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OUR JOB P90103

QUARTERLY GROUNDWATER SAMPLING
SAMPLING PERIOD NO. 1
FIRE STATION NO. 1
7494 DONOHUE DRIVE
DUBLIN, CALIFORNIA

Sep 1990

BSK & Associates, Geotechnical Consultants, Inc

Geotechnical Engineering • Engineering • Geology • Environmental Engineering • Engineering Laboratories • Chemical Laboratories

September 27, 1990

OUR JOB P90103

Dougherty Regional Fire Authority
9399 Fircrest Lane
San Ramon, California 94583

Attention: Mr. Tom Hathcox
Fire Marshal

SUBJECT: Quarterly Groundwater Sampling
Sampling Period No. 1
Fire Station No. 1
7494 Donohue Drive
Dublin, California

Gentlemen:

As requested and authorized, we have performed the first quarterly groundwater sampling of three groundwater monitoring wells at Fire Station No. 1, 7494 Donohue Drive, Dublin, California.

The study site location with respect to surrounding geographical features is shown on Figure 1, Vicinity Map. The groundwater monitoring well locations, as well as the approximate layout of the former underground tank group, are shown in Figure 1, Site Plan.

BACKGROUND

According to Fire Department authorities, three USTs containing gasoline and diesel were in use at the project site in the 1960's. The largest tank was 4,000 gallons in capacity and stored gasoline. The two smaller tanks were 550 gallons in

[] Fresno, California 93706	• 1645 "E" Street, Suite 105	• Telephone (209) 485 3200, Fax (209) 485 7477
[] Fresno, California	• 1145 "E" Street	• Telephone (209) 485 0100
[] Fresno, California 93706	• 1114 Stanislaus Street	• Telephone (209) 485 8310
[] Visalia, California 93291	• 808 E. Douglas Avenue	• Telephone (209) 732 8857, Fax (209) 732 6570
[] Bakersfield, California 93304	• 117 "V" Street	• Telephone (805) 327 0671, Fax (805) 324 4218
[X] Pleasanton, California 94566	• 5729 E. Sonoma Drive	• Telephone (415) 462 4000, Fax (415) 462 6283
[] Sacramento, California 95839	• 9901 Horn Road, Suite C	• Telephone (916) 363 1871, Fax (916) 363 1875

capacity and stored diesel fuel and gasoline. In 1965 or 1966, the 550-gallon gasoline tank was observed to not maintain fuel levels, and was subsequently abandoned by grouting in place. The two remaining tanks were in use until 1989, when they were removed by Hageman-Shank, Inc. in November of that year. During removal, soils in the close vicinity of the abandoned gasoline tank were observed to be contaminated by petroleum product. Chemical tests revealed Total Petroleum Hydrocarbons, as gasoline, levels to 1500 parts per million.

Contaminated soil was removed from the tank excavation and aerated on-site, under a permit from the Bay Area Air Quality Management District (BAAQMD) and with the approval of the Alameda County Environmental Health Department (ACEH). Following adequate aeration of the soil pile, the excavated spoils were used as backfill in the UST group excavation, with approval by the ACEH.

In May and June of 1990, BSK & Associates installed three groundwater monitoring wells at the site, and performed soil and groundwater sampling and chemical analyses for contaminants derivative of gasoline and diesel fuel. The results of the BSK study, as well as a summation of previous work was provided in BSK Report P90103, dated 27 June 1990.

SITE LOCATION AND DESCRIPTION

The project site is the Dougherty Regional Fire Station No. 1, located at 7494 Donohue Drive in Dublin, California. The site is approximately one-third acre in size, and consists of a fire station building and paved parking area. The former tank group was located behind the fire truck garage, in the western portion of the site, as shown on Figure 1. The former tank excavation has been backfilled as described, and subsequently repaved with asphalt. A Convault-type above-ground tank is presently located in the former UST location.

The Fire Station property is fenced on the south, west and north perimeters. It is bound to the east by Donohue Drive, to the north by an open, concrete-lined storm channel, to the west by an apartment complex, and to the south by a vacant lot and parking area. Surrounding neighborhoods are primarily

residential, with extensive commercial development located one to two blocks to the south. The site area is located near the center of the San Ramon Valley, at a surface elevation of approximately 350 feet above mean sea-level. Topography slopes gently to the east-southeast at a gradient of approximately one and one-half percent.

GROUNDWATER SAMPLING

Groundwater Monitoring Wells MW-1, MW-2 and MW-3, were sampled 27 August 1990. The field procedures utilized for sampling are presented below.

Each monitoring well was first measured for water depth using a Solinst electric sounding tape marked in twentieths of a foot. Measurements were made from the top of the well casing and extrapolated to 1/100 of a foot. The well water was then observed for floating and sinking immiscible layers, surface sheen and odor using a clear PVC bailer with a point-source ball-check arrangement. Following observation, each well was purged of five volumes of well water using a PVC hand pump. At regular intervals during purge, a water sample was obtained and tested for pH, electrical conductivity, and temperature. These results were recorded for each sample for record of purge adequacy. Upon purge completion, each well was re-measured for depth to groundwater to assure a minimum of 80 percent well water level recovery, prior to sampling. Once recovery was assured, the wells were sampled for the subject contaminants using a teflon bailer with a point source ball-check arrangement. Following sample withdrawal, each well was then re-secured and sealed.

As described, a field log for each well was prepared containing depth to water data, measured parameters, sampling information, etc. The Well Field Logs are presented in Figures 2, 3, and 4 of this report.

Equipment used during sampling, purging and field analyses were thoroughly cleaned using a non-phosphate wash and rinse prior to each usage in order to prevent cross-contamination between wells or with other project sites.

Purged and other effluent from each well not utilized as samples were placed into DOT-approved 55-gallon drums for storage until sample analyses determined the condition of the water. Each drum was labeled as to the origin of its contents, suspected contaminants, sampling party and date of sampling event.

Each groundwater sample obtained was placed into the receptacle specified for the respective analysis, sealed, labeled and refrigerated for immediate delivery to our State-certified analytical laboratory.

BORING SPOILS

Drummed waste soils from the excavation of the monitoring and exploratory borings were removed from the project site by Bay Area Tank and Marine, following composite analyses of the drummed soils for organic lead content. Chemical analyses showed no detected organic lead. (See Figure A-4 for Laboratory Chemical Test Data Sheet.)

HYDROLOGIC CONDITIONS

As stated previously, groundwater levels were measured prior to sampling on 27 August 1990. Groundwater was found to be at a depth of approximately 10 feet below grade. Precise groundwater measurements with respect to individual well-head elevations enabled a derivation of shallow groundwater flow direction and gradient. As shown on Figure 5, Groundwater Flow Direction And Gradient, flow direction was measured to be N65° E, with a gradient of 0.7 percent. In comparison to the direction and gradient measured in June of 1990, flow has rotated northerly approximately 35 degrees. Gradient has remained steady. The precise reason for flow direction change is unknown, but may be attributed to seasonal fluctuations in groundwater flow, or in response to a man-made alteration of the flow regime.

CHEMICAL ANALYSES

Water samples obtained from Wells MW-1, MW-2 and MW-3, were tested for the presence of Benzene, Toluene, Xylene and Ethylbenzene (BTXE), and Total Volatile Hydrocarbons (TVH) as gasoline.

A summation of the chemical analyses results is presented in the following tables. The Chemical Test Data Sheets are presented in Appendix "A" as Figures A-1 through A-4. The project Chain-of-Custody documentation is provided as Figure A-5.

WATER ANALYSES

TABLE 1
(Results in PPB)

<u>Sample Location</u> <u>Boring Number</u>	<u>Benzene</u> <u>(1.0*)</u>	<u>Toluene</u> <u>(100)+</u>	<u>Xylene</u> <u>(1750)*</u>	<u>Ethylbenzene</u> <u>(680)*</u>
MW-1	ND	ND	ND	ND
MW-2	ND	ND	ND	ND
MW-3	ND	ND	ND	ND

ND - None Detected

*DHS Primary Drinking Water Standard (3/89)

+ - DHS Action Level

TABLE 2
(Results in PPB)

<u>Sample Location</u> <u>Boring Number</u>	<u>TVH</u> <u>(100)*</u>
MW-1	ND
MW-2	ND
MW-3	ND

ND - None Detected

*Quantified Action Levels are not provided for this parameter. The amount given is often informally used as a threshold value.

CONCLUSIONS

As demonstrated by the preceding tables, groundwater does not currently appear to be affected by residual contaminated soils discovered during our initial study, or by other sources.

In accordance with our agreement, we will continue to monitor the groundwater monitoring wells on a quarterly basis for a period of one year from the time of our initial study and report our findings.

REPORT DISTRIBUTION

Copies of this report should be submitted to the Alameda County Environmental Health District (Attention Gil Wistar) for their review. We are providing you with extra copies for this purpose. We understand that copies of this report will be forwarded by ACEH to the Regional Water Quality Control Board in Oakland for their review.

LIMITATIONS

The findings and conclusions presented in this report are based on field review and observations, and from the limited testing program described in this report. This report has been prepared in accordance with generally accepted methodologies and standards of practice in the area. No other warranties, expressed or implied, are made as to the findings, conclusions and recommendations included in the report.

The findings of this report are valid as of the present. The passage of time, natural processes or human intervention on the property or adjacent property can cause changed conditions which can invalidate the findings and conclusions presented in this report.

BSK & Associates is pleased to have been of service to you during this project. If you have questions concerning the contents of this report, please do not hesitate to contact us.

* * * *

The following are attached and complete this report:

FIGURE 1: Vicinity Map and Site Plan
FIGURES 2-4: Well Field Logs
FIGURE 5: Groundwater Flow Direction and Gradient

Appendix "A"

FIGURES A-1
through A-4: Laboratory Chemical Test Data Sheets
FIGURE A-5: Project Chain of Custody Records

Respectfully submitted,
BSK & Associates

Alex Y. Eskandari

Alex Y. Eskandari, P.E.
Project Manager
C.E. 38101

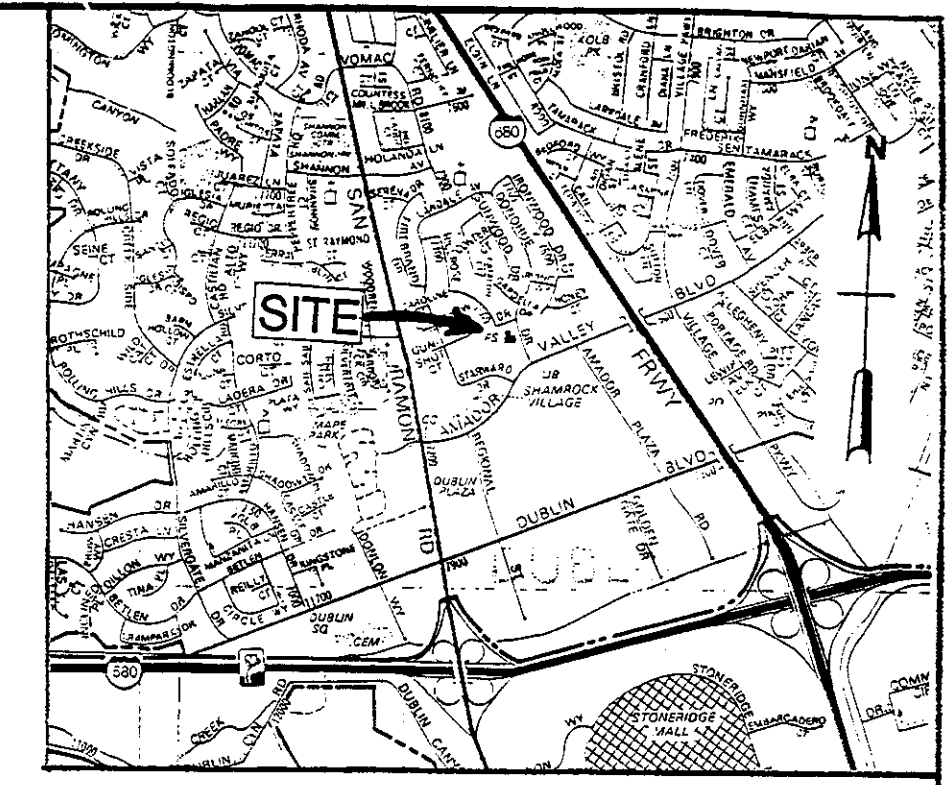
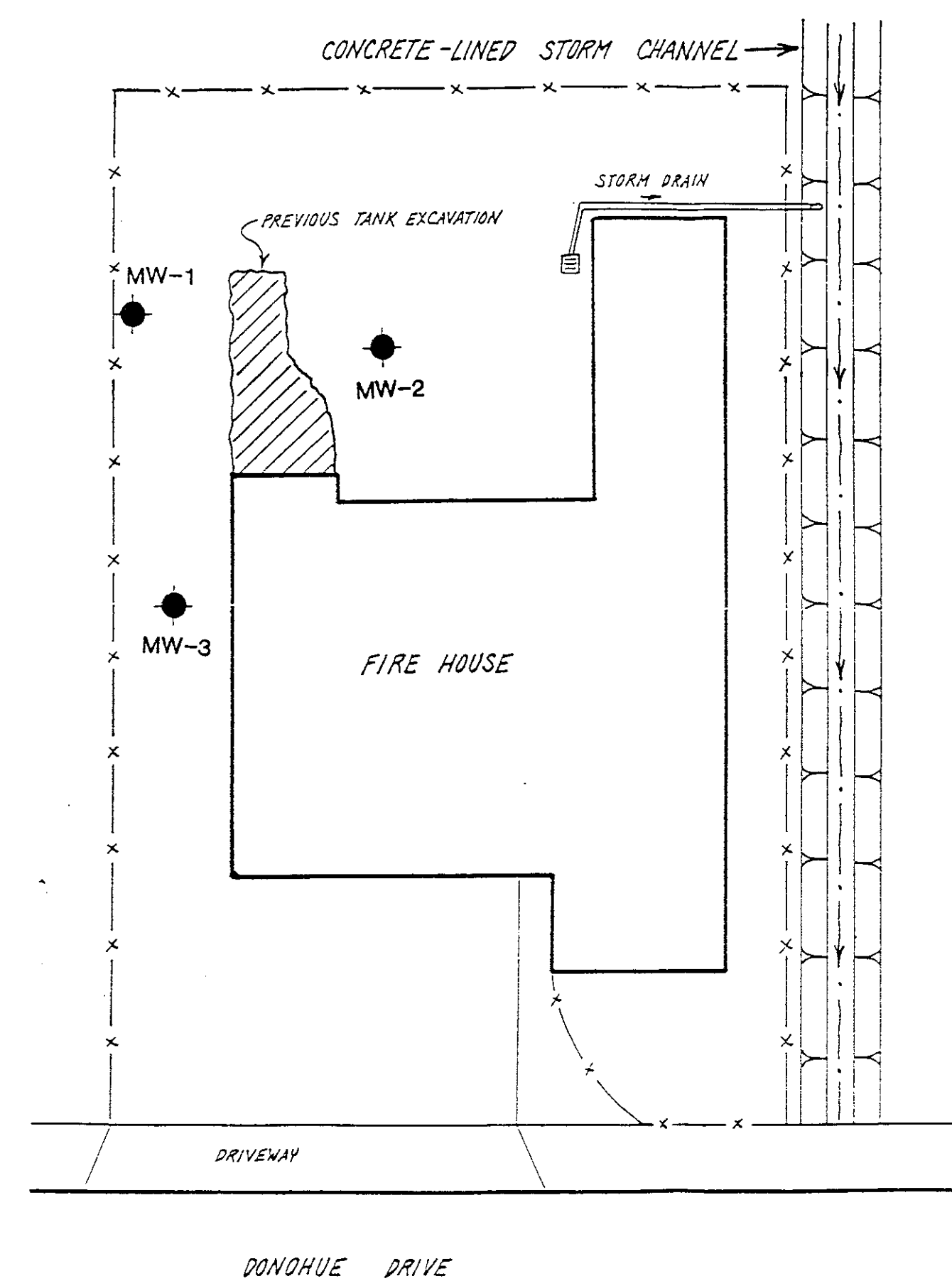
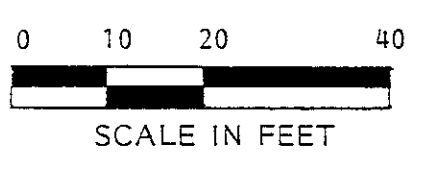
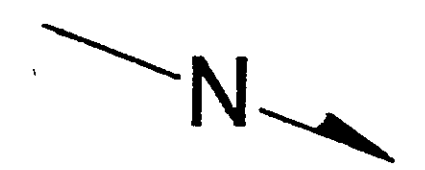
Tim W. Berger

Tim W. Berger
Staff Geologist



AYE/TWB:kl/nb
(MISC#2)

Distribution:
Dougherty Regional Fire Authority (5 copies)



VICINITY MAP

LEGEND:

● MW - Denotes Approximate Location of Monitoring Facilities installed on 5/16 and 5/17/90

SITE PLAN

QUARTERLY GROUNDWATER SAMPLING
SAMPLING PERIOD No. 1
FIRE STATION No. 1
7494 DONOHUE DRIVE
DUBLIN, CALIFORNIA

Job No. P90103
September 1990
FIGURE: 1



Base By: Hageman-Schank, Inc., print titled: "Site Map",
Figure 2, undated

INDIVIDUAL WELL FIELD LOG

WELL DEVELOPMENT: _____ Date: _____
 SAMPLE COLLECTION: Date: 8/27/90

PROJECT NAME & LOCATION: Dougherty Fire Authority

PERSONNEL: M. Cline
 WEATHER: Clear 80's

WELL INFORMATION:

Well No.: MW-1
 Depth to water: 10.37
 Well Depth: 29'
 Water Volume: 3.1 gals
 Reference Point Elevation: +350
 Groundwater Elevation: 339.63
 Measurement Technique: Solinst Well Sounder

Date Purged: 8/27/90
 Purge Method: PVC Hand Pump
 Purge Begin: 10:25 a.m.
 End Purge: 10:39 a.m.

IMMISCIBLE LAYERS:

TOP: None observed BOTTOM: 1' Clay - Colloids, No Odor
 Detection Method: Visual - Olfactory
 Collection Method: Clear PVC Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	VOLUME REMOVED (gal)	ELECTRICAL CONDUCTIVITY (Ec/Range)	pH	TEMPERATURE (° F)	COMMENTS
10:28 a.m.	3	2650	6.98	80.1	
10:31 a.m.	6	2580	6.79	79.3	
10:34 a.m.	9	2610	6.66	78.3	
10:36 a.m.	12	2610	6.64	77.6	
10:39 a.m.	15	2580	6.57	75.9	

SAMPLE COLLECTION DATA:

Sampling Equipment and Procedures: Teflon Point Sampler

TIME	TYPE OF TEST	AMOUNT/CONTAINER USED	DEPTH
10:45 a.m.	TVH & BTXE	(2) 40 ml vials with HCL	11'

Field Observations: No sheen or odor during purge

INDIVIDUAL WELL FIELD LOG

WELL DEVELOPMENT: _____ Date: _____
 SAMPLE COLLECTION: X Date: 8/27/90

PROJECT NAME & LOCATION: Dougherty Fire Authority

PERSONNEL: M. Cline
 WEATHER: Clear 80's

WELL INFORMATION:

Well No.: MW-2
 Depth to water: 9.98 Date Purged: 8/27/90
 Well Depth: 29' Purge Method: PVC Hand Pump
 Water Volume: 3.1 gals Purge Begin: 9:22 a.m.
 Reference Point Elevation: +349.54 End Purge: 9:37 a.m.
 Groundwater Elevation: 339.56
 Measurement Technique: Solinst Well Sounder

IMMISCIBLE LAYERS:

TOP: None observed BOTTOM: 1' Clay - Colloids, No Odor
 Detection Method: Visual - Olfactory
 Collection Method: Clear PVC Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	VOLUME REMOVED (gal)	ELECTRICAL CONDUCTIVITY (Ec/Range)	pH	TEMPERATURE (° F)	COMMENTS
9:25 a.m.	3	2550	7.10	76.3	
9:28 a.m.	6	2550	7.06	77.1	
9:31 a.m.	9	2550	7.10	76.0	
9:34 a.m.	12	2550	6.96	76.0	
9:37 a.m.	15	2530	6.90	75.3	

SAMPLE COLLECTION DATA:

Sampling Equipment and Procedures: Teflon Point Sampler

TIME	TYPE OF TEST	AMOUNT/CONTAINER USED	DEPTH
9:44 a.m.	TVH & BTXE	(2) 40 ml vials with HCL	11'

Field Observations: No sheen or odor during purge

INDIVIDUAL WELL FIELD LOG

WELL DEVELOPMENT: _____ Date: _____
 SAMPLE COLLECTION: X Date: 8/27/90

PROJECT NAME & LOCATION: Dougherty Fire Authority

PERSONNEL: M. Cline
 WEATHER: Clear 80's

WELL INFORMATION:

Well No.: MW-3
 Depth to water: 10.28 from T.O.C. Date Purged: 8/27/90
 Well Depth: 29' Purge Method: PVC Hand Pump
 Water Volume: 3.1 gals. Purge Begin: 11:22 a.m.
 Reference Point Elevation: 349.60 End Purge: 11:35 a.m.
 Groundwater Elevation: 339.32
 Measurement Technique: Solinst Well Sounder

IMMISCIBLE LAYERS:

TOP: None observed BOTTOM: 2' Clay Colloids, No Odor
 Detection Method: Visual - Olfactory
 Collection Method: Clear PVC Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	VOLUME REMOVED (gal)	ELECTRICAL CONDUCTIVITY (Ec/Range)	pH	TEMPERATURE (° F)	COMMENTS
11:25 a.m.	3	2770	6.94	81.7	
11:28 a.m.	6	2660	6.78	79.2	
11:31 a.m.	9	2620	6.72	78.8	
11:33 a.m.	12	2570	6.68	75.6	
11:35 a.m.	15	2620	6.70	76.8	

SAMPLE COLLECTION DATA:

Sampling Equipment and Procedures: Teflon Point Sampler

TIME	TYPE OF TEST	AMOUNT/CONTAINER USED	DEPTH
11:40 a.m.	TVH & BTXE	(2) 40 ml vials with HCL	11'

Field Observations: No sheen or odor during purge

CHECKED BY

DATE

BY

Property Boundary

Scale: 1" = 10'



Tank Excavation Limit

MW-1
+339.63

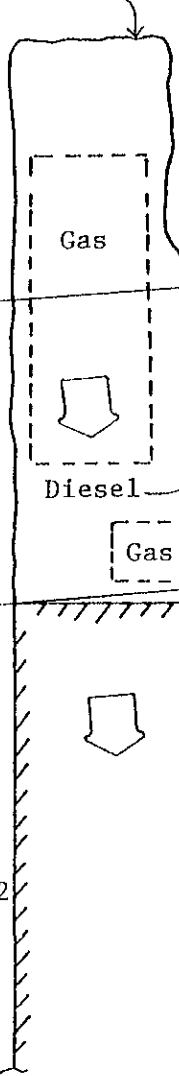
MW-2
+339.56

+339.56

+339.40

+339.40

MW-3
+339.32





Fire Station
No. 1


Flow Direction: N63°E
Gradient: 0.7 percent
Date: August 27, 1990


GROUNDWATER FLOW DIRECTION AND GRADIENT

LEGEND:

 - Approximate Former Tank Location & Content

 - Groundwater Flow Direction

 - Monitoring Well Location & Designation

+340.50  - Line of Equal Groundwater Elevation

Job No. P90103
September 1990
FIGURE: 5

BSK
& Associates

APPENDIX "A"

LABORATORY CHEMICAL TEST DATA

BSK Analytical Laboratories

FIGURE A-1

1414 Stanislaus Street * Fresno, California 93706 * Telephone (209) 485-8310 * Fax (209) 485-7427

BSK - Pleasanton
 P90103
 Dougherty Fire Authority

Lab No. Ch903386-1

Report Date 9/10/90

Sample Type Water

Date Sampled 8/27/90

Sample Description 0944 hrs.

Date Received 8/27/90

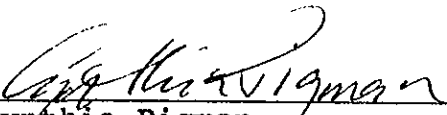
MW-2 #1


Date of Analyses 8/28/90

Water Analyses for BTXE and TVH

Compound	Results (ug/l)	Detection Limit (DLR)
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
Total Xylene Isomers	ND	0.5
Total Volatile Hydrocarbons	ND	50

Method: BTXE-EPA 8020 TVH-EPA 8015M
 ND-None Detected BDL-Below Detection Limit
 DLR-Detection Limit For the Purposes of Reporting


 Cynthia Pigman,
 QA/QC Supervisor


 Michael Brechmann,
 Organics Supervisor

BSK Analytical Laboratories

FIGURE A-2

1414 Stanislaus Street * Fresno, California 93706 * Telephone (209) 485-8310 * Fax (209) 485-7427

BSK - Pleasanton
 P90103
 Dougherty Fire Authority

Lab No. Ch903386-2

Report Date 9/10/90

Sample Type Water

Date Sampled 8/27/90

Sample Description 1045 hrs.

Date Received 8/27/90

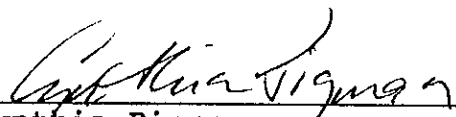
MW-1 #1


Date of Analyses 8/28/90

Water Analyses for BTXE and TVH

Compound	Results (ug/l)	Detection Limit (DLR)
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
Total Xylene Isomers	ND	0.5
Total Volatile Hydrocarbons	ND	50

Method: BTXE-EPA 8020 TVH-EPA 8015M
 ND-None Detected BDL-Below Detection Limit
 DLR-Detection Limit For the Purposes of Reporting


 Cynthia Pigman,
 QA/QC Supervisor


 Michael Brechmann,
 Organics Supervisor

BSK Analytical Laboratories

FIGURE A-3

1414 Stanislaus Street * Fresno, California 93706 * Telephone (209) 485-8310 * Fax (209) 485-7427

BSK - Pleasanton
P90103
Dougherty Fire Authority

Lab No. Ch903386-3

Report Date 9/10/90

Sample Type Water

Date Sampled 8/27/90

Sample Description 1140 hrs.

Date Received 8/27/90

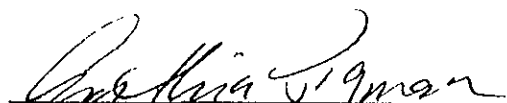
MW-3 #1


Date of Analyses 8/28/90

Water Analyses for BTXE and TVH

Compound	Results (ug/l)	Detection Limit (DLR)
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
Total Xylene Isomers	ND	0.5
Total Volatile Hydrocarbons	ND	50

Method: BTXE-EPA 8020 TVH-EPA 8015M
 ND-None Detected BDL-Below Detection Limit
 DLR-Detection Limit For the Purposes of Reporting


 Cynthia Pigman,
 QA/QC Supervisor


 Michael Brechmann,
 Organics Supervisor

BSK Analytical Laboratories

FIGURE A-4

1414 Stanislaus Street * Fresno, California 93706 * Telephone (209) 485-8310 * Fax (209) 485-7427

Dougherty Fire Authority
P90103

Lab No. Ch902924

Report Date 8/22/90

Sample Type Soil

Date Sampled 7/30/90

Sample Description 1000 hrs.

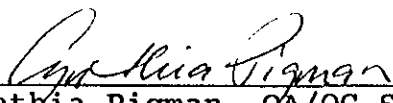
Date Received 7/31/90

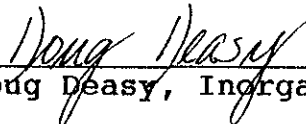
Comp. #1 (From 6 Drums) Date Analyses Completed 8/16/90

Results of General Chemical Analyses

Analyte	Units	Results
Lead (Pb).....	<u>mg/l</u>	<u><0.5</u>

Sample preparation by waste extraction WEF for STLC


Cynthia Pigman, QA/QC Supervisor


Doug Deasy, Inorganics Supervisor

Client Name <i>Dougherty Fire Authority (BSK Pleasanton)</i>			Project or PO # <i>P90103</i>			Analysis required						
Address <i>5779 F Sonoma Dr.</i>			Phone # <i>(415)462-4000</i>									Lab Use Only in this section <i>CK IVH/BTNE</i>
City, State, Zip <i>Pleasanton CA 94566</i>			Report, attention <i>Tim Berger</i>			Hazardous sample special handling required <i>9-5-90</i>						
Date sampled	Time sampled	Type (See key below)	Sampled by <i>M. Cline</i>	Number of containers	Lab Sample number							Sample Seals (See key below)
<i>8-27-90</i>	<i>9:44</i>	<i>AG</i>	<i>MW-2 #1</i>	<i>2</i>	<i>-1</i>	<i>P</i>	<i>2 x 40 ml UDA</i>					
<i>↓</i>	<i>10:45</i>	<i>↓</i>	<i>MW-1 #1</i>	<i>2</i>	<i>-2</i>	<i>↓</i>	<i>↓</i>					
<i>↓</i>	<i>11:40</i>	<i>↓</i>	<i>MW-3 #1</i>	<i>2</i>	<i>-3</i>	<i>↓</i>	<i>↓</i>					

IMPORTANT NOTICE: No samples will be analyzed without an authorized signature in this section.

I am hereby requesting BSK's Normal Chain-of-Custody Procedures for the above samples. I understand that these procedures are generally consistent with those outlined in the U.S. E.P.A. SW 846 and that there is no extra charge for this service.

By: *Marty Cline*
Authorized Signature

I am hereby requesting BSK's Formal Chain-of-Custody Procedures for the above samples. I understand that these procedures are generally consistent with those outlined in U.S. EPA Contract Laboratory Program Statement of Work, Section F, and that there is a charge of \$50.00 per work order or \$5.00 a bottle, whichever is greater.

By: _____
Authorized Signature

Signature	Print Name	Company	Date	Time
Relinquished by <i>Marty Cline</i>	<i>Martin Cline</i>	<i>BSK Pleasanton</i>	<i>8-27-90</i>	<i>8:15:36</i>
Received by <i>Carol Harris</i>	<i>C. HARRIS</i>	<i>B.S.K. Labs</i>	<i>8-27-90</i>	<i>14:00</i>
Relinquished by				
Received by				
Relinquished by				
Received by				

BSK & Associates Chemical Laboratories

1414 Stanislaus Street Fresno, California 93706

Telephone (209) 485-8310 • Fax (209) 485-7427

KEY: Type: AQ-Aqueous SL-Sludge SO-Soil PE-Petroleum OT-Other

Seals: P-Present A-Absent B-Broken

DISTRIBUTION: WHITE, CANARY - LABORATORY PINK - ORIGINATOR

Note:

Samples are discarded 14 days after results are reported unless other arrangements are made.

Hazardous samples will be returned to client or disposed of at client expense.