well logging service) will be used to obtain a discrete groundwater sample from the target depths of 450 and 550 feet BGS in well M-1. This is the same equipment used for the August 1, 2002 sampling program conducted by Rincon Consultants, Inc. Pacific Surveys possesses a custom fabricated stainless steel device referred to as a s*pecific depth sampler (SDS).* The SDS is approximately eight feet in length and can obtain approximately 4 liters of sample well water at a specific depth per "trip." Prior to sampling, air will be evacuated from the sampling chamber in the SDS (using a vacuum pump), and the electronically triggered sampling port will be closed. At the target depth, the sample port will be electronically opened (remotely) from the command console in the wireline truck and then closed and the SDS will be retrieved.

Once the SDS has obtained the samples at the target depths, the samples will be transferred by opening the sample port on the SDS and inserting a short (2-inch) section of Tygon® tubing which will conduct the water sample directly into laboratory-supplied containers with the appropriate preservatives for the various required analyses as summarized in Table 2. For each analyte, samples will be "split" from the same SDS sample. For example, the first sample will be obtained from 450 feet BGS and split and transferred to the appropriate containers for Psomas as well as the other agencies so that all participants to each have their perchlorate analysis performed. The order of split sample acquisition (at each depth) will be as follows; 1) perchlorate, 2) VOCs, 3) NDMA, 4) general minerals, 5) radiologicals (for Department of Health Services only). Sufficient sample volume for perchlorate analysis shall be collected at each depth to provide an "archive sample" in the event additional testing is later desired.

Prior to sampling and after each "trip" in and out of the well, the entire SDS will be disassembled and carefully decontaminated with a solution of D.I. water and Alquinox®, followed by a D.I. water rinse. The SDS will then be re-assembled and air will be evacuated from the sample chamber by vacuum pump, prior to re-insertion in the well.

The proposed sampling procedures are somewhat complicated by the remote location of the well. The wireline unit will be parked on the dirt access road as close to the well as practicable and the wireline will be hand-carried across Las Virgenes Creek to the wellhead. A large pulley will be attached at the wellhead to conduct the wireline from the rig down the wellbore with the SDS attached. Instruments in the wireline rig will monitor the depth of the SDS and electronically control opening and closing of the sampler at depth. Due to the volume of groundwater sample required, it is anticipated that three to four "trips" in and out of the well may be required to fill all of the sample containers at each target depth.

5.4 Target Sampling Depths

Well M-1 will be sampled at depths of 450 feet and 550-feet BGS, (the 550-foot BGS groundwater sample obtained by Rincon Consultants, Inc. on August 1, 2002 reportedly contained perchlorate concentration of 28 ppb).

5.5 Sample Labeling and Transportation

All water samples and QA/QC blanks will be collected in accordance with U.S. Environmental Protection Agency (EPA) methodology, including the strict use of Chain-of-Custody forms, procedures, and properly labeled containers.

Each sample container will be labeled using the following alphanumeric protocol:

- P (to indicate that this was a Psomas sample)
- A single letter to indicate the sample type (M for M-1, E for equipment blank, F for field blank).
- The six-digit date that the water sample was obtained.
- Alpha characters A through F for each of the individual sample containers required for each sampling suite.

As an example, if the water sample is obtained from well M-1 on February 1, 2003, the individual containers will be labeled PM020103-A through F.

The samples will be immediately labeled, and placed into ice-chests containing Blue-Ice™ for transportation to Del Mar Analytical Laboratory. Del Mar Analytical is located at 2852 Alton Avenue, Irvine, California and is certified by the California Department of Health Services (DOHS) under the Environmental Laboratory Accreditation Program (ELAP No. 1197).

5.6 Decontamination Procedures

As described in Section 5.3 (above), after each "trip" in and out of the well, the sampling device will be disassembled and carefully decontaminated with a solution of D.I. water and Alquinox®, followed by a triple D.I. water rinse. The SDS device will then be re-assembled and prepared for re-lowering into the well.

5.7 Sampling Frequency

Two sampling rounds will be conducted, approximately one week apart.

6.0 LABORATORY ANALYSIS

The groundwater sample from well M-1 will be transported to Del Mar Analytical Laboratory for analysis of volatile organic compounds (VOCs), perchlorate and N-Nitrosodimethylamine (NDMA), and general minerals in accordance with the EPA methodologies summarized in Table 2 below.

TABLE 2

WATER SAMPLE COLLECTION, PROCESSING AND LABORATORY ANALYSIS METHODOLOGY

ANALYTE	COLLECT. METHOD	ANALYSIS METHOD	SAMPLE CONTAINER	PRESERV-ATIVE[1]	HOLD TIME
Perchlorate	SDS Bailer	EPA 314.0	500ml Glass/ Poly	None	28 Days
VOC's	SDS Bailer	EPA 8260 B	40ml VOA-Glass	HCL	14 Days
NDMA	SDS Bailer	EPA 1625 C	1Liter Glass Amber	None	7 Days
pH	SDS Bailer	EPA 150.1	1-Liter Poly	None	Immediate
Elec. Cond.	SDS Bailer	SM2510 B		None	28 Days
TDS	SDS Bailer	EPA 160.1		None	7 Days
Cl, SO_4	SDS Bailer	EPA 300.0		None	28 Days
Alkalinity ($HC0_3$, CO_3)	SDS Bailer	SM 2320 B		None	14 Days
Na, K, Ca, Mg	SDS Bailer	EPA 200.7	500ml Poly	HNO_3	6 Months

Notes:
1. All samples will be immediately placed in an ice chest containing ice.

6.1 Sample Filtration and/or Particulate Separation

Based on the previous sampling effort by Rincon Consultants, Inc. in cooperation with Psomas, it is anticipated that particulates will be present in the samples obtained from the 450 and 550 depths. Therefore, filtration or separation of the particulates from the water samples prior to laboratory analysis will be a critical element of the sampling program. All filtration and /or separation of particulates will be performed by the analytical laboratory.

Specific Del Mar Analytical Laboratory filtration/separation procedures to be performed for each of the analytes is described in the following subsections:

6.1.1 Filtration for Perchlorate Analysis (by EPA Method 314.0)

All reagent solutions (eluents, external water for ASRS suppressor, etc.) used by the instrument must be filtered through no larger than a 0.45 μm nominal pore size membrane or frit to remove particulates and prevent damage to the instrument, columns and flow systems. Sample filtration must also be employed on every sample prior to analysis. This applies not only to field samples but also to the laboratory reagent blank (LRB) and laboratory fortified blank (LFB). The LRB and LFB samples function as controls and must be filtered to confirm no bias is attributable to the filtration. Filter the samples through a membrane or frit with no larger than a 0.45 m nominal pore size. Syringe mounted, cartridge type, filters work well. Filters specifically designed for IC applications should be used.

6.1.2 Particulate Separation for Volatile Organics Analysis (by EPA Method 8260 B)

There is a potential for volatile organic compounds (VOCs) to be affected (volatilized) by filtration in the lab. Therefore Del Mar Analytical Laboratory proposes to centrifuge the VOC samples prior to analysis to separate the particulates.

6.1.3 *Particulate Separation NDMA Analysis (by EPA Method 1625 C)*

As with VOCs, there is a potential for NDMA to be affected (volatilized) by filtration in the lab. But, according to Del Mar Analytical, centrifuging the water samples prior to NDMA analysis may also be inadvisable. The appropriate separation process is currently under review by Del Mar Analytical Laboratory, and may best be resolved during the planned pre-sampling conference call between the various participating laboratories.

6.1.4 Filtration for Metals (Major Cations) Analysis (by EPA 200.7)

For the determination of dissolved elements the sample must be filtered through a 0.45-μm membrane filter as soon as practical after collection. (Glass or plastic filtering apparatus are recommended to avoid possible contamination.) Use the first 50–100 mL to rinse the filter flask. Discard this portion and collect the required volume of filtrate. Acidify the filtrate with (1+1) HNO3 to a pH of 2 or less. Normally, 3 mL of (1+1) acid per liter should be sufficient to preserve the sample.

6.1.5 Filtration for Other General Minerals Analysis (by EPA 200.7)

Prior to analysis the laboratory will filter the alkalinity (carbonate and bicarbonate), electrical conductivity, and pH samples with 0.45-μm membrane filters. Water samples for chloride and sulfate analysis will be filtered with a 0.22-μm membrane filter. The water sample for total dissolved solids analyses will be pre-filtered with a Whatman glass-fiber filter.

6.1.6 Coordination with other Agencies and their Laboratories

Prior to sampling, Psomas will coordinate a conference call between all the laboratories involved in the program to make sure that they agree with the analysis procedures described herein. The objective will be for all laboratories conducting the analysis to conform to the same procedures to the extent practicable.

7.0 FIELD MEASUREMENT OF BASIC WATER QUALITY PARAMETERS

In addition to the collection of analytical laboratory samples described above, basic water quality parameters including temperature, pH, and electrical conductivity will be measured in the field utilizing portable "pocket probes" as briefly described in the following subsections.

7.1 Temperature

Water temperature of the groundwater samples from well M-1 will be measured in the field with a 6-inch total immersion thermometer with a 0-120 °F range and 1°F gradations. The thermometer is filled with an environmentally safe liquid (as opposed to mercury) as protection against accidental breakage.

7.2 pH

The pH of groundwater samples from well M-1 will be determined in the field with a Hanna Model pHep+ pocket probe with automatic temperature compensation. The probe has a range of 0.0 to 14.0 units, with a resolution of 0.1 pH units and an accuracy of ±0.2 units. The unit features manual 2-point calibration. Calitech 7.00 pH buffer solution and 10.00 pH buffer solutions will be used to calibrate the probe immediately prior to testing.

7.3 Electrical Conductivity

A Myron Model EP-10 automatic temperature compensating meter featuring 0-10, 0-100, 0-1000 and 0-10,000 µS/cm ranges will be utilized to measure the electrical conductivity of groundwater samples from Well M-1 in the field. Calitech 1,413 µS/cm conductivity standard will be utilized to calibrate the electrical conductivity probe immediately prior to testing.

8.0 QUALITY CONTROL/QUALITY ASSURANCE

Implementation of the quality assurance/quality control program is essential in order to obtain high-quality and well-documented data for the project. The following sections of the report summarize the QA/QC measures that will be implemented in the field and in the laboratory during the sampling, transportation, storage and analysis process and are consistent with Psomas' previous sampling efforts.

8.1 Sample Containers

Del Mar Analytical Laboratory will provide all new and certified clean sample containers for the project. According to the laboratory, the sample containers are purchased in large lots from commercial sources and are equivalent to those listed in 40 CFR Part 136. Del Mar Analytical will add the appropriate preservatives to the sample containers required for the specified analytical methods prior to shipment to the field. The lab stores and clearly marks all types of containers in an organized manner, and adds preservatives to sample bottles in a specially designated area.

8.2 Sample Preservation and Holding Times

The purpose of sample preservation is to maintain the original character of the analytes during transportation and storage until the samples are analyzed. While preservation techniques (such as pH control and refrigeration) may retard chemical and biological change, as a general rule the best way to minimize sample degradation is to conduct the analyses as soon as possible after collection. Therefore, one of the objectives of the sampling program will be to transport the water samples to the laboratory as soon as practicable following each sampling round. Maximum holding times for all water constituents analyzed by the laboratory are summarized in Table 2.

8.3 Field Quality Control Samples

8.3.1 *Field Blank*

A field blank will be prepared to identify potential VOC and perchlorate sample contamination occurring during field collection, handling and shipment, and storage of the water samples. The field blank will be prepared by the sampling crew under normal sampling conditions at the same time the regular water quality samples are collected. Wearing the same gloves used for the rest of the sampling, D.I. water will be poured directly into the appropriate containers.

The field blank will be submitted to the analytical laboratory "blind" (disguised as a regular water sample with a similar label pseudonym) and analyzed for VOC's by EPA Method 8260B.

8.3.2 *Equipment Rinsate Blank*

An equipment rinsate blank will be collected from the SDS and analyzed for the same constituents as the groundwater sample from well M-1. The equipment rinsate blank will be obtained by pouring analyte-free water (D.I. water) through the decontaminated field sampling equipment that is considered ready to collect or process an additional sample. The purpose of collecting the equipment rinsate blank is to assess the adequacy of the decontamination process. The equipment blank will be obtained following completion of the discrete sampler decontamination/cleaning process.

The equipment rinsate blank will be submitted to the analytical laboratory and analyzed for VOC's (EPA Method 8260B), perchlorate (EPA Method 314.0) and NDMA (EPA Method 1625C).

8.4 Laboratory Quality Assurance/Quality Control

Del Mar Analytical Laboratory maintains a rigorous QA/QC program for all sample analyses. Laboratory QA/QC documentation will be included along with the analytical results in Appendix A of the Sampling Report.

Del Mar Analytical Laboratory offers four "tiers" of quality control data package reporting. For this sampling a quaternary data package (level IV) will be provided. This is a CLP-type validation package.

8.4.1 *Laboratory Data Management and Reporting*

Due to the large volume of data generated by the analytical laboratory data management and reporting procedures were a critical component of the overall monitoring program. To enhance the QA/QC program and reduce data entry errors, an essentially seamless automated transfer and synthesis of the analytical data will be accomplished by integrating the laboratory's database software system with customized automated reporting and graphical output software developed by the environmental consulting team. Both of these systems are briefly described below.

8.4.2 Laboratory Information Management System (LIMS)

Del Mar Analytical has developed an automated Laboratory Information Management System (LIMS) based on Microsoft SQL Database software, which includes modules that integrate all pertinent information related to a specific project. The system consists of modules, which address all the major processes of laboratory operation:

- Sample Tracking Module
- Project Management Module
- Data Integrity Module
- Electronic Deliverables Module

8.4.2.1 Sample Tracking Module

As samples are received at the laboratory, they are logged into a database, which immediately assigns a unique laboratory identification number to each sample. With this laboratory ID number, samples can be monitored through every stage, providing an accurate account of sample status from analysis to QA review to invoice generation to mail production.

8.4.2.2 Project Management Module

The client database is developed within this module and is linked directly with the sample tracking module. Project specifications, including price quotes, turnaround time, analytes of interest, specific reporting limits, permit limits, and/or holding times, are entered for each individual project. This information is also linked to all other modules to provide the Analysts, QA department, EDD Processor, and Invoice Processor with accurate information concerning projects. Project Managers can monitor the status of every stage of the report through this module.

8.4.2.3 Data Integrity Module

All instruments at Del Mar Analytical are equipped with computerized data management programs and instrument control systems. The lab has the ability to automatically transfer data directly into the LIMS, which reduces or eliminates transcription errors. The Microsoft SQL server is set up to provide safeguards against multiple entries of the same data, unauthorized entries, or unauthorized users. While the data may be entered manually for non-computer linked analyses or uploaded automatically from computer-linked analyses, the data is not reported until it has been reviewed by the Group Leader and/or QA department. After the data has been validated by the QA Group, the system will not allow any manual changes to the data without proper authorization. All changes made are automatically documented.

8.4.2.4 Electronic Deliverables Module

Data may be transferred automatically from the LIMS into virtually any electronic format including but not limited to ASCII, Access, Excel, Lotus, Comma Delimited, and may be delivered via E-mail, Internet or Floppy Diskette. A dedicated EDD coordinator is on staff at the laboratory. Del Mar Analytical's LIMS relies solely on automated data transfer. The lab has created a system, called Element, which automates all laboratory data transfers originating from instruments with computerized data systems.

8.4.3 Laboratory Reports

All analytical data including results and quality control information will be provided by Del Mar Laboratory in both written format and as an electronic data deliverable (EDD). Hard (paper) copies of all laboratory results including quality control information will be included in an Appendix to the sampling and analysis report.

9.0 REPORTING

A bound report will be prepared for the LARWQCB containing all sampling and QA/QC procedures, summary tables, analytical laboratory results and Chain-of Custody Forms. The report will be provided in both hard-copy (printed) form and if desired by the LARWQCB in digital (*.PDF) format. The final report will bear the "wet stamp" of John Thornton, P.E.

A general outline of the final report format is provided below:

Table of Contents

Executive Summary

1.0 INTRODUCTION
1.1 Background Information

2.0 PURPOSE AND OBJECTIVES

3.0 SCOPE OF SERVICES

4.0 METHODOLOGY
4.1 Sampling Procedures
4.2 QA/QC Procedures

5.0 RESULTS

6.0 DISCUSSION

7.0 CONCLUSIONS

8.0 REFERENCES

10.0 SCHEDULE

It is anticipated that the fieldwork can be initiated within approximately ten (10) working days of receiving final written approval of this work plan from the LARWQCB (depending upon wireline-rig availability and favorable weather). It is recognized that this is a cooperative effort, and therefore a sample date will be selected that is favorable for all agencies and participants.

APPENDIX A

Del Mar Analytical Laboratory
Standard Operating Procedure
Determination of Perchlorate
By
Ion Chromatography

(See attached .pdf file:
Appendix A – Del Mar 314_0.pdf)

APPENDIX B

Del Mar Analytical Laboratory
Quality Control Tiers

DEL MAR ANALYTICAL
QUALITY CONTROL TIERS

Level I/Level II*. Standard QC Data Package Provided With All Reports

A. Analytical Report
B. Chain of Custody (COC) Form (including those for subcontract analyses)
C. Method Blank
D. Matrix Spike/Spike Duplicate Summary (MS/MSD) - with Control Limits
E. Laboratory Control Samples (LCS) – with Control Limits
E. Reporting Limits listed on all reports
F. Surrogate Recoveries for GC and GC/MS analyses - with Control Limits
G. Case Narrative upon request
H. Corrective Action Reports when necessary

Level III. Tertiary Data Package Provided Upon Request

A. All QC Data Included In Levels I and II plus:
B. MS/MSD analysis performed on specific sample upon request
C. Chromatograms, including QC and Samples
D. Quantitation reports
E. Initial and Continuing Calibration Information
F. Analysis Logs
G. Extraction Logs

Level IV. Quaternary Data Package Provided Upon Request
(CLP-TYPE Validation package)

A. All QC Data Included In Levels I, II, and III plus:
B. Multiple Sample Dilutions Reported
C. Initial and Continuing Calibration Chromatograms and Quantitation Reports
D. Standard Preparation Log

Diskette deliverables available for any level upon request.

***Due to improvements made in our reporting system, the Del Mar Analytical standard report is now a combination of what was formally our Level I and II data packages. There is no longer an additional charge for a Level II data package.**

APPENDIX C

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

AHMANSON RANCH
WELL M-1
GROUNDWATER INVESTIGATION

1.0 INTRODUCTION

This Health and Safety Plan (HASP) is designed to provide safe working conditions for the field team, including subcontractors, during field activities. The goal of this HASP is to prevent and minimize personal injuries, illnesses, and damage to equipment, supplies, and property. All employees and subcontractors involved with this project are required to adhere to safe work practices and comply at all times with appropriate safety requirements of OSHA, Cal-OSHA, and Psomas.

2.0 PSOMAS SAFETY AND HEALTH POLICY

The health and safety of employees is of paramount importance to Psomas. Psomas' goal is to provide a safe, healthy and productive environment. In an effort to attain this goal, Psomas has implemented an Injury Illness and Prevention Program (IIPP). The program includes:

- Identifying safety coordinators, who can be contacted regarding workplace safety and health concerns.
- Providing work place health and safety practices.
- Conducting safety and health inspections to find and eliminate unsafe working conditions or health hazards.
- Investigating promptly and thoroughly workplace accidents to find out what happened and correct the situation so it won't happen again.
- Training all employees in good health and safety practices.
- Establishing communications regarding health and safety issues.
- Developing and enforcing safety and health rules and requiring employees to follow these rules as a condition of employment.
- Recognizing employees for safe practices, and counseling employees for failure to follow safe and healthful practices.

Psomas' objective is to reduce the number of injuries and illnesses to an absolute minimum with the ultimate goal of zero accidents and injuries. The personal health and safety of each employee is of absolute importance. Psomas recognizes that safety is a shared responsibility. The safety program is only effective with full participation and commitment from all employees.

2.1 Safety Coordinators

Each Psomas office has a Human Resources staff person, who serves as the safety coordinator for that office or region. Offices with staff potentially participating in this sampling effort are listed below:

West Los Angeles Region – Fred Mueller
Cost Mesa Region - Fred Henstridge

2.2 Code of Safe Practices

All Psomas employees and contract workers shall adhere to the Code of Safe Practices as excerpted from the CAL/OSHA Construction Safety Orders as summarized below.

CODE OF SAFE PRACTICES
AS EXCERPTED FROM CAL/OSHA CONSTRUCTION SAFETY ORDERS

GENERAL

1. All persons shall follow these safe practices rules, render every possible aid to safe operations and report all unsafe conditions or practices to the foreman or superintendent.
2. Foreman shall insist on employees observing and obeying every rule, regulations and order as is necessary to the safe conduct of work, and shall take such actions as is necessary to the safe conduct of work, and shall take such actions as is necessary to obtain observance.
3. All employees shall be given frequent accident prevention instructions. Instructions shall be given at least every 10 working days.
4. Anyone known to be under the influence of drugs or intoxicating substances that impair the employee's ability to safely perform the assigned duties shall not be allowed on the job while in that condition.
5. Horseplay, scuffling and other acts tend to have an adverse influence on safety or well being of the employees shall be prohibited.
6. Work shall be well planned and supervised to prevent injuries in the handling of materials and in working together with equipment.
7. No one shall knowingly be permitted or required to work while the employee's ability or alertness is so impaired by fatigue, illness or other causes that it might unnecessarily expose the employee or others to injury.
8. Employees shall not enter manholes, underground vaults, chambers, tanks, silos or similar places that receive little ventilation, unless it has been determined it is safe to enter.
9. Employees shall be instructed to ensure that all guards and other protective devices are in proper places and adjusted, and shall report deficiencies promptly to the foreman or superintendent.
10. Crowding or pushing when boarding or leaving any vehicle or other conveyance shall be prohibited.
11. Workers shall not handle or tamper with any electrical equipment, machinery or air or water lines in a manner not within the scope of duties, unless they have received instructions from their foreman.
12. All injuries shall be reported promptly to the foreman or superintendent so that arrangements can be made for medical or first aid treatment.
13. When lifting heavy objects, the large muscles of the leg instead of the smaller muscles of the back shall be used.
14. Inappropriate footwear or shoes with thin or badly worn soles shall not be worn.
15. Materials, tools or other objects shall not be thrown from buildings or structures until proper precautions are taken to protect others from falling objects.
16. Employees shall cleanse thoroughly after handling hazardous substances, and follow special instructions from authorized sources.

17. Hod carriers should avoid the use of extension ladders when carrying loads. Such ladders may provide adequate strength, but the rung position and rope arrangement make such climbing difficult and hazardous for this trade.
18. Work shall be arranged so that employees are able to face the ladder and use both hands while climbing.
19. Gasoline shall not be used for cleaning purposes.
20. No burning, welding or other source of ignition shall be applied to any enclosed tank or vessel, even if there are some openings, until it has first been determined that no possibility of explosion exists, and authority for the work is obtained from the foreman or superintendent.
21. Any damage to scaffolds, false-work or other supporting structures shall be immediately reported to the foreman and repaired before use.

USE OF TOOLS AND EQUIPMENT

22. All tools and equipment shall be maintained in good condition.
23. Damaged tools or equipment shall be removed from service and tagged "DEFECTIVE".
24. Pipe or Stillson wrenches shall not be used as a substitute for other wrenches.
25. Only appropriate tools shall be used for the job.
26. Wrenches shall not be altered by the addition of handle-extensions or "cheaters".
27. Files shall not be equipped with handles and not used to punch or pry.
28. A Screwdriver shall not be used as a chisel.
29. Wheelbarrows shall not be pushed with handles in an upright position.
30. Portable electric tools shall not be lifted or lowered by means of the power cord. Ropes shall be used.
31. Electric cords shall not be exposed to damage from vehicles.
32. In locations where the use of a portable power tool is difficult, the tool shall be supported by means of a rope or similar support of adequate strength.

MACHINERY AND VEHICLES

33. Only authorized persons shall operate machinery or equipment.
34. Loose or frayed clothing, or long hair, dangling ties, finger rings, etc., shall not be worn around moving machinery or other sources of entanglement.
35. Machinery shall not be serviced, repaired or adjusted while in operation, nor shall oiling of moving parts be attempted, except on equipment that is designed or fitted with safeguards to protect the person performing the work.
36. Where appropriate lockout procedures shall be used.
37. Employees shall not work under vehicles supported by jacks or chain hoists, without protective blocking that will prevent injury if jacks or hoists fail.
38. Air hoses shall not be disconnected at compressors until the hose line has been bled.
39. All excavators shall be visually inspected before backfilling, to ensure that it is safe to backfill.
40. Excavating equipment shall not be operated near tops of cuts, banks, and cliffs if employees are working below.
41. Tractors, bulldozers, scrapers, and carryalls shall not operate where there is possibility of overturning in dangerous areas like edges of deep fills, cut banks, and steep slopes.
42. When loading where there is a probability of dangerous slides or movement of material, the wheels or treads of loading equipment, other than that riding on rails, should be turned in the direction which will facilitate escape in case of danger, except in a situation where this position of the wheels or treads would cause a greater operational hazard.

3.0 WORK DESCRIPTION

The description of work to be implemented is presented in the main body of this Work Plan. The planned fieldwork will consist of obtaining groundwater samples from a flowing artesian agricultural well designated "M-1" which may put Psomas personnel in direct contact with groundwater.

4.0 HAZARD ASSESSMENT

4.1 Exposure to Environmental Contaminants

A perchlorate concentration of 28 ppb was recently reported in a groundwater sample obtained from well M-1 (Rincon, 2002). Due to the possibility of contact with this or other unknown environmental contaminants, personnel conducting the sampling will wear the appropriate Personal Protective Equipment (PPE) described in section 5.0 of this HASP.

4.1.1 Inhalation Hazard

It is not anticipated that the proposed sampling program will present an inhalation hazard to workers.

4.1.2 Dermal Exposure Hazard

To minimize dermal exposure all personnel shall wear the required personal protective gear at all times during the entire sampling operations, including rubber or nitrile gloves, disposable coveralls (Tyvek), and rubber steel-toed boots. If contact does occur, the exposed areas shall be immediately washed with soap and water and rinsed thoroughly.

Following completion of the sampling program, all disposable gloves, coveralls, and trash shall be placed in a plastic garbage bag for proper disposal.

4.1.3 Explosion Hazard

The work plan does not include the use of any motorized or electrical equipment and smoking will not be permitted at the site. Therefore, potential sources of ignition will be minimal. Furthermore, the sampling program will be performed in an open-air environment (no confined space) and there are no known contaminants or materials present which would be expected to produce elevated vapor concentrations. Therefore, the explosion hazard potential is considered to be extremely low.

4.1.4 Activity Hazard

The principal type of activity hazard expected to be encountered during the groundwater sampling operations include the potential for falls, contact with tools and equipment, and environmental factors including induced heat stress and wildland fire hazard. Maintaining a clean and orderly work area can minimize the potential for falls. Properly utilizing tools and equipment in accordance with manufacturers recommendations will help minimize the potential for injurious accidents.

Heat Stress

The potential hazard posed by heat stress is associated with high ambient temperatures, use of protective clothing, heavy physical labor, working in confined spaces, and/or any combination thereof. Depending on the time of year, heat stress can be a great hazard. Even during cooler months, heavy equipment, PPE and confined spaces can lead to heat stress. Procedures that shall be implemented to reduce the risk of heat stress include:

- Training to familiarize individuals with heat stress syndrome;
- Implementation of work/rest cycles, as appropriate, to periodically allow employees to remove protective clothing and cool down;
- Availability of liquids to replace loss of body fluids;
- Monitoring of employee stress levels; and,
- Utilization of cooling devices, such as ice vests or fans, if necessary.

Employees shall be encouraged to take rest breaks as necessary. Plenty of water will be provided on site in the form of water bottles and/or water coolers. Individual use cups will also be provided and potable water containers properly identified.

To monitor workers for heat stress, the following guidelines should be followed:

- Heart Rate. Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same. If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one third.

- Oral Temperature. Use a clinical thermometer (3 minutes under the tongue) or a similar device to measure the oral temperature at the end of the work period (before drinking fluids). If the oral temperature exceeds 99.6 ^{0}F, shorten the next work cycle by one third without changing the rest period. If oral temperature still exceeds 99.6 ^{0}F at the beginning of the next rest period, shorten the following work cycle by one-third. Do not permit a worker to wear a semi-permeable or impermeable garment when his/her oral temperature exceeds 100.6 ^{0}F.

- Body water loss (if possible). Measure weight on a scale accurate to ±0.25 lb at the beginning of each workday to see if enough fluids are being taken to prevent dehydration. The body water loss should not exceed 1.5 percent total body weight loss in a workday.

Fire Hazard

The Ahmanson Ranch is covered in dry annual grasses, presenting a high fire danger. Caution must be taken to minimize sources of ignition such as cigarettes, open flames, and hot engines. No smoking will be allowed on the Ahmanson Ranch Property. Vehicles shall be parked on

existing dirt access roads and/or existing turnouts and no off-road driving is permitted. Each Psomas field vehicle shall carry a fire extinguisher.

Psomas' previous experience with this type of environment and our approach to safe operations should help minimize potential fire hazards.

5.0 GENERAL HEALTH AND SAFETY REQUIREMENTS

5.1 Safety Orientation Meeting

All field personnel will attend a safety orientation meeting before commencing fieldwork. The meeting will be scheduled and conducted by the Project Manager. The meeting will include a presentation of this Health and Safety Plan. All field personnel will sign a copy of the Safety Compliance Agreement.

5.2 Code For Safe Practices

The following is a list of safety procedures that will be adhered to while working at any field location:

- All OSHA requirements will be observed
- Walkman type radios with earphones are not permitted on the job.
- Approved hard hats must be worn at sites where it is required.
- Eye, ear, hand protection devices and weather protective gear must be worn when the type of work being done requires this type of protection.
- Employees shall not enter any enclosed space that receives little ventilation unless it has been determined that it is safe to enter.
- Employees are not permitted to enter sewers, storm drains, tunnels or other potentially dangerous infrastructure without the appropriate safety equipment.
- No smoking except in designated places.
- Employees shall not enter any area that presents a risk of coming into contact with any hazardous materials unless it has been determined that it is safe to enter.

5.3 Protective Equipment and Clothing

Selection of the appropriate personal protective equipment is required prior to the commencement of work. Key factors in this process are the identification of known and suspected hazards, routes of entry and the performance of the PPE in providing a barrier to these hazards.

The level of protection for field personnel shall be utilized for work activities that may involve skin hazards, but not respiratory hazards. This level includes:

- Work apparel appropriate for the task to be performed. This generally means a sleeved shirt and long pants;

- Impervious Rubber or Nitrile gloves;
- Steel-toed rubber or Nitrile boots;
- Safety glasses or goggle;
- Hardhat; and
- Tyvek or chemical resistant coveralls.

Additional equipment is to be available onsite and/or in field vehicle:

- Fire Extinguisher
- First–aid kit
- Cellular phone
- Flashlight
- Construction tape/ flagging
- A vehicle must be kept on site while personnel are working, for the transport of slightly injured personnel to the hospital. Severely injured personnel MUST ONLY be transported by paramedics as described in Section 6.0. A copy of the hospital address and map (see Section 6) must remain in the vehicle.
- List of facilities for referring accident victims.

All Psomas field personnel are to follow a pre-established field schedule. Psomas field personnel are to check in at Psomas Costa Mesa office via phone or in person at the beginning and end of every field day. Field personnel are never to work alone on the site.

6.0 EMERGENCY RESPONSE PROCEDURES

6.1 Physical Injury and Injury Reporting Requirements

In the event of an accident resulting in physical injury, call paramedics immediately and perform first aid commensurate with training and seriousness of the injury. Severely injured personnel are to be transported only by paramedics and/or by ambulance personnel, unless a life-threatening condition is judged to exist that must be addressed immediately. At the hospital, a physician's attention is mandatory regardless of how serious the injury appears.

The Project Manager and appropriate senior Psomas management are to be notified immediately.

The Worker's Compensation Accident Report Form shall be completed and forwarded to the Human Resources Representative in the local office. A separate accident report must be submitted if any of the following conditions apply

a) Results in lost time beyond the day of injury.
b) Requires medical treatment other than first aid.
c) Requires in-patent hospitalization of more than 24 hours for other than medical observation.
d) Produces any serious degree of permanent disfigurement.
e) An OSHA citation is issued for the incident.

f) Any injury where the general public is involved.

Fire, Explosion, Flooding, and Property Damage
In the event of a fire, explosion, or flooding notify the fire department immediately by dialing 911. The Team Leader and Project Manager are to be notified by the field personnel as soon as practical and a written report prepared.

6.2 Emergency Telephone Numbers

Fire Department	911
Police Department	911
Paramedics	911
Ahmanson Ranch	(818) 880-4325

6.2.1 Contacts

Rob Johnson
Phone: (714) 751-7373
Cell: (714) 345-9184

John Thornton
Phone: (714) 751-7373
Cell: (714) 323-7929

6.2.2 Hospital Address and Directions from Work Site (Map Attached*)*

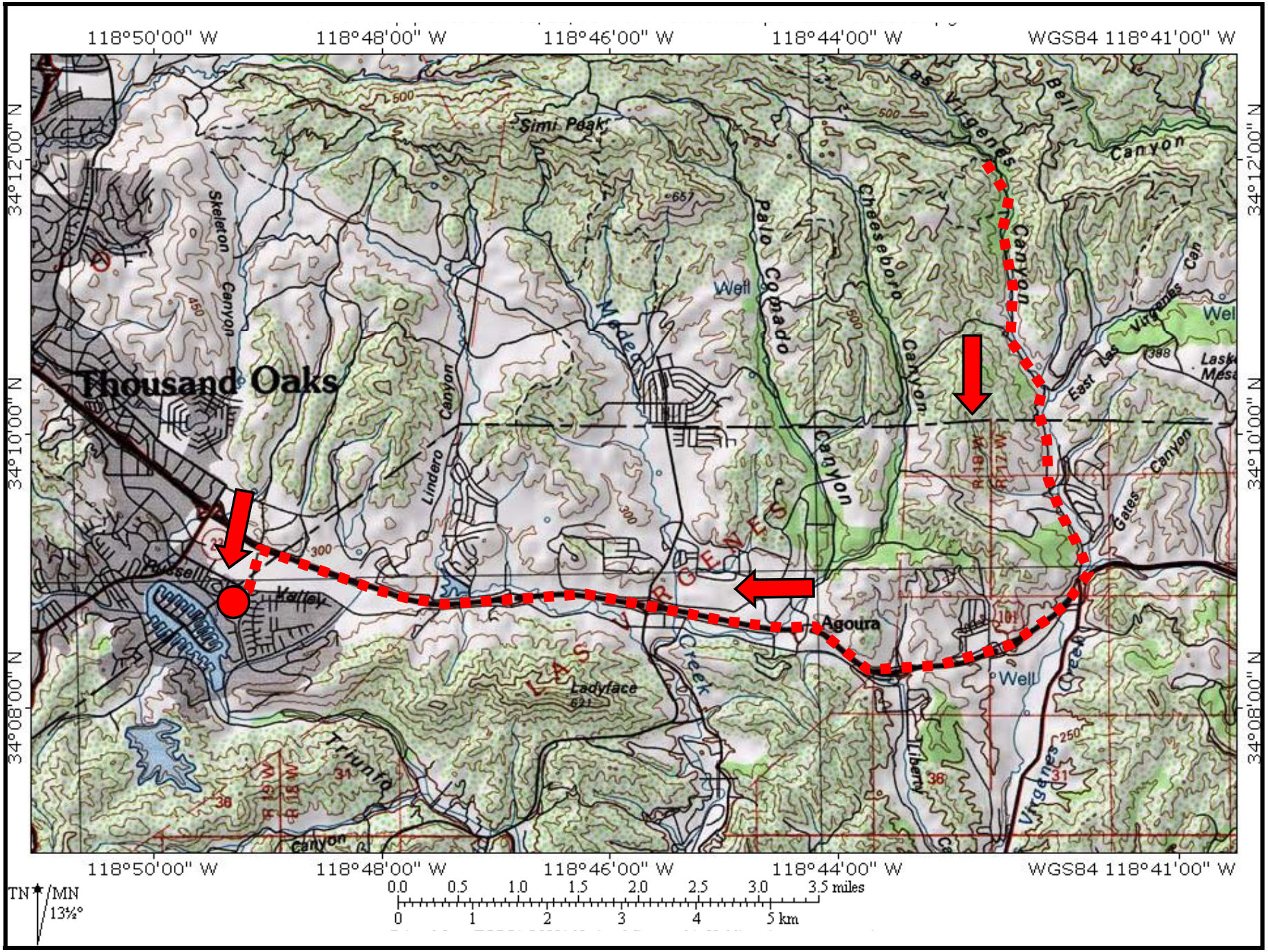
Westlake Medical Center
4415 Lakeview Canyon Road
Westlake Village, CA 91631
Phone (818) 889-5144

Take Las Virgenes Road west to 101 North.
Take 101 North to Lakeview Canyon Road West
Westlake Medical Center is on corner of Lakeview Canyon Road and Agoura Road

7.0 PROJECT PERSONNEL

Psomas

Team Leader – John Thornton
Technical Manager – John Thornton
Project Manager – Rob Johnson
Field Hydrogeologist – Todd Bear



EMERGENCY MAP - Well M-1 to Westlake Medical Center – 4415 Lakeview Canyon Road, Westlake Village (818) 889-5144