REPLY MESSAGE SET

TO

Alameda County Health Care Services Agen
Department of Environmental Health
Hazardous Materiia Program
80 Swan Way, Room 200
Oakland, CA 94621

RETURN TO

PELLEGRINI REFRIGERATION AND RESTAURANT EQUIPMENT
1550 PARK AVE., EMERYVILLE, CA 94608
PHONE (415) 653-9850
1617 HARRISON ST., SAN FRANCISCO, 94103
PHONE (415) 626-5822

MESSAGE

—FOLD

Subject Groundwater Monitoring Well Installation Report

Date July 6, 1994

Above report enclosed as per Tank Protect Engineering instructions.

94 JUL 13 AM10:56
ALCO HAZMAT

By Frances L. Foster

REPLY

Date **By**

Return White to Sender • Keep Pink • Fold in Center
Return Address Fits Standard # 10 Window Envelope

STD 4042

GROUNDWATER MONITORING WELL INSTALLATION REPORT

PELLEGRINI REFRIGERATION
& RESTAURANT EQUIPMENT CO.
1550 PARK AVENUE
EMERYVILLE, CA 94608

Prepared For:
MR. JOHN PELLEGRINI
PELLEGRINI REFRIGERATION
& RESTAURANT EQUIPMENT CO.
1550 PARK AVENUE
EMERYVILLE, CA 94608

Submitted By:
TANK PROTECT ENGINEERING (429-8088)
Of Northern California, Inc.
June 30, 1994

Project Number 294

John V. Mrakovich, Ph.D.
Registered Geologist

Jeff J. Farhoomand, M.S.
Civil Engineer

GROUNDWATER MONITORING WELL INSTALLATION REPORT

PELLEGRINI REFRIGERATION
& RESTAURANT EQUIPMENT CO.
1550 PARK AVENUE
EMERYVILLE, CA 94608

Prepared For:
MR. JOHN PELLEGRINI
PELLEGRINI REFRIGERATION
& RESTAURANT EQUIPMENT CO.
1550 PARK AVENUE
EMERYVILLE, CA 94608

June 30, 1994

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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1.0 INTRODUCTION

The site is located at 1550 Park Avenue in the City of Emeryville in Alameda County, California (see Figure 1). The site is occupied by Pellegrini Refrigeration & Restaurant Equipment Co. (PRRE). PRRE's contact person is Mr. John Pellegrini; telephone number (510) 653-9850.

On January 10, 1994, Tank Protect Engineering of Northern California, Inc. (TPE) removed a 1,500-gallon, underground, gasoline fuel tank and associated piping from the subject site (see Figure 2). Analytical results for native soil samples collected from beneath the ends of the underground storage tank at depths of about 5 feet were nondetectable for total petroleum hydrocarbons as gasoline (TPHG). However, analytical results from composite sample (STK-1,2,3) collected from the stockpiled soil detected TPHG at a concentration of 39 parts per million (ppm). Additionally, a groundwater "grab" sample (WS-1), collected from the bottom of the excavation, detected TPHG at a concentration of 2,700 parts per billion (ppb). A second groundwater "grab" sample (WS-1A), collected from the bottom of the excavation to confirm sample WS-1 results, detected TPHG at a concentration of 690 ppb. As a result of the contamination, the Alameda County Health Care Services Agency (ACHCSA) required that a groundwater investigation be conducted to determine the vertical and lateral extent of groundwater contamination and suggested that the investigation may consist of installing 1 groundwater monitoring well in the verified downgradient direction (of groundwater flow) from the former tank location.

TPE submitted a May 9, 1994 TANK CLOSURE REPORT AND WORKPLAN FOR GROUNDWATER MONITORING WELL INSTALLATION (WP) to PRRE and the ACHCSA for their review, comment, and approval. The WP proposed to install 1 groundwater monitoring well in the estimated downgradient direction of the former underground gasoline tank based on gradient information obtained from a review of the California Regional Water Quality Control Board (CRWQCB) - San Francisco Bay Region's files of documented leaking underground fuel tanks (LUFT). The WP was conditionally approved by the ACHCSA in a June 6, 1994 letter (see Appendix A). A condition of the ACHCSA's letter was to provide disposal documentation of the above mentioned stockpiled soil; documentation is provided in Appendix B.

This GROUNDWATER MONITORING WELL INSTALLATION REPORT (GMWIR) documents work conducted by TPE and results of chemical analyses of soil and groundwater samples.

2.0 GROUNDWATER INVESTIGATION

As an investigation of groundwater contamination, TPE conducted the following scope of work:

- Conducted a file review at the CRWQCB'S office to investigate vicinity and site groundwater flow direction.
- Obtained a well installation permit.
- Notified Underground Service Alert (USA) to locate utilities in the area.
- Drilled 1 soil boring to further investigate the horizontal and vertical extent of vadose zone soil contamination and for conversion into a groundwater monitoring well.
- Collected soil samples from the boring at approximately 5-foot depth intervals for construction of a boring log and for selection for chemical analysis.
- Analyzed the vadose zone soil sample collected from a depth of about 5.0 feet for TPHG and benzene, toluene, ethylbenzene, and xylenes (BTEX).
- Converted the boring into a 2-inch diameter casing groundwater monitoring well.
- Developed, purged, and sampled groundwater from the monitoring well for chemical analysis for TPHG and BTEX; also analyzed 1 trip blank sample for TPHG and BTEX.

- Prepared this GMWIR.

Details of the above scope of work are presented below.

2.1 File Review

To establish a location for a groundwater monitoring well, a representative of TPE reviewed the CRWQCB's files on May 5, 1994 to investigate if any groundwater monitoring wells exist in the vicinity of the subject site. This information is useful in estimating groundwater depth and gradient beneath the site.

Two nearby sites were found during the file review. The sites are:

Sherwin-Williams Co.
1450 Sherwin Avenue
Emeryville, California

City of Emeryville
1333 Park Avenue
Emeryville, California

Groundwater flow directions at the above 2 sites indicate Sherwin-Williams Co. (SHERWIN) is located about 500 feet up and crossgradient and City of Emeryville (COE) is located about 1,500 feet upgradient from the subject site. On January 5, 1994, groundwater flow direction at the SHERWIN facility was west-northwesterly. Groundwater flow directions for the COE site, measured for 4 consecutive quarters from March 17 through December 30, 1992, ranged from west-southwest to west-northwest (see Appendix C for SHERWIN and COE site gradient maps).

Based on the groundwater flow directions at the above 2 sites, TPE proposed to the ACHCSA, in a telephone conversation on June 13, 1994, that a well be installed at the location shown in Figure 2. The location is within 10 feet and in the estimated downgradient direction of the former underground tank location in accordance with the

CRWQCB's "Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites", dated August 10, 1990.

2.2 Predrilling Activities

Before commencing drilling activities, TPE obtained a well installation permit [(number 94372) see Appendix A] from the Alameda County Flood Control and Water Conservation District, Water Resources Management Zone 7; visited the site to mark the proposed soil boring location; and notified USA to locate utilities in the area.

2.3 Soil Boring and Sampling Procedures

The vertical and horizontal limits of potential soil contamination were further investigated while drilling the soil boring for construction of groundwater monitoring well MW-1 on June 22, 1994. See Appendices D and E for TPE's protocols relative to hollow-stem auger drilling and soil sampling procedures and waste handling and decontamination procedures.

The exploratory boring for well MW-1 was drilled to a total depth of about 13.5 feet by State of California licensed PC Exploration, Inc. (C-57 Water Well Driller Contractor's License Number 265556) using 8-inch diameter, hollow-stem, auger drilling equipment and sampled to a depth of about 15 feet with a California split-spoon sampler. The augers were steam-cleaned before drilling to minimize the potential of introducing off-site contamination to the boring. Representative soil samples were collected at approximately 5-foot depth intervals below the ground surface 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 was cleaned before each sampling event by washing with a trisodium phosphate solution and rinsing in tap water.

All vadose zone soil samples were field-screened for the presence of hydrocarbon contamination as evidenced by stains, odors, and headspace analysis using a Gastech, Inc., Trace-Techtor hydrocarbon vapor tester (HVT). Headspace analysis was

conducted by partially filling a quart-size plastic bag with a soil sample, sealing the bag air tight, and placing the bag in the sun and allowing volatilization of hydrocarbons, if any, into the air space of the bag. After a minimum of about 15 minutes of volatilization, the air space of the bag was sampled by the HVT and the response was recorded in ppm.

The vadose zone soil sample collected from a depth of about 5.0 feet, at the groundwater interface, was selected for chemical analysis for TPHG and BTEX. After collecting the sample, the brass tube ends were covered with Teflon sheeting and capped with plastic end-caps. The tube was then labeled to show site name, project number, date and time sampled, sample name and depth, and sampler name; sealed in a quart-size plastic bag; and placed in an iced-cooler for transport to California Department of Health Services (DHS) certified Trace Analysis Laboratory, Inc. (TAL), located in Hayward, California, accompanied by chain-of-custody documentation (see Appendix F for TPE's protocol relative to sample handling procedures).

A detailed boring log was prepared from auger return material and split-spoon samples (see Appendix G). The soil was logged according to the Unified Soil Classification System under the direction of a California Registered Geologist.

Drill cuttings were stored on site in a 55-gallon steel drum. The drum was labeled to show contents, date stored, suspected contaminant, expected date of removal, company name, contact person, and telephone number.

2.3.1 Results of Chemical Analyses

The soil sample collected at a depth of about 5.0 feet was analyzed for TPHG and BTEX by the DHS Method and Modified United States Environmental Protection Agency (EPA) Method 8020, respectively.

Analytical results were nondetectable for TPHG and BTEX.

Analytical results are summarized in Table 1 and documented with a certified analytical report and chain-of-custody in Appendix H.

2.4 Groundwater Monitoring Well Installation, Development, and Sampling

The following discussion documents groundwater monitoring well construction, development, and sampling procedures; and results of chemical analyses. See Appendices I, J, K, and L for TPE's protocols relative to groundwater monitoring well construction, development, and sampling procedures; and quality assurance and quality control procedures (QA/QC).

2.4.1 Groundwater Monitoring Well Installation

The boring for well MW-1 was drilled to a total depth of about 13.5 feet. Confined groundwater was encountered at a depth of about 5.5 feet. Groundwater stabilized at a depth of about 4.0 feet.

The boring was converted into a monitoring well by installing 2-inch diameter, flush-threaded, schedule 40, polyvinyl chloride (PVC) casing and 0.010-inch machine-slotted screen. The bottom of the boring was sealed with bentonite to a depth of about 13.0 feet. The screen was constructed to range in depth from about 5.0 feet to 13.0 feet. A sand pack of number 2/12 filter sand was placed in the annular space from a depth of about 13.0 feet to about 4.0 feet below the ground surface. About 1.0 foot of bentonite was placed above the sand pack followed by a neat cement slurry to within about 0.5 foot of ground surface. A traffic rated, bolt-locked, vault box was set in concrete to protect the well. A locking well cap with lock was installed on the well casing.

2.4.2 Groundwater Monitoring Well Development

On June 23, 1994, TPE developed well MW-1 (see Appendix M for Record of Well Development). Before development, depth to water was measured from the top-of-casing (TOC) to the nearest 0.01 foot using an electronic Solinst water level meter. A minimum of 3 repetitive measurements were made for each depth determination to ensure accuracy. The well was checked for floating product using a dedicated polyethylene bailer; no floating product, sheen, or odor was detected.

The well was developed using a 1.7-inch, positive displacement, PVC hand pump until the well was free of sand, silt, and turbidity or no further improvement was apparent. A total of 55 gallons of water were developed from the well.

Development water was stored on site in a 55-gallon steel drum labeled to show contents, date filled, suspected contaminant, company name, contact person, and telephone number.

2.4.3 Groundwater Monitoring Well Sampling

On June 28, 1994, TPE sampled well MW-1 (see Appendix M for Record of Water Sampling). Prior to sampling, depth to stabilized water was measured and recorded as discussed above in section 2.4.2 Groundwater Monitoring Well Development and the well was purged a minimum of 3 wetted well volumes and until temperature, pH, and electrical conductivity stabilized. A water sample was 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 and a trip blank were immediately stored in an iced-cooler and delivered to DHS certified Priority Environmental Labs (PEL) located in Milpitas, California, accompanied by chain-of-custody documentation.

Purge water was stored on site in a 55-gallon steel drum labeled to show contents, date filled, suspected contaminant, company name, contact person, and telephone number.

2.4.3.1 Results of Chemical Analyses

The water sample from well MW-1 and a trip blank sample were analyzed for TPHG and BTEX by EPA Method 5030/8015 and EPA Method 602, respectively.

No TPHG or BTEX were detected in the sample collected from monitoring well MW-1 or from the trip blank (sample I.D. MW-2).

Analytical results are summarized in Table 2 and documented with a certified analytical report and chain-of-custody in Appendix H.

3.0 RECOMMENDATIONS

3.1 Vadose Zone Soil

TPE recommends that no more investigation of the vadose zone soil be conducted.

3.2 Groundwater

TPE recommends that quarterly groundwater monitoring be implemented for TPHG and BTEX for 3 additional consecutive quarters to establish a trend of chemical concentrations for well MW-1. After groundwater analytical data from 4 consecutive quarters has been collected, the data will be reviewed and site closure may be considered at that time.

The next sampling event is due on or about September 28, 1994.

4.0 STUDY LIMITATIONS

This GMWIR is based on subsurface exploration and laboratory analyses of soil and groundwater samples. The chemical analytical results for the samples are considered applicable to that borehole or location from which they were collected. The soil encountered in the boring is believed to be representative of the site; however, the soil may vary in character between observation points. The conclusions contained herein are based on the field observations, analytical data, and professional judgement which is in accordance with current standards of professional practice. Representations made of soil and groundwater conditions between sample locations are extrapolations based on professional opinions and judgements and accepted industry practice. Therefore, TPE cannot and will not provide guarantees, certifications, or warranties that the

subject property is or is not free of all contaminated soil or groundwater and such assessments are provided only in order that the client may make an informed decision.

The extent of testing and data collection directly affects the statistical confidence level of all work performed. As a practical matter, to reach or even approach a 100 percent statistical confidence level would be prohibitively expensive. Therefore, if a reassessment of the subject property becomes necessary in the future, TPE will not reassess the area at its own cost. No other warranty is expressed or implied.

The findings and conclusions of this report are valid as of the present time; however, the passing of time could change the conditions of the subsurface due to natural processes or the influence of man. Accordingly, the findings of this report may be invalidated, wholly or partly, by changes beyond TPE's control. Therefore, this report should not be relied upon after an extended period of time without being reviewed by a Civil Engineer or Registered Geologist.

5.0 STATEMENT OF QUALIFICATIONS

A statement of qualifications for the lead professional involved in this project is included in Appendix N.

LEGEND

NOTE: REFERENCE: USGS 7.5 MINUTE SERIES QUADRANGLE MAP OAKLAND WEST, CALIFORNIA PHOTOREVISED 1980

N

0 2,000

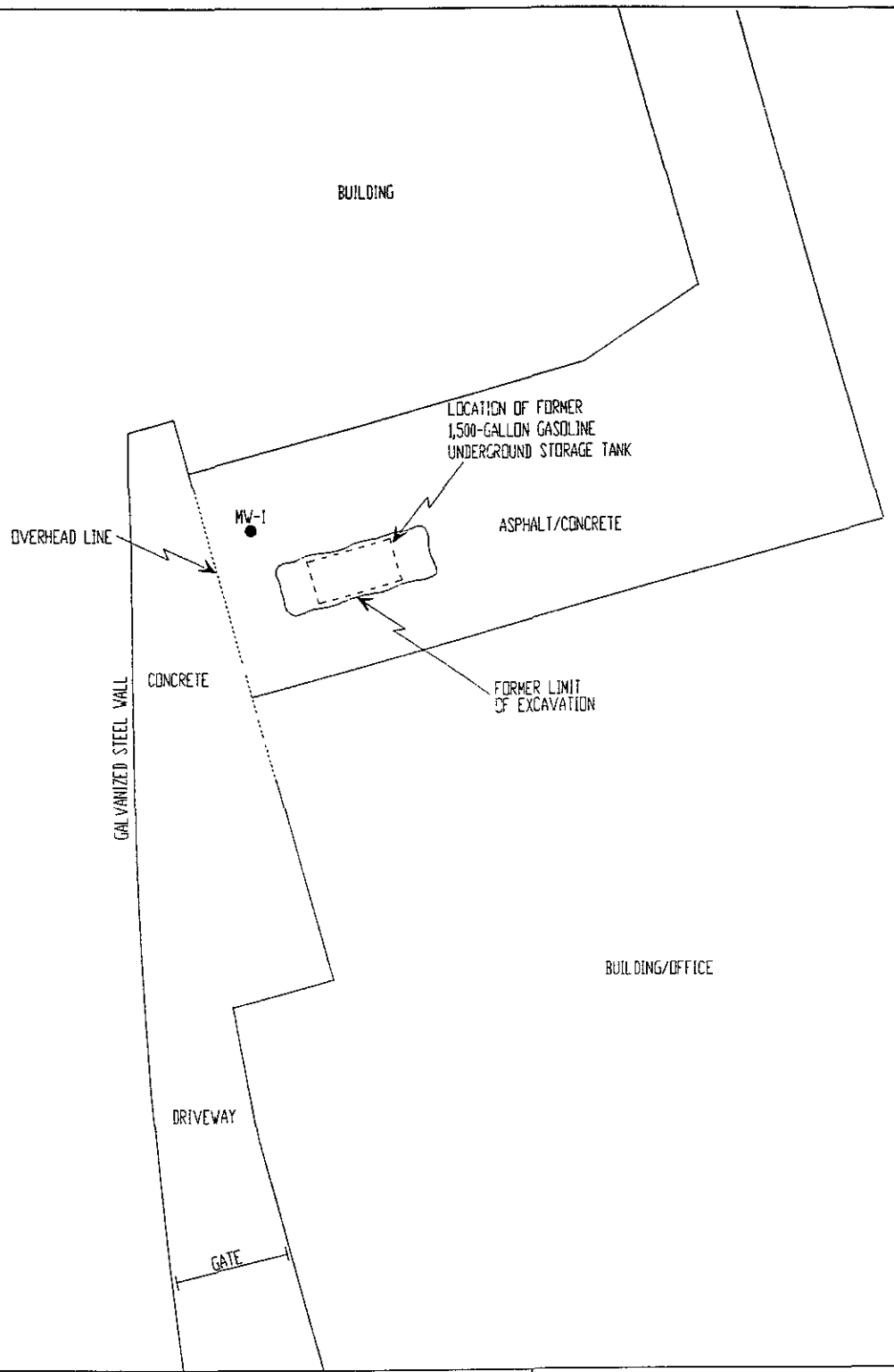
SCALE IN FEET

TANK PROTECT ENGINEERING

SITE VICINITY MAP

PELLEGRINI REFRIGERATION & RESTAURANT EQUIPMENT CO.
1550 PARK AVENUE
EMERYVILLE, CA 94608

DATE	6/30/94
FIGURE	1
FILE #	294-0
DRAWN BY	TM
CHECKED BY	RA



LEGEND

MW-1 ● NAME AND LOCATION OF GROUNDWATER MONITORING WELL

-N-

0 20

SCALE IN FEET

TANK PROTECT ENGINEERING

SITE PLAN

PELLEGRINI REFRIGERATION
& RESTAURANT EQUIPMENT CO.
1550 PARK AVENUE
EMERYVILLE, CA 94608

DATE	6/30/94
FIGURE	2
FILE #	294-2
DRAWN BY	TN
CHECKED BY	LH

TABLE 1

SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS

(ppm[1])

Sample ID Name	Date	Depth (Feet)	TPHG	Benzene	Toluene	Ethyl-Benzene	Xylenes
MW-1	06/22/94	5.0-5.5	<.500	<.0050	<.0050	<.0050	<.015

[1] PARTS PER MILLION

TABLE 2

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS

(ppb[1])

Sample ID Name	Date	TPHG	Benzene	Toluene	Ethyl-Benzene	Xylenes
MW-1	06/28/94	<50	<0.50	<0.50	<0.50	<0.50
MW-2	06/28/94	<50	<0.50	<0.50	<0.50	<0.50

[1] PARTS PER BILLION

[2] TRIP BLANK

APPENDIX A

- ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY, JUNE 6, 1994 LETTER
- ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, WATER RESOURCES MANAGEMENT, ZONE 7 DRILLING PERMIT APPLICATION

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

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

June 6, 1994
STID# 4042

Mr. John Pellegrini
Pelco Distributors
1550 Park Avenue
Emeryville, California 94608

RE: Tank Closure Report and Work Plan for Groundwater Monitoring Well Installation - Pellegrini Refrigeration & Restaurant Equipment Co., 1550 Park Avenue, Emeryville, CA 94608

Dear Mr. Pellegrini:

This office has completed review of the Tank Closure Report and Work Plan for Groundwater Monitoring Well Installation (May 9, 1994), prepared and submitted by Tank Protect Engineering for the referenced site.

Based on this review, the basic elements of the workplan is acceptable provided the following items are addressed:

1) During borehole advancement, soil samples must be collected at a minimum of every five feet in the unsaturated zone, significant changes in lithology and where field screening identifies the presence of contaminants. The selection of samples chosen for laboratory analysis should be based primarily on field evidence. A minimum of one sample submitted for analysis from each boring must be from the saturated/ unsaturated zone interface.

2) A minimum of 24 hours, and preferably 72 hours should pass between well development and purging/sampling.

3) Wells should be surveyed to an accuracy of 0.01 foot and referenced to a common bench mark such as mean sea level (MSL).

4) Please submit a copy of the monitoring well construction diagrams.

5) Please provide this office with documentation of the disposal of the stockpiled soil.

6) Please notify this office at least 72 hours in advance for the start up of the work plan implementation so a site visit can be arranged by a representative from this office.

7) Groundwater monitoring well must be installed in the verified downgradient location of the former underground storage tank. The use of groundwater data from neighboring sites to determine groundwater flow direction must be documented and the rationale must be explained.

8) Groundwater samples must be analyzed every quarter for the following target compounds: TPH gasoline, benzene, ethyl benzene, toluene, and xylene. Measurement of groundwater elevation must be incorporated in the quarterly monitoring program. After four quarters of sampling, the monitoring program will be evaluated and/or the site will be recommended for closure.

Response to items #4 and #5 should be included in the report to be submitted to this office following completion of this investigation. Report must be submitted within **45 days** after workplan implementation.

Until cleanup is complete, you will need to submit reports to this office every three months (or at a more frequent interval, if specified at any time by this agency). In addition, the following items must be incorporated in your future reports or workplans:

- a cover letter from the responsible party or tank owner stating the accuracy of the report and whether he/she concurs with the conclusions and recommendations in the report or workplan
- site map delineating contamination contours for soil and groundwater based on recent data should be included and the status of the investigation and cleanup must be identified
- proposed continuing or next phase of investigation / cleanup activities must be included to inform this department of the responsible party or tank owner's intention
- any changes in the groundwater flow direction and gradient based on the measured data since the last sampling event must be explained
- historical records of groundwater level in each well must be tabulated to indicate the fluctuation in water levels
- tabulate analytical results from all previous sampling events; provide laboratory reports (including quality control/quality assurance) and chain of custody documentation

All reports and proposals must be submitted under seal of a California Registered Geologist or Registered Civil Engineer with a statement of qualifications for each lead professionals involved with the project.

Please contact me at (510) 271-4530 if you have any questions concerning this letter.

Sincerely,

Susan L. Hugo

Susan L. Hugo
Senior Hazardous Materials Specialist

cc: Rafat A. Shahid, Asst. Agency Director, Environmental Health
Gil Jensen, Alameda County District Attorney's Office
Edgar B. Howell, Chief, Hazardous Materials Division - files
John Mrakovich, Ph.D., Tank Protect Engineering
2821 Whipple Road, Union City, CA 94587

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588 VOICE (510) 484-2600
FAX (510) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 1550 Park Avenue
Emeryville, CA 94608

CLIENT
Name Pellegrini Refrigeration
Address 1550 Park Ave Voice 510-653-9850
City Emeryville Zip 94608

APPLICANT
Name Tank Protect Engineering of Northern California Inc Fax 510-429-8089
Address 2821 Whipple Rd Voice 429-8088
City Union City Zip 94587

TYPE OF PROJECT

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

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

DRILLER'S LICENSE NO. C57 626556

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 20 ft.
Surface Seal Depth 5 ft. Number 1

GEOTECHNICAL PROJECTS
Number of Borings ___ Maximum
Hole Diameter ___ in. Depth ___ ft.

ESTIMATED STARTING DATE 6-22-94
ESTIMATED COMPLETION DATE 6-22-94

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Lee Huckins Date 6-14-94

FOR OFFICE USE

PERMIT NUMBER 94372
LOCATION NUMBER ___

PERMIT CONDITIONS

Circled Permit Requirements Apply

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

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

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

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

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 29 Jun 94
Wyman Hong

91992

APPENDIX B

REDWOOD LANDFILL, INC., WASTE GENERATOR'S AGREEMENT & CERTIFICATE OF RESPONSIBILITY

REDWOOD LANDFILL, INC.
WASTE GENERATOR'S AGREEMENT & CERTIFICATE OF RESPONSIBILITY

GENERATOR INFORMATION

*Generator Name: See below
Generating Facility Name: Pelco Distributors
Facility Address: 1550 Park Avenue
City: Emeryville State: CA
General Site Activity: Parts Distributors
Contact Name: John Pellegrini
Title:
Phone: 510/653-9851
Zip: 94608

WASTE INFORMATION

General Waste Description: Gasoline Contaminated Soil

Process Generating Waste: Underground Storage Tank (Gasoline)

Has this waste ever been handled or disposed of as hazardous? If yes, explain NO

Quantity: 20 cubic yards/tons/gallons (circle one) 100 % Solids

Are any hazardous or potentially hazardous materials stored or used on site? (POTW's exempt from this question)
Yes (No) If yes, please list:

ANALYTICAL DATA (Attach Lab Report and Chain of Custody)

I certify that this information is truly representative of the above mentioned waste. I agree to notify Redwood if there is a change in the generating process that would result in a change in the waste. I certify that all samples were collected according to EPA SW-846 and that the appropriate chain of custody was attached.

Initial

GENERATOR'S CERTIFICATION

In Consideration of the acceptance of materials to be deposited at its Landfill, the undersigned represents and agrees for the benefit of REDWOOD LANDFILL, INC. as follows:

1. The material deposited does not constitute any hazardous waste classified as such by the State of California, the Federal Government, or any other agency having jurisdiction over the Landfill;

2. The material does not contain any ignitable, reactive, corrosive or toxic substances;

3. The undersigned agrees to hold REDWOOD LANDFILL, INC. harmless from any claim, liability, damage, or expense including reasonable attorney's fees arising out of the violation or untruth of any of the foregoing statements.

Printed name Lee Huckins Title/Company Geologist / Tank Protect Engin

Generator Signature Lee Huckins For Pelco Distributers Date 4/12/94

FACILITY DECISION			BILLING INFORMATION		
	Accept	Reject		Accept	Reject
Comments:			Comments:		
wastegt.xls			RLI Account No.:		

* Pellegrini Refrigeration & Restaurant Equipment Co.

APPENDIX C

SHERWIN-WILLIAMS CO., AND CITY OF EMERYVILLE
GROUNDWATER GRADIENT MAPS

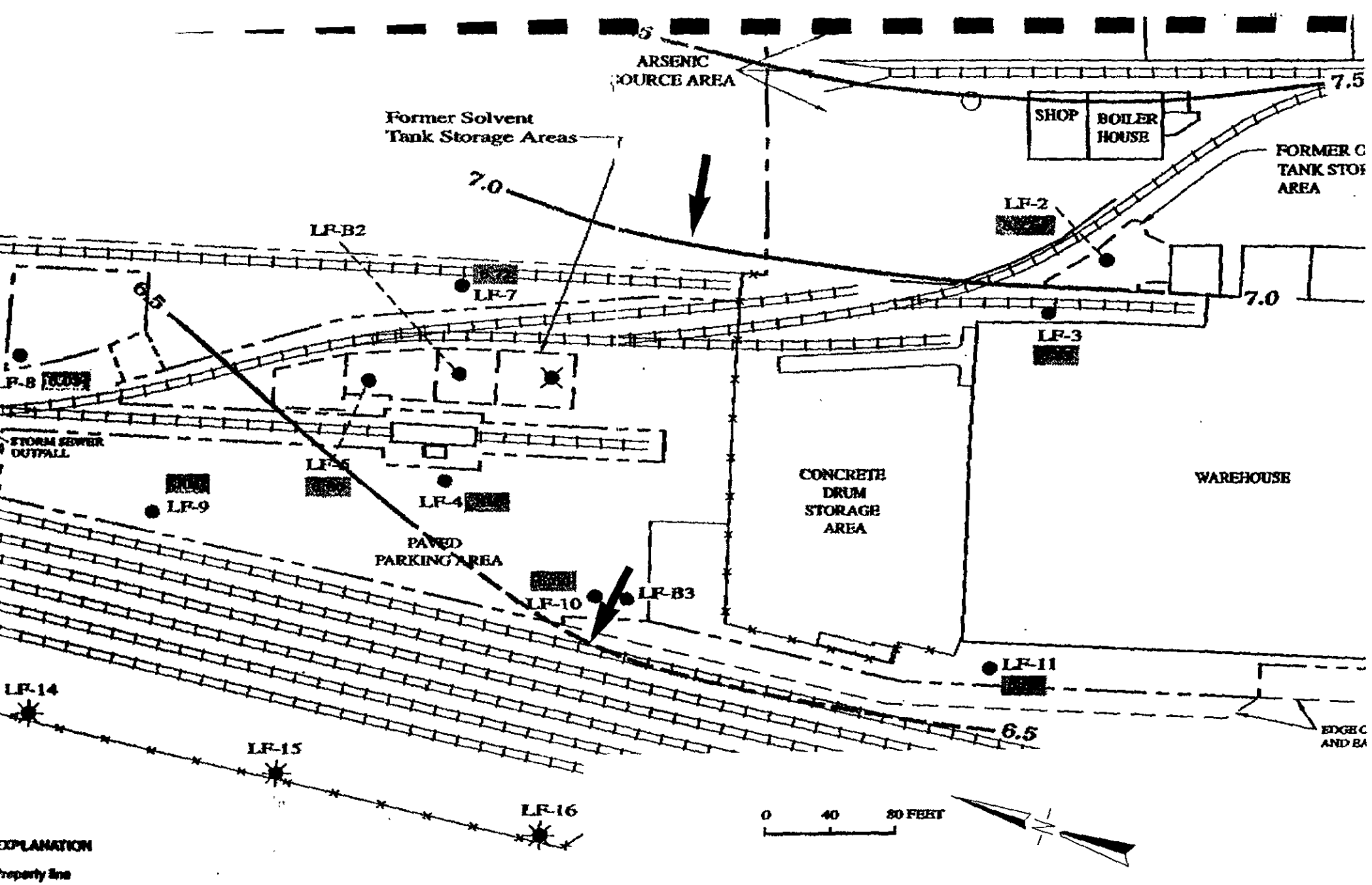
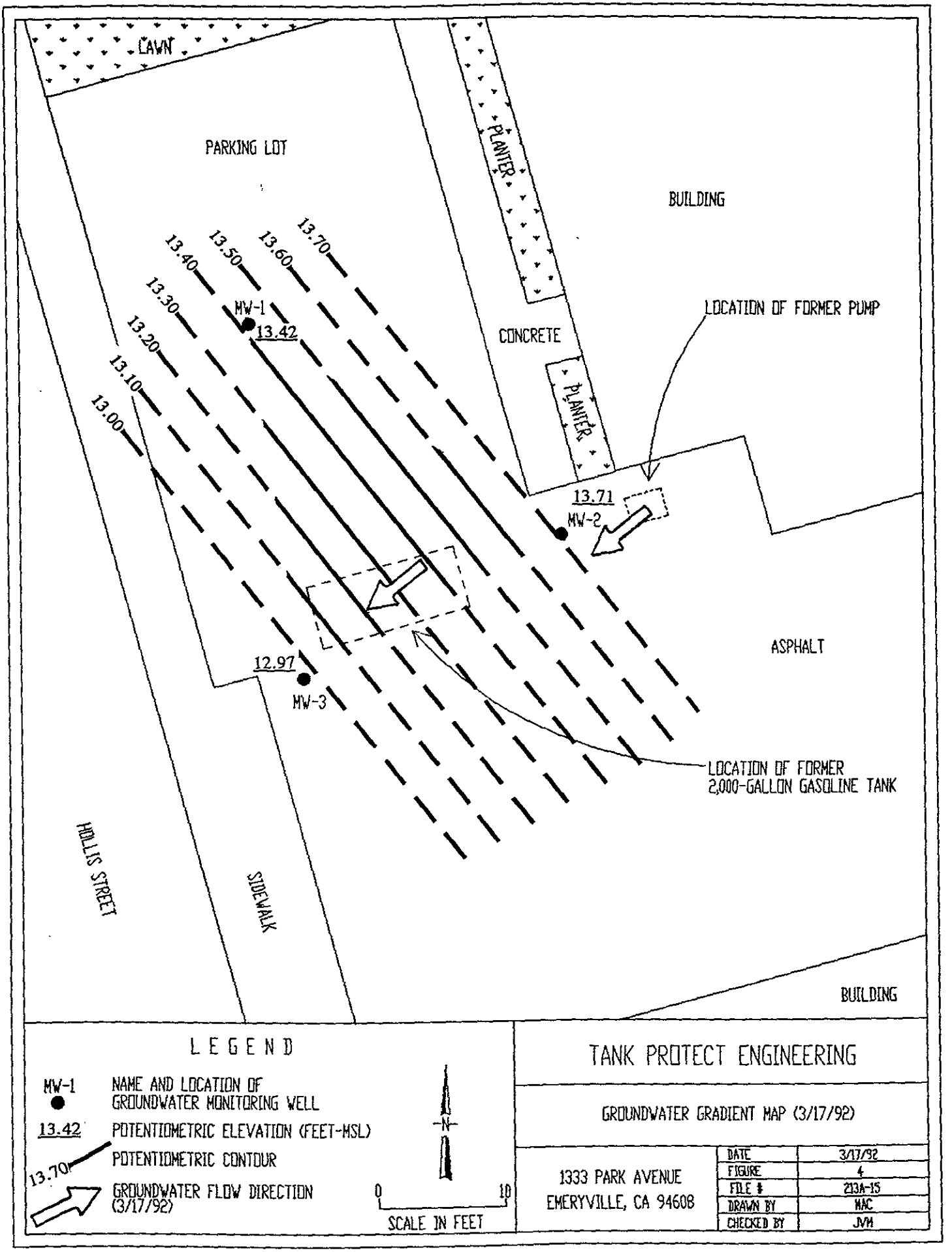


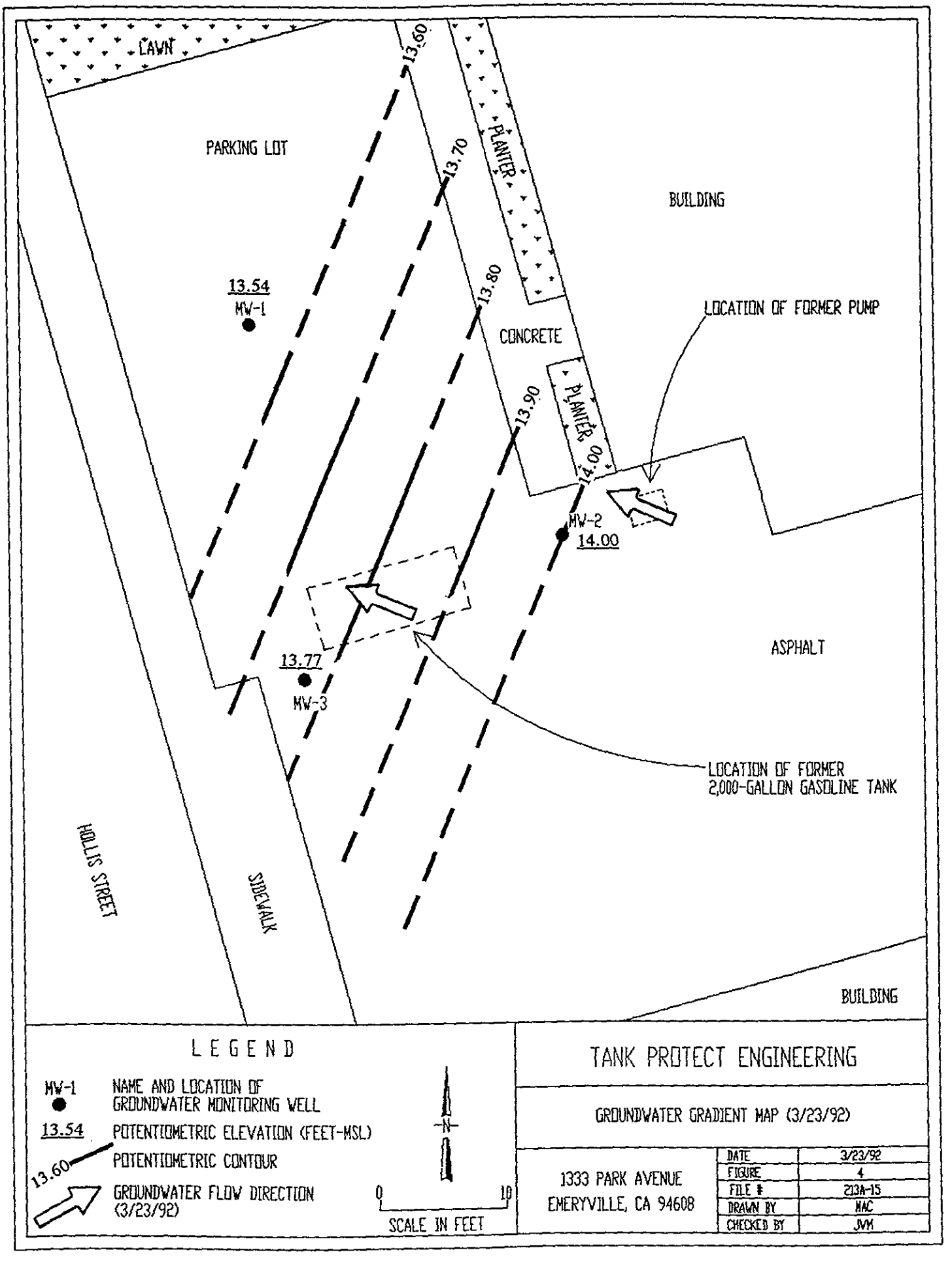
Figure 3:
A-ZONE GROUND-WATER ELEVATION MAP
JANUARY 5, 1994

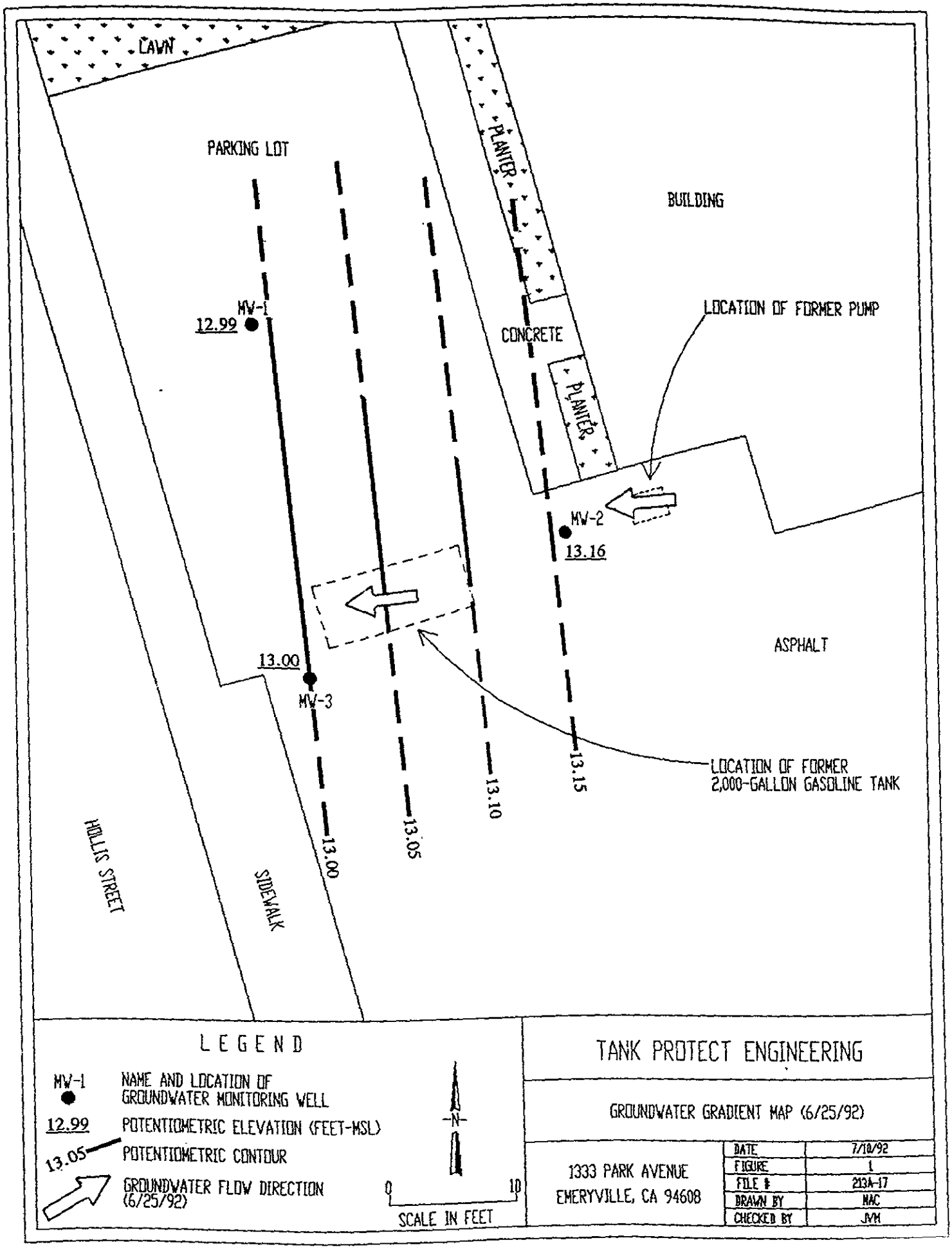
SHERWIN-WILLIAMS CO.
1450 SHERWIN AVENUE
EMERYVILLE, CA

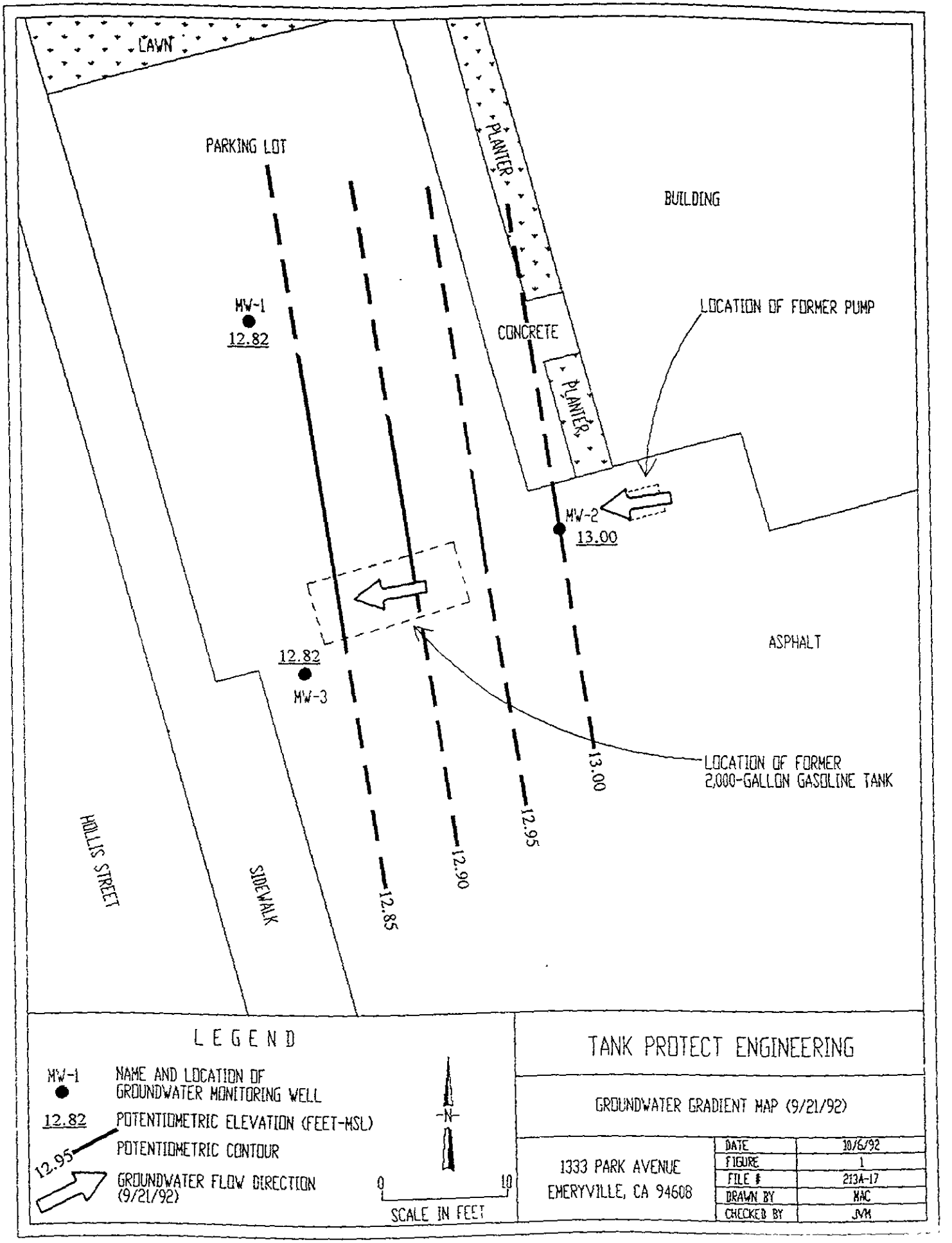
Project No. 1563

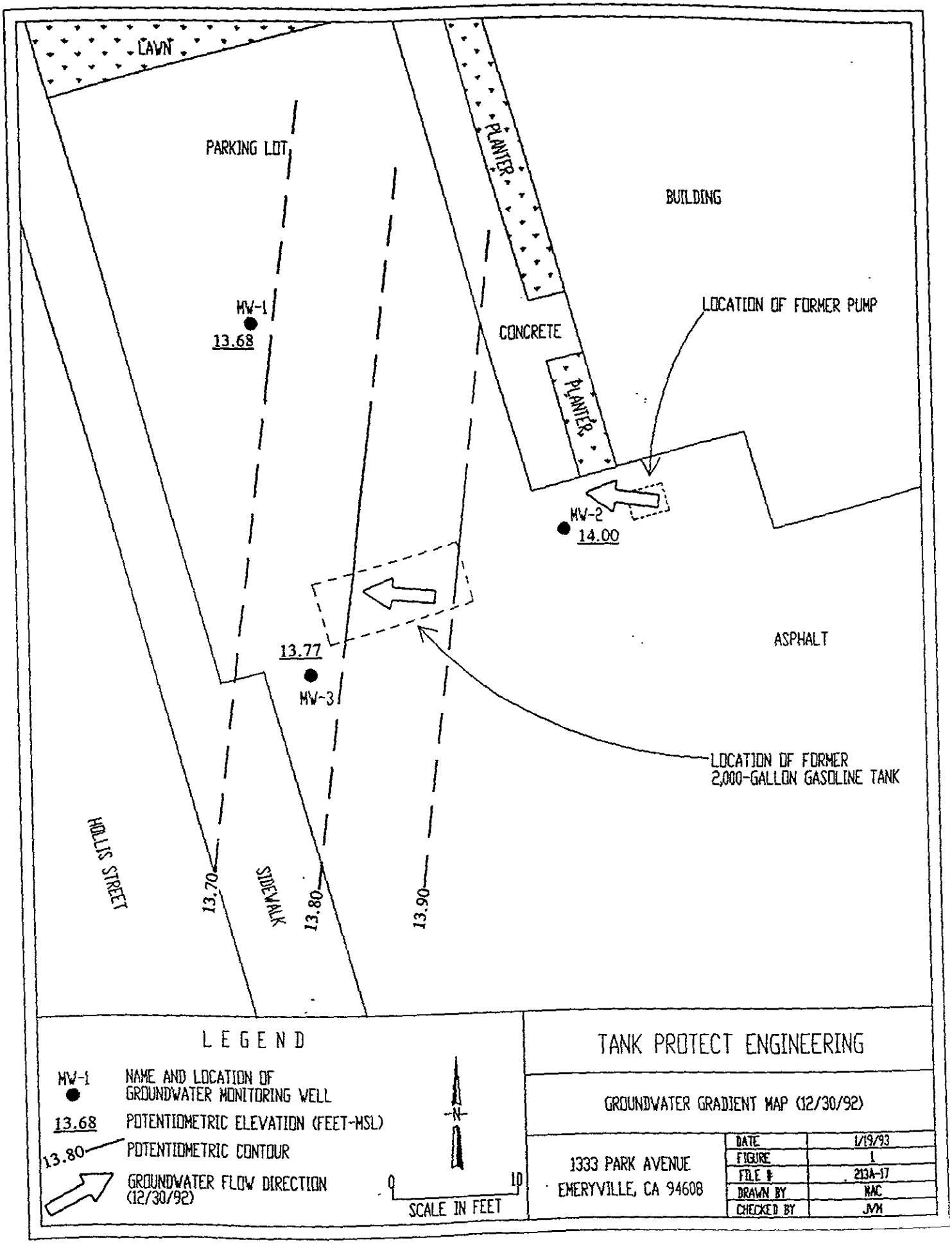
LEVINE•FRICKE


LAWN
PARKING LOT
PLANTER
BUILDING
13.70
13.60
13.50
13.40
13.30
13.20
13.10
13.00
MW-1
13.42
LOCATION OF FORMER PUMP
CONCRETE
PLANTER
13.71
MW-2
ASPHALT
12.97
MW-3
LOCATION OF FORMER
2,000-GALLON GASOLINE TANK
HOLLIS STREET
SIDEWALK
BUILDING
LEGEND
MW-1
NAME AND LOCATION OF
GROUNDWATER MONITORING WELL
13.42
POTENTIOMETRIC ELEVATION (FEET-MSL)
13.70
POTENTIOMETRIC CONTOUR
GROUNDWATER FLOW DIRECTION
(3/17/92)
N
0
10
SCALE IN FEET
TANK PROTECT ENGINEERING
GROUNDWATER GRADIENT MAP (3/17/92)
1333 PARK AVENUE
EMERYVILLE, CA 94608
DATE 3/17/92
FIGURE 4
FILE # 213A-15
DRAWN BY MAC
CHECKED BY JVH


LAWN
PARKING LOT
13.60
13.70
13.80
13.90
14.00
PLANTER
BUILDING
13.54
MW-1
CONCRETE
LOCATION OF FORMER PUMP
PLANTER
MW-2
14.00
13.77
MW-3
ASPHALT
LOCATION OF FORMER
2,000-GALLON GASOLINE TANK
HOLLIS STREET
SIDEWALK
BUILDING
LEGEND
MW-1
NAME AND LOCATION OF
GROUNDWATER MONITORING WELL
13.54
POTENTIOMETRIC ELEVATION (FEET-MSL)
13.60
POTENTIOMETRIC CONTOUR
GROUNDWATER FLOW DIRECTION
(3/23/92)
N
0
10
SCALE IN FEET
TANK PROTECT ENGINEERING
GROUNDWATER GRADIENT MAP (3/23/92)
1333 PARK AVENUE
EMERYVILLE, CA 94608
DATE 3/23/92
FIGURE 4
FILE # 213A-15
DRAWN BY MAC
CHECKED BY JVM


LAWN
PARKING LOT
PLANTER
BUILDING
MW-1
12.99
CONCRETE
PLANTER
LOCATION OF FORMER PUMP
MW-2
13.16
ASPHALT
13.00
MW-3
LOCATION OF FORMER
2,000-GALLON GASOLINE TANK
13.15
13.10
13.05
13.00
HOLLIS STREET
SIDEWALK
LEGEND
MW-1
NAME AND LOCATION OF
GROUNDWATER MONITORING WELL
12.99
POTENTIOMETRIC ELEVATION (FEET-MSL)
13.05
POTENTIOMETRIC CONTOUR
GROUNDWATER FLOW DIRECTION
(6/25/92)
N
0
10
SCALE IN FEET
TANK PROTECT ENGINEERING
GROUNDWATER GRADIENT MAP (6/25/92)
1333 PARK AVENUE
EMERYVILLE, CA 94608
DATE 7/10/92
FIGURE 1
FILE # 213A-17
DRAWN BY MAC
CHECKED BY JVH


LAWN
PARKING LOT
PLANTER
BUILDING
MW-1
12.82
CONCRETE
PLANTER
LOCATION OF FORMER PUMP
MW-2
13.00
12.82
MW-3
ASPHALT
LOCATION OF FORMER
2,000-GALLON GASOLINE TANK
13.00
12.95
12.90
12.85
HOLLIS STREET
SIDEWALK
LEGEND
MW-1
NAME AND LOCATION OF
GROUNDWATER MONITORING WELL
12.82
POTENTIOMETRIC ELEVATION (FEET-MSL)
12.95
POTENTIOMETRIC CONTOUR
GROUNDWATER FLOW DIRECTION
(9/21/92)
0
10
SCALE IN FEET
TANK PROTECT ENGINEERING
GROUNDWATER GRADIENT MAP (9/21/92)
1333 PARK AVENUE
EMERYVILLE, CA 94608
DATE 10/6/92
FIGURE 1
FILE # 213A-17
DRAWN BY MAC
CHECKED BY JVM


LAWN
PARKING LOT
PLANTER
BUILDING
MW-1
13.68
LOCATION OF FORMER PUMP
CONCRETE
PLANTER
MW-2
14.00
13.77
MW-3
ASPHALT
LOCATION OF FORMER
2,000-GALLON GASOLINE TANK
HOLLIS STREET
SIDEWALK
13.70
13.80
13.90
LEGEND
MW-1
NAME AND LOCATION OF
GROUNDWATER MONITORING WELL
13.68
POTENTIOMETRIC ELEVATION (FEET-MSL)
13.80
POTENTIOMETRIC CONTOUR
GROUNDWATER FLOW DIRECTION
(12/30/92)
N
0
10
SCALE IN FEET
TANK PROTECT ENGINEERING
GROUNDWATER GRADIENT MAP (12/30/92)
1333 PARK AVENUE
EMERYVILLE, CA 94608
DATE 1/19/93
FIGURE 1
FILE # 213A-17
DRAWN BY MAC
CHECKED BY JVH

APPENDIX D

HOLLOW-STEM AUGER DRILLING AND SOIL SAMPLING PROCEDURES

APPENDIX D

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 on ice at a temperature of 4 degrees Celsius.

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 E

WASTE HANDLING AND DECONTAMINATION PROCEDURES

APPENDIX E

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-tube sampler and brass tubes, will be cleaned by washing with trisodium phosphate detergent, followed by rinsing with potable 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 F

SAMPLE HANDLING PROCEDURES

APPENDIX F

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.
- 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 capped 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 are to be identified with labels and all sample bottles are to 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 locations, station numbers, dates, times, sampler's name, designation of the samples as a grab or composite, notation of the type of sample (e.g. groundwater, soil boring, etc.), preservatives used, on-site measurement data, and other observations or remarks.

APPENDIX G

LOG OF EXPLORATORY BORING AND WELL COMPLETION DETAIL

LOG OF EXPLORATORY BORING

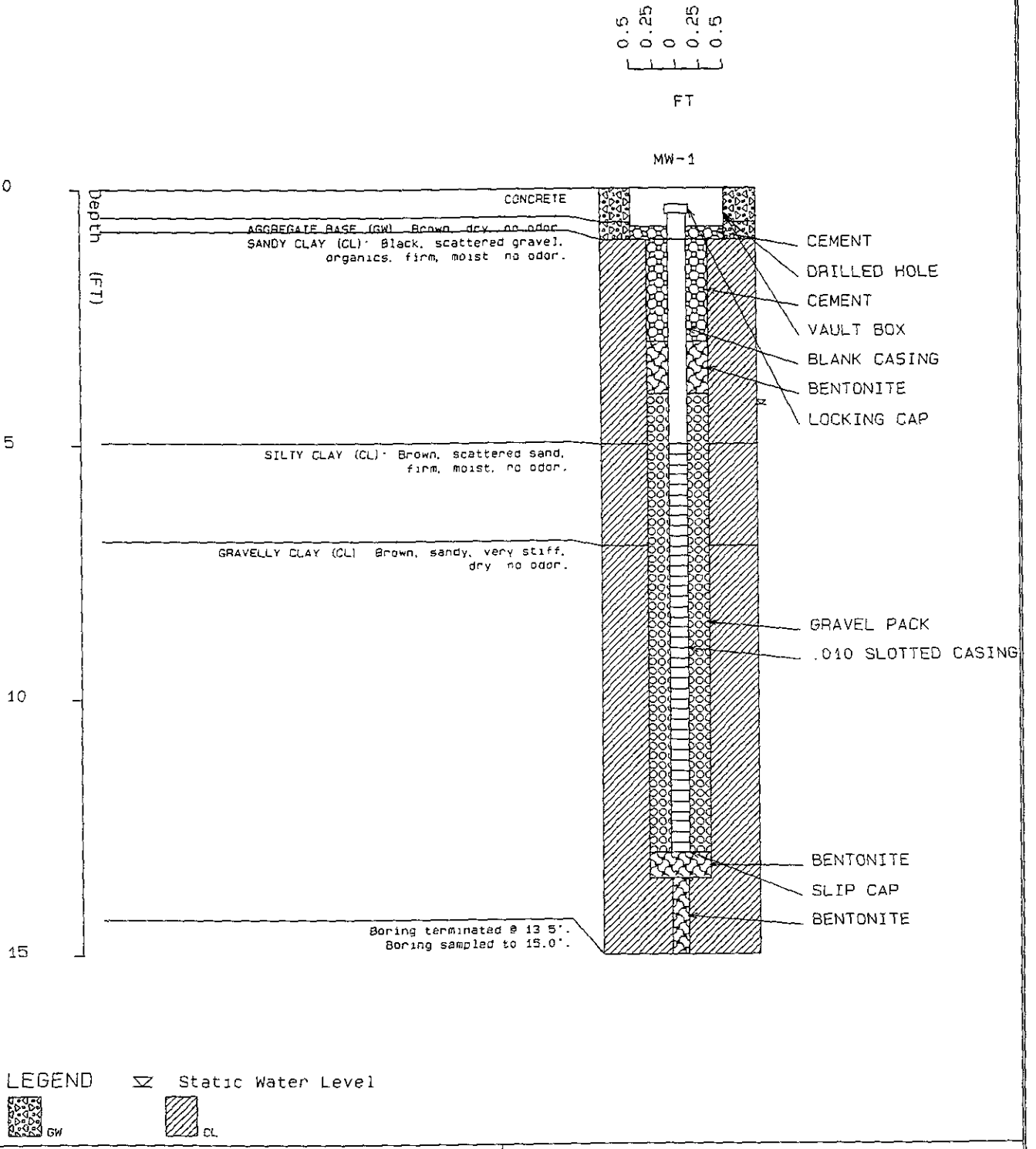
PROJECT NUMBER 294 BORING NO. MW-1

PROJECT NAME 1550 Park Avenue, Emeryville, CA

BY LNH DATE 6/22/94 SURFACE ELEV. 8 FT

RECOVERY (FT/FT)	OVA (PPM)	PENETRATION (BLOWS/FT)	GROUND WATER LEVELS	DEPTH IN FT	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				1			CONCRETE
							AGGREGATE BASE (GW): Brown, dry, no odor.
				2			SANDY CLAY (CL): Black, scattered gravel, organics, firm, moist, no odor.
				3			
				4			
1.5/1.5	16	6		5			SILTY CLAY (CL): Brown, scattered sand, firm, moist, wet at 5.5', no odor.
				6			
				7			GRAVELLY CLAY (CL) Brown, sandy, very stiff, dry, no odor
				8			
				9			
1.5/1.5	-	24		10			
				11			
				12			Boring terminated @ 13.5'. Boring sampled to 15.0'.
				13			
1.0/1.5	-	22		14			
				15			

REMARKS: Boring drilled with continuous-flight, hollow-stem, 8-inch O.D augers. Samples collected in a 2.0-inch I.D. California sampler.



LEGEND ▽ Static Water Level

GW CL

WELL ID : MW-1

1550 PARK AVENUE, EMERYVILLE, CA

TANK PROTECT ENGINEERING

Figure :

APPENDIX H

CERTIFIED ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

LOG NUMBER: 4535
DATE SAMPLED: 06/22/94
DATE RECEIVED: 06/23/94
DATE EXTRACTED: 06/23/94
DATE ANALYZED: 06/24/94
DATE REPORTED: 06/27/94

CUSTOMER: Tank Protect Engineering

REQUESTER: Jeff Farhoomand

PROJECT: No. 294-062294, Pelligrini Refrigeration, 1550 Park Avenue

Sample Type: Soil

Method and Constituent:	Units	MW-1, 5.0-5.5 Concentration	MW-1, 5.0-5.5 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
DHS Method:					
Total Petroleum Hydrocarbons as Gasoline	ug/kg	ND	500	ND	500
Modified EPA Method 8020 for:					
Benzene	ug/kg	ND	5.0	ND	5.0
Toluene	ug/kg	ND	5.0	ND	5.0
Ethylbenzene	ug/kg	ND	5.0	ND	5.0
Xylenes	ug/kg	ND	15	ND	15

QC Summary:

% Recovery: 120
% RPD: 3.7

Concentrations reported as ND were not detected at or above the reporting limit.

Louis W. DuPuis
Quality Assurance/Quality Control Manager

TANK PROTECT ENGINEERING
2921 WHIPPLE ROAD
UNION CITY, CA 94587
(415)429-8088
(800)523-8088
FAX(415)429-8089

4535

LAB: Trace

TURNAROUND: 5 day

P.O. #: 867

PAGE 1 OF 1

CHAIN OF CUSTODY

PROJECT NO.	SITE NAME & ADDRESS
294067244	Pelligrini Refrigeration 1570 Park Ave

SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER
Lee Huckins
2821 WHIPPLE ROAD, UNION CITY, CA 94587 (415) 429-8088

ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION	(1) TYPE OF CONTAINER	ANALYTES REQUESTED: TOTAL LIGHT HC	AROMATIC HC (BTX)	TOTAL HEAVY HC	OIL & GREASE	VOC SCAN (624's)	OTHER	REMARKS
mw-1 5.0-5.5	6/22	944	X		5.0-5.5	Bags	X	X					

Relinquished by : (Signature)	Date / Time	Received by : (Signature)	Relinquished by : (Signature)	Date / Time	Received by : (Signature)
Lee Huckins	6/23/94 8:00	Joe Miller	Joe Miller	6/23/94 3:00	
Relinquished by : (Signature)	Date / Time	Received by : (Signature)	Relinquished by : (Signature)	Date / Time	Received by : (Signature)
Relinquished by : (Signature)	Date / Time	Received for Laboratory by: (Signature) Scott Tanner	Date / Time 6/24/94 3:00 pm	Remarks	

4/4, 50.4, 1-BT. Y-4, 5. Day

DATE: 6/23/94

PRIORITY ENVIRONMENTAL LABS

Precision Environmental Analytical Laboratory

June 29, 1994 PEL # 940613

TANK PROTECT ENGINEERING, INC.

Attn: Jeff
Re: Two rush water samples for Gasoline/BTEX analysis.

Project name: Pellegrini Refrigeration
Project location: 1550 Park Ave. - Emeryville
Project number: 294062894

Date sampled: Jun 28, 1994 Date submitted: Jun 29, 1994
Date extracted: Jun 29, 1994 Date analyzed: Jun 29, 1994

RESULTS:

SAMPLE I.D.	Gasoline (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
MW-1	N.D.	N.D.	N.D.	N.D.	N.D.
MW-2	N.D.	N.D.	N.D.	N.D.	N.D.
Blank	N.D.	N.D.	N.D.	N.D.	N.D.
Spiked Recovery	86.2%	97.4%	99.4%	102.3%	106.5%
Detection limit	50	0.5	0.5	0.5	0.5
Method of Analysis	5030 / 8015	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

2821 WHIPPLE ROAD
UNION CITY, CA 94587
(415)429-8088
(800)523-8088
FAX(415)429-8089

PEL # 9406119

INV # 24951

LAB: ~~Fed Ex~~ Priority

TURNAROUND: ~~Friday~~ 24 hr

P.O. #: 870

PAGE 1 OF 1

CHAIN OF CUSTODY

PROJECT NO.	SITE NAME & ADDRESS
294062894	1550 Park Ave Emeryville Pellegrini Refrigeration

SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER
Rhett Arbuckle
2821 WHIPPLE ROAD, UNION CITY, CA 94587 (415) 429-8088

ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION	(1) TYPE OF CONTAINER	ANALYTES REQUESTED: TOTAL LIGHT HC	AROMATIC HC (BTX)	TOTAL HEAVY HC	OIL & GREASE	VOC SCAN (624's)	OTHER	REMARKS
MW-1	6/28/94	12:38		X		2-40 ml VOAs	X	X					
MW-2	6/28/94	12:59		X		↓	X	X					

Relinquished by : (Signature)	Date / Time	Received by : (Signature)	Relinquished by : (Signature)	Date / Time	Received by : (Signature)
	6/28/94 14:00			6/29/94 9:35	
Relinquished by : (Signature)	Date / Time	Received by : (Signature)	Relinquished by : (Signature)	Date / Time	Received by : (Signature)
Relinquished by : (Signature)	Date / Time	Received for Laboratory by: [Signature]	Date / Time	Remarks	
			6/29/94 9:35		

DATE: 6/29/94

APPENDIX I

GROUNDWATER MONITORING WELL CONSTRUCTION PROCEDURES

APPENDIX I

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. 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 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 shall 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 shall be thoroughly cleaned immediately before starting each well installation. When available, each component shall be cleaned with a high temperature, high pressure washer for a minimum of 5 minutes. When a washer is not available, components shall 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 shall not donate to, capture, mask, nor 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 shall be limited to inorganic and non-hazardous compounds. Compressed air introduced into the borehole shall 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 shall 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.

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 shall be placed by 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 J

GROUNDWATER MONITORING WELL DEVELOPMENT PROCEDURES

APPENDIX J

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, 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 shall 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 shall be thoroughly cleaned immediately before starting each well installation. When available, each component shall be cleaned with a high temperature, high pressure washer for a minimum of 5 minutes. When a washer is not available, components shall be cleaned with potable or tap water, then rinsed with distilled water.

Development equipment shall not donate to, capture, mask, nor 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 to not 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 (sand/gravelly) aquifers, the rate of surge block lifting shall 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 shall 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 shall 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 K

GROUNDWATER MONITORING WELL SAMPLING PROCEDURES

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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 either 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% of its initial water level or more.

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 or probe 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 shall be handled and preserved according to the latest EPA 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 shall be documented in writing on TPE development logs.

APPENDIX L

QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

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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 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 samples, field blanks, and duplicate samples.

Trip blanks are a check for cross-contamination during sample collection, shipment, and in the laboratory. Analytically confirmed organic-free water shall be used for organic parameters and deionized water for metal parameters. Blanks will be prepared by the laboratory supplying the sample containers. The blank shall 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 a water sample that remains with the collected samples during transportation and is analyzed along with the field samples to check for residual contamination. 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 for air exposure can vary considerably from site to site.

The laboratory will not be informed about the presence of field and trip blanks and a false identifying number will be put on the label. Full documentation of these collection and decoy procedure 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 test 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 EPA-certified standards), duplicates, replicates, and sample spikes. Internal QC also requires adherence to written methods, procedural documentation, and record keeping, and the observance of good laboratory practices.

APPENDIX M

RECORD OF WELL DEVELOPMENT AND RECORD OF WATER SAMPLING

RECORD OF WELL DEVELOPMENT

PROJECT NO.: 294 DATE: 6/23/94

WELL NO.: MW-1

PROJECT NAME: PELCO DISTRIBUITORS.

WELL DIAMETER: 2"

PROJECT LOCATION: 1550 PARK AVE. EMERIVILLECA.

TOC ELEV:

DEVELOPER: ADRIAN ARDELEANO

LOCK NO.: P-605.

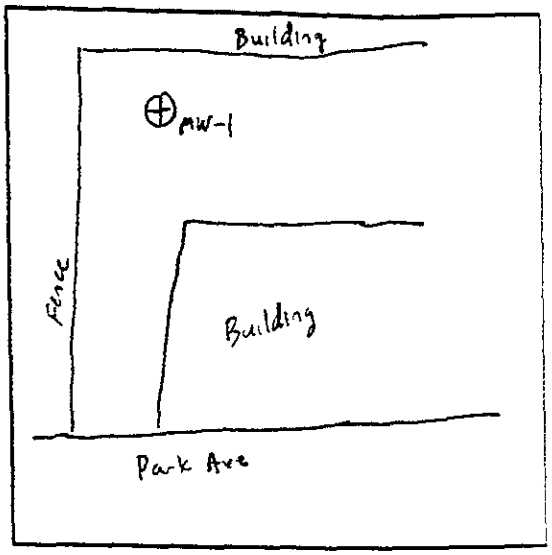
WELL DEPTH (from construction detail): 13'.5"

WELL DEPTH (measured): 12.5 SOFT BOTTOM?: Yes.

DEPTH TO WATER: 4'.6" TIME: 9:15 AM.

PRESSURE (circle one)?: YES OR (NO)

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



LOCATION MAP

WATER VOLUME IN WELL:

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

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

DEVELOPMENT METHOD: HAND PUMP.

FLOATING PRODUCT PRESENT: YES ☐ NO ☒

SHEEN PRESENT: YES ☐ NO ☒

ODOR PRESENT: YES ☐ NO ☒

FIELD MEASUREMENTS

Time	Depth to Water (FT)	Vol (Gal)	Clarity (NTU'S)	Remarks
9:15 AM	4'.6"	55		
				Clear...

TOTAL VOLUME DEVELOPED (GAL): 55 (L):

WATER VOL. IN DRUM: 55 galans.

SIGNATURE:

NEED NEW DRUM?: NO.

RECORD OF WATER SAMPLING

PROJECT NO.: 294 DATE: 6/28/94 WELL NO.: MW-1

PROJECT NAME: Pelligrini Refrigeration WELL DIAMETER: 2"

PROJECT LOCATION: 1550 Park Ave Emeryville TOC ELEV: _____

SAMPLER: RPA LOCK NO.: P605

ANALYSES: TPHG + BTEX

WELL DEPTH (from construction detail): _____

WELL DEPTH (measured): 12.38 SOFT BOTTOM?: NO

DEPTH TO WATER: 4.25' TIME: 12:06

PRESSURE (circle one)?: YES OR (NO)

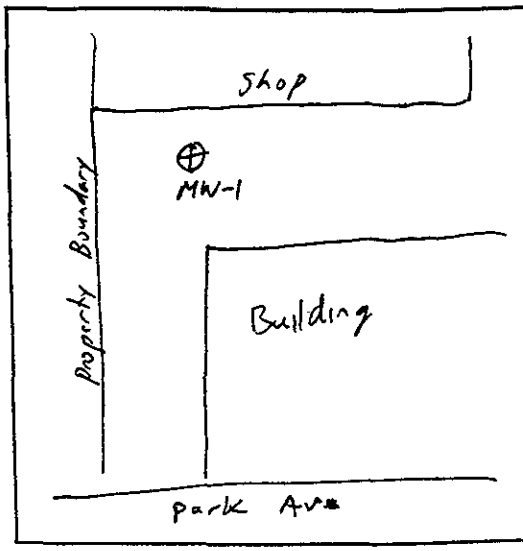
IF YES, WAS PRESSURE (circle one): POSITIVE OR NEGATIVE?

1st Bail— No Free product, no sheen, no odor.

WATER VOLUME IN WELL: 1.30

[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): 3.90 (L): 14.75 ACTUAL PURGE VOL. (GAL): _____ (L): 19

PURGE METHOD: POLY SAMPLE METHOD: POLY

FIELD MEASUREMENTS

Time	Depth to Water (FT)	Vol (L)	Temp (Deg. F)	pH	EC x 100	Clarity	Turbidity (NTU)	Remarks
12:20		3	72.8	5.50	7.29	clear		no odor
12:23		6	69.8	6.25	7.43	light brown		"
12:25		9	69.0	7.55	7.46	"		"
12:26		11	68.2	7.26	7.40	"		"
12:28		13	67.8	6.96	7.70	"		"
12:29		15	67.5	7.10	7.84	"		"
12:31		17	67.2	6.78	8.02			"
12:32		19	67.0	6.70	8.09			"
12:38	Sampled Well						>200	

WATER VOL. IN DRUM: 10%

NEED NEW DRUM?: NO

SIGNATURE: _____

APPENDIX N

STATEMENT OF QUALIFICATIONS

APPENDIX N

STATEMENT OF QUALIFICATIONS
JOHN V. MRAKOVICH
REGISTERED GEOLOGIST

EXPERIENCE

- Managed the design, implementation, and reporting of chemical plume definition projects of major Silicon Valley corporations. Site hydrogeology was assessed using soil borings, cone penetration testing, HydroPunch sampling, and monitoring wells.

- Managed multiple groundwater contaminant plume projects for Aerojet Gencorp at the firm's 8,500-acre site near Sacramento, California. Responsibilities included supervision of environmental consultants and subcontractors, management of all drilling and mapping operations, and well installation projects. Also developed and tracked annual budgets.

- Managed tasks associated with modeling groundwater and contaminants to predict the effectiveness of groundwater wells for intercepting contaminant plumes and the effectiveness of recharge wells to contain plumes. The projects involved the interpretation of subsurface geology and formation hydrogeology using electrical and lithological logs and pump test results. Data was used as input to numerical and analytical groundwater flow models.

- Managed excavation and remediation of contaminated soil at many underground fuel tank leak sites. Tasks included characterization of soil and groundwater contaminant plumes, soil remediation by aeration, chemical oxidation, and bioremediation. Developed statistical soil sampling plans for remediated stockpiled soil.

- Mapped subsurface geologic stratigraphy for numerous oil companies, both onshore and offshore Gulf of Mexico. Project work was accomplished using geophysical techniques to determine geologic structures and locations of permeable formations. Specific tasks included determining locations and depths for test hole drilling and evaluating the data obtained.

- Conducted subsurface site investigations for Bechtel Professional Corporation at nuclear power facilities and earthen damns. Tasks included supervision of soil borings, surveying of drill site locations, construction of lithologic logs, and collection of soil samples.

WORK HISTORY

Tank Protect Engineering — 1990 - Present
of Northern California, Inc.
Union City, CA
Project Manager

EMCON Associates — 1989 - 1990
San Jose, CA
Project Manager

Aerojet Gencorp (Superfund Site) — 1987 - 1989
Sacramento, CA
Hydrogeologist

Meridian Oil, Inc. — 1982 - 1987
Houston, TX
Exploration Geologist

MHP Exploration Company — 1981 - 1982
Houston, TX
President

Home Petroleum Corporation 1979 - 1981
Houston, TX
Exploration Geologist

Natural Gas Pipeline Co. of America 1976 - 1979
Houston, TX
Reservoir Geologist

Bechtel Incorporated 1974 - 1976
Houston, TX
Engineering Geologist

Gulf Oil Corporation 1969 - 1971
New Orleans, LA
Development/Exploration Geologist

EDUCATION

Ph.D., Geology, Michigan State University, East Lansing, MI, 1974
M.S., Geology, Kent State University, Kent, OH, 1969
B.S., Geology, Kent State University, Kent, OH, 1967

PROFESSIONAL REGISTRATION

Registered Geologist, State of California, No. 4665

CERTIFICATES

Certified Professional Geologist
OSHA 40 Hour Training

AFFILIATIONS

Association of Groundwater Scientists and Engineers (NWWA)
Association of Professional Geological Scientists
American Association of Petroleum Geologists

PUBLICATIONS

"Sharon Conglomerate of Northeastern Ohio," 1969, Compass. v. 34, No. 3, pp. 150-158.

"Ancient Fluvial Deposits in Northeastern Ohio," 1969, Northern Ohio Geological Society Field Trip Guidebook.

"The Sharon Conglomerate," Coauthor, Guide to the Geology of Northeastern Ohio, 1970, Northern Ohio Geological Society.

"Sedimentary Environments of the Lower Pennsylvanian Sharon Conglomerate near Akron, Ohio," Coauthor, Selected Field Trips in Northeastern Ohio, 1974, Ohio State Geological Survey, Guidebook No. 2.

"Depositional Environment of the Sharon Conglomerate Member of the Pottsville Formation in Northeastern Ohio," 1974, Jour. Sed.
Petrology, v. 44 ,1186, 1199.

"Use of Fourier Shape Analysis in Zircon Petrogenetic Studies," Coauthor, 1975, Geol. Soc. America Bull., v.86, pp. 956-8.

"New Techniques for Stratigraphic Analysis and Correlation-Fourier Grain Shape Analysis, Louisiana Offshore Pliocene," 1976, Jour. Sed. Petrology, v. 46, pp. 226-233.