Shell Oil Company

San Francisco District

1150 Bayhill Dr., Suite 200
P.O. Box 5500
San Bruno, CA 94066
(415) 737-2200
(415) 929-1100

December 10, 1990

Mr. Rick Mueller
City of Pleasanton
Pleasanton Fire Department
Post Office Box 520
Pleasanton, California 94566-0802

SUBJECT: SHELL SERVICE STATION
3790 HOPYARD ROAD
PLEASANTON, CALIFORNIA

Dear Mr. Mueller:

Enclosed is a copy of the December 7, 1990 Site Update report prepared for the subject location. The report presents the results of the ground-water sampling conducted during the third quarter of 1990.

If you should have any questions or comments regarding this project please do not hesitate to call me at (415) 675-6127.

Very truly yours,

Jack Brastad
Senior Engineer

enclosure

cc: Mr. Tom Callaghan, Regional Water Quality Control Board
Mr. John Werfal, Gettler-Ryan Inc.

GeoStrategies Inc.

SITE UPDATE

Shell Service Station
3790 Hopyard Road
Pleasanton, California

Report No. 7632-7

December 7, 1990

GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545
(415) 352-4800

December 7, 1990

Gettler-Ryan Inc.
2150 West Winton Avenue
Hayward, California 94545

Attn: Mr. John Werfal

Re: SITE UPDATE
Shell Service Station
3790 Hopyard Road
Pleasanton, California

Gentlemen:

This Site Update has been prepared by GeoStrategies Inc. (GSI) and presents the results of the ground-water sampling which took place on October 2, 1990, at the above referenced location (Plate 1). Gettler-Ryan Inc. (G-R) sampled the current ground-water monitoring well network (monitoring wells S-2 through S-10 and recovery wells SR-1, SR-2 and SR-3) in accordance with the current quarterly ground-water sampling plan for the site.

The initial site investigation began in January 1986. EMCON Associates drilled three soil borings in the vicinity of the tank complex to collect soil samples prior to the replacement of the Underground Storage Tanks (UGSTs). A temporary monitoring well was placed in Boring S-C, but ground-water samples were unavailable due to dewatering of the well during purging. Two vadose wells (ST-1 and ST-2) were installed within the former tank backfill material, and two monitoring wells (S-1 and S-2) were installed by Pacific Environmental Group (PACIFIC) in October 1987. PACIFIC installed three additional monitoring wells (S-3, S-4 and S-5) in January 1988. The UGSTs were replaced in August of 1988. Woodward-Clyde Consultants installed monitoring wells S-6 through S-9 during the first quarter 1989. Monitoring wells S-10 and recovery wells SR-1 through SR-3 were installed by GSI during the third quarter 1989.

In February 1990, aquifer tests (slug and constant-rate discharge) were performed at the site to estimate specific aquifer characteristics for the selection of an appropriate remedial action.

CURRENT QUARTER SAMPLING RESULTS

Potentiometric Data

Water level data were collected on October 2, 1990 by G-R. Prior to ground-water sampling, depth to ground-water levels were measured in each well using a portable oil-water interface probe. Static ground-water levels were measured from the surveyed top of the well box and recorded to the nearest ± 0.01 foot. Groundwater was encountered between 12.33 feet and 17.68 feet below the top of the well box or from 310.56 to 315.34 feet above Mean Sea Level (MSL).

Ground-water elevation data for this sampling have been plotted and contoured and are presented on Plate 3. Water-level data indicate an approximate hydraulic gradient of 0.015 with shallow ground-water flow toward the south. A summary of the potentiometric data are presented on Table 1.

Each well was monitored for the presence of separate-phase hydrocarbons using an electronic oil-water interface probe. Wells were visually checked using a clean, clear acrylic bailer to confirm interface probe results and to check for the presence of a product sheen. Separate-phase product or product sheens were not observed in any monitoring wells.

Chemical Analytical Data

Ground-water samples were collected from the monitoring well network on October 2, 1990 and from Well S-5 on November 20, 1990 by G-R. The ground-water samples were analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) according to EPA Method 8015 (Modified) and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) according to EPA Method 8020. All samples were analyzed by International Technology Corporation (IT) Analytical Services, a State-certified environmental laboratory located in San Jose, California. G-R ground-water sampling procedures are presented in Appendix A.

Chemical analytical data are summarized in Table 1. TPH-Gasoline was detected in Wells S-2, S-4, S-5, S-6 and SR-3 at concentrations ranging from 0.19 parts per million (ppm) in Well S-6 to 4.5 ppm in Well S-5. Benzene was identified in Wells S-2, S-4, S-5, S-6, SR-1 and SR-3 at concentrations ranging from 0.005 ppm in Well SR-1, to 1.4 ppm in Well S-5 for the October 2, 1990 sampling. These benzene concentrations are above the current Regional Water Quality Control Board (RWQCB) Maximum Contaminant Level (MCL). Well S-5 contained toluene (0.16 ppm) above the Department of Health Services (DHS) Action Level. TPH-Gasoline and benzene were reported as none detected (ND) for Wells S-3, S-7 through S-10 and SR-2. Analyses of groundwater from the resampling of Well S-5 indicates an increase in chemical concentrations at this monitoring point. TPH-Gasoline and benzene were reported at 16 and 4.6 ppm, respectively. The G-R Ground-water Sampling Reports, IT Analytical Services certified analytical reports and Chain-of-Custody Forms are included in Appendix B.

Table 2 presents a historical summary of the available ground-water chemical analytical data for the site. Chemical analytical data for Wells SR-3, S-2, S-4, S-5 and S-6 indicate an increase in benzene concentrations from the previous quarter. Chemical results from the remaining wells appear to be consistent with historical chemical analytical data. TPH-Gasoline and benzene concentrations have been plotted and contoured and are presented on Plates 4 and 5.

Background Water-Quality Analysis

Ground-water samples were collected from three wells; S-3, S-9 and S-10 on October 2, 1990 to evaluate background ground-water quality. Well S-3 is upgradient, S-10 is crossgradient and S-9 is downgradient of the source area. Historical chemical analytical data indicate that dissolved hydrocarbons beneath the site have apparently not affected ground-water quality in the vicinity of these wells (Table 2). Therefore, evaluation of the general ground-water quality by sampling and analyzing ground-water samples from Wells S-3, S-9 and S-10 is considered to be representative of natural water-quality conditions.

Chemical analyses of the ground-water samples from Wells S-3, S-9 and S-10 included lead, sulfate, mercury, chloride, total dissolved solids (TDS), specific conductance, nitrate, pH, and fecal coliform (bacteria). Fecal coliform bacterial analysis of the ground-water samples detected less than 3.8 colony forming units (CFUs) per 100 ml. TDS and specific conductance levels measured in ground-water samples from the three wells exceeded the current California drinking water standard (SWRCB Resolution 68-16). Chloride concentrations in Wells S-3 and S-9 and sulfate concentrations in Wells S-9 and S-10 exceeded the State of California drinking water standard. Chemical analytical data for the miscellaneous inorganic and bacterial constituents are presented in Table 3. Primary or recommended MCL concentrations presented in Table 3 are taken from the RWQCB San Francisco Bay Basin Region Water Quality Control Plan (1986).

Chemical analyses of ground-water samples from Wells S-3, S-9 and S-10 for background ground-water quality was performed by Sequoia Analytical (Sequoia), a State-certified environmental laboratory located in Redwood City, California. The Sequoia certified analytical report is included with the G-R Groundwater Sampling Report in Appendix B.

Quality Control

Quality Control (QC) samples for this sampling included a trip blank (TB), a field blank (SF-2) and two duplicate samples (SD-4 and SD-5). The trip blank sample was prepared in the laboratory to evaluate sample handling and transport procedures. The field blank was prepared in the field using laboratory supplied organic-free water to evaluate field sampling procedures. The duplicate sample was collected as a split (second sample) to quantitatively evaluate laboratory procedures and analytical precision. The analyses performed on the trip blank and field blank did not detect measurable concentrations of hydrocarbons above established laboratory detection limits for the targeted chemical parameters. The chemical results for the blanks indicate that hydrocarbons were not introduced into the ground-water samples during sampling, transport or from ambient field conditions.

The analytical results for TPH-Gasoline and benzene from samples S-4 and SD-4 were evaluated for precision using the Relative Percent Difference (RPD) Method. The calculated RPD values for TPH-Gasoline and benzene were 4.4% and 3.9%, respectively. These RPD values are considered to be within acceptable ranges for precision. The calculated RPD values for TPH-Gasoline and benzene for ground-water samples S-5 and SD-5 were 0%.

BENEFICIAL WATER USES

The site is located within the Livermore Valley Sub-Basin, as described in Regional Water Quality Control Board (RWQCB) 88-9WQ Basin Plan. Within the Livermore Valley Sub-Basin is the Arroyo De La Laguna surface water drainage area, which includes the Chabot Canal, the Arroyo Mocho Canal, Arroyo De La Positas, the Alamo Canal, Hewitt Canal and Tassajara Creek. Hewitt Canal, Chabot Canal, Alamo Canal, and Tassajara Creek are east of the site and flow from the north into the Arroyo Mocho Canal. The Arroyo Mocho Canal, located approximately 250 feet south of the site, appears to be the primary surface water feature within the local surface water drainage area.

As discussed in the Water Quality Control Plan (San Francisco Bay Basin Region, December 1986), existing beneficial uses of water within the Arroyo De La Laguna drainage area include ground-water recharge, recreation (contact and non-contact), wildlife, fish migration and spawning. Potential beneficial uses of water in this area are warm and cold fresh water habitats.

Based on ground-water chemical analytical data from the monitoring well network for the last three quarters, the dissolved hydrocarbon plume beneath the site appears to extend approximately 130 feet south and 80 feet east and west of the suspected source area. In addition, Wells S-3, S-7 through S-10 have been reported as ND for the last three quarters for TPH-Gasoline and benzene. It is GSI's opinion that there is no apparent potential impact from the dissolved petroleum hydrocarbon plume in the groundwater in the vicinity of Arroyo Mocho Canal downgradient of the site at this time.

SUMMARY

A summary of activities and findings associated with the fourth this quarter report for 1990 are presented below:

- o The monitoring well network was sampled by G-R on October 2, 1990.
- o Ground-water elevations ranged from 310.56 to 315.34 feet above MSL.
- o The calculated hydraulic gradient for this quarter is 0.015. Ground-water flow is to the south.
- o Floating product or product sheens were not observed in any of the monitoring wells.
- o TPH-Gasoline was detected in Wells S-2, S-4 through S-6 and SR-3 with concentrations ranging from 0.19 to 4.5 ppm.
- o Benzene was detected in Wells S-2, S-4 through S-6, SR-1 and SR-3 with concentrations ranging from 0.0050 to 1.4 ppm. These benzene concentrations are above the RWQCB MCL.
- o Wells S-3, S-7 through S-10, and SR-2 were ND for TPH-Gasoline and benzene. Well SR-1 was ND for TPH-Gasoline.
- o Well S-5 was resampled on November 20, 1990 to substantiate higher concentrations reported this quarter.
- o TPH-Gasoline and benzene were reported in Well S-5 for the November 20, 1990 sampling at 16 and 4.6 ppm, respectively.
- o Ground-water samples from Wells S-3, S-9 and S-10 were analyzed for background water quality (Table 2). Total Dissolved Solids and specific conductance in Wells S-3, S-9 and S-10 were above the State of California drinking water standard (SWRCB Resolution 68-16).
- o Chloride concentrations in Wells S-3 and S-9 and sulfate concentrations in Wells S-9 and S-10 were above the State of California drinking water standard.

PLANNED SITE ACTIVITIES

The following activities are planned for the first quarter, January through March 1991.

- o All scheduled monitoring and recovery wells will be sampled and analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020.
- o Water levels will be measured monthly and selected data will be used to prepare a potentiometric map. The shallow ground-water gradient will be calculated.
- o Chemical analytical data will be used to construct isoconcentration maps for TPH-Gasoline and benzene.
- o A duplicate sample will be collected from Well S-5 to further evaluate increasing concentrations of petroleum hydrocarbons in this well.
- o Remedial alternatives will be screened after analyzing ground-water data for the first quarter 1991.
- o A Remedial Action Plan (RAP), as described in the GSI Aquifer Test Report (dated May 25, 1990), will be prepared after analyzing the ground-water chemical data for the first quarter of 1991 sampling.

If you have any questions, please call.

GeoStrategies Inc. by,

Timothy J. Walker
Geologist

Jeffrey L. Peterson
Senior Hydrogeologist
R.E.A. 1021

REGISTERED GEOLOGIST
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№ 1262
CERTIFIED
ENGINEERING
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STATE OF CALIFORNIA

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C.E.G. 1262, R.E.A. 285

TJW/JLP/kjj

Plate 1. Vicinity Map
Plate 2. Site Plan
Plate 3. Potentiometric Map
Plate 4. TPH-Gasoline Isoconcentration Map
Plate 5. Benzene Isoconcentration Map

Appendix A: Gettler-Ryan Groundwater Sampling Procedures
Appendix B: Gettler-Ryan Groundwater Sampling Report

QC Review: _____

Report No. 7632-7

TABLE 1

GROUND-WATER ANALYSIS DATA

WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	WELL ELEV (FT)	STATIC WATER ELEV (FT)	PRODUCT THICKNESS (FT)	DEPTH TO WATER (FT)
S-2	02-Oct-90	15-Oct-90	0.29	0.084	0.0017	0.16	0.0081	329.21	314.76	----	14.45
S-3	02-Oct-90	15-Oct-90	<0.05	<0.0005	<0.0005	<0.0005	0.0010	327.67	315.34	----	12.33
S-4	02-Oct-90	16-Oct-90	0.70	0.074	0.0022	0.10	0.055	328.53	314.71	----	13.82
S-5	02-Oct-90	16-Oct-90	4.5	1.4	0.16	0.26	0.30	329.66	313.23	----	16.43
S-5	20-Nov-90	26-Nov-90	16	4.6	0.72	0.79	1.0	329.66	312.91	----	16.75
S-6	02-Oct-90	16-Oct-90	0.19	0.0066	0.0016	0.0019	0.0028	327.62	313.62	----	14.00
S-7	02-Oct-90	15-Oct-90	<0.05	<0.0005	0.0006	<0.0005	0.0009	328.67	312.11	----	16.56
S-8	02-Oct-90	15-Oct-90	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	327.00	311.98	----	15.02
S-9	02-Oct-90	15-Oct-90	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	328.24	310.56	----	17.68
S-10	02-Oct-90	15-Oct-90	<0.05	<0.0005	<0.0005	<0.0005	0.0010	326.55	313.05	----	13.50

CURRENT REGIONAL WATER QUALITY CONTROL BOARD MAXIMUM CONTAMINANT LEVELS
Benzene 0.001 ppm Xylenes 1.750 ppm Ethylbenzene 0.68 ppm

CURRENT DHS ACTION LEVELS
Toluene 0.100 ppm

TPH-G = Total Petroleum Hydrocarbons as Gasoline
PPM = Parts Per Million SR = Recovery Well SF = Field Blank TB = Trip Blank SD = Duplicate Sample

Note: 1. All data shown as <x are reported as ND (none detected).
2. Water Level elevations referenced to mean sea level (MSL)
3. DHS Action Levels and MCLs are subject to change pending State review.

Report No. 7632-7

TABLE 1

GROUND-WATER ANALYSIS DATA

WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	WELL ELEV (FT)	STATIC WATER ELEV (FT)	PRODUCT THICKNESS (FT)	DEPTH TO WATER (FT)
SR-1	02-Oct-90	15-Oct-90	<0.05	0.0050	<0.0005	<0.0005	<0.0005	329.78	313.62	----	16.16
SR-2	02-Oct-90	15-Oct-90	<0.05	<0.0005	<0.0005	0.0005	<0.0005	328.35	314.30	----	14.05
SR-3	02-Oct-90	16-Oct-90	1.7	0.091	0.0062	0.0070	0.10	329.11	314.61	----	14.50
SF-2	02-Oct-90	15-Oct-90	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	----	----	----	----
SD-4	02-Oct-90	16-Oct-90	0.67	0.077	0.0020	0.11	0.35	----	----	----	----
SD-5	20-Nov-90	26-Nov-90	16	4.6	0.70	0.77	0.99	----	----	----	----
TB	02-Oct-90	15-Oct-90	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	----	----	----	----
TB	20-Nov-90	21-Nov-90	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	----	----	----	----

TABLE 2

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH (PPM)	BENZENE (PPM)	TOLUENE (PPM)	E.B. (PPM)	XYLENES (PPM)
11-Oct-89	SR-1	0.20	0.10	<0.001	0.010	0.010
14-Dec-89	SR-1	0.5	0.21	<0.0005	0.016	0.016
05-Mar-90	SR-1	0.064	0.020	<0.0005	0.0015	0.004
14-Jun-90	SR-1	0.06	0.017	<0.0005	0.0019	0.001
02-Oct-90	SR-1	<0.05	0.0050	<0.0005	<0.0005	<0.0005
11-Oct-89	SR-2	0.88	<0.01	0.001	0.029	0.033
14-Dec-89	SR-2	1.1	0.017	<0.0005	0.10	0.067
05-Mar-90	SR-2	0.14	0.0030	<0.0005	0.012	0.007
14-Jun-90	SR-2	<0.05	<0.0005	<0.0005	0.0026	<0.001
02-Oct-90	SR-2	<0.05	<0.0005	<0.0005	0.0005	<0.0005
11-Oct-89	SR-3	0.50	0.092	0.010	0.043	0.10
14-Dec-89	SR-3	2.4	0.31	0.027	0.17	0.34
05-Mar-90	SR-3	0.070	0.015	0.0008	0.0058	0.010
14-Jun-90	SR-3	0.47	0.059	0.0023	0.035	0.05
02-Oct-90	SR-3	1.7	0.091	0.0062	0.0070	0.10
06-Nov-87	S-1	0.92	0.230	<0.005	----	0.150
14-Feb-88	S-1	3.5	1.3	<0.04	----	0.5
06-Nov-87	S-2	16.0	0.87	0.10	----	2.7
14-Feb-88	S-2	1.8	0.44	<0.01	----	0.14
13-Oct-88	S-2	0.55	0.11	0.001	0.045	0.015
31-Jan-89	S-2	0.62	0.17	0.002	0.062	0.014
07-Mar-89	S-2	1.90	0.26	0.27	0.13	0.26
26-Jun-89	S-2	0.32	0.088	0.001	0.032	0.010
08-Sep-89	S-2	0.23	0.08	0.001	0.030	0.015
14-Dec-89	S-2	0.16	0.056	0.0005	0.021	0.003
05-Mar-90	S-2	0.71	0.057	<0.0005	<0.0005	0.088
14-Jun-90	S-2	0.11	0.039	0.0005	0.011	0.002
02-Oct-90	S-2	0.29	0.084	0.0017	0.16	0.0081
14-Feb-88	S-3	<0.05	<0.0005	<0.001	----	<0.004
13-Oct-88	S-3	<0.05	<0.0005	<0.001	<0.001	<0.003
31-Jan-89	S-3	<0.05	<0.0005	<0.001	<0.001	<0.003
07-Mar-89	S-3	<0.05	<0.0005	<0.001	<0.001	<0.003
26-Jun-89	S-3	<0.05	<0.0005	<0.001	<0.001	<0.003
08-Sep-89	S-3	<0.05	<0.0005	<0.001	<0.001	<0.003
14-Dec-89	S-3	<0.05	<0.0005	<0.0005	<0.0005	<0.001
05-Mar-90	S-3	<0.050	<0.0005	<0.0005	<0.0005	<0.001
14-Jun-90	S-3	<0.5	<0.0005	<0.0005	<0.0005	<0.001
02-Oct-90	S-3	<0.05	<0.0005	<0.0005	<0.0005	0.0010

TABLE 2

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH (PPM)	BENZENE (PPM)	TOLUENE (PPM)	E.B. (PPM)	XYLENES (PPM)
14-Feb-88	S-4	5.1	0.16	0.008	----	0.73
13-Oct-88	S-4	0.53	0.024	0.001	0.025	0.016
31-Jan-89	S-4	1.1	0.033	0.002	0.020	0.024
07-Mar-89	S-4	0.65	0.037	0.001	0.035	0.027
26-Jun-89	S-4	0.67	0.11	<0.001	0.085	0.071
08-Sep-89	S-4	0.38	0.032	<0.001	0.036	0.026
14-Dec-89	S-4	0.21	0.021	<0.0005	0.030	0.023
05-Mar-90	S-4	0.35	0.043	<0.0005	0.024	0.047
14-Jun-90	S-4	0.43	0.074	<0.0005	0.071	0.046
02-Oct-90	S-4	0.70	0.074	0.0022	0.10	0.055
14-Feb-88	S-5	1.0	0.04	0.086	----	0.180
13-Oct-88	S-5	0.56	0.066	0.020	0.018	0.036
31-Jan-89	S-5	0.18	0.027	0.008	0.009	0.013
07-Mar-89	S-5	3.8	0.52	0.53	0.26	0.57
26-Jun-89	S-5	<0.05	0.0038	<0.001	0.002	<0.003
08-Sep-89	S-5	0.11	0.025	0.002	0.002	0.012
14-Dec-89	S-5	1.7	0.30	0.086	0.067	0.14
05-Mar-90	S-5	1.1	0.10	0.11	0.079	0.24
14-Jun-90	S-5	0.6	0.094	0.036	0.04	0.062
02-Oct-90	S-5	4.5	1.4	0.16	0.26	0.30
20-Nov-90	S-5	16.	4.6	0.72	0.79	1.0
13-Oct-88	S-6	1.1	0.0130	0.001	0.042	0.033
31-Jan-89	S-6	0.34	0.0038	<0.001	0.008	0.003
07-Mar-89	S-6	0.19	0.0038	<0.001	0.007	0.003
26-Jun-89	S-6	0.48	0.015	<0.001	0.006	<0.003
08-Sep-89	S-6	0.27	0.0013	0.001	0.007	<0.003
15-Dec-89	S-6	0.32	0.0010	<0.0005	0.0026	<0.001
06-Mar-90	S-6	0.42	0.0031	<0.0005	0.014	<0.001
14-Jun-90	S-6	0.37	0.0037	0.0009	0.0048	0.003
02-Oct-90	S-6	0.19	0.0066	0.0016	0.0019	0.0028
13-Oct-88	S-7	<0.05	0.0006	0.001	<0.001	<0.003
31-Jan-89	S-7	<0.05	<0.0005	<0.001	<0.001	<0.003
07-Mar-89	S-7	<0.05	<0.0005	<0.001	<0.001	<0.003
26-Jun-89	S-7	<0.05	<0.0005	<0.001	<0.001	<0.003
08-Sep-89	S-7	<0.05	<0.0005	<0.001	<0.001	<0.003
15-Dec-89	S-7	<0.05	<0.0005	<0.0005	<0.0005	<0.001
06-Mar-90	S-7	<0.050	<0.0005	<0.0005	<0.0005	<0.001
14-Jun-90	S-7	<0.05	<0.0005	<0.0005	<0.0005	<0.001
02-Oct-90	S-7	<0.05	<0.0005	0.0006	<0.0005	0.0009
07-Mar-89	S-8	<0.05	0.0012	0.001	<0.001	<0.003

TABLE 2

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH (PPM)	BENZENE (PPM)	TOLUENE (PPM)	E.B. (PPM)	XYLENES (PPM)
26-Jun-89	S-8	<0.05	0.0008	0.001	<0.001	<0.003
08-Sep-89	S-8	<0.05	<0.0005	<0.001	<0.001	<0.003
14-Dec-89	S-8	<0.05	<0.0005	<0.0005	<0.0005	<0.001
05-Mar-90	S-8	<0.050	<0.0005	0.0005	<0.0005	<0.001
14-Jun-90	S-8	<0.05	<0.0005	<0.0005	<0.0005	<0.001
02-Oct-90	S-8	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
07-Mar-89	S-9	<0.05	<0.0005	<0.001	<0.001	<0.003
26-Jun-89	S-9	<0.05	<0.0005	<0.001	<0.001	<0.003
08-Sep-89	S-9	<0.05	0.0017	0.002	<0.001	<0.003
15-Dec-89	S-9	<0.05	0.0005	<0.0005	<0.0005	<0.001
06-Mar-90	S-9	<0.050	<0.0005	<0.0005	<0.0005	<0.001
14-Jun-90	S-9	<0.05	<0.0005	<0.0005	<0.0005	<0.001
02-Oct-90	S-9	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
11-Aug-89	S-10	<0.05	<0.0005	<0.001	<0.001	<0.003
08-Sep-89	S-10	<0.05	<0.0005	<0.001	<0.001	<0.003
15-Dec-89	S-10	<0.05	<0.0005	<0.0005	<0.0005	<0.001
06-Mar-90	S-10	<0.050	<0.0005	<0.0005	<0.0005	<0.001
14-Jun-90	S-10	<0.05	<0.0005	<0.0005	<0.0005	<0.001
02-Oct-90	S-10	<0.05	<0.0005	<0.0005	<0.0005	0.0010

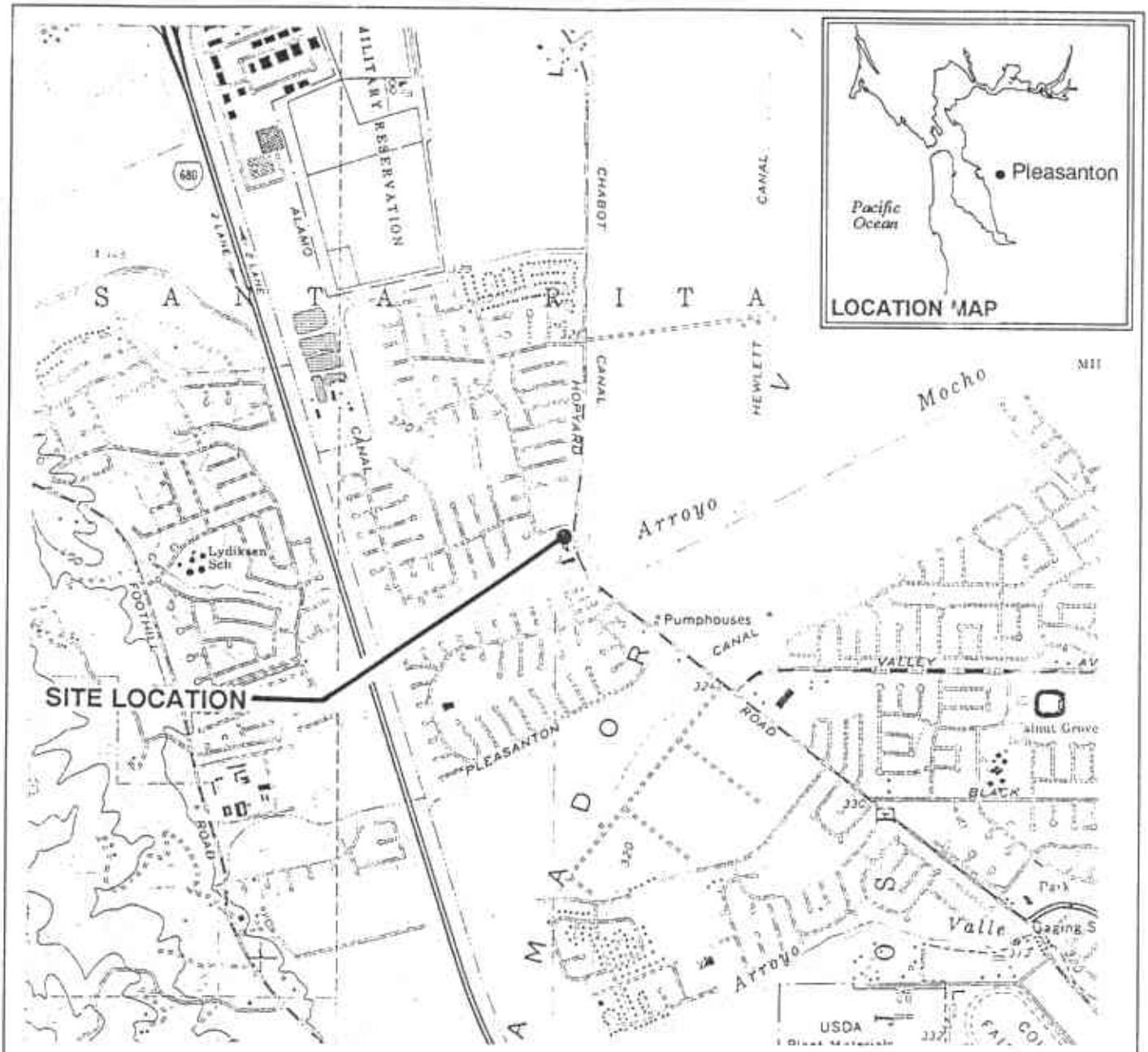
TPH = Total Petroleum Hydrocarbons
PPM = Parts per million
E.B. = Ethylbenzene
---- = Not analyzed
NOTE: 1. All data shown as <X are reported as ND (none detected)
2. Ethylbenzene and Xylenes were combined prior to October 1988

TABLE 3

ANALYSIS	WELL S-3 (PPM)	WELL S-9 (PPM)	WELL S-10 (PPM)	DETECTION LIMIT (PPM, EXCEPT AS NOTED	CURRENT DRINKING WATER STANDARD (PPM, EXCEPT AS NOTED)
Lead	ND	ND	0.035	0.0050	0.05 (primary MCL) 0.005 (EPA proposed value)
Mercury	ND	ND	ND	0.0002	0.002 (primary MCL)
Chloride	380	270	100	0.20	250 (recommended level)
Total Dissolved Solids	4000	3500	1600	1.0	500 (recommended level)
Specific Conductance (umhos/cm)	4600	4100	2300	1.0	900 umhos/cm (recommended level)
Sulfate	170	1100	290	0.10	250 (recommended level)
Nitrate	ND	ND	ND	0.10	46 (as NO_3)
Fecal Coliform (CFU/100ml)	<3.8	<3.8	<3.8	N/A	N/A
pH	6.9	6.8	7.0	N/A	N/A

PPM = Parts Per Million
MCL = Maximum Contaminant Level
N/A = Not Applicable

CFU/100 ml = Colony Forming Units/100 milliliters
umhos/cm = micromhos/centimeter



Base Map: USGS Topographic Map

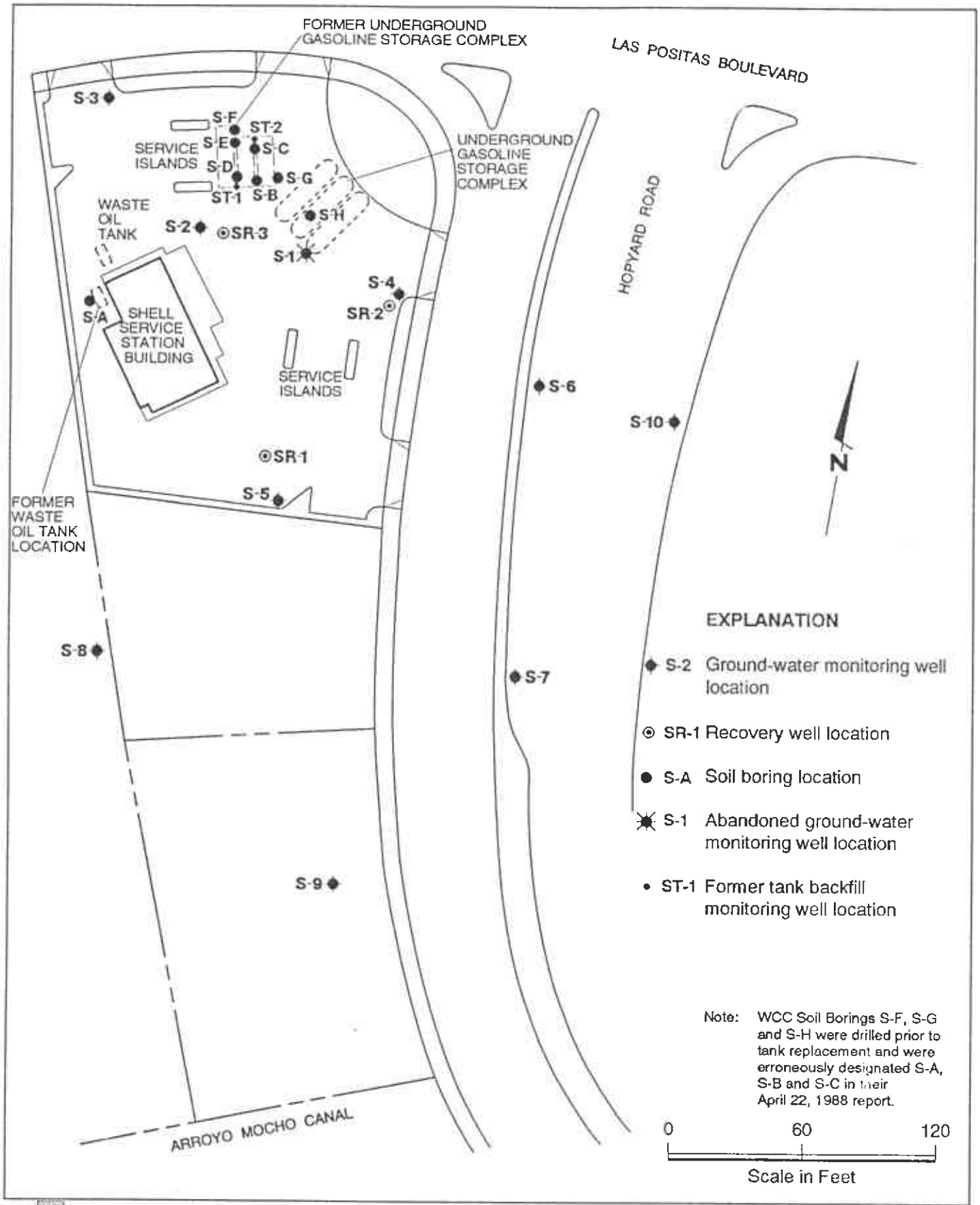
Approximate Scale : 1" = 2000'

GeoStrategies Inc.

Vicinity Map
Shell Service Station
3790 Hopyard Road
Pleasanton, California

PLATE
1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7632		3/90		

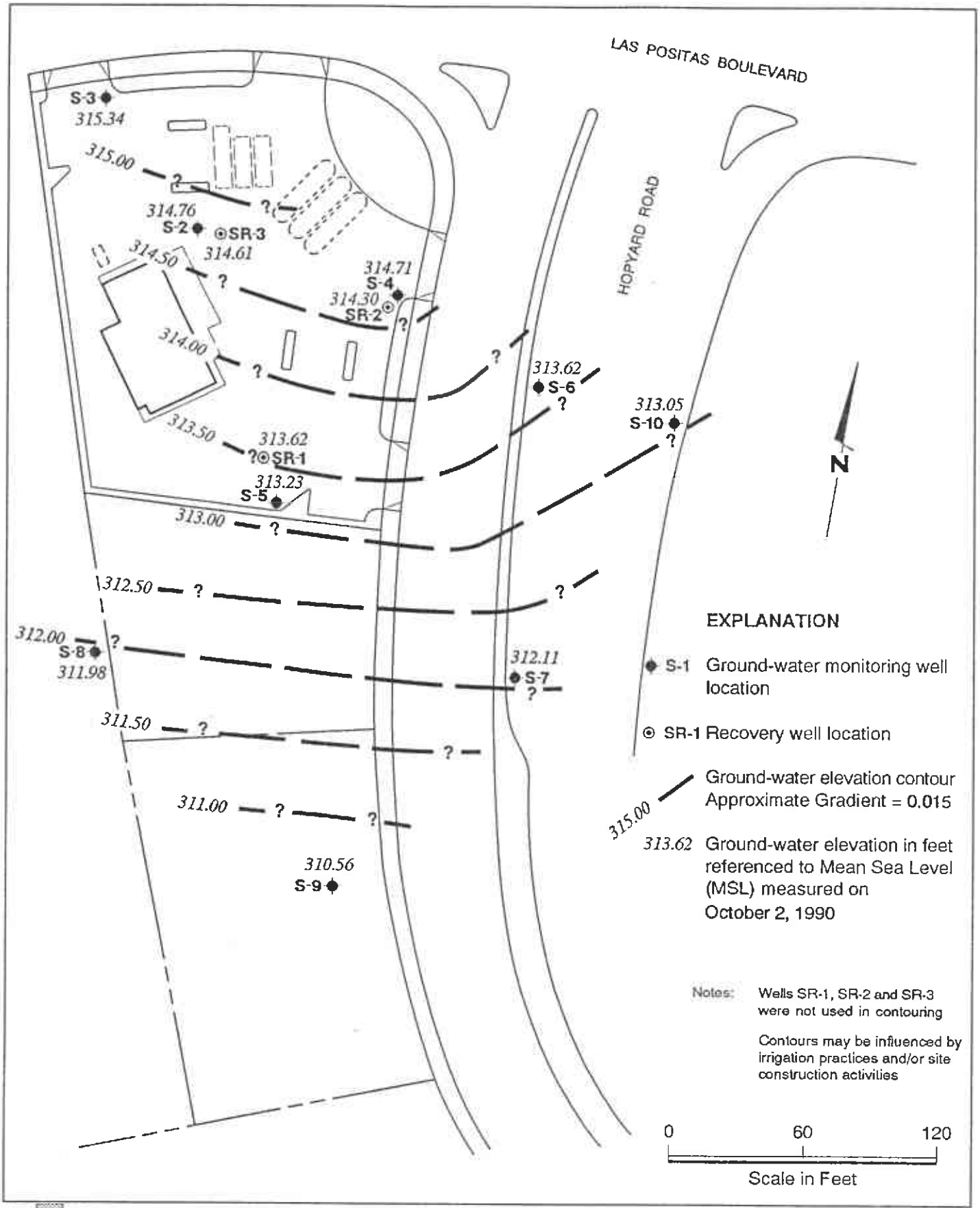


GeoStrategies Inc.

Site Plan
Shell Service Station
3790 Hopyard Road
Pleasanton, California

PLATE
2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7632	CMP DEC 1262	11/90		

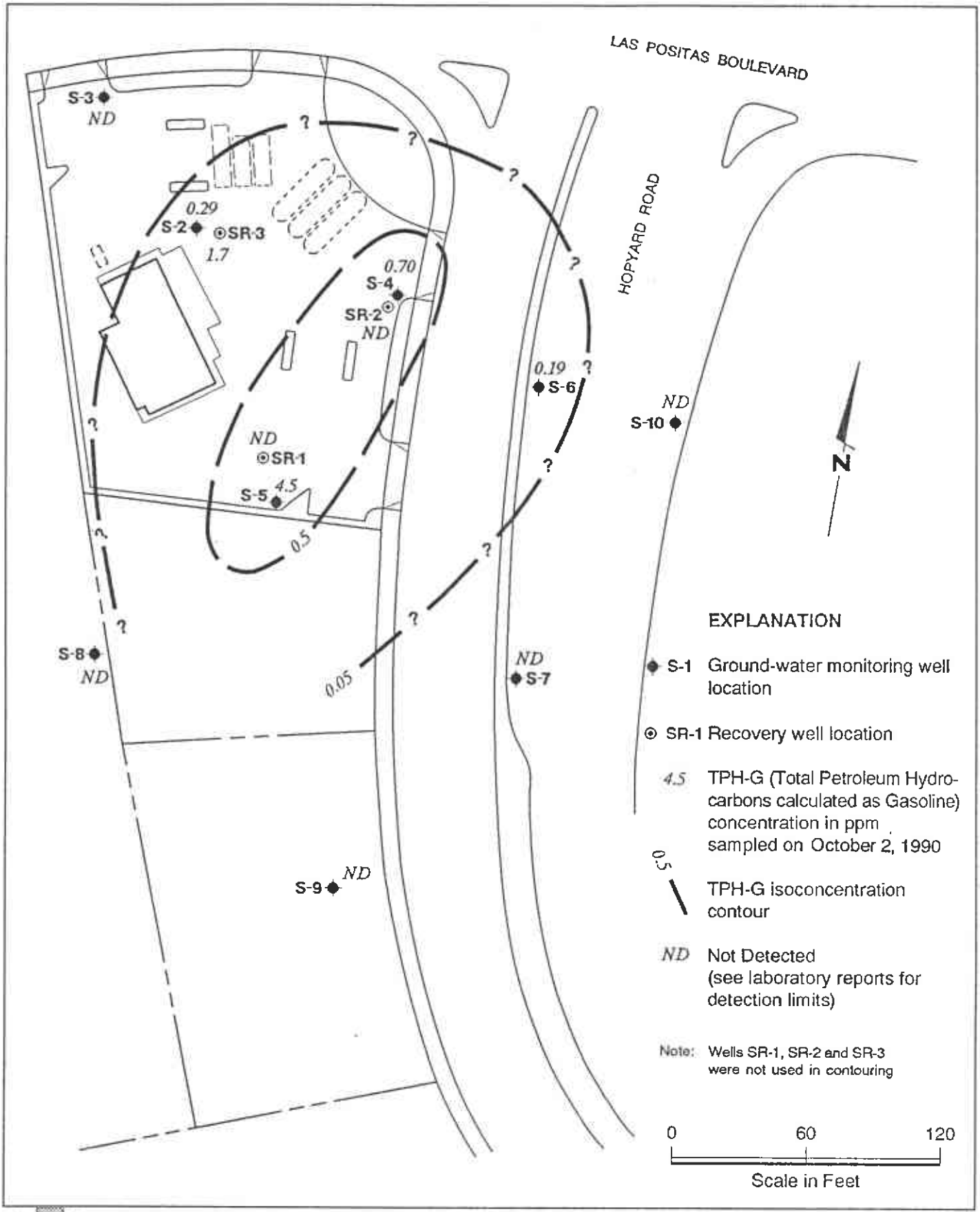


GeoStrategies Inc.

Potentiometric Map
Shell Service Station
3790 Hopyard Road
Pleasanton, California

PLATE
3

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7632	Chip CEG 262	11/90		

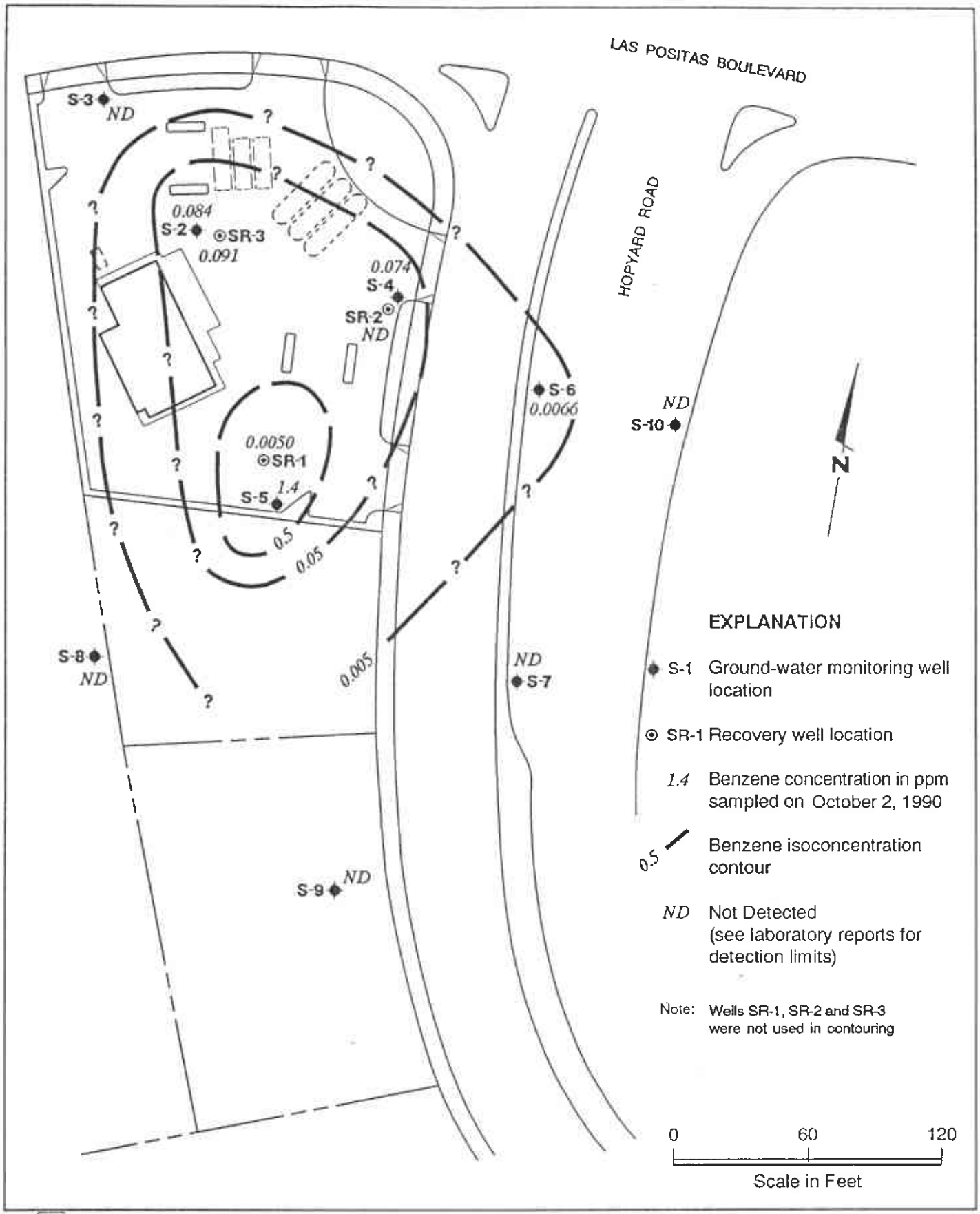


GeoStrategies Inc.

TPH-G Isoconcentration Map
Shell Service Station
3790 Hopyard Road
Pleasanton, California

PLATE
4

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7632	CEG 12/92	11/90		



GeoStrategies Inc.

Benzene Isoconcentration Map
Shell Service Station
3790 Hopyard Road
Pleasanton, California

PLATE
5

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7632	CMP CEG 1262	11/90		

APPENDIX A

GETTLER-RYAN INC.

GROUNDWATER SAMPLING PROCEDURES

GROUND-WATER SAMPLING AND ANALYSIS

Quality Assurance/Quality Control Objectives

The sampling and analysis procedures employed by Gettler-Ryan Inc. (G-R) for ground-water sampling and monitoring follow specific Quality Assurance/Quality Control (QA/QC) guidelines. Quality Assurance objectives have been established by G-R to develop and implement procedures for obtaining and evaluating water quality and field data in an accurate, precise, and complete manner so that sampling procedures and field measurements provide information that is comparable and representative of actual field conditions. Quality Control (QC) is maintained by G-R by using specific field protocols and requiring the analytical laboratory to perform internal and external QC checks. It is the goal of G-R to provide data that are accurate, precise, complete, comparable, and representative. The definitions for accuracy, precision, completeness, comparability, and representativeness are as follows:

- Accuracy - the degree of agreement of a measurement with an accepted referenced or true value.

- Precision - a measure of agreement among individual measurements under similar conditions. Usually expressed in terms of the standard deviation.

- Completeness - the amount of valid data obtained from a measurement system compared to the amount that was expected to meet the project data goals.

- Comparability - expresses the confidence with which one data set can be compared to another.

- Representativeness - a sample or group of samples that reflects the characteristics of the media at the sampling point. It also includes how well the sampling point represents the actual parameter variations which are under study.

As part of the G-R QA/QC program, applicable federal, state, and local reference guidance documents are followed. The procedures outlined in these regulations, manuals, handbooks, guidance documents, and journals are incorporated into the G-R sampling procedures to assure that; (1) ground-water samples are properly collected, (2) ground-water samples are identified, preserved, and transported in a manner such that they are representative of field conditions, and (3) chemical analysis of samples are accurate and reproducible.

Guidance and Reference Documents Used to Collect Groundwater Samples

These documents are used to verify G-R sampling procedures and are consistent with current regulatory guidance. If site specific work and sampling plans are required, those plans will be developed from these documents, and newly received applicable documents.

U.S.E.P.A. - 330/9-51-002	NEIC Manual for Groundwater/Subsurface Investigation at Hazardous Waste Sites
U.S.E.P.A. - 530/SW611	Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities (August, 1977)
U.S.E.P.A. - 600/4-79-020	Methods for Chemical Analysis of Water and Wastes (1983)
U.S.E.P.A. - 600/4-82-029	Handbook for Sampling and Sample Preservation of Water and Wastewater (1982)
U.S.E.P.A. - 600/4-82-057	Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater (July, 1982)
U.S.E.P.A. - SW-846#, 3rd Edition	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (November, 1986)
40 CFR 136.3e,Table II (Code of Federal Regulations)	Required Containers, Preservation Techniques, and Holding Times
Resources Conservation and Recover Act (OSWER 9950.1)	Groundwater Monitoring Technical Enforcement Guidance Document (September, 1986)
California Regional Water Quality Control Board (Central Valley Region)	A Compilation of Water Quality Goals (September, 1988); Updates (October, 1988)
California Regional Water Quality Control Board (North Coast, San Francisco Bay, and Central Valley)	Regional Board Staff Recommendations for Initial Evaluations and Investigation of Underground Tanks: Tri-Regional Recommendations (June, 1988)

Guidance and Reference Documents Used to Collect Groundwater Samples (cont.)

Regional Water Quality Control Board (Central Valley Region)	Memorandum: Disposal, Treatment, and Refuse of Soils Contaminated with Petroleum Fractions (August, 1986)
State of California Department of Health Services	Hazardous Waste Testing Laboratory Certification List (March, 1987)
State of California Water Resources Control Board	Leaking Underground Fuel Tank (LUFT) Field Manual (May, 1988), and LUFT Field Manual Revision (April, 1989)
State of California Water Resources Control Board	Title 23, (Register #85.#33-8-17-85), Subchapter 16: Underground Tank Regulations; Article 3, Sections 2632 and 2634; Article 4, Sections 2645, 2646, 2647, and 2648; Article 7, Sections 2670, 2671, and 2672 (October, 1986: including 1988 Amendments)
Alameda County Water District	Groundwater Protection Program: Guidelines for Groundwater and Soil Investigations at Leaking Underground Fuel Tank Sites (November, 1988)
American Public Health Association	Standard Methods for the Examination of Water and Wastewaters, 16th Edition
Analytical Chemistry (journal)	Principles of Environmental Analysis, Volume 55, Pages 2212-2218 (December, 1983)
Napa County	Napa County Underground Storage Tank Program: Guidelines for Site Investigations; February 1989.
Santa Clara Valley Water District	Guidelines for Preparing or Reviewing Sampling Plans for Soil and Groundwater Investigation of Fuel Contamination Sites (January, 1989)

Guidance and Reference Documents Used to Collect Groundwater Samples (cont.)

Santa Clara Valley Water District	Investigation and Remediation at Fuel Leak sites: Guidelines for Investigation and Technical Report Preparation (March 1989)
Santa Clara Valley Water District	Revised Well Standards for Santa Clara County (July 18, 1989)
American Petroleum Institute	Groundwater Monitoring & Sample Bias; API Publication 4367, Environmental Affairs Department, June 1983
American Petroleum Institute	A Guide to the Assessment and Remediation of Underground Petroleum Releases; API Publication 1628, February 1989
American Petroleum Institute	Literature Summary: Hydrocarbon Solubilities and Attenuations Mechanisms, API Publication 4414, August 1985
Site Specific (as needed)	General and specific regulatory documents as required.

Because ground-water samples collected by G-R are analyzed to the parts per billion (ppb) range for many compounds, extreme care is exercised to prevent contamination of samples. When volatile or semi-volatile organic compounds are included for analysis, G-R sampling crew members will adhere to the following precautions in the field:

1. A clean pair of new, disposable gloves are worn for each well being sampled.

2. When possible, samples are collected from known or suspected wells that are least contaminated (i.e. background) followed by wells in increasing order of contamination.

3. Ambient conditions are continually monitored to maintain sample integrity.

When known or potential organic compounds are being sampled for, the following additional precautions are taken:

1. All sample bottles and equipment are kept away from fuels and solvents. When possible, gasoline (used in generators) is stored away from bailers, sample bottles, purging pumps, etc.

2. Bailers are made of Teflon or Stainless Steel. Other materials such as plastic may contaminate samples with phthalate esters which interfere with many Gas Chromatography (GC) analyses.

3. Volatile organic ground-water samples are collected so that air passage through the sample does not occur or is minimal (to prevent volatiles from being stripped from the samples): sample bottles are filled by slowly running the sample down the side of the bottle until there is a positive convex meniscus over the neck of the bottle; the Teflon side of the septum (in cap) is positioned against the meniscus, and the cap screwed on tightly; the sample is inverted and the bottle lightly tapped. The absence of an air bubble indicates a successful seal; if a bubble is evident, the cap is removed, more sample is added, and the bottle is resealed.

4. Extra Teflon seals are brought into the field in case seals are difficult to handle and/or are dropped. Dropped seals are considered contaminated and are not used. When replacing seals or if seals become flipped, care is taken to assure that the Teflon seal faces down.

Sample analysis methods, containers, preservatives and holding times are shown on Table 1.

Laboratory and field handling procedures of samples are monitored by including QC samples for analysis with every submitted sample lot from a project site. QC samples may include any combination of the following:

A. Trip Blank: Used for purgeable organic compounds only; QC samples are collected in 40 milliliter (ml) sample vials filled in the analytical laboratory with organic-free water. Trip blanks are sent to the project site, and travel with project site samples. Trip blanks are not opened, and are returned from a project site with the project site samples for analysis.

B. Field Blank: Prepared in the field using organic-free water. These QC samples accompany project site samples to the laboratory and are analyzed for specific chemical parameters unique to the project site where they were prepared.

C. Duplicates: Duplicated samples are collected "second samples" from a selected well and project site. They are collected as either split samples or second-run samples collected from the same well.

D. Equipment Blank: Periodic QC sample collected from field equipment rinsate to verify decontamination procedures.

The number and types of QC samples are determined as follows:

A. Up to 2 wells - Trip Blank Only

B. 2 to 5 Wells - 1 Field Blank and 1 Trip Blank

C. 5 to 10 Wells - 1 Field blank, 1 Trip Blank, and 1 Duplicate

D. More than 10 Wells - 1 Field Blank, 1 Trip Blank, and 1 Duplicate per each 12 wells

E. If sampling extends beyond one day, quality control samples will be collected for each day.

Additional QC is performed through ongoing and random reviews of duplicate samples to evaluate the precision of the field sampling procedures and analytical laboratory. Precision of QC data is accomplished by calculating the Relative Percent Difference (RPD). The RPD is evaluated to assess whether values are within an acceptable range (typically ± 20% of duplicate sample).

SAMPLE COLLECTION

This section describes the routine procedures followed by G-R while collecting ground-water samples for chemical analysis. These procedures include decontamination, water-level measurements, well purging, physical parameter measurements, sample collection, sample preservation, sample handling, and sample documentation. Critical sampling objectives for G-R are to:

1. Collect ground-water samples that are representative of the sampled matrix and,

2. Maintain sample integrity from the time of sample collection to receipt by the analytical laboratory.

Sample analyses methods, containers, preservation, and holding times are presented in Table 1.

Decontamination Procedures

All physical parameter measuring and sampling equipment are decontaminated prior to sample collection using Alconox or equivalent detergent followed by steam cleaning with deionized water. Any sampling equipment surfaces or parts that might absorb specific contaminants, such as plastic pump valves, impellers, etc., are cleaned in the same manner.

Sample bottles, bottle caps, and septa used for sampling volatile organics are thoroughly cleaned and prepared in the laboratory. Sample bottles, bottle caps, and septa are protected from all potential chemical contact before actual usage at a sample location.

During field sampling, equipment placed in a well are decontaminated before purging or sampling the next well. The equipment are decontaminated by cleaning with Alconox or equivalent detergent followed by steam cleaning with deionized water.

Water-Level Measurements

Prior to purging and sampling a well, the static-water levels are measured in all wells at a project site using an electric sounder and/or calibrated portable oil-water interface probe (Figure 4). Both static water-level and separate-phase product thickness are measured to the nearest ±0.01 foot. The presence of separate-phase product is confirmed using a clean, acrylic or polyvinylchloride (PVC) bailer, measured to the nearest ±0.01 foot with a decimal scale tape.

Water-Level Measurements (continued)

The monofilament line used to lower the bailer is replaced between wells with new line to preclude the possibility of cross-contamination. Field observations (e.g. well integrity, product color, turbidity, water color, odors, etc.) are noted on the G-R Well Sampling Field Data Sheet shown in Figure 4. Before and after each use, the electric sounder, interface probe and bailer are decontaminated by washing with Alconox or equivalent detergent followed by rinsing with deionized water to prevent cross-contamination.

As mentioned previously, water-levels are measured in wells with known or suspected lowest dissolved chemical concentrations to the highest dissolved concentrations.

Well Purging

Before sampling occurs, well casing storage water and interstitial water in the artificial sand pack will be purged using (1) a positive displacement bladder pump constructed of inert, non-wetting, Teflon and stainless steel, (2) a pneumatic-airlift pumping system, (3) a centrifigal pumping system, or (4) a Teflon or Stainless steel bailer (Figure 5). Methods of purging will be assessed based on well size, location, accessibility, and known chemical conditions. Individual well purge volumes are calculated from borehole volumes which take into account the sand packed interval in the well annular space. As a general rule, a minimum of 3 and a maximum of 10 borehole volumes will be purged. Wells which dewater or demonstrate slow recharge periods (i.e. low-yield wells) during purging activities may be sampled after fewer purging cycles. If a low-yield (low recovery) well is to be sampled, sampling will not take place until at least 80 percent of the previously measured water column has been replaced by recharge, or as per local requirements. Physical parameter measurements (temperature, pH, and specific conductance) are closely monitored throughout the well purging process and are used by the G-R sampling crew as indicators for assessing sufficient purging. Purging is continued until all three physical parameters have stabilized. Specific conductance (conductivity) meters are read to the nearest ± 10 umhos/cm, and are calibrated daily. pH meters are read to the nearest ± 0.1 pH units and are calibrated daily. Temperature is read to the nearest 0.1 degree F. Calibration of physical parameter meters will follow manufacturers specifications. Monitoring wells will be purged according to the protocol presented in Figure 5. Collected field data during purging activities will be entered on the G-R Well Sampling Field Data Sheet shown in Figure 4. Copies of the G-R Field Data Sheets will be reviewed by the G-R Sampling Manager for accuracy and completeness.

DOCUMENTATION

Sample Container Labels

Each sample container will be labeled by an adhesive label, noted in permanent ink immediately after the sample is collected. Label information will include:

Sample point designation (i.e. well number or code)

Sampler's identification

Project number

Date and time of collection

Type of preservation used

Well Sampling Data Forms

In the field, the G-R sampling crew will record the following information on the Well Sampling Data Sheet for each sample collected:

Project number

Client

Location

Source (i.e. well number)

Time and date

Well accessibility and integrity

Pertinent well data (e.g. depth, product thickness, static water-level, pH, specific conductance, temperature)

Calculated and actual purge volumes

Chain-of-Custody

A Chain-of-Custody record (Figure 6) shall be completed and accompany every sample and every shipment of samples to the analytical laboratory in order to establish the documentation necessary to trace sample possession from time of collections. The record will contain the following information:

- Sample or station number or sample identification (ID)
- Signature of collector, sampler, or recorder
- Date and time of collection
- Place of collection
- Sample type
- Signatures of persons involved in chain of possession
- Inclusive dates of possession

Samples shall always be accompanied by a Chain-of-Custody record. When transferring the samples, the individual relinquishing and receiving the samples will sign, date, and note the time on the Chain-of-Custody record. G-R will be responsible for notifying the laboratory coordinator when and how many samples will be sent to the laboratory for analysis, and what types of analyses shall be performed.

TABLE 1

SAMPLE ANALYSIS METHODS, CONTAINERS, PRESERVATIONS, AND HOLDING TIMES

Parameter	Analytical Method	Reporting Units	Container	Preservation	Maximum Holding Time
Total Petroleum Hydrocarbons (Gasoline)	EPA 8015 (modified)	mg/l ug/l	40 ml. vial glass, Teflon	cool, 4 C HCl to pH<2	14 days (maximum)
Benzene Toluene Ethylbenzene Xylenes (BTEX	EPA 8020	mg/l ug/l	50 ml. vial glass, Teflon lined septum	cool, 4 C HCl to pH<2	7 days (w/o preservative) 14 days (w preservative)
Oil & Grease	SM 503E	mg/l ug/l	1 l glass, Teflon lined septum	H2SO4 or HCl to pH<2	28 days (maximum)
Total Petroleum Hydrocarbons (Diesel)	EPA 8015 (modified)	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C	14 days (maximum)
Halogented Volatile Organics (chlorinated solvents)	8010	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C	14 days (maximum)
Non chlorinated solvents	8020	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C HCl to pH<2	14 days (maximum)
Volatile Organics	8240	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C HCl to pH<2	14 days (maximum)
Semi-Volatile Organics	8270	mg/l ug/l	1 l amber glass, Teflon lined septum	cool, 4 C	7 days extract 40 days (maximum to analyze)
Specific Conductance (Field test)		umhos/cm			
pH (Field test)		pH units			
Temperature (Field test)		Deg F			

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FIELD EXPLORATORY BORING LOG

FIGURE 1

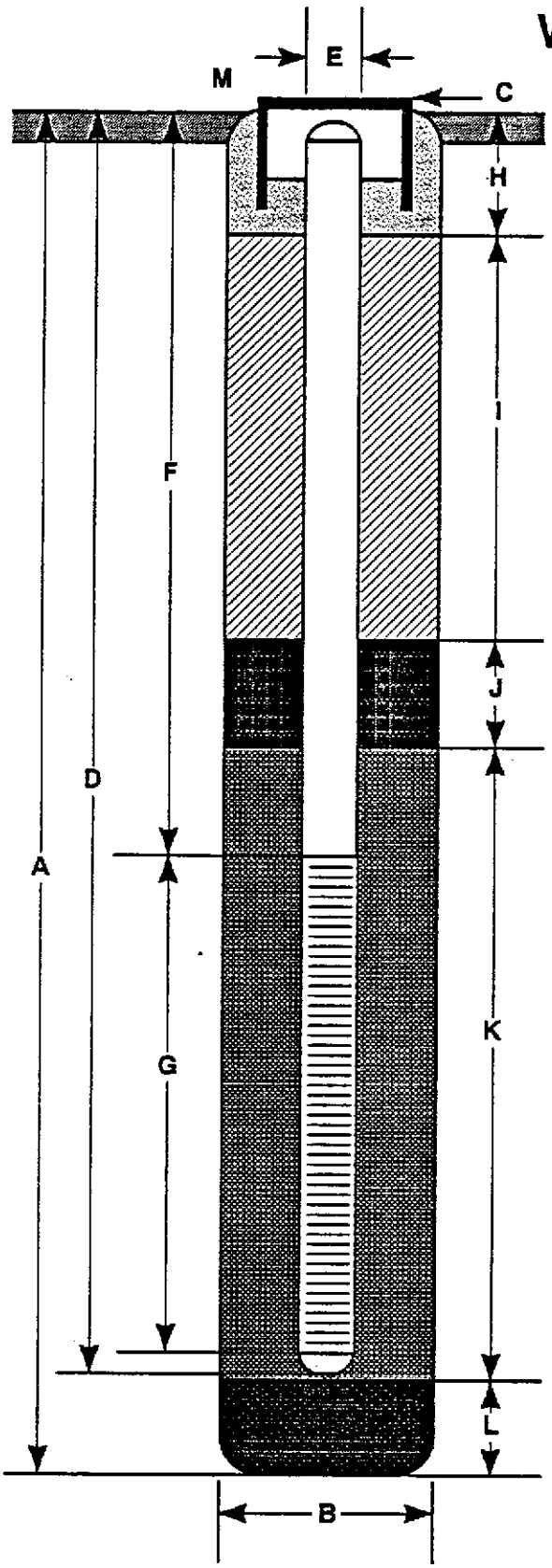
Field location of boring:	Project No.:	Date:	Boring No:
	Client:		
	Location:		
	City:		Sheet
	Logged by:	Driller:	of
Drilling method:	Casing installation data:		
Hole diameter:	Top of Box Elevation:		Datum:

								Water Level		
								Time		
								Date		
PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description		

Remarks:

WELL CONSTRUCTION DETAIL

FIGURE 2



A Total Depth of Boring _____ ft.

B Diameter of Boring _____ in.
Drilling Method _____

C Top of Box Elevation _____ ft.
☐ Referenced to Mean Sea Level
☐ Referenced to Project Datum

D Casing Length _____ ft.
Material _____

E Casing Diameter _____ in.

F Depth to Top Perforations _____ ft.

G Perforated Length _____ ft.
Perforated Interval from _____ to _____ ft.
Perforation Type _____
Perforation Size _____ in.

H Surface Seal from _____ to _____ ft.
Seal Material _____

I Backfill from _____ to _____ ft.
Backfill Material _____

J Seal from _____ to _____ ft.
Seal Material _____

K Gravel Pack from _____ to _____ ft.
Pack Material _____

L Bottom Seal _____ ft.
Seal Material _____

M _____
_____

Note: Depths measured from initial ground surface

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Well Construction Detail

WELL NO.

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE

WELL DEVELOPMENT FORM FIGURE 3

Page_____ of_____

(to be filled out in office)

Client_____ SS#_____ Job#_____

Name_____ Location_____

Well#_____ Screened Interval_____ Depth_____

Aquifer Material_____ Installation Date _____

Drilling Method_____ Borehole Diameter_____

Comments regarding well installation:_____

(to be filled out in the field) Name_____

Date_____ Development Method_____

Total Depth_____ - Depth to liquid_____ = WaterColumn_____

Product thickness_____

_____ x _____ x _____ x 0.0408 = _____gals
Water Column Diameter (in.) #Vol

Purge Start_____ Stop_____ Rate_____ gpm

Gallons	Time	Clarity	Temp.	pH	Conductivity
0					

Total gallons removed_____ Development stop time_____

Depth to liquid _____at_____(time)

Odor of water_____ Water discharged to_____

Comments_____

GETTLER–RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

FIGURE 4

COMPANY _____ JOB # _____

LOCATION _____ DATE _____

CITY _____ TIME _____

Well ID. _____ Well Condition _____

Well Diameter _____ in. Hydrocarbon Thickness _____ ft.

Total Depth _____ ft.

Depth to Liquid- _____ ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) _____ x _____ x(VF) _____ = (Estimated Purge Volume) _____ gal.

Purging Equipment _____

Sampling Equipment _____

Starting Time _____ Purging Flow Rate _____ gpm.

(Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume

Did well dewater? _____ If yes, time _____ Volume _____

Sampling Time _____ Weather Conditions _____

Analysis _____ Bottles Used _____

Chain of Custody Number _____

COMMENTS _____

FOREMAN _____ ASSISTANT _____

FIGURE 5

Monitoring Well Sampling Protocol Schematic

Sampling Crew Reviews Project Sampling Requirements/Schedule

↓

Field Decontamination and Instrumentation Calibration

↓

Check Integrity of Well (Inspect for Well Damage)

↓

Measure and Record Depth to Water and Total Well Depth (Electric Well Sounder)

↓

Check for Floating Product (Oil/Water Interface Probe)

Floating Product Present

↓

Confirm Product Thickness (Acrylic or PVC Bailer)

↓

Collect Free-Product Sample

↓

Dissolved Product Sample Not Required

↓

Record Data on Field Data Form

Floating Product Not Present

↓

Purge Volume Calculation

$V = \pi (r/12)^2 h(\_\% \text{ vol})(7.48) = \_\_\_ / \text{gallons}$

V = Purge volume (gallons)

$\pi = 3.14159$

h = Height of Water Column (feet)

r = Borehole radius (inches)

↓

Evacuate water from well equal to the calculated purge volume while monitoring groundwater stabilization indicator parameters (pH, conductivity, temperature) at intervals of one casing volume.

Well Dewaters after One Purge Volume (Low yield well)

↓

Well Recharges to 80% of Initial Measured Water Column Height in Feet within 24 hrs. of Evacuation.

↓

Measure Groundwater Stability Indicator Parameters (pH, Temperature, Conductivity)

↓

Collect Sample and Complete Chain-of-Custody

↓

Preserve Sample According to Required Chemical Analysis

↓

Transport to Analytical Laboratory

Well Readily Recovers

↓

Record Groundwater Stability Indicator Parameters from each Additional Purge Volume

Stability indicated when the following Criteria are met:

pH :	± 0.1 pH units
Conductivity:	± 10%
Temperature:	1.0 degrees F

Groundwater Stability Achieved

↓

Collect Sample and Complete Chain-of-Custody

↓

Preserve Sample According to Required Chemical Analysis

↓

Transport to Analytical Laboratory

Groundwater Stability Not Achieved

↓

Continue Purging Until Stability is Achieved

↓

Collect Sample and complete Chain-of-Custody

↓

Preserve Sample According to Required Chemical Analysis

↓

Transport to Analytical Laboratory

Gettler - Ryan Inc.
ENVIRONMENTAL DIVISION

Chain of Custody
FIGURE 6

COMPANY _____ JOB NO. _____

JOB LOCATION _____

CITY _____ PHONE NO. _____

AUTHORIZED _____ DATE _____ P.O. NO. _____

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID

RELINQUISHED BY: _____ RECEIVED BY: _____

RELINQUISHED BY: _____ RECEIVED BY: _____

RELINQUISHED BY: _____ RECEIVED BY LAB: _____

DESIGNATED LABORATORY: _____ DHS #: _____

REMARKS: _____

DATE COMPLETED _____ FOREMAN _____

APPENDIX B

GETTLER-RYAN INC.

GROUNDWATER SAMPLING REPORT

gettler — ryan inc.

October 19, 1990

GROUNDWATER SAMPLING REPORT

Referenced Site: Shell Service Station
3790 Hopyard Road/Las Positas Boulevard
Pleasanton, California

Sampling Date: October 2, 1990

This report presents the results of the quarterly groundwater sampling and analytical program conducted by Gettler-Ryan Inc. on October 2, 1990 at the referenced location. The site is occupied by an operating service station located on the southwest corner of Hopyard Road and Los Positas Boulevard. The service station has underground storage tanks containing regular leaded, unleaded and super unleaded gasoline products and waste oil.

There are currently seven groundwater monitoring wells on site, five off site, and three recovery wells at the locations shown on the attached site map. Prior to sampling, the wells were inspected for total well depth, water levels, and presence of separate phase product using an electronic interface probe. A clean acrylic bailer was used to visually detect the presence of separate phase product. Groundwater depths ranged from 12.33 to 17.68 feet below grade. Separate phase product was not observed in any monitoring wells.

The wells were then purged and sampled. The purge water was contained in drums for proper disposal. Standard sampling procedure calls for a minimum of four case volumes to be purged from each well. Each well was purged while pH, temperature, and conductivity measurements were monitored for stability. Details of the final well purging results are presented on the attached Table of Monitoring Data. In cases where a well dewatered or less than four case volumes were purged, groundwater samples were obtained after the physical parameters had stabilized. Under such circumstances the sample may not represent actual formation water, due to low flow conditions.

Samples were collected using Teflon bailers, in properly cleaned and laboratory prepared containers. All sampling equipment was thoroughly cleaned after each well was sampled and steam cleaned upon completion of work at the site. The samples were labeled, stored on blue ice, and transported to the laboratory for analysis. A field blank (SF-2) and a trip blank, supplied by the laboratory, were included and analyzed to assess quality control. A duplicate sample (SD-4), was submitted without well designation, to assess laboratory performance. Analytical results for the blanks are included in the Certified Analytical Report (CAR's). Chain of custody records were established noting sample identification numbers, time, date, and custody signatures.

2150 west winton avenue • hayward, california 94545-1210 • (415) 783-7500

Selected water quality analyses were performed by Sequoia Analytical Laboratory, located at 680 Chesapeake Drive, Redwood City, California. The laboratory is assigned a California DHS-HMTL Certification number of 145.

The samples were analyzed at International Technology Corporation - Santa Clara Valley Laboratory, located at 2055 Junction Avenue, San Jose, California. The laboratory is assigned a California DHS-HMTL Certification number of 137. The results are presented as a Certified Analytical Report, a copy of which is attached to this report.

Tom Paulson
Sampling Manager

attachments

TABLE OF MONITORING DATA
GROUNDWATER WELL SAMPLING REPORT

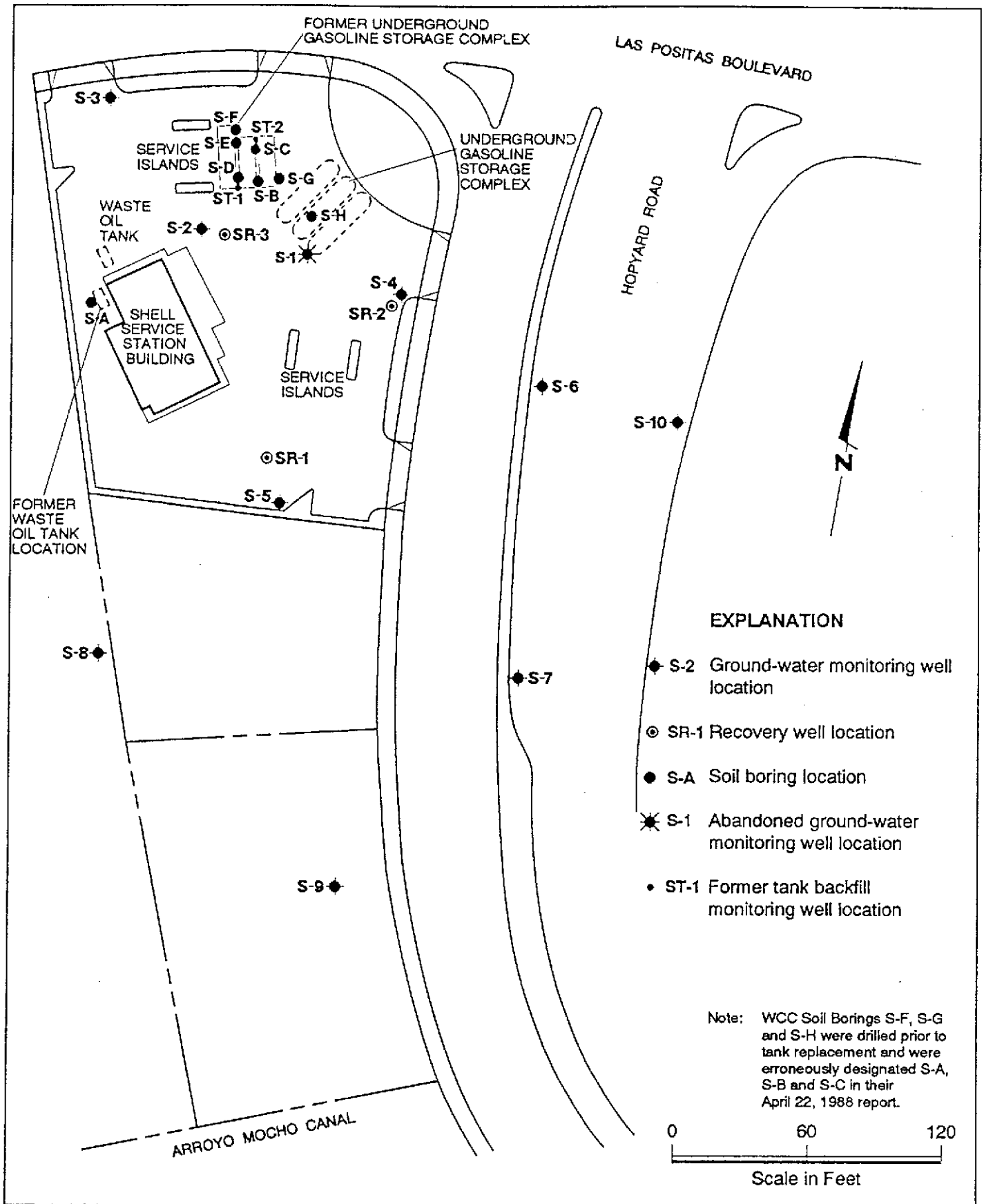
WELL I.D.	S-2	S-3	S-4 SD-4	S-5	S-6	S-7
Casing Diameter (inches)	3	3	3	3	3	3
Total Well Depth (feet)	34.0	27.3	35.2	34.3	34.0	34.8
Depth to Water (feet)	14.45	12.33	13.82	16.43	14.00	16.56
Free Product (feet)	none	none	none	none	none	none
Reason Not Sampled	----	----	----	----	----	----
Calculated 4 Case Vol.(gal.)	29.7	22.7	32.4	27.2	30.4	27.6
Did Well Dewater?	yes	no	yes	no	no	no
Volume Evacuated (gal.)	21.0	29.0	16.0	34.0	39.0	36.0
Purging Device	Diaphram	Diaphram	Suction	Diaphram	Suction	Suction
Sampling Device	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer
Time	12:32	11:59	12:35	11:17	10:17	09:43
Temperature (F)*	68.8	67.0	69.1	65.3	66.8	66.9
pH*	7.43	6.77	6.66	6.48	6.75	6.61
Conductivity (umhos/cm)*	3470	4210	4000	3310	2250	4300

* Indicates Stabilized Value

TABLE OF MONITORING DATA
GROUNDWATER WELL SAMPLING REPORT

WELL I.D.	S-8	S-9	S-10	SR-1	SR-2	SR-3
Casing Diameter (inches)	3	3	3	4	4	4
Total Well Depth (feet)	33.6	34.7	34.3	35.1	35.3	34.8
Depth to Water (feet)	15.02	17.68	13.50	16.16	14.05	14.50
Free Product (feet)	none	none	none	none	none	none
Reason Not Sampled	----	----	----	----	----	----
Calculated 4 Case Vol.(gal.)	28.2	25.8	31.6	50.0	56.0	53.6
Did Well Dewater?	no	no	no	no	yes	yes
Volume Evacuated (gal.)	36.0	33.0	41.0	61.0	52.0	26.0
Purging Device	Diaphram	Diaphram	Suction	Diaphram	Suction	Suction
Sampling Device	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer
Time	09:50	08:47	11:07	10:40	12:08	12:54
Temperature (F)*	64.1	64.7	66.3	65.7	66.8	69.0
pH*	6.69	6.56	6.74	6.75	6.71	6.28
Conductivity (umhos/cm)*	4290	3730	2530	4190	4320	4370

* Indicates Stabilized Value



GeoStrategies Inc.

Site Plan
Shell Service Station
3790 Hopyard Road
Pleasanton, California

PLATE
2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7632				

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

RECEIVED
OCT 17 1990
GETTLER-RYAN INC

Shell Oil Company
Gettler-Ryan
2150 West Winton
Hayward, CA 94545
Tom Paulson

Date: 10/17/90

Work Order: TO-10-052 P.O. Number: MOH 880-021 Vendor #I0002402

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3632, 3790 Hopyard, Plsntn
Date Received: 10/03/90
Number of Samples: 8
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

Reviewed and Approved:

Suzanne Veaudry
Project Manager

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-10-052

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-2**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **TO10052-01**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/90
Low Boiling Hydrocarbons	Mod.8015		10/15/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**0.29**
BTEX		
Benzene	0.0005	**0.084**
Toluene	0.0005	**0.0017**
Ethylbenzene	0.0005	**0.16**
Xylenes (total)	0.0005	**0.0081**

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-10-052

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-3**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **TO10052-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/90
Low Boiling Hydrocarbons	Mod.8015		10/15/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	0.0010

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-10-052

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-5**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **TO10052-03**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/16/90
Low Boiling Hydrocarbons	Mod.8015		10/16/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	1.0	**4.5**
BTEX		
Benzene	0.01	**1.4**
Toluene	0.01	**0.16**
Ethylbenzene	0.01	**0.26**
Xylenes (total)	0.01	**0.30**

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: T0-10-052

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-8**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **T010052-04**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/90
Low Boiling Hydrocarbons	Mod.8015		10/15/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	None

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-10-052

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-9**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **TO10052-05**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/90
Low Boiling Hydrocarbons	Mod.8015		10/15/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	None

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: T0-10-052

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **SF-2**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **T010052-06**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/90
Low Boiling Hydrocarbons	Mod.8015		10/15/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	None

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: T0-10-052

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **Trip Blank**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: **T010052-07**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/90
Low Boiling Hydrocarbons	Mod.8015		10/15/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	None

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-10-052

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **SR-1**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **TO10052-08**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/90
Low Boiling Hydrocarbons	Mod.8015		10/15/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**None**
BTEX		
Benzene	0.0005	**0.0050**
Toluene	0.0005	**None**
Ethylbenzene	0.0005	**None**
Xylenes (total)	0.0005	**None**

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-10-052

TEST CODE **TPHVB** TEST NAME **TPH Gas,BTEX by 8015/8020**

The method of analysis for low boiling hydrocarbons is taken from E.P.A. Methods 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatograhy using a flame ionization detector as well as a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline and includes benzene, toluene, ethylbenzene and xylenes.

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Shell Oil Company
Gettler-Ryan
2150 West Winton
Hayward, CA 94545
Tom Paulson

Date: 10/17/90

Work Order: TO-10-053 P.O. Number: MOH 880-021 Vendor #I0002402

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3632, 3790 Hopyard, Plsntn
Date Received: 10/03/90
Number of Samples: 7
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

Reviewed and Approved:

Suzanne Veaudry
Project Manager

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-10-053

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-4**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **TO10053-01**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/16/90
Low Boiling Hydrocarbons	Mod.8015		10/16/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**0.70**
BTEX		
Benzene	0.0005	**0.074**
Toluene	0.0005	**0.0022**
Ethylbenzene	0.0005	**0.10**
Xylenes (total)	0.0005	**0.055**

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-10-053

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-6**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **TO10053-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/16/90
Low Boiling Hydrocarbons	Mod.8015		10/16/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.19
BTEX		
Benzene	0.0005	0.0066
Toluene	0.0005	0.0016
Ethylbenzene	0.0005	0.0019
Xylenes (total)	0.0005	0.0028

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-10-053

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-7**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **TO10053-03**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/90
Low Boiling Hydrocarbons	Mod.8015		10/15/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	None
Toluene	0.0005	0.0006
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	0.0009

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-10-053

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-10**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **TO10053-04**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/90
Low Boiling Hydrocarbons	Mod.8015		10/15/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	0.0010

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-10-053

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **SR-2**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **TO10053-05**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/90
Low Boiling Hydrocarbons	Mod.8015		10/15/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	0.0005
Xylenes (total)	0.0005	None

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: T0-10-053

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **SR-3**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **T010053-06**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/16/90
Low Boiling Hydrocarbons	Mod.8015		10/16/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	1.7
BTEX		
Benzene	0.0005	0.091
Toluene	0.0005	0.0062
Ethylbenzene	0.0005	0.0070
Xylenes (total)	0.0005	0.10

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-10-053

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **SD-4**
SAMPLE DATE: **10/02/90**
LAB SAMPLE ID: **TO10053-07**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/16/90
Low Boiling Hydrocarbons	Mod.8015		10/16/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**0.67**
BTEX		
Benzene	0.0005	**0.077**
Toluene	0.0005	**0.0020**
Ethylbenzene	0.0005	**0.11**
Xylenes (total)	0.0005	**0.35**

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/17/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-10-053

TEST CODE **TPHVB** TEST NAME **TPH Gas,BTEX by 8015/8020**

The method of analysis for low boiling hydrocarbons is taken from E.P.A. Methods 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatograhy using a flame ionization detector as well as a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline and includes benzene, toluene, ethylbenzene and xylenes.

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: Tom Paulsen

Project: #3632, Shell, Pleasanton

Enclosed are the results from 3 water samples received at Sequoia Analytical on October 3,1990. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
100480 A-B	Water, S-3	10/2/90	Miscellaneous Inorganics
100481 A-B	Water, S-9	10/2/90	Miscellaneous Inorganics
100482 A-B	Water, S-10	10/2/90	Miscellaneous Inorganics
100529	Water, S-3	10/2/90	Fecal Coliform
100530	Water, S-9	10/2/90	Fecal Coliform
100531	Water, S-10	10/2/90	Fecal Coliform

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

VM Tague

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan	Client Project ID:	#3632, Shell, Pleasanton	Sampled:	Oct 2, 1990
2150 W. Winton Avenue	Sample Descript:	Water, S-3	Received:	Oct 3, 1990
Hayward, CA 94545			Analyzed:	Oct 3-8, 1990
Attention: Tom Paulsen	Lab Number:	010-0480 A-B	Reported:	Oct 10, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Mercury	0.0002	N.D.
Lead	0.005	N.D.
Nitrate	0.10	N.D.
Sulfate	0.10	170
Dissolved Solids	1.0	4,000
pH	N.A.	6.9
Specific Conductance, µmhos/cm	1.0	4,600
Chloride	0.20	380

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

MTague

Vickie Tague
Project Manager

Please Note:
Shell, 3790 Hopyard, Pleasanton, CA

100480.GET <1>

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan	Client Project ID:	#3632, Shell, Pleasanton	Sampled:	Oct 2, 1990
2150 W. Winton Avenue	Sample Descript:	Water, S-9	Received:	Oct 3, 1990
Hayward, CA 94545			Analyzed:	Oct 3-8, 1990
Attention: Tom Paulsen	Lab Number:	010-0481 A-B	Reported:	Oct 10, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Mercury	0.0002	N.D.
Lead	0.005	N.D.
Nitrate	0.10	N.D.
Sulfate	0.10	1,100
Dissolved Solids	1.0	3,500
pH	N.A.	6.8
Specific Conductance, µmhos/cm	1.0	4,100
Chloride	0.20	270

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
Shell, 3790 Hopyard, Pleasanton, CA

100480.GET <2>

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan	Client Project ID:	#3632, Shell, Pleasanton	Sampled:	Oct 2, 1990
2150 W. Winton Avenue	Sample Descript:	Water, S-10	Received:	Oct 3, 1990
Hayward, CA 94545			Analyzed:	Oct 3-8, 1990
Attention: Tom Paulsen	Lab Number:	010-0482 A-B	Reported:	Oct 10, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Mercury	0.0002	N.D.
Lead	0.005	0.035
Nitrate	0.10	N.D.
Sulfate	0.10	290
Dissolved Solids	1.0	1,600
pH	N.A.	7.0
Specific Conductance, µmhos/cm	1.0	2,300
Chloride	0.20	100

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
Shell, 3790 Hopyard, Pleasanton, CA

100480.GET <3>

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan	Client Project ID:	PO # 3632 / 3790 Hopyard - Los Positas		
2150 W. Winton Avenue	Sample Descript:	Water	Sampled:	Oct 2, 1990
Hayward, CA 94545	Analysis Method:	Membrane Filtration	Received:	Oct 2, 1990
Attention: Tom Paulsen	First Sample #:	010-0529	Reported:	Oct 5, 1990

BACTERIOLOGICAL ANALYSIS: FECAL COLIFORM

Sample Number	Sample Description	Fecal Coliform CFU/100 mL
010-0529	S - 3	<3.8
010-0530	S - 9	<3.8
010-0531	S - 10	<3.8

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Gettler - Ryan Inc. TO-10-052 ENVIRONMENTAL DIVISION 0391 **Chain of Custody**

COMPANY Shell Oil Co. JOB NO.

JOB LOCATION 3790 Hopyard Rd.

CITY Pleasonton PHONE NO. 783-7500

AUTHORIZED Tom Paulson DATE P.O. NO. 3632

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
S-2	3	Liquid	10-2-90/12:32	THC(gas) BTXE	Cool
S-3	~~6~~ 3		11:59	~~EC, Hg, Pb, NO3, TDS, pH~~	
S-5	3		11:17		
S-8	3		9:50	~~EC, Hg, Pb, TDS, pH~~	
S-9	~~6~~ 3		8:47		
SF-2	3		12:32		
Trip	1				
SR-1	3		10-2-90/10:40		

RELINQUISHED BY: [signature] 10-2 15:12 RECEIVED BY: Refrig #1 [signature] 10-3-90 ~~15:30~~ 07:00

RELINQUISHED BY: [signature] 10-3-90 15:30 RECEIVED BY:

RELINQUISHED BY: RECEIVED BY LAB: [signature] 10/3/90 1530

DESIGNATED LABORATORY: IT (SCV) DHS #: 137

REMARKS: Normal TAT

WIC # 204-6138-0501 AFE # 086621

Exp. Code 5440 Eng. Diane Lundquist

DATE COMPLETED 10-2-90 FOREMAN [signature]

ORIGINAL

Gettler - Ryan Inc. TC-10-053 ENVIRONMENTAL DIVISION **Chain of Custody**

COMPANY Shell Oil Company JOB NO.

JOB LOCATION 3790 Hopyard Rd

CITY Pleasanton, CA PHONE NO. (415) 783-7500

AUTHORIZED Tom Paulson DATE 10-2-90 P.O. NO. 3632

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
S-4	3	liquid	10-2-90 12:35	THC (gas) BTXE	Cool/(B)
2 S-6	↓	↓	10:17		↓
3 S-7	↓	↓	9:43		↓
4 S-10	3	↓	11:07	E. coli bacteria, Mercury, Lead, Nitrate, Chloride, Sulfate, Total dissolved Solids, Specific Conductance, pH.	↓
SR-2	3	Liquid	10-2-90 12:08	THC (gas) BTXE	Cool/(B)
6 SR-3	3	↓	12:54	↓	↓
7 SD-4	3	↓	—	↓	↓

RELINQUISHED BY: Guadalupe Sanchez 10-2-90 14:56

RECEIVED BY: [signature] 10-3-90 Refrigerator 07:00

RELINQUISHED BY: [signature] 10-3-90 15:30

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY LAB: [signature] 10/3/90 1530

DESIGNATED LABORATORY: IT SCV DHS #: 137

REMARKS: WIC # 204-6138-0501

AFE # 086621

Normal TAT EXP CODE 5440

Shell Eng. D. Lundquist

DATE COMPLETED 10-2-90 FOREMAN Guadalupe Sanchez

ORIGINAL

Gettler - Ryan Inc. ENVIRONMENTAL DIVISION — **Chain of Custody**

COMPANY Shell Oil Company JOB NO.

JOB LOCATION 3790 Hopyard / Los Positas

CITY Pleasanton CA PHONE NO.

AUTHORIZED Tom Paulsen DATE 10-2-90 P.O. NO. 36-32

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
S-3	3	Liquid	10-2-90/11:59	EColi Bateria	
				Hg Pb, NO_3 Sulfates	
S-9	3		10-2-90/8:47	~~TDS~~ Total Dissolved Solids	
				pH, Specific Conductance	
				Chlorides	
S-10	3		10-2-90/11:07		
WIC	204-6138-0501				
AFE	086621				
EXP	5440				
BNG	Diane Lundquist				

RELINQUISHED BY: John D. Zwerneke 10-2-90 15:12 RECEIVED BY: 10-3-90 07:00

RELINQUISHED BY: 10-3-90 13:46 RECEIVED BY:

RELINQUISHED BY: RECEIVED BY LAB: 10-3 1:45p

DESIGNATED LABORATORY: Sequoia DHS #: 145

REMARKS: Normal TAT

DATE COMPLETED 10-2-90 FOREMAN

ORIGINAL

gettler — ryan inc.

November 28, 1990

GROUNDWATER SAMPLING REPORT

Referenced Site: Shell Service Station
3790 Hopyard Road/Las Positas Boulevard
Pleasanton, California

Sampling Date: November 20, 1990

This report presents the results of the groundwater sampling and analytical program conducted by Gettler-Ryan Inc. on November 20, 1990 at the referenced location. The site is occupied by an operating service station located on the southwest corner of Hopyard Road and Los Positas Boulevard. The service station has underground storage tanks containing regular leaded, unleaded and super unleaded gasoline products and waste oil.

There are currently four groundwater monitoring wells on site, five off site, and three on-site recovery wells at the locations shown on the attached site map. Well S-5 was re-sampled during this event. Prior to sampling, the well was inspected for total well depth, water level, and presence of separate phase product using an electronic interface probe. A clean acrylic bailer was used to visually detect the presence of separate phase product. Groundwater depth was 16.75 feet below grade. Separate phase product was not observed in well S-5.

The well was then purged and sampled. The purge water was drummed for proper disposal. Standard sampling procedure calls for a minimum of four case volumes to be purged from each well. The well was purged while pH, temperature, and conductivity measurements were monitored for stability. Details of the final well purging results are presented on the attached Table of Monitoring Data. In cases where a well dewatered or less than four case volumes were purged, groundwater samples were obtained after the physical parameters had stabilized. Under such circumstances the sample may not represent actual formation water, due to low flow conditions.

Samples were collected, using a Teflon bailer, in properly cleaned and laboratory prepared containers. All sampling equipment was thoroughly cleaned after each well was sampled and steam cleaned upon completion of work at the site. The samples were labeled, stored on blue ice, and transported to the laboratory for analysis. A trip blank, supplied by the laboratory, was included and analyzed to assess quality control. A duplicate sample (SD-5), was submitted without well designation, to assess laboratory performance. Analytical results for the blank are included in the Certified Analytical Report (CAR's). Chain of custody records were established noting sample identification numbers, time, date, and custody signatures.

2150 west winton avenue • hayward, california 94545-1210 • (415) 783-7500

The samples were analyzed at International Technology Corporation - Santa Clara Valley Laboratory, located at 2055 Junction Avenue, San Jose, California. The laboratory is assigned a California DHS-HMTL Certification number of 137. The results are presented as a Certified Analytical Report, a copy of which is attached to this report.

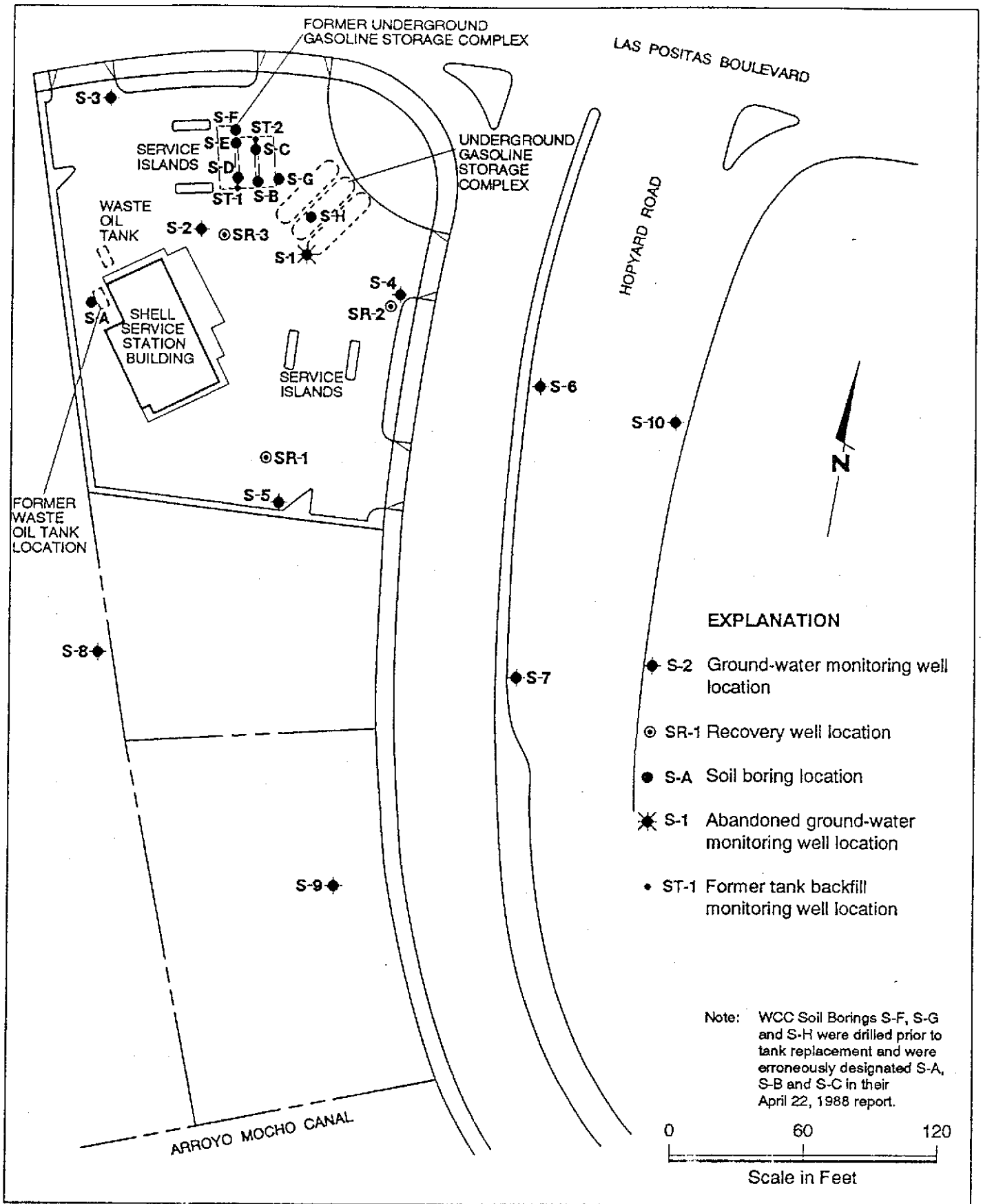
Tom Paulson
Sampling Manager

attachments

TABLE OF MONITORING DATA
GROUNDWATER WELL SAMPLING REPORT

WELL I.D.	S-5 SD-5
Casing Diameter (inches)	3
Total Well Depth (feet)	34.2
Depth to Water (feet)	16.75
Free Product (feet)	none
Reason Not Sampled	----
Calculated 4 Case Vol.(gal.)	26.5
Did Well Dewater?	yes
Volume Evacuated (gal.)	15.0
Purging Device	Diaphram/Bailer
Sampling Device	Bailer
Time	09:13
Temperature (F)*	64.4
pH*	6.37
Conductivity (umhos/cm)*	3160

* Indicates Stabilized Value



GeoStrategies Inc.

Site Plan
Shell Service Station
3790 Hopyard Road
Pleasanton, California

PLATE
2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7632				

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

RECEIVED
NOV 28 1990
GETTLER-RYAN INC.
GENERAL CONTRACTORS

CERTIFICATE OF ANALYSIS

Shell Oil Company
Gettler-Ryan
2150 West Winton
Hayward, CA 94545
Tom Paulson

Date: 11/27/90

Work Order: TO-11-242

P.O. Number: MOH 880-021 Vendor #I0002402

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3632, 3790 Hopyard, Plsntn
Date Received: 11/20/90
Number of Samples: 3
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

Reviewed and Approved:

Suzanne Veaudry
Project Manager

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/27/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-11-242

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-5**
SAMPLE DATE: **11/20/90**
LAB SAMPLE ID: **T011242-01**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		11/26/90
Low Boiling Hydrocarbons	Mod.8015		11/26/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	1.0	16.
BTEX		
Benzene	0.05	4.6
Toluene	0.01	0.72
Ethylbenzene	0.01	0.79
Xylenes (total)	0.01	1.0

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/27/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-11-242

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **SD-5**
SAMPLE DATE: **11/20/90**
LAB SAMPLE ID: **TO11242-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		11/26/90
Low Boiling Hydrocarbons	Mod.8015		11/26/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	1.0	16.
BTEX		
Benzene	0.05	4.6
Toluene	0.01	0.70
Ethylbenzene	0.01	0.77
Xylenes (total)	0.01	0.99

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/27/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-11-242

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **Trip Blank**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: **T011242-03**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		11/21/90
Low Boiling Hydrocarbons	Mod.8015		11/21/90

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	None

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/27/90
Client Work ID: GR3632, 3790 Hopyard, Plsntn

Work Order: TO-11-242

TEST CODE **TPHVB** TEST NAME **TPH Gas,BTEX by 8015/8020**

The method of analysis for low boiling hydrocarbons is taken from E.P.A. Methods 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatograhy using a flame ionization detector as well as a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline and includes benzene, toluene, ethylbenzene and xylenes.

Settler - Ryan Inc. TO-11-242 ENVIRONMENTAL DIVISION

Chain of Custody

COMPANY Shell JOB NO.

JOB LOCATION 3790 Hopyard Rd

CITY Pleasonton PHONE NO. 783-7500

AUTHORIZED Tom Paulson DATE 11-20-90 P.O. NO. 3632

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB IO
S-5	3	liquid	11-20-90	TH(Cages)BTXE	ice cool JE 11/20
SD-5	3	↓	↓	↓	↓
Trip	1	↓	↓	↓	↓

RELINQUISHED BY: John D. Zwerzyb 11-20-90 11:45 RECEIVED BY:

RELINQUISHED BY: RECEIVED BY:

RELINQUISHED BY: RECEIVED BY LAB: Jason J. Koch 11/20/90 11:45

DESIGNATED LABORATORY: IT (SCV) DHS #: 137

REMARKS: WIC # 204-6138-0501
Exp. Code 5440
Eng. Diane Lundquist
* 24 to 48 hour TAT

DATE COMPLETED 11-20-90 FOREMAN John D. Zwerzyb

ORIGINAL