Environmental
Science &
Engineering, Inc.
A CILCORP Company

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COPY

May 20, 1991

Mr. F.R. Fossati
Senior Environmental Engineer
Shell Oil Company
511 North Brookhurst
Anaheim, California 92803

SUBJECT: **RESULTS OF GROUND WATER MONITORING AT SHELL SERVICE STATION #14 31660 PACIFIC HIGHWAY SOUTH, FEDERAL WAY, WASHINGTON - WIC NO. 246-2877-0109**

Dear Mr. Fossati:

Environmental Science & Engineering, Inc. (ESE) is submitting this letter report which presents the results of ground water monitoring conducted in April, 1991, at the subject site (Figure 1). The following sections summarize the sampling procedures and the physical and chemical results.

MONITORING PROGRAM

Monitoring Well Status and Hydrogeological Data

Five ground water monitoring wells, MW1-20 through MW5-20, are located at the site (Figure 2). Depth to ground water was measured using an electronic water level meter on April 17, 1991. Actual depth to ground water measurements are presented in Table 1. These data were used to construct a water table contour map, depicting the relative elevation of the ground water surface, and the direction of ground water flow (Figure 3). As shown on Figure 3, the apparent ground water flow direction is to the west. The ground water flow gradient is approximately 4 vertical feet per 100 lateral feet or .04 feet per foot.

TABLE 1 - GROUND WATER ELEVATION DATA
MEASURED APRIL 17, 1991

WELL NUMBER	RELATIVE WELL ELEVATION (ft above MSL)	* DEPTH TO GROUND WATER (ft)	RELATIVE GROUND WATER ELEVATION (ft above MSL)
MW1-20	437.60	5.94	431.66
MW2-20	436.39	5.60	430.79
MW3-20	439.49	4.50	434.99
MW4-20	NA	3.64	--
MW5-20	435.99	5.22	430.77

NOTES:

MSL	-	Mean sea level
ft	-	feet
NA	-	Not Applicable; well installed or altered after initial survey
*	-	Measured From the top of well casing

Ground Water Sampling Program

On April 17, 1991, Wells MW1-20 through MW5-20 were purged and sampled by a geologist from ESE. Purging and ground water sampling procedures are detailed in Appendix A. Well purging data sheets were completed for each well sampled and are included in Appendix B.

Laboratory Analyses

Chemical analyses of ground water samples were performed by Analytical Services Inc. (ASI), an independent analytical laboratory located in Redmond, Washington. Ground water samples collected from each well were analyzed for total petroleum hydrocarbons (TPH) using Environmental Protection Agency (EPA) Method 8015; and for benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 602. The ground water sample collected from Well MW1-20, which contained the highest benzene concentration during the previous sampling, was also analyzed for total lead using EPA Method 7000 series.

Results of Ground Water Analyses

Results of the laboratory analyses using EPA Methods 8015 and 602 are presented in Table 2. A copy of the laboratory reports and chain-of-custody document are included in Appendix C.

TABLE 2 -RESULTS OF CHEMICAL ANALYSES
OF GROUND WATER SAMPLES COLLECTED APRIL 17, 1991

SAMPLE NUMBER	TPH (ppm)	BENZENE (ppb)	TOLUENE (ppb)	ETHYL BENZENE (ppb)	TOTAL XYLENES (ppb)
MW1-20	16	570	440	810	2,930
MW2-20	20	350	570	1,300	4,920
MW3-20	ND < 1	ND < 1	ND < 1	ND < 1	ND < 1
MW4-20	ND < 1	ND < 1	ND < 1	ND < 1	1
MW5-20	12	370	300	210	2,750
SCLG	1	5	40	20	20

NOTES:

ND<1	-	Not detected at indicated detection limit
ppm	-	Parts per million or milligrams per liter (mg/L)
ppb	-	parts per billion or micrograms per liter (ug/L)

Analytical results indicate that the ground water samples collected from Well MW1-20, MW2-20, and MW5-20 contained TPH and BTEX concentrations above the State of Washington, Department of Ecology (Ecology) clean-up level guidelines for ground water. None of the other ground water samples collected and analyzed during this Ground Water Monitoring Program contained TPH or BTEX concentrations above the state clean-up level guidelines (SCLGs). Figure 4 depicts the concentrations of benzene found in ground water samples during this monitoring period. A comparison of BTEX concentrations in ground water samples collected in August/September, 1990, with BTEX concentrations detected in ground water samples collected April 17, 1991, is presented in Table 3. A comparison of TPH concentrations is not possible, as this is the first time that site ground water has been analyzed for TPH. The ground water sample collected from Well MW1-20 contained no detectable total lead concentrations.

TABLE 3 - COMPARISON OF CONCENTRATIONS OF TPH AND BTEX IN GROUND WATER (UG/L UNLESS NOTED OTHERWISE)

Sample Well	August-September, 1990	April 17, 1991
Well MW1-20:		
TPH (mg/L)	NA	16
Benzene	480	570
Toluene	140	440
Ethyl Benzene	130	810
Total Xylenes	900	2,930
Well MW2-20:		
TPH (mg/L)	NA	20
Benzene	380	350
Toluene	3	570
Ethyl Benzene	290	1,300
Total Xylenes	111	4,920
Well MW3-20:		
TPH (mg/L)	NA	ND < 1
Benzene	ND < 1	ND < 1
Toluene	ND < 1	ND < 1
Ethyl Benzene	ND < 1	ND < 1
Total Xylenes	ND < 1	ND < 1
Well MW4-20:		
TPH (mg/L)	NA	ND < 1
Benzene	ND < 1	ND < 1
Toluene	ND < 1	ND < 1
Ethyl Benzene	ND < 1	ND < 1
Total Xylenes	ND < 1	1
Well MW5-20:		
TPH (mg/L)	NA	12
Benzene	75	370
Toluene	2	300
Ethyl Benzene	3	210
Total Xylenes	9	2,750

NOTES:

ND - Not detected at indicated detection limit
NA - Not Analyzed
mg/L - Milligrams per liter or parts per million (ppm)
ug/L - Micrograms per liter or parts per billion (ppb)

SUMMARY

A summary of the analytical results and physical measurements obtained during the previous monitoring and this monitoring period, are as follows:

- **Well MW1-20** - TPH was detected in the ground water sample collected from this well @ 16 mg/l. The benzene, toluene, ethylbenzene and total xylene concentrations have increased since the August and September 1990 sampling.

- **Well MW2-20** - TPH was detected in the ground water sample collected from this well @ 20 mg/l. The benzene concentration has decreased slightly, but the toluene, ethylbenzene, and total xylene concentrations have increased since the previous monitoring period.

- **Well MW3-20** - TPH was not detected in the ground water sample collected from this well. The benzene, toluene, ethylbenzene, and total xylene concentrations have remained below laboratory detection limits during this monitoring period.

- **Well MW4-20** - TPH was not detected in the ground water sample collected from this well. The benzene, toluene, and ethylbenzene concentrations have remained below laboratory detection limits during this monitoring period. A total xylene concentration was detected at the labortory detetion limit during this monitoring period.

- **Well MW5-20** - TPH was detected in the ground water sample collected from this well @ 12 mg/l. The benzene, toluene, ethylbenzene, and total xylene concentrations have increased since the previous sampling round.

- **Ground water gradient** - The ground water gradient as measured by ESE appears to be to the west. The ground water gradient direction measured on April 17, 1991, shows a slight shift from the gradient measured in the Fall of 1990. The ground water flowed towards the southwest when water table levels were measured in September 1990.

  The ground water elevation at the site has increased by more than two feet in MW2-20 and MW5-20, by approximately three feet in MW1-20, and by approximately five and one-half feet in MW3-20, as compared to the ground water elevations measured in the wells during the Fall of 1990. The overall increase in ground water levels is most likely due to the normal increase in precipitation during the winter and spring. A large grassy area is located on

the northeast corner of the site, and infiltration of precipitation would be greater here than on other areas of the property. This is most likely the reason the ground water elevations in wells MW1-20 and MW3-20 are significantly higher than in the wells on the western portions of the site.

Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by other hydrogeologists and engineers practicing in this field. No other warranty, express or implied, is made as to the professional advice in this report. If you have any questions or comments regarding this letter report, please contact one of the undersigned at (206) 869-8220.

Sincerely,
ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

Susan S. Swan
Senior Associate Scientist

Chris L. Generous
Staff Engineer

I:\WP\SHELL\7083QM.LET

cc: Annette Petrie - Department of Ecology
Anita Burke - Texaco

REFERENCES

State of Washington, Department of Ecology, 1990, The Model Toxics Control Act Cleanup Regulation (Chapter 173-340 WAC).

United States Geological Survey, 1973, Des Moines Quadrangle, Washington - King County, 7.5 Minute Series Topographic Map.

FIGURES

APPENDIX A

FIELD PROCEDURES

FIELD PROCEDURES

Survey of Ground Water Monitoring Wells

The relative elevations of the ground water monitoring wells were determined by establishing a level line for vertical control from the top of the PVC casing in each well. This was accomplished using an engineer's level and a Philadelphia rod. The error of closure for the level line was maintained at no more than 0.01-feet. The relative elevation used was based on information obtained from a U.S. Geological Survey 7.5 Minute topographic map or other reliable references. This information was used to establish the ground water elevations above mean sea level (msl) in each well and in the construction of a ground water table contour map.

Depth to Ground Water Measurements

Depth to ground water surface measurements were recorded for each ground water monitoring well by ESE personnel. The ground water surface measurements were made by lowering an Oil Recovery Systems (ORS) interface probe into each well. The tape on the instrument, which is graduated in one hundredths of a foot increments, was lowered into the well until the electronic sounder is triggered. The depth to the ground water surface is then recorded relative to the top of the PVC casing.

Ground Water Monitoring Well Development and Sampling

Following the installation of the ground water monitoring wells, the wells were developed using disposable Teflon bailers or a submersible pump. Typically, development consists of removing approximately four casing volumes of liquid. Prior to being lowered into each well, the equipment was washed and/or flushed with a Liqui-Nox detergent solution, rinsed and /or flushed with tap water, rinsed with distilled water, and then allowed to air dry.

Ground water samples were collected from each well using a dedicated, disposable Teflon bailer attached to a nylon cord. The ground water samples were transferred from the bailer to 40-milliliter (ml) glass vials with Teflon septum lids, labeled , and placed in an ice chest for cold storage and transport. To prevent cross contamination of the ground water samples, the Teflon bailer and cord was disposed of following sample collection in each well.

APPENDIX B

FIELD DATA SHEETS

WELL PURGING/SAMPLING DATA SHEET

Project Name: SHELL / TEXACO REM. PRG.

Project Number: 6-91-7083 Date: 4/17/91 Time: _____

Well Number: MW-20 Boring Dia: 11" Casing Dia: 4"

Casing size	2 in.	4 in.	6 in.
Gal/ft.	0.17	0.66	1.50

WATER LEVEL

Held: _____

Cut: _____

DTW: 5.94 from TOC

COLUMN OF WATER IN WELL

Well T.D.: 22.8'

DTW from TOC: 5.94

Column of water in well: 16.86

VOLUME TO BE REMOVED

Gallons per foot of casing (from table)	=	.66
Column of water in well	x	16.86
Total gallons in well	=	11.12
Number of casing volumes to be purged (minimum of 3)	x	3
Total volume to be purged	=	33.38

Method of purging (pump, bailer, etc.): DIAPHRAM Pump

FIELD ANALYSES

	Start	Mid	End
Time			
pH			
Cond.			
Temp.			

Purged Dry

Total volume purged = 15 gallons

Sample date/time: 4/17/91 Sample I.D.: MW-20-2

Signed/Sampler: [signature] Date: 4/17/91

Signed/Reviewer: _____ Date: _____

WELL PURGING/SAMPLING DATA SHEET

Project Name: SHELL / TEXACO Rem PRG

Project Number: 6-91-7083 Date: 4/17/91 Time: _____

Well Number: MW2-20 Boring Dia: 11" Casing Dia: 4"

Casing size	2 in.	4 in.	6 in.
Gal/ft.	0.17	0.66	1.50

WATER LEVEL

Held: _____

Cut: _____

DTW: 5.60 from TOC

COLUMN OF WATER IN WELL

Well T.D.: 18.0

DTW from TOC: 5.60

Column of water in well: 12.4

VOLUME TO BE REMOVED

Gallons per foot of casing (from table) = .66

Column of water in well x 12.4

Total gallons in well = 8.18

Number of casing volumes to be purged (minimum of 3) x 3

Total volume to be purged = 24.55

Method of purging (pump, bailer, etc.): DIAPHRAM Pump

FIELD ANALYSES

	Start	Mid	End
Time			
pH			
Cond.			
Temp.			

PUMPED ESSENTIALLY DRY

Total volume purged = 20 gallons

Sample date/time: 4/17/91 Sample I.D.: MW2-20-2

Signed/Sampler: J Mat Date: 4/17/91

Signed/Reviewer: _____ Date: _____

WELL PURGING/SAMPLING DATA SHEET

Project Name: SHELL / TEXACO Rem. Proj.

Project Number: 6-91-7083 Date: 4/17/91 Time: _____

Well Number: MW3-20 Boring Dia: 11" Casing Dia: 4"

WATER LEVEL

Held: _____

Cut: _____

DTW: 4.50 from TOC

Casing size	2 in.	4 in.	6 in.
Gal/ft.	0.17	0.66	1.50

COLUMN OF WATER IN WELL

Well T.D.: 19.50

DTW from TOC: 4.50

Column of water in well: 15.

VOLUME TO BE REMOVED

Gallons per foot of casing (from table) = .66

Column of water in well x 15

Total gallons in well = 9.9

Number of casing volumes to be purged (minimum of 3) x 3

Total volume to be purged = 29.7

Method of purging (pump, bailer, etc.): DIAPHRAM Pump

FIELD ANALYSES

	Start	Mid	End
Time			
pH			
Cond.			
Temp.			

Pumped essentially dry

Total volume purged = 25 gallons

Sample date/time: 4/17/91 Sample I.D.: MW3-20

Signed/Sampler: [signature] Date: 4/17/91

Signed/Reviewer: _____ Date: _____

WELL PURGING/SAMPLING DATA SHEET

Project Name: SHELL / TEXACO REM. PRJ.

Project Number: 6-91-7083 Date: 4/17/91 Time: _____

Well Number: MW4-20 Boring Dia: 11" Casing Dia: 4"

Casing size	2 in.	4 in.	6 in.
Gal/ft.	0.17	0.66	1.50

WATER LEVEL

Held: _____

Cut: _____

DTW: 3.64 from TOC

COLUMN OF WATER IN WELL

Well T.D.: 19.9

DTW from TOC: 3.64

Column of water in well: 16.26

VOLUME TO BE REMOVED

Gallons per foot of casing (from table) = .66

Column of water in well x 16.26

Total gallons in well = 10.73

Number of casing volumes to be purged (minimum of 3) x 3

Total volume to be purged = 32.19

Method of purging (pump, bailer, etc.): DIAPHRAM PUMP

FIELD ANALYSES

	Start	Mid	End
Time			
pH			
Cond.			
Temp.			

PUMPED DESCRIBED OK

Total volume purged = 20 gallons

Sample date/time: 4/17/91 Sample I.D.: MW4-20-2

Signed/Sampler: J Martin Date: 4/17/91

Signed/Reviewer: _____ Date: _____

WELL PURGING/SAMPLING DATA SHEET

Project Name: SHELL / TEXACO Rem. Pro

Project Number: 6-91-7083 Date: 4/17/91 Time: _____

Well Number: MW5-20 Boring Dia: 11" Casing Dia: 4"

WATER LEVEL

Held: _____

Cut: _____

DTW: 5.22 from TOC

Casing size	2 in.	4 in.	6 in.
Gal/ft.	0.17	0.66	1.50

COLUMN OF WATER IN WELL

Well T.D.: 19.6

DTW from TOC: 5.22

Column of water in well: 14.38

VOLUME TO BE REMOVED

Gallons per foot of casing (from table) = .66

Column of water in well X 14.38

Total gallons in well = 9.49

Number of casing volumes to be purged (minimum of 3) X 3

Total volume to be purged = 28.47

Method of purging (pump, bailer, etc.): DIAPHRAM PUMP

FIELD ANALYSES

	Start	Mid	End
Time			
pH			
Cond.			
Temp.			

PUMPED ESSENTIALLY DRY

Total volume purged = 55 gallons

Sample date/time: 4/17/91 Sample I.D.: MW5-20-2

Signed/Sampler: _____ Date: 4/17/91

Signed/Reviewer: _____ Date: _____

APPENDIX C

LABORATORY REPORT AND CHAIN-OF-CUSTODY DOCUMENT

Date of Report: April 29, 1991
Date Submitted: April 17, 1991
Project #:6-91-7083
WIC #:246-2877-0109
Station Address:31660 Pacific Hwy. S., Federal WAy, WA

RESULTS OF ANALYSES OF ENVIRONMENTAL SAMPLES FOR BTEX & TPH-GASOLINE BY GC/PURGE & TRAP (EPA METHOD 8015/5030)

						Detection Limit
Dilution Factor:	1	1	1	1	1	---
Matrix:	Water	Water	Water	Water	Water	---
Units:	ppb	ppb	ppb	ppb	ppb	ppb
Sample #:	MW1-20-2	MW2-20-2	MW3-20-2	MW4-20-2	MW5-20-2	
Benzene	570	350	N.D.	N.D.	370	1
Toluene	440	570	N.D.	N.D.	300	1
Ethylbenzene	810	1,300	N.D.	N.D.	210	1
m- & p-Xylene	2,500	4,200	N.D.	1[J]	2,400	1
o-Xylene	430	720	N.D.	N.D.	350	1
Surrogate Recovery:	110%	100%	96%	95%	110%	

J-The value indicated was less than the practical quantitation limit.

Total Petroleum Hydrocarbon:

C7-C12 (Carbon Range)						Detection Limit
Units:	ppm	ppm	ppm	ppm	ppm	(1 ppm)
Sample #:	MW1-20-2	MW2-20-2	MW3-20-2	MW4-20-2	MW5-20-2	
	16	20	N.D.	N.D.	12	

Date of Report: April 29, 1991
Date Submitted: April 17, 1991
Project #:6-91-7083
WIC #:246-2877-0109
Station Address:31660 Pacific Hwy. S., Federal WAy, WA

RESULTS OF ANALYSES OF ENVIRONMENTAL SAMPLES FOR BTEX & TPH-GASOLINE BY GC/PURGE & TRAP (EPA METHOD 8015/5030)

QUALITY CONTROL DATA

Dil.Fact.:	1	1	1	1	
Matrix:	Water	Water	Water	Water	
Units:	ppb	ppb	ppb	%Rec.	
Batch Sample #:	Method Blank	04036-7 Original	04036-7 Duplicate	04036-7 Matrix Spikes @ 20 ppb	R%D
Benzene	N.D.	N.D.	N.D.	99/100%	1%
Toluene	N.D.	1^J	1^J	110/120%	9%
Ethylbenzene	N.D.	N.D.	N.D.	110/110%	--%
m- & p-Xylene	N.D.	N.D.	N.D.	120/130%	8%
o-Xylene	N.D.	N.D.	N.D.	110/110%	--%
Surrogate Recovery:	--%	100%	100%	110/100%	9%

Total Petroleum Hydrocarbon: C7-C12 (Carbon Range)			Detection Limit 1ppm
Batch Sample #:	Method Blank	04036-7 Original	04036-7 Duplicate
Units:	ppm	ppm	ppm
	N.D.	N.D.	N.D.

Date of Report: April 29, 1991
Date Submitted: April 17, 1991
Project #:6-91-7083
WIC #:246-2877-0109
Station Address:31660 Pacific Hwy. S., Federal WAy, WA

Analysis for Total Lead(Pb)
Using EPA Method 7421
Results reported as ug/Lit (ppb)

Sample#:	MW1-20-2	
Matrix:	Water	
Dil. Factor:	1	
Analyte		Det. Limit
Lead:	N.D.	1

Quality Control Data:

Sample #:	MW1-20-2 (Original)	MW1-20-2 (Dup.)	RPD	Matrix Spike	Method Blank	Detection Limit
Matrix:	water	water	---	water	water	
Analyte						
Lead:	N.D.	N.D.	--%	81%	N.D.	1

CHAIN OF CUSTODY RECORD

ANALYTICAL SERVICES, INC.
12277 134th Ct. NE, Suite 200
Redmond, WA 98052
(206) 820-4551 fax 820-6337

Client: ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

Project Manager: JEFF MARTIN

Project #: 6917083

Project Name: SHELL

dash	Sample Number	Date Sampled	Type	# Jars	Analysis Required	Comments
	MW1-20-2	4/17/91	WATER	4	8015 GAS / BTEX, TOTAL LEAD	
	MW2-20-2	"	"	3	8015 GAS / BTEX	
	MW3-20-2	"	"	3	8015 GAS / BTEX	
	MW4-20-2	"	"	3	8015 GAS / BTEX	
	MW5-20-2	"	"	3	8015 GAS / BTEX	

Relinquished:		date: 4/17/91	Received by:		date: 4/17/91
Firm: ESE		time: 4:09	Firm: ASI		time: 4:10
Relinquished:		date:	Received by:		date:
Firm:		time:	Firm:		time:

CHAIN OF CUSTODY RECORD

ANALYTICAL SERVICES, INC.
12277 134th Ct. NE, Suite 200
Redmond, WA 98052
(206) 820-4551 fax 820-6337

04-032

Client: ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

Project Manager: JEFF MARTIN

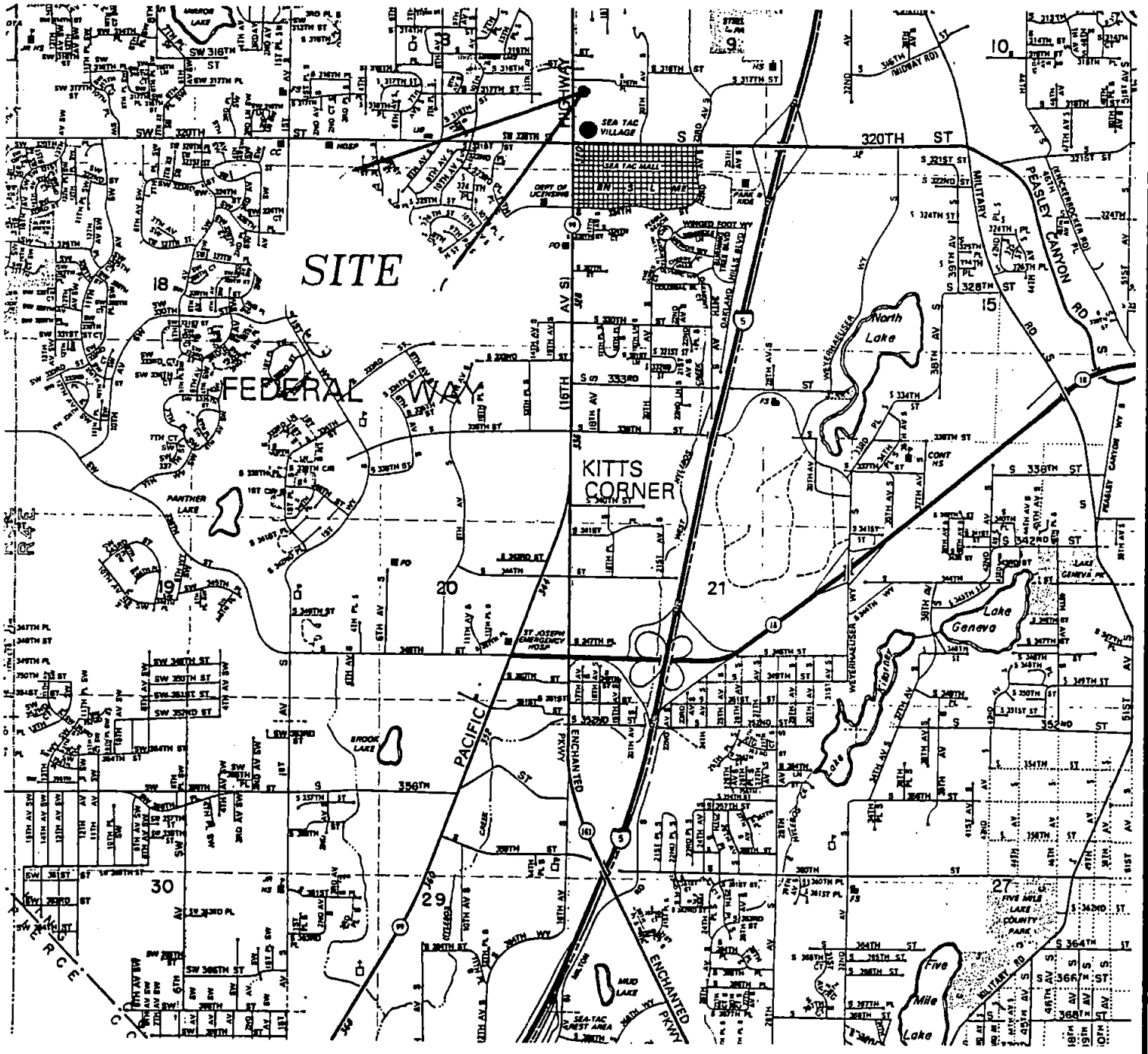
Project #: 6917083

Project Name: SHELL

dash	Sample Number	Date Sampled	Type	ars	Analysis Required	Comments
	MW1-20-2	4/17/91	WATER	4	8015 GAS / BTEX, TOTAL LEAD	
	MW2-20-2	"	"	3	8015 GAS / BTEX	
	MW3-20-2	"	"	3	8015 GAS / BTEX	
	MW4-20-2	"	"	3	8015 GAS / BTEX	
	MW5-20-2	"	"	3	8015 GAS / BTEX	

Relinquished:		date: 4/17/91	Received by:		date: 4/17/91
Firm: ESE		time: 4:09	Firm: AST		time: 4:10
Relinquished:		date:	Received by:		date:
Firm:		time:	Firm:		time:

FIGURES



ESE
A CILCORP COMPANY

SHELL OIL
31660 PACIFIC HWY. S.
FEDERAL WAY, WASH.

LOCATION MAP

DATE: 11-28-90	PROJECT NO. 6-90-7042	FIG# 1
SCALE: 1" =2560'	DWG NO.: SOC20A--	SIZE: A
DRAWN BY: M. ARMSTRONG	APPROVED BY: D. ALFORD	REV: -

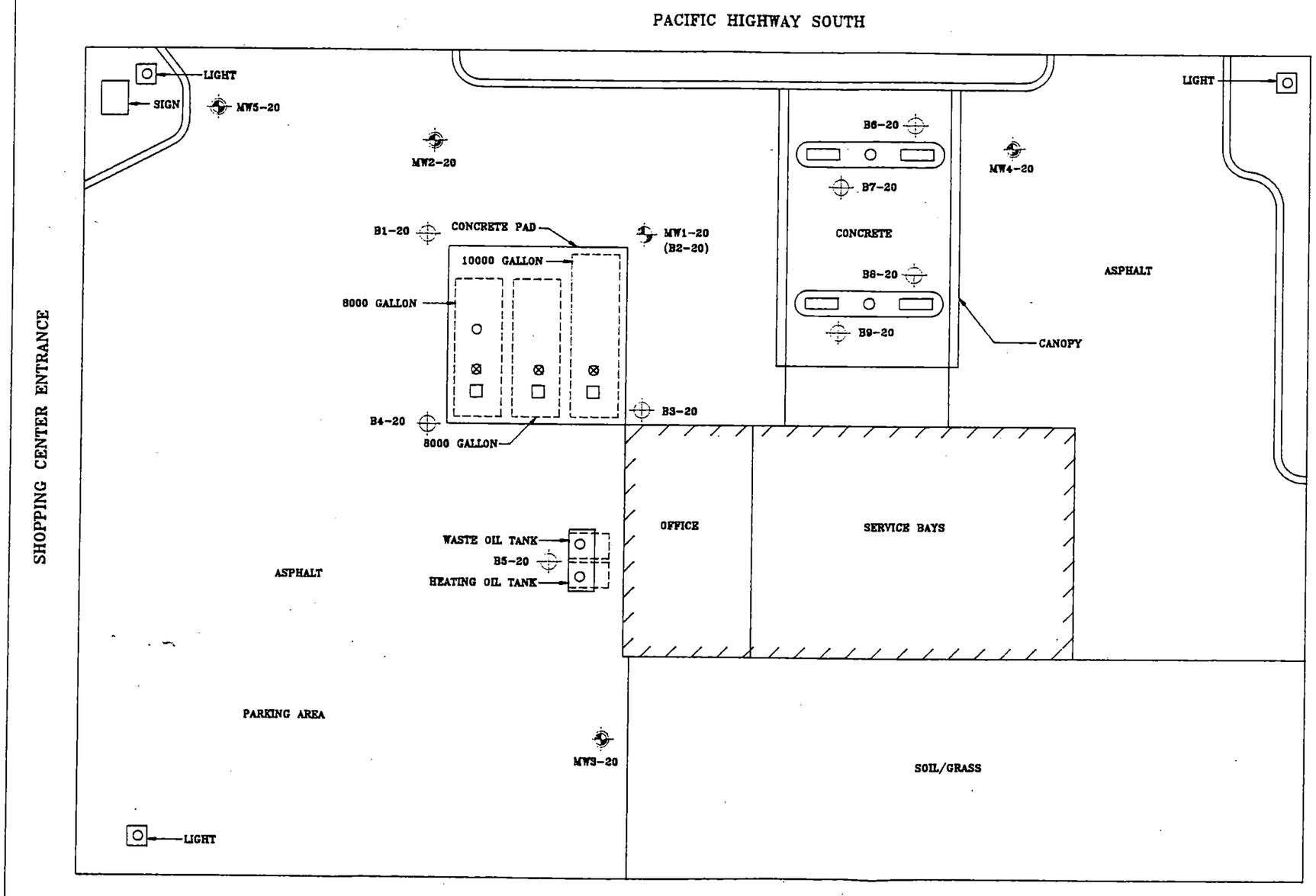
LEGEND

EXPLANATION:

B1-20 — PHASE I SOIL BORING LOCATION

MW1-20 — PHASE I GROUND WATER MONITORING WELL LOCATION

MW3-20 — PHASE II GROUND WATER MONITORING WELL LOCATION



0 20 FEET

SCALE

N

ESE — A CH2M HILL COMPANY

SHELL OIL
31660 PACIFIC HWY S.
FEDERAL WAY, WASH.

SITE MAP

DATE: 02-05-91	PROJECT NO. 6-91-7083	FIG# 2
SCALE: 1"=20'	DWG NO.: SOC20C--	SIZE: B
DRAWN BY: M. ARMSTRONG	APPROVED BY: D. ALFORD	REV: -

PACIFIC HIGHWAY SOUTH

SHOPPING CENTER ENTRANCE

ACCESS ROAD

LIGHT

SIGN

MW5-20
(430.77)

431.00

MW2-20
(430.79)

CONCRETE PAD

MW1-20
(B2-20)
(431.66)

10000 GALLON

432.00

8000 GALLON

CONCRETE

MW4-20

ASPHALT

CANOPY

LIGHT

433.00

8000 GALLON

OFFICE

SERVICE BAYS

WASTE OIL TANK

434.00

HEATING OIL TANK

ASPHALT

PARKING AREA

435.00

MW3-20
(434.99)

SOIL/GRASS

LIGHT

LEGEND

EXPLANATION:

MW1-20 PHASE I GROUND WATER MONITORING WELL LOCATION

MW3-20 PHASE II GROUND WATER MONITORING WELL LOCATION

431.00 GROUND WATER SURFACE ELEVATION CONTOUR

(430.79) APPROXIMATE GROUND WATER SURFACE ELEVATION (FEET ABOVE MEAN SEA LEVEL)

APPROXIMATE GROUND WATER FLOW DIRECTION

NOTE:
MEASUREMENTS TAKEN ON 4-18-91.

0 20 FEET
SCALE

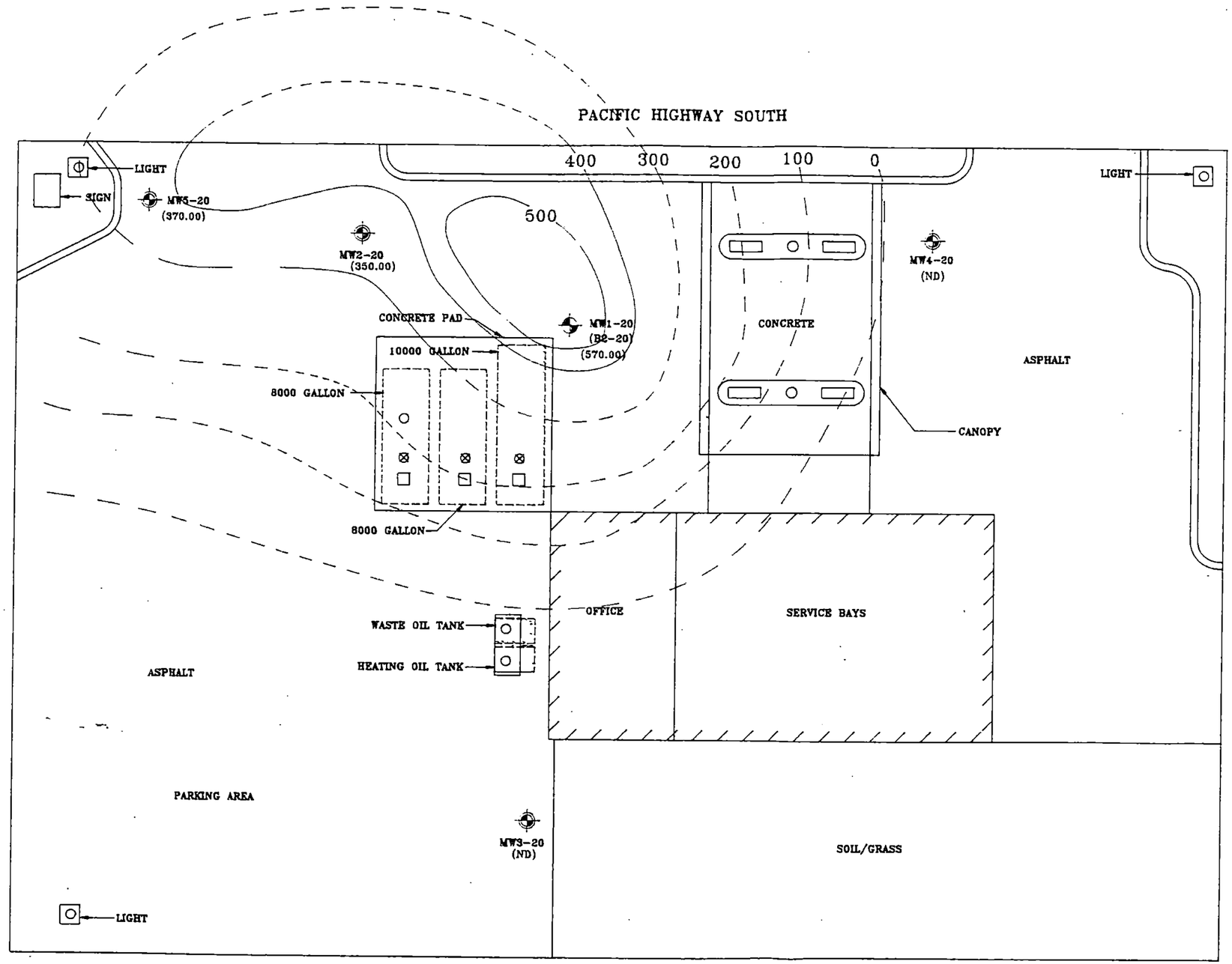
CONTOUR INTERVAL = 0.40 FEET

ESE
A CILCORP COMPANY

SHELL OIL
31660 PACIFIC HWY S.
FEDERAL WAY, WASH.

GROUND WATER TABLE CONTOUR MAP

DATE: 02-06-91	PROJECT NO. 6-91-7083	FIG# 3
SCALE: 1"=20'	DWG NO.: SOC20D-A	SIZE: B
DRAWN BY: M. ARMSTRONG	APPROVED BY: S. SWAN	REV: A



LEGEND

EXPLANATION:

MW1-20	PHASE I GROUND WATER MONITORING WELL LOCATION
MW3-20	PHASE II GROUND WATER MONITORING WELL LOCATION
(480)	BENZENE CONCENTRATION IN GROUND WATER – ug/l
ug/l	MICROGRAMS PER LITER OR PARTS PER BILLION (PPB)
(ND)	NOT DETECTED
300	BENZENE CONCENTRATION CONTOUR DASHED WHERE INFERRED

APPROXIMATE GROUND WATER FLOW DIRECTION

0 20 FEET
SCALE

CONTOUR INTERVAL = 100 ug/l

ESE A CELCORP COMPANY

SHELL OIL
31660 PACIFIC HWY S.
FEDERAL WAY, WASH.

BENZENE CONCENTRATION IN GROUND WATER CONTOUR MAP

DATE: 02-06-91	PROJECT NO. 6-91-7083	FIG# 4
SCALE: 1"=20'	DWG NO.: SOC20E-A	SIZE: B
DRAWN BY: M. ARMSTRONG	APPROVED BY: S. SWAN	REV: A