GIANT
REFINING CO.

Route 3, Box 7
Gallup, New Mexico
87301

505
722-3833

November 25, 1996

Mr. Patricio Sanchez
Petroleum Engineer
Oil Conservation District
2040 S. Pacheco
Santa Fe, New Mexico 87505

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RE: Update On Tank 569 / SWMU 6 Investigation

Dear Mr. Sanchez:

As part of Giant's investigation of contamination in the vicinity of Tank 569, eight (8) soil borings were completed during the period from 8/22/96 through 9/9/96. Soils were sampled and analyzed during the drilling event to identify "clean" areas in front of the plume.

Enclosed please find the following documents:

- Boring Logs for borings 0643 through 0650
- Well Installation Diagrams for Wells OW-29 and OW-30
- Analytical Data from soil sampled during the drilling event
- Analytical Data from groundwater sampled from W-29 and OW-30
- A Ciniza Site Map showing borings completed to date

The following Table lists corresponding identifications to help match data to boring/well.

Boring/Well	Analytical ID	Sample Type	Notes
0643	RFI06-1-X-Date	Soil	X - depth of sample in ft.
0644	RFI06-2-X-Date	Soil	Completed as OW-29
0645	RFI06-3-X-Date	Soil	
0646	RFI06-4-X-Date	Soil	
0647	RFI06-5-X-Date	Soil	Completed as OW-30
0648	RFI06-6-X-Date	Soil	
0649	RFI06-7-X-Date	Soil	
0650	RFI06-8-X-Date	Soil	
OW-29	OW-29-Date	Water	
OW-30	OW-30-Date	Water	

Installation of the air compressors associated with the two recovery wells is in progress. We expect final installation to be completed within the next month or so.

As discussed during several phone conversations, Giant plans to delineate the eastern edge of the plume during the first quarter of 1997. We are currently negotiating the purchase of the parcel east of the refinery property line.

As new information becomes available, we will provide your office with an update of the project.

If you have questions or comments regarding this report, please feel free to call me at (505) 722-0227.

Sincerely,

Dorinda Mancini
Environmental Manager, Ciniza Refinery

cc: w/attachments
Michael Chacon, NMED
Denny Foust, NMOCD - Farmington

w/o attachments
Dick Platt, Refinery Manager
Dave Pavlich, HSE Manager
Steve Morris, Environmental Specialist

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS

Giant Refining Company

Project ID:	Ciniza	Report Date:	11/20/96
Sample ID:	OW-29-111396	Date Sampled:	11/13/96
Lab ID:	0396G02498	Date Received:	11/15/96
Sample Matrix:	water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	11/18/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
MTBE	2.0	0.2
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:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	96%	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

VOLATILE AROMATIC HYDROCARBONS

Giant Refining Company

Project ID:	Ciniza	Report Date:	11/20/96
Sample ID:	OW-30-111396	Date Sampled:	11/13/96
Lab ID:	0396G02497	Date Received:	11/15/96
Sample Matrix:	water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	11/18/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
MTBE	0.9	0.2
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:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	94%	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

American Environmental Network, Inc.

CLIENT	: GIANT	AEN I.D.	: 608348
PROJECT #	: RFI06 TANK 569	DATE RECEIVED	: 8/23/96
PROJECT NAME	: RFI06 TANK 569	REPORT DATE	: 8/26/96

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	RFI06-1-42-82296	SOIL	8/22/96
02	RFI06-1-44-82296	SOIL	8/22/96
03	RFI06-1-46-82296	SOIL	8/22/96
04	RFI06-1-48-82296	SOIL	8/22/96
05	RFI06-1-50-82296	SOIL	8/22/96

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT
PROJECT # : RFI06 TANK 569
PROJECT NAME : RFI06 TANK 569

AEN I.D.: 608348

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	RFIO6-1-42-82296	NON-AQ	8/22/96	8/23/96	8/23/96	1
02	RFIO6-1-44-82296	NON-AQ	8/22/96	8/23/96	8/23/96	1
03	RFIO6-1-46-82296	NON-AQ	8/22/96	8/23/96	8/23/96	1

PARAMETER	DET. LIMIT	UNITS	01	02	03
BENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOLUENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
ETHYLBENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOTAL XYLENES	0.025	MG/KG	< 0.025	< 0.025	< 0.025
METHYL-t-BUTYL ETHER	0.13	MG/KG	< 0.13	< 0.13	< 0.13

SURROGATE:

BROMOFLUOROBENZENE (%)		92	102	99
SURROGATE LIMITS	(65 - 120)			

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT
PROJECT # : RFI06 TANK 569
PROJECT NAME : RFI06 TANK 569

AEN I.D.: 608348

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	RFIO6-1-48-82296	NON-AQ	8/22/96	8/23/96	8/23/96	1
05	RFIO6-1-50-82296	NON-AQ	8/22/96	8/23/96	8/23/96	1

PARAMETER	DET. LIMIT	UNITS	04	05
BENZENE	0.025	MG/KG	< 0.025	< 0.025
TOLUENE	0.025	MG/KG	< 0.025	< 0.025
ETHYLBENZENE	0.025	MG/KG	< 0.025	< 0.025
TOTAL XYLENES	0.025	MG/KG	< 0.025	< 0.025
METHYL-t-BUTYL ETHER	0.13	MG/KG	< 0.13	< 0.13

SURROGATE:

BROMOFLUOROBENZENE (%)		101	104
SURROGATE LIMITS	(65 - 120)		

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)
CLIENT : GIANT INDUSTRIES AEN I.D.: 608348
PROJECT # : 0
PROJECT NAME : RFI06 TANK 569

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
03	RF106-1-46-82296	NON-AQ	8/22/96	8/26/96	8/26/96	1

PARAMETER	DET. LIMIT	UNITS	03
FUEL HYDROCARBONS, C6-C10	10	MG/KG	< 10
FUEL HYDROCARBONS, C10-C22	**5.0**	**MG/KG**	**15**
FUEL HYDROCARBONS, C22-C36	**5.0**	**MG/KG**	**7.4**
CALCULATED SUM			22
SURROGATE:			
O-TERPHENYL (%)			103
SURROGATE LIMITS	(66 - 151)		

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

CLIENT	: GIANT REFINING CO.	AEN I.D.	: 608352
PROJECT #	: RFI O6 TANK 569	DATE RECEIVED	: 8/26/96
PROJECT NAME	: RFI O6 TANK 569	REPORT DATE	: 8/29/96

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	RFI06-3-35-82396	AQUEOUS	8/23/96
02	RFI06-3-18-82396	SOIL	8/23/96
03	RFI06-3-28-82396	SOIL	8/23/96
04	RFI06-3-40-82396	SOIL	8/23/96
05	RFI06-2-22-82396	SOIL	8/23/96
06	RFI06-2-44-82396	SOIL	8/23/96
07	RFI06-1-28-8-22-96	SOIL	8/22/96
08	TRIP BLANK	AQUEOUS	8/19/96

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT REFINING CO. AEN I.D.: 608352
PROJECT # : RFI O6 TANK 569
PROJECT NAME : RFI O6 TANK 569

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	RFI06-3-35-82396	AQUEOUS	8/23/96	NA	8/26/96	10
08	TRIP BLANK	AQUEOUS	8/19/96	NA	8/26/96	1

PARAMETER	DET. LIMIT	UNITS	01	08
BENZENE	0.5	**UG/L**	**3400**	< 0.5
TOLUENE	0.5	**UG/L**	**110**	< 0.5
ETHYLBENZENE	0.5	**UG/L**	**1100**	< 0.5
TOTAL XYLENES	0.5	**UG/L**	**4400**	< 0.5
METHYL-t-BUTYL ETHER	2.5	**UG/L**	**150**	< 2.5

SURROGATE:

BROMOFLUOROBENZENE (%)		113	109
SURROGATE LIMITS	(80 - 120)		

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT REFINING CO.
PROJECT # : RFI O6 TANK 569
PROJECT NAME : RFI O6 TANK 569

AEN I.D.: 608352

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
02	RFI06-3-18-82396	NON-AQ	8/23/96	8/26/96	8/26/96	1
03	RFI06-3-28-82396	NON-AQ	8/23/96	8/26/96	8/26/96	1
04	RFI06-3-40-82396	NON-AQ	8/23/96	8/26/96	8/26/96	1

PARAMETER	DET. LIMIT	UNITS	02	03	04
BENZENE	0.025	**MG/KG**	< 0.025	**0.49**	< 0.025
TOLUENE	0.025	**MG/KG**	< 0.025	**0.038**	< 0.025
ETHYLBENZENE	0.025	**MG/KG**	< 0.025	**0.63**	< 0.025
TOTAL XYLENES	0.025	**MG/KG**	**0.076**	**0.92**	< 0.025
METHYL-t-BUTYL ETHER	0.13	MG/KG	< 0.13	< 0.13	< 0.13

SURROGATE:

BROMOFLUOROBENZENE (%)		90	81	92
SURROGATE LIMITS	(65 - 120)			

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT REFINING CO.
PROJECT # : RFI O6 TANK 569
PROJECT NAME : RFI O6 TANK 569

AEN I.D.: 608352

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
05	RFI06-2-22-82396	NON-AQ	8/23/96	8/26/96	8/26/96	1
06	RFI06-2-44-82396	NON-AQ	8/23/96	8/26/96	8/26/96	1
07	RFI06-1-28-8-22-96	NON-AQ	8/22/96	8/26/96	8/26/96	1

PARAMETER	DET. LIMIT	UNITS	05	06	07
BENZENE	0.025	**MG/KG**	< 0.025	< 0.025	**0.073**
TOLUENE	0.025	**MG/KG**	< 0.025	< 0.025	**0.032**
ETHYLBENZENE	0.025	**MG/KG**	< 0.025	< 0.025	**0.81**
TOTAL XYLENES	0.025	**MG/KG**	< 0.025	< 0.025	**0.83**
METHYL-t-BUTYL ETHER	0.13	MG/KG	< 0.13	< 0.13	< 0.13

SURROGATE:

BROMOFLUOROBENZENE (%)		88	77	114
SURROGATE LIMITS	(65 - 120)			

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

CLIENT	: GIANT REFINING	AEN I.D.	: 608358
PROJECT #	: RFI06-TANK 569	DATE RECEIVED	: 8/28/96
PROJECT NAME	: RFI06-TANK 569	REPORT DATE	: 8/30/96

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	RFI06-3-42-82596	SOIL	8/25/96
02	RFI06-4-28-82696	SOIL	8/26/96
03	RFI06-4-26-82696	SOIL	8/26/96
04	RFI06-4-31-82696	SOIL	8/26/96
05	RFI06-4-31W-82696	AQUEOUS	8/26/96
06	RFI06-4-33-82696	SOIL	8/26/96
07	RFI06-4-34-82696	SOIL	8/26/96
08	RFI06-4-36-82696	SOIL	8/26/96
09	RFI06-4-38-82696	SOIL	8/26/96

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)
CLIENT : GIANT REFINING
PROJECT # : RFI06-TANK 569
PROJECT NAME : RFI06-TANK 569

AEN I.D.: 608358

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
05	RFI06-4-31W-82696	AQUEOUS	8/26/96	8/28/96	8/28/96	1

PARAMETER	DET. LIMIT	UNITS	05
FUEL HYDROCARBONS, C6-C10	2.0	MG/L	5.6
FUEL HYDROCARBONS, C10-C22	1.0	MG/L	53
FUEL HYDROCARBONS, C22-C36	1.0	MG/L	2.2
CALCULATED SUM			61
SURROGATE:			
O-TERPHENYL (%)			98
SURROGATE LIMITS	(79 - 124)		

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)
CLIENT : GIANT REFINING
PROJECT # : RFI06-TANK 569
PROJECT NAME : RFI06-TANK 569

AEN I.D.: 608358

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
03	RFI06-4-26-82696	NON-AQ	8/26/96	8/28/96	8/28/96	1
07	RFI06-4-34-82696	NON-AQ	8/26/96	8/28/96	8/28/96	1

PARAMETER	DET. LIMIT	UNITS	03	07
FUEL HYDROCARBONS, C6-C10	10	MG/KG	<10	<10
FUEL HYDROCARBONS, C10-C22	5.0	**MG/KG**	<5.0	**110**
FUEL HYDROCARBONS, C22-C36	5.0	**MG/KG**	<5.0	**25**
CALCULATED SUM			NA	140
SURROGATE:				
O-TERPHENYL (%)			102	101
SURROGATE LIMITS	(66 - 151)			

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT REFINING
PROJECT # : RFI06-TANK 569
PROJECT NAME : RFI06-TANK 569

AEN I.D.: 608358

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
05	RFI06-4-31W-82696	AQUEOUS	8/26/96	NA	8/28/96	10

PARAMETER	DET. LIMIT	UNITS	05
BENZENE	0.5	**UG/L**	**12**
TOLUENE	0.5	**UG/L**	**6.1**
ETHYLBENZENE	0.5	**UG/L**	**65**
TOTAL XYLENES	0.5	**UG/L**	**77**
METHYL-t-BUTYL ETHER	2.5	UG/L	< 25

SURROGATE:
BROMOFLUOROBENZENE (%) 93
SURROGATE LIMITS (80 - 120)

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT REFINING
PROJECT # : RFI06-TANK 569
PROJECT NAME : RFI06-TANK 569

AEN I.D.: 608358

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	RFI06-3-42-82596	NON-AQ	8/25/96	8/28/96	8/28/96	1
02	RFI06-4-28-82696	NON-AQ	8/26/96	8/28/96	8/28/96	1
03	RFI06-4-26-82696	NON-AQ	8/26/96	8/28/96	8/28/96	1

PARAMETER	DET. LIMIT	UNITS	01	02	03
BENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOLUENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
ETHYLBENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOTAL XYLENES	0.025	MG/KG	< 0.025	< 0.025	< 0.025
METHYL-t-BUTYL ETHER	0.13	MG/KG	< 0.13	< 0.13	< 0.13

SURROGATE:

BROMOFLUOROBENZENE (%)			100	95	91
SURROGATE LIMITS	(65 - 120)				

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT REFINING
PROJECT # : RFI06-TANK 569
PROJECT NAME : RFI06-TANK 569

AEN I.D.: 608358

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	RFI06-4-31-82696	NON-AQ	8/26/96	8/28/96	8/28/96	1
06	RFI06-4-33-82696	NON-AQ	8/26/96	8/28/96	8/28/96	1
07	RFI06-4-34-82696	NON-AQ	8/26/96	8/28/96	8/28/96	1

PARAMETER	DET. LIMIT	UNITS	04	06	07
BENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOLUENE	0.025	**MG/KG**	**0.035**	< 0.025	< 0.025
ETHYLBENZENE	0.025	**MG/KG**	**0.35**	**0.061**	< 0.025
TOTAL XYLENES	0.025	**MG/KG**	**0.36**	**0.16**	< 0.025
METHYL-t-BUTYL ETHER	0.13	MG/KG	< 0.13	< 0.13	< 0.13

SURROGATE:				
BROMOFLUOROBENZENE (%)		86	81	96
SURROGATE LIMITS	(65 - 120)			

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT REFINING
PROJECT # : RFI06-TANK 569
PROJECT NAME : RFI06-TANK 569

AEN I.D.: 608358

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
08	RFI06-4-36-82696	NON-AQ	8/26/96	8/28/96	8/28/96	1
09	RFI06-4-38-82696	NON-AQ	8/26/96	8/28/96	8/28/96	1

PARAMETER	DET. LIMIT	UNITS	08	09
BENZENE	0.025	MG/KG	< 0.025	< 0.025
TOLUENE	0.025	MG/KG	< 0.025	< 0.025
ETHYLBENZENE	0.025	MG/KG	< 0.025	< 0.025
TOTAL XYLENES	0.025	MG/KG	< 0.025	< 0.025
METHYL-t-BUTYL ETHER	0.13	MG/KG	< 0.13	< 0.13

SURROGATE:

BROMOFLUOROBENZENE (%)		90	93
SURROGATE LIMITS	(65 - 120)		

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

CLIENT	: GIANT REFINING CO.	AEN I.D.	: 609301
PROJECT #	: (none)	DATE RECEIVED	: 9/5/96
PROJECT NAME	: (none)	REPORT DATE	: 9/10/96

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	RFI-06-5-82896	AQUEOUS	8/28/96
02	RFI-06-5-42-82896	SOIL	8/28/96
03	RFI-06-5-48-82896	SOIL	8/28/96
04	RFI-06-6-30-9496	AQUEOUS	9/4/96
05	RFI-06-6-32-9496	SOIL	9/4/96
06	RFI-06-6-36-9496	SOIL	9/4/96
07	RFI-06-7-24-9496	AQUEOUS	9/4/96
08	RFI-06-7-26-9496	SOUL	9/4/96
09	RFI-06-7-28-9496	SOIL	9/4/96

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT REFINING CO.
PROJECT # : (none)
PROJECT NAME : (none)

AEN I.D.: 609301

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	RFI-06-5-82896	AQUEOUS	8/28/96	NA	9/5/96	1
04	RFI-06-6-30-9496	AQUEOUS	9/4/96	NA	9/5/96	1
07	RFI-06-7-24-9496	AQUEOUS	9/4/96	NA	9/5/96	1

PARAMETER	DET. LIMIT	UNITS	01	04	07
BENZENE	0.5	**UG/L**	< 0.5	**1500 D(10)**	< 0.5
TOLUENE	0.5	**UG/L**	< 0.5	**5.4**	< 0.5
ETHYLBENZENE	0.5	**UG/L**	< 0.5	**9.3**	< 0.5
TOTAL XYLENES	0.5	**UG/L**	< 0.5	**8.0**	< 0.5
METHYL-t-BUTYL ETHER	2.5	**UG/L**	< 2.5	**59**	**11**

SURROGATE:

BROMOFLUOROBENZENE (%)			100	117	107
SURROGATE LIMITS	(80 - 120)				

CHEMIST NOTES:
D(10)=DILUTED 10X, ANALYZED 9/5/96.

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT REFINING CO.
PROJECT # : (none)
PROJECT NAME : (none)

AEN I.D.: 609301

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
02	RFI-06-5-42-82896	NON-AQ	8/28/96	9/5/96	9/5/96	1
03	RFI-06-5-48-82896	NON-AQ	8/28/96	9/5/96	9/5/96	1
05	RFI-06-6-32-9496	NON-AQ	9/4/96	9/5/96	9/5/96	1

PARAMETER	DET. LIMIT	UNITS	02	03	05
BENZENE	0.025	**MG/KG**	< 0.025	< 0.025	**0.049**
TOLUENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
ETHYLBENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOTAL XYLENES	0.025	MG/KG	< 0.025	< 0.025	< 0.025
METHYL-t-BUTYL ETHER	0.13	MG/KG	< 0.13	< 0.13	< 0.13

SURROGATE:

BROMOFLUOROBENZENE (%)		97	92	96
SURROGATE LIMITS	(65 - 120)			

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT REFINING CO.
PROJECT # : (none)
PROJECT NAME : (none)

AEN I.D.: 609301

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
06	RFI-06-6-36-9496	NON-AQ	9/4/96	9/5/96	9/5/96	1
08	RFI-06-7-26-9496	NON-AQ	9/4/96	9/5/96	9/5/96	1
09	RFI-06-7-28-9496	NON-AQ	9/4/96	9/5/96	9/5/96	1

PARAMETER	DET. LIMIT	UNITS	06	08	09
BENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOLUENE	0.025	**MG/KG**	< 0.025	**0.047**	< 0.025
ETHYLBENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOTAL XYLENES	0.025	**MG/KG**	< 0.025	**0.11**	**0.14**
METHYL-t-BUTYL ETHER	0.13	MG/KG	< 0.13	< 0.13	< 0.13

SURROGATE:				
BROMOFLUOROBENZENE (%)		92	97	97
SURROGATE LIMITS	(65 - 120)			

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)
CLIENT : GIANT REFINING CO.
PROJECT # : (none)
PROJECT NAME : (none)

AEN I.D.: 609301

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	RFI-06-5-82896	AQUEOUS	8/28/96	9/5/96	9/5/96	1
04	RFI-06-6-30-9496	AQUEOUS	9/4/96	9/5/96	9/5/96	1
07	RFI-06-7-24-9496	AQUEOUS	9/4/96	9/5/96	9/5/96	1

PARAMETER	DET. LIMIT	UNITS	01	04	07
FUEL HYDROCARBONS, C6-C10	2.0	**MG/L**	< 2.0	**2.0**	< 2.0
FUEL HYDROCARBONS, C10-C22	1.0	**MG/L**	< 1.0	**1.1**	< 1.0
FUEL HYDROCARBONS, C22-C36	1.0	MG/L	< 1.0	< 1.0	< 1.0
CALCULATED SUM			N/A	3.1	N/A
SURROGATE:					
O-TERPHENYL (%)			109	108	106
SURROGATE LIMITS	(79 - 124)				

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)
CLIENT : GIANT REFINING CO.
PROJECT # : (none)
PROJECT NAME : (none)

AEN I.D.: 609301

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
02	RFI-06-5-42-82896	NON-AQ	8/28/96	9/5/96	9/5/96	1
03	RFI-06-5-48-82896	NON-AQ	8/28/96	9/5/96	9/5/96	1
05	RFI-06-6-32-9496	NON-AQ	9/4/96	9/5/96	9/5/96	1

PARAMETER	DET. LIMIT	UNITS	02	03	05
FUEL HYDROCARBONS, C6-C10	10	MG/KG	< 10	< 10	< 10
FUEL HYDROCARBONS, C10-C22	5.0	MG/KG	< 5.0	< 5.0	< 5.0
FUEL HYDROCARBONS, C22-C36	5.0	MG/KG	< 5.0	< 5.0	< 5.0
CALCULATED SUM			N/A	N/A	N/A
SURROGATE:					
O-TERPHENYL (%)			106	107	104
SURROGATE LIMITS	(66 - 151)				

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)
CLIENT : GIANT REFINING CO.
PROJECT # : (none)
PROJECT NAME : (none)

AEN I.D.: 609301

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
06	RFI-06-6-36-9496	NON-AQ	9/4/96	9/5/96	9/5/96	1
08	RFI-06-7-26-9496	NON-AQ	9/4/96	9/5/96	9/5/96	1
09	RFI-06-7-28-9496	NON-AQ	9/4/96	9/5/96	9/5/96	1

PARAMETER	DET. LIMIT	UNITS	06	08	09
FUEL HYDROCARBONS, C6-C10	10	MG/KG	< 10	< 10	< 10
FUEL HYDROCARBONS, C10-C22	5.0	MG/KG	< 5.0	< 5.0	< 5.0
FUEL HYDROCARBONS, C22-C36	5.0	MG/KG	< 5.0	< 5.0	< 5.0
CALCULATED SUM			N/A	N/A	N/A
SURROGATE:					
O-TERPHENYL (%)			108	107	107
SURROGATE LIMITS	(66 - 151)				

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

CLIENT	: GIANT REFINING	AEN I.D.	: 609305
PROJECT #	: (none)	DATE RECEIVED	: 9/6/96
PROJECT NAME	: RFI-06	REPORT DATE	: 9/10/96

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	RFI06-8-28-9596	SOIL	9/5/96
02	RFI06-8-30-9596	SOIL	9/5/96

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)
CLIENT : GIANT REFINING
PROJECT # : (none)
PROJECT NAME : RFI-06

AEN I.D.: 609305

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	RFI06-8-28-9596	NON-AQ	9/5/96	9/9/96	9/9/96	1
02	RFI06-8-30-9596	NON-AQ	9/5/96	9/9/96	9/9/96	1

PARAMETER	DET. LIMIT	UNITS	01	02
FUEL HYDROCARBONS, C6-C10	10	MG/KG	< 10	< 10
FUEL HYDROCARBONS, C10-C22	5.0	MG/KG	< 5.0	< 5.0
FUEL HYDROCARBONS, C22-C36	5.0	MG/KG	< 5.0	< 5.0
CALCULATED SUM:			N/A	N/A
SURROGATE:				
O-TERPHENYL (%)			89	96
SURROGATE LIMITS	(66 - 151)			

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GAS CHROMOTOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT REFINING
PROJECT # : (none)
PROJECT NAME : RFI-06

AEN I.D.: 609305

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	RFI06-8-28-9596	NON-AQ	9/5/96	9/9/96	9/9/96	1
02	RFI06-8-30-9596	NON-AQ	9/5/96	9/9/96	9/9/96	1

PARAMETER	DET. LIMIT	UNITS	01	02
BENZENE	0.025	MG/KG	< 0.025	< 0.025
TOLUENE	0.025	MG/KG	< 0.025	< 0.025
ETHYLBENZENE	0.025	MG/KG	< 0.025	< 0.025
TOTAL XYLENES	0.025	MG/KG	< 0.025	< 0.025
METHYL-t-BUTYL ETHER	0.13	MG/KG	< 0.13	< 0.13

SURROGATE:

BROMOFLUOROBENZENE (%)		106	119
SURROGATE LIMITS	(65 - 120)		

CHEMIST NOTES:
N/A

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6920.1
TOTAL DEPTH: 50.0
LOGGED BY: WHK
DATE: 8/22/96
STATIC WATER: 31.4
BORING ID: 0643
PAGE: 1

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
0.0-1.0	//////////		C	**CLAY**, LOOSE, DRY, SOFT, RED BROWN	
	//////////		C		
1.0-1.6	***///***		C	**SAND**, CLAYEY, DARK BROWN, MOIST, SOFT, APPEARS CONTAMINATED	
1.6-6.3	//////////		C	**CLAY**, RED BROWN, FIRM, SOME ROOT MATTER, MOIST	
	//////////		C		
	//////////		C		
	//////////		C		
	//////////		C		
	//////////		C		
	//////////	5.0	C		
	//////////		C		
	//////////		C		
6.3-8.5	///***///		C	**CLAY**, SANDY, VERY FINE, MOIST, FIRM, RED BROWN, SOME ROOT MATTER	
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
8.5-12.3	//////////		C	**CLAY**, FIRM, RED BROWN, MOIST	
	//////////		C		
	//////////	10	C		
	//////////		C		
	//////////		C		
	//////////		C		
	//////////		C		
12.3-12.5	///**-///		C	**CLAY**, SANDY, SILTY, GRADES TO SILT @ 12.5	
12.5-13.3	---------		C	**SILT**, DRY, FIRM, MOIST, LIGHT BROWN	
13.3-13.5	///---///		C	**CLAY**, SILTY	
13.5-13.75	*********		C	**SAND**, LOOSE, DRY, FINE, BROWN	
13.75-15.8	////*////		C	**CLAY**, WEAKLY SANDY, BROWN, STIFF, MOIST	
	////*////	15	C		
	////*////		C		
15.8-16.7	///***///		C	**CLAY**, VERY SANDY (COARSE), WET (NOT WATER BEARING), FIRM, RED BROWN	
	///***///		C		
16.7-17.75	///---///		C	**CLAY**, SILTY, STIFF, MOIST, RED BROWN	
	///---///		C		
17.75-21.8	//////////		C	**CLAY**, WET, RED BROWN, STIFF, SOME ROOT MATTER	
	//////////		C		
	//////////		C		
	//////////		C		
	//////////	20	C		
	//////////		C		
	//////////		C		
	//////////		C		
21.8-25.3	///***///		C	**CLAY**, FINE SANDY, WET, HYDROCARBON ODOR, GREY BROWN, SOME BLACK MOTTLING, NOT WATER	
	///***///		C	BEARING, SOFT	22'-20 ppm
	///***///		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6920.1
TOTAL DEPTH: 50.0
LOGGED BY: WHK
DATE: 8-22-96
STATIC WATER: 31.4
BORING ID: 0643
PAGE: 2

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
21.8-25.3	///***/ ///***/ ///***/ ///***/ ///***/	25	C C C C C	**CLAY**, FINE SANDY, WET, HYDROCARBON ODOR, GREY BROWN, SOME DARK MOTTLING, NOT WATER BEARING, SOFT	22'-20 ppm 24'-29 ppm
25.3-27.0	****/**** ****/**** ****/**** ****/****		C C C C	**SAND**, LOOSE, VERY WET, VERY WEAKLY FLUID BEARING, HYDROCARBON SHEEN, GREY BROWN, CLAYEY	26'-34ppm
27.0-28.1	****/**** ****/****		C C	AS ABOVE BUT RED BROWN, LESS ODOR	
28.1-29.5	///**//// ///**//// ///**////		C C C	**CLAY**, SLIGHTLY SANDY, SOFT, WET, NOT WATER BEARING	28'-48ppm
29.5-31.4	***///*** ***///*** ***///***	30	C C C	**SAND**, CLAYEY, SOFT, WET, NOT WATER BEARING, CANNOT DETECT ODOR, VERY WEAK WATER BEARING	30'-0ppm
31.4-34.8	///***/// ///***/// ///***/// ///***/// ///***/// ///***/// ///***///		C C C C C C C	**CLAY**, SANDY, FINE, SOFT, WET (NOT WATER BEARING), VERY WEAKLY SANDY > 33.0'	32'-0ppm 34'-0ppm
34.8-36.1	***--**** ***--**** ***--****	35	C C C	**SAND**, BROWN, SILTY, GRAVELLY (1"), MOIST, NO ODOR, MODERATELY DENSE **WATER BEARING** 35.0-36.1, NO ODOR	
36.1-41.2	//////// //////// //////// //////// //////// //////// //////// //////// ////////	40	C C C C C C C C C	**CLAY**, LIGHT BROWN, CARBONATE SALTS APPEAR AS WEB-LIKE FILIMENTS, SOME ROOT MATTER, STIFF	36'-0ppm 38'-0ppm 40'-0ppm
41.2-42.7	000000000 000000000 000000000		C C C	**GRAVEL (2")**, CHERT, SANDSTONE, PETRIFIED WOOD, **WATER BEARING**, MULTICOLORED	
42.7-48.0	========= ========= ========= ========= ========= ========= =========	45	C C C C C C C	**SHALE**, RED, DRY/MOIST/WET, DENSE **CHINLE FORMATION**	42'-20ppm 44'-30ppm

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4"ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6920.1
TOTAL DEPTH: 50.0
LOGGED BY: WHK
DATE: 8-22-96
STATIC WATER: 31.4
BORING ID: 0643
PAGE: 3

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
42.7-48.0	=========		C	**SHALE**, RED, DRY/MOIST/WET, DENSE	
	=========		C	**CHINLE FORMATION**	46'-10ppm
	=========		C		
	=========		C		
	=========		C		
48.0-50.0	=========		C	**SHALE**, DARK RED TO PURPLE RED, DRY, DENSE	48'-0ppm
	=========		C		
	=========		C		
	=========	50	C		50'-0ppm
TOTAL DEPTH					
		55			
		60			
		65			

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6913.5
TOTAL DEPTH: 49.0
LOGGED BY: WHK
DATE: 8-23-96
STATIC WATER: 30.6
BORING ID: OW-29(0644)
PAGE: 1

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
0.0-6.9	///--////		C	**CLAY**, SLIGHTLY SILTY, DAMP TO DRY, DARK RED BROWN, STIFF	PID=0ppm ALL SAMPLES
	///--////		C		
	///--////		C		
	///--////		C		
	///--////		C		
	///--////		C		
	///--////		C		
	///--////		C		
	///--////		C		
	///--////		C		
	///--////	5.0	C		
	///--////		C		
	///--////		C		
	///--////		C		
6.9	///--////		C		
6.9-7.4	///**////		C	**CLAY**, SLIGHTLY SANDY, ROOT MATTER, RED BROWN, MOIST, STIFF	
7.4-10.6	///---///		C	**CLAY**, SILTY, ROOT MATTER, RED BROWN, MOIST, SOME CALCIUM CARBONATE NODULES < 2 mm, STIFF-HARD	
	///---///		C		
	///---///		C		
	///---///		C		
	///---///	10	C		
10.6	///---///		C		
10.6-14.3	////////		C	**CLAY**, RED BROWN, WET, STIFF	
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
14.3	////////		C		
14.3-14.7	///**////		C	**CLAY**, SLIGHTLY SANDY, MOIST, STIFF, RED BROWN	
14.7-14.9	///---///	15	C	**CLAY**, SILTY, STIFF, MOIST, RED BROWN	
14.9-16.0	***//****		C	**SAND**, SLIGHTLY CLAYEY, DENSE, MOIST, RED BROWN	
16.0	***//****		C		
16.0-20.5	////////		C	**CLAY**, MOIST, RED BROWN, HARD, CHARCOAL 19-20'	
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////	20	C		
20.5	////////		C		
20.5-22.2	///***///		C	**CLAY**, SANDY, CHARCOAL, RED BROWN, STIFF, MOIST	
	///***///		C		
22.2	///***///		C		
22.2-24.3	///---///		C	CLAY, SILTY, SILT IN LAMINATIONS, DRY-MOIST	
	///---///		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6913.5
TOTAL DEPTH: 49.0
LOGGED BY: WHK
DATE: 8-23-96
STATIC WATER: 30.6
BORING ID: OW-29(0644)
PAGE: 2

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
22.2-24.3	///---///		C	**CLAY**, SILTY, SILT IN LAMINATIONS, DRY-MOIST	PID=0ppm ALL SAMPLES
	///---///		C		
24.3	///---///		C		
24.3-36.8	///**////	25	C	**CLAY**, ROOT MATTER, RED BROWN, STIFF, MOIST, SLIGHTLY BLOCKY, SOME CARBONATE NODULES APPROXIMATELY 1/2 cm AT 26.0-27.5, FRACTURES DURING SAMPLING FORM SLICKENSIDED SURFACES, SLIGHTLY SANDY 33.5-33.8', WET > 35'	
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////	30	C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////	35	C		
	///**////		C		
	///**////		C		
36.8	///**////		C		
36.8-37.1	*********		C	**SAND**, LIGHT BROWN, WET, MEDIUM, DENSE	
37.1-39.6	////0////		C	**CLAY**, LIGHT BROWN, WET, SOFT, SOME 3/4" GRAVEL RARE	
	////0////		C		
	////0////		C		
	////0////		C		
39.6	////0////		C		
39.6-40.4	///***///	40	C	**CLAY**, COARSE SANDY, WET, SOFT, LIGHT BROWN, CALCIUM CARBONATE	
40.4	///***///		C		
40.4-43.4	///**////		C	**CLAY**, LIGHT BROWN, WET, SOFT, SLIGHTLY SANDY > 42.5'	
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
43.4	///**////		C		
43.4-47.0	000//0000		C	**GRAVEL**, SLIGHTLY CLAYEY, CHERT, LIMESTONE, PETRIFIED WOOD, SANDSTONE, MULTICOLORED TO LIGHT RED BROWN, DENSE, **WATER BEARING**, SANDIER >45'	
	000//0000		C		
	000//0000	45	C		
	000//0000		C		
	000//0000		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6913.5
TOTAL DEPTH: 49.0
LOGGED BY: WHK
DATE: 8-23-96
STATIC WATER: 30.6
BORING ID: OW-29(0644)
PAGE: 3

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
43.4-47.0 47.0	000//0000 000//0000		C C	**GRAVEL**, SLIGHTLY CLAYEY, CHERT, LIMESTONE, PETRIFIED WOOD, SANDSTONE, MULTICOLORED TO LIGHT RED BROWN, DENSE, **WATER BEARING**, SANDIER > 45'	PID=0ppm ALL SAMPLES
47.0-49.0	========= ========= ========= =========		C	SHALE, RED PURPLE, DENSE, DAMP-MOIST (APPEARS DRY), NO WATER	
TOTAL DEPTH		50 55 60 65		NOTE: COMPLETED AS A 4" MONITORING WELL. SEE COMPLETION DIAGRAM.	

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6931.1
TOTAL DEPTH: 43.0
LOGGED BY: WHK
DATE: 8-23-96
STATIC WATER: 29.3
BORING ID: 0645
PAGE: 1

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
0.0-3.2	///---///		C	**CLAY**, SILT, STIFF, DAMP, RED BROWN, ROOT MATTER	0ppm TO 14.0
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
3.2	///---///		C		
3.2-6.6	***--****		C	**SAND**, FINE, SLIGHTLY SILTY, RED BROWN, MODERATELY DENSE	
	--*		C		
	--*		C		
	--*	5.0	C		
	--*		C		
	--*		C		
6.6	***--****		C		
6.6-7.1	///***///		C	**CLAY**, SANDY, SOFT, DAMP, RED BROWN	
7.1-7.6	***///***		C	**SAND**, CLAYEY, LOOSE, DAMP, RED BROWN	
7.6-8.3	///***///		C	**CLAY**, SANDY, SOFT, MOIST, RED BROWN	
8.3-8.5	*********		C	**SAND**, FINE, LOOSE, RED BROWN, DAMP	
8.5-9.6	///***///		C	**CLAY**, SANDY	
9.6	///***///		C		
9.6-9.9	*********	10	C	**SAND**, FINE	
9.9-10.4	///***///		C	**CLAY**, SANDY	
10.4-13.2	*********		C	**SAND**, FINE, MOIST, RED BROWN, LOOSE	
	*********		C		
	*********		C		
	*********		C		
13.2	*********		C		
13.2-13.9	///***///		C	**CLAY**, SANDY, WET, RED BROWN, SOFT	
13.9	///***///		C		14'-1ppm
13.9-14.2	*********		C	**SAND**, FINE, RED BROWN, LOOSE, MOIST	
14.2-14.5	***///***	15	C	**SAND**, FINE, DARK RED BROWN, WET, LOOSE, CLAYEY	
14.5-15.2	*********		C	**SAND**, FINE-MEDIUM, MODERATELY DENSE, RED BROWN, MOIST	
15.2-16.2	/////////		C	**CLAY**, LIGHT BROWN, SILTY, SOME CALCIUM CARBONATE NODULES, FIRM	16'-1ppm
16.2-21.5	////0////		C	**CLAY**, DARK BROWN, CARBONATE FILIMENTS, SOME NODULES, < 3/4" GRAVEL RARE, NO GRAVEL	
	////0////		C	> 18', SOME BLACK INFILLING (PSOLOMOLENE)	
	////0////		C		
	////0////		C		18'-32ppm
	////0////		C		
	////0////		C		
	////0////		C		
	////0////	20	C		20'-4ppm
	////0////		C		
	////0////		C		
21.5	////0////		C		
21.5-23.8	/////////		C	**CLAY**, SANDY, SAND IN < 1" SEAMS, DARK BROWN TO PURPLE BROWN, STIFF, WET	22'-2ppm
	/////////		C		
	/////////		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6931.1
TOTAL DEPTH: 43.0
LOGGED BY: WHK
DATE: 8-23-96
STATIC WATER: 29.3
BORING ID: 0645
PAGE: 2

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
21.5-23.8	///***///		C	**CLAY**, SANDY, SAND IN 1" SEAMS, DARK BROWN TO PURPLE BROWN, STIFF, WET	
23.8	///***///		C		24'-3ppm
23.8-25.6	///**////		C	**CLAY**, SLIGHTLY SANDY, STIFF, WET, BROWN-RED BROWN, SOME CHARCOAL IN < 2mm PIECES	
	///**////	25	C		
25.6	///**////		C		
25.6-29.2	///***///		C	**CLAY**, SANDY, **HYDROCARBON ODOR**, BLOCKY, JOINT FILLED WITH CALCIUM CARBONATE SALTS,	26'-24ppm
	///***///		C	SOME CHARCOAL, WET, RED BROWN-GREY BROWN, STIFF, LESS SAND AT 29.0	
	///***///		C		
	///***///		C		
	///***///		C		28'-185ppm
	///***///		C		
29.2	///***///		C		
29.2-30.0	///***///		C	**CLAY**, COARSE SANDY, WET, RED BROWN, STIFF	
30.0	///***///	30	C		30'-46ppm
30.0-34.1	///***///		C	**CLAY**, SANDY, **HYDROCARBON ODOR**, STIFF, RED BROWN, BLOCKY, WET	
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
34.1	///***///		C		
34.1-36.1	*********		C	**SAND**, **WATER BEARING**, FINE, GREY-GREENGREY, MODERATELY DENSE, **HYDROCARBON ODOR**,	
	*********	35	C	HYDROCARBON SHEEN	35'-130ppm
	*********		C		
36.1	*********		C		36'-90ppm
36.1-38.2	000***000		C	**GRAVEL**, SANDY, SANDSTONE, CHERT, PETRIFIED WOOD, **WATER BEARING**	
	000***000		C		
	000***000		C		
38.2	000***000		C		38'-30ppm
38.2-41.0	===***===		C	**SHALE**, VERY SANDY, FISSLE, DENSE, CRUMBLES IN HAND, MOIST-WET	
	===***===		C		
	===***===		C		
	===***===	40	C		40'-2ppm
	===***===		C	DRILLING STOPPED-OUT OF AUGER, WEATHER BAD	
41.0	===***===		C	RESTART DRILLING 8-25-96 @ 8:40 AM	
41.0-43.0	SSSSSSSSS		C	SANDSTONE, HARD, LIGHT GREY, SUSPECT NEAR SONSELA, WET, NOT WATER BEARING, NO ODOR	
	SSSSSSSSS				
	SSSSSSSSS				
	SSSSSSSSS				
TOTAL DEPTH					
		45			

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6987.2
TOTAL DEPTH: 40.0
LOGGED BY: WHK
DATE: 8-27-96
STATIC WATER: 30.0
BORING ID: 0646
PAGE: 1

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
0.0-4.2	///***///		C	**CLAY**, SANDY, GRAVELLY, MOIST-WET, RED BROWN, STIFF	
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
4.2	///***///		C		
4.2-5.8	***//0***		C	**SAND**, SLIGHTLY CLAYEY, SCATTERED GRAVEL, (<1/2"), MOIST, RED BROWN, MODERATELY DENSE	
	//0	5.0	C		
	//0		C		
5.8	***//0***		C		
5.8-9.0	///**////		C	**CLAY**, WET, SOFT, BROWN, SOME COARSE SAND	
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
9.0	///**////		C		
9.0-11.0	**///0***		C	**SAND**, VERY CLAYEY, SOFT-LOOSE, WET, BROWN, SCATTERED GRAVEL (MAXIMUM 1.5")	
	///0*	10	C		
	///0*		C		
11.0	**///0***		C		
11.0-13.8	///**////		C	**CLAY**, WET, SOFT, BROWN, SLIGHTLY SANDY	
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
13.8	///**////		C		
13.8-28.5	***000***		C	**SAND**, GRAVELLY, MOIST-WET, SLIGHTLY BANDED GRAVEL (SANDSTONE, CHERT MAINLY), BROWN-RED BROWN, SOME 2" GRAVEL,SOME ROCK > 4" > 15', (WHITE SANDSTONE GRAVEL) VERY GRAVELLY > 20', DENSE	
	000	15	C		
	000		C		
	000		C		
	000		C		
	000		C		
	000		C		
	000		C		
	000		C		
	000		C		
	000		C		
	000		C		
	000	20	C		
	000		C		
	000		C		
	000		C		
	000		C		
	000		C		
	000		C		
	000		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6987.2
TOTAL DEPTH: 40.0
LOGGED BY: WHK
DATE: 8-27-96
STATIC WATER: 30.0
BORING ID: 0646
PAGE: 2

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
13.8-28.5	***000***		C	**SAND**, GRAVELLY, MOIST-WET, SLIGHTLY BANDED GRAVEL (SANDSTONE, CHERT MAINLY), BROWN-RED BROWN, SOME 2" GRAVEL, SOME ROCK > 4" > 15', (WHITE SANDSTONE GRAVEL), VERY GRAVELLY > 20', DENSE	
	000		C		
	000		C		
	000	25	C		
	000		C		
	000		C		
	000		C		
	000		C		
	000		C		
	000		C		
	000		C		
28.5	***000***		C		
28.5- 29.1	///**////		C	**CLAY**, WET, BROWN, SLIGHTLY SANDY, SOFT	
29.1-30.0	***//****		C	**SAND**, SLIGHTLY CLAYEY, LIGHT BROWN-RED BROWN, MODERATELY DENSE, WET, MEDIUM TO FINE	
30.0	***//****	30	C	POSSIBLE **HYDROCARBON ODOR**	
30.0-30.8	***//****		C	**SAND**, SLIGHTLY CLAYEY, RED BROWN/GREY STREAKS, WATER BEARING, DEFINITE **HYDROCARBON**	
30.8	***//****		C	**ODOR** AND SHEEN, APPEARS SAME ZONE AS ABOVE	
30.8-31.8	SSSSSSSSS		C	**CHINLE FORMATION**	
31.8	SSSSSSSSS		C	**SANDSTONE**, WHITE, HARD, NOT VERY POROUS, **HYDROCARBON ODOR**	
31.8-40.0	===***===		C	**SHALE**, VERY SANDY, WET, NOT WATER BEARING, LESS SAND @ 34', MODERATELY DENSE,	
	===***===		C	**HYDROCARBON ODOR** TO 34', NO ODOR AT 40', LAMINAR BANDING, RED PURPLE, SHALEY	
	===***===		C	SANDSTONE, BREAKS ALONG LAMINATIONS OTHERWISE MASSIVE, DAMP-DRY >35'	
	===***===		C		
	===***===		C		
	===***===	35	C		
	===***===		C		
	===***===		C		
	===***===		C		
	===***===		C		
	===***===		C		
	===***===		C		
	===***===		C		
	===***===		C		
	===***===		C		
	===***===	40	C		
TOTAL DEPTH		45			

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6921.6
TOTAL DEPTH: 48.4
LOGGED BY: WHK
DATE: 8-28-96
STATIC WATER: 24.4
BORING ID: OW-30(0647)
PAGE: 1

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
0.0-6.5	///---///		C	**CLAY**, SILTY, DRY, RED BROWN, FIRM, SOME ROOT MATTER	PID-0ppm ALL SAMPLES
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
	///---///	5.0	C		
	///---///		C		
	///---///		C		
6.5	///---///		C		
6.5-13.1	////////		C	**CLAY**, RED BROWN, MOIST, STIFF, SOME ROOT MATTER, SOME CARBONATE NODULES < 1 cm	
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////	10	C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
13.1	////////		C		
13.1-13.8	///***///		C	**CLAY**, SANDY, CARBONATE NODULES APPROXIMATELY 3mm, STIFF, DAMP, RED BROWN	
	///***///		C		
13.8	///***///		C		
13.8-16.5	///---///	15	C	**CLAY**, SILTY, DAMP-MOIST, RED BROWN, STIFF	
	///---///		C		
	///---///		C		
16.5	///---///		C		
16.5-22.5	////////		C	**CLAY**, VERY STIFF, RED BROWN, MOIST	
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////	20	C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
22.5	////////		C		
22.5-23.2	////////		C	**CLAY**, SILTY, STIFF, MOIST, BROWN	

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PROJECT: Giant Refinery
Ciniza

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 96-133
ELEVATION: 6921.6
TOTAL DEPTH: 48.4
LOGGED BY: WHK
DATE: 8-28-96
STATIC WATER: 24.4
BORING ID: OW-30(0647)
PAGE: 2

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
23.2-23.8	***---***		C	**SAND**, FINE, SILTY, BROWN, DAMP, MODERATELY DENSE	PID=0ppm
23.8	***---***		C		ALL SAMPLES
23.8-24.3	///---///		C	**CLAY**, SILTY, BROWN, VERY STIFF, MOIST	
24.3-39.7	////////	25	C	**CLAY**, BROWM, VERY STIFF, MOIST, SOME CARBONATE SPECKS > 28'	
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////	30	C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////	35	C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
	////////		C		
39.7	////////		C		
39.7-41.7	///***///	40	C	**CLAY**, SANDY, WET, SOFT, RED BROWN, SANDIER @ 41.2-41.7	
	///***///		C		
	///***///		C		
41.7	///***///		C		
41.7-42.6	////////		C	**CLAY**, BLACK, WET, ABUNDANT CHARCOAL, SOFT, SOME ROOT MATTER	
42.6	////////		C		
42.6-44.2	///--*///		C	**CLAY**, LIGHT BROWN, WET, SOFT, VERY SLIGHTLY SANDY, SILTY	
	///--*///		C		
44.2	///--*///		C		
44.2-47.3	000SSS000		C	**GRAVEL**, **WATER BEARING**, CHERT, SANDSTONE, SOME LIMESTONE, MODERATELY DENSE	
	000SSS000	45	C		
	000SSS000		C		
	000SSS000		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6921.6
TOTAL DEPTH: 48.4
LOGGED BY: WHK
DATE: 8-28-96
STATIC WATER: 24.4
BORING ID: OW-30(0647)
PAGE: 3

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
44.2-47.3	000SSS000 000SSS000 000SSS000		C C C	**GRAVEL**, **WATER BEARING**, CHERT, SANDSTONE, SOME LIMESTONE, MODERATELY DENSE	PID=0ppm ALL SAMPLES
47.3					
47.3-48.4	========= =========		C C	**SHALE**, **CHINLE FORMATION**, MOIST, HARD, RED TO WHITE (CARBONATE INDURATION)	
TOTAL DEPTH				NOTE: STATIC WATER ELEVATION 33.5 @ .5 HOURS AND 24.4 @ 72 HOURS	
		50			
		55			
		60			
		65			

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery Ciniza

FILE #: 96-133
ELEVATION: 6917.6
TOTAL DEPTH: 36.5
LOGGED BY: WHK
DATE: 9-4-96
STATIC WATER: 19' @ 27 HRS
BORING ID: 0648
PAGE: 1

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
0.0-6.2	///--////		C	**CLAY**, SLIGHTLY SILTY, ROOT MATTER, RED, BROWN, STIFF, MOIST	PID-0ppm ALL SAMPLES
	///--////		C		
	///--////		C		
	///--////		C		
	///--////		C		
	///--////		C		
	///--////		C		
	///--////		C		
	///--////		C		
	///--////	5.0	C		
	///--////		C		
6.2	///--////		C		
6.2-7.1	***///***		C	**SAND**, CLAYEY, GRADATIONALLY CONTACTS TOP, LOOSE, DRY, RED BROWN	
7.1	***///***		C		
7.1-8.3	///---///		C	**CLAY**, VERY SILTY, LAMINAR SILT, DRY-DAMP, FIRM, RED BROWN	
	///---///		C		
8.3	///---///		C		
8.3-12.3	---///---		C	**SILT**, CLAYEY, LAMINAR, DAMP-DRY, LIGHT BROWN, FIRM, ROOT MATTER	
	---///---		C		
	---///---	10	C		
	---///---		C		
	---///---		C		
	---///---		C		
	---///---		C		
12.3	---///---		C		
12.3-12.8	***---***		C	**SAND**, SILTY, FINE, LOOSE, DRY, RED BROWN	
12.8-14.3	///---///		C	**CLAY**, SILTY, STIFF, DAMP, ROOT MATTER, RED BROWN, SILT LAMINAR	
	///---///		C		
14.3	///---///		C		
14.3-16.5	***OO****	15	C	**SAND**, FINE, SCATTERED GRAVEL TO 2", SILTY, RED BROWN, MODERATELY DENSE, DRY-DAMP	
	OO*		C		
	OO*		C		
16.5	***OO****		C		
16.5-21.5	***SS****		C	**SAND**, COARSE-FINE, WET, SOME SANDSTONE GRAVEL TO 3", RED BROWN, SOME CLAY @ 19.5-20.0, WATER BEARING @ 20.0	
	SS*		C		
	SS*		C		
	SS*		C		
	SS*		C		
	SS*		C		
	SS*	20	C		
	SS*		C		
	SS*		C		
21.5	***SS****		C		
21.5-25.0	/////////		C	LOST SAMPLE-POSSIBLE SOFT, WET, CLAY BASED ON LEFTOVERS IN SAMPLER	
	/////////		C		
	/////////		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery Ciniza

FILE #: 96-133
ELEVATION: 6917.6
TOTAL DEPTH: 36.5
LOGGED BY: WHK
DATE: 9-4-96
STATIC WATER: 19.0 @ 27 HRS
BORING ID: 0648
PAGE: 2

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
21.5-25.0 25.0	///////// ///////// ///////// /////////	25	C C C C	LOST SAMPLE-POSSOBLE SOFT, WET, CLAY BASED ON LEFTOVERS IN SAMPLER	PID-0ppm ALL SAMPLES
25.0-28.0 28.0	///////// ///////// ///////// ///////// ///////// /////////		C C C C C C	**CLAY**, WET, SOFT, RED BROWN	
28.0-30.0 30.0	*0*SS*0*0 *0*SS*0*0 *0*SS*0*0 *0*SS*0*0	30	C C C C	**SAND & GRAVEL**, 4" SANDSTONE, CHERT, **WATER BEARING**, **HYDROCARBON ODOR**, LOOSE, MULTICOLORED	
30.0-32.0 32.0	S=S=S=S=S S=S=S=S=S S=S=S=S=S S=S=S=S=S		C C C C	**CHINLE FORMATION** SAMPLER REFUSAL-POSSIBLE "SWEET" ODOR, SANDSTONE & SHALE > 30', NO ODOR, DRILL WITHOUT SAMPLER TO 35', MATRIX > 30' GREYGREEN, CEMENTED VERY DENSE ROCK @ 32' DIVE SAMPLER 3"-STUCK IN ROCK	
32.0-36.5 36.5	S=S=S=S=S S=S=S=S=S S=S=S=S=S S=S=S=S=S S=S=S=S=S S=S=S=S=S S=S=S=S=S S=S=S=S=S S=S=S=S=S	35	C C C C C C C C C	**SANDSTONE & SHALE**, HARD, CALCARIOUS CEMENTATION, FINE TO COARSE, SHALE, GREEN-RED B	
TOTAL DEPTH		40 45		NOTE: HYDROCARBON ODOR APPEARS TO BE CONCETRATED IN WATER LYING ON CHINLE FORMATION	

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6913.4
TOTAL DEPTH: 30.0
LOGGED BY: WHK
DATE: 9-4-96
STATIC WATER: 20.0
BORING ID: 0649
PAGE: 1

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
0.0-3.1	///--////		C	**CLAY**, DAMP, MOIST, RED BROWN, STIFF, SLIGHTLY SILTY, ROOT MATTER	PID-0ppm ALL SAMPLES
	///--////		C		
	///--////		C		
	///--////		C		
	///--////		C		
3.1	///--////		C		
3.1-4.0	***///***		C	**SAND**, CLAYEY, RED BROWN, MODERATELY DENSE, DRY-DAMP	
	///		C		
4.0	***///***		C		
4.0-5.0	///---///	5.0	C	**CLAY**, MOIST, RED BROWN, STIFF, SILTY, ROOT MATTER	
5.0-6.0	***///***		C	**SAND**, CLAYEY, RED BROWN, SOME COARSE, MODERATELY DENSE, DAMP	
6.0	***///***		C		
6.0-6.9	///***///		C	**CLAY**, SANDY, RED BROWN, VERY STIFF, MOIST	
6.9	///***///		C		
6.9-8.5	///--*///		C	**CLAY**, SLIGHTLY SILTY, WEAKLY SANDY, SOME CHARCOAL, SOME ROOT MATTER, RED BROWN, STIFF	
	///--*///		C		
8.5	///--*///		C		
8.5-8.9	*********		C	**SAND**, MEDIUM, RED BROWN, MODERATELY DENSE, DAMP	
8.9-17.0	///**////		C	**CLAY**, SLIGHTLY SANDY, RED BROWN, VERY STIFF, MOIST, SOME SCATTERED GRAVEL	
	///**////	10	C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////		C		
	///**////	15	C		
	///**////		C		
	///**////		C		
	///**////		C		
17.0	///**////		C		
17.0-17.3	***//****		C	**SAND**, RED BROWN, FINE, MOIST, SLIGHTLY CLAYEY, LOOSE	
17.3-23.2	///00////		C	**CLAY**, WET, RED BROWN, STIFF, SCATTERED FINE GRAVEL (RARE), SOME WHITE FILIMENTS OF CALCIUM CARBONATE SALTS	
	///00////		C		
	///00////		C		
	///00////		C		
	///00////	20	C		
	///00////		C		
	///00////		C		
	///00////		C		
	///00////		C		
	///00////		C		
	///00////		C		
	///00////		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 6913.4
TOTAL DEPTH: 30.0
LOGGED BY: WHK
DATE: 9-4-96
STATIC WATER: 20.0
BORING ID: 0649
PAGE: 2

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
23.2-25.0	000***/00 000***/00 000***/00 000***/00	25	C C C C	**GRAVEL**, SANDY, CHERT, SANDSTONE, SLIGHTLY CLAYEY, RED BROWN, DENSE, **WATER BEARING**	PID-0ppm ALL SAMPLES
25.0-30.0	===***=== ===***=== ===***=== ===***=== ===***=== ===***=== ===***=== ===***=== ===***=== ===***===	30	C C C C C C C C C C	**CHINLE FORMATION** **SHALE**, SANDY, RED BROWN/GREEN INTERBEDS, DENSE, MOIST, NOT WATER BEARING	
TOTAL DEPTH		35 40 45			

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Giant Refinery
Ciniza

FILE #: 96-133
ELEVATION: 7004.7
TOTAL DEPTH: 30.0
LOGGED BY: WHK
DATE: 9-9-96
STATIC WATER: NOT FOUND
BORING ID: 0650
PAGE: 1

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
0.0-3.7	///**--//		C	**CLAY**, SANDY, SILTY, MOIST, BROWN, FIRM	PID-0ppm ALL SAMPLES
	///**--//		C		
	///**--//		C		
	///**--//		C		
	///**--//		C		
	///**--//		C		
	///**--//		C		
3.7	///**--//		C		
3.7-5.0	***000***		C	**SAND**, VERY GRAVELLY, DENSE, MOIST, BROWN-RED BROWN, GRAVEL 2-3"	
	000		C		
5.0	***000***	5.0	C		
5.0-8.7	000**SS00		C	**GRAVEL**, SANDY, SANDSTONE, CHERT, RED BROWN, DENSE, MOIST	
	000**SS00		C		
	000**SS00		C		
	000**SS00		C		
	000**SS00		C		
	000**SS00		C		
8.7	000**SS00		C		
8.7-9.8	///***///		C	**CLAY**, SANDY, MOIST, RED BROWN, FIRM	
	///***///		C		
9.8	///***///	10	C		
9.8-13.0	*********		C	**SAND**, FINE TO MEDIUM, RED BROWN, MOIST, LOOSE	
	*********		C		
	*********		C		
	*********		C		
	*********		C		
13.0	*********		C		
13.0-14.6	000**SS00		C	**GRAVEL**, SLIGHTLY SANDY, CEMENTED SANDSTONE, HARD	
	000**SS00		C		
14.6	000**SS00		C		
14.6-18.1	///**--//	15	C	**CLAY**, SANDY, SILTY, FIRM, WET, RED BROWN	
	///**--//		C		
	///**--//		C		
	///**--//		C		
	///**--//		C		
	///**--//		C		
18.1	///**--//		C		
18.1-18.4	***---***		C	**SAND**, SILTY, BROWN, LOOSE, FINE, MOIST	
18.4-29.0	///***///		C	**CLAY**, SANDY, SAND IN LANINATIONS, WET, FIRM, RED BROWN, SOME SAND STREAKS TO 1cm BUT VERY CLAYEY(> 20')	
	///***///		C		
	///***///	20	C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PROJECT: Giant Refinery
Ciniza

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 96-133
ELEVATION: 7004.7
TOTAL DEPTH: 30.0
LOGGED BY: WHK
DATE: 9-9-96
STATIC WATER: NOT FOUND
BORING ID: 0650
PAGE: 2

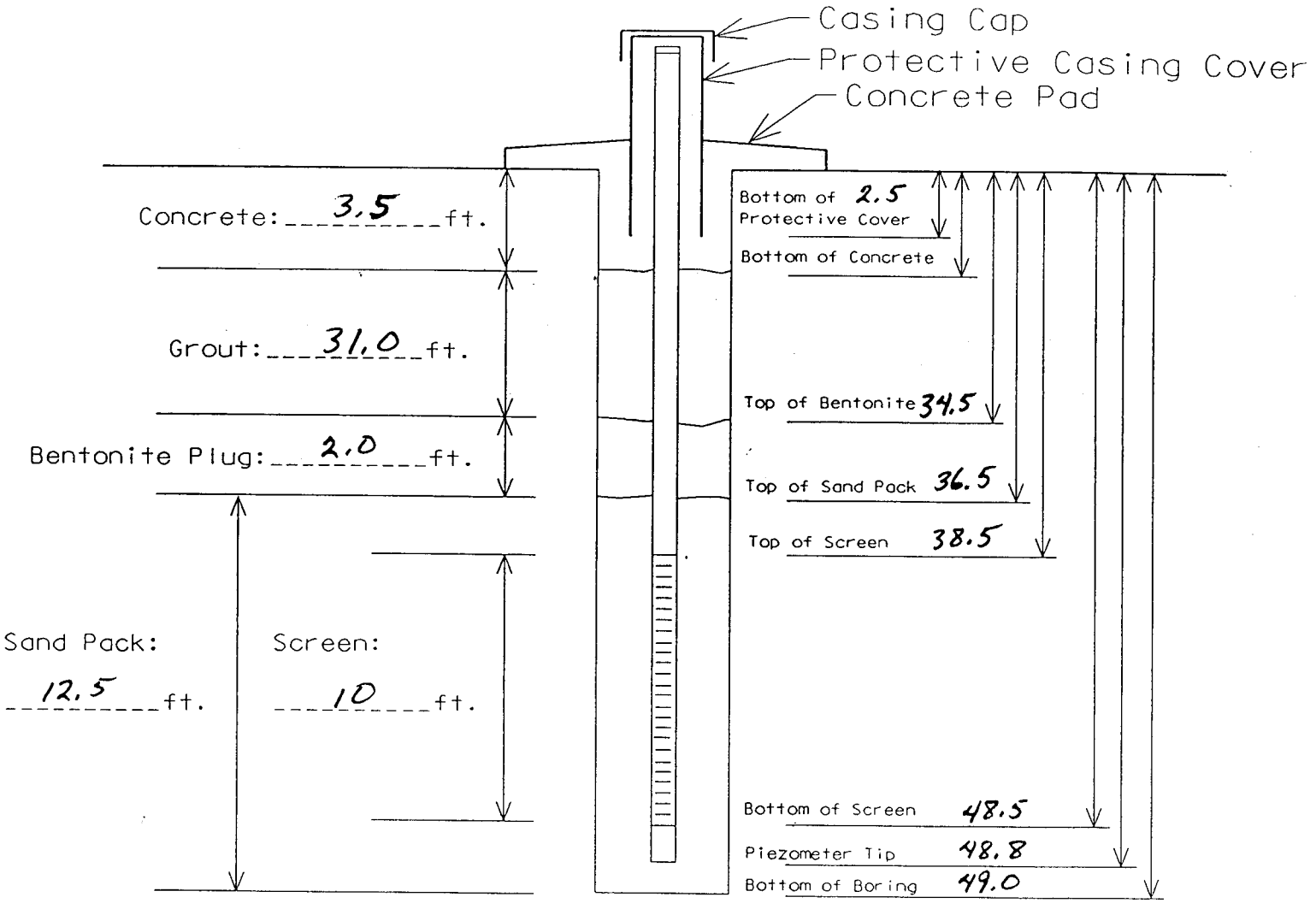
DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
18.4-29.0	///***///		C	**CLAY**, SANDY, SAND IN LAMINATIONS, WET, FIRM, RED BROWN, SOME SAND STREAKS TO 1cm	PID-0ppm
	///***///		C	BUT VERY CLAYEY (> 20')	ALL SAMPLES
	///***///		C		
	///***///	25	C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
29.0	///***///		C		
29.0-30.0	SSS===SSS		C	**CHINLE FORMATION**	
30.0	SSS===SSS	30	C	**SANDSTONE**, SHALEY, FINE, HARD, SLIGHTLY FISSLE, MOIST, RED PURPLE	
TOTAL DEPTH					
		35			
		40			
		45			

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

LOGGED BY: WHK

Installation Diagram

Monitoring Well No. OW-29



Boring Diameter: 8 5/8"

Sand Type: 20-40

Bollards, Type/Size: NONE

Bentonite: PEL PLUG TR-30, 3/8 PELLETS

Screen Type/Size: 4" ID, SCH. 40, PVC, #10 SLOT

Cement/Grout: 6% BENTONITE/CEMENT

Riser Type/Size: 4" ID SCH 40, PVC

PRECISION ENGINEERING, INC.
505-523-7674

Water: POTABLE

Locking Expandable Casing Plug? YES

Site Northing: 5099.3

Other:

Bottom Cap Used? YES

Site Easting: 360.0

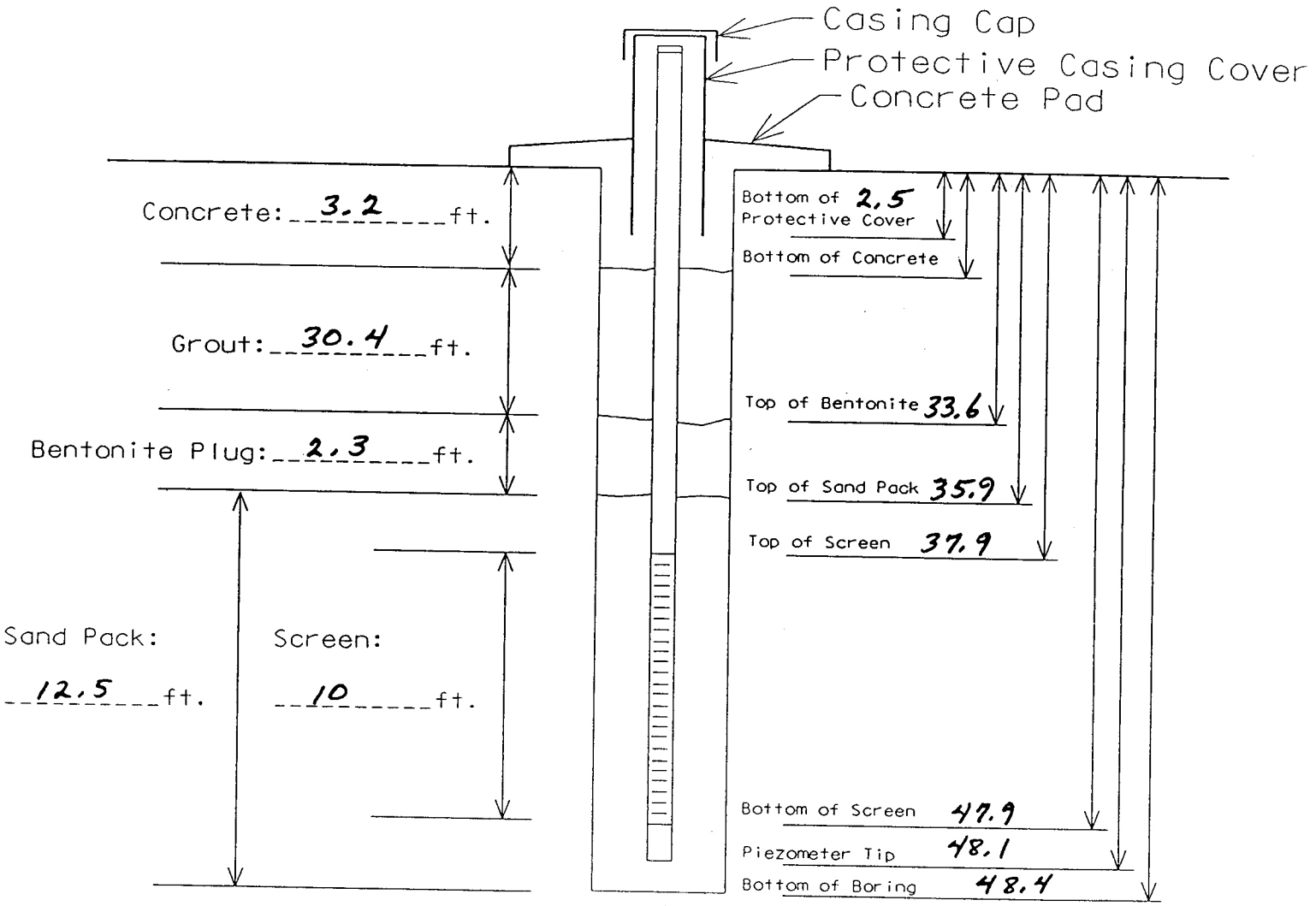
Project #: 96-134

Project Name: CINIZA REFINERY INVESTIGATION

Elevation: 6913.5

Installation Diagram

Monitoring Well No. OW-30



Boring Diameter: 8 5/8"

Sand Type: 20-40

Bollards, Type/Size: NONE

Bentonite: PELPLUG, TR-30 3/8" PELLETS

Screen Type/Size: 4"ID, #10, SCH40 PVC

Cement/Grout: 6% BENTONITE/CEMENT

Riser Type/Size: 4"ID, SCH 40, PVC

PRECISION ENGINEERING, INC.
505-523-7674

Water: POTABLE

Locking Expandable Casing Plug? YES

Site Northing: 4599.3

Other:

Bottom Cap Used? YES

Site Easting: 30.0

Project #: 96-134

Project Name: CINIZA REFINERY INVESTIGATION

Elevation: 6921.6

TO VIEW THE MAP AND/OR MAPS WITH THIS DOCUMENT, PLEASE CALL THE HAZARDOUS WASTE BUREAU AT 505-476-6000 TO MAKE AN APPOINTMENT