GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545
(510) 352-4800

December 27, 1991

Ms. Pam Evans
Alameda County Health Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Reference: Former Shell Service Station
15275 Washington Street
San Leandro, California
WIC 204-6852-1008

Ms. Evans:

As requested by Paul Hayes of Shell Oil Company, we are forwarding the December 27, 1991 Site Update report prepared for the referenced location. The report presents the results of the ground-water sampling conducted during the fourth quarter of 1991.

Should have any questions or comments please do not hesitate to call.

Sincerely,

John Werfal
Project Manager

enclosure

cc: Mr. Paul Hayes, Shell Oil Company
Mr. Tom Callaghan, Regional Water Quality Control Board

GeoStrategies Inc.

SITE UPDATE

Former Shell Service Station
15275 Washington Avenue
San Leandro, California
WIC 204-6852-1008

761501-15

December 27, 1991

GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545
(510) 352-4800

December 27, 1991

Shell Oil Company
P.O. Box 5278
Concord, California 94520

Attn: Mr. Paul Hayes

Re: SITE UPDATE
Former Shell Service Station
15275 Washington Avenue
San Leandro, California

Gentlemen:

This Site Update has been prepared by GeoStrategies Inc. (GSI) and presents the results of the 1991 fourth quarter ground-water sampling performed by Gettler-Ryan Inc. (G-R) for the above referenced site (Plate 1). The scope of work presented in this document was performed at the request of Shell Oil Company. Field work and laboratory analysis methods were performed to comply with current State of California Water Resources Control Board guidelines.

SITE BACKGROUND

There are currently sixteen monitoring wells and one recovery well at the site; Wells S-1, S-3, S-5 through S-18, and SR-1 (Plate 2). These wells were installed between 1985 and 1991 by EMCON Associates, Woodward-Clyde Consultants, and GSI. The former underground storage tanks were removed and Wells S-2 and S-4 were destroyed in June 1987. Wells S-1, S-3, S-5 through S-7, S-16, and SR-1 are onsite. Wells S-8 through S-18 are offsite. These wells were installed to evaluate the vertical and horizontal extent of petroleum hydrocarbons in soils and shallow groundwater beneath the site.

Quarterly monitoring and sampling of wells began in September 1988. Ground-water samples have been 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.

CURRENT QUARTERLY SAMPLING RESULTS

Potentiometric Data

Prior to ground-water sampling, depth to water-level measurements were obtained in each monitoring well (S-1, S-3, and S-5 through S-18) using an electronic oil-water interface probe. Static ground-water levels were measured from the surveyed top of well box and recorded to the nearest $\pm$0.01 foot. Corresponding elevations, referenced to Mean Sea Level (MSL) datum are presented in Table 1. Water-level data were used to construct a quarterly potentiometric map (Plate 3). Shallow ground-water flow is to the southwest at a calculated gradient of 0.006.

Floating Product Measurements

Each well was checked for the presence of floating product using an electronic oil-water interface probe. A clear acrylic bailer was used to confirm probe results. Floating product was not observed in the wells this quarter.

Ground-water Analytical Data

Ground-water samples were collected on October 8, 1991. The samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020 by International Technology (IT), a State of California certified laboratory located in San Jose, California.

TPH-Gasoline was detected in Wells S-3, S-5, S-8, S-9, S-10, S-12, S-13, S-14 and SR-1 at concentrations ranging from 0.05 to 130. parts per million (ppm). Benzene concentrations detected in these same wells and in Wells S-1 and S-6 ranged from 0.0007 to 3.6 ppm. These data are summarized in Table 2 and included in Appendix A. Chemical isoconcentration maps for TPH-Gasoline and benzene are presented on Plates 4 and 5. Historical chemical analytical data are presented in Table 3.

Quality Control

Quality Control (QC) samples for this quarter's sampling included a duplicate sample, a trip blank and a field blank. The duplicate sample was collected as a second (split) sample to assess analytical precision. The trip and field blanks were prepared in the laboratory and field using organic-free water to evaluate laboratory and field handling procedures. The results of QC sample analyses are presented in Table 2.

Discussion

Given the configuration of the well network and the historical chemical analytical data, GSI recommends sampling Wells S-5, S-6, S-11, S-13, S-14, and S-17 on a semi-annual basis. The sampling plan will be adjusted if conditions change.

If you have any questions, please call.

GeoStrategies Inc. by,

Ellen C. Fostersmith

Stephen J. Carter
Geologist

John F. Vargas
Senior Geologist
R.G. 5046

REGISTERED GEOLOGIST
JOHN F. VARGAS
NO. 5046
STATE OF CALIFORNIA

SJC/JFV/kjj

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

Appendix A: Analytical Laboratory Report and Chain-of-Custody

QC Review: RAL

761501-15

TABLE 1

FIELD MONITORING DATA

WELL NO.	MONITORING DATE	CASING DIA. (IN)	TOTAL WELL DEPTH (FT)	WELL ELEV. (FT)	DEPTH TO WATER (FT)	PRODUCT THICKNESS (FT)	STATIC WATER ELEV. (FT)	PURGED WELL VOLUMES	pH	TEMPERATURE (F)	CONDUCTIVITY (uMHOS/cm)
S-1	08-Oct-91	3	19.9	21.55	8.70	----	12.85	5	7.38	70.9	879
S-3	08-Oct-91	3	15.3	21.14	8.61	----	12.53	5	6.97	70.0	1048
S-5	08-Oct-91	3	18.4	21.41	9.00	----	12.41	5	7.12	71.0	1243
S-6	08-Oct-91	3	24.7	22.02	9.26	----	12.76	4	7.48	69.4	853
S-7	08-Oct-91	3	22.7	21.47	8.95	----	12.52	3	7.20	73.8	1095
S-8	08-Oct-91	3	24.2	20.72	8.55	----	12.17	4	7.34	73.2	1243
S-9	08-Oct-91	3	17.9	20.96	8.55	----	12.41	3	7.47	74.5	1206
S-10	08-Oct-91	3	18.2	20.69	8.70	----	11.99	2	7.14	68.1	749
S-11	08-Oct-91	3	22.5	21.26	9.34	----	11.92	5	7.71	68.6	875
S-12	08-Oct-91	3	24.0	21.05	8.80	----	12.25	5	7.82	69.8	947
S-13	08-Oct-91	3	23.9	20.57	8.69	----	11.88	5	7.50	69.0	1296
S-14	08-Oct-91	3	23.2	20.44	8.24	----	12.20	5	7.59	68.1	1125
S-15	08-Oct-91	3	23.7	22.22	9.26	----	12.96	4	7.57	69.7	752

Notes: 1. Static water elevations referenced to Mean Sea Level (MSL).
2. Physical parameter measurements represent stabilized values.

TABLE 1

FIELD MONITORING DATA

WELL NO.	MONITORING DATE	CASING DIA. (IN)	TOTAL WELL DEPTH (FT)	WELL ELEV. (FT)	DEPTH TO WATER (FT)	PRODUCT THICKNESS (FT)	STATIC WATER ELEV. (FT)	PURGED WELL VOLUMES	pH	TEMPERATURE (F)	CONDUCTIVITY (uMHOS/cm)
S-16	08-Oct-91	3	24.1	21.82	8.95	----	12.87	5	7.10	69.5	1085
S-17	08-Oct-91	3	24.4	20.95	8.86	----	12.09	5	7.40	69.8	967
S-18	08-Oct-91	3	18.1	21.03	8.84	----	12.19	2	7.39	71.8	1038
SR-1	08-Oct-91	6	21.3	21.45	8.63	----	12.82	3	7.14	70.4	1249

TABLE 2

GROUND-WATER ANALYSIS DATA

WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
S-1	08-Oct-91	11-Oct-91	<0.05	0.0023	<0.0005	<0.0005	<0.0005
S-3	08-Oct-91	16-Oct-91	130.	3.6	1.0	2.8	8.4
S-5	08-Oct-91	16-Oct-91	6.6	0.37	0.0070	0.19	0.38
S-6	08-Oct-91	11-Oct-91	<0.05	0.0007	<0.0005	<0.0005	<0.0005
S-7	08-Oct-91	11-Oct-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-8	08-Oct-91	11-Oct-91	0.58	0.095	0.0022	0.0049	0.0065
S-9	08-Oct-91	11-Oct-91	0.89	0.096	<0.0025	0.016	0.029
S-10	08-Oct-91	10-Oct-91	0.14*	<0.0005	<0.0005	<0.0005	<0.0005

CURRENT REGIONAL WATER QUALITY CONTROL BOARD MAXIMUM CONTAMINANT LEVELS
Benzene 0.001 ppm Xylenes 1.750 ppm Ethylbenzene 0.680 ppm

CURRENT DHS ACTION LEVELS
Toluene 0.1000 ppm

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPM = Parts Per Million

SD = Duplicate Sample
SF = Field Blank
TB = Trip Blank

* Compounds detected and calculated as low boiling hydrocarbons are due to a petroleum mixture other than gasoline.

Notes: 1. All data shown as <x are reported as ND (none detected).
2. DHS Action Levels and MCLs are subject to change pending State review.

761501-15

TABLE 2

GROUND-WATER ANALYSIS DATA

WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
S-11	08-Oct-91	10-Oct-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-12	08-Oct-91	10-Oct-91	0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-13	08-Oct-91	11-Oct-91	0.31	<0.0005	<0.0005	<0.0005	<0.0005
S-14	08-Oct-91	11-Oct-91	5.4	0.081	0.057	0.095	0.38
S-15	08-Oct-91	11-Oct-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-16	08-Oct-91	11-Oct-91	0.05	0.017	0.0014	0.0012	0.0055
S-17	08-Oct-91	11-Oct-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-18	08-Oct-91	11-Oct-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
SR-1	08-Oct-91	16-Oct-91	0.98	0.079	0.0015	0.044	0.052
SD-3	08-Oct-91	16-Oct-91	150.	3.6	1.1	2.9	8.8
SF-10	08-Oct-91	11-Oct-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
TB	----	11-Oct-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
08-Jul-85	S-1	0.52	N/A	N/A	N/A	N/A
06-Sep-88	S-1	<0.05	<0.0005	<0.001	<0.001	<0.003
16-Nov-88	S-1	<0.05	<0.0005	<0.001	<0.001	<0.003
27-Feb-89	S-1	<0.05	0.0005	<0.001	<0.001	<0.003
04-May-89	S-1	<0.05	0.001	<0.001	<0.001	<0.003
10-Aug-89	S-1	<0.05	0.0007	<0.001	<0.001	<0.003
10-Oct-89	S-1	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-1	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-1	<0.050	<0.0005	<0.0005	<0.0005	<0.001
23-Jul-90	S-1	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
18-Oct-90	S-1	0.08	0.0050	<0.0005	<0.0005	0.0030
28-Jan-91	S-1	<0.05	.0045	<0.0005	<0.0005	0.002
25-Apr-91	S-1	0.08&	0.0037	<0.0005	0.0007	0.0020
09-Jul-91	S-1	0.20	0.016	<0.0005	0.0013	0.0058
08-Oct-91	S-1	<0.05	0.0023	<0.0005	<0.0005	<0.0005
08-Jul-85	S-2	2.20	N/A	N/A	N/A	N/A
06-Sep-88	S-3	96.	3.4	9.5	2.7	17.
16-Nov-88	S-3	70.	4.6	8.4	2.5	13.
27-Feb-89	S-3	32.	2.4	3.1	1.5	6.4
04-May-89	S-3	47.	4.4	6.3	2.4	15.
09-Aug-89	S-3	110.	5.7	5.7	3.2	19.
10-Oct-89	S-3	52.	4.6	3.3	2.6	15.
25-Jan-90	S-3	420.	5.2	4.1	6.7	34.
18-Apr-90	S-3	58.	3.8	1.4	2.4	12.
23-Jul-90	S-3	49.	3.4	1.8	2.3	12.
18-Oct-90	S-3	44.	3.5	0.65	2.4	11.
28-Jan-91	S-3	64.	4.09	0.57	1.94	8.09
25-Apr-91	S-3	120.	3.9	3.6	2.4	8.9

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
09-Jul-91	S-3	50.	3.6	2.3	1.8	10.
08-Oct-91	S-3	130.	3.6	1.0	2.8	8.4
08-Jul-85	S-4	32.	N/A	N/A	N/A	N/A
08-Jan-87	S-5	7.8	0.38	0.510	----	1.0
06-Sep-88	S-5	7.	2.6	0.06	0.4	0.7
16-Nov-88	S-5	3.	0.66	0.06	0.12	0.22
27-Feb-89	S-5	5.7	2.	0.22	0.26	0.32
04-May-89	S-5	9.	3.	0.6	0.63	1.7
09-Aug-89	S-5	5.1	1.1	<0.05	0.27	0.4
10-Oct-89	S-5	15.	3.3	0.16	0.83	2.2
25-Jan-90	S-5	12.	2.4	0.36	0.57	1.4
18-Apr-90	S-5	5.2	1.1	0.04	0.30	0.46
23-Jul-90	S-5	5.5	1.3	0.14	0.32	0.73
18-Oct-90	S-5	12.	3.2	0.04	0.72	0.90
28-Jan-91	S-5	2.55	0.41	.015	0.11	0.06
25-Apr-91	S-5	67.	5.1	3.1	2.8	11.
09-Jul-91	S-5	4.9	0.48	0.036	0.36	1.0
08-Oct-91	S-5	6.6	0.37	0.0070	0.19	0.38
16-Nov-88	S-6	0.05	0.0007	<0.001	<0.001	<0.003
27-Feb-89	S-6	<0.05	<0.0005	<0.001	<0.001	<0.003
04-May-89	S-6	<0.05	<0.0005	<0.001	<0.001	<0.003
10-Aug-89	S-6	<0.05	<0.0005	<0.001	<0.001	<0.003
10-Oct-89	S-6	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-6	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-6	<0.050	<0.0005	0.0006	<0.0005	0.001
23-Jul-90	S-6	<0.05	<0.0005	0.0009	<0.0005	0.0018
18-Oct-90	S-6	<0.05	<0.0005	0.0007	<0.0005	0.0008
28-Jan-91	S-6	<0.05	<0.0005	<0.0005	<0.0005	<0.0005

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
25-Apr-91	S-6	<0.05	<0.0005	<0.0005	<0.0005	0.0007
09-Jul-91	S-6	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
08-Oct-91	S-6	<0.05	0.0007	<0.0005	<0.0005	<0.0005
16-Nov-88	S-7	0.1	0.0051	0.015	0.002	0.013
27-Feb-89	S-7	0.05	0.0005	0.003	0.001	0.011
04-May-89	S-7	<0.05	<0.0005	<0.001	<0.001	<0.003
10-Aug-89	S-7	<0.05	<0.0005	<0.001	<0.001	<0.003
10-Oct-89	S-7	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-7	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-7	<0.050	<0.0005	<0.0005	<0.0005	<0.001
23-Jul-90	S-7	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
18-Oct-90	S-7	<0.05	<0.0005	<0.0005	0.0005	0.0041
28-Jan-91	S-7	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
25-Apr-91	S-7	0.06&	<0.0005	<0.0005	<0.0005	<0.0005
09-Jul-91	S-7	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
08-Oct-91	S-7	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
16-Nov-88	S-8	0.21	0.005	<0.001	0.001	0.005
27-Feb-89	S-8	<0.05	0.0024	<0.001	<0.001	<0.003
03-May-89	S-8	<0.05	0.0075	<0.001	0.002	<0.003
09-Aug-89	S-8	<0.05	0.0006	<0.001	<0.001	<0.003
09-Oct-89	S-8	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-8	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-8	<0.050	<0.0005	<0.0005	<0.0005	<0.001
23-Jul-90	S-8	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
18-Oct-90	S-8	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
28-Jan-91	S-8	<0.05	0.055	0.0005	<0.0005	0.0014
25-Apr-91	S-8	0.13&	0.019	<0.0005	0.0013	0.0011
09-Jul-91	S-8	0.20	0.033	<0.0005	0.0018	0.0028
08-Oct-91	S-8	0.58	0.095	0.0022	0.0049	0.0065

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
16-Nov-88	S-9	1.4	0.069	0.003	0.052	0.18
27-Feb-89	S-9	1.6	0.24	0.004	0.13	0.18
03-May-89	S-9	2.6	0.47	0.01	0.24	0.48
09-Aug-89	S-9	0.52	0.073	<0.01	0.04	<0.03
09-Oct-89	S-9	0.38	0.082	<0.001	0.046	0.013
25-Jan-90	S-9	0.75	0.14	0.0012	0.069	0.075
18-Apr-90	S-9	0.68	0.15	0.0017	0.050	0.037
23-Jul-90	S-9	0.49	0.094	0.0012	0.032	0.024
18-Oct-90	S-9	0.39	0.14	0.0007	0.0033	0.024
28-Jan-91	S-9	1.040	0.450	.0046	0.085	0.097
25-Apr-91	S-9	5.8	0.88	0.0090	0.36	0.50
09-Jul-91	S-9	1.4	0.22	0.0028	0.082	0.10
08-Oct-91	S-9	0.89	~~0.96~~ .096	<0.0025	0.016	0.029
16-Nov-88	S-10	0.33	0.0005	<0.001	0.001	0.011
27-Feb-89	S-10	0.14	<0.0005	<0.003	0.002	0.006
03-May-89	S-10	0.22	<0.0005	0.001	0.002	0.007
09-Aug-89	S-10	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Oct-89	S-10	0.17	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-10	<0.050	<0.0005	<0.0005	0.0011	0.004
18-Apr-90	S-10	<0.050	<0.0005	0.0009	<0.0005	0.002
23-Jul-90	S-10	0.59	<0.0005	<0.0005	0.0019	0.019
18-Oct-90	S-10	0.14	<0.0005	0.0007	<0.0005	0.0070
28-Jan-91	S-10	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
25-Apr-91	S-10	<0.05	<0.0005	<0.0005	0.0011	0.0008
09-Jul-91	S-10	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
08-Oct-91	S-10	0.14^	<0.0005	<0.0005	<0.0005	<0.0005
16-Nov-88	S-11	<0.05	<0.0005	<0.001	<0.001	<0.003
27-Feb-89	S-11	<0.05	<0.0005	<0.001	<0.001	<0.003

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
03-May-89	S-11	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Aug-89	S-11	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Oct-89	S-11	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-11	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-11	<0.050	<0.0005	<0.0005	<0.0005	<0.001
23-Jul-90	S-11	<0.05	<0.0005	0.0006	<0.0005	0.0011
18-Oct-90	S-11	<0.05	<0.0005	<0.0005	<0.0005	0.0005
28-Jan-91	S-11	.063	<0.0005	0.0033	0.0009	0.007
25-Apr-91	S-11	<0.05	<0.0005	<0.0005	0.0008	<0.0005
09-Jul-91	S-11	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
08-Oct-91	S-11	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
16-Nov-88	S-12	0.05	0.0035	<0.001	<0.001	<0.003
27-Feb-89	S-12	<0.05	0.0008	<0.001	<0.001	<0.003
03-May-89	S-12	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Aug-89	S-12	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Oct-89	S-12	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-12	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-12	<0.050	<0.0005	<0.0005	<0.0005	<0.001
23-Jul-90	S-12	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
18-Oct-90	S-12	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
28-Jan-91	S-12	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
25-Apr-91	S-12	0.09	0.0054	<0.0005	0.0011	0.0007
09-Jul-91	S-12	<0.05	0.0029	<0.0005	<0.0005	<0.0005
08-Oct-91	S-12	0.05	<0.0005	<0.0005	<0.0005	<0.0005
03-May-89	S-13	0.15	0.0049	0.004	0.002	0.014
09-Aug-89	S-13	0.11	0.0029	<0.001	<0.001	<0.003
09-Oct-89	S-13	0.077	0.0014	<0.001	<0.001	<0.003
25-Jan-90	S-13	0.051	0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-13	0.085	0.0087	<0.0005	<0.0005	<0.001

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
23-Jul-90	S-13	0.08	0.0008	<0.0005	<0.0005	<0.0005
18-Oct-90	S-13	0.13	<0.0005	<0.0005	<0.0005	<0.0005
28-Jan-91	S-13	<0.05	<0.0005	0.0009	<0.0005	0.001
25-Apr-91	S-13	0.44&	0.0038	<0.0005	0.0012	0.0006
09-Jul-91	S-13	0.32&	0.0006	<0.0005	<0.0005	<0.0005
08-Oct-91	S-13	0.31	<0.0005	<0.0005	<0.0005	<0.0005
03-May-89	S-14	5.3	0.75	0.4	0.200	0.800
09-Aug-89	S-14	1.8	0.54	0.14	0.042	0.050
09-Oct-89	S-14	1.0	0.36	0.06	0.020	0.030
25-Jan-90	S-14	0.64	0.16	0.077	0.017	0.039
18-Apr-90	S-14	1.2	0.20	0.11	0.030	0.096
23-Jul-90	S-14	5.0	0.43	0.34	0.14	0.66
19-Oct-90	S-14	1.8	0.77	0.013	0.017	0.12
28-Jan-91	S-14	0.72	0.200	0.036	0.021	0.078
25-Apr-91	S-14	14.	0.93	0.43	0.25	0.97
09-Jul-91	S-14	0.16	0.030	0.0053	0.0050	0.016
08-Oct-91	S-14	5.4	0.081	0.057	0.095	0.38
03-May-89	S-15	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Aug-89	S-15	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Oct-89	S-15	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-15	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-15	<0.050	<0.0005	<0.0005	<0.0005	<0.001
23-Jul-90	S-15	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
18-Oct-90	S-15	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
28-Jan-91	S-15	<0.05	<0.0005	0.0006	<0.0005	0.0008
25-Apr-91	S-15	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
09-Jul-91	S-15	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
08-Oct-91	S-15	<0.05	<0.0005	<0.0005	<0.0005	<0.0005

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
04-May-89	S-16	0.38	0.044	0.003	0.002	<0.003
10-Aug-89	S-16	<0.05	0.0006	<0.001	<0.001	<0.003
10-Oct-89	S-16	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-16	0.24	0.16	0.0033	0.0008	0.011
18-Apr-90	S-16	<0.050	0.0010	<0.0005	<0.0005	<0.001
23-Jul-90	S-16	<0.05	0.0011	<0.0005	<0.0005	<0.0005
18-Oct-90	S-16	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
28-Jan-91	S-16	<0.05	<0.0005	0.0006	<0.0005	0.0009
25-Apr-91	S-16	0.06*	0.021	0.0005	0.0032	0.0048
09-Jul-91	S-16	<0.05	0.0010	<0.0005	<0.0005	<0.0005
08-Oct-91	S-16	0.05	0.017	0.0014	0.0012	0.0055
03-May-89	S-17	<0.05	<0.005	<0.001	<0.001	<0.003
09-Aug-89	S-17	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Oct-89	S-17	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-17	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-17	<0.050	<0.0005	<0.0005	<0.0005	<0.001
23-Jul-90	S-17	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
18-Oct-90	S-17	0.39	0.010	0.062	0.022	0.11
28-Jan-91	S-17	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
25-Apr-91	S-17	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
09-Jul-91	S-17	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
08-Oct-91	S-17	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
31-May-91	S-18	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
09-Jul-91	S-18	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
08-Oct-91	S-18	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
22-Mar-89	SR-1	5.4	1.1	0.23	0.35	1.3
25-Jan-90	SR-1	2.2	0.47	0.12	0.11	0.51

TABLE 3

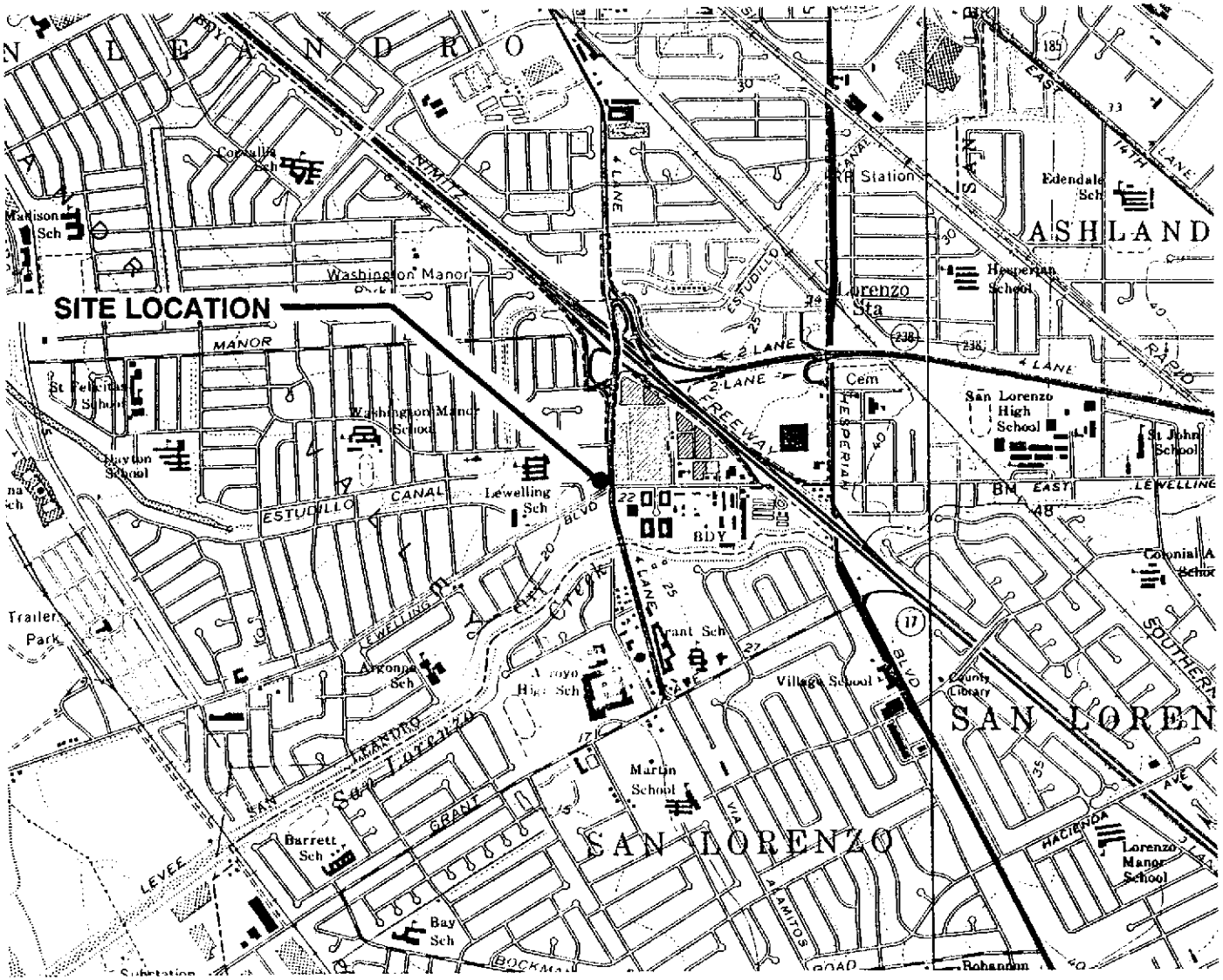
HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
18-Apr-90	SR-1	1.0	0.13	0.047	0.047	0.22
23-Jul-90	SR-1	3.2	0.47	0.32	0.17	0.87
18-Oct-90	SR-1	1.3	0.28	0.0066	0.11	0.13
28-Jan-91	SR-1	1.1	0.120	0.012	0.051	0.110
09-Jul-91	SR-1	1.4	0.20	0.027	0.13	0.34
08-Oct-91	SR-1	0.98	0.079	0.0015	0.044	0.052

Current Regional Water Quality Control Board Maximum Contaminant Levels
Benzene 0.001 ppm Xylenes 1.750 ppm Ethylbenzene 0.680 ppm

Current DHS Action Levels Toluene 0.1000 ppm

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPM = Parts Per Million
* Compounds detected and calculated as low boiling hydrocarbons are due to the volatile aromatics (BETX) present in the sample. Gasoline was not detected.
& Compounds detected and calculated as low boiling hydrocarbons consist of compounds eluting within the chromatographic range of gasoline, but are not characteristic of the standard gasoline pattern.
Compounds detected and calculated as low boiling hydrocarbons are due to a petroleum mixture other than gasoline.
NOTE: 1. DHS Action levels and MCL's are subject to change pending State of California review.
2. All data shown as <X are reported as ND (none detected).



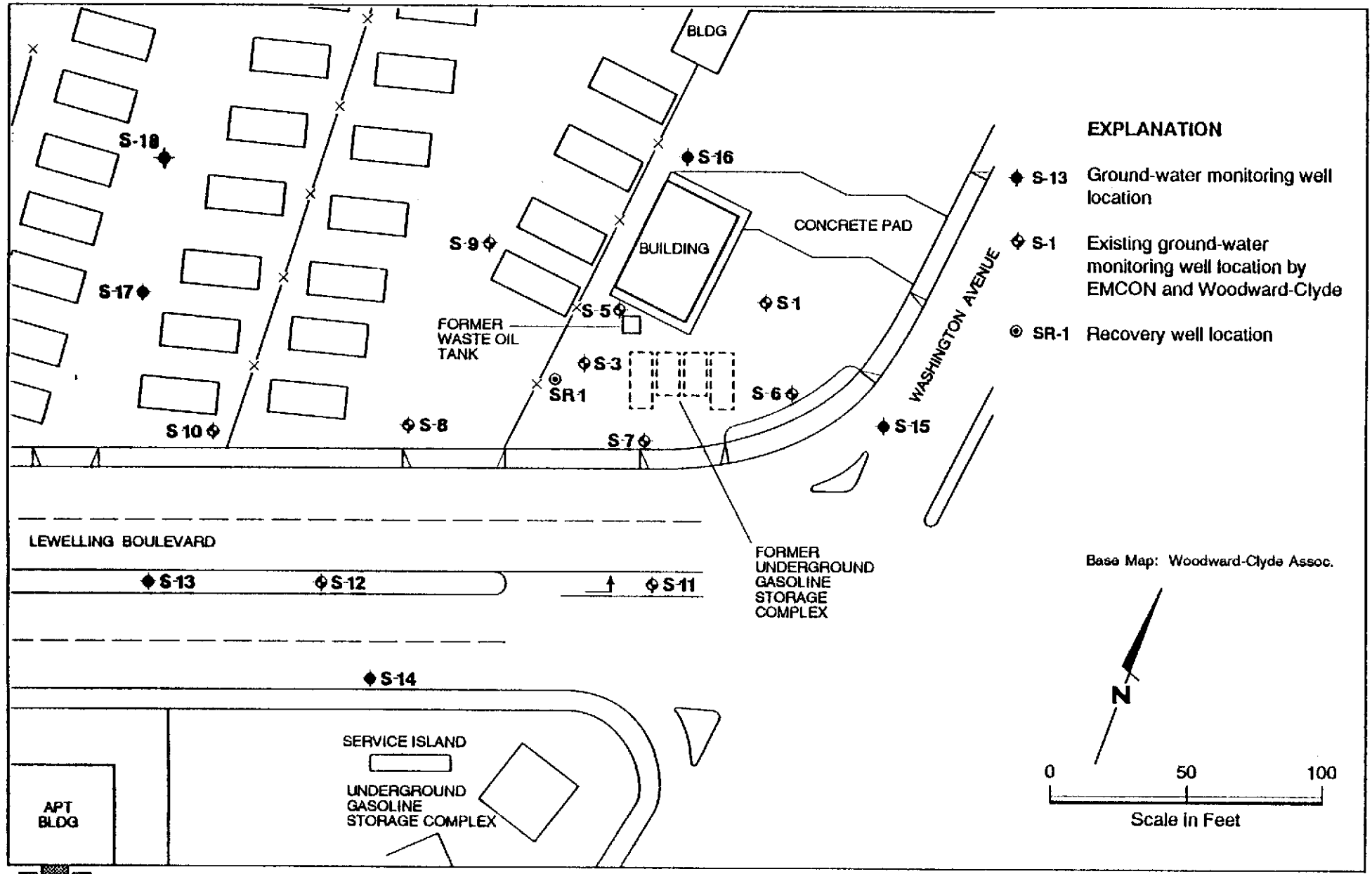
Base Map: USGS Topographic Map

GeoStrategies Inc.

Vicinity Map
Former Shell Service Station
15275 Washington Avenue
San Leandro, California

PLATE
1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615		11/89		

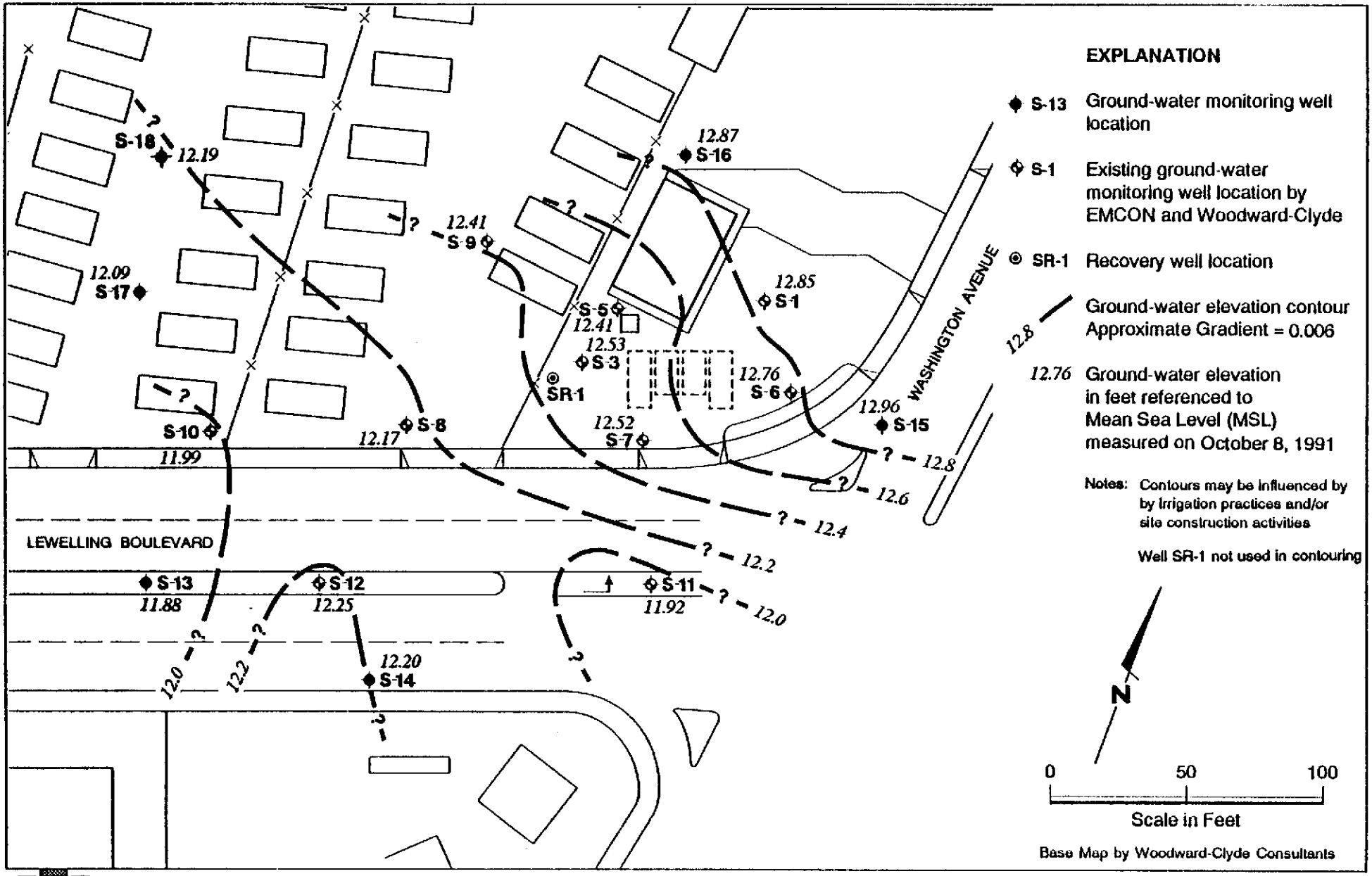


GeoStrategies Inc.

Site Plan
Former Shell Service Station
15275 Washington Avenue
San Leandro, California

PLATE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
761501-15	CFS	12/91		

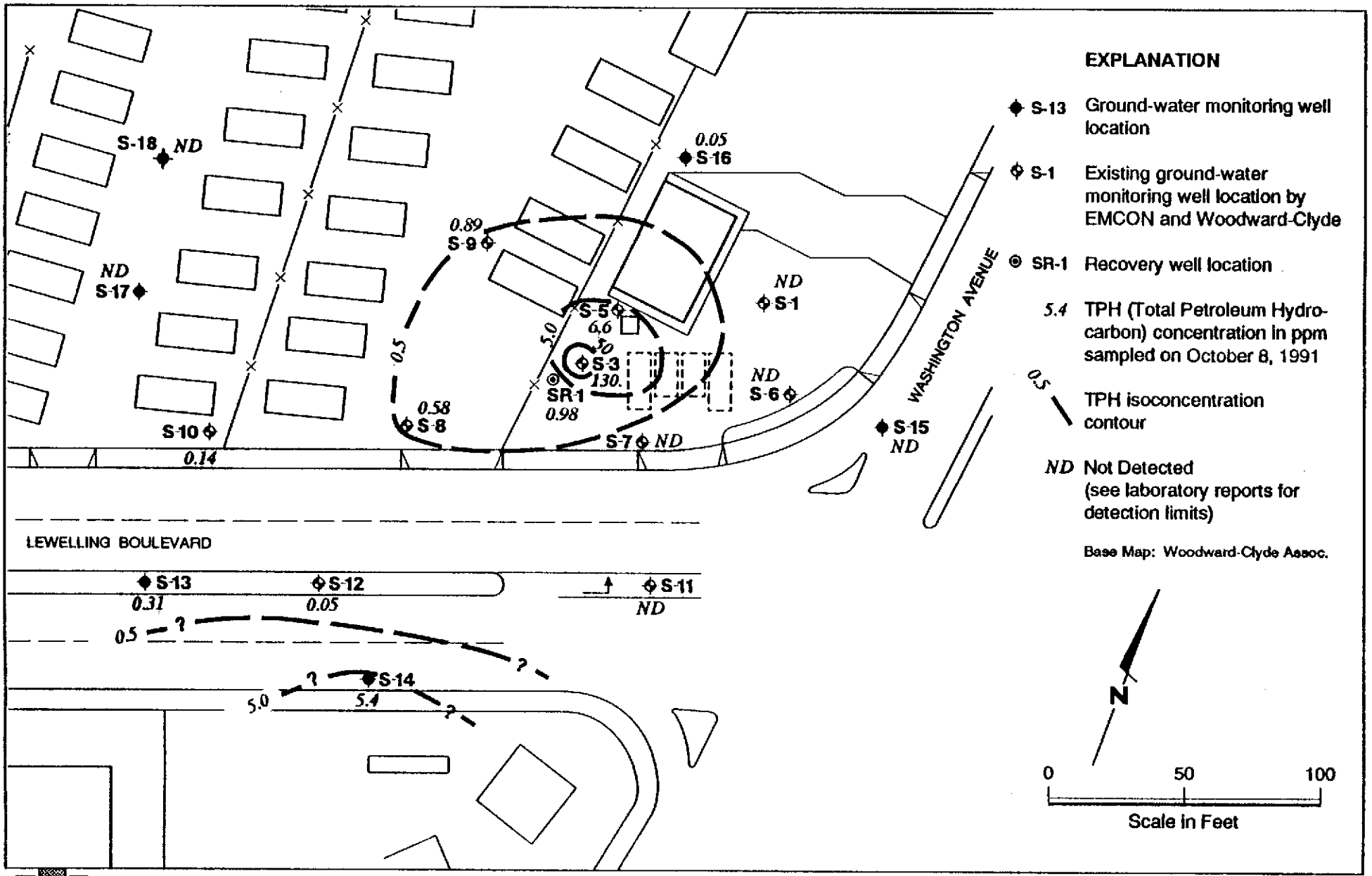


GeoStrategies Inc.

Potentiometric Map
Former Shell Service Station
15275 Washington Avenue
San Leandro, California

PLATE
3

JOB NUMBER	REVIEWED	DATE	REVISED DATE	REVISED DATE
761501-15	CFS	12/91		

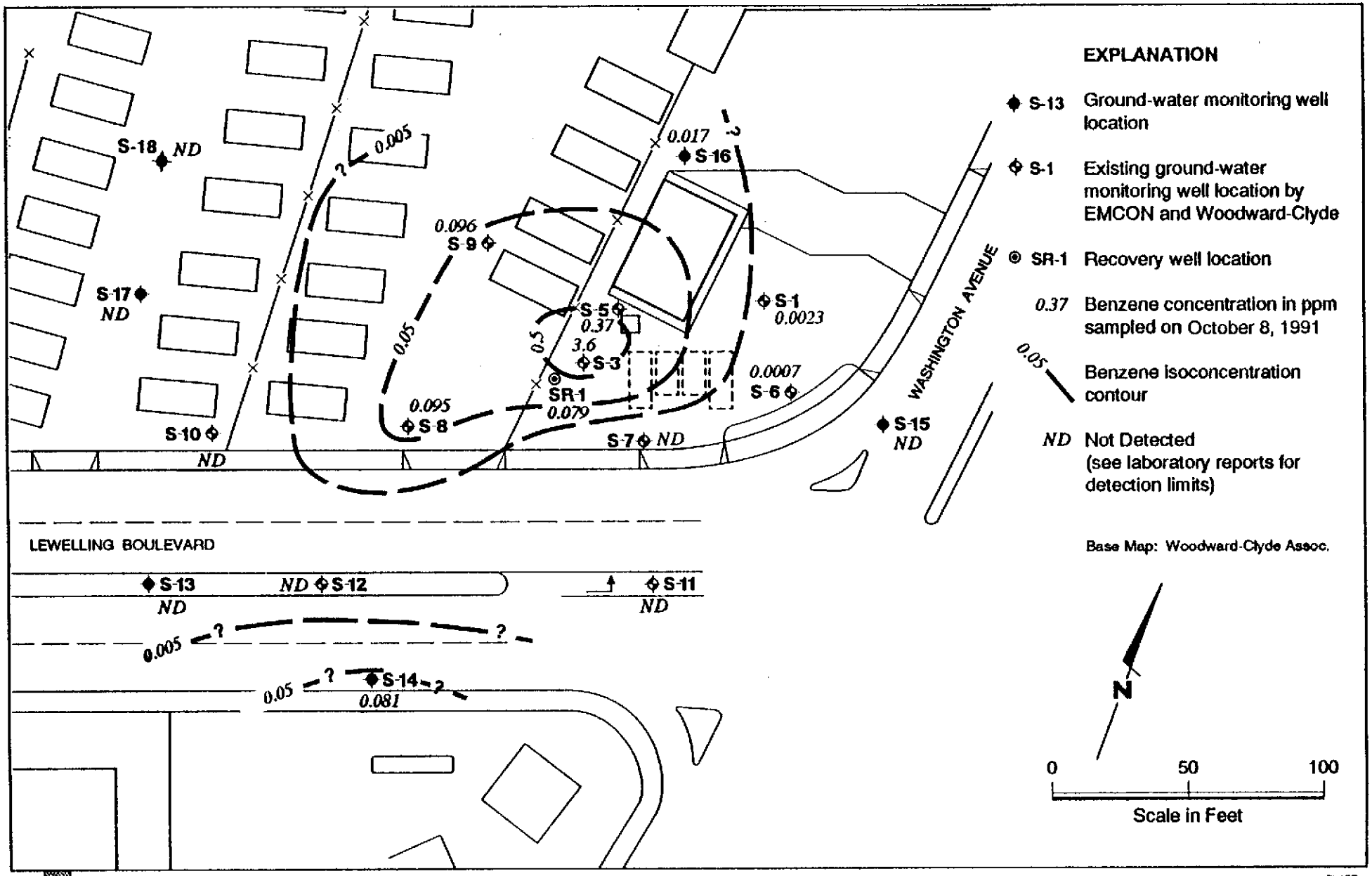


GeoStrategies Inc.

TPH Isoconcentration Map
Former Shell Service Station
15275 Washington Avenue
San Leandro, California

PLATE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
761501-15		12/91		



GeoStrategies Inc.

Benzene Isoconcentration Map
Former Shell Service Station
15275 Washington Avenue
San Leandro, California

PLATE
5

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
761501-15	EPS	12/91		

APPENDIX A
ANALYTICAL LABORATORY REPORT
AND CHAIN-OF-CUSTODY

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

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

Date: 10/24/91

Work Order: T1-10-104

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

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3615, 15275 Wash., S.Lndro
Date Received: 10/09/91
Number of Samples: 7
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

Reviewed and Approved:

Hamid Allameh
Petroleum GC Team Leader

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-104

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-1
SAMPLE DATE: 10/08/91
LAB SAMPLE ID: T110104-01
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/11/91
Low Boiling Hydrocarbons	Mod.8015		10/11/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	0.0023
Toluene	0.0005	None
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	None

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	95.
1,3-Dichlorobenzene (BTEX)	96.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-104

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-3
SAMPLE DATE: 10/08/91
LAB SAMPLE ID: T110104-02
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/16/91
Low Boiling Hydrocarbons	Mod.8015		10/16/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	5.0	130.
BTEX		
Benzene	0.05	3.6
Toluene	0.05	1.0
Ethylbenzene	0.05	2.8
Xylenes (total)	0.05	8.4

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	* 128.
1,3-Dichlorobenzene (BTEX)	101.

*Surrogate elevated due to hydrocarbon interferences.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-104

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-5
SAMPLE DATE: 10/08/91
LAB SAMPLE ID: T110104-03
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/16/91
Low Boiling Hydrocarbons	Mod.8015		10/16/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.25	6.6
BTEX		
Benzene	0.0025	0.37
Toluene	0.0025	0.0070
Ethylbenzene	0.0025	0.19
Xylenes (total)	0.0025	0.38

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	* 132.
1,3-Dichlorobenzene (BTEX)	* 123.

*Surrogate elevated due to hydrocarbon interferences.

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-10-104

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-6**
SAMPLE DATE: **10/08/91**
LAB SAMPLE ID: **T110104-04**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/11/91
Low Boiling Hydrocarbons	Mod.8015		10/11/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons		
calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	0.0007
Toluene	0.0005	None
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	None

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	96.
1,3-Dichlorobenzene (BTEX)	96.

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-10-104

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: S-7
SAMPLE DATE: 10/08/91
LAB SAMPLE ID: T110104-05
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/11/91
Low Boiling Hydrocarbons	Mod.8015		10/11/91

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

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	95.
1,3-Dichlorobenzene (BTEX)	97.

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-10-104

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-8**
SAMPLE DATE: **10/08/91**
LAB SAMPLE ID: **T110104-06**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/11/91
Low Boiling Hydrocarbons	Mod.8015		10/11/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**0.58**
BTEX		
Benzene	0.0005	**0.095**
Toluene	0.0005	**0.0022**
Ethylbenzene	0.0005	**0.0049**
Xylenes (total)	0.0005	**0.0065**

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	96.
1,3-Dichlorobenzene (BTEX)	101.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-104

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-9**
SAMPLE DATE: **10/08/91**
LAB SAMPLE ID: **T110104-07**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/11/91
Low Boiling Hydrocarbons	Mod.8015		10/11/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.25	0.89
BTEX		
Benzene	0.0025	0.096
Toluene	0.0025	None
Ethylbenzene	0.0025	0.016
Xylenes (total)	0.0025	0.029

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	110.
1,3-Dichlorobenzene (BTEX)	111.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-104

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T110104-08A
EXTRACTION DATE:
ANALYSIS DATE: 10/10/91
ANALYSIS METHOD: Mod. 8015

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Gasoline	142.	500.	514.	542.	74.	80.	8.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	107.	108.

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-10-104

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T110104-08B
EXTRACTION DATE:
ANALYSIS DATE: 10/15/91
ANALYSIS METHOD: Mod. 8015

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Gasoline	ND<50.	2500.	2231.	2174.	89.	87.	2.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	100.	100.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-104

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T110104-08C
EXTRACTION DATE:
ANALYSIS DATE: 10/15/91
ANALYSIS METHOD: Mod. 8015

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Gasoline	ND<50.	500.	481.	471.	96.	94.	2.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	*119.	*116.

*Surrogate elevated due to hydrocarbon interferences.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-104

TEST CODE QC TEST NAME Quality Control

Quality control (QC) samples are analyzed and used to assess the laboratory control measures. Routine QC samples include method blanks, spikes and duplicates. The purpose of the method blank (MB) analysis is to demonstrate that artifacts of the test do not yield false positives. The laboratory control spike (LS) and /or matrix spike (MS) analysis is used to evaluate the ability of the test to recover analytes of interest, i.e. accuracy. Accuracy is expressed as percent (%) recovery. The laboratory spike duplicate (LSD), matrix spike duplicate (MSD), or duplicate sample (DUP) is used to determine the precision of the test, by comparing the result from the original spike (or sample) to the duplicate spike (or sample). Precision is expressed as relative percent difference (RPD).

The results of appropriate QC samples from QC batches associated with the listed samples are included in this report.

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

The method of analysis for low boiling hydrocarbons is taken from EPA Methods modified 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector in series with a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline. Results in soils are corrected for moisture content and are reported on a dry soil basis unless otherwise noted.

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

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

Date: 10/24/91

Work Order: T1-10-105 P.O. Number: MOH 880-021 Vendor #I0002402

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3615, 15275 Wash., S.Lndro
Date Received: 10/09/91
Number of Samples: 5
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

Reviewed and Approved:

Hamid Allameh
Petroleum GC Team Leader

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-105

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-10**
SAMPLE DATE: **10/08/91**
LAB SAMPLE ID: **T110105-01**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/10/91
Low Boiling Hydrocarbons	Mod.8015		10/10/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.14 ^
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	None

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	102.
1,3-Dichlorobenzene (BTEX)	101.

Comments:
^ Compounds detected and calculated as low boiling hydrocarbons are due to a petroleum mixture other than gasoline.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-105

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: S-10 MS/MSD
SAMPLE DATE: 10/08/91
LAB SAMPLE ID: T110105-01D
EXTRACTION DATE:
ANALYSIS DATE: 10/10/91
ANALYSIS METHOD: Mod. 8015

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Gasoline	142.	500.	514.	542.	74.	80.	8.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	107.	108.

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-10-105

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-11**
SAMPLE DATE: **10/08/91**
LAB SAMPLE ID: **T110105-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/10/91
Low Boiling Hydrocarbons	Mod.8015		10/10/91

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

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	97.
1,3-Dichlorobenzene (BTEX)	99.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-105

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-12
SAMPLE DATE: 10/08/91
LAB SAMPLE ID: T110105-03
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/10/91
Low Boiling Hydrocarbons	Mod.8015		10/10/91

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

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	97.
1,3-Dichlorobenzene (BTEX)	99.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-105

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-13
SAMPLE DATE: 10/08/91
LAB SAMPLE ID: T110105-04
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/11/91
Low Boiling Hydrocarbons	Mod.8015		10/11/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.31
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	None

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	97.
1,3-Dichlorobenzene (BTEX)	99.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-105

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-14**
SAMPLE DATE: **10/08/91**
LAB SAMPLE ID: **T110105-05**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/11/91
Low Boiling Hydrocarbons	Mod.8015		10/11/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.25	5.4
BTEX		
Benzene	0.0025	0.081
Toluene	0.0025	0.057
Ethylbenzene	0.0025	0.095
Xylenes (total)	0.0025	0.38

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	* 123.
1,3-Dichlorobenzene (BTEX)	111.

*Surrogate elevated due to hydrocarbon interferences.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-105

TEST CODE QC TEST NAME Quality Control

Quality control (QC) samples are analyzed and used to assess the laboratory control measures. Routine QC samples include method blanks, spikes and duplicates. The purpose of the method blank (MB) analysis is to demonstrate that artifacts of the test do not yield false positives. The laboratory control spike (LS) and /or matrix spike (MS) analysis is used to evaluate the ability of the test to recover analytes of interest, i.e. accuracy. Accuracy is expressed as percent (%) recovery. The laboratory spike duplicate (LSD), matrix spike duplicate (MSD), or duplicate sample (DUP) is used to determine the precision of the test, by comparing the result from the original spike (or sample) to the duplicate spike (or sample). Precision is expressed as relative percent difference (RPD).

The results of appropriate QC samples from QC batches associated with the listed samples are included in this report.

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

The method of analysis for low boiling hydrocarbons is taken from EPA Methods modified 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector in series with a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline. Results in soils are corrected for moisture content and are reported on a dry soil basis unless otherwise noted.

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

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

Date: 10/24/91

Work Order: T1-10-106 P.O. Number: MOH 880-021 Vendor #I0002402

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3615, 15275 Wash., S.Lndro
Date Received: 10/09/91
Number of Samples: 8
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

Reviewed and Approved:

Hamid Allameh
Petroleum GC Team Leader

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-106

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-15**
SAMPLE DATE: **10/08/91**
LAB SAMPLE ID: **T110106-01**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/11/91
Low Boiling Hydrocarbons	Mod.8015		10/11/91

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

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	96.
1,3-Dichlorobenzene (BTEX)	97.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-106

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: S-15 MS/MSD
SAMPLE DATE: 10/08/91
LAB SAMPLE ID: T110106-01D
EXTRACTION DATE:
ANALYSIS DATE: 10/15/91
ANALYSIS METHOD: Mod. 8015

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Gasoline	ND<50.	500.	481.	471.	96.	94.	2.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	119.*	116.*

* Hydrocarbon interferences.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-106

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-16**
SAMPLE DATE: **10/08/91**
LAB SAMPLE ID: **T110106-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/11/91
Low Boiling Hydrocarbons	Mod.8015		10/11/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.05
BTEX		
Benzene	0.0005	0.017
Toluene	0.0005	0.0014
Ethylbenzene	0.0005	0.0012
Xylenes (total)	0.0005	0.0055

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	93.
1,3-Dichlorobenzene (BTEX)	98.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-106

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-17**
SAMPLE DATE: **10/08/91**
LAB SAMPLE ID: **T110106-03**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/11/91
Low Boiling Hydrocarbons	Mod.8015		10/11/91

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

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	95.
1,3-Dichlorobenzene (BTEX)	102.

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-10-106

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-18
SAMPLE DATE: 10/08/91
LAB SAMPLE ID: T110106-04
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/11/91
Low Boiling Hydrocarbons	Mod.8015		10/11/91

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

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	96.
1,3-Dichlorobenzene (BTEX)	97.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-106

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **SR-1**
SAMPLE DATE: **10/08/91**
LAB SAMPLE ID: **T110106-05**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/16/91
Low Boiling Hydrocarbons	Mod.8015		10/16/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.98
BTEX		
Benzene	0.0005	0.079
Toluene	0.0005	0.0015
Ethylbenzene	0.0005	0.044
Xylenes (total)	0.0005	0.052

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	122.*
1,3-Dichlorobenzene (BTEX)	123.*

* Hydrocarbon interferences.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-106

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **SD-3**
SAMPLE DATE: **10/08/91**
LAB SAMPLE ID: **T110106-06**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/16/91
Low Boiling Hydrocarbons	Mod.8015		10/16/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	5.0	150.
BTEX		
Benzene	0.05	3.6
Toluene	0.05	1.1
Ethylbenzene	0.05	2.9
Xylenes (total)	0.05	8.8

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	135.*
1,3-Dichlorobenzene (BTEX)	101.

* Hydrocarbon interferences.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-106

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **SP-10**
SAMPLE DATE: **10/08/91**
LAB SAMPLE ID: **T110106-07**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/11/91
Low Boiling Hydrocarbons	Mod.8015		10/11/91

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

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	93.
1,3-Dichlorobenzene (BTEX)	99.

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-10-106

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **Trip Blank**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: **T110106-08**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/11/91
Low Boiling Hydrocarbons	Mod.8015		10/11/91

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

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	95.
1,3-Dichlorobenzene (BTEX)	97.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-106

TEST NAME: **Spike and Spike Duplicates**

SAMPLE ID: **Quality Control**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: **T110106-09A**
EXTRACTION DATE:
ANALYSIS DATE: **10/10/91**
ANALYSIS METHOD: **Mod. 8015**

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Gasoline	ND<50.	500.	514.	542.	74.	80.	8.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	107.	108.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-106

TEST NAME: **Spike and Spike Duplicates**

SAMPLE ID: **Quality Control**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: T110106-09B
EXTRACTION DATE:
ANALYSIS DATE: 10/15/91
ANALYSIS METHOD: Mod. 8015

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Gasoline	ND<50.	2500.	2231.	2174.	89.	87.	2.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	100.	100.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/24/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-10-106

TEST CODE QC TEST NAME Quality Control

Quality control (QC) samples are analyzed and used to assess the laboratory control measures. Routine QC samples include method blanks, spikes and duplicates. The purpose of the method blank (MB) analysis is to demonstrate that artifacts of the test do not yield false positives. The laboratory control spike (LS) and /or matrix spike (MS) analysis is used to evaluate the ability of the test to recover analytes of interest, i.e. accuracy. Accuracy is expressed as percent (%) recovery. The laboratory spike duplicate (LSD), matrix spike duplicate (MSD), or duplicate sample (DUP) is used to determine the precision of the test, by comparing the result from the original spike (or sample) to the duplicate spike (or sample). Precision is expressed as relative percent difference (RPD).

The results of appropriate QC samples from QC batches associated with the listed samples are included in this report.

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

The method of analysis for low boiling hydrocarbons is taken from EPA Methods modified 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector in series with a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline. Results in soils are corrected for moisture content and are reported on a dry soil basis unless otherwise noted.

T1-10-104
T1-10-105

Gettler - Ryan Inc. ENVIRONMENTAL DIVISION — **1521 Chain of Custody**

COMPANY Shell JOB NO. _____

JOB LOCATION 15275 Washington Av.

CITY San Leandro PHONE NO. 4 3615.01

AUTHORIZED Tom Paulson DATE 10-8-91 P.O. NO. 415/783-7500

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
S-1	3	liquid	10-8-91/1100	THC(gas) BTXE	Cool g.D. 10/9/91
S-3			/0946		
S-5			/1145		
S-6			/1317		
S-7			/1310		
S-8			/1241		
S-9			/1230		
S-10			/1305		
S-11			/1034		
S-12			/1010		
S-13			/0943		
S-14			/1103		

RELINQUISHED BY: Guadalupe Sanchez 10-8-91 15:10

RECEIVED BY: Refrig #1 10-8-91 15:10

RELINQUISHED BY: Refrig #1 10-9-91 08:00

RECEIVED BY: [signature] 10-9-91 08:00

RELINQUISHED BY: [signature] 10-9-91 13:30

RECEIVED BY LAB: Josephine DeCarli 10/9/91 13:50

DESIGNATED LABORATORY: IT(SCV) DHS #: 137

REMARKS: Normal TAT

WIC : 204-6852-1008

EXP CODE: 5461

ENG: Jack Brastad

DATE COMPLETED 10-8-91 FOREMAN Guadalupe Sanchez

Gettler - Ryan Inc. T1-10.106 ENVIRONMENTAL DIVISION **1520 Chain of Custody**

COMPANY Shell JOB NO.

JOB LOCATION 15275 Washington Av

CITY San Leandro PHONE NO. 415/783-7500

AUTHORIZED Tom Paulson DATE 10-8-91 P.O. NO. 3615.01

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
S-15	3	liquid	10-8-91/1326	TPH-G(gas) BTXE	Cool 8.P 10/9/91
S-16			/1210		
S-17			/1152		
S-18			/1230		
SR-1			/1250		
SD-3			~~/1416~~		
SF-~~14~~10			/13:05	per pair	
Trip Blank	1		—		

RELINQUISHED BY: [signature] 10-8-91 1510

RECEIVED BY: Refrig #1 10-8-91 1510

RELINQUISHED BY: Refrig #1 10-9-91 08:00

RECEIVED BY: [signature] 10-9-91 08:00

RELINQUISHED BY: [signature] 10-9-91 13:50

RECEIVED BY LAB: Josephine DeCarli 10/9/91 13:50

DESIGNATED LABORATORY: IT (Scv) DHS #: 137

REMARKS: Normal TAT

WIC#: 204-6852-1008

ExpCode: 5461

Eng: J. Brasted

DATE COMPLETED 10-8-91 FOREMAN [signature]