Shell Oil Company

P.O. Box 4023
Concord, CA 94520

Telephone. (415) 676-1414

March 14, 1989

Mr. Rafat Shahid
County of Alameda
Department of Environmental Health
470 27th Street, Room 324
Oakland, California 94612

SUBJECT: SHELL SERVICE STATION
318 SOUTH LIVERMORE AVENUE
LIVERMORE, CALIFORNIA

Dear Mr. Shahid:

Enclosed is a copy of the report issued by Woodward-Clyde Consultants, dated March 8, 1989, presenting the findings of the soil investigation conducted at the subject location. The investigation involved the drilling of four exploratory soil borings and the analysis of soil samples collected during drilling. Gasoline related hydrocarbons were not detected in either the head-space tests conducted in the field or in the laboratory analyses.

The purpose of this investigation was to assess soil conditions adjacent to the existing underground storage tank complex prior to the pending tank replacement project.

If you should have any questions or comments regarding this project please do not hesitate to call me at (415) 676-1414 ext. 145.

Very truly yours,

Stanley J. Roller
Project Engineer

SJR/jw

enclosure

cc: Ms. Lisa McCann, Regional Water Quality Control Board

Oakland City Center
500 12th Street
Suite 100
Oakland, CA 94607-4014
(415) 893-3600

Woodward-Clyde Consultants

March 8, 1989
8820011A/0117

Gettler-Ryan Inc.
1992 National Avenue
Hayward, CA 94545

Attention: Mr. Jeff Ryan

Subject: Letter Report
Shell Service Station
318 S. Livermore Avenue
Livermore, California

This letter summarizes Woodward-Clyde Consultants' field activities at the Shell service station at 318 S. Livermore in Livermore, California on February 27, 1989. Four soil borings, designated S-A through S-D, were drilled within the tank complex at locations specified by Shell Oil Company and shown on Figure 1.

The borings were advanced using hollow-stem augers. A total of three soil samples were collected from each boring with a modified California Sampler fitted with brass liners at the following depth intervals: 4 to 5.5, 9 to 10.5 and 15 to 16.5 feet below grade. A Woodward-Clyde Consultants' (WCC) geologist observed the drilling, described the samples using the Unified Soils Classification System, and prepared a log for each boring. Preliminary copies of the logs are attached to this memorandum.

A portion of each soil sample collected was used to perform a head-space test in the field for volatile organic compounds. The test procedure involved emptying the contents of the brass liner used to collect the soil samples (approximately 30 grams) into a clean glass jar and covering the jar with aluminum foil secured under a ring-type threaded lid. After approximately twenty minutes, the foil was pierced and the head-space within the jar was tested for total organic vapor, measured in parts per million (HNu units), with an HNu photoionization detector. The head-space test results are presented on the attached boring logs.

A portion of the soil sample collected from each sample interval in each boring was retained for chemical analysis. These samples were collected in clean brass liners which were covered on both ends with Teflon sheeting and sealed with plastic end caps. The samples were then labeled and later transported on ice to I.T. Corporation's California

composited from the 3 depths?

State Department of Health Services-certified environmental laboratory in Santa Clara, California using WCC chain-of-custody documentation.

The analyses requested were for benzene, toluene, ethyl benzene, xylenes (BTEX), and low boiling point hydrocarbons (calculated as gasoline). The laboratory results will be sent directly to Gettler-Ryan by the IT Laboratory.

We appreciate the opportunity to provide consulting services on this project. Please call if we can be of additional assistance.

Sincerely,

WOODWARD-CLYDE CONSULTANTS

O. Glenn Heyman
Senior Staff Geologist

Michael S. Bonkowski
Senior Project Geologist
CEG 1329

RCP/sst
COT/8820011L22

Enclosures

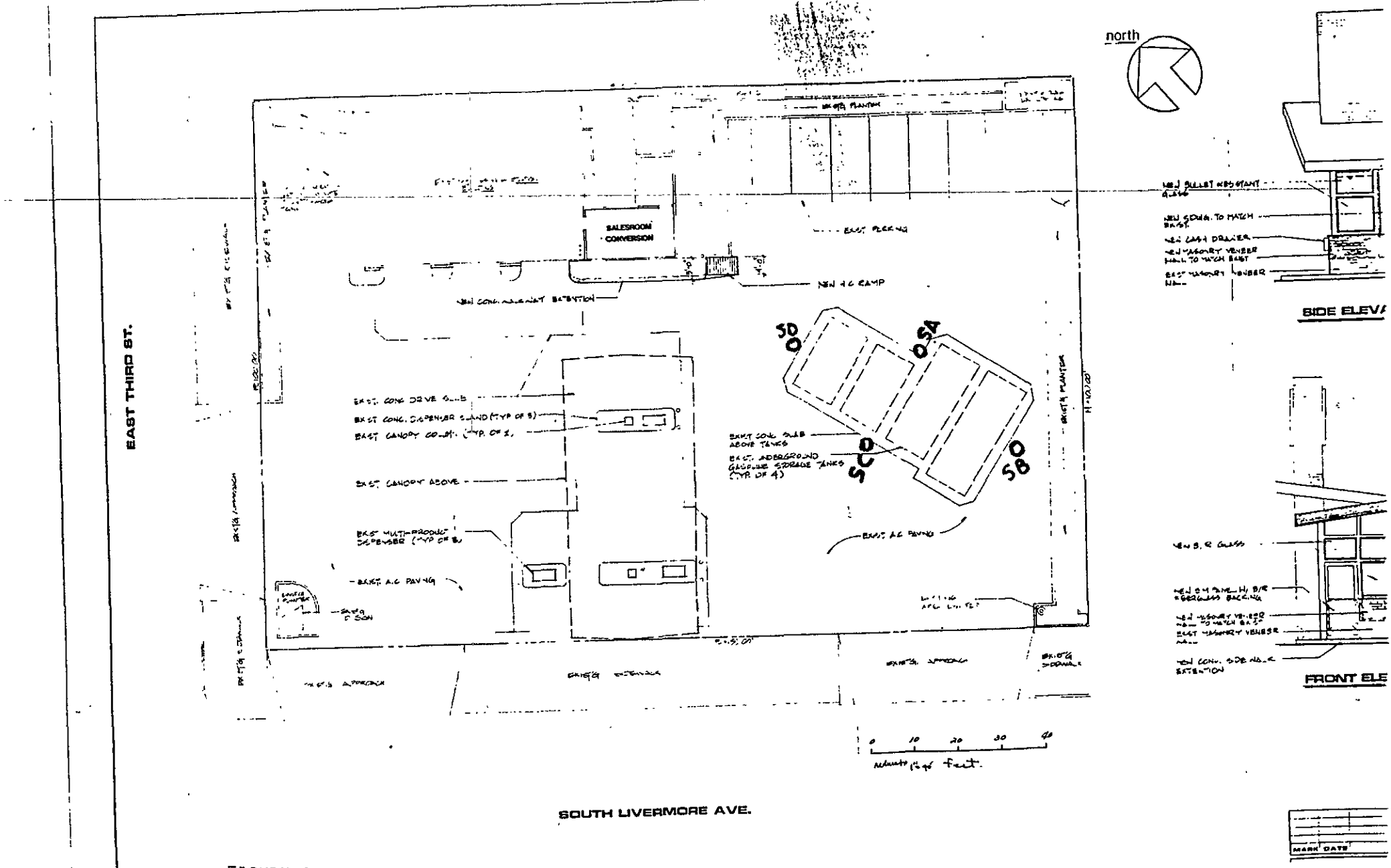

FIGURE 1
MODIFIED AFTER SITE PLAN
PROVIDED BY GETTLER-RYAN, INC.

1" = 30'

Woodward-Clyde Consultants

PROJECT NAME SHELL GETLER RYDN NO. 8820011A 0117

BORING LOCATION S-A SHELL STATION 318 S. LIVERMORE		ELEVATION AND DATUM	
DRILLING AGENCY BAY LAND	DRILLER CURT	DATE STARTED / DATE FINISHED 2-27-89	
DRILLING EQUIPMENT CME-76		COMPLETION DEPTH 10½	SAMPLER CAL MOD
DRILLING METHOD 8" Ø Hollow	DRILL BIT 8"	NO. OF SAMPLES / DIST.	UNDIST. 3
SIZE AND TYPE OF CASING —		WATER ELEV. / FIRST 16 ±	COMPL. 16½ 24 HRS
TYPE OF PERFORATION —	FROM — TO — FT.	LOGGED BY C. PARTEN	CHECKED BY:
SIZE AND TYPE OF PACK —	FROM — TO — FT.		
TYPE OF SEAL —	FROM — TO — FT.		

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	SAMPLES: Water Content	SAMPLES: Piezometer Data	SAMPLES: Type No	SAMPLES: Recov. ft	SAMPLES: Penetro Resist (Blows/6 in)	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
1	2" asphalt ; base rock fill								
2									
3									
4	clayey gravel w/sand, (GC) dense, brown, damp, w/ ½" gravel fill?								push to 450 psi
5				1				450 psi	No Odor
6	clayey gravel fill gravel to 4"Ø +								Oppm HNU
7	slow drilling								
8									
9	clayey gravel w/ sand, (GC) dense, brown, damp, Sand gravel to 2"Ø +							15	
10				2				32 24	No Odor Oppm HNU
11									
12									
13									
14									

FIELD LOG OF BORING NO. S-A SHEET 1 of 2

Woodward-Clyde Consultants

PROJECT NAME 8820011A 0117 NO. SHELL

DEPTH IN FEET	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Blows/6 inches	Penetration Data	SAMPLES: Type No.	SAMPLES: Recovery In.	SAMPLES: Penetration Resistance (Blows/ft or other)	REMARKS (Drill Rate, Field Tests, Odor, etc.)
15	clayey gravel, (GC), dense damp, brown, w/ angular rock fragments to 2"ø, native soil, free water noted around gravel	? ▽ ?		3				16	NO ODOR
16								20	0 ppm
17	bottom of boring 16½'							26	HNU
18									
19									
20									

FIELD LOG OF BORING NO. S-A SHEET 2 of 2

0120

Woodward-Clyde Consultants PROJECT NAME SHELL STATION NO. 8820014 ~~017~~

BORING LOCATION SHELL SERVICE 218 S. LIVERMORE AVE		ELEVATION AND DATUM	
DRILLING AGENCY BAY LANDS	DRILLER KURT	DATE STARTED / DATE FINISHED	2-27-89
DRILLING EQUIPMENT C-75		COMPLETION DEPTH	SAMPLER
DRILLING METHOD Borrow STEM	DRILL BIT 8" AUGER	NO. OF SAMPLES / DIST.	UNDIST. 3
SIZE AND TYPE OF CASING —		WATER ELEV. / FIRST ▽ 16'	COMPL. / 24 HRS
TYPE OF PERFORATION —	FROM — TO — FT.	LOGGED BY C. PARKER	CHECKED BY:
SIZE AND TYPE OF PACK —	FROM — TO — FT.		
TYPE OF SEAL —	FROM — TO — FT.		

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No.	SAMPLES: Recov. in.	SAMPLES: Penetr. Resist. (Blows/6 in.)	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
1	3" asphalt, base rock fill								
2	clayey gravel								
3									
4	gravelly clay (CL), (stiff) dense, damp brown, gravel to 1/2" ø							500 PSI E=	
5				1					NO Odor 0 ppm HNU
6									
7									
8									
9	clayey gravel (GC), dense, damp, brown, gravel to 2" ø,							8	
10				2				16 18	No Odor 0 ppm HNU.
11									
12									
13									
14									

FIELD LOG OF BORING NO. S-8 SHEET 1 of 2

Woodward-Clyde Consultants

PROJECT NAME GETTLER RYAN NO. 882007.A 01.5

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No.	SAMPLES: Recov. in	SAMPLES: Penetr. Resist. (blows/ft.)	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
15	silty clay (CL) damp, medium	▼						3	
16	stiff brown mottled tan			3				7	No Odor
	no gravel							15	0 ppm
	bottom of hole 16½'								HNU
17									

FIELD LOG OF BORING NO. S-8 SHEET 2 of 2

Woodward-Clyde Consultants PROJECT NAME SHELL SERVICE NO. 8820014 OU

BORING LOCATION SHELL SERVICE 318 LIVERMORE AVE (S-C)	ELEVATION AND DATUM
DRILLING AGENCY BAY LAND / DRILLER	DATE STARTED 2-27-89 / DATE FINISHED
DRILLING EQUIPMENT C-75	COMPLETION DEPTH / SAMPLER
DRILLING METHOD 8" HOLLOW AUGER / DRILL BIT 8"	NO. OF SAMPLES / DIST. / UNDIST. 3
SIZE AND TYPE OF CASING —	WATER ELEV. / FIRST ~16 / COMPL. / 24 HRS
TYPE OF PERFORATION — FROM TO FT.	LOGGED BY C. PARTEN / CHECKED BY:
SIZE AND TYPE OF PACK — FROM TO FT.	
TYPE OF SEAL — FROM TO FT.	

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No.	SAMPLES: Recov. ft.	SAMPLES: Penetr. Resist. (Blows/6 in.)	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
0	3" asphalt, base rock, fill								
1	clayey gravel								
2									
3									
4	gravely clay w/sand (CL), damp very stiff, brown (dark), gravel to 2" ø.					1	6"	500 psi	No Odor 0 ppm HNU
5									
6									
7									
8									
9	clayey gravel (GC), damp dense, brown, gravel to 1½" ø					2		15 24 28	No Odor HNU 0 ppm
10									
11									
12									
13									
14									

Woodward-Clyde Consultants

PROJECT NAME SHELL SERVICE NO. 8820014.017

DEPTH (feet)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer installation	Water Content	Penetration Data	SAMPLES: Type No.	SAMPLES: Recov.	SAMPLES: Penetr. Resist. (Blows/ft.)	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
15	clayey gravel to gravelly clay (CL-GC) damp, brown, gravel to 1½"ø;	▼		3				10	No Odor
16								19	0 ppm
								12	HNU
	bottom of hole 16½'								
17									

FIELD LOG OF BORING NO. S-C SHEET 2 of 2

Woodward-Clyde Consultants

PROJECT NAME SHELL SERVICE NO. 88200MA 817

BORING LOCATION SHELL SERVICE/ 38 LIVERMORE AVE.	ELEVATION AND DATUM
DRILLING AGENCY BAY LANDS / DRILLER	DATE STARTED / DATE FINISHED 2-27-89
DRILLING EQUIPMENT C-75 "	COMPLETION DEPTH / SAMPLER
DRILLING METHOD HOLLOW STEM / DRILL BIT 8" AUGER	NO. OF SAMPLES / DIST. / UNDIST.
SIZE AND TYPE OF CASING —	WATER ELEV. / FIRST ~16 / COMPL. / 24 HRS
TYPE OF PERFORATION — / FROM — TO — FT.	LOGGED BY C. PARTEN / CHECKED BY:
SIZE AND TYPE OF PACK — / FROM — TO — FT.	
TYPE OF SEAL — / FROM — TO — FT.	

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No.	SAMPLES: Blows/6 in.	SAMPLES: Pocket Pen. (Blows/6 in.)	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
1	3" asphalt, base rock fill,								
2									
3	clayey gravel ø 3"								
4	(GC) clayey gravel w/ sand, dense, damp, brown, gravel to 2" ø Fill.								
5				1				500 psi	500 psi push No Odor Open HNU
6									
7									
8									
9	clayey gravel (GC) w/ sand dense, damp, brown, gravel rounded, 1½ø; native soil.							19	
10				2			19		No odor Open HNU
11								16	
12									
13									
14									

FIELD LOG OF BORING NO. S-D SHEET 1 of 2

Woodward-Clyde Consultants

PROJECT NAME SHELL Service NO. 8820011A 01D

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Penetration Data	SAMPLES: Type No.	SAMPLES: Recov. %	SAMPLES: Penetr. (Blows/6 in.)	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
15	clayey gravel (GC) w/sand moist, brown, rounded gravel, 2"ø			3				22	No odor
16								24	0 ppm
								20	ANU
17	bottom of hole 16½								

FIELD LOG OF BORING NO. S-D SHEET 2 of 2

INTERNATIONAL TECHNOLOGY CORPORATION

March 6, 1989

Gettler-Ryan
1992 National Avenue
Hayward, CA 94545

ATTN: John Werfal

Following are the results of analyses on the samples described below.

Project:	GR #9657, WCC #8820011A/0117, Shell, 318 S. Livermore Avenue, Livermore
Lab Numbers:	S9-02-329-03, S9-02-329-06, S9-02-329-09, S9-02-329-12
Number of Samples:	4
Sample Type:	Soil
Date Received:	2/27/89
Analyses Requested:	Low Boiling Hydrocarbons

The method of analysis for low boiling hydrocarbons is taken from EPA Methods 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 as well as a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline and includes benzene, toluene, ethyl benzene and xylenes.

ITAS/San Jose Lab Number	Client Sample Identification	Sample Date	Extraction Date	Date Analysis Completed	Sample Condition on receipt
S9-02-329-03	SA-3-4	2/27/89	3/1/89	3/2/89	cool
S9-02-329-06	SB-3-4	2/27/89	3/1/89	3/2/89	cool
S9-02-329-09	SC-3-4	2/27/89	3/1/89	3/2/89	cool
S9-02-329-12	SD-3-4	2/27/89	3/1/89	3/2/89	cool

Fred Rouse

FR/an

1 Page Following - Table of Results

ITAS/San Jose to Gettler-Ryan
ATTN: John Werfal

March 6, 1989
Page 1 of 1

Project: GR #9657, WCC #8820011A/0117, Shell, 318 S. Livermore, Livermore

Summary of Results

ND = None Detected

Lab Number	Sample Identification	Milligrams per Kilogram - (Dry Soil Basis) Low Boiling Hydrocarbons (calculated as gasoline)	Benzene	Toluene	Ethyl Benzene	Xylenes
S9-02-229-03	SA-3-4	ND	ND	ND	ND	ND
S9-02-229-06	SB-3-4	ND	ND	ND	ND	ND
S9-02-229-09	SC-3-4	ND	ND	ND	ND	ND
S9-02-229-12	SD-3-4	ND	ND	ND	ND	ND
Detection Limit		5.	0.05	0.1	0.1	0.3