

GW - 32

MONITORING REPORTS

DATE:

4/98

OCD ANNUAL REPORT



April 4, 1998

Mr. Roger Anderson
Environmental Bureau Chief
New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

Route 3, Box 7
Gallup, New Mexico
87301

505.
722.3833

Dear Mr. Anderson

SUBJECT: OCD ANNUAL REPORT

Pursuant to the water discharge permit, GW-32, Giant Refining Company - Ciniza (Giant) submits the 1997 Annual OCD Report.

The data presented in the enclosed report is arranged in the following order:

- I. Aerated Lagoon and API Effluent Analytical Data
- II. OCD LTA Soil Analytical Data
- III. Tabulated Analytical Data - OW-1, 2, and 3
- IV. Original Analytical Data - OW-1, 2, and 3

If there are any questions please contact Dorinda Mancini at (505) 722-0227, or myself at (505) 722-0258.

Sincerely,

Stephen C. Morris, Environmental Specialist
Giant Refining Company

cc: Dick Platt, General Manager
Giant Refining Company

David Pavlich, HSE Manager
Giant Refining Company

Dorinda Mancini, Environmental Manager
Giant Refining Company

Kathleen O'Leary, Corporate Counsel
Giant Industries Arizona, Inc.

Denny Foust, OCD, Aztec Office

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

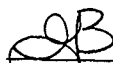
Client: Giant Refining Co.
Project: Ciniza Refinery
Sample ID: Aeration Lagoon Influent
Lab ID: 0397W00618
Matrix: Water
Condition: Cool/Intact

Date Received: 04/17/97
Date Reported: 06/17/97
Date Sampled: 04/16/97
Time Sampled: 0915

Parameter	Analytical		Units	Units	PQL	Method	Analysis		
	Result						Date	Time	Init.
GENERAL PARAMETERS									
Oxygen Demand - BOD	297		mg/L		N/A	EPA 405.1	04/17/97	1230	WM
Oxygen Demand - COD	1,650		mg/L		N/A	EPA 410.1	04/25/97	0830	BJ
Solids - Total Dissolved	3,858		mg/L		10	EPA 160.1	04/18/97	0850	BJ

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes", United States Environmental Protection Agency, EPA 600/4-79-020, Revised March, 1983.

Reviewed By:



Gloria Bartlett, Asst. Lab Manager

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

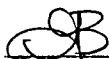
Client: Giant Refining Co.
Project: Ciniza Refinery
Sample ID: Pond Influent
Lab ID: 0397W00617
Matrix: Water
Condition: Cool/Intact

Date Received: 04/17/97
Date Reported: 06/17/97
Date Sampled: 04/16/97
Time Sampled: 0905

Parameter	Analytical		Units	Units	PQL	Method	Analysis		
	Result						Date	Time	Init.
GENERAL PARAMETERS									
Oxygen Demand - BOD	330	mg/L		N/A	EPA 405.1	04/17/97	1230	WM	
Oxygen Demand - COD	1,449	mg/L		N/A	EPA 410.1	04/25/97	0830	BJ	
Solids - Total Dissolved	7,120	mg/L		10	EPA 160.1	04/18/97	0850	BJ	

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes", United States Environmental Protection Agency, EPA 600/4-79-020, Revised March, 1983.

Reviewed By:



Gloria Bartlett, Asst. Lab Manager

TOTAL ORGANIC CARBON
TOC

Client: **Giant Refining Co.**
Project: Annual Groundwater
Sample ID: Pond 1 Influent
Lab ID: 0397W00617
Matrix: Water
Condition: Cool / Intact

Date Reported: 06/17/97
Date Analyzed: 04/30/97
Date Sampled: 04/16/97
Time Sampled: 9:05
Date Received: 04/17/97

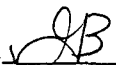
Parameter	Concentration mg/L	Detection Limit mg/L
Total Organic Carbon	150.2	1.0
Concentration is the average of the replicates reported below		
Replicate #1	141.1	1.0
Replicate #2	150.3	1.0
Replicate #3	159.2	1.0

ND - Analyte not detected at stated detection limit.

Reference: Method 415.1: TOTAL ORGANIC CARBON (TOC). Test Methods for Evaluating Solid Waste, SW-846, USEPA, 3rd Edition, Final Update II, Sept., 1994.

Comments:

Reported by: 

Reviewed by: 

TOTAL ORGANIC CARBON
TOC

Client: **Giant Refining Co.**
Project: Annual Groundwater
Sample ID: Aeration Lagoon Influent
Lab ID: 0397W00618
Matrix: Water
Condition: Cool / Intact

Date Reported: 06/17/97
Date Analyzed: 04/30/97
Date Sampled: 04/16/97
Time Sampled: 9:15
Date Received: 04/17/97

Parameter	Concentration mg/L	Detection Limit mg/L
Total Organic Carbon	208.2	1.0

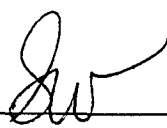
Concentration is the average of the replicates reported below

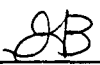
Replicate #1	217.3	1.0
Replicate #2	205.4	1.0
Replicate #3	202.0	1.0

ND - Analyte not detected at stated detection limit.

Reference: Method 415.1: TOTAL ORGANIC CARBON (TOC). Test Methods for Evaluating Solid Waste, SW-846, USEPA, 3rd Edition, Final Update II, Sept., 1994.

Comments:

Reported by: 

Reviewed by: 



CHAIN OF CUSTODY RECORD

Inter-Mountain
Laboratories, Inc.

Client/Project Name		Project Location		Analyses / Parameters			
SANT - Annual Groundwater		CINIZA					
Sampler: (Signature) <i>Steve Morris</i>		Chain of Custody Tape No.					
Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	Remarks	
SHW-3-41497	4/14/97	1525		H2O	6	See attached list.	
SHW-4-41497	4/14/97	1345		"	6		
SHW-5-41497	4/14/97	1310		"	6		
MW-1-41597	4/15/97	0920		"	8		
MW-2-41597	4/15/97	1145		"	8	Note =	
MW-4-41697	4/14/97	0745		"	8	TOC and TOX	
MW-5-41597	4/15/97	1530		"	8	need to have two replicates each.	
Panel influent	4/16/97	905					
Acetic Legion influent	4/16/97	915					
Relinquished by: (Signature) <i>Steve Morris</i>		Date	Time	Received by: (Signature) <i>Chris Rogers</i>		Date	Time
		4/16/97	1030			4-17-97	1025
Relinquished by: (Signature)		Date	Time	Received by laboratory: (Signature)		Date	Time
Relinquished by: (Signature)		Date	Time				

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Telephone (505) 326-4737

☐ 1160 Research Dr.
Bozeman, Montana 59715
Telephone (406) 586-8450

☐ 11183 SH 30
College Station, TX 77845
Telephone (409) 776-8945

Inter-Mountain Laboratories, Inc.

46232

American Environmental Network, Inc.

AEN I.D. 709372

October 1, 1997

GIANT REFINING COMPANY
ROUTE 3 BOX 7
GALLUP, NM 87301

Project Name OCD LTA TPH
Project Number (none)

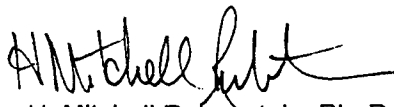
Attention: STEVE MORRIS

On 9/30/97 American Environmental Network (NM), Inc. (ADHS License No. AZ0015), received a request to analyze **non-aq** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (505)344-3777.



Kimberly D. McNeill
Project Manager



H. Mitchell Rubenstein, Ph. D.
General Manager

MR: mt

Enclosure

American Environmental Network, Inc.

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 709372
PROJECT #	: (none)	DATE RECEIVED	: 9/30/97
PROJECT NAME	: OCD LTA TPH	REPORT DATE	: 10/1/97

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	OCD 01-92997	NA	9/29/97
02	OCD 02-92997	NA	9/29/97

American Environmental Network, Inc.

GENERAL CHEMISTRY RESULTS

418.1

CLIENT : GIANT REFINING COMPANY AEN I.D. : 709372
PROJECT # : (none) DATE RECEIVED : 9/30/97
PROJECT NAME : OCD LTA TPH

SAMPLE			DATE	DATE	DATE	DIL.
ID. #	CLIENT I.D.	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
01	OCD 01-92997	NON-AQ	9/29/97	9/30/97	9/30/97	10
02	OCD 02-92997	NON-AQ	9/29/97	9/30/97	9/30/97	10
PARAMETER		DET. LIMIT	UNITS	01	02	
PETROLEUM HYDROCARBONS, IR		20	MG/KG	1400	3500	

CHEMIST NOTES:

N/A

American Environmental Network, Inc.

GENERAL CHEMISTRY - REAGENT BLANK
418.1

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 709372
PROJECT #	: (none)	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: OCD LTA TPH	UNITS	: MG/KG

PARAMETER	AEN I.D.	SAMPLE RESULT
PETROLEUM HYDROCARBONS	093097	<20

CHEMIST NOTES:
N/A

GENERAL CHEMISTRY - QUALITY CONTROL
418.1

CLIENT : GIANT REFINING COMPANY AEN I.D. : 709372
PROJECT # : (none) SAMPLE MATRIX : NON-AQ
PROJECT NAME : OCD LTA TPH UNITS : MG/KG

PARAMETER	AEN I.D.	SAMPLE RESULT	DUP. RESULT	% RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
PETROLEUM HYDROCARBONS	093097	<20	<20	NA	141	150	94%

CHEMIST NOTES:
N/A

% Recovery = $\frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$

RPD (Relative Percent Difference) = $\frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$

CASE NARRATIVE

Client: GIANT REFINING COMPANY
Project: Ciniza - OCD LTA Biannual Received on: 05/07/97
Set ID: 0597H02362 # samples: 2

Suites: 8020 BETX, Soil Parameters, TPH (418.1)

Samples were received for analysis at Inter-Mountain Laboratories (IML), Bozeman, Montana. Enclosed are the results of these analyses.

The analysis of sample OCD 123 (B972362) by EPA Method 8020 did not detect the presence of any target compounds above the Practical Quantitation Limit (PQL). The analysis for Total Petroleum Hydrocarbons (TPH) by EPA Method 418.1 also indicated the absence of petroleum related compounds above the PQL. The TPH and General Parameters values are presented on a dry weight basis while the 8020 BETX was determined on an as-received basis due to the volatility of the target compounds.

The analysis of sample OCD LTA-COMP (B972363) by Method 418.1 indicated the presence of petroleum products at concentrations requiring significant dilutions. The elevated PQL reflects the required dilution.

Limits of detection for each instrument/analysis are determined by sample matrix effects, instrument performance under standard conditions, and dilution requirements to maintain chromatography output within calibration ranges.

Quality Control reports have been included for your information and use. These reports appear at the end of the analytical package and may be identified by title. If there are any questions regarding the information presented in this package, please contact me at (800) 828-1413.



Charles Ballek
IML-Bozeman

EPA METHOD 8020
AROMATIC VOLATILE COMPOUNDS
BETX1160 Research Drive
Bozeman, Montana 59718

Client: GIANT REFINING COMPANY
Sample ID: OCD 123
Project ID: Ciniza - OCD LTA Biannual
Lab ID: B972362
Matrix: Soil

Date Reported: 05/14/97
Date Sampled: 05/05/97
Date Received: 05/07/97
Date Extracted: 05/08/97
Date Analyzed: 05/12/97

Parameter	Result	PQL	Units
Benzene	ND	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
m,p-Xylene	ND	0.2	mg/kg
o-Xylene	ND	0.2	mg/kg
Toluene	ND	0.2	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)

@18-24"

Reference: Method 8020, Volatile Organic Compounds, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, United States Environmental Protection Agency, SW-846, Volume IB, September 1994. Analysis Method: Gas Chromatograph / Purge and Trap / PID.

Analyst SD

Reviewed CTB

GENERAL PARAMETERS

1160 Research Drive
Bozeman, Montana 59718

Client: GIANT REFINING COMPANY
Sample ID: OCD 123
Project ID: Ciniza - OCD LTA Biannual
Lab ID: B972362
Matrix: Soil

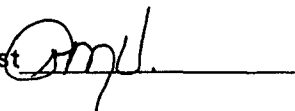
Date Reported: 05/16/97
Date Sampled: 05/05/97
Date Received: 05/07/97
Date Extracted: 05/08/97

Parameter	Date Analyzed	Result	PQL	Units
% Moisture	05/08/97	11	NA	%
Carbon, Total Organic (TOC)	05/14/97	0.3	0.1	%
Nitrogen, Total Kjeldahl (TKN)	05/15/97	0.05	0.05	%
Phosphorus, Total	05/13/97	310	0.05	mg/kg
pH	05/13/97	7.66	NA	s.u.

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1982.
SW-846, United States Environmental Protection Agency, Nov. 1986.
USDA Handbook # 60.

Analyst



Reviewed



TOTAL PETROLEUM HYDROCARBONS

1160 Research Drive
Bozeman, Montana 59718

Client: GIANT REFINING COMPANY
Sample ID: OCD 123
Project ID: Ciniza - OCD LTA Biannual
Lab ID: B972362
Matrix: Soil

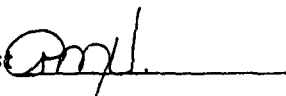
Date Reported: 05/09/97
Date Sampled: 05/05/97
Date Received: 05/07/97
Date Extracted: 05/08/97
Date Analyzed: 05/08/97

Parameter	Result	PQL	Units
Total Petroleum Hydrocarbons	ND	0.5	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: WTPH-418.1 Modified, Total Petroleum Hydrocarbons Analytical Methods for Soil and Water,
Washington State Department of Ecology, April, 1992.

Analyst



Reviewed



TOTAL PETROLEUM HYDROCARBONS

1160 Research Drive
Bozeman, Montana 59718

Client: GIANT REFINING COMPANY
Sample ID: OCD LTA-COMP
Project ID: Ciniza - OCD LTA Biannual
Lab ID: B972363
Matrix: Soil

Date Reported: 05/16/97
Date Sampled: 05/06/97
Date Received: 05/07/97
Date Extracted: 05/08/97
Date Analyzed: 05/08/97

Parameter	Result	PQL	Units
Total Petroleum Hydrocarbons	860	50	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: WTPH-418.1 Modified, Total Petroleum Hydrocarbons Analytical Methods for Soil and Water,
Washington State Department of Ecology, April, 1992.

Analyst

[Signature]

Reviewed

[Signature]

QUALITY ASSURANCE / QUALITY CONTROL

LAB QA/QC
EPA METHOD 8020
INSTRUMENT BLANK

Date Analyzed: 05/12/97
Lab ID: IBW97132A
Matrix: Water

Parameter	Result	PQL	Units
Benzene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
m,p-Xylene	ND	1.0	ug/L
Methyl tert-butyl Ether (MTBE)	ND	1.0	ug/L
o-Xylene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L

ND - Not Detected at Practical Quantitation Level (PQL)

Analyst SP

Reviewed OTB

LAB QA/QC
EPA METHOD 8020
METHOD BLANK

Date Analyzed: 05/13/97
Lab ID: MBS97128
Matrix: Sand
Date Extracted 05/08/97

Parameter	Result	PQL	Units
Benzene	ND	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
m,p-Xylene	ND	0.2	mg/kg
Methyl tert-butyl Ether (MTBE)	ND	0.2	mg/kg
o-Xylene	ND	0.2	mg/kg
Toluene	ND	0.2	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)

Analyst SD

Reviewed CRB

LAB QA/QC

EPA METHOD 8020

MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARY

1160 Research Drive
Bozeman, Montana 59718

Date Analyzed: 05/13/97

Lab ID: 0597H02290

Matrix: Soil

Date Extracted: 05/08/97

Original Sample Parameters

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	MS Recovery %	QC Limits Rec.
Methyl tert-butyl Ether (MTBE)	2.0	0	1.4	70	50 - 150
Benzene	2.0	0	1.1	55	50 - 110
Ethylbenzene	2.0	0	1.3	65	59 - 116
m,p-Xylene	4.0	0	2.6	65	61 - 112
o-Xylene	2.0	0	1.3	65	60 - 117
Toluene	2.0	0	1.2	60	58 - 110

Duplicate Sample Parameters

Parameter	Spike Added (mg/kg)	MSD Result (mg/kg)	MSD Recovery %	RPD %	QC Limits RPD Rec.
Methyl tert-butyl Ether (MTBE)	2.0	1.1	55	24	25 50 - 150
Benzene	2.0	1.1	55	0	25 50 - 110
Ethylbenzene	2.0	1.3	65	0	25 59 - 116
m,p-Xylene	4.0	2.5	63	4	25 61 - 112
o-Xylene	2.0	1.3	65	0	25 60 - 117
Toluene	2.0	1.2	60	0	25 58 - 110

Note: Spike Recoveries are calculated using zero for Sample result
if Sample result was less than PQL (Practical Quantitation Level).

Spike Recovery: 0 out of 12 outside QC limits.

RPD: 0 out of 6 outside QC limits.

Analyst SDReviewed CRB

LAB QA/QC
EPA METHOD 8020
LAB CONTROL SAMPLEDate Analyzed: 05/13/97
Lab ID: LCS97128A
Matrix: Sand
Date Extracted 05/08/97

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	LCS Result (mg/kg)	LCS Recovery %	QC Limits Rec.
Methyl tert-butyl Ether (MTBE)	2.0	0	1.5	75	50 -150
Benzene	2.0	0	1.7	85	50 -110
Ethylbenzene	2.0	0	1.9	95	59 -116
m,p-Xylene	4.0	0	3.8	95	61 -112
o-Xylene	2.0	0	1.9	95	60 -117
Toluene	2.0	0	1.8	90	58 -110

Spike Recovery: 0 out of 6 outside QC limits.

Analyst SDReviewed CTB

LAB QA/QC
TOTAL PETROLEUM HYDROCARBONS
METHOD BLANK

Date Analyzed: 05/08/97
Lab ID: MBS000508
Matrix: Sand
Date Extracted 05/08/97

Parameter	Result	PQL	Units
Total Petroleum Hydrocarbons	ND	0.5	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)

Analyst

aml

Reviewed

CTB

**LAB QA/QC
TOTAL PETROLEUM HYDROCARBONS
BLANK SPIKE**

Date Analyzed: 05/08/97
Lab ID: BSS00058B BS1
Matrix: Sand
Date Extracted: 05/08/97

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	BS Recovery %	QC Limits Rec.
Total Petroleum Hydrocarbons	12.9	0	9.8	76	50 -150

Note: Spike Recoveries are calculated using zero for Sample result
if Sample result was less than PQL (Practical Quantitation Level).

Spike Recovery: 0 out of 1 outside QC limits.

Analyst aml.Reviewed CB

LAB QA/QC
TOTAL PETROLEUM HYDROCARBONS
DUPLICATE SUMMARY

Date Analyzed: 05/08/97
Lab ID: 0597H02363
Matrix: Soil

Parameter	Sample Result (mg/kg)	Dup Result (mg/kg)	RPD %	QC Limits	
				RPD	PQL
Total Petroleum Hydrocarbons	860	930	8	25	0.5

ND - Not Detected at Practical Quantitation Level (PQL)
NA - Not Applicable at low levels.

Analyst

aml

Reviewed

CS



CHAIN OF CUSTODY RECORD

Client/Project Name			Project Location			ANALYSES / PARAMETERS		
GINT - ODDTH BROAD			Unit 24					
Sampler: (Signature)		Chain of Custody Tape No.						
Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	Remarks		
ODD 183	5/6/97	1445	1970322	Soil	3	TQ * BTEX (8000) TPH (418.1) % Moisture TOTAL PHOS		
ODD LTA-COMP	5/6/97	0915	2363	Soil	2	BTEX - please use detection limit no less than 10 ppb		
						Cooler Temp		
						5-Years infect		
Relinquished by: (Signature)			Date		Time	Received by: (Signature)		
Relinquished by: (Signature)			5/6/97		0930	Received by: (Signature)		
Relinquished by: (Signature)			Date		Time	Received by laboratory: (Signature)		
Relinquished by: (Signature)			5/7/97		1153	Date		
Relinquished by: (Signature)			Date		Time	Date		

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Bozeman, Montana 59715
Telephone (406) 586-8450

☐ 11183 SH 30
College Station, TX 77845
Telephone (409) 776-8945

☐ 3304 Longmire Drive
College Station, TX 77845
Telephone (409) 774-4999

Inter-Mountain Laboratories, Inc.

37074

OCD LTA SAMPLE GRID LENGTH 22FT.
WIDTH 20FT.

5/5/97

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150

EXCEL RAND # CHOICES

0.631727	94.75904
0.816864	122.5296
0.371103	55.6655

OCD LTA SAMPLE GRID LENGTH 22FT.

WIDTH 20FT.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150

CHAIN OF CUSTODY

DATE: 9-29-97 PAGE: 1 OF 1
 AEN LAB I.D. 709372

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER: Steve Morris COMPANY: Giant Refining ADDRESS: Dallas, NM, 87301 PHONE: 505 722 0258 FAX: 505 722 0210 BILL TO: SAME COMPANY: ADDRESS:				ANALYSIS REQUEST Petroleum Hydrocarbons (418.1) TRPH (MOD.8015) Diesel/Direct/Inject (M8015) Gas/Purge & Trap Gasoline/BTEX & MTBE (M8015/8020) BTXE/MTBE (8020) BTEX & Chlorinated Aromatics (602/8020) BTEX/MTBE/EDC & EDB (8020/8010/Short) Chlorinated Hydrocarbons (601/8010) 504 EDB ☐ / DBCP ☐ Polynuclear Aromatics (610/8310) Volatile Organics (624/8240) GC/MS Volatile Organics (8260) GC/MS Pesticides/PCB (608/8080) Herbicides (615/8150) Base/Neutral/Acid Compounds GC/MS (625/8270) General Chemistry: Priority Pollutant Metals (13) Target Analyte List Metals (23) RCRA Metals (8) RCRA Metals by TCLP (Method 1311) Metals: NUMBER OF CONTAINERS			
SAMPLE ID DATE TIME MATRIX LAB I.D. 00001-92997 9/29/97 0900 Soil -01-X 00002-92997 9/29/97 0910 Soil -02-X							
PROJECT INFORMATION PROJ. NO.: (RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ PROJ. NAME: CCD LTA TRH CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER P.O. NO.: METHANOL PRESERVATION ☐ SHIPPED VIA: COMMENTS: FIXED FEE ☐ SAMPLE RECEIPT NO. CONTAINERS: 2 CUSTODY SEALS: Y/N/NA RECEIVED INTACT: YES BLUE ICE/CE: YES				PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS RELINQUISHED BY: 1. Signature: [Signature] Time: 0930 Printed Name: Steve Morris Date: 9/29/97 Company: Giant RECEIVED BY: 1. Signature: [Signature] Time: 11:00 Printed Name: Brinlee Date: 9-30-97 Company: American Environmental Network (NM), Inc.			
RELINQUISHED BY: 2. Signature: _____ Time: _____ Printed Name: _____ Date: _____ Company: _____				RECEIVED BY: 2. Signature: _____ Time: _____ Printed Name: _____ Date: _____ Company: _____			

TABULATED ANALYTICAL RESULTS

OW-1 Giant Refining - Ciniza

Volatile Organics (8260)

Parameter	Spring 94 Result	Spring 94 Repeat	Spring 94 Repeat	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Benzene	ND	ND	ND	ND	ND	ND	µg/L	5
Toluene	0.9	ND	ND	ND	ND	ND	µg/L	5
Ethylbenzene	ND	ND	ND	ND	ND	ND	µg/L	5
Xylenes (total)	2.7	ND	ND	ND	ND	ND	µg/L	5

Dissolved Metals

Parameter	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Calcium	2.0	2.6	2.0	mg/L	---
Magnesium	0.2	0.2	0.3	mg/L	---
Potassium	ND	0.8	1.3	mg/L	---
Sodium	287	299	311	mg/L	---

General Chemistry / Other

Parameter	Spring 92 Result	Spring 93 Result	Spring 94 Result	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Alkalinity, Bicarbonate as CaCO ₃ @ pH 4.5	410	387	388	410	467	401	mg/L	5
Alkalinity, Carbonate as CaCO ₃ @ pH 8.3	60	22	37	19	14	42	mg/L	5
Chloride	58	41	55	46	49	48	mg/L	3
pH	8.80	8.70	8.82	8.70	8.60	8.70	s.u.	---
Sulfate	210	210	210	10	216	221	mg/L	5
Spec. Conduct. @ 25° C	1300	1260	1270	1300	1380	1310	µmhos/cm	1
Total Dissolved Solids	2800	870	840	830	832	842	mg/L	10

TABULATED ANALYTICAL RESULTS

OW-2 Giant Refining - Ciniza

Volatile Organics (8260)

Parameter	Spring 94 Result	Spring 94 Repeat	Spring 94 Repeat	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Benzene	ND	ND	ND	ND	ND	ND	µg/L	5
Toluene	ND	ND	ND	ND	ND	ND	µg/L	5
Ethylbenzene	ND	ND	ND	ND	ND	ND	µg/L	5
Xylenes (total)	1.1	2.2	ND	ND	ND	ND	µg/L	5

Dissolved Metals

Parameter	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Calcium	8.9	9.0	9.3	mg/L	---
Magnesium	3.6	3.2	3.2	mg/L	---
Potassium	ND	0.39	0.3	mg/L	---
Sodium	297	320	322	mg/L	---

General Chemistry / Other

Parameter	Spring 92 Result	Spring 93 Result	Spring 94 Result	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Alkalinity, Bicarbonate as CaCO ₃ @ pH 4.5	670	662	668	660	810	785	mg/L	5
Alkalinity, Carbonate as CaCO ₃ @ pH 8.3	ND	ND	ND	5	0	0	mg/L	5
Chloride	72	42	46	41	42	39	mg/L	3
pH	8.00	8.10	8.04	7.90	7.90	7.70	s.u.	---
Sulfate	15	19	20	19	12.3	16	mg/L	5
Spec. Conduct. @ 25° C	1300	1220	1260	1300	1340	1287	µmhos/cm	1
Total Dissolved Solids	1800	1100	890	840	840	852	mg/L	10

TABULATED ANALYTICAL RESULTS

OW-3 Giant Refining - Ciniza

Volatile Organics (8260)

Parameter	Spring 92 Result	Spring 93 Result	Spring 94 Result	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Benzene	ND	ND	ND	ND	ND	ND	µg/L	5
Toluene	ND	ND	ND	ND	ND	ND	µg/L	5
Ethylbenzene	ND	ND	ND	ND	ND	ND	µg/L	5
Xylenes (total)	ND	ND	ND	ND	ND	ND	µg/L	5

Dissolved Metals

Parameter	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Calcium	8.1	9.4	9.2	mg/L	---
Magnesium	2.7	3.0	3.0	mg/L	---
Potassium	ND	0.78	0.3	mg/L	---
Sodium	276	317	303	mg/L	---

General Chemistry / Other

Parameter	Spring 92 Result	Spring 93 Result	Spring 94 Result	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Alkalinity, Bicarbonate as CaCO3 @ pH 4.5	580	660	662	670	811	781	mg/L	5
Alkalinity, Carbonate as CaCO3 @ pH 8.3	ND	ND	ND	6	0	0	mg/L	5
Chloride	39	41	42	39	42	37	mg/L	3
pH	7.90	8.20	7.88	8.00	8.00	7.70	s.u.	---
Sulfate	34	16	18	29	26.3	24	mg/L	5
Spec. Conduct. @ 25° C	1200	1260	1240	1300	1340	1280	µmhos/cm	1
Total Dissolved Solids	1100	840	800	980	798	834	mg/L	10

TABULATED ANALYTICAL RESULTS

OW-1 Giant Refining - Ciniza

Volatile Organics (8260)

Parameter	Spring 94 Result	Spring 94 Repeat	Spring 94 Repeat	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Benzene	ND	ND	ND	ND	ND	ND	µg/L	5
Toluene	0.9	ND	ND	ND	ND	ND	µg/L	5
Ethylbenzene	ND	ND	ND	ND	ND	ND	µg/L	5
Xylenes (total)	2.7	ND	ND	ND	ND	ND	µg/L	5

Dissolved Metals

Parameter	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Calcium	2.0	2.6	2.0	mg/L	---
Magnesium	0.2	0.2	0.3	mg/L	---
Potassium	ND	0.8	1.3	mg/L	---
Sodium	287	299	311	mg/L	---

General Chemistry / Other

Parameter	Spring 92 Result	Spring 93 Result	Spring 94 Result	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Alkalinity, Bicarbonate as CaCO ₃ @ pH 4.5	410	387	388	410	467	401	mg/L	5
Alkalinity, Carbonate as CaCO ₃ @ pH 8.3	60	22	37	19	14	42	mg/L	5
Chloride	58	41	55	46	49	48	mg/L	3
pH	8.80	8.70	8.82	8.70	8.60	8.70	s.u.	---
Sulfate	210	210	210	10	216	221	mg/L	5
Spec. Conduct. @ 25° C	1300	1260	1270	1300	1380	1310	µmhos/cm	1
Total Dissolved Solids	2800	870	840	830	832	842	mg/L	10

TABULATED ANALYTICAL RESULTS

OW-2 Giant Refining - Ciniza

Volatile Organics (8260)

Parameter	Spring 94 Result	Spring 94 Repeat	Spring 94 Repeat	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Benzene	ND	ND	ND	ND	ND	ND	µg/L	5
Toluene	ND	ND	ND	ND	ND	ND	µg/L	5
Ethylbenzene	ND	ND	ND	ND	ND	ND	µg/L	5
Xylenes (total)	1.1	2.2	ND	ND	ND	ND	µg/L	5

Dissolved Metals

Parameter	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Calcium	8.9	9.0	9.3	mg/L	---
Magnesium	3.6	3.2	3.2	mg/L	---
Potassium	ND	0.39	0.3	mg/L	---
Sodium	297	320	322	mg/L	---

General Chemistry / Other

Parameter	Spring 92 Result	Spring 93 Result	Spring 94 Result	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Alkalinity, Bicarbonate as CaCO ₃ @ pH 4.5	670	662	668	660	810	785	mg/L	5
Alkalinity, Carbonate as CaCO ₃ @ pH 8.3	ND	ND	ND	5	0	0	mg/L	5
Chloride	72	42	46	41	42	39	mg/L	3
pH	8.00	8.10	8.04	7.90	7.90	7.70	s.u.	---
Sulfate	15	19	20	19	12.3	16	mg/L	5
Spec. Conduct. @ 25° C	1300	1220	1260	1300	1340	1287	µmhos/cm	1
Total Dissolved Solids	1800	1100	890	840	840	852	mg/L	10

TABULATED ANALYTICAL RESULTS

OW-3 Giant Refining - Ciniza

Volatile Organics (8260)

Parameter	Spring 92 Result	Spring 93 Result	Spring 94 Result	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Benzene	ND	ND	ND	ND	ND	ND	µg/L	5
Toluene	ND	ND	ND	ND	ND	ND	µg/L	5
Ethylbenzene	ND	ND	ND	ND	ND	ND	µg/L	5
Xylenes (total)	ND	ND	ND	ND	ND	ND	µg/L	5

Dissolved Metals

Parameter	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Calcium	8.1	9.4	9.2	mg/L	---
Magnesium	2.7	3.0	3.0	mg/L	---
Potassium	ND	0.78	0.3	mg/L	---
Sodium	276	317	303	mg/L	---

General Chemistry / Other

Parameter	Spring 92 Result	Spring 93 Result	Spring 94 Result	Spring 95 Result	Spring 96 Result	Spring 97 Result	Units	Reporting Limit
Alkalinity, Bicarbonate as CaCO3 @ pH 4.5	580	660	662	670	811	781	mg/L	5
Alkalinity, Carbonate as CaCO3 @ pH 8.3	ND	ND	ND	6	0	0	mg/L	5
Chloride	39	41	42	39	42	37	mg/L	3
pH	7.90	8.20	7.88	8.00	8.00	7.70	s.u.	---
Sulfate	34	16	18	29	26.3	24	mg/L	5
Spec. Conduct. @ 25° C	1200	1260	1240	1300	1340	1280	µmhos/cm	1
Total Dissolved Solids	1100	840	800	980	798	834	mg/L	10

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client: Giant Refining Co.
Project: Annual GW Set 3
Sample ID: OW-1-43097
Lab ID: 0397W00741
Matrix: Water
Condition: Cool/Intact

Date Received: 05/02/97
Date Reported: 06/18/97
Date Sampled: 04/30/97
Time Sampled: 0845

Parameter	Analytical					PQL	Method	Analysis		
	Result	Units	Units	Units	Date			Time	Init.	
GENERAL PARAMETERS										
pH	8.7	s.u.			0.1	EPA 150.1	05/02/97	1340	BJ	
Electrical Conductivity	1,310	µmhos/cm			10	EPA 120.1	05/02/97	1430	BJ	
Solids - Total Dissolved	842	mg/L			10	EPA 160.1	05/06/97	0830	BJ	
Alkalinity as CaCO3	399	mg/L			1	EPA 310.1	05/06/97	1021	TH	
MAJOR ANIONS										
Bicarbonate (HCO3)	401	mg/L	6.57	meq/L	1	EPA 310.1	05/06/97	1021	TH	
Carbonate (CO3)	42.3	mg/L	1.41	meq/L	1	EPA 310.1	05/06/97	1021	TH	
Hydroxide (OH)	<1	mg/L	<0.01	meq/L	1	EPA 310.1	05/06/97	1021	TH	
Chloride	47.6	mg/L	1.34	meq/L	1	EPA 325.2	05/07/97	0945	BJ	
Sulfate	221	mg/L	4.61	meq/L	5	EPA 375.3	05/07/97	0840	TH	
DISSOLVED METALS										
Calcium	1.97	mg/L	0.10	meq/L	0.2	EPA 200.7	05/02/97	1256	JW	
Magnesium	0.27	mg/L	0.02	meq/L	0.2	EPA 200.7	05/02/97	1256	JW	
Potassium	1.30	mg/L	0.03	meq/L	0.2	EPA 200.7	05/02/97	1256	JW	
Sodium	311	mg/L	13.5	meq/L	0.2	EPA 200.7	05/02/97	1256	JW	

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes", United States Environmental Protection Agency, EPA 600/4-79-020, Revised March, 1983.

Reviewed By: GB

Gloria Bartlett, Asst. Lab Manager

VOLATILE AROMATIC HYDROCARBONS

GIANT REFINING COMPANY

Project ID:	Annual Groundwater Set 3	Report Date:	06/03/97
Sample ID:	OW-1-43097	Date Sampled:	04/30/97
Lab ID:	0397W00741	Time Sampled:	8:45
Sample Matrix:	Water	Date Received:	05/02/97
Condition:	Cool/Intact	Date Extracted:	NA
		Date Analyzed:	05/07/97

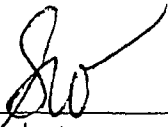
Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.2
Toluene	ND	0.2
Ethylbenzene	ND	0.2
m,p-Xylenes	ND	0.2
o-Xylene	ND	0.2

ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	90%	70%-130%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:


Analyst
Review

Client: Giant Refining Co.
 Project: Annual GW Set 3
 Sample ID: OW-2-41797
 Lab ID: 0397W00651
 Matrix: Water
 Condition: Cool/Intact

Date Received: 04/19/97
 Date Reported: 06/18/97
 Date Sampled: 04/17/97
 Time Sampled: 0845

Parameter	Analytical Result	Units	Units	PQL	Method	Analysis Date	Time	Init.
GENERAL PARAMETERS								
pH	7.7	s.u.		0.1	EPA 150.1	04/21/97	1655	BJ
Electrical Conductivity	1,287	µmhos/cm		10	EPA 120.1	04/21/97	1655	BJ
Solids - Total Dissolved	852	mg/L		10	EPA 160.1	04/22/97	0615	TH
Alkalinity as CaCO ₃	643	mg/L		1	EPA 310.1	04/24/97	0920	BJ
MAJOR ANIONS								
Bicarbonate (HCO ₃)	785	mg/L	12.86	meq/L	1	EPA 310.1	04/24/97	0920 BJ
Carbonate (CO ₃)	<1	mg/L	<0.01	meq/L	1	EPA 310.1	04/24/97	0920 BJ
Hydroxide (OH)	<1	mg/L	<0.01	meq/L	1	EPA 310.1	04/24/97	0910 BJ
Chloride	38.5	mg/L	1.08	meq/L	1	EPA 325.2	04/24/97	1046 TH
Sulfate	16	mg/L	0.34	meq/L	5	EPA 375.3	04/22/97	1202 TH
DISSOLVED METALS								
Calcium	9.26	mg/L	0.46	meq/L	0.2	EPA 200.7	04/22/97	1410 JW
Magnesium	3.16	mg/L	0.26	meq/L	0.2	EPA 200.7	04/22/97	1220 JW
Potassium	0.32	mg/L	0.01	meq/L	0.2	EPA 200.7	04/22/97	1220 JW
Sodium	322	mg/L	14.0	meq/L	0.2	EPA 200.7	04/22/97	1220 JW

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes", United States Environmental Protection Agency, EPA 600/4-79-020, Revised March, 1983.

Reviewed By: 

Gloria Bartlett, Asst. Lab Manager

VOLATILE AROMATIC HYDROCARBONS

GIANT REFINING COMPANY

Project ID: Annual GW Set 1
Sample ID: OW-2-41797
Lab ID: 0397W00651
Sample Matrix: Water
Condition: Cool/Intact

Report Date: 06/03/97
Date Sampled: 04/17/97
Time Sampled: 8:45
Date Received: 04/19/97
Date Extracted: NA
Date Analyzed: 04/22/97

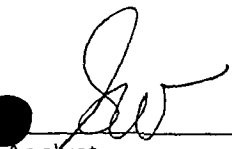
Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.2
Toluene	ND	0.2
Ethylbenzene	ND	0.2
m,p-Xylenes	ND	0.2
o-Xylene	ND	0.2

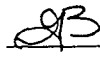
ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	84%	70%-130%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:


Analyst


Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client: Giant Refining Co.
Project: Annual GW Set 3
Sample ID: OW-3-41897
Lab ID: 0397W00652
Matrix: Water
Condition: Cool/Intact

Date Received: 04/19/97
Date Reported: 06/18/97
Date Sampled: 04/18/97
Time Sampled: 0715

Parameter	Analytical		Units		PQL	Method	Analysis		
	Result						Date	Time	Init.
GENERAL PARAMETERS									
pH	7.7	s.u.			0.1	EPA 150.1	04/21/97	1655	BJ
Electrical Conductivity	1,280	µmhos/cm			10	EPA 120.1	04/21/97	1655	BJ
Solids - Total Dissolved	834	mg/L			10	EPA 160.1	04/22/97	0615	TH
Alkalinity as CaCO3	640	mg/L			1	EPA 310.1	04/24/97	0920	BJ
MAJOR ANIONS									
Bicarbonate (HCO3)	781	mg/L	12.80	meq/L	1	EPA 310.1	04/24/97	0920	BJ
Carbonate (CO3)	<1	mg/L	<0.01	meq/L	1	EPA 310.1	04/24/97	0920	BJ
Hydroxide (OH)	<1	mg/L	<0.01	meq/L	1	EPA 310.1	04/24/97	0910	BJ
Chloride	37.3	mg/L	1.05	meq/L	1	EPA 325.2	04/24/97	1046	TH
Sulfate	24	mg/L	0.50	meq/L	5	EPA 375.3	04/22/97	1202	TH
DISSOLVED METALS									
Calcium	9.19	mg/L	0.46	meq/L	0.2	EPA 200.7	04/22/97	1410	JW
Magnesium	2.98	mg/L	0.25	meq/L	0.2	EPA 200.7	04/22/97	1220	JW
Potassium	0.32	mg/L	0.01	meq/L	0.2	EPA 200.7	04/22/97	1220	JW
Sodium	303	mg/L	13.2	meq/L	0.2	EPA 200.7	04/22/97	1220	JW

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes", United States Environmental Protection Agency, EPA 600/4-79-020, Revised March, 1983.

Reviewed By:



Gloria Bartlett, Asst. Lab Manager

VOLATILE AROMATIC HYDROCARBONS

GIANT REFINING COMPANY

Project ID:	Annual GW Set 1	Report Date:	06/03/97
Sample ID:	OW-3-41897	Date Sampled:	04/18/97
Lab ID:	0397W00652	Time Sampled:	7:15
Sample Matrix:	Water	Date Received:	04/19/97
Condition:	Cool/Intact	Date Extracted:	NA
		Date Analyzed:	04/22/97

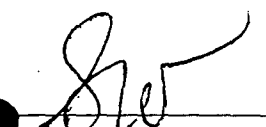
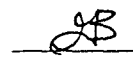
Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.2
Toluene	ND	0.2
Ethylbenzene	ND	0.2
m,p-Xylenes	ND	0.2
o-Xylene	ND	0.2

ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	75%	70%-130%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:


analyst
Review

OW-1 GIANT REFINING - CINIZA

OW-1 Volatile Organics Method 8240

Parameter	4/28/93 Result	6/4/93 Result	7/14/93 Result	10/29/93 Result	4/27/94 Result	7/6/94 Result	8/11/94 Result	5/15/95 Result	3/25/96 Result	4/30/97 Result	Units
Benzene	ND	0.9	ND	ND	ND	ND	ND	ND	ND	ND	ug/L
Toluene	2.3	1.9	1.4	ND	0.9	ND	ND	ND	ND	ND	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ug/L
Xylenes (total)	ND	1.6	0.6	ND	2.7	ND	ND	ND	ND	ND	ug/L

OW-1 Dissolved Metals

Parameter	4/23/92 Result	4/28/93 Result	4/27/94 Result	5/15/95 Result	3/26/96 Result	4/30/97 Result	Units
Calcium	2.6	3.6	1.1	2.0	2.6	2	mg/L
Magnesium	1.5	4.5	0.2	0.2	0.2	0.3	mg/L
Potassium	1.2	2.1	ND	ND	0.8	1.3	mg/L
Sodium	83	326	306	287	299	311	mg/L

OW-1 General Inorganics

Parameter	4/23/92 Result	4/28/93 Result	4/27/94 Result	5/15/95 Result	3/26/96 Result	4/30/97 Result	Units
Alkalinity, Bicarb. as CaCO3 at pH 4.5	410	387	388	410	467	401	mg/L
Alkalinity, Carb. as CaCO3 at pH 8.3	60	22	37	19	14	42	mg/L
Chloride	58	41	55	46	49	48	mg/L
pH	8.8	8.7	8.82	8.70	8.60	8.70	units
Sulfate	210	210	210	10	216	221	mg/L
Specific Conductance at 25 deg.C	1300	1260	1270	1300	1380	1310	umhos/cm
Total Dissolved Solids	2800	870	840	830	832	842	mg/L

OW-2 GIANT REFINING CINIZA

OW-2 Volatile Organics

Parameter	4/23/92 Result	4/28/93 Result	4/27/94 Result	7/7/94 Result	8/11/94 Result	5/15/95 Result	3/18/96 Result	4/30/97 Result	Units
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Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ug/L
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ug/L
Xylenes (total)	ND	ND	1.1	2.2	ND	ND	ND	ND	ug/L

OW-2 Dissolved Metals

Parameter	4/23/92 Result	4/28/93 Result	4/27/94 Result	5/15/95 Result	3/18/96 Result	4/30/97 Result	Units
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Calcium	6.8	8.7	7.6	8.9	9.02	9.3	mg/L
Magnesium	2.5	3.7	3.1	3.6	3.16	3.2	mg/L
Potassium	ND	ND	ND	ND	0.39	0.3	mg/L
Sodium	88	336	318	297	320	322	mg/L

OW-2 General Inorganics

Parameter	4/23/92 Result	4/28/93 Result	4/27/94 Result	5/15/95 Result	3/18/96 Result	4/30/97 Result	Units
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Alkalinity, Bicarb. as CaCO3 at pH 4.5	670	662	668	660	810	785	mg/L
Alkalinity, Carb. as CaCO3 at pH 8.3	ND	ND	ND	5	0	0	mg/L
Chloride	72	42	46	41	42.4	39	mg/L
pH	8.0	8.1	8.04	7.09	7.9	7.7	units
Sulfate	15	19	20	19	12.3	16	mg/L
Specific Conductance at 25 deg C	1300	1220	1260	1300	1340	1287	umhos/cm
Total Dissolved Solids	1800	1100	890	840	840	852	mg/L

OW-3 GIANT REFINING CINIZA

OW-3 Volatile Organics

Parameter	4/23/92 Result	4/28/93 Result	4/27/94 Result	5/15/95 Result	3/18/96 Result	4/30/97 Result	Units
Benzene	ND	ND	ND	ND	ND	ND	ug/L
Toluene	ND	ND	ND	ND	ND	ND	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	ND	ug/L
Xylenes (total)	ND	ND	ND	ND	ND	ND	ug/L

OW-3 Dissolved Metals

Parameter	4/23/92 Result	4/28/93 Result	4/27/95 Result	5/15/95 Result	3/18/96 Result	4/30/97 Result	Units
Calcium	9.5	9.5	8.1	8.1	9.42	9.2	mg/L
Magnesium	3.0	3.6	3.1	2.7	3.04	3	mg/L
Potassium	ND	ND	ND	ND	0.78	0.3	mg/L
Sodium	82	340	313	276	317	303	mg/L

OW-3 General Chemistry

Parameter	4/23/92 Result	4/28/93 Result	4/27/94 Result	5/15/95 Result	3/18/96 Result	4/30/97 Result	Units
Alkalinity, Bicarb. as CaCO3 at pH 4.5	580	660	662	670	811	781	mg/L
Alkalinity, Carb. as CaCO3 at pH 8.3	ND	ND	ND	6	0	0	mg/L
Chloride	39	41	42	39	42.2	37	mg/L
pH	7.9	8.2	7.88	8.00	8	7.7	units
Sulfate	34	16	18	29	26.3	24	mg/L
Specific Conductance at 25 deg.C	1200	1260	1240	1300	1340	1280	umhos/cm
Total Dissolved Solids	1100	840	800	980	798	834	mg/L