



grettler — ryan inc.

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October 14, 1991

LOP 413

County of Alameda
Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

Reference: Former Shell Service Station
2800 Telegraph Avenue
Oakland, California
WIC 204-5508-2303

Gentlemen:

As requested by Mr. Jack Brastad of Shell Oil Company, we are forwarding a copy of the Site Update Report dated October 8, 1991. The enclosed report presents the third quarter 1991 ground-water sampling conducted at the above referenced location.

Please do not hesitate to call should you have any questions or comments.

Sincerely,

John P. Werfal
Project Manager

enclosure

cc: Mr. Jack Brastad, Shell Oil Company
Mr. Tom Callaghan, Regional Water Quality Control Board



GeoStrategies Inc.

SITE UPDATE

Former Shell Service Station
2800 Telegraph Avenue
Oakland, California
WIC 204-5508-2303

761001-16

October 8, 1991



GeoStrategies Inc.

2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545

(415) 352-4800

October 8, 1991

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

Attn: Mr. John Werfal

Re: SITE UPDATE
Former Shell Service Station
2800 Telegraph Avenue
Oakland, California

Gentlemen:

This Site Update has been prepared by GeoStrategies Inc. (GSI), and presents the results of the 1991 third 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

Eleven ground-water monitoring wells (Wells S-1 through S-11) and one recovery well (SR-1) currently exist at the site (Plate 2). These wells were installed between the second quarter of 1988 and the fourth quarter of 1989. Four underground storage tanks were removed from the site in late 1988. Wells S-1 through S-3 and SR-1 are onsite. Wells S-4 through S-11 are offsite. These wells have been installed to evaluate the vertical and horizontal extent of petroleum hydrocarbons in the soil and shallow groundwater beneath the site.

Quarterly monitoring and sampling of wells began in 1989. 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.

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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 each well box, and recorded to the nearest ± 0.01 foot. Corresponding elevations relative to Mean Sea Level (MSL) are presented in Table 1. Water-level data were used to construct a quarterly potentiometric map (Plate 3). Shallow ground-water flow is generally to the south at a calculated gradient of 0.015.

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, 0.13 feet thick, was observed in Well S-3 this quarter.

Ground-water Analytical Data

Ground-water samples were collected on July 12, 1991. The samples were analyzed for TPH-Gasoline 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-2, S-6, S-7, S-8 and S-11 at concentrations ranging from 0.15 ppm to 2.9 ppm. Benzene was detected in the same wells, at concentrations ranging from 0.012 ppm to 0.66 ppm (Table 2). Chemical concentration maps for TPH-Gasoline and benzene are presented on Plates 4 and 5, respectively. Historical chemical analytical data are presented on Table 3. Appendix A contains the analytical laboratory reports and Chain-of-Custody.

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Gettler-Ryan Inc.
October 8, 1991
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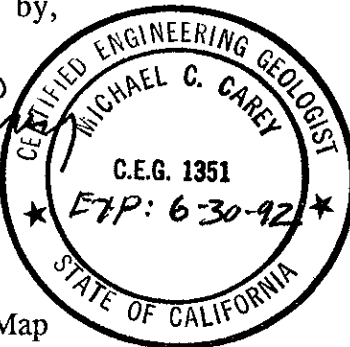
Quality Control

Quality Control (QC) samples for this quarter's sampling included a trip blank (TB) and duplicate sample (SD-1). These samples were prepared in the laboratory and field using organic-free water to evaluate laboratory and field handling procedures of samples and assess analytical precision. The results of QC sample analyses are presented in Table 2.

If you have any questions, please call.

GeoStrategies Inc. by,

Michael Carey
Michael C. Carey
C.E.G. 1351



MCC/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: Analytical Laboratory Report and Chain-of-Custody

QC Review: *JZ*

761001-16

TABLE 1

FIELD MONITORING DATA 2800 Telegraph Avenue, Oakland											
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	12-Jul-91	3	29.0	35.31	10.13	----	25.18	5	6.55	67.1	536
S-2	12-Jul-91	3	29.0	33.91	10.00	----	23.91	3	6.67	68.9	703
S-3	12-Jul-91	3	----	33.56	9.90	0.13	23.76	----	----	----	----
S-4	12-Jul-91	3	30.5	34.08	10.82	----	23.26	5	6.51	66.9	469
S-5	12-Jul-91	3	30.6	33.42	10.44	----	22.98	5	6.98	68.1	134
S-6	12-Jul-91	3	22.2	32.59	9.83	----	22.76	3	6.90	69.6	628
S-7	12-Jul-91	3	30.7	33.33	11.60	----	21.73	6	6.87	68.9	595
S-8	12-Jul-91	3	19.2	31.97	10.53	----	21.44	6	6.97	71.0	475
S-9	12-Jul-91	3	30.0	31.86	10.85	----	21.01	6	6.88	68.7	537
S-10	12-Jul-91	3	24.3	32.95	9.72	----	23.23	2	6.88	67.9	173
S-11	12-Jul-91	3	19.2	30.78	10.29	----	20.49	5	6.68	67.6	439
SR-1	12-Jul-91	6	----	----	9.67	----	----	----	----	----	----

- Notes:
1. Static water elevations referenced to Mean Sea Level (MSL).
 2. Physical parameter measurements represent stabilized values.
 3. pH values reported in pH units.
 4. ~~Static water levels corrected for floating product (conversion factor = 0.80).~~
 5. Recovery Well SR-1 was monitored, but not sampled.
(Depth to water is referenced from top of casing.)

TABLE 2

GROUND-WATER ANALYSIS DATA 2800 Telegraph Avenue, Oakland							
WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
S-1	12-Jul-91	18-Jul-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-2	12-Jul-91	19-Jul-91	0.15	0.022	<0.0005	0.0036	0.0027
S-4	12-Jul-91	18-Jul-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-5	12-Jul-91	19-Jul-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-6	12-Jul-91	19-Jul-91	2.9	0.66	0.02	0.02	0.08
S-7	12-Jul-91	19-Jul-91	0.96	0.067	0.0043	0.0068	0.032
S-8	12-Jul-91	19-Jul-91	0.82	0.034	0.038	0.041	0.11
S-9	12-Jul-91	18-Jul-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-10	12-Jul-91	19-Jul-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-11	12-Jul-91	19-Jul-91	0.19	0.012	0.0023	0.010	0.044

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

SD = Duplicate Sample

PPM = Parts Per Million

TB = Trip Blank

- Note: 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.

TABLE 2

GROUND-WATER ANALYSIS DATA 2800 Telegraph Avenue, Oakland							
WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
SD-1	12-Jul-91	18-Jul-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
TB	----	17-Jul-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE
2800 Telegraph Avenue
Oakland, CA

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)	OIL (PPM)
02-May-88	S-1	<0.05	0.5	<0.001	----	<0.004	<1.	<5.
08-Nov-88	S-1	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
02-May-89	S-1	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
03-Aug-89	S-1	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
03-Oct-89	S-1	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
16-Jan-90	S-1	<0.050	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
13-Apr-90	S-1	<0.050	<0.0005	0.0006	<0.0005	<0.001	N/A	N/A
05-Jul-90	S-1	<0.05	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
12-Oct-90	S-1	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	N/A	N/A
22-Jan-91	S-1	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	N/A	N/A
30-Apr-91	S-1	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	N/A	N/A
12-Jul-91	S-1	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	N/A	N/A
02-May-88	S-2	1.6	0.079	0.089	----	0.048	N/A	N/A
08-Nov-88	S-2	0.2	0.022	0.001	0.016	0.008	N/A	N/A
02-May-89	S-2	2.2	0.5	0.052	0.12	0.18	N/A	N/A
03-Aug-89	S-2	0.43	0.073	0.001	0.014	0.007	N/A	N/A
03-Oct-89	S-2	0.37	0.012	0.019	0.013	0.078	N/A	N/A
16-Jan-90	S-2	0.42	0.075	0.0099	0.032	0.052	N/A	N/A
13-Apr-90	S-2	0.34	0.063	0.0025	0.019	0.015	N/A	N/A
05-Jul-90	S-2	0.10	0.01	<0.0005	0.0018	0.002	N/A	N/A
12-Oct-90	S-2	<0.05	0.0020	<0.0005	<0.0005	<0.0005	N/A	N/A
22-Jan-91	S-2	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	N/A	N/A
30-Apr-91	S-2	0.60	0.060	0.0036	0.016	0.015	N/A	N/A
12-Jul-91	S-2	0.15	0.022	<0.0005	0.0036	0.0027	N/A	N/A
02-May-88	S-3	46.	2.7	10.	----	10.	N/A	N/A
02-May-89	S-3	47.	2.0	6.0	1.7	7.2	N/A	N/A
13-Apr-90	S-3	16.	0.54	2.4	0.81	3.9	N/A	N/A

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE
2800 Telegraph Avenue
Oakland, CA

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)	OIL (PPM)
05-Jul-90	S-3	16.	0.42	1.7	0.64	3.1	N/A	N/A
12-Oct-90	S-3	Free Product	0.12 ft					
22-Jan-91	S-3	Free Product	0.15 ft					
30-Apr-91	S-3	Free Product	0.13 ft					
12-Jul-91	S-3	Free Product	0.13 ft					
08-Nov-88	S-4	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
22-Feb-89	S-4	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
02-May-89	S-4	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
03-Aug-89	S-4	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
03-Oct-89	S-4	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
16-Jan-90	S-4	<0.050	<0.0005	<0.0005	<0.0005	0.001	N/A	N/A
13-Apr-90	S-4	<0.050	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
05-Jul-90	S-4	<0.05	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
12-Oct-90	S-4	<0.05	0.0010	0.0047	0.0010	0.0032	N/A	N/A
22-Jan-91	S-4	<0.05	<0.0005	<0.0005	<0.0005	0.0029	N/A	N/A
30-Apr-91	S-4	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	N/A	N/A
12-Jul-91	S-4	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	N/A	N/A
08-Nov-88	S-5	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
22-Feb-89	S-5	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
02-May-89	S-5	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
03-Aug-89	S-5	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
03-Oct-89	S-5	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
16-Jan-90	S-5	<0.050	<0.0005	<0.0005	<0.0005	0.001	N/A	N/A
13-Apr-90	S-5	<0.050	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
05-Jul-90	S-5	<0.050	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
12-Oct-90	S-5	<0.05	0.0005	0.0026	0.0005	0.0017	N/A	N/A
22-Jan-91	S-5	<0.05	<0.0005	<0.0005	<0.0005	0.0010	N/A	N/A
30-Apr-91	S-5	<0.05	<0.0005	<0.0005	<0.0005	0.0008	N/A	N/A

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE
2800 Telegraph Avenue
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SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)	OIL (PPM)
12-Jul-91	S-5	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	N/A	N/A
08-Nov-88	S-6	5.5	1.7	0.02	0.02	0.12	N/A	N/A
22-Feb-89	S-6	6.0	2.4	0.05	0.11	0.3	N/A	N/A
02-May-89	S-6	9.1	3.7	0.12	0.28	0.3	N/A	N/A
03-Aug-89	S-6	7.1	2.4	<0.05	0.07	<0.2	N/A	N/A
03-Oct-89	S-6	5.9	1.6	0.033	0.058	0.10	N/A	N/A
16-Jan-90	S-6	5.9	1.8	0.15	0.16	0.41	N/A	N/A
13-Apr-90	S-6	5.9	1.8	0.07	0.02	0.16	N/A	N/A
05-Jul-90	S-6	4.2	1.2	0.02	0.03	0.08	N/A	N/A
12-Oct-90	S-6	1.7	0.39	0.0065	0.0036	0.016	N/A	N/A
22-Jan-91	S-6	2.2	0.44	0.015	<0.01	0.059	N/A	N/A
30-Apr-91	S-6	4.8	0.64	0.15	0.17	0.48	N/A	N/A
12-Jul-91	S-6	2.9	0.66	0.02	0.02	0.08	N/A	N/A
08-Nov-88	S-7	2.6	0.088	0.43	0.086	0.43	N/A	N/A
22-Feb-89	S-7	0.8	0.025	0.027	0.029	0.17	N/A	N/A
02-May-89	S-7	0.8	0.032	0.014	0.021	0.11	N/A	N/A
03-Aug-89	S-7	5.0	0.66	0.38	0.23	0.71	N/A	N/A
03-Oct-89	S-7	0.96	0.11	0.008	0.013	0.046	N/A	N/A
16-Jan-90	S-7	0.23	0.0010	0.0018	0.0031	0.017	N/A	N/A
13-Apr-90	S-7	0.32	0.0051	0.0008	0.0023	0.012	N/A	N/A
05-Jul-90	S-7	0.27	0.0055	0.001	0.0006	0.005	N/A	N/A
12-Oct-90	S-7	0.63	0.043	0.0053	0.0048	0.012	N/A	N/A
22-Jan-91	S-7	1.2	0.077	0.027	0.057	0.16	N/A	N/A
30-Apr-91	S-7	0.24	0.0032	0.0023	0.0036	0.010	N/A	N/A
12-Jul-91	S-7	0.96	0.067	0.0043	0.0068	0.032	N/A	N/A
03-Aug-89	S-8	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
03-Oct-89	S-8	1.6	0.022	0.11	0.053	0.24	N/A	N/A

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE
2800 Telegraph Avenue
Oakland, CA

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)	OIL (PPM)
16-Jan-90	S-8	2.0	0.040	0.15	0.090	0.40	N/A	N/A
13-Apr-90	S-8	1.6	0.027	0.071	0.048	0.21	N/A	N/A
05-Jul-90	S-8	1.5	0.025	0.075	0.067	0.25	N/A	N/A
12-Oct-90	S-8	1.0	0.017	0.031	0.034	0.12	N/A	N/A
22-Jan-91	S-8	0.82	0.017	0.037	0.030	0.12	N/A	N/A
30-Apr-91	S-8	2.9	0.046	0.11	0.12	0.33	N/A	N/A
12-Jul-91	S-8	0.82	0.034	0.038	0.041	0.11	N/A	N/A
03-Aug-89	S-9	1.6	0.032	0.12	0.052	0.25	N/A	N/A
03-Oct-89	S-9	<0.05	<0.0005	0.001	<0.001	0.003	N/A	N/A
16-Jan-90	S-9	<0.050	<0.0005	<0.0005	<0.0005	0.001	N/A	N/A
13-Apr-90	S-9	<0.050	0.0007	0.0023	<0.0005	0.003	N/A	N/A
05-Jul-90	S-9	<0.05	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
12-Oct-90	S-9	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	N/A	N/A
22-Jan-91	S-9	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	N/A	N/A
30-Apr-91	S-9	<0.05	<0.0005	<0.0005	<0.0005	0.0006	N/A	N/A
12-Jul-91	S-9	<0.05	<0.0005	<0.0005	<0.0005	<0.0005		
03-Aug-89	S-10	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
03-Oct-89	S-10	<0.05	<0.0005	<0.001	<0.001	<0.003	N/A	N/A
16-Jan-90	S-10	<0.050	<0.0005	<0.0005	<0.0005	0.001	N/A	N/A
13-Apr-90	S-10	<0.050	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
05-Jul-90	S-10	<0.05	<0.0005	<0.0005	<0.0005	<0.001	N/A	N/A
12-Oct-90	S-10	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	N/A	N/A
22-Jan-91	S-10	<0.05	0.0007	0.0082	0.0022	0.014	N/A	N/A
30-Apr-91	S-10	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	N/A	N/A
12-Jul-91	S-10	<0.05	<0.0005	<0.0005	<0.0005	<0.0005		
16-Oct-89	S-11	0.65	0.042	0.047	0.024	0.16	N/A	N/A
16-Jan-90	S-11	0.35	0.027	0.035	0.020	0.11	N/A	N/A

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE
 2800 Telegraph Avenue
 Oakland, CA

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)	OIL (PPM)
13-Apr-90	S-11	0.90	0.057	0.11	0.037	0.24	N/A	N/A
05-Jul-90	S-11	2.0	0.11	0.21	0.093	0.53	N/A	N/A
12-Oct-90	S-11	1.2	0.14	0.10	0.064	0.22	N/A	N/A
22-Jan-91	S-11	1.4	0.085	0.093	0.088	0.30	N/A	N/A
30-Apr-91	S-11	5.4	0.048	0.026	0.080	0.37	N/A	N/A
12-Jul-91	S-11	0.19	0.012	0.0023	0.010	0.044	N/A	N/A

Current Regional Water Quality Control Board Maximum Contaminant Levels

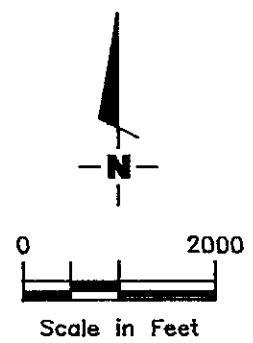
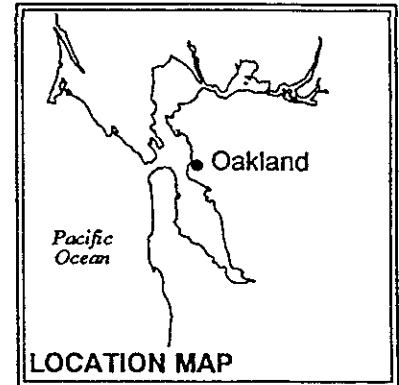
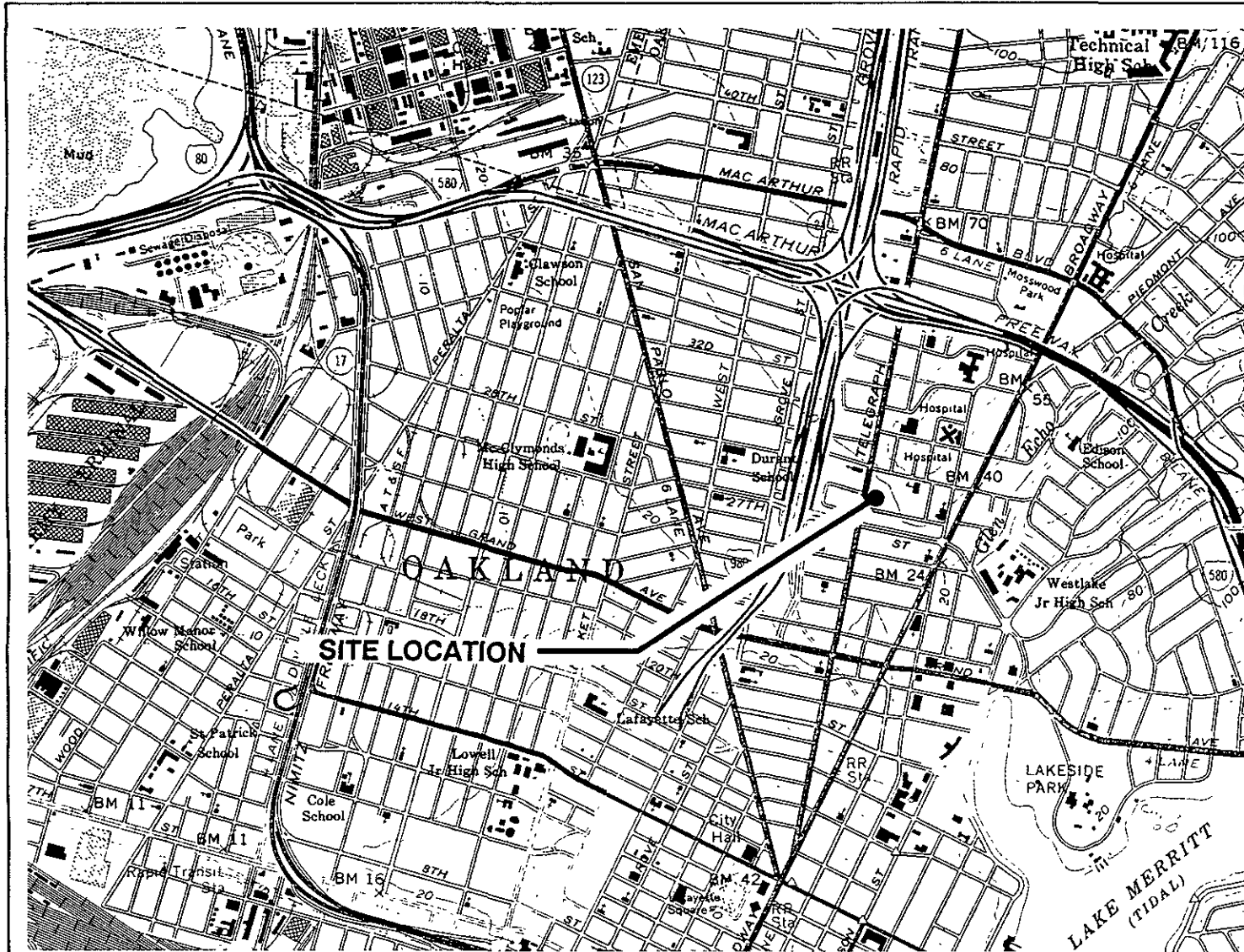
Benzene 0.001 ppm Xylenes 1.750 ppm Ethylbenzene 0.680 ppm

Current DHS Action Levels Toluene 0.1000 ppm

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline

PPM = Parts Per Million

- 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 prior to May 1989.



Base Map: USGS Topographic Map

VICINITY MAP
 Former Shell Service Station
 2800 Telegraph Avenue
 Oakland, California

PLATE

1



GeoStrategies Inc.

JOB NUMBER
7610

REVIEWED BY

DATE
3/91

REVISED DATE

EXPLANATION

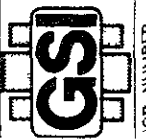
- ◆ Ground-water monitoring well
- ⊕ Ground-water recovery well
- Soil boring

SITE PLAN
 Former Shell Service Station
 2800 Telegraph Avenue
 Oakland, California

REVISED DATE

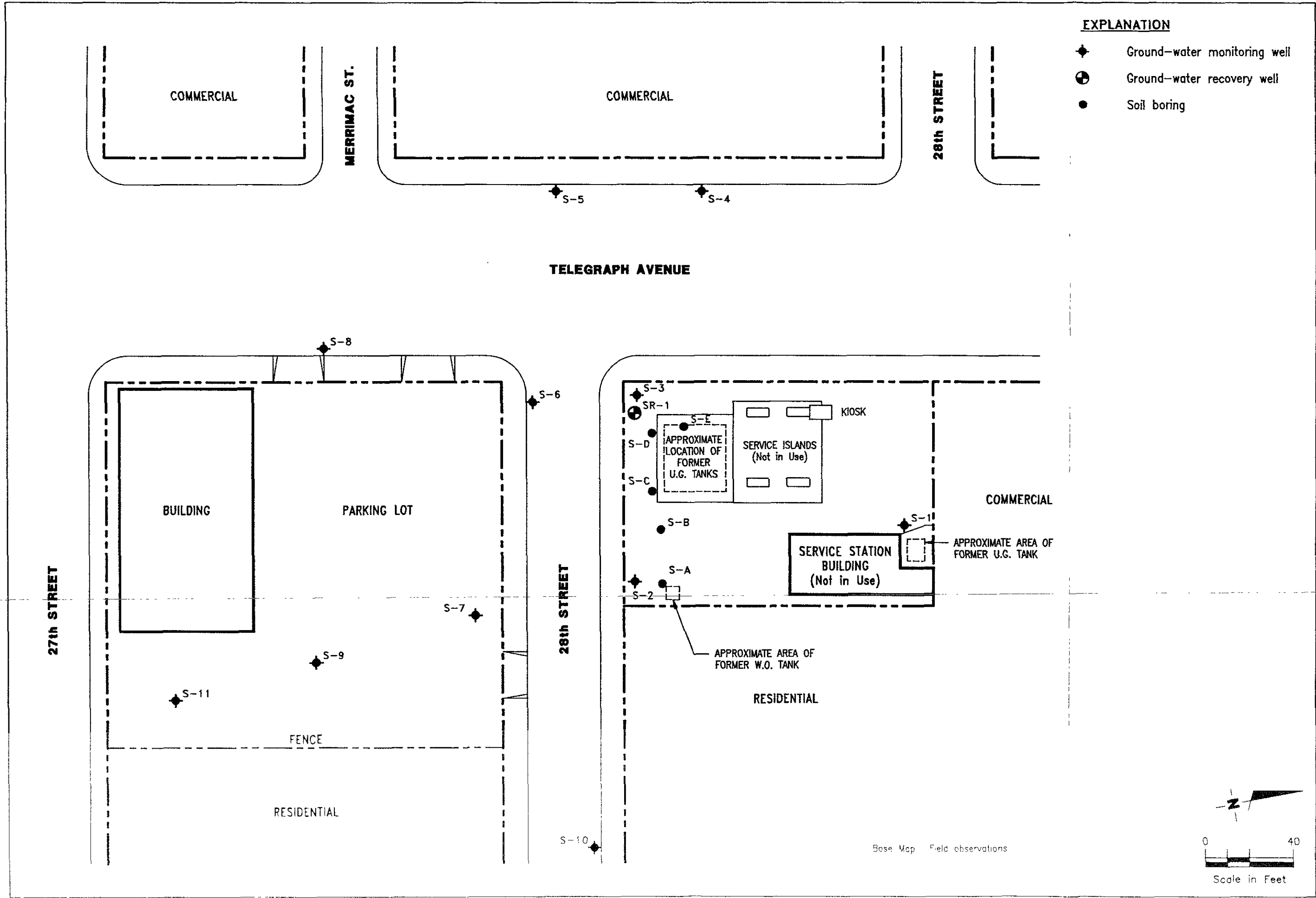
DATE 10/91

GeoStrategies Inc.



REVIEWED BY MCC

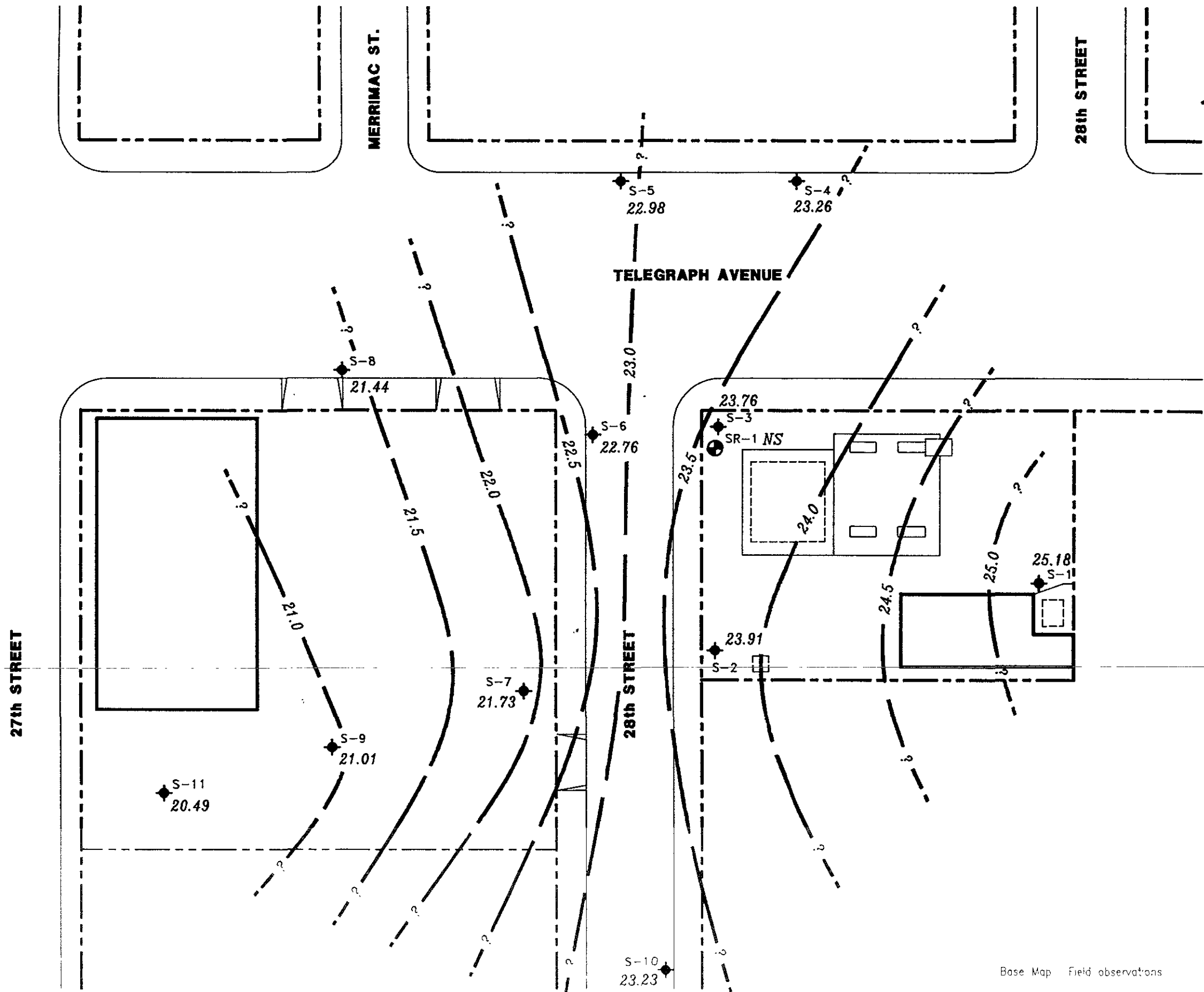
JOB NUMBER 761001-16



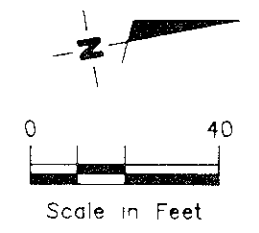
EXPLANATION

- ◆ Ground-water monitoring well
- ⊕ Ground-water recovery well
- 99.99- Ground-water elevation contour
Approximate Gradient = 0.015
- 99.99 Ground-water elevation in feet
referenced to Mean Sea Level
(MSL) measured on July 12,
1991
- NS Not sampled

Note: Contours may be influenced by irrigation practices and/or site construction activities.

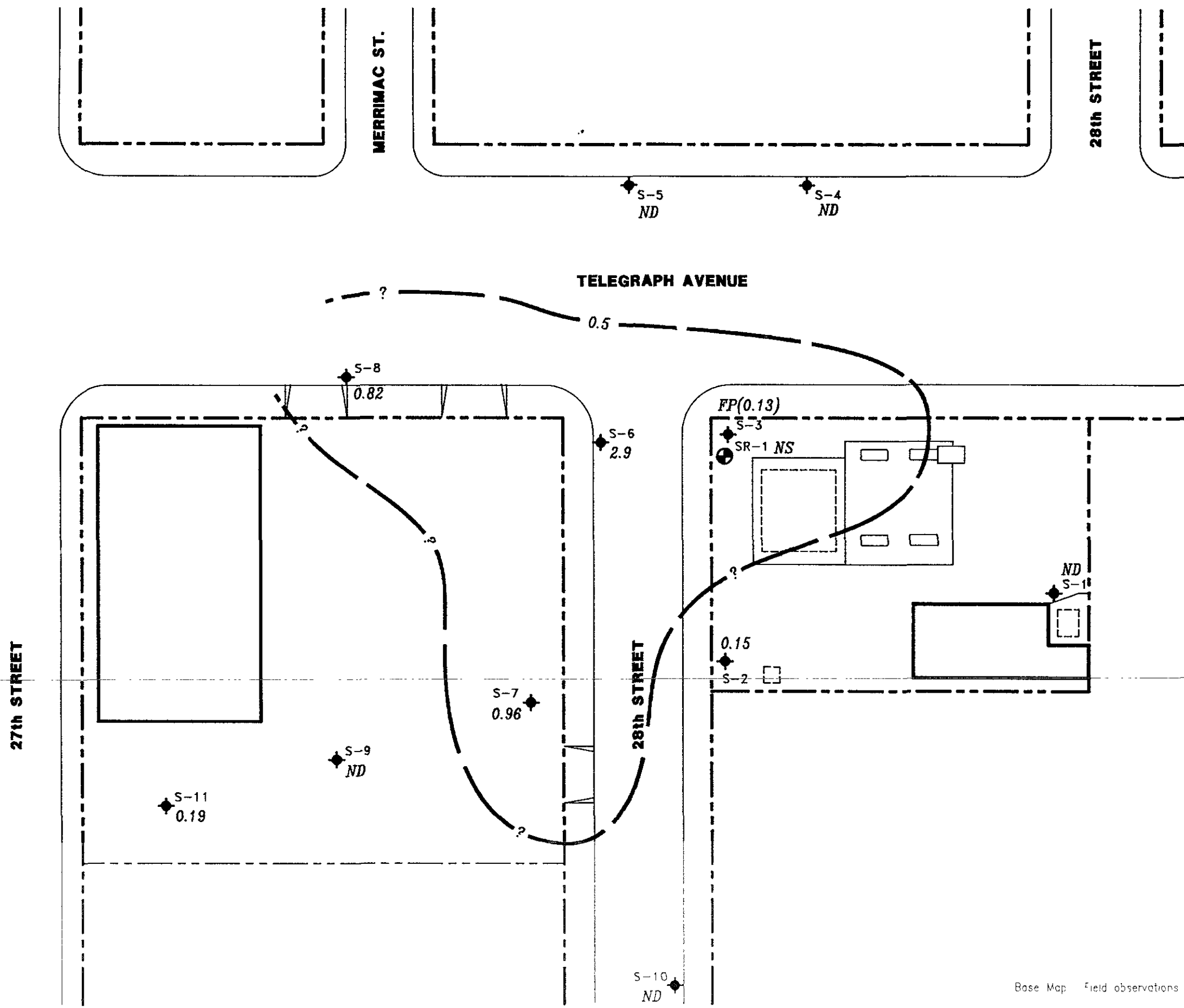


Base Map Field observations

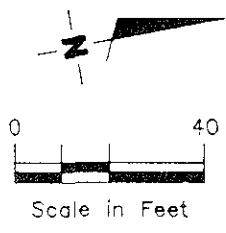


EXPLANATION

- ◆ Ground-water monitoring well
- ⊕ Ground-water recovery well
- 5.00
5.0 TPH-G isoconcentration contour
- 5.0 TPH-G (Total Petroleum Hydrocarbons calculated as Gasoline) concentration in ppm sampled on July 12, 1991
- FP(0.01) Floating Product (measured thickness in feet)
- ND Not Detected (See laboratory reports for detection limits)
- NS Not sampled



Base Map Field observations



BENZENE ISOCONCENTRATION MAP
 Former Shell Service Station
 2800 Telegraph Avenue
 Oakland, California

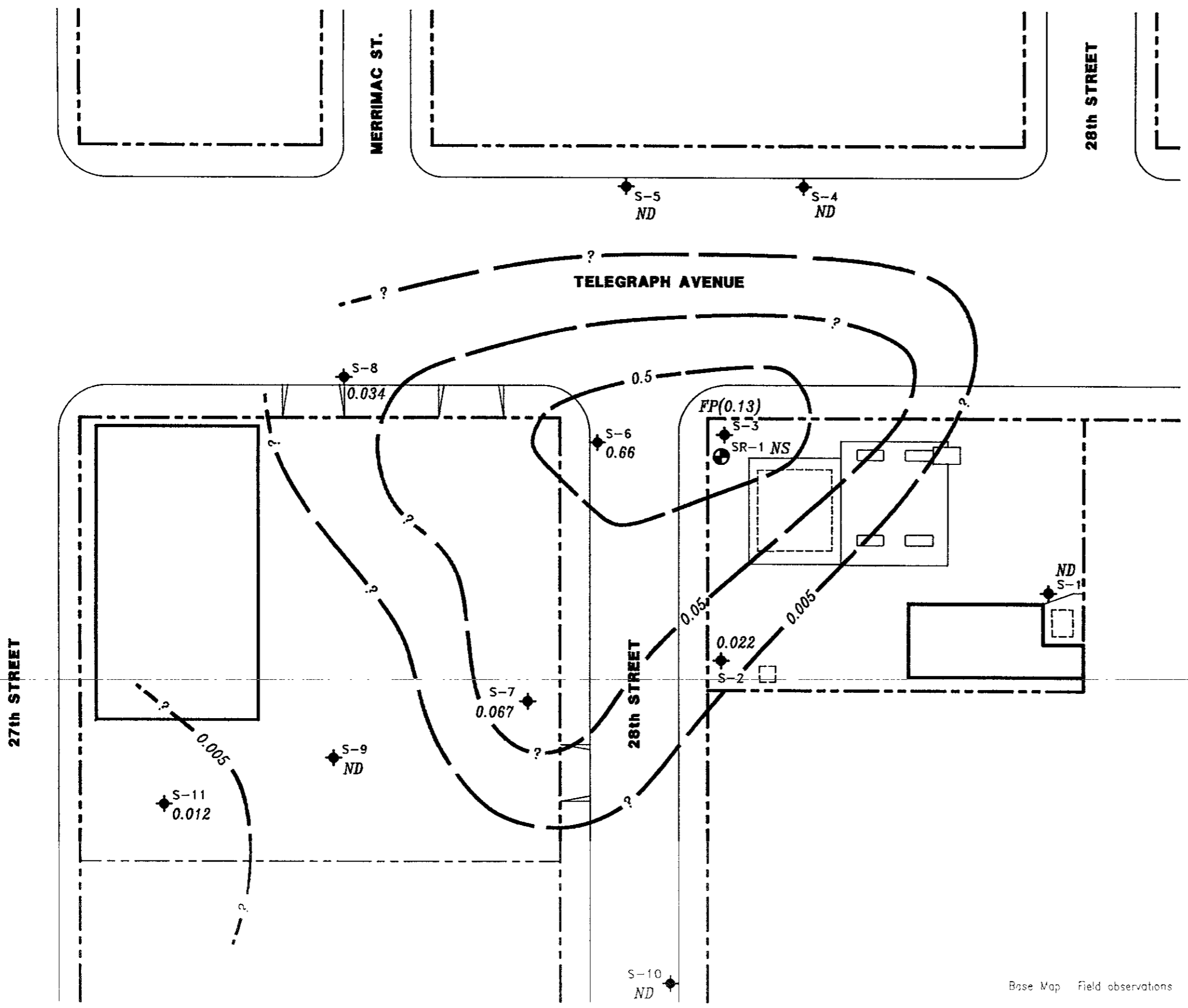
GeoStrategies Inc.



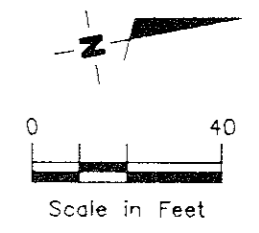
JOB NUMBER 761001-16
 DATE 10/91
 REVISOR BY *MCC*
 REVISED DATE

EXPLANATION

- ◆ Ground-water monitoring well
- ⊕ Ground-water recovery well
- - - 0.05 Benzene isoconcentration contour
- 0.05 Benzene concentration in ppm sampled on July 12, 1991
- FP(0.01) Floating Product (measured thickness in feet)
- ND Not Detected (See laboratory reports for detection limits)
- NS Not sampled



Base Map Field observations



GeoStrategies Inc.

APPENDIX A
ANALYTICAL LABORATORY REPORT
AND CHAIN-OF-CUSTODY



ANALYTICAL SERVICES

RECEIVED

JUL 31 1991

CERTIFICATE OF ANALYSIS GETTLER-RYAN INC. GENERAL CONTRACTORS

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

Date: 07/30/91

Work Order: T1-07-191

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

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3610, 2800 Telegraph, Okln
Date Received: 07/16/91
Number of Samples: 12
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

<u>PAGES</u>	<u>LABORATORY #</u>	<u>SAMPLE IDENTIFICATION</u>
2	T1-07-191-01	S-1
3	T1-07-191-02	S-2
4	T1-07-191-03	S-4
5	T1-07-191-04	S-5
6	T1-07-191-05	S-6
7	T1-07-191-06	S-7
8	T1-07-191-07	S-8
9	T1-07-191-08	S-9
10	T1-07-191-09	S-10
11	T1-07-191-10	S-11
12	T1-07-191-11	SD-1
13	T1-07-191-12	TRIP BLANK
15	T1-07-191-13	Quality Control

Reviewed and Approved:


Suzanne Veaudry
Project Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

Company: Shell Oil Company
 Date: 07/30/91
 Client Work ID: GR3610, 2800 Telegraph, Oklnd

IT ANALYTICAL SERVICES
 SAN JOSE, CA

Work Order: T1-07-191

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-1
 SAMPLE DATE: 07/12/91
 LAB SAMPLE ID: T107191-01
 SAMPLE MATRIX: aqueous
 RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/18/91
Low Boiling Hydrocarbons	Mod.8015		07/18/91

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)	113.
1,3-Dichlorobenzene (BTEX)	100.

Company: Shell Oil Company
 Date: 07/30/91
 Client Work ID: GR3610, 2800 Telegraph, Okind

IT ANALYTICAL SERVICES
 SAN JOSE, CA

Work Order: T1-07-191

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-2
 SAMPLE DATE: 07/12/91
 LAB SAMPLE ID: T107191-02
 SAMPLE MATRIX: aqueous
 RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/19/91
Low Boiling Hydrocarbons	Mod.8015		07/19/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.15
BTEX		
Benzene	0.0005	0.022
Toluene	0.0005	None
Ethylbenzene	0.0005	0.0036
Xylenes (total)	0.0005	0.0027

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	117.
1,3-Dichlorobenzene (BTEX)	105.

Company: Shell Oil Company
 Date: 07/30/91
 Client Work ID: GR3610, 2800 Telegraph, Okln

IT ANALYTICAL SERVICES
 SAN JOSE, CA

Work Order: T1-07-191

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-4
 SAMPLE DATE: 07/12/91
 LAB SAMPLE ID: T107191-03
 SAMPLE MATRIX: aqueous
 RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/18/91
Low Boiling Hydrocarbons	Mod.8015		07/18/91

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)	110.
1,3-Dichlorobenzene (BTEX)	98.

Company: Shell Oil Company
 Date: 07/30/91
 Client Work ID: GR3610, 2800 Telegraph, Okind

IT ANALYTICAL SERVICES
 SAN JOSE, CA

Work Order: T1-07-191

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-5
 SAMPLE DATE: 07/12/91
 LAB SAMPLE ID: T107191-04
 SAMPLE MATRIX: aqueous
 RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/19/91
Low Boiling Hydrocarbons	Mod.8015		07/19/91

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)	114.
1,3-Dichlorobenzene (BTEX)	100.

Company: Shell Oil Company
 Date: 07/30/91
 Client Work ID: GR3610, 2800 Telegraph, Okind

IT ANALYTICAL SERVICES
 SAN JOSE, CA

Work Order: T1-07-191

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-6
 SAMPLE DATE: 07/12/91
 LAB SAMPLE ID: T107191-05
 SAMPLE MATRIX: aqueous
 RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/19/91
Low Boiling Hydrocarbons	Mod.8015		07/19/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	1.0	2.9
BTEX		
Benzene	0.01	0.66
Toluene	0.01	0.02
Ethylbenzene	0.01	0.02
Xylenes (total)	0.01	0.08

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	103.
1,3-Dichlorobenzene (BTEX)	98.

Company: Shell Oil Company
 Date: 07/30/91
 Client Work ID: GR3610, 2800 Telegraph, Okln

IT ANALYTICAL SERVICES
 SAN JOSE, CA

Work Order: T1-07-191

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-7
 SAMPLE DATE: 07/12/91
 LAB SAMPLE ID: T107191-06
 SAMPLE MATRIX: aqueous
 RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/19/91
Low Boiling Hydrocarbons	Mod.8015		07/19/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.96
BTEX		
Benzene	0.0005	0.067
Toluene	0.0005	0.0043
Ethylbenzene	0.0005	0.0068
Xylenes (total)	0.0005	0.032

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	*150.
1,3-Dichlorobenzene (BTEX)	108.

*Surrogate elevated due to hydrocarbon interferences.

Company: Shell Oil Company
 Date: 07/30/91
 Client Work ID: GR3610, 2800 Telegraph, Okind

IT ANALYTICAL SERVICES
 SAN JOSE, CA

Work Order: T1-07-191

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-8
 SAMPLE DATE: 07/12/91
 LAB SAMPLE ID: T107191-07
 SAMPLE MATRIX: aqueous
 RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/19/91
Low Boiling Hydrocarbons	Mod.8015		07/19/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.25	0.82
BTEX		
Benzene	0.0025	0.034
Toluene	0.0025	0.038
Ethylbenzene	0.0025	0.041
Xylenes (total)	0.0025	0.11

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	106.
1,3-Dichlorobenzene (BTEX)	99.

Company: Shell Oil Company
 Date: 07/30/91
 Client Work ID: GR3610, 2800 Telegraph, Okind

IT ANALYTICAL SERVICES
 SAN JOSE, CA

Work Order: T1-07-191

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-9
 SAMPLE DATE: 07/12/91
 LAB SAMPLE ID: T107191-08
 SAMPLE MATRIX: aqueous
 RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/18/91
Low Boiling Hydrocarbons	Mod.8015		07/18/91

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)	111.
1,3-Dichlorobenzene (BTEX)	99.

Company: Shell Oil Company
 Date: 07/30/91
 Client Work ID: GR3610, 2800 Telegraph, Okind

IT ANALYTICAL SERVICES
 SAN JOSE, CA

Work Order: T1-07-191

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-10
 SAMPLE DATE: 07/12/91
 LAB SAMPLE ID: T107191-09
 SAMPLE MATRIX: aqueous
 RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/19/91
Low Boiling Hydrocarbons	Mod.8015		07/19/91

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)	114.
1,3-Dichlorobenzene (BTEX)	99.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company

Date: 07/30/91

Client Work ID: GR3610, 2800 Telegraph, Okind

Work Order: T1-07-191

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-11

SAMPLE DATE: 07/12/91

LAB SAMPLE ID: T107191-10

SAMPLE MATRIX: aqueous

RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/19/91
Low Boiling Hydrocarbons	Mod.8015		07/19/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.19
BTEX		
Benzene	0.0005	0.012
Toluene	0.0005	0.0023
Ethylbenzene	0.0005	0.010
Xylenes (total)	0.0005	0.044

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	116.
1,3-Dichlorobenzene (BTEX)	98.

Company: Shell Oil Company
 Date: 07/30/91
 Client Work ID: GR3610, 2800 Telegraph, Okind

IT ANALYTICAL SERVICES
 SAN JOSE, CA

Work Order: T1-07-191

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: SD-1
 SAMPLE DATE: 07/12/91
 LAB SAMPLE ID: T107191-11
 SAMPLE MATRIX: aqueous
 RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/18/91
Low Boiling Hydrocarbons	Mod.8015		07/18/91

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)	110.
1,3-Dichlorobenzene (BTEX)	97.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company

Date: 07/30/91

Client Work ID: GR3610, 2800 Telegraph, Oklnd

Work Order: T1-07-191

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: TRIP BLANK

SAMPLE DATE: not spec

LAB SAMPLE ID: T107191-12

SAMPLE MATRIX: aqueous

RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	<u>METHOD</u>	<u>EXTRACTION DATE</u>	<u>ANALYSIS DATE</u>
BTEX	8020		07/17/91
Low Boiling Hydrocarbons	Mod.8015		07/17/91

<u>PARAMETER</u>	<u>DETECTION LIMIT</u>	<u>DETECTED</u>
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

<u>SURROGATES</u>	<u>% REC</u>
1,3-Dichlorobenzene (Gasoline)	110.
1,3-Dichlorobenzene (BTEX)	99.

Company: Shell Oil Company

Date: 07/30/91

Client Work ID: GR3610, 2800 Telegraph, Oklnd

Work Order: T1-07-191

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control

SAMPLE DATE: not spec

LAB SAMPLE ID: T107191-13A

EXTRACTION DATE:

ANALYSIS DATE: 07/17/91

ANALYSIS METHOD: 8020

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
Benzene	ND<0.5	50.0	47.0	48.6	94.	97.	3.
Toluene	ND<0.5	50.0	48.6	48.3	97.	97.	0
Ethyl benzene	ND<0.5	50.0	48.5	48.4	97.	97.	0
Xylenes	ND<0.5	150.	140.	140.	93.	93.	0

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

Company: Shell Oil Company
 Date: 07/30/91
 Client Work ID: GR3610, 2800 Telegraph, Okind

IT ANALYTICAL SERVICES
 SAN JOSE, CA

Work Order: T1-07-191

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
 SAMPLE DATE: not spec
 LAB SAMPLE ID: T107191-13B
 EXTRACTION DATE:
 ANALYSIS DATE: 07/19/91
 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.	448.	461.	90.	92.	2.
SURROGATES					MS %Rec	MSD %Rec	
1,3-Dichlorobenzene					124.*	124.*	

*Surrogate elevated due to hydrocarbon interferences.

Company: Shell Oil Company

Date: 07/30/91

Client Work ID: GR3610, 2800 Telegraph, Okind

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-07-191

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.

COMPANY Shell JOB NO. _____
 JOB LOCATION 2800 Telegraph Ave / 28th
 CITY Oakland PHONE NO. 783-7500
 AUTHORIZED Tom Paulson DATE 7-12-91 P.O. NO. 3610.01

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
01 S-1	3	H ₂ O	7/12-91 / 11:05	THC (gas) BTX	Cool / by hand
02 S-2	↓	↓	12:35	↓	↓
03 S-4	↓	↓	10953	↓	↓
04 S-5	↓	↓	11031	↓	↓
05 S-6	↓	↓	112:40	↓	↓
06 S-7	↓	↓	110:07	↓	↓
07 S-8	↓	↓	111:13	↓	↓
08 S-9	↓	↓	109:41	↓	↓
09 S-10	↓	↓	112:00	↓	↓
10 S-11	↓	↓	109:04	↓	↓
11 SD-1	↓	↓	1 -	↓	↓
12 Trip	1	↓	- / -	↓	↓

RELINQUISHED BY: Guadalupe Sanchez 7-12-91 14:30
 RECEIVED BY: Rehig #1 7-12-91 14:30
 RELINQUISHED BY: Rehig #1 7-16-91 02:00
 RECEIVED BY: Shell 7-16-91 07:00
 RELINQUISHED BY: Alva 7-16-91 10:00
 RECEIVED BY LAB: J. DeHenera 7-16-91 10:00
 DESIGNATED LABORATORY: IT SCV DHS #: 137

REMARKS: Normal TAT
WIC# 204-5508-2303
EXPCODE: 5461
ENG. Jack Brastad
 DATE COMPLETED 7-12-91 FOREMAN Guadalupe Sanchez