# WORKPLAN
# FOR
# SOIL AND WATER INVESTIGATION

MISSION VALLEY ROCK
799 ATHENOUR WAY 2-13-98
SUNOL, CA 94586

Prepared For:
MORT CALVERT
MISSION VALLEY ROCK
799 ATHENOUR WAY
SUNOL, CA 94586

Submitted By:
TANK PROTECT ENGINEERING
Of Northern California, Inc.
2821 WHIPPLE ROAD
UNION CITY, CA 94587
(510) 429-8088

February 13, 1998

Project Number 384

MISSION VALLEY / ROCK COMPANY
ASPHALT COMPANY
READY MIX COMPANY

7999 ATHENOUR WAY SUNOL, CA 94586 (510) 862-2257



March 5, 1998

Mr. Scott Seery
Alameda County Health Care Services Agency
Environmental Health Services
1131 Harbor Bay Parkway Suite 250
Alameda, CA 94502-6577

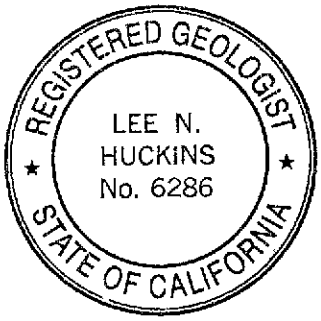
Dear Mr. Seery:

Enclosed is the work plan you requested for the tank removal site at Mission Valley Rock Co., Sunol, CA. Once the work plan is approved, Mission Valley will proceed with the scheduling of the work required.

Very truly yours,
MISSION VALLEY ROCK CO.

W.M. Calvert

Lee N. Huckins
Registered Geologist




Jeff J. Farhoomand, M.S.
Principal Engineer

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This report has been prepared by the staff of **Tank Protect Engineering of Northern California, Inc.** under direction of an Engineer and/or Geologist whose seal(s) and/or signature(s) appear hereon.

The findings, recommendations, specifications or professional opinions are presented, within the limits prescribed by the client, after being prepared in accordance with generally accepted professional engineering and geologic practice. We make no other warranty, either expressed or implied.

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## APPENDICES

## 1.0 INTRODUCTION

The subject site is located at 799 Athenour Way in the City of Sunol in Alameda County, California (see Figure 1). The contact person for the site is Mr. Mort Calvert; telephone number (510) 862-2257.

Because of soil and groundwater samples obtained during the soil boring investigation, the Alameda County Health Care Services Agency (ACHCSA) requested by letter dated January 19, 1998 (see Appendix A) that a soil and water investigation be conducted to evaluate the extent of the contamination associated with the underground storage tank (UST) release at the site.

This WORKPLAN FOR SOIL BORING INVESTIGATION AND STOCKPILE SOIL REMEDIATION (WP) proposes excavation of contaminated soil, remediation stockpiled soil and the installation of three monitoring wells to investigate soil and groundwater contamination.

## 2.0 BACKGROUND

Tank Protect Engineering of Northern California, Inc. (TPE) was contracted by Mission Valley Rock (MVR) to remove two 10,000-gallon underground steel, diesel storage tanks and one 2,000-gallon underground steel, gasoline storage tank.

Verification sampling was conducted under the supervision of a representative from the ACHCSA. Six discrete verification soil samples were collected from the excavation sidewalls and floor at depths of 9.0 to 13.5 feet. Sixteen discrete verification soil samples were collected from the stockpiled soil for laboratory compositing into 4 composites samples (SP1-A,B,C,D through SP5-A,B,C,D). A "grab" groundwater sample (WS-1) was collected from the excavation at a depth of 10 feet (see Figure 2). Soil and groundwater samples were analyzed for total petroleum hydrocarbons as diesel (TPHD), as gasoline (TPHG), benzene, toluene, ethylbenzene, and xylenes (MBTEX) and methyl t-butyl ether (MTBE).

All discrete and stockpile soil samples, with the exception of sample S-2, showed detectable limits of hydrocarbon contamination. MTBE was nondetectable in all samples.

Tank removal and subsequent soil sampling activities are documented in TPE's August 12, 1996 TANK CLOSURE REPORT, MISSION VALLEY ROCK, 799 ATHENOUR WAY, SUNOL, CA 94586.

Because of soil and groundwater samples obtained during a recent tank removal showed concentrations of hydrocarbons to be present, the ACHCSA requested by letter dated October 28, 1996 that a environmental investigation be conducted to determine the lateral and vertical extent of soil and groundwater impact resulting from a release at the site. In response to ACHCSA, TPE submitted a December 4, 1996 WORKPLAN FOR SOIL BORING INVESTIGATION AND STOCKPILE SOIL REMEDIATION, MISSION VALLEY ROCK, 799 ATHENOUR WAY, SUNOL, CA 94586. ACHCSA approved the workplan on December 13, 1996.

Chemical results of soil samples collected during the soil boring investigation (see Figure 3) detected TPHD and TPHD in concentrations up to 2,500 parts per million (ppm) and 160 ppm, respectively. Groundwater "grab" samples obtained during the soil boring investigation detected TPHD and TPHG in concentrations ranging up to 500,000 part per billion (ppb) and 400,000 ppb, respectively. Results from the soil boring investigation are documented in TPE's March 13, 1997 PRELIMINARY SITE ASSESSMENT REPORT, MISSION VALLEY ROCK, 799 ATHENOUR WAY, SUNOL, CA 94586.

An additional underground storage tank was located east of the removed three underground storage tanks described above. Although this underground storage tank had been removed, ACHCSA requested that an additional investigation be conducted in their May 9, 1997 letter titled Unpermitted Removal of Underground Storage Tank Mission Valley Rock Company, 799 Athenour Way, Sunol. In response to ACHCSA, TPE submitted a July 8, 1997 WORKPLAN FOR SUBSURFACE INVESTIGATION AND SOIL SAMPLING FOR MISSION VALLEY ROCK, 799 ATHENOUR WAY, SUNOL, CA 94586 which proposed exploratory trenching as a method of investigation. The workplan was approved by ACHCSA on August 25, 1997.

Analytical results detected TPHD in soil at concentrations ranging up to 58 ppm (T2-B).

Results of the exploratory trenching and stockpile soil sampling are documented in TPE's October 20, 1997 STOCKPILE SOIL REMEDIATION AND EXPLORATORY TRENCHING REPORT, MISSION VALLEY ROCK, 799 ATHENOUR WAY, SUNOL, CA 94586.

All soil and groundwater analytical results are summarized in Tables 1 and 2.

## 3.0 PROPOSED SCOPE OF WORK

As a investigation of the vertical and horizontal extent of soil and groundwater contamination, TPE proposes the following scope of work:

- Excavate contaminated soil from the sidewalls of the former underground tank excavation.
- After excavating contaminated soil in the above task, collect verification soil samples from the sidewalls and floor of the excavation for chemical analysis to document cleanup concentrations of TPHD, TPHG and MBTEX.
- Conduct onsite remediation of the stockpiled soil and collect verification soil samples to document cleanup concentrations of TPHD, TPHG and MBTEX contamination.
- Reuse the remediated soil to backfill the excavation.
- Conduct an Underground Service Alert (USA) location request to minimize the potential of encountering unexpected utilities, if necessary.

- Obtain monitoring well installation permits from the Alameda County Flood Control and Water Conservation District, Water Resources Management, Zone 7 (Zone 7).

- Obtain a permit for installing a groundwater monitoring wells and notify appropriate agencies prior to conducting field activities.

- Drill three soil borings to further investigate the horizontal and vertical extent of vadose zone soil contamination (approximately 25 feet).

- Collect soil samples from each boring at approximately 5-foot depth intervals, at changes in lithology and at the occurrence of apparent soil contamination for construction of a boring log and for chemical analysis.

- Analyze selected vadose zone soil samples from the borings for TPHD, TPHG and MBTEX.

- Convert the borings into groundwater monitoring wells.

- Develop, purge and sample groundwater from the monitoring wells for chemical analysis.

- Analyze 1 groundwater sample from each well for TPHD, TPHG, and MBTEX and a trip blank sample for TPHG and MBTEX.

- Prepare a Preliminary Site Assessment Report (PSAR).

Details of the proposed scope of work are presented below.

### 3.1 Prefield Activities

Prior to beginning excavation activities, TPE will notify the Bay Area Air Quality Management District (BAAQMD) and the ACHCSA.

## 3.2 Excavation of Contaminated Soil

Figure 4 shows the proposed area of excavation. This proposed area is based upon the results of the initial verification soil sampling and the soil boring program presented in Figure 5. TPE proposes to conduct excavation of contaminated vadose zone soil to a horizontal distance up to about 2 to 10 feet outward from the position of the former excavation sidewalls and vertical excavation up to a depth of about 10 feet or the depth of groundwater, whichever occurs first. Horizontal excavation will not be conducted off site or to the extent of endangering buildings, sidewalk areas, utilities, or any other structures or objects.

The extent of excavation will be based on field-screening methods that will include the detection of apparent soil contamination as evidenced by visible hydrocarbon stains, odors, and headspace analyses of soil samples using a Gastech, Inc., Trace-Techtor Hydrocarbon Vapor Tester (HVT).

Headspace analysis will be conducted by sealing a soil sample in a quart-size plastic bag and allowing hydrocarbons, if present, to volatilize into the headspace of the bag. The headspace will be tested by inserting the probe of the HVT into the headspace, while minimizing the entry of fresh air, and recording the response in ppm.

Excavated soil will be stockpiled on site. If the ground surface is not protected by concrete or asphalt, the excavated soil will be placed on top of plastic sheeting. When leaving the site, TPE personnel will cover the stockpile with plastic sheeting. The client will be responsible to maintain the cover when TPE personnel are not working on site.

### 3.2.1 Verification Soil Sampling

When the horizontal and vertical extent of contaminated vadose zone soil has been reached, based on field screening, or the horizontal and vertical limits discussed above have been reached, verification soil samples will be collected for chemical analysis. The ACHCSA will be notified 24 hours prior to sampling. Verification sampling will be conducted in the presence of the ACHCSA, if necessary. As a minimum, soil

samples will be collected from the sidewalls at about 20-foot intervals both horizontally and vertically. If groundwater is present within the excavation, the vertical depth of sampling will be about 1 foot above the groundwater's surface. If no groundwater is encountered, soil samples will be collected from the floor of the excavation at about 20-foot horizontal intervals. If any sidewall or the floor is less than 20 feet, a minimum of 1 sample will be collected from that sidewall or floor. Additional soil samples may be collected where contaminated soil may be suspected and in permeable materials that may act as conduits for contaminant transport. Additional excavation may be conducted, with the approval of MVR, if all contaminated soil has not been removed based on results of chemical analyses.

Soil samples will be collected from the excavation by removing about 1 foot of soil to expose a fresh surface and driving a clean 2-inch diameter by 6-inch long brass tube into the newly exposed surface with a slide-hammer corer. The samples may also be collected by excavating soil with the bucket of a backhoe and collecting a sample in a brass tube from soil in the bucket. All tubes will be completely filled with no headspace. After collecting each sample, the brass tube ends will be quickly covered with Teflon sheeting and capped with plastic end-caps. Each tube will be labeled to show site name, sample name and depth, time and date collected, and sampler name; sealed in a quart-size plastic bag; and placed in an iced-cooler for transport to a California State Department of Health Services (DHS) certified laboratory accompanied by chain-of-custody documentation.

Appendices B, C, and D document TPE's protocols relative to sample handling, waste handling and decontamination, and quality assurance and quality control procedures.

3.2.1.1 Chemical Analyses of Verification Soil Samples

The above soil samples are proposed to be analyzed for TPHD, TPHG and MBTEX by the United States Environmental Protection Agency (EPA) Methods GCFID 3550/8015, 5030/8015 and 8020, respectively.

### 3.3 Proposed Remediation of Stockpiled Soil

To remediate contaminated stockpiled soil from excavation activities at the time of tank removal, TPE proposes the following scope of work:

- Use bioremediation/aeration to remediate the contaminated soil to acceptable county levels for potential re-use.
- Sample remediated soil stockpiles for TPHD, TPHG and MBTEX.
- Obtain ACHCSA approval for re-use.

#### 3.3.1 Method of Soil Remediation

TPE proposes to conduct onsite remediation of the stockpiled soil by bioremediation to remediate the contaminated soil stockpile for potential reuse onsite.

Prior to beginning work, TPE will notify the BAAQMD.

Aeration of the soil will be conducted by moving the soil between onsite treatment areas with a front-end loader and dumping the soil from the bucket of the loader while in an elevated position.

Bioremediation of the soil will be accomplished by inoculating the soil with a proprietary bacterial culture formulated to destroy TPHD and TPHG chemicals. Nutrients will be applied to the soil prior to inoculating with bacteria. The nutrients will be applied with a spray machine while the soil is being aerated by turning with a front-end loader. Within 1 to 2 days after applying the nutrients, the soil will again be aerated by turning with a front-end loader and sprayed (inoculated) with the bacterial culture. After about 2 to 4 weeks, the soil will be sampled and analyzed for TPHD, TPHG and MBTEX chemicals to test the effectiveness of remediation.

If the treatment areas are covered with concrete or asphalt, no plastic underlayment of the soil is proposed. Plastic underlayment is proposed for all areas not covered with asphalt or concrete.

### 3.3.2 Stockpile Verification Sampling Plan

TPE understands that chemical analyses of 1 discrete soil sample for about each 20 cyds of stockpiled soil is acceptable to the CRWQCB and the ACHCSA for soil characterization.

TPE understands that the CRWQCB and ACHCSA will accept cleanup concentrations of 10 ppm for TPHD and TPHG and nondetectable for MBTEX chemicals for onsite reuse of remediated soil.

### 3.3.3 Location and Depth of Stockpile Verification Soil Samples

The stockpile of remediated soil will be well mixed and spread over a square or rectangular area to a height of about 5 or 6 feet. The stockpile will be subdivided by a grid, such that, each cell of the grid contains about 20 cyds of soil prior to sampling. Each cell will be further subdivided into 4 equal quadrants labeled A, B, C, and D. A systematic random sampling plan will be implemented with a discrete sample being collected in numerical and alphabetical order from each larger cell. For example, the first sample will be collected from the approximate center of quadrant A in cell 1; the second sample will be collected from the approximate center of quadrant B in cell 2, and so forth, until all larger cells are sampled. The sample depth will be rotated, if stockpile depth is adequate. For example, the first sample will be collected at a depth of 2 feet; the second sample will be collected at a depth of 3 feet; the third sample will be collected at a depth of 4 feet; the fourth sample will be collected at a depth of 2 feet; and so forth, until all samples are collected (see Appendix B for TPE's protocol relative to sample handling procedures).

Samples will be collected by digging holes to the target depths and collecting soil in a 2-inch diameter by 6-inch long brass tube driven by a slide-hammer corer. The ends of each tube will be quickly covered with Teflon sheeting followed by an end-cap. Each tube will be labeled to show site name, project number, date and time sampled, sample name and depth, and sampler name; sealed in individual plastic bags; and preserved in an iced-cooler for delivery to a DHS certified laboratory for analysis for TPHD, TPHG and MBTEX.

### 3.4 Excavation Closure

With the approval of the ACHCSA, TPE will use remediated soil or import clean backfill material (pea gravel) to backfill the excavation. The soil will be placed in the excavation in compacted lifts to ground surface.

## 4.0 PROPOSED GROUNDWATER MONITORING WELLS

### 4.1 Predrilling Activities

Before commencing drilling activities, TPE will obtain soil boring permits from Zone 7 and visit the site to mark the proposed exploratory soil boring locations. TPE will contact USA to minimize the potential of encountering underground utilities and objects while conducting soil borings, if necessary, and notify ACHCSA.

### 4.2 Rationale for Monitoring Well Locations

Figure 6 presents the results of groundwater samples collected during the soil boring program for TPHD and TPHG. The results indicate high concentrations of TPHD and TPHG in groundwater to the west and south of the former excavation. The assumed regional flow direction based upon topography would be to the northwest towards Niles Canyon. Figure 7 shows the proposed locations of the three groundwater monitoring wells. The proposed well locations are based upon the results of the soil boring

program. TPE believes that the area around the former excavation is influenced by the large silt ponds to the north and east.

### 4.3 Soil Boring and Sampling Procedures

The exploratory soil borings are proposed to be drilled to depths up to 25 feet or groundwater (whichever occurs first) by a State of California licensed water well driller (C-57 Water Well Driller contractor's license) using 8-inch diameter, hollow-stem, auger drilling equipment. The augers will be steam-cleaned before drilling each boring to minimize the potential of cross-contamination between borings or introducing offsite contamination to the initial boring. **Representative soil samples will be collected for chemical analyses in the vadose zone at approximately 5-foot depth intervals below the ground surface, at changes in lithology, and the occurrence of apparent hydrocarbon** contamination by advancing a California split-spoon sampler, equipped with 2-inch diameter by 6-inch long brass tubes, into the undisturbed soil beyond the tip of the augers. The sampling equipment will be cleaned before each sampling event by washing with an Alconox® solution and rinsing in tap water.

Drill cuttings will be added to onsite stockpiled soil and remediated.

Detailed boring logs will be prepared from auger return material and split-spoon samples. The soil will be logged according to the Unified Soil Classification System under the direction of a California Registered Geologist.

Appendices E and C document TPE's protocols relative to hollow-stem auger drilling and soil sampling procedures, and waste handling and decontamination procedures, respectively.

#### 4.3.1 Soil Sample Selection for Chemical Analyses

**All vadose zone soil core samples will be field-screened for the presence of apparent hydrocarbon soil contamination** based on field screening methods described in Section 3.2 Excavation of Contaminated Soil.

Samples containing apparent hydrocarbon contamination will be selected for chemical analysis. If no contamination is apparent, the sample nearest to groundwater will be selected for chemical analysis.

Selected samples will be preserved in the brass tubes by quickly covering the open ends with Teflon sheeting and capping with plastic end-caps. The tubes will be labeled to show site name, project number, date and time collected, sample name and depth, and sampler name; sealed in quart-size plastic bags; and placed in an iced-cooler for transport to a California Department of Health Services (DHS) certified laboratory accompanied by chain-of-custody documentation.

Appendix B documents TPE's protocol relative to sample handling procedures.

4.3.2.1 Chemical Analyses of Soil Boring samples

Chemical analysis for the above soil samples will be conducted as described in section 3.2.1.1 Chemical Analysis of Verification Soil Samples.

4.4 Groundwater Investigation

The following discussion proposes groundwater monitoring well construction, development and sampling procedures and chemical analysis. Appendices F, G and H document TPE's protocols relative to groundwater monitoring well construction, development and sampling procedures.

4.4.1 Groundwater Monitoring Well Construction

The boring will be converted into a groundwater monitoring well by installing 2-inch diameter, flush-threaded, schedule 40, polyvinyl chloride (PVC) casing and 0.010-inch machine-slotted screen. The exact depth of each boring and screen length will be determined by the geologic profile, depth of groundwater and whether the groundwater is confined or unconfined. If groundwater is unconfined, the screen is proposed to

extend about 5 feet above and about 15 feet below the water table surface. The length of screen below the water table surface may be less than 15 feet if an aquiclude/aquitard or bedrock is encountered. If groundwater is confined, the screen length will extend from the upper contact of the aquifer to a maximum depth of 10 feet. If the aquifer is less than 10 feet thick, the screen length will equal the thickness of the aquifer. A sand pack of Number 2/12 filter sand will be placed in the annular space from the bottom of the boring to a maximum of 2 feet above the top of the screened interval. Approximately 1 foot of bentonite will be placed above the sand pack followed by a neat cement slurry seal. A traffic rated, bolt-locked, vault box will be set in concrete to protect the well. A water tight locking well cap with lock will be installed on each well casing.

4.4.2 Groundwater Monitoring Well Development

**The monitoring well will be developed a minimum of 72 hours after well construction** is completed. Before development, depth-to-groundwater will be measured from the TOC to the nearest 0.01 foot using an electronic Solinst water level meter. A minimum of 3 repetitive measurements will be made for each level determination to ensure accuracy. The well will be checked for floating product using a dedicated polyethylene bailer. If floating product is present, the thickness of product in the well will be measured by an electronic device before sampling and the depth-to-groundwater will be corrected to account for the thickness of floating product.

The well will be developed by using a surge block and a 1.7-inch, positive displacement, PVC hand pump or a Well Wizard gas displacement pump until the well is free of sand, silt and turbidity or no further improvement is apparent.

Development water will be stored on site in 55-gallon steel drums labeled to show contents, date filled, suspected chemical contaminant, expected date of removal, company's name, contact person and telephone number. Disposal of the drummed water and the drums containing the water will be the responsibility of the client. After the water is characterized by chemical analysis, TPE will provide recommendations to the client and, upon their request, assist them in remediation or

disposal of the fluids and drums, or both, in an appropriate manner as an additional work item.

4.4.3 Groundwater Monitoring Well Sampling

After a minimum of 72 hours after well development, depth to stabilized water will be measured and recorded as discussed above under section 4.4.1 Groundwater Monitoring Well Development and the well will be sampled.

Prior to sampling, the well will be purged a minimum of 3 wetted well volumes with a dedicated polyethylene bailer. Temperature, pH and electrical conductivity will be monitored and purging will continue until they are stabilized. After purging is completed, turbidity will be measured and a water sample will be collected in sterilized glass vials having Teflon-lined screw caps, immediately sealed in the vials and labeled to include: date, time, sample location, project number and sampler name. The sample will be immediately stored in an iced-cooler for transport to a DHS certified laboratory accompanied by chain-of-custody documentation. Appendices C and D document TPE's protocols relative to waste handling and decontamination procedures, and quality assurance and quality control procedures.

Purge water will be stored on site in labeled 55-gallon steel drums. Disposal of the drummed water and the drums containing the water is the responsibility of the client. After the drummed water is characterized by chemical analysis, TPE will provide recommendations to the client and, upon their request, assist them in remediation or disposal of the water and drums, or both, in an appropriate manner as an additional work item.

4.4.3.1 Chemical Analyses

The groundwater samples and a trip blank sample are proposed to be analyzed for TPHD and TPHG by EPA Method 5030/8015 and 3510/8015, respectively, for MBTEX by EPA Method 602.

## 5.0 PRELIMINARY SITE ASSESSMENT REPORT

After completing the above scope of work, TPE will prepare a report documenting soil excavation, verification sampling, remediation of soil stockpile and results of chemical analysis. The report will include: copies of all required permits, an area map, a detailed site plan showing limits of excavation and the location of the installed monitoring wells, locations of verification soil samples, graphic boring logs, graphic monitoring well construction details, a table summarizing results of chemical analysis, and copies of certified analytical reports and chain-of-custodies.

Conclusions regarding the extent and type(s) of contamination will be presented within the context of this WP. Recommendations for feasible remedial alternatives and/or supplemental sampling and analyses will be included.

The report will be reviewed and signed by a California Registered Geologist or Professional Engineer.

## 6.0 SITE SAFETY PLAN

A Site Safety Plan for conducting work under this workplan is included in Appendix I.

## 7.0 TIME SCHEDULE

The projected time schedule for implementation of the activities described in this workplan is presented below. The schedule reflects a relatively problem-free program. However, delays in the workplan review, permitting or laboratory analysis could lengthen the project schedule. Access difficulties, adverse weather, and regulator review could also delay the proposed time schedule. TPE will make every effort to adhere to the project schedule. This time schedule will be implemented, once ACHCSA approval is obtained.

Week 1: Conduct excavation of contaminated soil, collect verification soil samples, and submit samples for chemical analyses.

Week 2: Remediate stockpiled soil.

Week 6: Remediate stockpiled soil, collect verification soil samples, and submit samples for chemical analyses.

Week 7: Submit well permits.

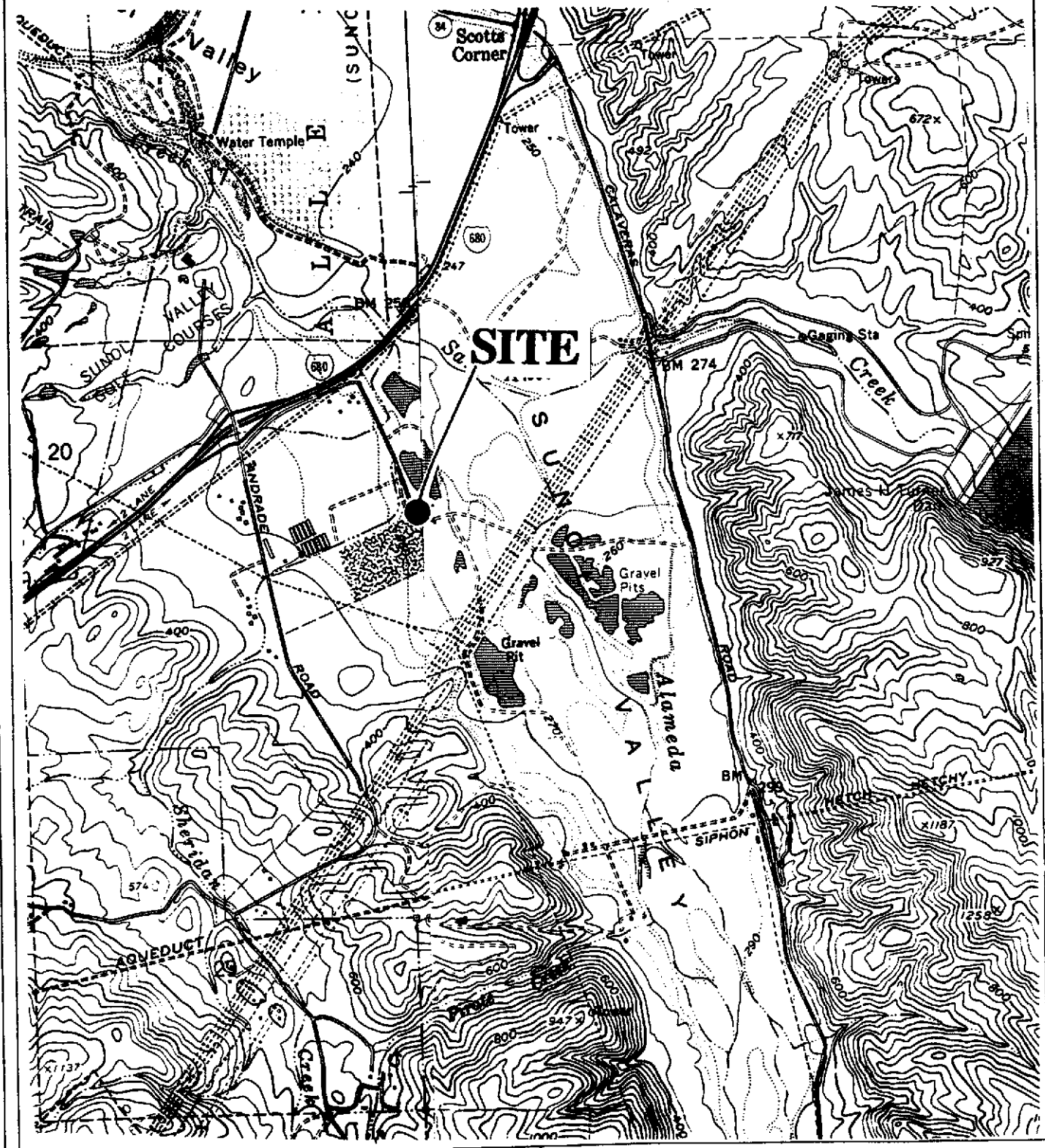
Week 8: Receive soil chemical analyses and backfill excavation.

Week 9: Install monitoring wells.

Week 10: Develop and sample monitoring wells. Submit groundwater samples for chemical analyses.

Week 12: Receive groundwater chemical analyses.

Week 16: Submit Site Assessment Report to client.




LEGEND

REFERENCE: USGS 7.5 MINUTE
SERIES QUADRANGLE MAPS
LA COSTA VALLEY, CALIFORNIA
PHOTOREVISED 1968
NILES, CALIFORNIA
PHOTOREVISED 1980

-N-

0 2,000
SCALE IN FEET

# TANK PROTECT ENGINEERING

## SITE VICINITY MAP

MISSION VALLEY ROCK
799 ATHENOUR WAY
SUNOL, CA 94586

| | |
|---|---|
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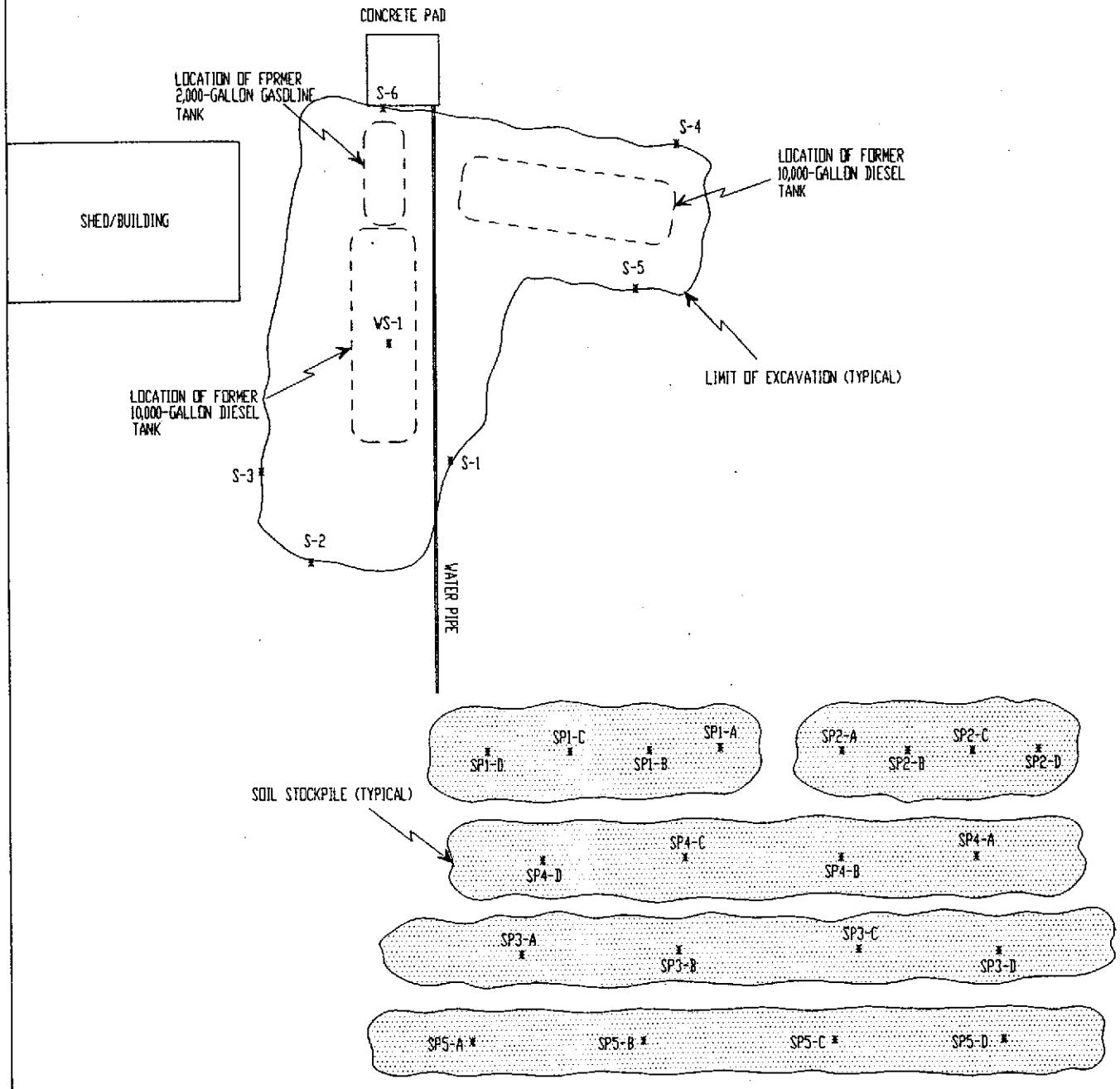
| CHECKED BY | LNH |




LEGEND

SP1-A NAME AND LOCATION OF
* SOIL SAMPLE

0 20

APPROXIMATE
SCALE IN FEET

# TANK PROTECT ENGINEERING

SITE PLAN:
OVEREXCAVATION (6/26/96)

MISSION VALLEY ROCK
799 ATHENOUR WAY
SUNOL, CA 94586

| | |
|---|---|
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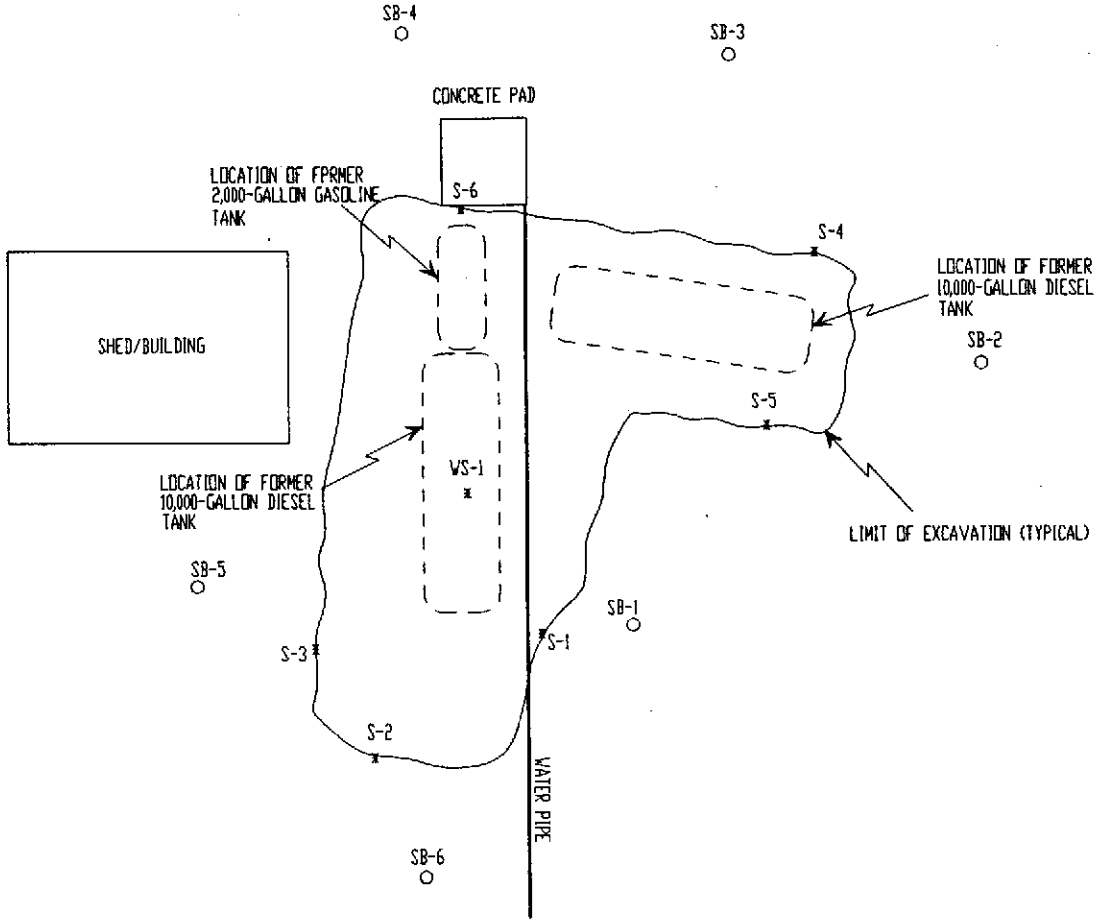


## LEGEND

S-1 * NAME AND LOCATION OF SOIL SAMPLE

SB-1 ○ SOIL BORING LOCATIONS

0 20

APPROXIMATE SCALE IN FEET

# TANK PROTECT ENGINEERING

SITE PLAN:
SOIL BORING LOCATION MAP

MISSION VALLEY ROCK
799 ATHENOUR WAY
SUNOL, CA 94586

| | |
|---|---|
| DATE | 3/3/97 |
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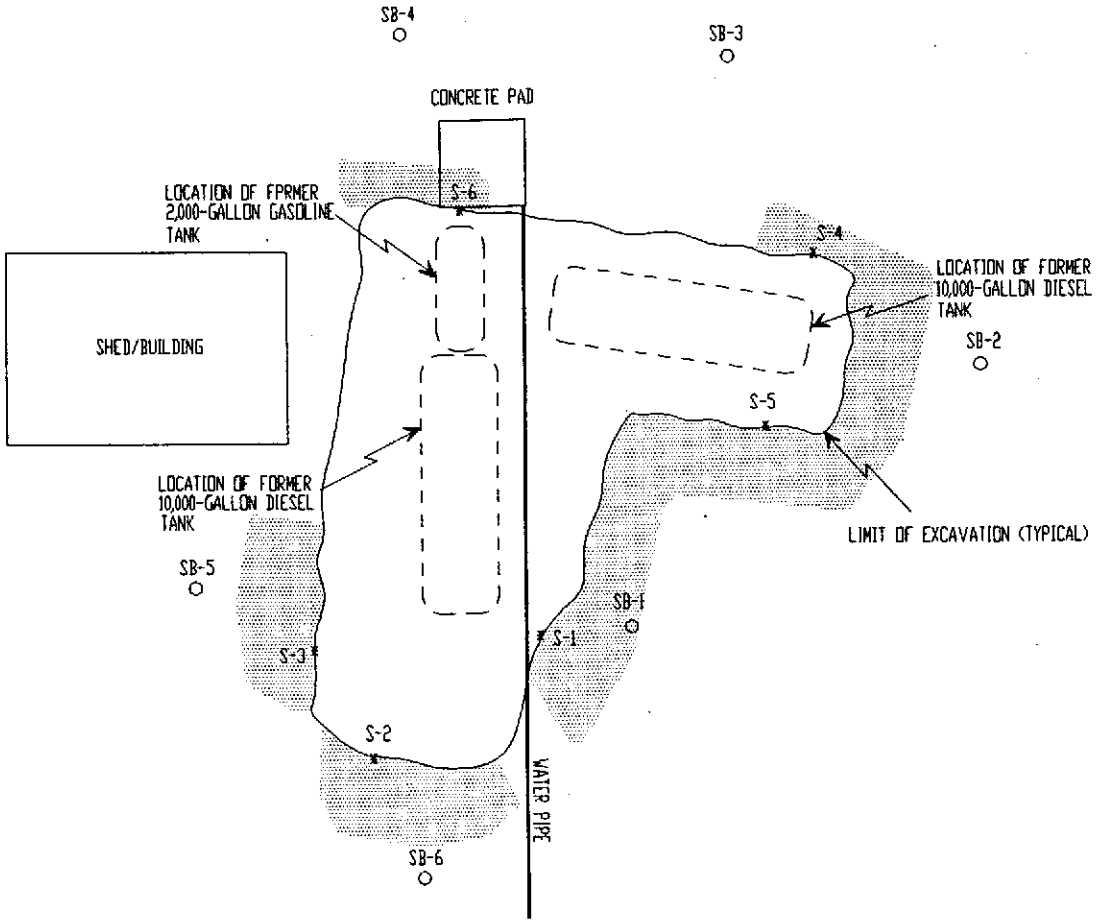


LEGEND

S-1 * NAME AND LOCATION OF SOIL SAMPLE

SB-1 ○ SOIL BORING LOCATIONS

PROPOSED AREA OF EXCAVATION

0 20

APPROXIMATE SCALE IN FEET

# TANK PROTECT ENGINEERING

SITE PLAN:
PROPOSED AREA OF EXCAVATION

MISSION VALLEY ROCK
799 ATHENOUR WAY
SUNOL, CA 94586

| | |
|---|---|
| DATE | 2/3/98 |
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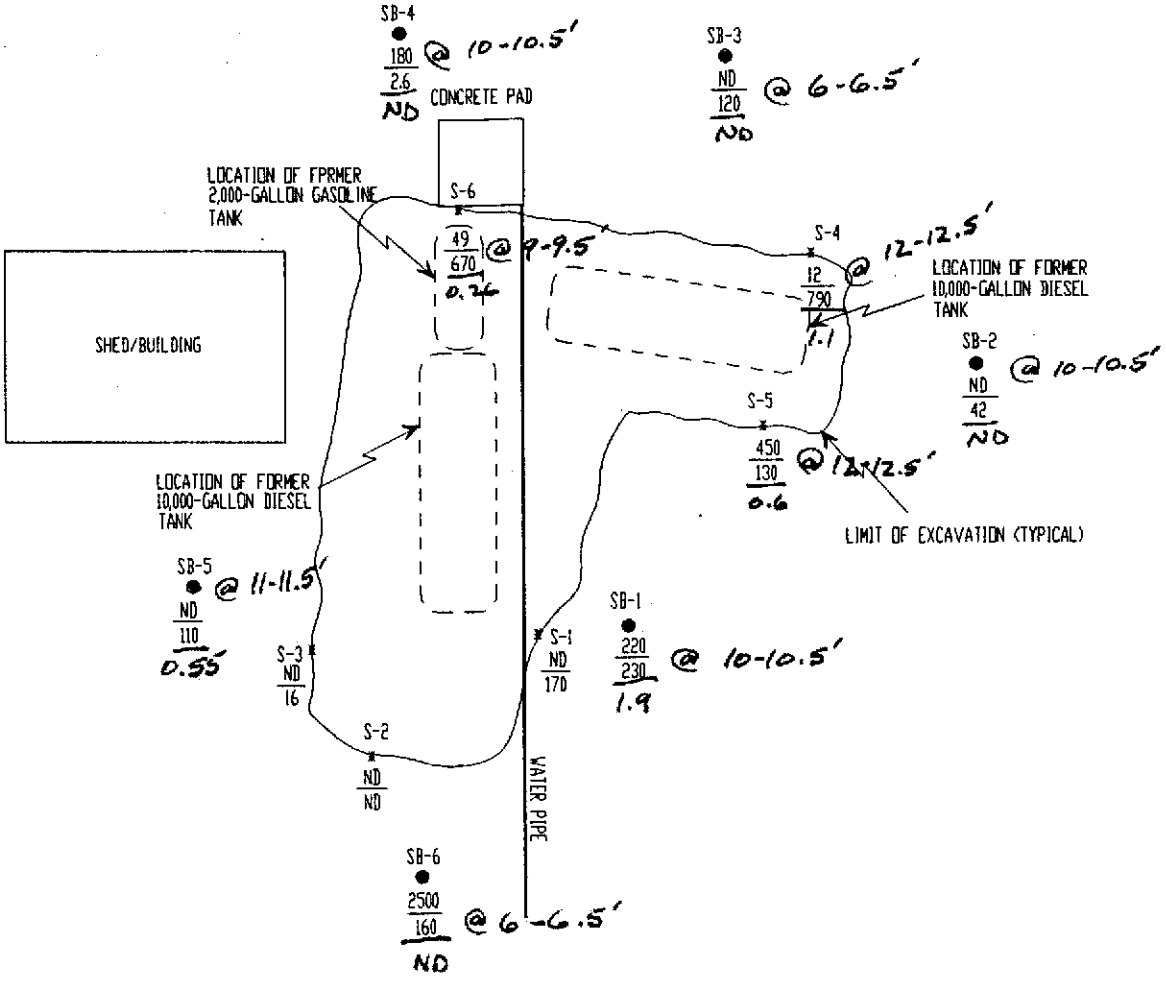


sample depths?

## LEGEND

S-1 * NAME AND LOCATION OF SOIL SAMPLE

SB-1 ○ SOIL BORING LOCATIONS

220 TPHD CONCENTRATION (ppm)

230 TPHG CONCENTRATION (ppm)

1.9 benzene

0 20

APPROXIMATE SCALE IN FEET

# TANK PROTECT ENGINEERING

SITE PLAN:
TPHD AND TPHG SOIL CONCENTRATIONS

MISSION VALLEY ROCK
799 ATHENOUR WAY
SUNOL, CA 94586

| | |
|---|---|
| DATE | 2/3/98 |
| FIGURE | 5 |
| FILE # | 384-2IN |
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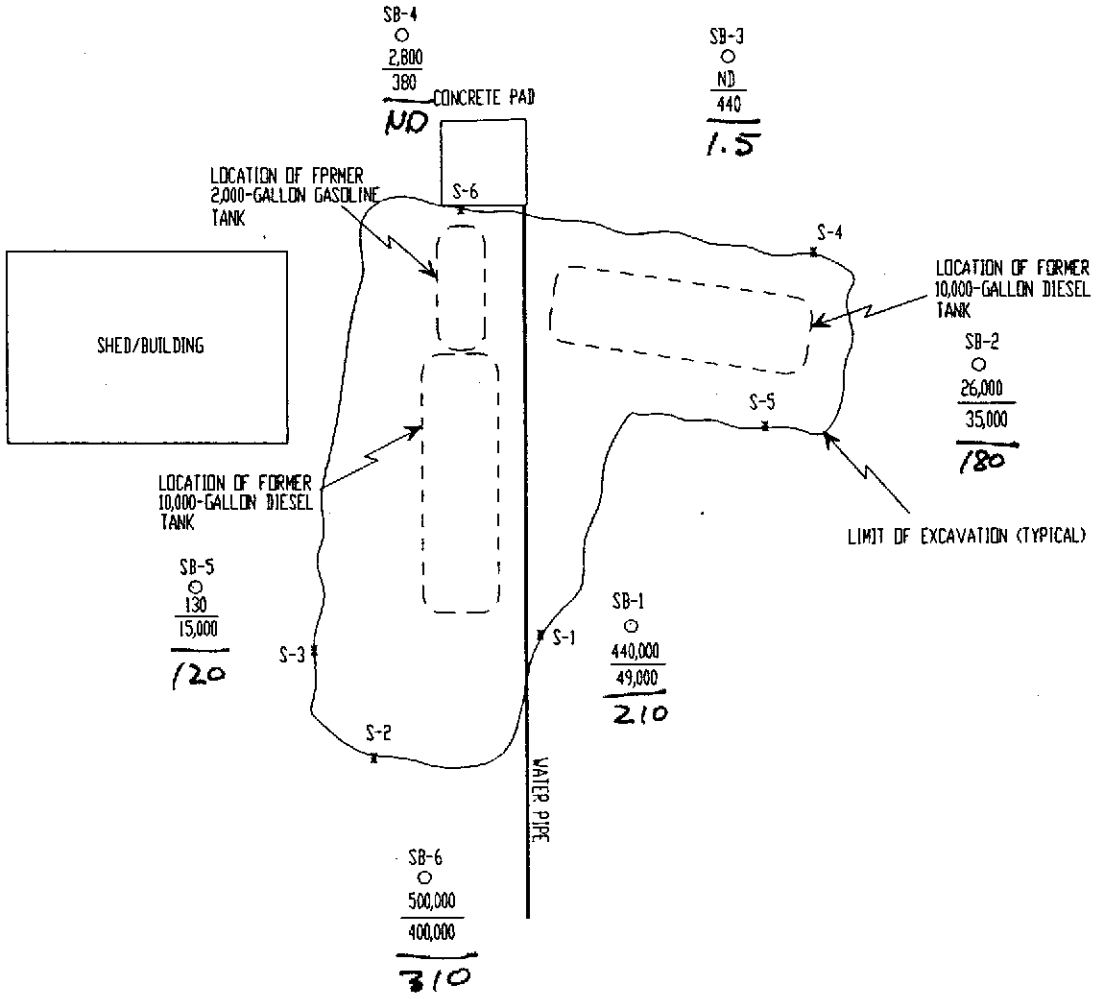
| CHECKED BY | LNH |




## LEGEND

S-1 NAME AND LOCATION OF SOIL SAMPLE

SB-1 SOIL BORING LOCATIONS

440,000 TPHD CONCENTRATION (ppb)

49,000 TPHG CONCENTRATION (ppb)

0 20

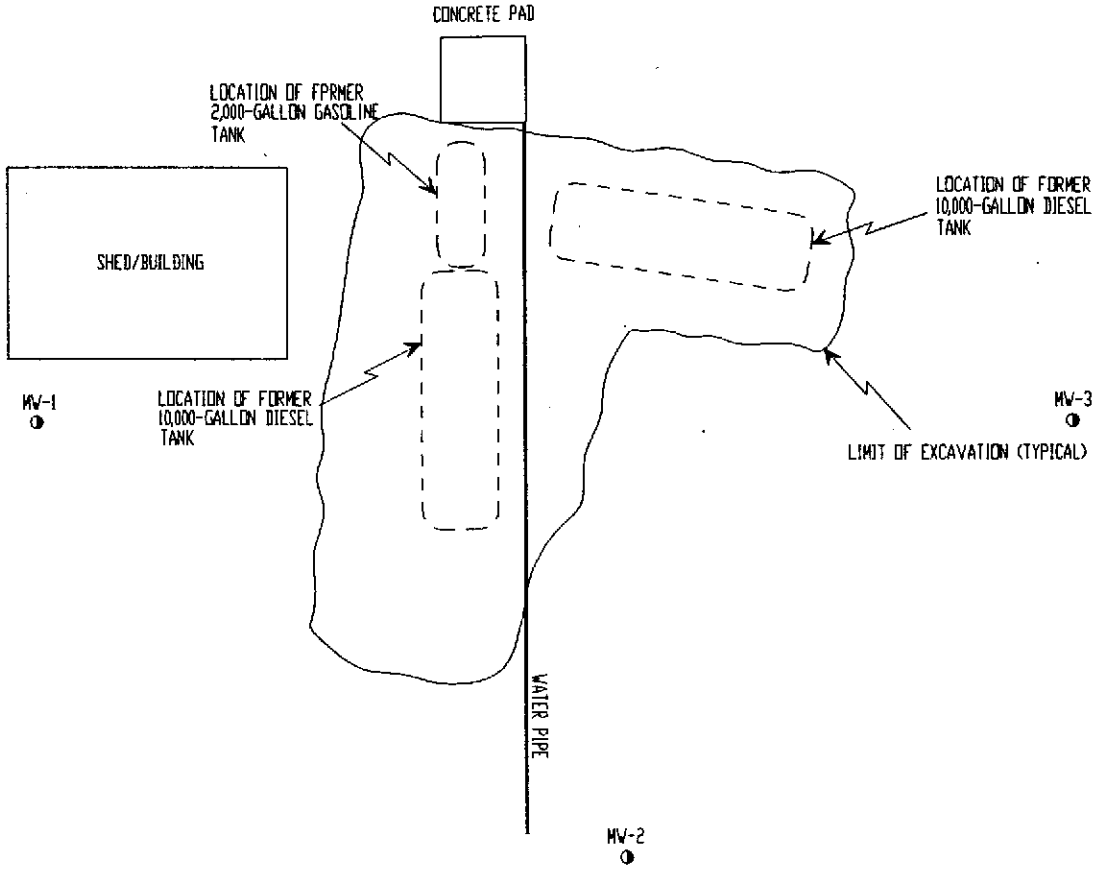
APPROXIMATE SCALE IN FEET

# TANK PROTECT ENGINEERING

SITE PLAN:
TPHD AND TPHG **GROUNDWATER** CONCENTRATIONS

MISSION VALLEY ROCK
799 ATHENOUR WAY
SUNOL, CA 94586

| | |
|---|---|
| DATE | 2/3/98 |
| FIGURE | 6 |
| FILE # | 384-23N |
| DRAWN BY | VK |
| CHECKED BY | LNH |




## LEGEND

S-1 * NAME AND LOCATION OF SOIL SAMPLE

SB-1 ○ SOIL BORING LOCATIONS

MW-1 ◑ PROPOSED GROUNDWATER MONITORING WELL LOCATIONS

0 20

APPROXIMATE SCALE IN FEET

# TANK PROTECT ENGINEERING

SITE PLAN:
PROPOSED MONITORING WELL LOCATIONS

MISSION VALLEY ROCK
799 ATHENOUR WAY
SUNOL, CA 94586

| | |
|---|---|
| DATE | 2/3/98 |
| FIGURE | 7 |
| FILE # | 384-22N |
| DRAWN BY | VK |
| CHECKED BY | LNH |

TABLE 1
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS
(ppm[1])

| Sample ID Name | Date | Depth (Feet) | TPHG | TPHD | Benzene | Toluene | Ethyl-benzene | Xylenes | MTBE |
|---|---|---|---|---|---|---|---|---|---|
| S-1 | 06/18/96 | 13.5-14.0 | 170 | <1.0 | 0.065 | 0.075 | 0.14 | 0.23 | <0.005 |
| S-2 | 06/18/96 | 13.0-13.5 | <1.0 | <1.0 | <.0050 | <.0050 | <.0050 | <.0050 | <0.005 |
| S-3 | 06/18/96 | 12.5-13.0 | 16 | <1.0 | 0.0061 | 0.0071 | 0.027 | 0.047 | <0.005 |
| S-4 | 06/18/96 | 12.0-12.5 | 790 | 12 | 1.1 | 2.8 | 4.4 | 14 | <0.005 |
| S-5 | 06/18/96 | 12.0-12.5 | 130 | 450 | 0.6 | 0.21 | 0.7 | 28 | <0.005 |
| S-6 | 06/18/96 | 9.0-9.5 | 670 | 49 | 0.26 | 0.077 | 0.2 | 0.44 | <0.005 |
| SP1-A,B,C,D | 06/18/96 | 2.0-2.5 | 160 | 150 | 0.033 | 0.028 | 0.13 | 0.19 | <0.005 |
| SP2-A,B,C,D | 06/18/96 | 2.0-2.5 | 4.5 | 90 | 0.0096 | <0.005 | 0.014 | 0.058 | <0.005 |
| SP3-A,B,C,D | 06/18/96 | 2.0-2.5 | 49 | 39 | 0.021 | 0.023 | 0.12 | 0.13 | <0.005 |
| SP4-A,B,C,D | 06/18/96 | 2.0-2.5 | 280 | 16 | 0.53 | 0.019 | 2.1 | 3.3 | <0.005 |
| SP5-A,B,C,D | 06/26/96 | 2.0-2.5 | 47 | 45 | 0.35 | 0.13 | 0.53 | 1.6 | <0.005 |
| SB-1 | 01/15/97 | 6.0-6.5 | <1.0 | 56 | <0.005 | <0.005 | <0.005 | <0.005 | 0.062 |
| SB-1 | 01/15/97 | 10.0-10.5 | 230 | 220 | 1.9 | 1.0 | 12 | 5.0 | <0.05 |
| SB-2 | 01/15/97 | 6.0-6.5 | <1.0 | 25 | <0.005 | <0.005 | 0.0072 | <0.005 | <0.05 |
| SB-2 | 01/15/97 | 10.0-10.5 | <1.0 | 42 | <0.005 | <0.005 | <0.005 | <0.005 | <0.05 |
| SB-3 | 01/15/97 | 6.0-6.5 | <1.0 | 120 | <0.005 | <0.005 | <0.005 | <0.005 | <0.05 |
| SB-3 | 01/15/97 | 10.0-10.5 | <1.0 | <1.0 | <0.005 | <0.005 | <0.005 | <0.005 | <0.05 |
| SB-4 | 01/15/97 | 6.0-6.5 | <1.0 | <1.0 | <0.005 | <0.005 | <0.005 | <0.005 | <0.05 |
| SB-4 | 01/15/97 | 10.0-10.5 | 2.6 | 180 | <0.005 | <0.005 | <0.005 | <0.005 | <0.05 |
| SB-5 | 01/15/97 | 6.0-6.5 | <1.0 | <1.0 | <0.005 | <0.005 | <0.005 | <0.005 | <0.05 |

UST pit

Stockpile

borings

TABLE 1
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS
(ppm[1])

borings

stockpile

| Sample ID Name | Date | Depth (Feet) | TPHG | TPHD | Benzene | Toluene | Ethyl-benzene | Xylenes | MTBE |
|---|---|---|---|---|---|---|---|---|---|
| SB-5 | 01/15/97 | 11.0-11.5 | 110 | <1.0 | 0.55 | 0.50 | 0.69 | 0.38 | <0.05 |
| SB-6 | 01/15/97 | 6.0-6.5 | 160 | 2,500 | <0.005 | <0.005 | <0.005 | 0.32 | <0.05 |
| SB-6 | 01/15/97 | 10.0-10.5 | 5.4 | 160 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| STK6-A,B,C,D | 04/08/97 | 1.5-2.0 | 2.1 | 57 | 9.9 | <0.005 | 8.5 | 32 | <0.005 |
| STK7-A,B,C,D | 04/08/97 | 1.5-2.0 | 1.5 | 37 | 5.6 | <0.005 | 5.1 | 22 | <0.005 |
| STK8-A,B,C,D | 04/08/97 | 1.5-2.0 | 1.0 | 12 | 9.6 | <0.005 | 5.7 | 19 | <0.005 |
| VSP-1A | 09/05/97 | 1.0-1.5 | NA[2] | 46 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| VSP-2B | 09/05/97 | 2.0-2.5 | NA | 9.2 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| VSP-3C | 09/05/97 | 3.0-3.5 | NA | 43 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| VSP-4D | 09/05/97 | 1.0-1.5 | NA | 45 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| VSP-5A | 09/05/97 | 2.0-2.5 | NA | 76 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| VSP-6B | 09/05/97 | 3.0-3.5 | NA | 32 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| VSP-7C | 09/05/97 | 1.0-1.5 | NA | 43 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| T1-A | 09/10/97 | 3.5 | <1.0 | <1.0 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| T1-B | 09/10/97 | 3.5 | <1.0 | 14 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| T2-A | 09/10/97 | 3.5 | <1.0 | 7.8 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| T2-B | 09/10/97 | 3.5 | <1.0 | 280/58[3] | <0.005 | <0.005 | <0.005 | <0.005 | NA |

[1] PARTS PER MILLION
[2] NOT ANALYZED
[3] SAMPLE WAS PROCESSED TO REMOVE NON-DIESEL ORGANIC COMPOUNDS

TABLE 2
SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS
(ppb)[1]

| Sample ID Name | Date | DEPTH (FEET) | TPHG | TPHD | Benzene | Toluene | Ethyl-benzene | Xylenes | MTBE |
|---|---|---|---|---|---|---|---|---|---|
| WS-1 | 06/18/96 | 10.0-10.5 | 12,000 | 1,200 | 35 | 26 | 29 | 72 | <0.5 |
| SB-1 | 01/15/97 | --- | 49,000 | 440,000 | 210 | <0.5 | 570 | 200 | <5.0 |
| SB-2 | 01/15/97 | --- | 35,000 | 26,000 | 180 | 220 | 1,100 | 2,000 | 710 |
| SB-3 | 01/15/97 | --- | 440 | <50.0 | 1.5 | 0.93 | 7.2 | 13 | 11 |
| SB-4 | 01/15/97 | --- | 380 | 2,800 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| SB-5 | 01/15/97 | --- | 15,000 | 130 | 120 | 40 | 1,200 | 300 | <5.0 |
| SB-6 | 01/15/97 | --- | 400,000 | 500,000 | 310 | 250 | <0.5 | <0.5 | <5.0 |

[1] PARTS PER BILLION

# APPENDIX A

ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY, LETTER DATED JANUARY 19,1998

ALAMEDA COUNTY
**HEALTH CARE SERVICES**
AGENCY
DAVID J. KEARS, Agency Director

January 19, 1998

STID 2786

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

Mr. Robert A. Saia
Mission Valley Rock Company
P.O. Box 567
Sunol, CA 94586

RE: MISSION VALLEY ROCK COMPANY, 7999 ATHENOUR WAY, SUNOL

Dear Mr. Saia:

I recently reviewed the October 20, 1997 Tank Protect Engineering, Inc. (TPE) report entitled "*Stockpile Soil Remediation and Exploratory Trenching Report*" and the case history for the previous underground storage tank (UST) work performed elsewhere at this site. The cited TPE report documents trenching and sampling activities in the area of former UST D-4, in addition to presenting soil stockpile sampling and treatment data. UST D-4 was removed from the site sans permit during 1995.

Based on information presented in the cited TPE report, and observations made in the field on September 10, 1997, no further environmental assessment work appears warranted at this time with respect to the UST D-4 area. However, I am in the process of consulting with Mr. Robert Weston of this office to determine whether additional information documenting the transport and disposal of UST D-4 is still needed to finalize the compliance file for this tank.

Previous assessment work associated with the remaining UST site (located several hundred feet west of tank D-4) is documented in the March 13, 1997 TPE report entitled "*Preliminary Site Assessment.*" Six (6) exploratory soil borings were advanced about the former UST excavation from which soil and "grab" ground water samples were collected.

Up to 2500 parts per million (ppm) total petroleum hydrocarbons as diesel (TPH-D), 230 ppm TPH-gasoline (TPH-G), and 1.9 ppm benzene, among other detected fuel compounds, were identified in soil sampled from depths ranging from 6.0 to 10.5' below grade (BG). In addition, up to 500,000 micrograms per liter (ug/l) TPH-D, 400,000 ug/l TPH-G, 310 ug/l benzene, and 710 ug/l MtBE (tentative), among other compounds detected, were identified in water sampled from various boreholes.

These data corroborate sample data from the June 1996 UST closure effort, and demonstrate that an unauthorized release has occurred.

At this time, you are directed to performed a soil and water investigation (SWI) consistent with provisions of Article 11 *Corrective Action Requirements*, Section 2725 et seq., Title 23, California Code of Regulations. The SWI is the next step in evaluating the extent of the pollution associated with this UST release, eventually leading to a final corrective action plan (CAP). To facilitate the SWI, a work plan must be submitted under seal of a California-registered geologist/engineer proposing actions in completion of this phase of work at the site. Permanent monitoring wells, among other elements, are commonly associated with a SWI.

**The SWI work plan is due within 90 days of the date of this letter.**

Please call me at (510) 567-6783 should you have any questions regarding the SWI. Please contact Mr. Weston at 567-6781 regarding UST compliance issues, including those associated with tank D-4.

Sincerely,

Scott O. Seery, CHMM
Hazardous Materials Specialist

cc: Mee Ling Tung, Director
Robert Weston, ACDEH
Stephen Hill, RWQCB
Jim Ferdinand, Alameda County Fire Department
Fred Moss, Tank Protect Engineering, Inc.

# APPENDIX B

## SAMPLE HANDLING PROCEDURES

# APPENDIX B

## SAMPLE HANDLING PROCEDURES

Soil and groundwater samples will be packaged carefully to avoid breakage or contamination and will be delivered to the laboratory in an iced-cooler. The following sample packaging requirements will be followed.

- Sample bottle/sleeve lids will not be mixed. All sample lids will stay with the original containers and have custody seals affixed to them.

- Samples will be secured in coolers to maintain custody, control temperature and prevent breakage during transportation to the laboratory.

- A chain-of-custody form will be completed for all samples and accompany the sample cooler to the laboratory.

- Ice, blue ice or dry ice (dry ice will be used for preserving soil samples collected for the Alameda County Water District) will be used to cool samples during transport to the laboratory.

- Water samples will be cooled with crushed ice. In the Alameda County Water District, water samples will be buried in the crushed ice with a thermometer, and the laboratory will be requested to record thermometer temperature at the time of receipt.

- Each sample will be identified by affixing a pressure sensitive, gummed label or standardized tag on the container(s). This label will contain the site identification, sample identification number, date and time of sample collection and the collector's initials.

- Soil samples collected in brass tubes will be preserved by covering the ends with Teflon tape and capping with plastic end-caps. The tubes will

be labeled, sealed in quart size bags and placed in an iced-cooler for transport to the laboratory.

All groundwater sample containers will be precleaned and will be obtained from a State Department of Health Services certified analytical laboratory.

Sample Control/Chain-of-Custody: All field personnel will refer to this workplan to verify the methods to be employed during sample collection. All sample gathering activities will be recorded in the site file; all sample transfers will be documented in the chain-of-custody; samples will be identified with labels; all sample bottles will be custody-sealed. All information is to be recorded in waterproof ink. All TPE field personnel are personally responsible for sample collection and the care and custody of collected samples until the samples are transferred or properly dispatched.

The custody record will be completed by the field technician or professional who has been designated by the TPE project manager as being responsible for sample shipment to the appropriate laboratory. The custody record will include, among other things, the following information: site identification, name of person collecting the samples, date and time samples were collected, type of sampling conducted (composite/grab), location of sampling station, number and type of containers used and signature of the TPE person relinquishing samples to a non-TPE person with the date and time of transfer noted. The relinquishing individual will also put all the specific shipping data on the custody record.

Records will be maintained by a designated TPE field employee for each sample: site identification, sampling location, station number, date, time, sampler's name, designation of the sample as a grab or composite, notation of the type of sample (e.g., groundwater, soil boring, etc.), preservatives used, onsite measurement data and other observations or remarks.

# APPENDIX C

## WASTE HANDLING AND DECONTAMINATION PROCEDURES

# APPENDIX C

## WASTE HANDLING AND DECONTAMINATION PROCEDURES

Decontamination: Any drilling, sampling or field measurement equipment that comes into contact with soil or groundwater will be properly decontaminated prior to its use at the site and after each incident of contact with the soil or groundwater being investigated. Proper decontamination is essential to obtain samples that are representative of environmental conditions and to accurately characterize the extent of soil and groundwater contamination. Hollow-stem auger flights and the drill bit will be steam-cleaned between the drilling of each well.

All sample equipment, including the split-spoon sampler and brass tubes, will be cleaned by washing with trisodium phosphate or alconox detergent, followed by rinsing with tap water. Where required by specific regulatory guidelines, a nonphosphate detergent will be used.

Waste Handling: Waste materials generated during site characterization activities will be handled and stored as hazardous waste and will be stored on site in appropriately labeled containers. Waste materials anticipated include excavated soil, drill cuttings, development and purge water, water generated during aquifer testing, water generated during decontamination and used personnel protection equipment such as gloves and Tyvek. The site owner will be responsible for providing the storage containers and will be responsible for the disposal of the waste materials. Drill cuttings from individual borings will be stored separately in drums or covered by plastic sheeting, and the appropriate disposal procedure will be determined by the site owner or TPE following receipt of the soil sample analytical results. Drums will be labeled to show material stored, known or suggested contaminant, date stored, expected removal date, company name, contact and telephone number.

# APPENDIX D

## QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

# APPENDIX D

## QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

The overall objectives of the field sampling program include generation of reliable data that will support development of a remedial action plan. Sample quality will be checked by the use of proper sampling, handling and testing methods. Additional sample quality control methods may include the use of background samples, equipment rinsate samples and trip and field blanks. Chain-of-custody forms, use of a qualified laboratory, acceptable detection limits and proper sample preservation and holding times also provide assurance of accurate analytical data.

TPE will follow a quality assurance and quality control (QA/QC) program in the field to ensure that all samples collected and field measurements taken are representative of actual field and environmental conditions and that data obtained are accurate and reproducible. These activities and laboratory QA/QC procedures are described below.

Field Samples: Additional samples may be taken in the field to evaluate both sampling and analytical methods. Three basic categories of QA/QC samples that may be collected are trip blanks, field blanks and duplicate samples.

Trip blanks are a check for cross-contamination during sample collection, shipment, and laboratory analysis. They are water samples that remain with the collected samples during transportation and are analyzed along with the field samples to check for residual contamination. Analytically confirmed organic-free water will be used for organic parameters and deionized water for metal parameters. Blanks will be prepared by the laboratory supplying the sample containers. The blanks will be numbered, packaged and sealed in the same manner as the other samples. One trip blank will be used for each sample set of less than 20 samples. At least 5% blanks will be used for sets greater than 20 samples. The trip blank is not to be opened by either the sample collectors or the handlers.

The field blank is a water sample that is taken into the field and is opened and exposed at the sampling point to detect contamination from air exposure. The water

sample is poured into appropriate containers to simulate actual sampling conditions. Contamination due to air exposure can vary considerably from site to site.

The laboratory will not be informed about the presence of trip and field blanks, and false identifying numbers will be put on the labels. Full documentation of these collection and decoy procedures will be made in the site log book.

Duplicate samples are identical sample pairs (collected in the same place and at the same time), placed in identical containers. For soils, adjacent sample liners will be analyzed. For the purpose of data reporting, one is arbitrarily designated the sample, and the other is designated as a duplicate sample. Both sets of results are reported to give an indication of the precision of sampling and analytical methods.

The laboratory's precision will be assessed without the laboratory's knowledge by labeling one of the duplicates with false identifying information. Data quality will be evaluated on the basis of the duplicate results.

Laboratory QA/QC: Execution of a strict QA/QC program is an essential ingredient in high-quality analytical results. By using accredited laboratory techniques and analytical procedures, estimates of the experimental values can be very close to the actual value of the environmental sample. The experimental value is monitored for its precision and accuracy by performing QC tests designed to measure the amount of random and systematic errors and to signal when correction of these errors is needed.

The QA/QC program describes methods for performing QC tests. These methods involve analyzing method blanks, calibration standards, check standards (both independent and the United States Environmental Protection Agency-certified standards), duplicates, replicates and sample spikes. Internal QC also requires adherence to written methods, procedural documentation and the observance of good laboratory practices.

# APPENDIX E

## HOLLOW-STEM AUGER DRILLING AND SOIL SAMPLING PROCEDURES

# APPENDIX E

## HOLLOW-STEM AUGER DRILLING AND SOIL SAMPLING PROCEDURES

Undisturbed soil samples will be recovered from soil without introducing liquids into the borings. At a minimum, soil samples as core will be taken at 5-foot depth intervals, changes in lithology and when encountering apparent soil contamination to termination depth, or through the aquifer zone of interest for lithologic logging.

Borings will be drilled with a hollow-stem auger and sampled with a California or modified California-type split-spoon sampler. Soil samples will be of sufficient volume to perform the analyses which may be required, including replicate analyses.

Soil from all borings will be described in detail using the Unified Soil Classification System and will be logged under the direction of a geologist, civil engineer or engineering geologist who is registered or certified by the State of California and is experienced in the use of the Unified Soil Classification System.

All wet zones above the free water zone will be noted and accurately logged.

Soil samples will be collected in clean brass or stainless steel sampling tubes in the split-spoon. Sediment traps will be used when unconsolidated sands and gravels fall from the sampler during retrieval. The brass tubes will be cut apart using a clean knife. The ends of the tubes will be covered with Teflon sheets or aluminum foil beneath plastic end caps and sealed with electrical or duct tape and properly labeled. In lieu of electrical or duct tape, the tubes may be individually sealed in plastic bags. The samples will be stored in an iced-cooler at a temperature of 4 degrees Celsius. In the Alameda County Water District, the samples will be stored in an iced-cooler containing dry ice.

Drill cuttings will be stored on site in 55-gallon drums or covered with plastic sheeting. Analytical results will be submitted immediately to the site owner for determination of appropriate disposal procedures. The soil borings not completed as wells will be backfilled with a cement grout.

# APPENDIX F

## GROUNDWATER MONITORING WELL CONSTRUCTION PROCEDURES

# APPENDIX F

## GROUNDWATER MONITORING WELL CONSTRUCTION PROCEDURES

### BOREHOLE DESIGN

Casing Diameter: The minimum diameter of well casings will be 2 inches (nominal).

Borehole Diameter: The diameter of the borehole will be a minimum of 4 inches and a maximum of 12 inches greater than the diameter of the well casing. The minimum annular space will be 2.5 inches as measured from the outside diameter of the casing to the drill hole wall.

Shallow (Unconfined Zone) Wells: When unconfined groundwater is encountered, the borehole will be advanced through the aquifer to an underlying clay layer or aquitard or to a maximum depth of 15 feet into the saturated zone, or the maximum depths required by regulatory guidelines. The screened interval will begin a minimum of 5 feet above the saturated zone or above the anticipated seasonal high level of groundwater. The screen will extend the full thickness of the aquifer or no more than 15 feet (or 20 feet if required by regulatory guidelines) into the saturated zone, whichever is reached first. The well screen will not extend into the aquitard, nor will the screened interval exceed 20 feet in length (or 30 feet if required by regulatory guidelines).

Deep (Confined Zone) Wells: Any monitoring well to be screened below the upper aquifer will be installed as a double-cased well. A steel conductor casing will be placed through the upper water-bearing zone to prevent aquifer cross-contamination.

The conductor casing will be installed in the following manner: a large diameter borehole (typically 18 inches) will be drilled until it is determined that the first competent aquitard has been reached; a low carbon steel conductor casing will be placed in the borehole to the depth drilled and centralizers will be used to center the casing in the borehole. The annular space between the conductor casing and the

formation will be cement-grouted from bottom to top by the tremie pipe method. The grout will be allowed to set for a minimum of 72 hours.

Drilling will continue inside the conductor casing, with a drill bit of smaller diameter than the conductor casing. If additional known aquifers are to be fully penetrated, the procedure will be repeated with successively smaller diameter conductor casings.

The bottom of the well screen in a confined aquifer will be determined by presence or lack of a clay layer or aquitard as described above. The screened interval in a confined zone will extend across the entire saturated zone of the aquifer or up to a length of 20 feet, whichever is less. The screened zone and filter pack will not cross-connect to another aquifer.

## CONSTRUCTION MATERIALS

Casing and Screen Materials: Well casing and screen will be constructed of clean materials that have the least potential for affecting the quality of the sample. The most suitable material for a particular installation will depend upon the parameters to be monitored. Acceptable materials include PVC, stainless steel or low carbon steel.

Casing Joints: Joints will be connected by flush threaded couplers. Organic bonding compounds and solvents will not be used on joints.

Well Screen Slots: Well screen will be factory slotted. The size of the slots will be selected to allow sufficient groundwater flow to the well for sampling, minimize the passage of formation materials into the well and ensure sufficient structural integrity to prevent the collapse of the intake structure.

Casing Bottom Plug: The bottom of the well casing will be permanently plugged, either by flush threaded screw-on or friction cap. Friction caps will be secured with stainless steel set screws. No organic solvents or cements will be applied.

Filter Pack Material: Filter envelope materials will be durable, water worn, and washed clean of silt, dirt and foreign matter. Sand size particles will be screened silica sand.

Particles will be well rounded and graded to an appropriate size for retention of aquifer materials.

Bentonite Seal Material: Bentonite will be pure and free of additives that may affect groundwater quality. Bentonite will be hydrated with potable or tap water.

Grout Seal Material: Neat cement grout or sand-cement grout will consist of a proper mixture of Type 1/11 Portland cement, hydrated with potable or tap water. Up to 3% bentonite may be added to the mixture to control shrinkage.

## CONSTRUCTION PROCEDURES

Decontamination: All downhole tools, well casings, casing fittings, screens, and all other components that are installed in the well will be thoroughly cleaned immediately before starting each well installation. When available, each component will be cleaned with a high temperature, high pressure washer for a minimum of 5 minutes. When a washer is not available, components will be cleaned with water and detergent, rinsed in potable or tap water, then rinsed in distilled water.

Soil and water sampling equipment and material used to construct the wells will not donate to, capture, mask or alter the chemical composition of the soil and groundwater.

Drilling Methods: Acceptable drilling methods include solid and hollow-stem auger, percussion, direct circulation mud and air rotary and reverse rotary. The best alternative is that which minimizes the introduction of foreign materials or fluids. If drilling fluid is employed, drilling fluid additives will be limited to inorganic and non-hazardous compounds. Compressed air introduced into the borehole will be adequately filtered to remove oil and particulates.

Casing Installation: The casing will be set under tension, when necessary, to ensure straightness. Centralizers will be used where necessary to prevent curvature or stress to the casing.

Sand Pack Installation: The sand pack will be installed so as to avoid bridging and the creation of void spaces. The tremie pipe method will be used where installation conditions or local regulations require. Drilling mud, when used, will be thinned prior to pack placement. The sand pack will cover the entire screened interval and rise a minimum of 2 feet above the highest perforation.

Bentonite Seal Placement: A bentonite seal will be placed above the sand pack by a method that prevents bridging. Bentonite pellets can be placed by free fall if proper sinking through annular water can be assured. Bentonite slurry will be placed by the tremie pipe method from the bottom upward. The bentonite seal will not be less than 1 to 3-feet in thickness, depending on regulatory guidelines. In the Alameda County Water District, the bentonite seal will be less than 1 foot in thickness.

Grout Seal Placement: The cement grout mixture will be hydrated with potable or tap water and thoroughly mixed prior to placement. If substantial groundwater exists in the bore hole, the grout will be placed by the tremie pipe method from the bottom upward. In a dry borehole, the grout may be surface poured to a depth of 30 feet. Below a depth of 30 feet, grout will be placed by tremie pipe. Grout will be placed in 1 continuous lift and will extend to the surface or to the well vault if the well head is completed below grade. A minimum of 5 feet of grout seal will be installed, unless impractical due to the shallow nature of the well.

Surface Completion: The well head will be protected from fluid entry, accidental damage, unauthorized access and vandalism. A watertight, locking cap will be installed on the well casing. Access to the casing will be controlled by a keyed lock.

Well heads completed below grade will be completed in a concrete and/or steel vault, installed to drain surface runoff away from the vault.

Well Identification: Each well will be labeled to show well number, depth, hole and casing diameter and screened interval.

# APPENDIX G

## GROUNDWATER MONITORING WELL DEVELOPMENT PROCEDURES

# APPENDIX G

## GROUNDWATER MONITORING WELL DEVELOPMENT PROCEDURES

### INTRODUCTION

Newly installed groundwater monitoring wells will be developed to restore natural hydraulic conductivity of the formation, remove sediments from well casing and filter pack, stabilize the filter pack and aquifer material and promote turbidity-free groundwater samples.

Wells may be developed by bailing, hand pumping, mechanical pumping, air lift pumping, surging, swabbing or an effective combination of methods. Wells will be developed until the water is free of sand and silt and minimum turbidity has stabilized.

In some cases where low permeability formations are involved or the drilling mud used fails to respond to cleanup, initial development pumping may immediately dewater the well casing and thereby inhibit development. When this occurs, clean, potable grade water may be introduced into the well, followed by surging of the introduced waters with a surge block. This operation will be followed by pumping or bailing. The procedure may be repeated as required to establish full development.

### METHODOLOGY

Seal Stabilization: Cement and bentonite annular seals will set and cure not less than 24 to 72 hours (according to local regulatory guidelines) prior to well development.

Decontamination: All well development tools and equipment will be thoroughly cleaned immediately before starting each well installation. When available, each component will be cleaned with a high temperature, high pressure washer for a minimum of 5 minutes. When a washer is not available, components will be cleaned with potable or tap water, then rinsed with distilled water.

Development equipment will not donate to, capture, mask or alter the chemical composition of the soil and groundwater.

Introduction of Water: Initial development of wells in low permeability formations may dewater the casing and filter pack. When this occurs, clean, potable or tap water will be introduced into the well to enhance development.

Bailing: Development will begin by bailing to remove heavy sediments from the well casing. Care will be taken not to damage the well bottom cap during lowering of the bailer.

Surging: Care will be exercised when using a surge block to avoid damaging the well screen and casing. When surging wells screened in coarse (sandy/gravelly) aquifers, the rate of surge block lifting will be slow and constant. When surging wells screened in fine (silty) aquifers, more vigorous lifting may be required. Between surging episodes, wells will be bailed to remove accumulated sediments.

Pumping: Development pumping rates will be less than the recharge rate of the well in order to avoid dewatering.

Discharged Water Containment and Disposal: All water and sediment generated by well development will be collected in labeled 55-gallon steel drums. Development water will be temporarily contained on site, pending sampling and laboratory analysis. No hazardous development water will be released to the environment. Disposal of development water will be the responsibility of the client

# APPENDIX H

## GROUNDWATER MONITORING WELL SAMPLING PROCEDURES

# APPENDIX H

## GROUNDWATER MONITORING WELL SAMPLING PROCEDURES

Groundwater monitoring wells will not be sampled until at least 24 to 72 hours (according to local regulatory guidelines) after well development. Groundwater samples will be obtained using a bladder pump, clear Teflon bailer or dedicated polyethylene bailer. Prior to collecting samples, the sampling equipment will be thoroughly decontaminated to prevent introduction of contaminants into the well and to avoid cross-contamination. Monitoring wells will be sampled after 3 to 10 wetted casing volumes of groundwater have been evacuated and pH, electrical conductivity and temperature have stabilized as measured with a Hydac Digital Tester. If the well is emptied before 3 to 10 well volumes are removed, the sample will be taken when the water level in the well recovers to 80% or more of its initial water level.

When a water sample is collected, turbidity of the water will be measured and recorded with a digital turbidimeter. Degree of turbidity will be measured and recorded in nephelometric turbidity units (NTU).

TPE will also measure the thickness of any floating product in the monitoring wells using an interface probe or clear Teflon or polyethylene bailer. The floating product will be measured after well development but prior to the collection of groundwater samples. If floating product is present in the well, TPE will recommend to the client that product removal be commenced immediately and reported to the appropriate regulatory agency.

Unless specifically waived or changed by the local, prevailing regulatory agency, water samples will be handled and preserved according to the latest United States Environmental Protection Agency methods as described in the Federal Register (Volume 44, No. 233, Page 69544, Table ll) for the type of analysis to be performed.

Development and/or purge water will be stored on site in labeled containers. The disposal of the containers and development and/or purge water is the responsibility of the client.

MEASUREMENTS

Purged Water Parameter: During purging, discharged water will be measured for the following parameters.

| Parameter | Units of Measurement |
|---|---|
| pH | None |
| Electrical Conductivity | Micromhos |
| Temperature | Degrees F or C |
| Depth to Water | Feet/Hundredths |
| Volume of Water Discharged | Gallons |
| Turbidity | NTU |

Documentation: All parameter measurements will be documented in writing on TPE development logs.

SITE HEALTH AND SAFETY PLAN
TANK PROTECT ENGINEERING OF NORTHERN CALIFORNIA, INC.

Site: **Mission Valley Rock, Inc.**
**799 Athenour Way**
**Sunol, CA 94586**

Project Number: **384**

Original Site Safety Plan: Yes (X) No ( ) Revision Number:
Plan Prepared by: **Tank Protect Engineering** Date: **02/13/98**
Plan Approved by: **Lee N. Huckins** Date: **02/13/98**

Please respond to each item as completely as possible. Where an item is not applicable, please mark "N/A".

1. KEY PERSONNEL AND RESPONSIBILITIES

| | | |
|---|---|---|
| Project Manager: | **Lee N. Huckins** | **(510) 429-8088** |
| Site Safety Manager: | **Lee N. Huckins** | **(510) 429-8088** |
| Alternate Site Safety Manager: | | |
| Field Team Members: | **To be determined** | |

Agency Reps: Please specify by one of the following symbols: Federal: (F), State: (S), Local: (L), Contractor(s): (C)

**(L) Alameda County Health Care Services Agency: (510) 567-6700**
**(L) Alameda County Fire Department: (510) 670-5853**

## 2. JOB HAZARD ANALYSIS

### 2.1 OVERALL HAZARD EVALUATION

| | | | | |
|---|---|---|---|---|
| Hazard Level: | High ( ) | Moderate ( ) | Low (X) | Unknown ( ) |
| Hazard Type: | Liquid (X) | Solid ( ) | Sludge ( ) | Vapor/Gas (X) |

Known or suspected hazardous materials present on site

**Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)**

Characteristics of hazardous materials included above (complete for each chemical presents):

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**MATERIAL #1**

| | | | |
|---|---|---|---|
| Corrosive ( ) | Ignitable (X) | Toxic (X) | Reactive ( ) |
| Volatile (X) | Radioactive ( ) | Biological Agent ( ) | |
| Exposure Routes: | Inhalation (X) | Ingestion (X) | Contact (X) |

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**MATERIAL #2**

| | | | |
|---|---|---|---|
| Corrosive ( ) | Ignitable ( ) | Toxic ( ) | Reactive ( ) |
| Volatile ( ) | Radioactive ( ) | Biological Agent ( ) | |
| Exposure Routes: | Inhalation ( ) | Ingestion ( ) | Contact ( ) |

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**MATERIAL #3**

| | | | |
|---|---|---|---|
| Corrosive ( ) | Ignitable ( ) | Toxic ( ) | Reactive ( ) |
| Volatile ( ) | Radioactive ( ) | Biological Agent ( ) | |
| Exposure Routes: | Inhalation ( ) | Ingestion ( ) | Contact ( ) |

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**MATERIAL #4**

| | | | |
|---|---|---|---|
| Corrosive ( ) | Ignitable ( ) | Toxic ( ) | Reactive ( ) |
| Volatile ( ) | Radioactive ( ) | Biological Agent ( ) | |
| Exposure Routes: | Inhalation ( ) | Ingestion ( ) | Contact ( ) |

## 2.2 JOB-SPECIFIC HAZARDS

For each labor category specify the possible hazards based on information available (i.e., Task-driller, Hazards-trauma from drill rig accidents, etc.). For each hazard, indicate steps to be taken to minimize the hazard.

**To prevent accidents-wear hard hat, gloves, steel-toed boots.**

The following additional hazards are expected on site (i.e., snake infested area, extreme heat, etc.):

**Temporary open boreholes.**

Measures to minimize the effects of the additional hazards are:

**Protect with barricades, caution tape, or traffic cones when unattended.**

# 3. MONITORING PLAN

## 3.1 (a) Air Monitoring Plan

Action levels for implementation of air monitoring. Action levels should be based on published data available on contaminants of concern. Action levels should be set by persons experienced in industrial hygiene.

| Level (i.e., .5 ppm) | Action Taken (i.e., commence perimeter monitoring) |
|---|---|
| **5 ppm** | **Cease work and commence perimeter monitoring until contamination disperses.** |

(b) Air Monitoring Equipment

Outline the specific equipment to be used, calibration method, frequency of monitoring, locations to be monitored, and analysis of samples (if applicable).

**Gastech, Inc., Trace-Techtor, hexane calibration. Monitor at borehole during each sampling event if vapors detected.**

If air monitoring is not to be implemented for this site, explain why:

**N/A**

3.2 Personnel Monitoring

(Include hierarchy of responsibilities decision making on the site)

**Site safety manager to make decision.**

3.3 Sampling Monitoring

(a) Techniques used for sampling: **Sample air at borehole.**

(b) Equipment used for sampling: **Gastech, Inc., Trace-Techtor.**

(c) Maintenance and calibration of equipment: **Calibrate to hexane prior to operation.**

## 4. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Equipment used by employees for the site tasks and operations being conducted. Be Specific (i.e., hard hat, impact resistance goggles, other protective glove, etc.).

**Hard hat, protective gloves (when necessary), steel-toed boots.**

## 5. SITE CONTROL AND SECURITY MEASURES

The following general work zone security guidelines should be implemented:

- Work zone shall be delineated with traffic cones.
- Boreholes shall be delineated with traffic cones when drilling and sampling activities are not actually taking place.
- Visitors will not be allowed to enter the work zone unless they have attended a project safety briefing.

## 6. DECONTAMINATION PROCEDURE

List the procedures and specific steps to be taken to decontaminate equipment and PPE.

**Wash equipment with a trisodium phosphate/tap water solution and rinse with clean tap water.**

## 7. TRAINING REQUIREMENTS

Prior to mobilization at the job site, employees will attend a safety briefing. The briefing will include the nature of the wastes and the site, donning personal protection equipment, decontamination procedures and emergency procedures.

Supervisory and key contractor personnel will take an instruction course and pass an airports operations test.

## 8. MEDICAL SURVEILLANCE REQUIREMENTS

If any task requires a very high personnel protection level (OSHA Level A or B), personnel shall provide assurances that they have received a physical examination and they are fit to do the task. Also personnel will be instructed

to look for any symptom of heat stress, heat stroke, heat exhaustion or any other unusual symptom. If there is any report of that kind it will be immediately followed through, and appropriate action will be taken.

## 9. STANDARD OPERATION PROCEDURES

Tank Protect Engineering of Northern California, Inc. (TPE) is responsible for the safety of all TPE employees on site. Each contractor shall provide all the equipment necessary to meet safe operation practices and procedures for their personnel on site and be responsible for the safety of their workers.

A "Three Warning" system is utilized to enforce compliance with Health and Safety procedures practices which will be implemented at the site for worker safety:

* Eating, drinking, chewing gum or tobacco, and smoking will be allowed only in designated areas.
* Wash facilities will be utilized by workers in the work areas before eating, drinking, or use of the toilet facilities.
* Containers will be labeled identifying them as waste, debris or contaminated clothing.
* All excavation/drilling work will comply with regulatory agency requirements.
* All site personnel will be required to wear hard hats and advised to take adequate measures for self protection.
* Any other action which is determined to be unsafe by the site safety officer.

## 10. CONFINED SPACE ENTRY PROCEDURES

No one is allowed to enter any confined space operation without proper safety measures. Specifically in case of an excavated Tank Pit no one should enter at any time.

## 11. EMERGENCY RESPONSE PLAN

Fire extinguisher(s) will be on site prior to excavation. Relevant phone numbers:

| Person | Title | Phone No. |
|---|---|---|
| **Lee N. Huckins** | Project Manager | **(510) 429-8088** |
| _____ | Fire | 911 or_____ |
| _____ | Police | 911 or_____ |
| _____ | Ambulance | 911 or_____ |
| _____ | Poison Control Center | (800) 523-2222 |
| _____ | Nearest off-site no. | _____ |
| **Kaiser Hospital** | Medical Advisor | **(510) 795-3444** |
| **Mr. Mort Calvert** | Client Contact | **(510) 862-2257** |

| | | |
|---|---|---|
| U.S EPA - ERT | | (201) 321-6660 |
| Chemtrec | | (800) 424-9300 |
| Centers for Disease Control | Day | (404) 329-3311 |
| | Night | (404) 329-2888 |
| National Response Center | | (800) 424-8802 |
| Superfund/RCRA Hotline | | (800) 424-8802 |
| TSCA Hotline | | (800) 424-9065 |
| National Pesticide Information Services | | (800) 845-7633 |
| Bureau of Alcohol, Tobacco, and Firearms | | (800) 424-9555 |

## HEALTH AND SAFETY COMPLIANCE STATEMENT

I, _____, have received and read a copy of the project Health and Safety Plan.

I understand that I am required to have read the aforementioned document and have received proper training under the occupational Safety and Health Act (29 CFR, Part 1910.120) prior to conducting site activities at the site.

_____ _____

Signature Date

_____ _____

Signature Date

Nearest Hospital:

**Kaiser Hospital**
**39400 Paseo Padre Parkway**
**Fremont, CA 94538**
**Emergency (510) 795-3444**
**Gen. Info. (510) 795-3000**

Directions From Site:

**Drive 680 towards San Jose, exit Mission Blvd. Turn right onto Mission Blvd Proceed on Mission Blvd. to Walnut. Turn left onto Walnut. Proceed on Walnu to Paseo Padre Parkway. Look for the hospital on the left side at corner of Walnu and Paseo Padre Parkway.**