TANK PROTECT ENGINEERING
of Northern California, Inc.

September 1, 1999

Mr. Mort Calvert
Mission Valley Rock
799 Athenour Way
Sunol, CA 94586

Re: First Quarter Report, 1999, Mission Valley Rock, 799 Athenour Way, Sunol, CA 94586

Dear Mr. Calvert:

Tank Protect Engineering of Northern California, Inc. (TPE) is pleased to submit this quarterly letter report of environmental services conducted at the subject site. Work conducted prior to the fourth quarter 1998, is documented in TPE's October 30, 1998 Preliminary Site Assessment Report, Mission Valley Rock, 799 Athenour Way, Sunol, CA 94586.

Work conducted by TPE during the fourth quarter, 1998:

- January 5, 1999 - Loosened well caps on all wells to allow depth-to groundwater to stabilize to atmospheric pressure for groundwater gradient determination. Measured depth-to-groundwater in monitoring wells MW-1 through MW-3 for evaluation of groundwater flow direction and gradient. Collected a groundwater sample from each well for analysis for total petroleum hydrocarbons as diesel (TPHD) and gasoline (TPHG); methyl t-butyl ether (MTBE); and benzene, toluene, ethylbenzene, and xylenes (BTEX). Additionally, analyzed a trip blank sample (MW-4) for BTEX.

WORK CONDUCTED BY TPE DURING THE FIRST QUARTER, 1999:

- February 24, 1999 - Submitted to the client a Fourth Quarter Report, 1998, Mission Valley Rock, 799 Athenour Way, Sunol, CA 94586.

- March 29, 1999 - Loosened well caps on all wells to allow depth-to groundwater to stabilize to atmospheric pressure for groundwater gradient determination. Measured depth-to-groundwater in monitoring wells MW-1 through MW-3 for evaluation of groundwater flow direction and gradient. Collected a groundwater sample from each well for analysis for TPHD, TPHG, MTBE, and BTEX. Additionally, analyzed a trip blank sample (MW-4) for TPHD, TPHG, MTBE, and BTEX. Collected one sample (DW) to characterize the on-site drummed water for landfill disposal.

Details of the above work are presented below.

Groundwater Gradient

On March 29, 1999, depth-to-groundwater was measured from top of casing (TOC) in wells MW-1 through MW-3 to the nearest 0.01 foot using an electronic Solinst water level meter. A minimum of 3 repetitive measurements were made for each level determination to ensure accuracy. Depth-to-groundwater was subtracted from the TOC elevation, measured relative to mean sea level, to calculate the elevation of the groundwater level in each well (see attached Table 1).

Attached Figure 1 is a groundwater gradient map constructed from the data collected on March 29, 1999. Groundwater flow direction was predominantly to the eastsouthern with an average gradient of about 0.02 feet per foot.

Based on the groundwater flow direction for the subject quarter, wells MW-1 and MW-2 are located upgradient and well MW-3 is downgradient of the location of the former underground fuel tanks.

Groundwater Sampling and Analytical Results

On March 29, 1999, groundwater samples were collected from monitoring wells MW-1 through MW-3. Before sampling, each well was purged of about 2.3 to 2.6 gallons of groundwater with a dedicated polyethylene bailer and until the temperature of the water in the wells had stabilized (see attached Records of Water Sampling). Because of equipment mal function, neither pH nor conductivity could be recorded. Because

a dedicated bailer was used for each well sampled, no decontamination was necessary between sampling events. The water samples were collected in laboratory-provided, sterilized, 40-milliliter glass vials having Teflon-lined screw caps; measured for turbidity and labeled with project name, date and time collected, sample number and sampler name. The samples were immediately stored on crushed ice for transport to California State Department of Health Services (DHS) certified Priority Environmental Labs, Inc. located in Milpitas, California accompanied by chain-of-custody documentation.

All groundwater samples and the trip blank sample MW-4 were analyzed for TPHD and TPHG by Environmental Protection Agency (EPA) Methods 3510/8015 and 5030/8015, respectively and for MTBE and BTEX by EPA Method 602.

Each well was checked for floating product using a dedicated, disposable polyethylene bailer. **Hydrocarbon odors were noted in wells MW-1 and MW-3. A hydrocarbon sheen was observed in MW-3 (see attached Table 2).**

Purge water was stored on site in 55-gallon drums labeled to show material stored, date filled, company name, contact person and telephone number.

See attached protocols for TPE's sample handling, groundwater monitoring well sampling and quality assurance and quality control procedures.

Analytical results for wells MW-1, MW-2, and MW-3 detected TPHD at concentrations of 190 parts per billion (ppb), 580 ppb, and 150 ppb, respectively. All other analytical results were nondetectable.

Sample DW collected to characterize the drummed water was analyzed for TPHD, TPHG, MTBE, and BTEX chemicals. Analytical results detected TPHD at concentrations of 120,000 ppb.

Analytical results are summarized in attached Table 3 and documented in an attached certified analytical report and chain-of-custody.

CONCLUSIONS AND RECOMMENDATIONS

TPHD was detected in all wells ranging in concentration from 150 ppb in well MW-3 to 580 ppb in well MW-2. Figure 2 presents concentration contour map for diesel.

TPE recommends that all wells continue to be monitored for floating product, sheen and odors.

TPE recommends continued quarterly groundwater sampling to evaluate gradient and to monitor contaminant concentrations.

The next sampling event is due in June, 1999.

Two additional copies of this letter report have been included for your delivery to:

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

California Regional Water Quality Control Board
San Francisco Bay Region
Toxics Cleanup Division
2101 Webster Street, Suite 500
Oakland, CA 94612

TPE recommends that this quarterly letter report be submitted with a cover letter from Mission Valley Rock. According to Alameda County Water District (ACWD) groundwater monitoring guidelines, the cover letter must be signed by an authorized representative and state, at a minimum, the following:

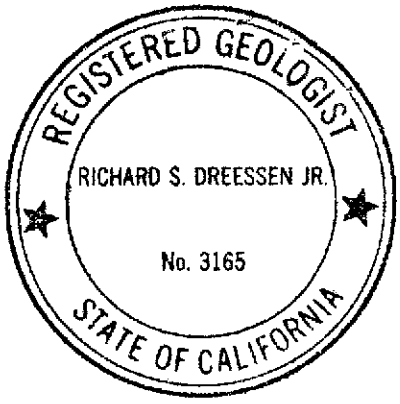
"I declare, under penalty of perjury, that the information and/or recommendations contained in the attached report are true and correct."

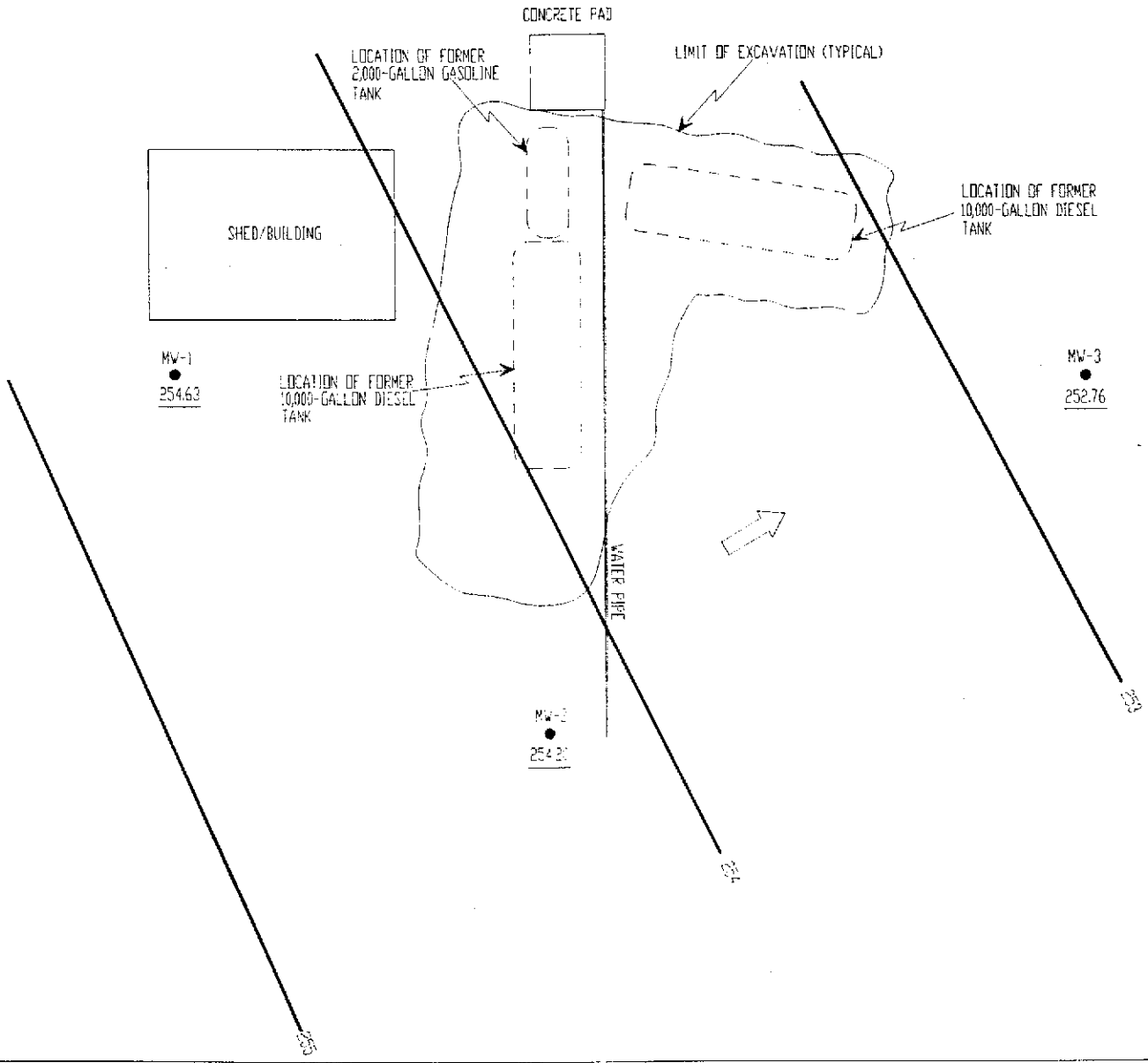
If you have any questions, please call TPE at (510) 429-8088.

Sincerely,

Richard S. Dreessen Jr.
Registered Geologist

Jeff Farhoomand, M.S.
Principal Engineer





LEGEND

MW-1 ● GROUNDWATER MONITORING WELL LOCATIONS

254.63 POTENTIOMETRIC ELEVATION

253 POTENTIOMETRIC CONTOUR

GROUNDWATER FLOW DIRECTION

0 20

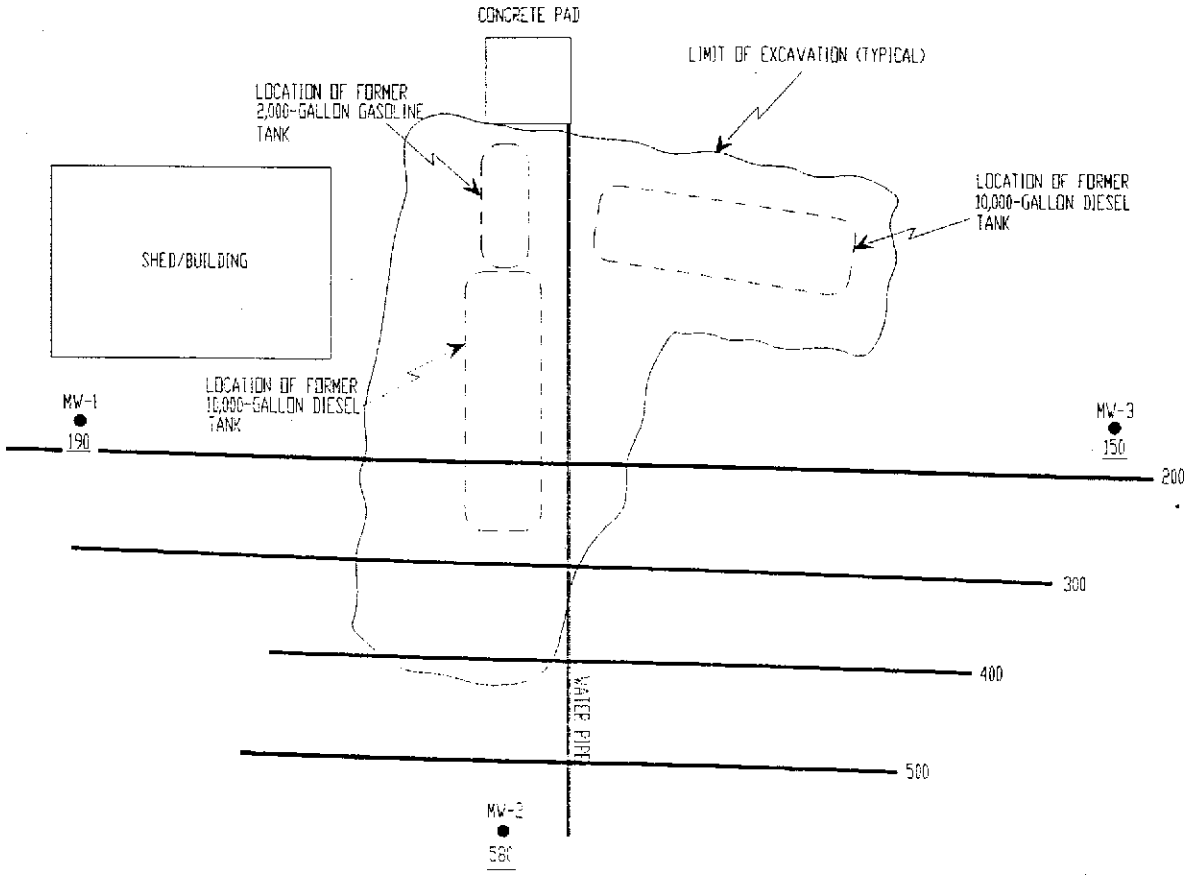
APPROXIMATE SCALE IN FEET

TANK PROTECT ENGINEERING

SITE PLAN:
GROUNDWATER ELEVATION AND GRADIENT MAP (03/29/99)

MISSION VALLEY ROCK
799 ATHENOUR WAY
SUNOL, CA 94586

DATE	09/15/99
FIGURE	1
FILE #	384-01-1
DRAWN BY	VK
CHECKED BY	RD



LEGEND

MW-1 ● GROUNDWATER MONITORING WELL LOCATIONS

190 CONCENTRATION (ppb)

0 20

APPROXIMATE SCALE IN FEET

TANK PROTECT ENGINEERING

SITE PLAN:
TPHD CONCENTRATIONS (03/29/99)

MISSION VALLEY ROCK
799 ATHENOUR WAY
SUNOL, CA 94586

DATE	09/15/99
FIGURE	2
FILE #	384-021
DRAWN BY	VK
CHECKED BY	RD

TABLE 1
GROUNDWATER ELEVATION

Well Name	Elevation TOC[1] (Feet MSL[2])	Date	Depth-to-Water From TOC	Groundwater Elevation (Feet MSL)
MW-1	256.51[2]	06/23/98	1.32	255.19
		01/05/99	2.28	254.23
		03/29/99	1.88	254.63
MW-2	256.70[2]	06/23/98	1.72	254.98
		01/05/99	2.69[3]	254.01
		03/29/99	2.50	254.20
MW-3	256.72[2]	06/23/98	2.66	254.06
		01/05/99	4.47	252.25
		03/29/99	3.96	252.76

[1] TOP-OF-CASING

[2] TOC SURVEYED 10/09/98 BY PROFESSIONAL ENGINEER. ELEVATION BASED ON ONSITE BENCHMARK ELEVATION 257.10,NATIONAL GEODETIC VERTICAL DATUM (NGVD), ESTABLISHED 1929.

[3] CORRECTED FOR FREE PRODUCT

TABLE 2
SUMMARY OF FLOATING PRODUCT THICKNESS

Well Name	Date	Depth-to-Water From TOC[1] (Feet)	Depth-to-Product From TOC (Feet)	Product Thickness (Feet)
MW-1	06/23/98	1.32	ND[2]	---
	01/05/99	2.28	ND	---
	03/29/99	1.88	ND	---
MW-2	06/23/98	1.72	1.715	.005
	01/05/99	2.69 (5.3[3])	1.33	4
	03/29/99	2.50	ND	---
MW-3	06/23/98	2.662	ND	---
	01/05/99	4.47	ND	---
	03/29/99	3.96	ND	SHEEN

[1] TOP-OF-CASING.
[2] NOT DETECTED.
[3] CORRECTED FOR FREE PRODUCT THICKNESS; ACTUAL FIELD MEASUREMENT IN PARENTHESIS

TABLE 3
SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS
(ppb)[1]

Sample ID Name	Date	TPHD	TPHG	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes
MW-1	06/23/98	<1.0	3,100	110	19	2.3	91	48
	10/08/98	<50	2,300	<0.50	3.1	4.2	5.0	15
	12/01/98	350	<50	<5.0	12	7.5	20	6.2
	03/29/99	190	<50	<0.50	<0.50	<0.50	<0.50	<0.50
MW-2	06/23/98	12,000	2,500	14	0.68	<0.50	1.2	0.57
	10/08/98	4,300	<50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/01/98	38,000	<5,000	<500	<0.50	<0.50	<0.50	<0.50
	03/29/99	580	<50	<0.50	<0.50	<0.50	<0.50	<0.50
MW-3	06/23/98	12,000	300	150	0.80	<0.50	<0.50	<0.50
	10/08/98	6,400	<50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/01/98	5,600	<100	110	1.6	1.4	<1.0	<1.0
	03/29/99	150	<50	<0.50	<0.50	<0.50	<0.50	<0.50
MW-4	06/23/98	NA[2]	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50
	10/08/98	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/01/98	NA	NA	NA	<0.50	<0.50	<0.50	<0.50
	03/29/99	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50

[1] PARTS PER BILLION
[2] NOT ANALYZED

RECORD OF WATER SAMPLING

PROJECT NO.: 384 DATE: 3/29/99

PROJECT NAME: Mission Valley Rock

PROJECT LOCATION: 799 Athenour Way, Sunol

SAMPLER: L.T. III

ANALYSES: TPHG, TPHD, MBTEX

WELL DEPTH (from construction detail): _____

WELL DEPTH (measured): 16.42 SOFT BOTTOM?: YES

DEPTH TO WATER: 1.88 TIME: 11:30

PRESSURE (circle one)?: (YES) OR NO slight pressure Time 10:15 AM

IF YES, WAS PRESSURE (circle one): (POSITIVE) OR NEGATIVE?

WELL NO.: MW-1

WELL DIAMETER: 2"ϕ

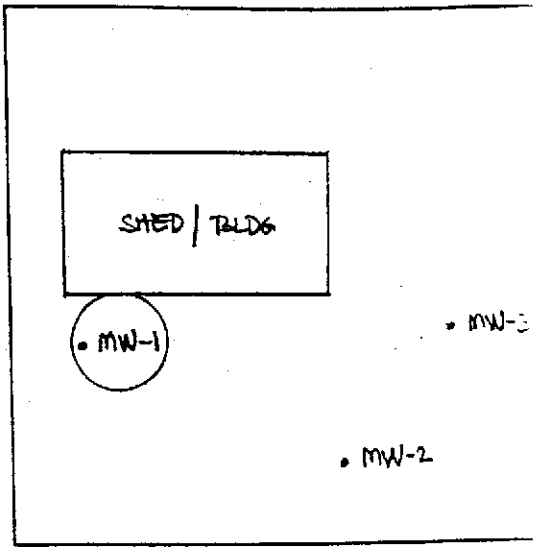
TOC ELEV: _____

LOCK NO.: P625

WATER VOLUME IN WELL: 2.3 gal

[2-INCH CASING = 0.16 GAL/FT] [4-INCH CASING = 0.65 GAL/FT]

[6-INCH CASING = 1.47 GAL/FT] [1 GAL = 3.78 L]



LOCATION MAP

CALCULATED PURGE VOL. (GAL): 9 (L): 36 ACTUAL PURGE VOL. (GAL): _____ (L): _____

PURGE METHOD: POLY SAMPLE METHOD: POLY

FIELD MEASUREMENTS

Time	Depth to Water (FT)	Vol (L)	Temp (Deg. F)	pH	EC	Clarity	Turbidity (NTU)	Remarks
12:01		1	57.2	10.67				clear; slight odor
			56.2	*	*			Equipment malfunctioning
			56.1	*	*			pH reading are too high
								needs to be set to
								factory for calibration.
12:37								Sampled MW-1

SIGNATURE: _____

WATER VOL. IN DRUM: _____

NEED NEW DRUM?: _____

* Equipment malfunctioning

RECORD OF WATER SAMPLING

OJECT NO.: 384 DATE: 3/29/99

OJECT NAME: Mission Valley Rock

OJECT LOCATION: 799 Athenour Way, Sunol

MPLER: L.T. TC

NALYSES: TPHG, TPHD, MBTEX

ELL DEPTH (from construction detail):

ELL DEPTH (measured): 19.02 SOFT BOTTOM?:

PTH TO WATER: 2.50 TIME: 1.42

ESSURE (circle one)?: (YES) OR NO @ 10:21 when lid opened allowed to equalize

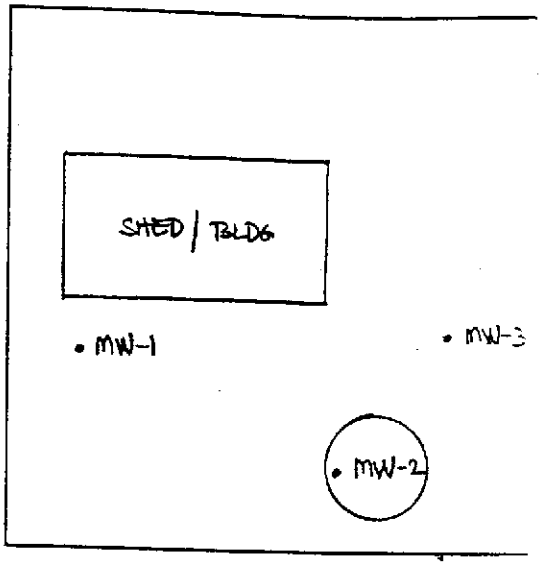
YES, WAS PRESSURE (circle one): POSITIVE OR NEGATIVE?

WELL NO.: MW-2

WELL DIAMETER: 2"ϕ

TOC ELEV:

LOCK NO.: P 605



LOCATION MAP

ATER VOLUME IN WELL: 2.6 gal

NCH CASING = 0.16 GAL/FT] [4-INCH CASING = 0.65 GAL/FT]

NCH CASING = 1.47 GAL/FT] [1 GAL = 3.78 L]

LCULATED PURGE VOL. (GAL): 10.5 (L): 42 ACTUAL PURGE VOL. (GAL): (L):

RGE METHOD: PDY SAMPLE METHOD: PDY

FIELD MEASUREMENTS

Time	Depth to Water (FT)	Vol (L)	Temp (Deg. F)	pH	EC	Clarity	Turbidity (NTU)	Remarks
46		1	59.8	—	—			Equipment maintenance
			60.2	—	—			PT Well 180 north
			60.5	—	—			
			60.5	—	—			
2:20								Sample MW-2

GNATURE:

WATER VOL. IN DRUM:

NEED NEW DRUM?:

RECORD OF WATER SAMPLING

PROJECT NO.: 384 DATE: 3/29/99

PROJECT NAME: Mission Valley Rock

PROJECT LOCATION: 799 Athenour Way, Sunol

SAMPLER: L.T. III

ANALYSES: TPHG, TPHD, MBTEX

WELL DEPTH (from construction detail): _____

WELL DEPTH (measured): 19.12 SOFT BOTTOM?: Y

DEPTH TO WATER: 3.96 TIME: 12:52

PRESSURE (circle one)?: YES OR NO when opened @ 10:15 AM - allowed to stabilized

IF YES, WAS PRESSURE (circle one): POSITIVE OR NEGATIVE?

WELL NO.: MW-3

WELL DIAMETER: 2"ϕ

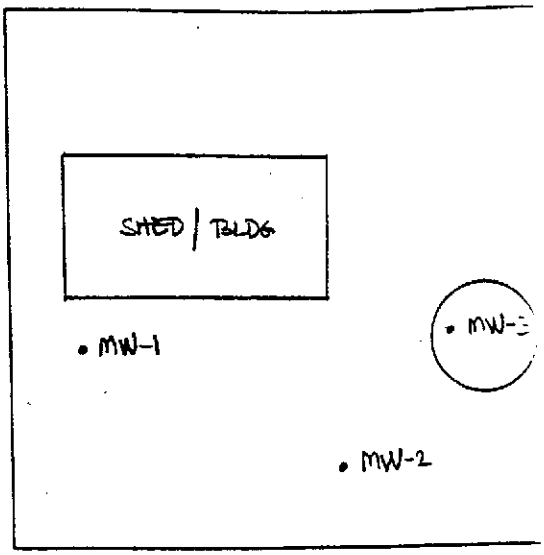
TOC ELEV: _____

LOCK NO.: P605

WATER VOLUME IN WELL: 2.4 gal

[2-INCH CASING = 0.16 GAL/FT] [4-INCH CASING = 0.65 GAL/FT]

[6-INCH CASING = 1.47 GAL/FT] [1 GAL = 3.78 L]



LOCATION MAP

CALCULATED PURGE VOL. (GAL): 1.7 (L): 39 ACTUAL PURGE VOL. (GAL): _____ (L): _____

PURGE METHOD: PDY SAMPLE METHOD: PDY

FIELD MEASUREMENTS

Time	Depth to Water (FT)	Vol (L)	Temp (Deg. F)	pH	EC	Clarity	Turbidity (NTU)	Remarks
1:00		1	60.5	*	*			Clear; slight odor - sheen
			63.2	*	*			Extra methane;
			63.6	*	*			PH levels too high
			61.9	*	*			
1:39								Sampled MW-3

SIGNATURE: _____

WATER VOL. IN DRUM: _____

NEED NEW DRUM?: _____

PRIORITY ENVIRONMENTAL LABS

Analytical Laboratory

April 05, 1999 PEL # 9903024

TANK PROTECT ENGINEERING

Attn: Louis Travis III

Re: Five water samples for Gasoline/BTEX with MTBE and Diesel analyses.

Project name: Mission Valley Park.
Project number: 384-032999

Date sampled: Mar 29, 1999
Date extracted: Apr 01-05, 1999

Date submitted: Mar 30, 1999
Date analyzed: Apr 01-05, 1999

RESULTS:

SAMPLE I.D.	Diesel (ug/L)	Gasoline (ug/L)	MTBE (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
MW-1	190	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
MW-2	580	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
MW-3	150	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
MW-4	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
DW	120000	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Blank	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spiked Recovery	88.7%	81.9%	---	90.1%	80.4%	96.5%	97.9%
Detection limit	50	50	0.5	0.5	0.5	0.5	0.5
Method of Analysis	3510/ 8015	5030/ 8015	602	602	602	602	602

David Duong
Laboratory Director

1764 Houret Court Milpitas, CA. 95035 Tel: 408-946-9636 Fax: 408-946-9663

TANK PROTECT ENGINEERING
of Northern California, Inc.
2821 Whipple Rd., Union City, CA 94587-1233
(510) 429-8088 ■ (800) 523-8088 ■ Fax (510) 429-8089

LAB: PEL

TURNAROUND: Normal

P.O. #: _____

PAGE 1 OF 1

CHAIN OF CUSTODY

PEL # 9903024

INV # 28770

PROJECT NO.: 284-032999

SITE NAME & ADDRESS: Mission Valley Rock, 7th Avenue Way, Sunol, CA

SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER:
Louis Franco III
2821 WHIPPLE ROAD, UNION CITY, CA 94587 (415) 429-8088

ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION	(1) TYPE OF CONTAINER	TOTAL LIGHT HC	AROMATIC HC (BTX)	TOTAL HEAVY HC	OIL & GREASE	VOC SCAN (624's)	OTHER METALS
MW-1	3/25/99	12:30		✓	MW-1	2-40ml 1-1 liter	✓	✓	✓		✓	
MW-2		2:20			MW-2		✓	✓	✓			
MW-3		1:31			MW-3		✓	✓	✓			
MW-4		3:30			MW-4		✓	✓	✓			
DW	↓	3:49		↓	DW 55 gal drums on site	2-40ml	✓	✓	✓		✓	

NO Diesel !!!
Test for Diesel

Relinquished by : (Signature)	Date / Time	Received by : (Signature)	Relinquished by : (Signature)	Date / Time	Received by : (Signature)
Relinquished by : (Signature)	Date / Time	Received by : (Signature)	Relinquished by : (Signature)	Date / Time	Received by : (Signature)
[signature]	3/30/99 11:30				
Relinquished by : (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature]	3/30/99 11:30 AM	P.E.L	

DATE: _____

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.

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.

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.