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DEPT. OF ENVIRONMENTAL CONSERVATION

Results of Quarterly Ground Water
Monitoring and Sampling
June 2002
Texaco Service Station
1501 West Northern Lights Boulevard
Anchorage, Alaska

July 22, 2002

For Shell Oil Products-US



July 22, 2002

RECEIVED

JUL 24 2002

Shell Oil Products-US 10602 NE 38th Place Kirkland, Washington 98033

Attention: Anthony J. Palagyi

DEPT. OF ENVIRONMENTAL CONSERVATION

Results of Quarterly Ground Water
Monitoring and Sampling
June 2002
Texaco Service Station
1501 West Northern Lights Boulevard
Anchorage, Alaska
ADEC File No. L25.20
GEI File No. 9876-004-00

INTRODUCTION

This letter presents the results of GeoEngineers' June quarterly ground water monitoring and sampling event at the Texaco Service Station located at 1501 West Northern Lights Boulevard in Anchorage, Alaska. The Alaska Department of Environmental Conservation (ADEC) file number for this site is L25.20. The site relative to surrounding physical features is shown on Figure 1. Existing site facilities include a service station building with a convenience store and an automotive maintenance facility, three service islands located east and south of the building, four product underground storage tanks (USTs) and associated buried product lines. The station also operates an automated car wash along the northwest corner of the site. The general layout of the service station facilities and approximate locations of the monitoring wells are shown on Figure 2.

Statewide Petroleum Services removed a 550-gallon waste oil UST and replaced the fuel dispensers in October 1996. GeoEngineers provided environmental compliance monitoring and sampling during removal of the tank. In 1997, GeoEngineers performed a site assessment consisting of drilling four borings (B-1 through B-4). Monitoring well MW-1 was installed by GeoEngineers in the vicinity of the former waste oil UST in December 1997. Four monitoring wells, MW-A through MW-D, were installed by GeoEngineers in November 1999. The wells were positioned to monitor ground water contamination from the former waste oil UST, the northeast dispensing island and the south dispensing island. Two additional downgradient wells

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(MW-E and MW-F) were installed by GeoEngineers in August 2001 to further characterize the extent of ground water contamination.

The purpose of our services for this quarterly event was to monitor ground water conditions beneath the site. Depth to ground water was measured in all accessible monitoring wells, and representative ground water samples were collected from monitoring wells MW-1, MW-C, MW-D, MW-E and MW-F during this event. Monitoring wells MW-A and MW-B were not sampled as part of this quarterly ground water monitoring program. Representative ground water samples were analyzed for benzene, ethylbenzene, toluene and xylenes (BETX) and gasoline-range organics (GRO) by Method AK101. Additionally, the ground water samples collected from MW-C and MW-E were analyzed for halogenated volatile organic compounds (HVOC) by U.S. Environmental Protection Agency (EPA) Method 8260B to identify the eluting compounds accounting for previous GRO detections. Monitoring well MW-1 was also analyzed for diesel-range organics (DRO) by Method AK102 and residual-range organics (RRO) by Method AK103.

The following sections discuss ground water monitoring. Monitoring and analytical data are presented in Tables 1 and 2, and on Figure 2 and 3.

GROUND WATER MONITORING AND SAMPLING

- The measured depths to ground water in the monitoring wells during this event ranged from 12.78 feet below the top of the well casing at MW-E to 14.25 feet below the top of the well casing at MW-D. Ground water elevations measured from August 2001 through June 2002 are presented in Table 1.
- The apparent shallow ground water flow direction calculated from the June 2002 depth to
 ground water measurements is generally toward the southwest, which is consistent with
 previous ground water monitoring data. The calculated water table elevations and inferred
 ground water flow direction for this event are shown on Figure 2.
- Historical ground water flow direction and frequency are illustrated in the rose diagram
 included as Figure 4. The data used for this diagram was gathered from quarterly monitoring
 events from August 2001 through the most recent event.
- Free product was not encountered in any wells during our monitoring activities.
- No purge water was generated during the sampling event. The representative ground water samples were collected with new, disposable bailers using no-purge sampling techniques, as authorized by ADEC in a letter dated February 24, 1998.
- Benzene was detected at concentrations exceeding the current ADEC Migration to Ground Water cleanup level of 5 micrograms per liter (μg/l) in the representative ground water sample collected from monitoring well MW-E at a concentration of 130 μg/l. GRO was detected in MW-E at a concentration of 8,500 μg/l, also exceeding the ADEC Migration to Ground Water cleanup level of 1,300 μg/l.
- Benzene concentrations increased noticeably in monitoring well MW-E and decreased noticeably in wells MW-D and MW-F. GRO concentrations increased noticeably in

monitoring well MW-E and decreased noticeably in monitoring wells MW-C, MW-D and MW-F.

- GRO detections in MW-C and MW-E were previously identified from the North Creek Analytical laboratory chromatograms as not being typical for a gasoline pattern. We analyzed these wells for halogenated volatile organic compounds by EPA Method 8260B to attempt to identify the eluting compounds accounting for the GRO detections. SPL Laboratories reported no detection of BETX, GRO or other HVOCs in MW-C, and only BETX compounds were detected in the HVOC analysis for MW-E.
- A field duplicate ground water sample was collected from monitoring well MW-E. The sample was identified as "Duplicate" on the laboratory chain-of-custody. BETX and GRO compounds were detected in samples from MW-E, and benzene, toluene, and GRO compounds were detected in the duplicate sample. A comparison of these values indicated that the relative percent differences (RPD) were outside of the acceptable control limits for xylenes and GRO compounds. Based on our data quality review and comparison of previous analytical data, it is our opinion that the analytical data are suspect for this reporting period.
- Ground water chemical analytical data for samples obtained from August 2001 to June 2002 are summarized in Table 2. Figure 3 shows chemical analytical data for the four most recent monitoring events.
- The laboratory reports and chain-of-custody records for the ground water samples collected during this event are included in Attachment A.

FUTURE MONITORING AND SAMPLING

- Measure ground water levels and collect representative ground water samples from accessible monitoring wells on a quarterly basis for the same parameters listed in this report.
- The next quarterly monitoring event is scheduled for September 2002.

LIMITATIONS

We have prepared this report for use by Shell Oil Products-US. This report may be made available to regulatory agencies and to other parties, as designated by Shell. The report is not intended for use by others, and the information contained herein is not applicable to other sites.

Our interpretation of ground water conditions is based on field observations, our review of chemical analytical data and our review of information prepared by others.

Within the limitation of scope, schedule and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

GeoEngineers

Shell Oil Products-US July 22, 2002 Page 4

We appreciate the opportunity to be of service to Shell Oil Products-US. Please contact us if you have questions regarding this project.

Yours very truly,

GeoEngineers, Inc.

Jamie J. Oakley

Project Geologist

Scott E. Widness, P.E.

Principal

JJO:SEW:skl

Document ID: Anch\0987004\00\Final\987600400qr2.doc

Attachments

Two copies submitted

cc: Robert Weimer

ADEC - Anchorage Office

TABLE 1 SUMMARY OF GROUND WATER ELEVATION DATA TEXACO SERVICE STATION 1501 WEST NORTHERN LIGHTS BOULEVARD ANCHORAGE, ALASKA GEI JOB #9876-004-00

		I	Donth to Materia	T
	Ton of Ossiss		Depth to Water	Ground
	Top of Casing		From	Water
Monitoring	Elevation ¹		Top of Casing	Elevation
Well	(feet)	Date	(feet)	(feet)
MW-1	98.99	08/07/01	13.74	85.25
	•	11/08/01	14.18	84.81
Ĭ		03/05/02	14.53	84.46
		06/01/02	13.80	85.19
MW-A	98.35	08/07/01	12.97	85.38
		11/08/01	13.43	84.92
		03/05/02	13.78	84.57
<u> </u>	· · · · · · · · · · · · · · · · · · ·	06/01/02	13.28	85.07
MW-B	98.37	08/07/01	13.21	85.16
1		11/08/01	13.66	84.71
		03/05/02	14.05	84.32
		06/01/02	13.02	85.35
MW-C	98.69	08/07/01	13.31	85.38
		11/08/01	13.76	84.93
		03/05/02	13.95	84.74
		06/01/02	13.34	85.35
MW-D	99.27	08/07/01	14.18	85.09
		11/08/01	14.60	84.67
	,	03/05/02	14.88	84.39
		06/01/02	14.25	85.02
MW-E	97.66	08/07/01	12.70	84.96
1	1	11/08/01	13.08	84.58
ļ	· ·	03/05/02	13.33	84.33
		06/01/02	12.78	84.88
MW-F	98.14	08/07/01	13.19	84.95
ĺ		11/08/01	13.59	84.55
İ		03/05/02	13.88	84.26
		06/01/02	13.27	84.87

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9876004002.xls

SUMMARY OF GROUND WATER ANALYTICAL RESULTS¹ TEXACO SERVICE STATION 1501 WEST NORTHERN LIGHTS BOULEVARD, ANCHORAGE, ALASKA GEI JOB #9876-004-00 TABLE 2 (Page 1 of 3)

		D∆H ⁷			2	1			ı	1	•	1	1		1		1 1	Nanhthalana - 8 20		1		1	
		HVOC	(//0/1)	(1,64)						<u> </u>		I :	, C	<u> </u>					1			2	<u>)</u>
		RRO	(//۵/1)	SERVICE CONTRACTOR		<750	240			1 1				Τ	ŀ		ı	<750	3 1		1	1	1
		DRO⁴	(l/on)	581 8	433 8	228 B	190	3					. I		ı	ı	i	957 10	'	ı	1	ŀ	ı
		GRO³	(1/611)				- CO					11 866		l	1.120					00000			
			×	1	ı	<1.00	<3.0	ĺ						Ī	104	84.0	20.5	3,110	1.720	1,690	735	2,230	3,000
TX²	EPA Method 8021B	(hg/l)			ı	<0.500	<1.0	0.867	1.98	0.907	0.911 10	1.28 10	7.0	0.675	41.00	0.901 10	2.1	61.9	<10.0	<10.0	8.78	100	110
BET	EPA Meth	n)	Ш	ŀ	ı	<0.500	~1.0	3.34	7.70	1.46	0.568	1.63	<1.0	39.6	49.7	32.4	6.1	231	173	170	63.2	220	240
			В	1	i	<0.200	<1.0	1.96	5.54	1.35	1.43	1.90	4.0	4.38	4.31	0.92	<1.0	0.00	(0) (0) (0)		36.5	3(0)	1301
		Date	Sampled	08/07/01	11/08/01	03/05/02	06/01/02	08/07/01	08/07/01	11/08/01	03/05/02	03/05/02	06/01/02	08/07/01	11/08/01	03/05/02	06/01/02	08/07/01	11/08/01	11/08/01 *	03/05/02	06/01/02	06/01/02 *
			Well ID	MW-1				MW-C						MW-D				MW-E					

Notes appear on page 3 of 3.

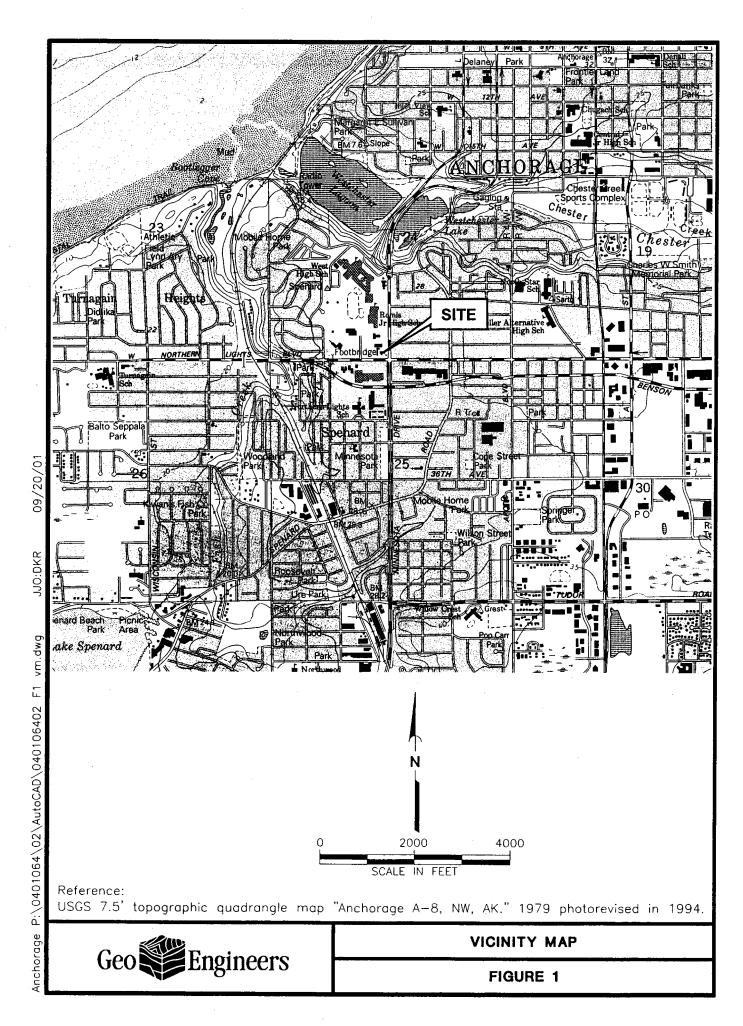
TABLE 2 (Page 2 of 3)

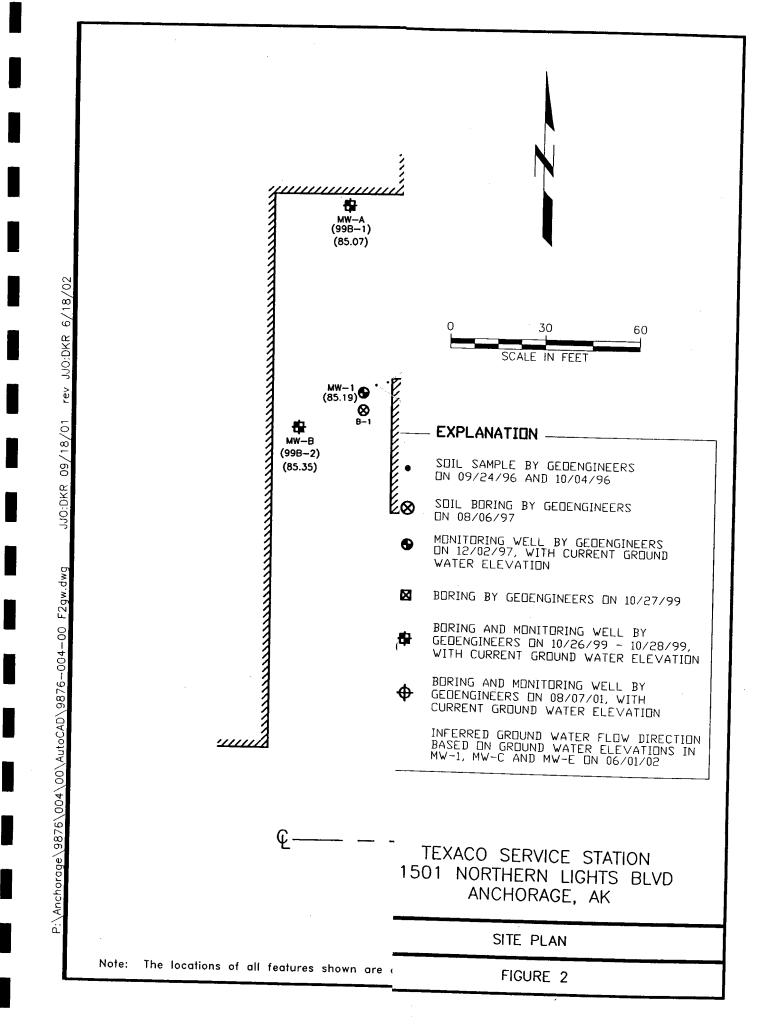
	HVOC PAH	Naphth.	- 1			T	1	1	1	
			_	1				-		1,10
Ĉ	(l/gr)	487	771	(0) / (0) / (0) (1)	570	<50.0	× 50.0	<50.0	×100	1,300
	×	45.6	62.2	172	31.6	41.00	V .	۷. د ۲.00	3.0	10,000
BETX ² EPA Method 8021B	T	0.728	1.49 10	1.89 10	1.1	<0.500	<0.500	<0.500	41.0	1,000
BE EPA Meth	E	28.4	40.2	66.0	30	<0.500	<0.500	<0.500	<1.0	700
	В	2.20	3.38		<1.0	<0.200	<0.200	<0.200	v.7.0	ည
o te	Sampled	08/07/01	11/08/01	03/05/02	06/01/02	08/07/01	11/08/01	03/05/02	06/01/02	nd Water Levels
	Well ID	MW-F				Trip Blank				ADEC Ground Water Cleanup Levels

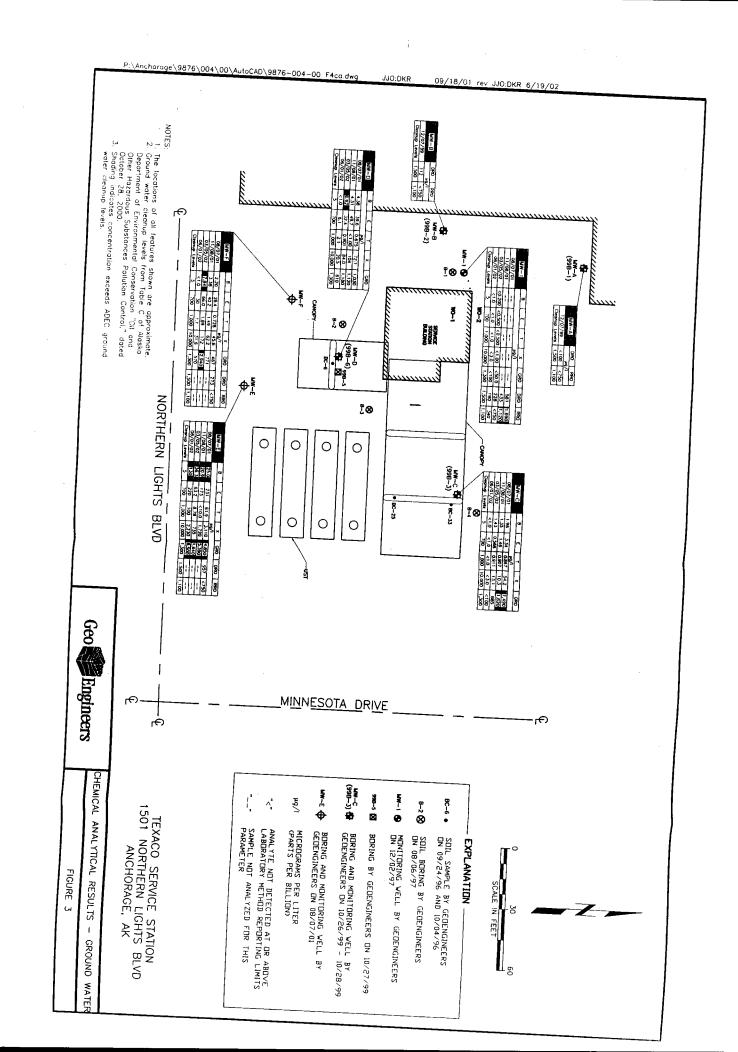
Notes appear on page 3 of 3.

TABLE 2 (Page 3 of 3)

⁹Sample was also tested for oxygenates by EPA Method 8260B and for ethanol by EPA Method 8015B (see lab data for results ⁸Laboratory chromatograms indicate that fesults in the diese range are p PAH = Polynuclear Aromatic Hydrocarbons by IEP Notes: 'SPL Laboratories in Lafayette, Louislana, 11 Laboratory chromatograms Indicate ff EPA = U.S. Environmental Protection A ¹⁰Laboratory reporting limit for this ADEC = Alaska Department DRO = Diesel-Range Ork ug/l = micrograms per liter GRO = Gasoline-Range "<" or ND = analyte no "" = duplicate sample North Creek Analyti 28 = benzene, E = ett ⁶HVOCs = Halogena -" = not analyzed; ⁵RRO ≈ Residual







Notes:

- 1. The information used to create this rose diagram was gathered from quarterly ground water monitoring reports dating from August 2001 to the present.
- 2. This diagram presents the direction of ground water flow based on measured ground water elevations in the monitoring wells versus the number of occurrences.



FIGURE 4

HISTORICAL GROUND WATER FLOW DIAGRAM

ATTACHMENT A



SCOTT, LA 70583 (337) 237-4775

Case Narrative for:

SHELL OIL PRODUCTS

Certificate of Analysis Number:

02060086

Report To:	Project Name: 9876-004-00
GEO ENGINEERS, INC JAMIE OAKLEY 4951 EAGLE STREET	Site: NORTHERN LIGHTS TEXACO Site Address: 1501 NORTHERN LIGHTS BLVD
ANCHORAGE AK 99503-7432	PO Number: State: Alaska State Cert. No.:
ph: (907) 561-3478 fax:	Date Reported: 6/27/02

Matrix spike (MS) and matrix spike duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

TOTAL NUMBER OF PAGES IN THIS REPORT: 32 PAGES

GeoEngineers ANCHORAGE

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Anthony Duhon
Project Manager

6/27/02

Date



LAFAYETTE LABORATORY 500 AMBASSADOR CAFFERY PARKWAY SCOTT, LA 70583 (337) 237-4775

SHELL OIL PRODUCTS

Certificate of Analysis Number:

02060086

Report To:

Fax To:

GEO ENGINEERS, INC

JAMIE OAKLEY

4951 EAGLE STREET

ANCHORAGE

AK

99503-7432

ph: (907) 561-3478

fax: (907) 561-5123

Project Name:

9876-004-00

Site:

NORTHERN LIGHTS TEXACO

Site Address:

1501 NORTHERN LIGHTS BLVD

PO Number:

State:

Alaska

State Cert. No.:

Date Reported:

6/27/02

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	000 10	1
			- Julio Golileotea	Date neceived	COC ID	HOLD
			•			
/W-1	02060086-01	Water	6/1/02 11:30:00 AM	6/4/02 10:00:00 AM	157320	, LJ
MW-C	02060086-02	Water	6/1/02 12:00:00 PM	6/4/02 10:00:00 AM	157320	-
/W-D	02060086-03	Water	6/1/02 12:10:00 PM	6/4/02 10:00:00 AM	157320	- - -
1W-E	02060086-04	Water	6/1/02 12:20:00 PM	6/4/02 10:00:00 AM	157320	- - -
fW-F	02060086-05	Water	6/1/02 12:30:00 PM	6/4/02 10:00:00 AM	157320	- - - -
UPLICATE	02060086-06	Water	6/1/02	6/4/02 10:00:00 AM		- 무무
P BLANK	02060086-07	Water	6/1/02	6/4/02 10:00:00 AM	157320 157320	ᆛ岩

nthony Duhon
roject Manager

6/27/02

Date

Ron Benjamin Laboratory Director

Tristan Davis
Quality Assurance Officer



SCOTT, LA 70583 (337) 237-4775

Client Sample ID: MW-1 Collected: 06/01/2002 11:30 SPL Sample ID: 02060086-01

						90/01/2002 11:00	or L Sample I	D. 0200	1 0-0000
				Site	: NO	RTHERN LIGHTS	TEXACO		
Analyses/Method	Res	ult		Rep.Limit		Dil. Factor QUAL	Date Analyzed	Analyst	Seq. #
BTEX BY METHOD 802	1B				MCL	SW8021B	Units: ug	2/L	
Benzene		ND		1		1	06/10/02 19:56	TO	395248
Ethylbenzene		ND		1		1	06/10/02 19:56	TO	395248
Toluene	1	ND		1		1	06/10/02 19:56	TO	395248
m,p-Xylene		ND	_	2	_	1	06/10/02 19:56	TO	395248
o-Xylene	P	ND		1		1	06/10/02 19:56	то	395248
Xylenes,Total	<u> </u>	ND		3		1	06/10/02 19:56	TO	395248
Surr: 1,4-Difluorobenze	ne 97	7.7	%	41-143		1	06/10/02 19:56	TO	395248
Surr: 4-Bromofluorober	zene 63	3.7	%	39-160		1	06/10/02 19:56	TO	395248
DIESEL RANGE ORGAN	VICS- AK		===		MCL	AK_DRO	Units: m	m/1	===
Diesel Range Organics	0.	19	_	0.1		1	06/12/02 21:24		399057
Surr: o-Terphenyl	1	16	%	50-150		1	06/12/02 21:24		399057
Prep Method	Prep Date			Prep Initials					
SW3510B	06/05/2002 13:54			СОМ					
GASOLINE RANGE OR	GANICS- ALASK	A			MCL	AK_GRO	Units: mg	7/1	
Gasoline Range Organics	N	1D	_	0.1		1		TO	395700
Surr: 4-Bromofluoroben	zene 60	.2	%	60-120		1		TO	395700
RESIDUAL RANGE ORG	GANICS-AK				MCL	AK_RRO	Units: mg	1/1	
Residual Range Organics	0.3	34		0.1		1	06/12/02 21:24		410415
Surr: o-Terphenyl	11	16	%	50-150		1	06/12/02 21:24		410415

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Surrogate Recovery Outside Advisable QC Limits

J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)

D - Surrogate Recovery Unreportable due to Dilution



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583 (337) 237-4775

Client Sample ID: MW-C

Collected: 06/01/2002 12:00

SPL Sample ID:

02060086-02

		TEXACO						
Analyses/Method	Result		Rep.Limit		Dil. Factor QUAL	Date Analyzed	Analyst	Seq. #
BTEX BY METHOD 8021B				MCL	SW8021B	Units: ug	/L	
Benzene	ND		1		1	06/10/02 20:24	TO	395250
Ethylbenzene	ND		1		1	06/10/02 20:24	то	395250
Toluene	ND		1		1	06/10/02 20:24	TO	395250
m,p-Xylene	2.3		2		1	06/10/02 20:24	TO	395250
o-Xylene	8.8		1		1	06/10/02 20:24	то	395250
Xylenes, Total	11.1		3		1	06/10/02 20:24	TO	395250
Surr: 1,4-Difluorobenzene	94.7	%	41-143		1	06/10/02 20:24	TO	395250
Surr: 4-Bromofluorobenzene	83.6	%	39-160		1	06/10/02 20:24	то	395250
GASOLINE RANGE ORGANICS-	LASKA			MCL	AK GRO	Units: mg	1/1	
Gasoline Range Organics	ND		0.1	····	1	06/10/02 20:24	ΤO	395703
Surr: 4-Bromofluorobenzene	81.7	%	60-120		1	06/10/02 20:24	ТО	395703

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Surrogate Recovery Outside Advisable QC Limits

J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)

D - Surrogate Recovery Unreportable due to Dilution



SCOTT, LA 70583 (337) 237-4775

Client Sample ID: MW-C

Collected: 06/01/2002 12:00

SPL Sample ID:

02060086-02

Site:	NORTHERN	Lights	TEXACO
-------	----------	--------	---------------

Analyses/Method	Result	Rep.Limit		Dil. Factor		Date Analyzed	Analyst	Seq. #
VOLATILE ORGANICS METH	OD 8260B		MCL		260B		<u> </u>	
1,1,1-Trichloroethane	ND	5	MOL	1	2006	Units: u 06/05/02 13:33		000004
1,1,2,2-Tetrachloroethane	ND			<u>'</u>		06/05/02 13:33		390261
1,1,2-Trichloroethane	ND	5				06/05/02 13:33		390261
1,1-Dichloroethane	ND	5		1		06/05/02 13:33		390261
1,1-Dichloroethene	ND	5		1		06/05/02 13:33		390261 390261
1,2-Dichloroethane	ND	5	·	<u>·</u>		06/05/02 13:33	 	
1,2-Dichloropropane	ND	5		1		06/05/02 13:33	· · · · · · · · · · · · · · · · · · ·	390261
2-Butanone	ND	20		<u> </u>		06/05/02 13:33		390261
2-Hexanone	ND	10		1		06/05/02 13:33	JCB	390261
4-Methyl-2-pentanone	ND	10		1		06/05/02 13:33		390261
Acetone	ND	100		1		06/05/02 13:33	JCB JCB	390261
Benzene	ND	5		<u>'</u>				390261
Bromodichloromethane	ND	5		1			JCB	390261
Bromoform	ND	5		<u>-</u>		06/05/02 13:33 06/05/02 13:33		390261
Bromomethane	ND	10		<u></u>			JCB JCB	390261
Carbon disulfide	ND	5		<u>'</u>		···-	JCB JCB	390261
Carbon tetrachloride	ND	5		<u>'</u>				390261
Chlorobenzene	ND	5		<u>'</u> -			JCB	390261
Chloroethane	ND	10		1			JCB JCB	390261
Chloroform	ND	5		<u>'</u>		06/05/02 13:33		390261
Chloromethane	ND	5		1		06/05/02 13:33		390261
cis-1,3-Dichloropropene	ND	5		-			JCB JCB	390261
Dibromochloromethane	ND	5		1		06/05/02 13:33		390261
Ethylbenzene	ND	5		- 			JCB JCB	390261
Methylene chloride	ND	5		1			JCB JCB	390261
Styrene	ND	5		1		06/05/02 13:33		390261
Tetrachloroethene	ND	5				06/05/02 13:33		390261
Toluene	ND	5		- <u> </u>			JCB JCB	390261
trans-1,3-Dichloropropene	ND	5		1				390261
Trichloroethene	ND	5		· -			JCB 10B	390261
Trichlorofluoromethane	ND	5		1		06/05/02 13:33		390261
Vinyl acetate	ND	10		<u>-</u>			JCB	390261
Vinyl chloride	ND	10		 1			JCB	390261
cis-1,2-Dichloroethene	ND	5		'			JCB	390261
m,p-Xylene	ND	5		<u>-</u>			JCB	390261
o-Xylene	ND	5					ICB	390261
trans-1,2-Dichloroethene	ND	5		1			ICB	390261
1,2-Dichloroethene (total)	ND	5		1			ICB	390261
Xylenes,Total	ND	5	·- ·- ·	1			ICB	390261
Surr: 1,2-Dichloroethane-d4	96.7	% 71-131		1			CB	390261
,		70 / I-101		1	(06/05/02 13:33 J	ICB	390261

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Surrogate Recovery Outside Advisable QC Limits

J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)

D - Surrogate Recovery Unreportable due to Dilution



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583 (337) 237-4775

Client Sample ID: MW-C

Collected: 06/01/2002 12:00

SPL Sample ID:

02060086-02

Site:	MODELLEDAL LIQUEO TOVA	~~
one:	NORTHERN LIGHTS TEXA	CU

Analyses/Method	Result	Rep.Limit	Dil. Factor QU	AL Date Analyzed	Analyst	Seq. #
Surr: 4-Bromofluorobenzene	101 %	86.3-112	1	06/05/02 13:33	JCB	390261
Surr: Toluene-d8	99.1 %	89.5-108	1	06/05/02 13:33	JCB	390261

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Surrogate Recovery Outside Advisable QC Limits

J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)

D - Surrogate Recovery Unreportable due to Dilution



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583 (337) 237-4775

Client Sample ID: MW-D

Collected: 06/01/2002 12:10

SPL Sample ID:

02060086-03

Site:	NORT	HERN L	IGHTS	TEXAC
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· · · · · · · · · · · · · · · · · · ·	Site: NORTHERN LIGHTS TEXACO								
Analyses/Method	Result		Rep.Limit		Dil. Factor QUAL	Date Analyzed	Analyst	Seq. #	
BTEX BY METHOD 8021B				MCL	SW8021B	l Imit		<u>:</u>	
Benzene	ND		1		1	Units: ug			
Ethylbenzene	6.1					06/10/02 20:52	ТО	395252	
Toluene			!		1	06/10/02 20:52	TO	395252	
	2.1		1		1	06/10/02 20:52	TO	395252	
m,p-Xylene	16		2		1	06/10/02 20:52	TO	395252	
o-Xylene	4.5		1		1	06/10/02 20:52	TO		
Xylenes,Total	20.5		3					395252	
Surr: 1,4-Difluorobenzene	96.9	%	41-143			06/10/02 20:52	то	395252	
Surr: 4-Bromofluorobenzene					1	06/10/02 20:52	TO	395252	
Suit. 4-bioinolluorobenzene	105	%	39-160		1	06/10/02 20:52	TO	395252	
GASOLINE RANGE ORGANICS-	ALASKA			MCL	AK_GRO	Units: mg	/1		
Gasoline Range Organics	0.61		0.1		1				
Surr: 4-Bromofluorobenzene	94.5	%	60-120				ТО	395704	
	94.5		00-120		1	06/10/02 20:52	TO	395704	

- B Analyte detected in the associated Method Blank
- * Surrogate Recovery Outside Advisable QC Limits
- J Estimated Value between MDL and PQL
- >MCL Result Over Maximum Contamination Limit(MCL)
- D Surrogate Recovery Unreportable due to Dilution
- MI Matrix Interference



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583 (337) 237-4775

Client Sample ID: MW-E Collected: 06/01/2002 12:20 SPL Sample ID: 02060086-04

			Site	NO	RTHERN LI	GHTS	TEXACO		
Analyses/Method	Result		Rep.Limit		Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
BTEX BY METHOD 8021B				MCL	SW8	3021B	Units: ug	J/L	
Benzene	130		1		1		06/10/02 21:20	ΤФ	395254
Ethylbenzene	220		1		1		06/10/02 21:20	тф	395254
Toluene	100		1		1		06/10/02 21:20	тф	395254
m,p-Xylene	1500		20		10		06/11/02 12:19	тф	398415
o-Xylene	730	•	10		10		06/11/02 12:19	ТФ	398415
Xylenes,Total	2230		30		10		06/11/02 12:19	тф	398415
Surr: 1,4-Difluorobenzene	97.1	%	41-143		10	_	06/11/02 12:19	ТФ	398415
Surr: 1,4-Difluorobenzene	96.2	%	41-143		1	•	06/10/02 21:20	тф	395254
Surr: 4-Bromofluorobenzene	102	%	39-160		10		06/11/02 12:19	тф	398415
Surr: 4-Bromofluorobenzene	198	%	39-160		1 -	MI	06/10/02 21:20	то	395254
GASOLINE RANGE ORGANICS-	ALASKA	-		MCL	AK_	GRO	Units: m	g/L	
Gasoline Range Organics	8.5		0.1		1		06/10/02 21:20	ТФ	395706
Surr: 4-Bromofluorobenzene	113	%	60-120		1		06/10/02 21:20	ТФ	395706

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Surrogate Recovery Outside Advisable QC Limits

J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)

D - Surrogate Recovery Unreportable due to Dilution



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583 (337) 237-4775

Client Sample ID: MW-E

Collected: 06/01/2002 12:20

SPL Sample ID:

02060086-04

Site:	NORTHERN	LIGHTS TEXACO
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Analyses/Method	Resul	t Rep.Limi	 t	Dil. Factor	QUAI	Date Analyzed	Analust	C "
VOLATILE ORGANICS METHO)D 8260B	•						Seq. #
1,1,1-Trichloroethane	NE	5	MCL		260B	Units: t		
1,1,2,2-Tetrachioroethane	NE			1		06/05/02 13:56		390262
1,1,2-Trichloroethane	NC					06/05/02 13:56		390262
1,1-Dichloroethane	ND					06/05/02 13:56		390262
1,1-Dichloroethene	ND			1		06/05/02 13:56		390262
1,2-Dichloroethane	ND			1		06/05/02 13:56		390262
1,2-Dichloropropane	ND			1		06/05/02 13:56		390262
2-Butanone	ND			1		06/05/02 13:56		390262
2-Hexanone	ND		· · · · · · · · · · · · · · · · · · ·	- 1		06/05/02 13:56		390262
4-Methyl-2-pentanone	ND	10		1	· · · · · · · · · · · · · · · · · · ·	06/05/02 13:56		390262
Acetone	ND			1		06/05/02 13:56		390262
Benzene	92	100		1		06/05/02 13:56		390262
Bromodichloromethane	ND	5		1		06/05/02 13:56	JCB	390262
Bromoform	ND	5		1		06/05/02 13:56	JCB	390262
Bromomethane		5		1		06/05/02 13:56	JCB	390262
Carbon disulfide	ND	10		1		06/05/02 13:56	JCB	390262
Carbon tetrachloride	ND ND	5		1		06/05/02 13:56	JCB	390262
Chlorobenzene	ND	5		1		06/05/02 13:56	JCB	390262
Chloroethane	ND	5		1		06/05/02 13:56	JCB	390262
Chloroform	ND ND	10		1		06/05/02 13:56	JCB	390262
Chloromethane	ND ND	5	·	1	·-	06/05/02 13:56	JCB	390262
cis-1,3-Dichloropropene	ND	5		1.		06/05/02 13:56	JCB	390262
Dibromochloromethane	ND	5		1 .		06/05/02 13:56	JCB	390262
Ethylbenzene	ND 155	5		1		06/05/02 13:56	JCB	390262
Methylene chloride	150	5		1		06/05/02 13:56	JCB	390262
Styrene	ND	5		1		06/05/02 13:56	JCB	390262
Tetrachioroethene	ND ND	5		1		06/05/02 13:56	JCB	390262
Toluene	ND	5		1		06/05/02 13:56	JCB	390262
	59	5		1		06/05/02 13:56	JCB	390262
trans-1,3-Dichloropropene Trichloroethene	ND	5		1		06/05/02 13:56	JCB	390262
Trichlorofluoromethane	ND	5		1		06/05/02 13:56	JCB	390262
Vinyl acetate	ND	5		1	(06/05/02 13:56	JCB	390262
	ND	10		1	- (06/05/02 13:56	JCB	390262
Vinyl chloride	ND	10		1		06/05/02 13:56	JCB	390262
cis-1,2-Dichloroethene	ND	5		1	C	06/05/02 13:56	JCB	390262
m,p-Xylene	2900	100		20			JCB	391697
o-Xylene	1200	100		20			JCB	391697
trans-1,2-Dichloroethene	ND ·	5		1			JCB	390262
1,2-Dichloroethene (total)	ND	5		1			JCB	390262
Xylenes, Total	4100	100	· · · · · · · · · · · · · · · · · · ·	20			JCB	391697
Surr: 1,2-Dichloroethane-d4	97.6	% 71-131		1		6/05/02 13:56		390262

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Surrogate Recovery Outside Advisable QC Limits

J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)

D - Surrogate Recovery Unreportable due to Dilution



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583 (337) 237-4775

Client Sample ID: MW-E

Collected: 06/01/2002 12:20

SPL Sample ID:

02060086-04

Site:	NORTHERN	LIGHTS	TEXACO
- 110.	1101111111111		ILAAOO

Analyses/Method	Result	Rep.Limit	Dil. Factor QUAL	Date Analyzed	Analyst	Seq. #
Surr: 1,2-Dichloroethane-d4	102	% 71-131	20	06/06/02 13:41	CB	391697
Surr: 4-Bromofluorobenzene	102	% 86.3-112	1	06/05/02 13:56	СВ	390262
Surr: 4-Bromofluorobenzene	101	% 86.3-112	20	06/06/02 13:41	ICB	391697
Surr: Toluene-d8	97.8	% 89.5-108	20	06/06/02 13:41	ICB	391697
Surr: Toluene-d8	99.4	% 89.5-108	1	06/05/02 13:56	СВ	390262

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Surrogate Recovery Outside Advisable QC Limits

J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)

D - Surrogate Recovery Unreportable due to Dilution



(337) 237-4775

Client Sample ID: MW-F Collected: 06/01/2002 12:30 SPL Sample ID: 02060086-05

Site: NORTHERN LIGHTS TEXACO

	Site: NORTHERN LIGHTS TEXACO										
Analyses/Method	Result		Rep.Limit		Dil. Factor QUAL	Date Analyzed	Analyst	Seq. #			
BTEX BY METHOD 8021B				MCL	SW8021B	Units: ug	-/I				
Benzene	ND		1		1						
Ethylbenzene	30					06/11/02 1:05	ТО	395260			
Toluene			<u>-</u> -		1	06/11/02 1:05	TO	395260			
	1.1		1		1	06/11/02 1:05	TO	395260			
m,p-Xylene	30		2		1	06/11/02 1:05	TO				
o-Xylene	1.6		1		· · · · · · · · · · · · · · · · · · ·			395260			
Xylenes,Total	31.6				<u> </u>	06/11/02 1:05	ТО	395260			
Surr: 1,4-Difluorobenzene			3		1	06/11/02 1:05	то	395260			
	88.5	%_	41-143		1	06/11/02 1:05	TO	395260			
Surr: 4-Bromofluorobenzene	127	%	39-160		1	06/11/02 1:05	ТО	395260			
GASOLINE RANGE ORGANICS-	ALASKA			MCL	AK_GRO	Units: mg	-/I				
Gasoline Range Organics	0.57		0.1		1						
Surr: 4-Bromofluorobenzene	112	0/				06/11/02 1:05	то	395714			
	112	<u>%</u>	60-120		1	06/11/02 1:05	TO	395714			

- B Analyte detected in the associated Method Blank
- * Surrogate Recovery Outside Advisable QC Limits
- J Estimated Value between MDL and PQL

- D Surrogate Recovery Unreportable due to Dilution
- MI Matrix Interference



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583 (337) 237-4775

Client Sample ID: DUPLICATE

Collected: 06/01/2002 0:00

SPL Sample ID:

02060086-06

Site:	NOR'	THERN !	LIGHTS	TEXA	CO
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			Site	: NO	RTHERN L	IGHTS	TEXACO		
Analyses/Method	Result		Rep.Limit		Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
BTEX BY METHOD 8021B				MCL	SW	8021B	Units: uç	1/L	
Benzene	130		1		1		06/09/02 0:39	JKM	393209
Ethylbenzene	240		1		1		06/09/02 0:39	JKM	393209
Toluene	110		1		1		06/09/02 0:39	JKM	393209
m,p-Xylene	2100		20		10		06/09/02 23:08	JKM	396538
o-Xylene	900	-	10		10		06/09/02 23:08	JKM	396538
Xylenes,Total	3000		30		10		06/09/02 23:08	JKM	396538
Surr: 1,4-Difluorobenzene	98.3	%	41-143		10		06/09/02 23:08	JKM	396538
Surr: 1,4-Difluorobenzene	93.2	%	41-143		1		06/09/02 0:39	JKM	393209
Surr: 4-Bromofluorobenzene	108	%	39-160		10		06/09/02 23:08	JKM	396538
Surr: 4-Bromofluorobenzene	168	%	39-160		1	MI	06/09/02 0:39	JKM	393209
GASOLINE RANGE ORGANICS-	ALASKA			MCL	AK	GRO	Units: mg	a/L	
Gasoline Range Organics	6.5		0.1		1			JKM	412461
Surr: 4-Bromofluorobenzene	101	%	60-120		1		06/09/02 0:39	JKM	412461

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Surrogate Recovery Outside Advisable QC Limits

J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)

D - Surrogate Recovery Unreportable due to Dilution



(337) 237-4775

Client Sample ID: TRIP BLANK Collected: 06/01/2002 0:00 SPL Sample ID: 02060086-07

Site:	NORTHERN LIGHTS TEXACO	
	" LIGHT EIGHTS FEARCO	

One. NORTHERN LIGHTS TEXACO									
Result		Rep.Limit	·—	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #	
			MCI	SWA	021B	Uniterre			
ND		1		1	OZ ID				
				<u> </u>			10	395264	
				1		06/11/02 2:02	TO	395264	
ND		1		1		06/11/02 2:02	TO	395264	
ND		2		1		06/11/02 2:02	TO		
. ND		1		<u>_</u>				395264	
ND							10	395264	
				1		06/11/02 2:02	TO	395264	
99.0	%	41-143		1		06/11/02 2:02	TO	395264	
65.7	%	39-160		1		06/11/02 2:02	TO	395264	
ALASKA			MCI	AV	CPO	12-14-			
		0.1	HOL		unu		γL		
				1		06/11/02 2:02	TO	395718	
61.1		60-120		1	_	06/11/02 2:02	TO	395718	
	ND ND ND ND ND ND	ND ND ND ND ND ND SSSSSSSSSSSSSSSSSSSSS	ND 1 ND 1 ND 1 ND 2 ND 1 ND 3 99.0 % 41-143 65.7 % 39-160 ALASKA ND 0.1	MCL ND 1 ND 1 ND 1 ND 2 ND 1 ND 3 99.0 % 41-143 65.7 % 39-160 ALASKA MCL ND 0.1	MCL SW8 ND 1 1 1 1 1 1 1 1 1	MCL SW8021B ND 1	MCL SW8021B Units: ug ND 1 1 06/11/02 2:02 ND 1 1 06/11/02 2:02 ND 1 1 06/11/02 2:02 ND 2 1 06/11/02 2:02 ND 1 1 06/11/02 2:02 ND 3 1 06/11/02 2:02 99.0 % 41-143 1 06/11/02 2:02 65.7 % 39-160 1 06/11/02 2:02 ALASKA MCL AK_GRO Units: mg ND 0.1 1 06/11/02 2:02	MCL SW8021B Units: ug/L	

- B Analyte detected in the associated Method Blank
- * Surrogate Recovery Outside Advisable QC Limits
- J Estimated Value between MDL and PQL

- D Surrogate Recovery Unreportable due to Dilution
- MI Matrix Interference

Quality Control Documentation



SCOTT, LA 70583 (337) 237-4775

Quality Control Report

SHELL OIL PRODUCTS

9876-004-00

alysis:

Diesel Range Organics- AK

Method: AK_DRO WorkOrder:

Samples in Analytical Batch:

Lab Batch ID:

02060086

8141

Method Blank TPHB_020612A-399041

Units:

mg/L

Lab Sample ID

Client Sample ID

Analysis Date:

06/12/2002 18:38

Analyst:

02060086-01B

MW-1

paration Date:

06/05/2002 13:54

Prep By:

SSH COM Method SW3510B

Analyte	Result	Rep Limit
Diesel Range Organics	ND	0.10
Surr: o-Terphenyl	90.6	

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

RunID:

TPHB_020612A-399042

Units:

mg/L

Analysis Date:

06/12/2002 18:49

Analyst: SSH

Preparation Date: 06/05/2002 13:54

Prep By: COM Method SW3510B

Analyte	LCS Spike Added	LCS Result	LCS Percent Recovery	LCSD Spike Added	LCSD Result	LCSD Percent Recovery	RPD	RPD Limit	Lower Limit	Upper Limit
Lasel Range Organics	3	2.5	83	3	2.9	96	14.2	20	75	125

Qualifiers:

ND/U - Not Detected at the Reporting Limit

MI - Matrix Interference

B - Analyte detected in the associated Method Blank

D - Recovery Unreportable due to Dilution

J - Estimated value between MDL and PQL

* - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and anding, the reported RPD may differ from the displayed RPD values but is correct as reported.

6/27/02 9:16:58 AM



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583

(337) 237-4775

Quality Control Report

SHELL OIL PRODUCTS 9876-004-00

Analysis: **Viethod:**

Residual Range Organics-AK

AK_RRO

WorkOrder:

02060086

Lab Batch ID:

R24677

Samples in Analytical Batch:

Lab Sample ID

Client Sample ID

02060086-01B

MW-1

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

J - Estimated value between MDL and PQL

MI - Matrix Interference

D - Recovery Unreportable due to Dilution

* - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and ounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

6/27/02 9:16:58 AM



SCOTT, LA 70583 (337) 237-4775

Quality Control Report

SHELL OIL PRODUCTS

9876-004-00

BTEX by Method 8021B

Method:

SW8021B

WorkOrder:

02060086

Lab Batch ID:

R23549

nID:

Analysis Date:

HPOO_020608A-393199

06/08/2002 19:41

Method Blank Units:

Analyst:

ug/L

JKM

Lab Sample ID

Samples in Analytical Batch:

Client Sample ID

02060086-06A

DUPLICATE

Analyte	Result	Rep Limit
Benzene	ND	1.0
Ethylbenzene	ND	1.0
Toluene	ND	1.0
Surr: 1,4-Difluorobenzene	97.7	57-136
Surr: 4-Bromofluorobenzene	99.2	58-137

Laboratory Control Sample (LCS)

RuniD:

HPOO_020608A-393197

Units:

ug/L

Analysis Date:

06/08/2002 16:49

Analyst:

JKM

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	50	54	107	70	130
Ethylbenzene	50	52	104	70	
Toluene	50	53	105	70	130

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked:

02060137-08

RunID:

HPOO_020608A-393211

Units:

ug/L

Analysis Date:

06/09/2002 12:59

Analyst:

JKM

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
zene	ND	200	240	119	200	220				ļ	
nylbenzene	ND						110	8.42	20	70	130
	ND ND		1900	968 *	200	1900	945 *	2.39	20	70	130
eneuk	ND	200	4200	2090 *	200	4100	2040 *	2.33			

Qualifiers:

ND/U - Not Detected at the Reporting Limit

MI - Matrix Interference

B - Analyte detected in the associated Method Blank

D - Recovery Unreportable due to Dilution

J - Estimated value between MDL and PQL

* - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and unding, the reported RPD may differ from the displayed RPD values but is correct as reported.



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583

(337) 237-4775

Quality Control Report

SHELL OIL PRODUCTS

9876-004-00

Analysis:

RunID:

BTEX by Method 8021B

SW8021B Method:

WorkOrder: Lab Batch ID: 02060086 R23680

Method Blank

Units:

ug/L

Lab Sample ID

Samples in Analytical Batch:

Client Sample ID

Analysis Date:

06/10/2002 14:33

HPZZ_020610A-395234

Analyst:

TO

02060086-01A 02060086-02A MW-1

MW-C

02060086-03A

MW-D

02060086-04A

MW-E

02060086-05A

MW-F

	,	
	ND	1.0
16	ND	1.0
· · · · · · · · · · · · · · · · · · ·	ND ND	1.0
	ND	2.0
	ND ND	1.0

02060086-07A

TRIP BLANK

Analyte	Result	Rep Limit
Benzene	ND	1.0
Ethylbenzene	ND	1.0
Toluene	ND	1.0
m,p-Xylene	ND	2.0
o-Xylene	ND	1.0
Xylenes, Total	ND	3.0
Surr: 1,4-Difluorobenzene	98.5	57-136
Surr: 4-Bromofluorobenzene	69.4	58-137

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

RunID:

HPZZ_020610A-396842

Units:

ug/L

Analysis Date:

06/10/2002 11:32

Analyst: TO

Analyte	LCS Spike Added	LCS Result	LCS Percent Recovery	LCSD Spike Added	LCSD Result	LCSD Percent Recovery	RPD	RPD		Upper Limit
3enzene	50	55	110	50	54	108	2.4	2	0 70	130
thylbenzene	50	57	113	50	56	111	1.7	2	0 70	130
oluene	50	57	114	50	55	110	3.2	2	0 70	130
n,p-Xylene	100	110	114	100	110	112	1.4	2	0 70	130
>-Xylene	50	55	110	50	54	108	1.7	2	0 70	130
(ylenes,Total	150	165	110	150	164	109	0.6	2	0 70	130

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked:

02060086-01

RunID:

HPZZ_020610A-395255

Units:

ug/L

Analysis Date:

06/10/2002 21:48

TO Analyst:

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RP	D	RPD Limit		High Limit
enzene	ND	20	20	97.9	20	20	97.8	0.	0981	20	70	130
thylbenzene	ND	20	19	95.9	20	19	92.8		3.34	20	70	130

Qualifiers:

ND/U - Not Detected at the Reporting Limit

MI - Matrix Interference

B - Analyte detected in the associated Method Blank

D - Recovery Unreportable due to Dilution

J - Estimated value between MDL and PQL

* - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

6/27/02 9:16:59 AM



SCOTT, LA 70583 (337) 237-4775

Quality Control Report

SHELL OIL PRODUCTS

9876-004-00

Method:

BTEX by Method 8021B

SW8021B

WorkOrder:

02060086

Lab Batch ID:

R23680

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked:

02060086-01

RunID:

HPZZ_020610A-395255

Units:

ug/L

Analysis Date:

06/10/2002 21:48

Analyst: TO

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
uene	ND	20	20	98.0	20						
-Xylene	ND					20	99.1	1.16	20	70	130
-Xvlene			44	111	40	39	97.4	13.3	20	70	130
	ND	20	22	109	20	19	93.0	16.0	20		
vlenes,Total	ND	60	66	110	60					70	130
	88-4-1		S) / Matrix S			58	96.7	12.9	20	70	130

IS) / Matrix Spike Duplicate (MSD)

Sample Spiked:

02060212-02

RunID:

HPZZ_020610A-396931

Units:

ug/L

Analysis Date:

06/10/2002 16:26

Analyst: To)
-------------	---

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
zene	630	200	540	-44.7 *	200	540	-45.2 °	1.04	20	70	100
/lbenzene	83	200	210	64.4 *	200	220	66.6 *	3.37			
uene	49	200	180	64.2 *	200	180	63.7 *		20	70	
-Xylene	30	400	340					0.716	20	70	130
/lene			340	77.4	400	340	78.1	0.918	20	70	130
	24	200	170	70.7	200	170	72.0	1.79	20	70	
enes,Total	54	600	510	76.0	600	510	76.0	0	20	70	

Qualifiers:

ND/U - Not Detected at the Reporting Limit

MI - Matrix Interference

B - Analyte detected in the associated Method Blank

D - Recovery Unreportable due to Dilution

J - Estimated value between MDL and PQL

* - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and unding, the reported RPD may differ from the displayed RPD values but is correct as reported.



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583

(337) 237-4775

Quality Control Report

SHELL OIL PRODUCTS

9876-004-00

Analysis:

RunID:

Gasoline Range Organics- ALASKA

Method:

Analysis Date:

AK_GRO

Samples in Analytical Batch:

WorkOrder: 02060086

Lab Batch ID:

R23699

Method Blank

HPZZ_020610C-395697

06/10/2002 14:33

Units: Analyst:

mg/L TO

Result

ND

Lab Sample ID

Client Sample ID

02060086-01A

MW-1

02060086-02A

MW-C

02060086-03A

MW-D

02060086-04A

MW-E

02060086-05A

MW-F

Gasoline Range Organics Surr. 4-Bromofluorobenzene

Analyte

02060086-07A

TRIP BLANK

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

0.10

60-120

Rep Limit

HPZZ_020610C-395694

Units:

mg/L

Analysis Date:

06/10/2002 13:09

TO Analyst:

Analyte	LCS Spike Added	LCS Result	LCS Percent Recovery	LCSD Spike Added	LCSD Result	LCSD Percent Recovery	RPD	RPD Limit	Lower Limit	Upper Limit
asoline Range Organics	5	5.6	113	5	5	101	11.4	20	70	1 (

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked:

Analysis Date:

02060087-08

RunID:

HPZZ_020610C-395707 06/10/2002 22:44

Units: Analyst:

mg/L

TO

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RP	D	RPD Limit		High Limit
asoline Range Organics	1.1	5	6	98.2	5	5.8	92.4		6.01	. 20	50	130

Qualifiers:

ND/U - Not Detected at the Reporting Limit

MI - Matrix Interference

B - Analyte detected in the associated Method Blank

D - Recovery Unreportable due to Dilution

J - Estimated value between MDL and PQL

* - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and ounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

6/27/02 9:16:59 AM



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583

(337) 237-4775

Quality Control Report

SHELL OIL PRODUCTS

9876-004-00

alysis: Method:

BTEX by Method 8021B

SW8021B

WorkOrder:

02060086

Lab Batch ID:

R23754

nID:

HPOO_020609A-396520

Units: ug/L

Lab Sample ID

Samples in Analytical Batch:

Client Sample ID

Analysis Date:

06/09/2002 19:51

JKM

02060086-06A

Analyst:

DUPLICATE

Analyte	Result	Rep Limit
m,p-Xylene	ND	2.0
o-Xylene	ND	1.0
Xylenes,Total	ND	3.0
Surr: 1,4-Difluorobenzene	98.2	57-136
Surr: 4-Bromofluorobenzene	100.8	58-137

Method Blank

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

RunID:

HPOO_020609A-396518

Units:

ug/L

Analysis Date:

06/09/2002 16:48

Analyst: JKM

Analyte	LCS Spike Added	LCS Result	LCS Percent Recovery	LCSD Spike Added	LCSD Result	LCSD Percent Recovery	RPD	RPD Limit	Lower Limit	Upper Limit
Xylene	100	110	112	100	110	107	3.8		70	400
ylene	50	54	108	50						130
(ylenes,Total					52	105	3.2	20	70	130
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	150	164	109	150	162	108	1.2	20	70	130

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked:

02060087-08

RunID:

HPOO_020609A-396525

Units:

ug/L

Analysis Date:

06/10/2002 1:29

Analyst:

JKM

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD		Low Limit	High Limit
Xylene	ND	400	2500	625 *	400						
Xylene		<u> </u>		025	400	2400	603 *	3.58	20	70	130
Mines, Total	ND		1100	549 *	200	1100	530 *	3.38	20	70	130
nes, rotar	ND	600	3600	600 *	600	3500	583 *	2.82	20		

Qualifiers:

ND/U - Not Detected at the Reporting Limit

MI - Matrix Interference

B - Analyte detected in the associated Method Blank J - Estimated value between MDL and PQL

D - Recovery Unreportable due to Dilution * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and anding, the reported RPD may differ from the displayed RPD values but is correct as reported.

6/27/02 9:17:00 AM



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583

(337) 237-4775

Quality Control Report

SHELL OIL PRODUCTS

9876-004-00

Analysis:

RunID:

BTEX by Method 8021B

Method: SW8021B WorkOrder:

02060086

Lab Batch ID:

R23884

Method Blank

Samples in Analytical Batch:

HPZZ_020611A-398440

Units: ug/L

Lab Sample iD

Client Sample ID

Analysis Date:

06/11/2002 8:08

Analyst: TO

02060086-04A

MW-E

Analyte	Result	Rep Limit
m,p-Xylene	ND	2.0
o-Xylene	ND	1.0
Xylenes, Total	ND	3.0
Surr: 1,4-Difluorobenzene	96.1	57-136
Surr: 4-Bromofluorobenzene	81.0	58-137

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

RunID:

HPZZ_020611A-398434

Units:

ug/L

Analysis Date:

06/11/2002 5:48

TO Analyst:

Analyte	LCS Spike Added	LCS Result	LCS Percent Recovery	LCSD Spike Added	LCSD Result	LCSD Percent Recovery	RPD	RPD Limit	Lower Limit	Upper Limit
n,p-Xylene	100	110	113	100	110	108	4.9	2	0 70	130
>-Xylene	50	55	109	50	53	107	2.5	2	0 70	130
Kylenes, Total	150	165	110	150	163	109	1.2	20	0 70	130

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

MI - Matrix Interference

J - Estimated value between MDL and PQL

D - Recovery Unreportable due to Dilution

* - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

6/27/02 9:17:00 AM



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583

(337) 237-4775

Quality Control Report

SHELL OIL PRODUCTS

9876-004-00

Method:

Gasoline Range Organics- ALASKA

AK_GRO

WorkOrder:

02060086

Lab Batch ID:

Method Blank

Units:

Samples in Analytical Batch:

R24835

Analysis Date:

HPOO_020608B-412460

mg/L

JKM

Lab Sample ID

Client Sample ID

06/08/2002 19:41

Analyst:

02060086-06A

DUPLICATE

Analyte	Result	Rep Limit
Gasoline Range Organics	ND	0.10
Surr: 4-Bromofluorobenzene	100.7	60-120

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

RunID:

HPOO_020608B-412458

Units:

mg/L

Analysis Date:

06/08/2002 18:15

Analyst:

JKM

Analyte	LCS Spike Added	LCS Result	LCS Percent Recovery	LCSD Spike Added	LCSD Result	LCSD Percent Recovery	RPD	RPD Limit	Lower Limit	Upper Limit
oline Range Organics	5	5.6	111	5	5.3	106	5.4	20	70	130

Qualifiers:

ND/U - Not Detected at the Reporting Limit

MI - Matrix Interference

B - Analyte detected in the associated Method Blank

D - Recovery Unreportable due to Dilution

J - Estimated value between MDL and PQL

* - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and reunding, the reported RPD may differ from the displayed RPD values but is correct as reported.



SCOTT, LA 70583 (337) 237-4775

Quality Control Report

SHELL OIL PRODUCTS

9876-004-00

Analysis: Method:

RunID:

Volatile Organics Method 8260B

SW8260B

WorkOrder:

02060086

Lab Batch ID:

R23326

Method Blank

X_020605A-390259

Units: ug/L

Lab Sample ID

Samples in Analytical Batch:

Client Sample ID

Analysis Date:

06/05/2002 11:41

Analyst: **JCB**

02060086-02B

MW-C

02060086-04B

MW-E

Analyte	Result	Rep Limi
1,1,1-Trichloroethane	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,1,2-Trichloroethane	ND	5.0
1,1-Dichloroethane	ND	5.0
1.1-Dichloroethene	ND	5.0
1,2-Dichloroethane	ND	.5.0
1,2-Dichloropropane	ND	5.0
2-Butanone	ND	20
2-Hexanone	ND	10
4-Methyl-2-pentanone	ND	10
Acetone	ND	100
Benzene	ND	5.0
Bromodichloromethane	ND	5.0
Bromoform	ND	5.0
Bromomethane	ND	10
Carbon disulfide	ND	5.0
Carbon tetrachloride	ND	5.0
Chlorobenzene	ND	5.0
Chloroethane	ND	10
Chloroform	ND	5.0
Chloromethane	ND	5.0
cis-1,3-Dichloropropene	ND	5.0
Dibromochloromethane	ND	5.0
Ethylbenzene	ND	5.0
Methylene chloride	ND	5.0
Styrene	ND	5.0
Tetrachloroethene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
Trichloroethene	ND	5.0
Trichlorofluoromethane	ND	5.0
Vinyl acetate	ND	10
Vinyl chloride	ND	10
cis-1,2-Dichloroethene	ND	5.0
m,p-Xylene	ND	5.0
o-Xylene	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
1,2-Dichloroethene (total)	ND	5.0
Xylenes, Total	ND	5.0
Surr: 1,2-Dichloroethane-d4	96.9	
Surr: 4-Bromofluorobenzene	101.0	86.3-112
Surr: Toluene-d8	97.9	89.5-108

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

Qualifiers:

ND/U - Not Detected at the Reporting Limit

MI - Matrix Interference

B - Analyte detected in the associated Method Blank J - Estimated value between MDL and PQL

D - Recovery Unreportable due to Dilution

* - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

6/27/02 9:17:00 AM



SCOTT, LA 70583 (337) 237-4775

Quality Control Report

SHELL OIL PRODUCTS

9876-004-00

alysis: Method:

Volatile Organics Method 8260B

SW8260B

WorkOrder:

02060086

RunID:

X_020605A-390254

Units: ug/L Lab Batch ID:

R23326

Analysis Date:

06/05/2002 10:56

Analyst:

JCB

Analyte	LCS Spike Added	LCS Result	LCS Percent Recovery	LCSD Spike Added	LCSD Result	LCSD Percent Recovery	RPD	RPD Limit	Lower Limit	Upper Limit
-Dichloroethene	50	54	108	50	55	111	2.9	18.9	73.7	105
nzene	50	48	95	50	48				1011	125
hlorobenzene	50	53				96	0.8	29.5	75.6	117
duene		—	107	50	53	107	0.3	11.3	84.3	120
	50	48	95	50	49	97	2.3	16.3	81.4	
chloroethene	50	49	98	50						112
			50	50	51	103	4.9	14.2	81.6	116

Qualifiers:

ND/U - Not Detected at the Reporting Limit

MI - Matrix Interference

B - Analyte detected in the associated Method Blank

D - Recovery Unreportable due to Dilution

J - Estimated value between MDL and PQL

* - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



500 AMBASSADOR CAFFERY PARKWAY

SCOTT, LA 70583

(337) 237-4775

Quality Control Report

SHELL OIL PRODUCTS

9876-004-00

Analysis: Method:

Volatile Organics Method 8260B

SW8260B

WorkOrder:

02060086

Lab Batch ID:

R23435

Method Blank

Samples in Analytical Batch:

RunID:

X_020606A-391691

Units:

ug/L

Lab Sample ID

Client Sample ID

Analysis Date:

06/06/2002 11:26

Analyst: **JCB** 02060086-04B

MW-E

Analyte -	Result	Rep Limit
m,p-Xylene	ND	5.0
o-Xylene	ND	5.0
Xylenes,Total	ND	5.0
Surr: 1,2-Dichloroethane-d4	95.2	71-131
Surr: 4-Bromofluorobenzene	103.2	86.3-112
Surr: Toluene-d8	99.0	89.5-108

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

RunID:

X_020606A-391689

Units:

ug/L

Analysis Date:

06/06/2002 10:41

Analyst: **JCB**

Analyte	LCS Spike Added	LCS Result	LCS Percent Recovery	LCSD Spike Added	LCSD Result	LCSD Percent Recovery	RPD	RPD Limit		Upper Limit
1,1-Dichloroethene	50	52	104	- 50	54	109	4.2	18.	9 73.7	125
3enzene	50	45	91	50	48	96	5.7	29.	5 75.6	117
Chlorobenzene	50	51	103	50	54	108	4.8	11.	3 84.3	120
Foluene	50	46	91	50	48	96	4.6	16.	3 81.4	112
Frichloroethene	50	48	96	50	49	98	2.5	14.	2 81.6	116

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

D - Recovery Unreportable due to Dilution

MI - Matrix Interference

J - Estimated value between MDL and PQL

* - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

6/27/02 9:17:01 AM

Sample Receipt Checklist And Chain of Custody



(337) 237-4775

Sample Receipt Checklist

Workorder: Date and Time Rece	·		Receive	name: Fed	Ex-Economy-2nd Day P
Temperature:	6C		Chilled I	by: Wat	er Ice
1. Shipping conta	iner/cooler in good condition?	Yes 🗹	No 🗌	Not Present	
2. Custody seals i	ntact on shippping container/cooler?	Yes 🗌	No 🗆	Not Present	
3. Custody seals i	ntact on sample bottles?	Yes 🗹	No 🗆	Not Present	
4. Chain of custoo	dy present?	Yes 🗹	No 🗆		
5. Chain of custoo	dy signed when relinquished and received?	Yes 🗹	No 🗌		
6. Chain of custod	ly agrees with sample labels?	Yes 🗹	No 🗀 📜	1	
7. Samples in pro	per container/bottle?	Yes 🗹	№ □		
8. Sample contain	ers intact?	Yes 🗹	No 🗌		
9. Sufficient samp	ele volume for indicated test?	Yes 🗹	No 🗀		
10. All samples rec	eived within holding time?	Yes 🗹	No 🗌	•	
11. Container/Temp	Blank temperature in compliance?	Yes 🗹	No 🗌		•
12. Water - VOA via	als have zero headspace?	Yes 🗹	No 🗌	Not Applicable	
13. Water - pH acce	ptable upon receipt?	Yes 🗹	No 🗆	Not Applicable	
-	entative: Duhon, Anthony	Contact Date	& Time:		
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Client Instruction	ns:				

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MW-F	6-1-02	1230			>	70	/	3	×							
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48hr 🔲 Standard 🔯	3. 7.	d by:						time		4. Received by:	<u>4</u>					
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 8880 Interchange Drive, Houston, TX 77054 (713) 660-0901 459-Hughes Drive, Traverse City, MI 49684 (616) 947-5777 	Houston, Tverse City, I	TX 77054 (7 VII 49684 (6	13) 660-0 16) 947-5	901		 	300 Am	bassac	lor Caf	fery Pa	ırkway,	South	500 Ambassador Caffery Parkway, Scott, LA 70583		(318) 237-4775	TC