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

December 6, 1991

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

Reference: Shell Service Station
5251 Hopyard Road
Pleasanton, California
WIC 204-6138-0907

Mr. Mueller:

As requested by Mr. Paul Hayes of Shell Oil Company, we are forwarding a copy of the December 6, 1991 Site Update report prepared for the above referenced location. The report documents 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

Shell Service Station
5251 Hopyard Road
Pleasanton, California
WIC 204-6138-0907

763301-12

December 6, 1991

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

December 6, 1991

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

Attn: Mr. E. Paul Hayes

Re: SITE UPDATE
Shell Service Station
5251 Hopyard Road
Pleasanton, 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 eight ground-water monitoring wells at the site; Wells S-1 through S-8. There are also three vadose zone wells; Wells V-1 through V-3 (Plate 2). These wells were installed between 1988 and 1989 by Pacific Environmental Group and GSI. The old underground storage tanks were replaced in January 1988. Wells S-1 through S-5 are on site. Wells S-6 through S-8 are off site. These wells have been 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 1988. Ground-water samples have been analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) and Total Petroleum Hydrocarbons calculated as Diesel (TPH - Diesel) 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 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 ± 0.01 foot. Elevations referenced to Mean Sea Level (MSL) are presented in Table 1. Water-level data were used to construct a quarterly potentiometric map (Plate 3). The approximate shallow ground-water flow is to the northwest at a calculated gradient of 0.005.

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 detected in the wells this quarter.

Ground-water Analytical Data

Ground-water samples were collected on October 18, 1991. The samples were analyzed for TPH-Gasoline and TPH-Diesel according 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-1, S-3, and S-5 at concentrations ranging from 0.12 to 12. ppm. Benzene concentrations in these wells ranged from 0.043 to 3.6 ppm. TPH-Diesel was detected in Wells S-1, S-3, S-7, and S-8 at concentrations ranging from 0.14 to 3.3 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 trip blank and a duplicate sample (SD-1). The trip blank was prepared in the laboratory using organic-free water to evaluate laboratory handling procedures of samples. The duplicate sample was collected as a split (second) sample to assess laboratory analytical precision. The results of QC sample analyses are presented in Table 2. TPH-Diesel was detected in the trip blank at a concentration of 0.21 ppm. This may infer that the TPH-Diesel detected in Wells S-1, S-3, S-7, and S-8 may be erroneous in presence and/or concentration.

If you have any questions, please call.

GeoStrategies Inc. by,

Ellen C. Fortenberry

Stephen J. Carter
Project Manager

John F. Vargas

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: JH

763301-12

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	18-Oct-91	3	28.5	326.73	8.85	----	317.88	2	7.04	70.4	2270
S-2	18-Oct-91	3	24.6	326.59	8.83	----	317.76	6	7.43	66.4	3280
S-3	18-Oct-91	3	24.9	327.38	9.64	----	317.74	3	7.20	68.2	2520
S-4	18-Oct-91	3	24.5	327.38	8.82	----	318.56	4	7.86	71.8	1228
S-5	18-Oct-91	3	24.7	327.76	10.00	----	317.76	5	7.66	65.5	1179
S-6	18-Oct-91	3	26.1	326.56	8.84	----	317.72	2	7.62	70.3	941
S-7	18-Oct-91	3	25.4	326.49	8.92	----	317.57	4	7.26	70.5	2870
S-8	18-Oct-91	3	25.3	325.32	7.62	----	317.70	3	7.40	68.0	4880

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

TABLE 2

GROUND-WATER ANALYSES DATA

WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)
S-1	18-Oct-91	25-Oct-91	12.	3.6	0.38	0.99	0.58	3.3*
S-2	18-Oct-91	25-Oct-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05
S-3	18-Oct-91	25-Oct-91	1.9	0.37	0.0031	0.12	0.022	0.5
S-4	18-Oct-91	24-Oct-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05
S-5	18-Oct-91	24-Oct-91	0.12^	0.043	<0.0005	0.0010	0.0007	<0.05
S-6	18-Oct-91	24-Oct-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05
S-7	18-Oct-91	24-Oct-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	0.14+

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
TPH-D = Total Petroleum Hydrocarbons calculated as Diesel
PPM = Parts Per Million

SD = Duplicate Sample
TB = Trip Blank

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.

* Compounds detected and calculated as diesel appear to be the less volatile constituents of gasoline.

^ 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 consist of compounds eluting within the chromatographic range of diesel, but are not characteristic of the standard diesel pattern.

TABLE 2

GROUND-WATER ANALYSES DATA

WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)
S-8	18-Oct-91	24-Oct-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	0.36+
SD-1	18-Oct-91	25-Oct-91	11.	3.2	0.31	0.88	0.48	4.8*
TB	----	24-Oct-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	0.21

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)	OIL (PPM)
06-Jan-88	S-1	0.6	0.22	<0.005	----	<0.02	<0.05	<0.2
14-Dec-88	S-1	17.	5.1	0.04	0.57	0.20	8.	N/A
30-Mar-89	S-1	8.2	2.9	<0.02	0.33	0.16	3.6	N/A
20-Jul-89	S-1	21.	6.2	1.5	1.1	0.7	8.5	N/A
16-Oct-89	S-1	16.	3.9	0.89	1.2	0.9	11.	N/A
05-Jan-90	S-1	8.2	2.3	0.10	0.66	0.32	6.5	N/A
11-Apr-90	S-1	11.	3.0	0.12	0.83	0.52	N/A	N/A
12-Jul-90	S-1	20.	4.4	0.96	1.3	1.2	8.0	N/A
25-Oct-90	S-1	6.0	1.4	0.14	0.60	0.32	3.5	N/A
25-Jan-91	S-1	2.5	0.46	<0.025	0.13	0.036	1.5	N/A
16-Apr-91	S-1	6.7	2.6	0.014	0.58	0.25	2.6*	N/A
24-Jul-91	S-1	8.8	2.3	0.03	0.64	0.22	3.8*	N/A
18-Oct-91	S-1	12.	3.6	0.38	0.99	0.58	3.3*	N/A
11-May-89	S-2	<0.05	<0.0005	<0.001	<0.001	<0.003	<0.1	N/A
20-Jul-89	S-2	<0.05	<0.0005	<0.001	<0.001	<0.003	<0.1	N/A
16-Oct-89	S-2	<0.05	<0.0005	<0.001	<0.001	<0.003	<0.1	N/A
05-Jan-90	S-2	<0.050	<0.0005	<0.0005	<0.0005	<0.001	<0.1	N/A
11-Apr-90	S-2	<0.050	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
12-Jul-90	S-2	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
25-Oct-90	S-2	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
25-Jan-91	S-2	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
16-Apr-91	S-2	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
24-Jul-91	S-2	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
18-Oct-91	S-2	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
11-May-89	S-3	2.6	0.33	0.014	0.22	0.20	1.4	N/A
20-Jul-89	S-3	9.7	2.3	0.03	0.88	0.16	2.2	N/A
16-Oct-89	S-3	3.4	0.70	0.008	0.36	0.06	2.8	N/A

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)	OIL (PPM)
05-Jan-90	S-3	0.86	0.14	0.0016	0.078	0.002	1.6	N/A
11-Apr-90	S-3	1.0	0.21	<0.002	0.15	0.013	N/A	N/A
12-Jul-90	S-3	2.8	0.49	0.0085	0.21	0.081	2.0	N/A
24-Oct-90	S-3	1.2	0.12	<0.0025	0.082	0.0051	0.86	N/A
25-Jan-91	S-3	0.87	0.23	<0.0025	0.13	<0.0025	0.33	N/A
16-Apr-91	S-3	0.19	0.012	0.0008	0.0062	0.0015	0.14*	N/A
24-Jul-91	S-3	1.7	0.45	0.0044	0.15	0.0029	1.2*	N/A
18-Oct-91	S-3	1.9	0.37	0.0031	0.12	0.22	0.5	N/A
11-May-89	S-4	<0.05	<0.0005	<0.001	<0.001	<0.003	<0.1	N/A
20-Jul-89	S-4	<0.05	<0.0005	<0.001	<0.001	<0.003	<0.1	N/A
16-Oct-89	S-4	<0.05	<0.0005	<0.001	<0.001	<0.003	<0.1	N/A
05-Jan-90	S-4	<0.050	<0.0005	<0.0005	<0.0005	<0.001	<0.1	N/A
11-Apr-90	S-4	<0.050	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
12-Jul-90	S-4	<0.05	<0.0005	0.0017	<0.0005	0.0021	<0.05	N/A
25-Oct-90	S-4	<0.05	<0.0005	<0.0005	<0.0005	0.0006	<0.05	N/A
25-Jan-91	S-4	<0.05	<0.0005	0.0015	<0.0005	0.0028	<0.05	N/A
16-Apr-91	S-4	<0.05	0.0007	<0.0005	<0.0005	<0.0005	<0.05	N/A
24-Jul-91	S-4	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
18-Oct-91	S-4	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
11-May-89	S-5	0.05	<0.0005	<0.001	0.001	0.003	<0.1	N/A
20-Jul-89	S-5	<0.05	0.01	<0.001	<0.001	<0.003	<0.1	N/A
16-Oct-89	S-5	<0.05	<0.0005	<0.001	<0.001	<0.003	<0.1	N/A
05-Jan-90	S-5	<0.050	<0.0005	<0.0005	<0.0005	<0.001	<0.1	N/A
11-Apr-90	S-5	<0.050	0.0005	0.0034	0.0008	0.004	N/A	N/A
12-Jul-90	S-5	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
25-Oct-90	S-5	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
25-Jan-91	S-5	<0.05	<0.0005	<0.0005	<0.0005	0.0007	<0.05	N/A
16-Apr-91	S-5	<0.05	<0.0005	<0.0005	<0.0005	0.0008	<0.05	N/A

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)	OIL (PPM)
24-Jul-91	S-5	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
18-Oct-91	S-5	0.12^	0.043	<0.0005	0.001	0.0007	<0.05	N/A
15-Nov-89	S-6	<0.050	<0.0005	<0.0005	<0.0005	<0.001	<0.1	N/A
05-Jan-90	S-6	<0.050	<0.0005	0.0005	<0.0005	<0.001	<0.1	N/A
11-Apr-90	S-6	<0.050	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
12-Jul-90	S-6	<0.05	<0.0005	0.0005	<0.0005	0.0006	<0.05	N/A
25-Oct-90	S-6	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
25-Jan-91	S-6	<0.05	<0.0005	0.0017	<0.0005	0.0028	<0.05	N/A
16-Apr-91	S-6	<0.05	<0.0005	<0.0005	<0.0005	0.0006	<0.05	N/A
24-Jul-91	S-6	<0.05	<0.0005	<0.0005	<0.0005	0.0005	<0.05	N/A
18-Oct-91	S-6	<0.05	<0.0005	<0.0005	<0.0005	0.0005	<0.05	N/A
15-Nov-89	S-7	<0.050	<0.0005	<0.0005	<0.0005	<0.001	<0.1	N/A
05-Jan-90	S-7	<0.050	<0.0005	<0.0005	<0.0005	<0.001	<0.1	N/A
11-Apr-90	S-7	<0.050	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
12-Jul-90	S-7	<0.05	<0.0005	0.0006	<0.0005	0.0007	N/A	N/A
25-Oct-90	S-7	<0.05	<0.0005	0.0005	<0.0005	0.0010	<0.05	N/A
25-Jan-91	S-7	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
16-Apr-91	S-7	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
24-Jul-91	S-7	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
18-Oct-91	S-7	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	0.14&	N/A
15-Nov-89	S-8	<0.050	<0.0005	<0.0005	<0.0005	<0.001	<0.1	N/A
05-Jan-90	S-8	<0.050	<0.0005	<0.0005	<0.0005	<0.001	<0.1	N/A
11-Apr-90	S-8	<0.050	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
12-Jul-90	S-8	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
25-Oct-90	S-8	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
25-Jan-91	S-8	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
16-Apr-91	S-8	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

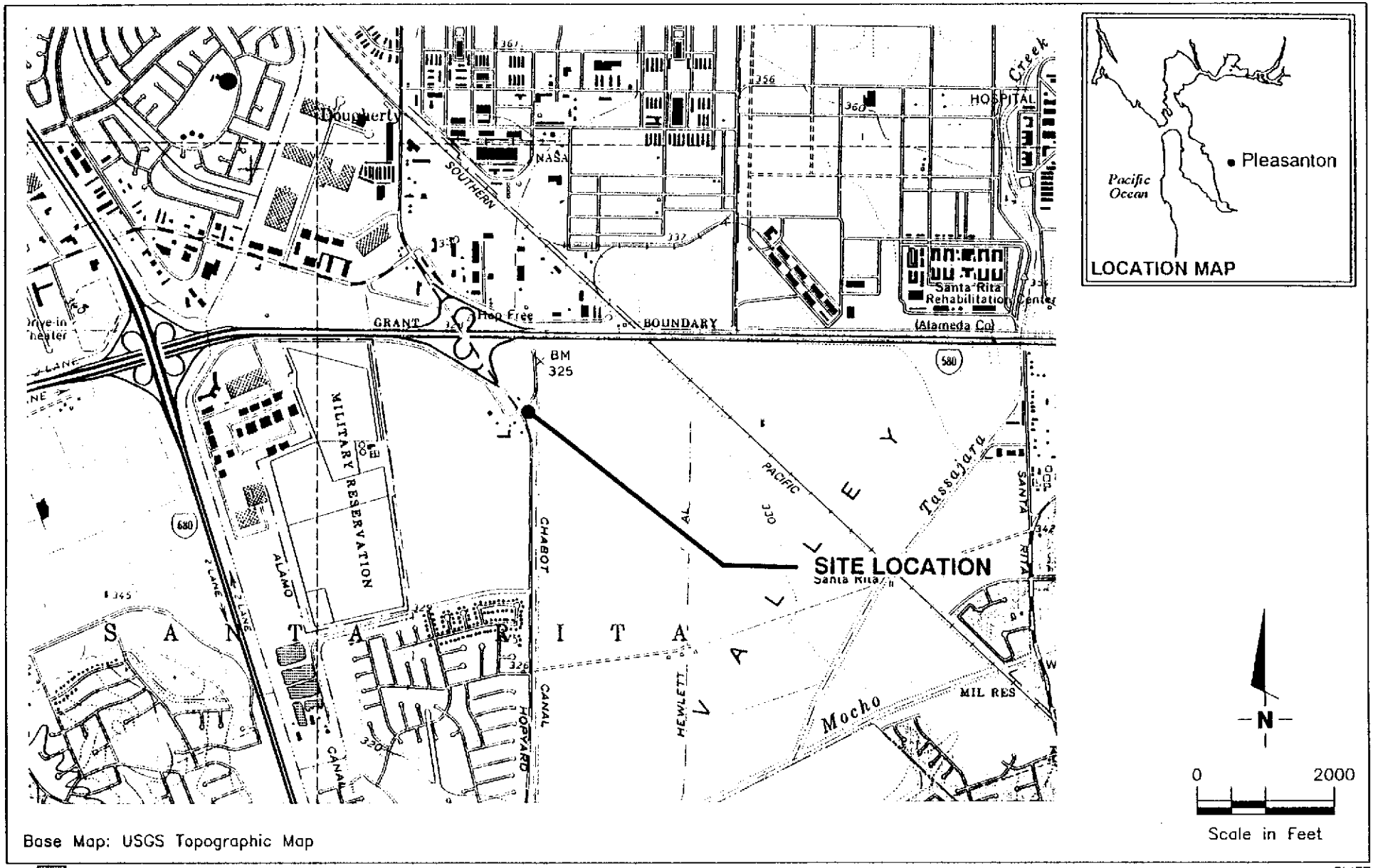
SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)	OIL (PPM)
24-Jul-91	S-8	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	N/A
18-Oct-91	S-8	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	0.36&	N/A
14-Dec-88	V-1	0.77	0.0064	0.021	0.009	0.087	4.5	N/A
14-Dec-88	V-2	0.16	0.0038	<0.001	<0.001	0.004	1.0	N/A
14-Dec-88	V-3	0.14	0.0087	<0.001	<0.001	0.003	0.8	N/A

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 diesel appear to be the less volatile constituents of gasoline.
^ 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 standard pattern.
& Compounds detected and calculated as low boiling hydrocarbons consist of compounds eluting within the chromatographic range of diesel, but are not characteristic of the standard diesel standard pattern.

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).
3. Ethylbenzene and Xylenes were combined in January 1988 in well S-1.



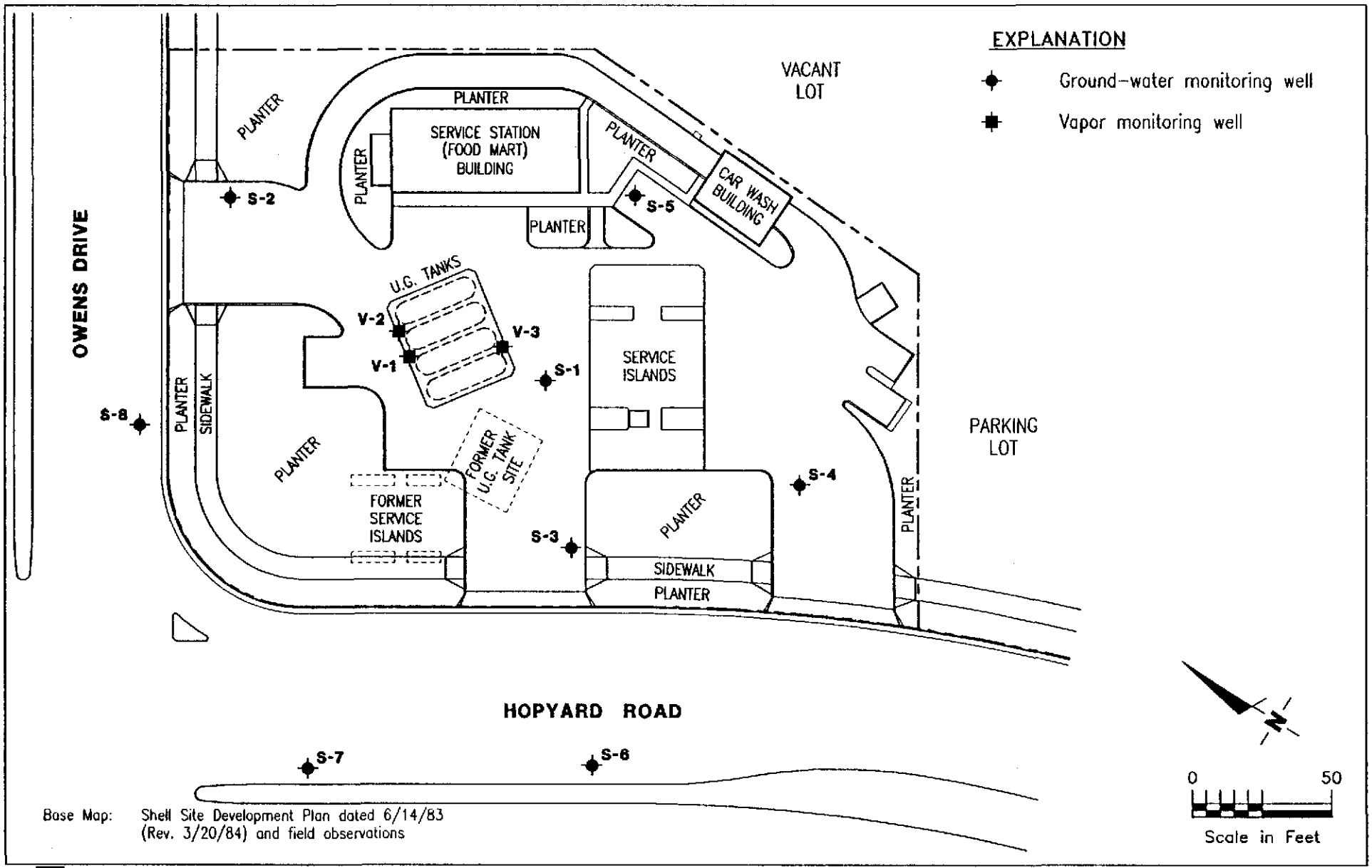
Base Map: USGS Topographic Map

GeoStrategies Inc.

VICINITY MAP
Shell Service Station
5251 Hopyard Road
Pleasanton, California

PLATE
1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE
7633		12/90	



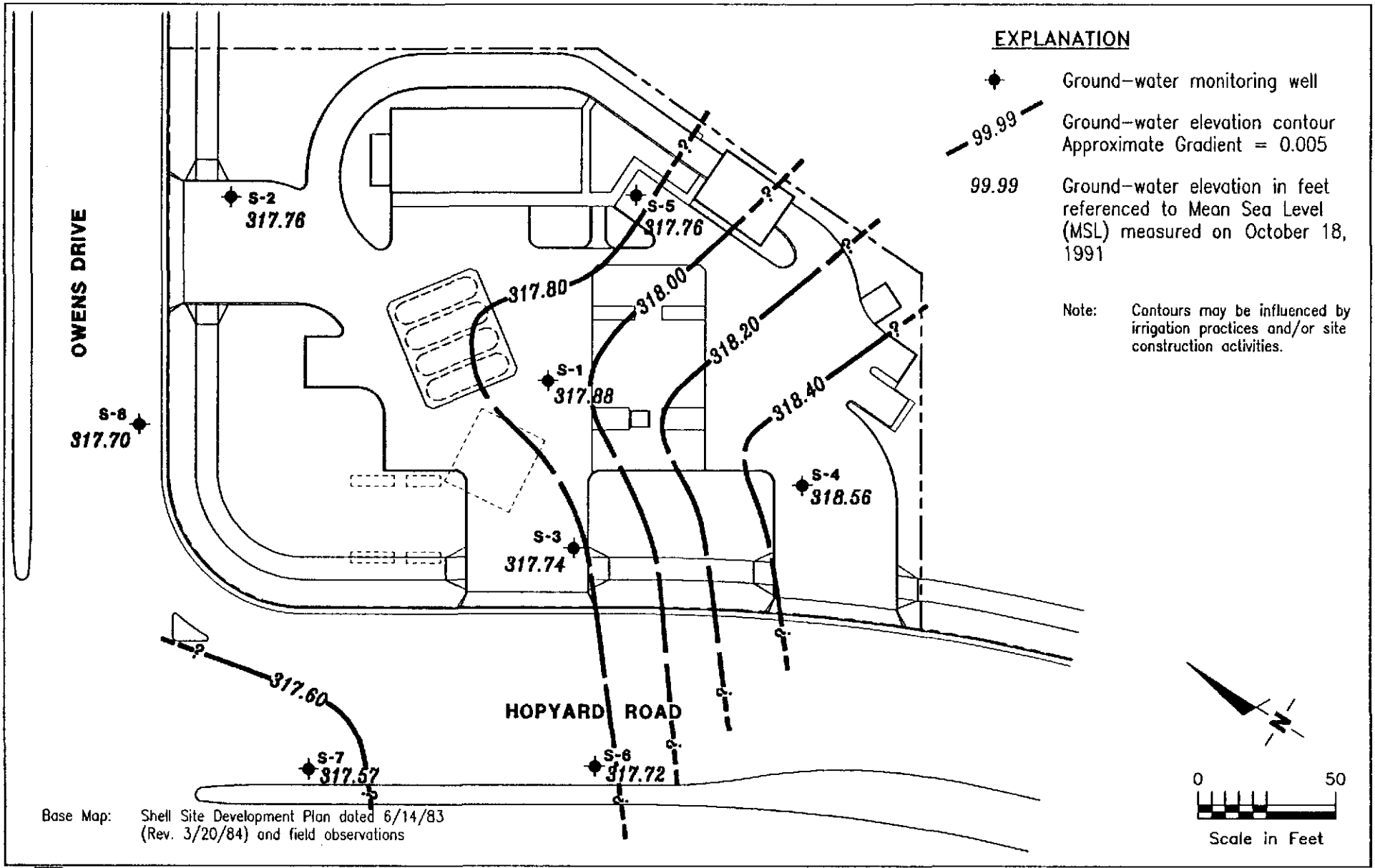
Base Map: Shell Site Development Plan dated 6/14/83 (Rev. 3/20/84) and field observations

GeoStrategies Inc.

SITE PLAN
Shell Service Station
5251 Hopyard Road
Pleasanton, California

PLATE **2**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
763301-12	GF	12/91	

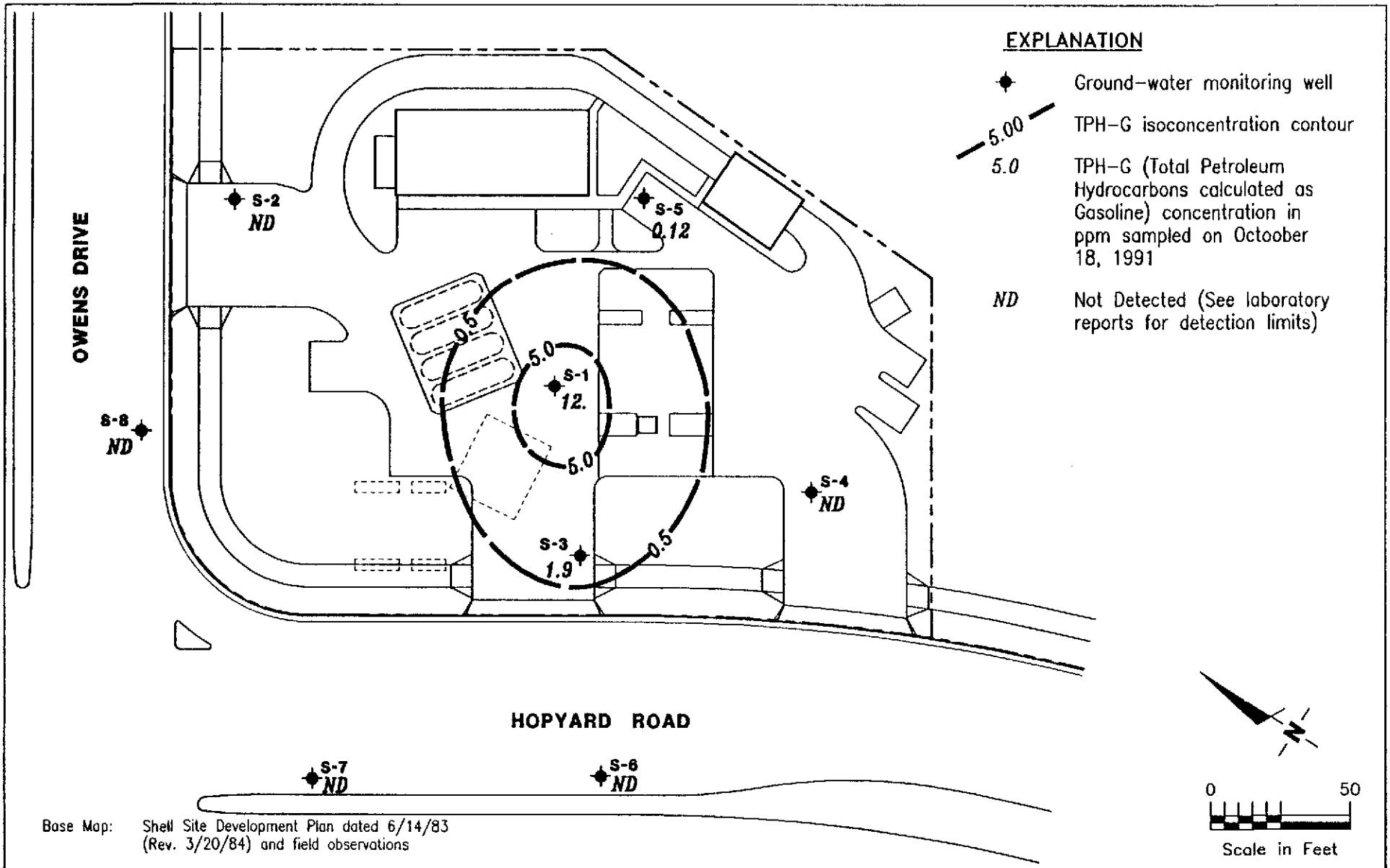


GeoStrategies Inc.

POTENTIOMETRIC MAP
Shell Service Station
5251 Hopyard Road
Pleasanton, California

PLATE
3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
763301-12	CPS	12/91	



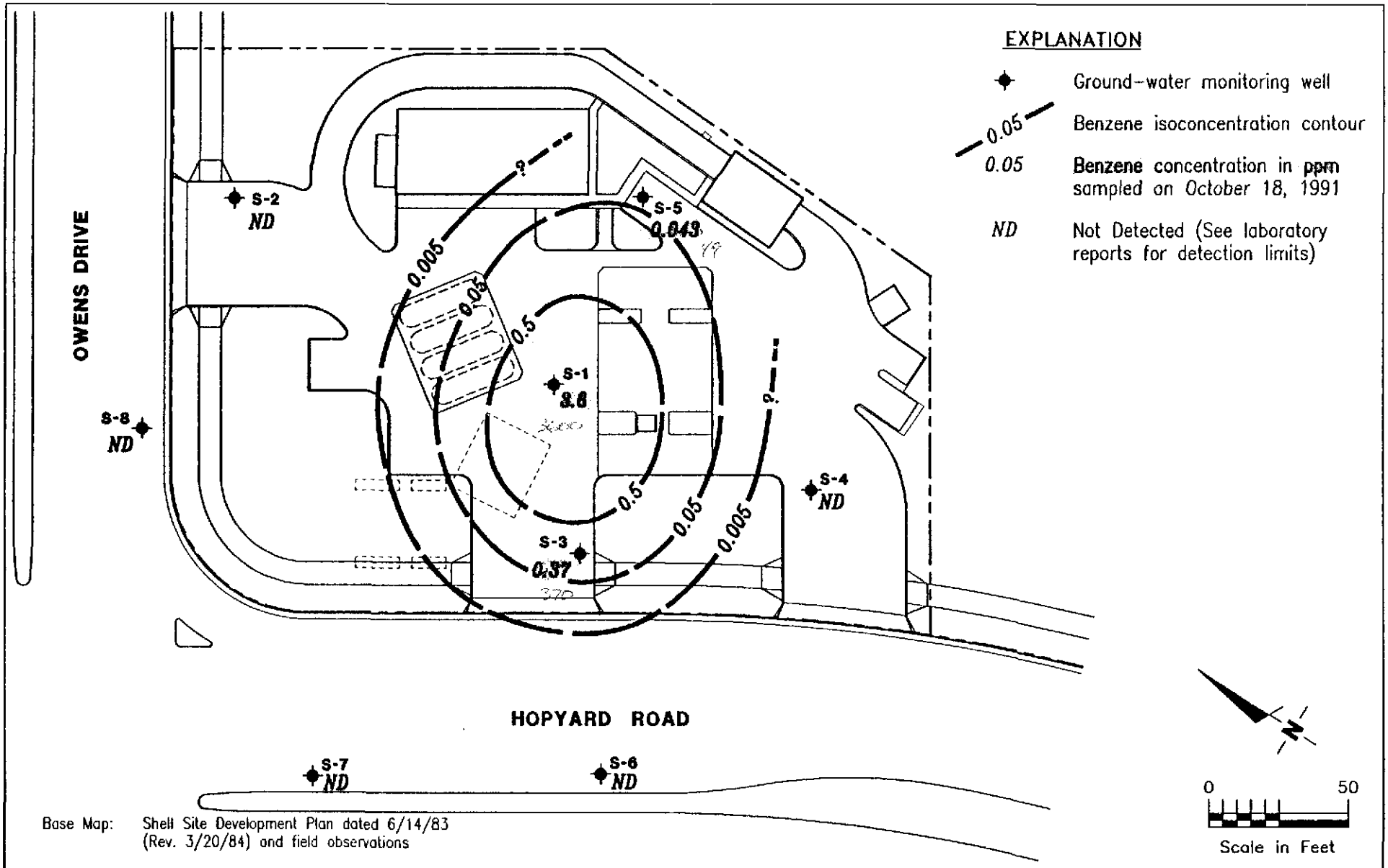
Base Map: Shell Site Development Plan dated 6/14/83 (Rev. 3/20/84) and field observations

GeoStrategies Inc.

TPH-G ISOCONCENTRATION MAP
Shell Service Station
5251 Hopyard Road
Pleasanton, California

PLATE **4**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
763301-12	EPS	12/91	



Base Map: Shell Site Development Plan dated 6/14/83 (Rev. 3/20/84) and field observations

GeoStrategies Inc.

BENZENE ISOCONCENTRATION MAP

Shell Service Station
5251 Hopyard Road
Pleasanton, California

PLATE 5

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
763301-12	EFS	12/91	

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

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

Date: 11/11/91

Work Order: T1-10-243

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

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3633, 5251 Hopyard, Plsnton
Date Received: 10/21/91
Number of Samples: 6
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

Reviewed and Approved:

Richard Jacobs

Richard Jacobs
Project Manager

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/11/91
Client Work ID: GR3633, 5251 Hopyard, Pleasanton

Work Order: T1-10-243

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-6
SAMPLE DATE: 10/18/91
LAB SAMPLE ID: T110243-01
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/24/91
Low Boiling Hydrocarbons	Mod.8015		10/24/91
High Boiling Hydrocarbons	Mod.8015	10/28/91	10/31/91

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
High Boiling Hydrocarbons calculated as Diesel	0.05	None

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	97.
1,3-Dichlorobenzene (BTEX)	98.
nC32 (Diesel)	61.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/11/91
Client Work ID: GR3633, 5251 Hopyard, Pleasanton

Work Order: T1-10-243

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: S-6 MS/MSD
SAMPLE DATE: 10/18/91
LAB SAMPLE ID: T110243-01F
EXTRACTION DATE:
ANALYSIS DATE: 10/22/91
ANALYSIS METHOD: Mod. 8015

QUALITY CONTROL REPORT

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

RESULTS in Milligrams per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Gasoline	ND<50.	500.	438.	429.	88.	86.	2.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	115.	110.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/11/91
Client Work ID: GR3633, 5251 Hopyard, Plsnton

Work Order: T1-10-243

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-7**
SAMPLE DATE: **10/18/91**
LAB SAMPLE ID: **T110243-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/24/91
Low Boiling Hydrocarbons	Mod.8015		10/24/91
High Boiling Hydrocarbons	Mod.8015	10/28/91	10/31/91

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	
High Boiling Hydrocarbons calculated as Diesel	0.05	0.14	@

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	99.
1,3-Dichlorobenzene (BTEX)	98.
nC32 (Diesel)	70.

Comments:
@ Compounds detected and calculated as high boiling hydrocarbons consist of compounds eluting within the chromatographic range of diesel, but are not characteristic of the standard diesel standard pattern.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/11/91
Client Work ID: GR3633, 5251 Hopyard, Plsnton

Work Order: T1-10-243

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-8**
SAMPLE DATE: **10/18/91**
LAB SAMPLE ID: **T110243-03**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/24/91
Low Boiling Hydrocarbons	Mod.8015		10/24/91
High Boiling Hydrocarbons	Mod.8015	10/28/91	10/31/91

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	
High Boiling Hydrocarbons calculated as Diesel	0.05	0.36	@

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	102.
1,3-Dichlorobenzene (BTEX)	98.
nC32 (Diesel)	65.

Comments:
@ Compounds detected and calculated as high boiling hydrocarbons consist of compounds eluting within the chromatographic range of diesel, but are not characteristic of the standard diesel standard pattern.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/11/91
Client Work ID: GR3633, 5251 Hopyard, Pleasanton

Work Order: T1-10-243

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **SD-1**
SAMPLE DATE: **10/18/91**
LAB SAMPLE ID: **T110243-04**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/25/91
Low Boiling Hydrocarbons	Mod.8015		10/25/91
High Boiling Hydrocarbons	Mod.8015	10/28/91	10/31/91

PARAMETER	DETECTION LIMIT	DETECTED	
Low Boiling Hydrocarbons calculated as Gasoline	1.0	11.	
BTEX			
Benzene	0.010	3.2	
Toluene	0.010	0.31	
Ethylbenzene	0.010	0.88	
Xylenes (total)	0.010	0.48	
High Boiling Hydrocarbons calculated as Diesel	0.05	4.8	#

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	104.
1,3-Dichlorobenzene (BTEX)	100.
nC32 (Diesel)	63.

Comments:
Compounds detected and calculated as diesel appear to be the less volatile constituents of gasoline.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/11/91
Client Work ID: GR3633, 5251 Hopyard, Pleaton

Work Order: T1-10-243

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: Trip Blank
SAMPLE DATE: not spec
LAB SAMPLE ID: T110243-05
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/24/91
Low Boiling Hydrocarbons	Mod.8015		10/24/91
High Boiling Hydrocarbons	Mod.8015	10/28/91	10/31/91

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
High Boiling Hydrocarbons calculated as Diesel	0.05	0.21

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	99.
1,3-Dichlorobenzene (BTEX)	97.
nC32 (Diesel)	59.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/11/91
Client Work ID: GR3633, 5251 Hopyard, Plsnton

Work Order: T1-10-243

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T110243-06A
EXTRACTION DATE: 10/28/91
ANALYSIS DATE: 10/30/91
ANALYSIS METHOD: Mod.8015

QUALITY CONTROL REPORT

Laboratory Spike(LS) and Laboratory Spike Duplicate(LSD) Analyses

RESULTS in Milligrams per Liter

PARAMETER	Sample Amt	Spike Amt	LS Result	LSD Result	LS %Rec	LSD %Rec	RPD
Diesel	None	1000.	854.	760.	85.	76.	11.

SURROGATES	LS %Rec	LSD %Rec
nC32	70.	65.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/11/91
Client Work ID: GR3633, 5251 Hopyard, Pleasanton

Work Order: T1-10-243

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T110243-06A
EXTRACTION DATE:
ANALYSIS DATE: 10/25/91
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.	428.	421.	86.	84.	2.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichloroebenzene	41.*	103.

* Surrogate recovery for the MS is below acceptance limits; however, surrogate recovery was acceptable for the laboratory spike.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/11/91
Client Work ID: GR3633, 5251 Hopyard, Pleasanton

Work Order: T1-10-243

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 **TPHN** TEST NAME **TPH High Boiling by 8015**

The method of analysis for high boiling hydrocarbons s taken from the LUFT field manual. Samples are extracted with solvent and examined by gas chromatography using a flame ionization detector. Results in soils are corrected for moisture content and are reported on a dry soil basis unless otherwise noted.

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: 11/10/91

Work Order: T1-10-242 P.O. Number: MOH 880-021 Vendor #I0002402

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3633, 5251 Hopyard, Plsnton
Date Received: 10/21/91
Number of Samples: 5
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

Reviewed and Approved:

Richard Jacobs
Project Manager

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/10/91
Client Work ID: GR3633, 5251 Hopyard, Pleasanton

Work Order: T1-10-242

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-1**
SAMPLE DATE: **10/18/91**
LAB SAMPLE ID: **T110242-01**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/25/91
Low Boiling Hydrocarbons	Mod.8015		10/25/91
High Boiling Hydrocarbons	Mod.8015	10/28/91	10/30/91

PARAMETER	DETECTION LIMIT	DETECTED	
Low Boiling Hydrocarbons calculated as Gasoline	1.0	12.	
BTEX			
Benzene	0.01	3.6	
Toluene	0.01	0.38	
Ethylbenzene	0.01	0.99	
Xylenes (total)	0.01	0.58	
High Boiling Hydrocarbons calculated as Diesel	0.05	3.3	#

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	101.
1,3-Dichlorobenzene (BTEX)	99.
nC32 (Diesel)	43.

Comments:
Compounds detected and calculated as diesel appear to be the less volatile constituents of gasoline.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/10/91
Client Work ID: GR3633, 5251 Hopyard, Pleasanton

Work Order: T1-10-242

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-2**
SAMPLE DATE: **10/18/91**
LAB SAMPLE ID: **T110242-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/25/91
Low Boiling Hydrocarbons	Mod.8015		10/25/91
High Boiling Hydrocarbons	Mod.8015	10/28/91	10/30/91

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
High Boiling Hydrocarbons calculated as Diesel	0.05	None

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	100.
1,3-Dichlorobenzene (BTEX)	97.
nC32 (Diesel)	40.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/10/91
Client Work ID: GR3633, 5251 Hopyard, Plsnton

Work Order: T1-10-242

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-3**
SAMPLE DATE: **10/18/91**
LAB SAMPLE ID: **T110242-03**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/25/91
Low Boiling Hydrocarbons	Mod.8015		10/25/91
High Boiling Hydrocarbons	Mod.8015	10/28/91	10/31/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.25	1.9
BTEX		
Benzene	0.0025	0.37
Toluene	0.0025	0.0031
Ethylbenzene	0.0025	0.12
Xylenes (total)	0.0025	0.022
High Boiling Hydrocarbons calculated as Diesel	0.05	0.5

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	113.
1,3-Dichlorobenzene (BTEX)	101.
nC32 (Diesel)	58.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/10/91
Client Work ID: GR3633, 5251 Hopyard, Plsnton

Work Order: T1-10-242

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-4**
SAMPLE DATE: **10/18/91**
LAB SAMPLE ID: **T110242-04**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/24/91
Low Boiling Hydrocarbons	Mod.8015		10/24/91
High Boiling Hydrocarbons	Mod.8015	10/28/91	10/31/91

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
High Boiling Hydrocarbons calculated as Diesel	0.05	None

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	99.
1,3-Dichlorobenzene (BTEX)	98.
nC32 (Diesel)	57.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/10/91
Client Work ID: GR3633, 5251 Hopyard, Pleasanton

Work Order: T1-10-242

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-5**
SAMPLE DATE: **10/18/91**
LAB SAMPLE ID: **T110242-05**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/24/91
Low Boiling Hydrocarbons	Mod.8015		10/24/91
High Boiling Hydrocarbons	Mod.8015	10/28/91	10/31/91

PARAMETER	DETECTION LIMIT	DETECTED	
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.12	@
BTEX			
Benzene	0.0005	0.043	
Toluene	0.0005	None	
Ethylbenzene	0.0005	0.0010	
Xylenes (total)	0.0005	0.0007	
High Boiling Hydrocarbons calculated as Diesel	0.05	None	

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	101.
1,3-Dichlorobenzene (BTEX)	96.
nC32 (Diesel)	61.

Comments:
@ 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 standard pattern.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/11/91
Client Work ID: GR3633, 5251 Hopyard, Pleasanton

Work Order: T1-10-242

TEST NAME: **Spike and Spike Duplicates**

SAMPLE ID: **T1-10-242 LS/LSD**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: **T110242-06B**
EXTRACTION DATE: **10/28/91**
ANALYSIS DATE: **10/30/91**
ANALYSIS METHOD: **Mod.8015**

QUALITY CONTROL REPORT

Laboratory Spike(LS) and Laboratory Spike Duplicate(LSD) Analyses

RESULTS in Milligrams per Liter

PARAMETER	Sample Amt	Spike Amt	LS Result	LSD Result	LS %Rec	LSD %Rec	RPD
Diesel	None	1000.	854.	760.	85.	76.	11.

SURROGATES	LS %Rec	LSD %Rec
nC32	70.	65.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/10/91
Client Work ID: GR3633, 5251 Hopyard, Plsnton

Work Order: T1-10-242

TEST NAME: **Spike and Spike Duplicates**

SAMPLE ID: **Quality Control**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: **T110242-06A**
EXTRACTION DATE:
ANALYSIS DATE: **10/25/91**
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.	428.	421.	86.	84.	2.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	41.*	103.

* Surrogate recovery for the MS is below acceptance limits; however, surrogate recovery was acceptable for the laboratory spike.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 11/10/91
Client Work ID: GR3633, 5251 Hopyard, Plsnton

Work Order: T1-10-242

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 **TPHN** TEST NAME **TPH High Boiling by 8015**

The method of analysis for high boiling hydrocarbons s taken from the LUFT field manual. Samples are extracted with solvent and examined by gas chromatography using a flame ionization detector. Results in soils are corrected for moisture content and are reported on a dry soil basis unless otherwise noted.

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.

Getler - Ryan Inc. T1-10-243 ENVIRONMENTAL DIVISION 1503 **Chain of Custody**

COMPANY Shell JOB NO.

JOB LOCATION 5251 Hopyard

CITY Pleasanton PHONE NO. 783-7500

AUTHORIZED Tom Paulson DATE 10-18-91 P.O. NO. 3633.01

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
S-1	5	H_2O	10-18-91/1219	THC(gas) BTXE, Diesel	cool 10-21-91
S-2			/951		
S-3			/1203		
S-4			/1155		
S-5			/1019		
S-6			/1030		
S-7			/1036		
S-8			/1050		
SD-1			/ —		
Trip Blank	2		—		

RELINQUISHED BY: 10-18-91 1330 RECEIVED BY: 10-18-91 1330

RELINQUISHED BY: Petris #1 RECEIVED BY: Petris #1

RELINQUISHED BY: 10-21-91 08:00 RECEIVED BY: 10-21-91 08:00

RELINQUISHED BY: 10-21-91 12:05 RECEIVED BY LAB: M. LeGrande 10-21-91 1205

DESIGNATED LABORATORY: IT (SCV) DHS #: 137

REMARKS: NORMAL TAT WIC # 204-6138-0907

Eng: J. BRAZEAU

Exp: 5461

DATE COMPLETED 10/18-91 FOREMAN

ORIGINAL