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GW - 32

WESTERN REFINING COMPANY L.P.

2/8/2017

TANK 569

CHARACTERIZATION PLAN

GIANT REFINING COMPANY
CINIZA REFINERY

PREPARED FOR:
OIL CONSERVATION DIVISION
ENVIRONMENTAL BUREAU

PREPARED BY:
LYNN SHELTON
SENIOR ENVIRONMENTAL COORDINATOR

FEBRUARY 24, 1995

TLS\TK569CP

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1.0 INTRODUCTION

As indicated in the November 11, 1994 correspondence with the **Oil Conservation Division (OCD), Giant Refining Company - Ciniza (Giant)**, while performing soil boring and sampling activities for the **RCRA Facility Investigation (RFI)** requirements of this facility, observed some free hydrocarbon mixed with the water that had flowed from a water bearing interval during the period of time that **RFI** boring number RFI0639 had remained open. Although not observed during drilling, the water containing free hydrocarbon was displaced and observed as the boring was being backfilled with a cement/bentonite slurry.

A. Statement of Potential Problem

It appears that lighter phase hydrocarbon, such as gasoline, alkylate, or distillate, for example, has migrated vertically and has pooled with water in a sand or shale interval. Review of the boring logs reveals multiple layers of clay/sand intervals which will be discussed in Section 2.0.C., Geology.

Giant must develop a plan to determine the source of the hydrocarbons, to quantify the total extent of the hydrocarbon contamination and volume, if possible, of the hydrocarbon, as well as develop a remediation plan to recover the hydrocarbon.

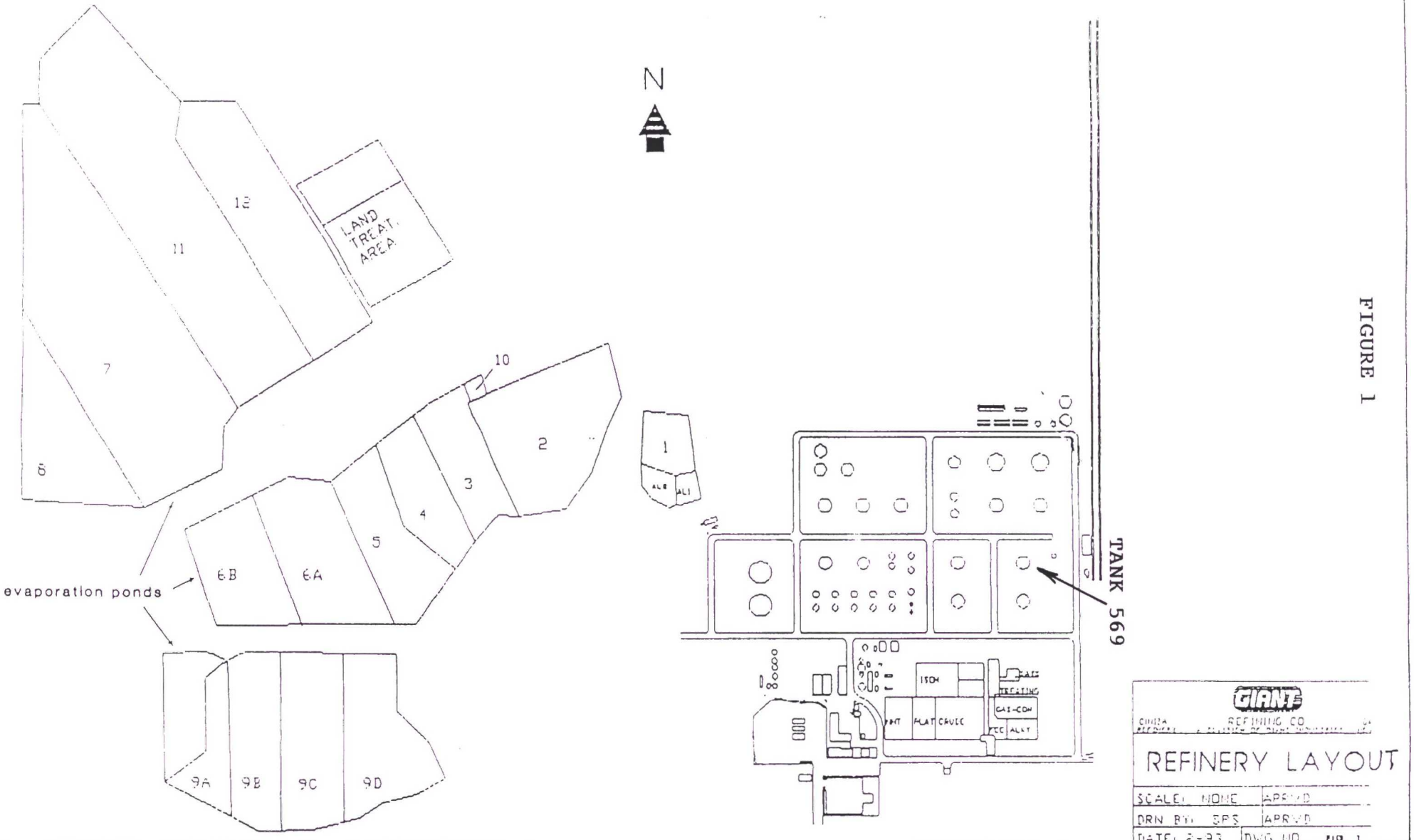
This characterization/remediation plan must satisfy the requirements of both the **OCD** and the **RFI** and provide for expeditious resolution of the problem.

The Characterization and Remediation Plan prepared for **OCD** will be a companion or component of the **Corrective Action Plan** for this Solid Waste Management Unit (SWMU) for the **RFI** project.

B. Historical Background

The observation of hydrocarbon was made approximately 25 feet north of tank 569, which is in the eastern tank farm area (see site drawing, Figure 1). Most of these tanks were built in 1957 and have traditionally been used to store leaded gasoline and gasoline components.

All tanks that once contained leaded gasoline or tetraethyl lead were required to be sampled under the May, 1990 **RFI Workplan**. This sampling was to determine potential contamination of the area with lead.



GIANT REFINING CO.

REFINERY LAYOUT

SCALE: NONE	APR'VD
DRN BY: SPS	APR'VD
DATE: 2-93	DWG NO FIG. 1

FIGURE 1

Past maintenance practices are responsible for the investigation. Prior to regulatory constraints, a tank was generally cleaned by digging a pit beneath the manway and the residual product plus any scale, sludge, or debris was drained, washed, or pushed into the pit for recovery. The potential for contamination is relatively high and the observation of hydrocarbon may be a result of this activity as opposed to another source such as a leaking tank or piping.

After approximately 1980, all cleaning activities included using lined pits, portable metal sumps and vacuum trucks or a combination of these.

2.0 SITE ASSESSMENT

A. Location

Tank 569 is located within the facility boundaries of Giant Refining Company's Ciniza refinery. The Ciniza refinery is located in Sections 28 and 33 of T15N, R15W, and T14N, R15W, N.M.P.M. Drainage is north and west toward the south fork of the Puerco River, a westward flowing intermittent stream. The western two-thirds of the property is nearly flat with a slight northwestward topographic gradient. The eastern one-third is dominated by a bedrock bluff which is 60 to 100 feet higher than the adjacent flatland.

B. Geography

The site occupies the northeast flank of the Zuni Uplift Region of the Colorado Plateau. The flatlands have been mapped as quarternary alluvium and the bedrock bluff has been identified as the Sonsela sandstone of the Chinle formation (Shomaker).

C. Geology

The location of the refinery process units and tank farm, and therefore boring RFI0639, appears to be situated on the weathered equivalent of the Sonsela sandstone, which is believed to be an erosional remnant and does not appear to extend below the ground surface beyond the bluff area. This area has at various times been

characterized as being structured of unweathered bedrock consisting of interbedded shale and sandstone, with the uppermost bedrock unit consisting of reddish-brown silty shale with some fine sand, which grades gray or brown with depth, to a depth of up to 110 feet thick. A discontinuous two foot sandstone lens has been observed in this unit in some borings. The formation appears to lie at a 4° dip to the north-northwest.

Underlying the shale is a gray to brown fine to coarse grained sandstone, which has been referred to as the "near-surface aquifer". Giant does not agree that this interval is indeed the "near-surface aquifer". A definitive determination would require additional geologic investigations; nevertheless, the sand intervals should be watched if depths approach 100+ feet.

The lithologic logs of boring RFI0639 indicate alternating clay, shale, sandstone, and gravel layers (in no particular order) from 27.3 to 55.3 feet. Giant feels that the water bearing shale at 41.9 to 43.6 feet is the interval that contained hydrocarbon.

The sand, shale, and gravel intervals are not believed to be hydraulicly connected with any potential aquifer and probably do not extend horizontally beyond the bluff area.

3. CHARACTERIZATION PLAN

Giant proposes to drill additional bore holes to determine the extent of vertical and horizontal contamination at tank 569.

A. Discussion of Borings

Six borings are planned and the table below lists the name and depths of those bore holes. Location of the bore holes is shown on Figure 2.

Boring Name	Description	Depth *
BG1	Background	75'
RFI0639	Original Drilling	75'
B1	Down gradient	75'
B2	Down gradient	75'
B3	Down gradient	75'
B4	Down gradient	75'

* This is an estimated depth. May go deeper as needed.

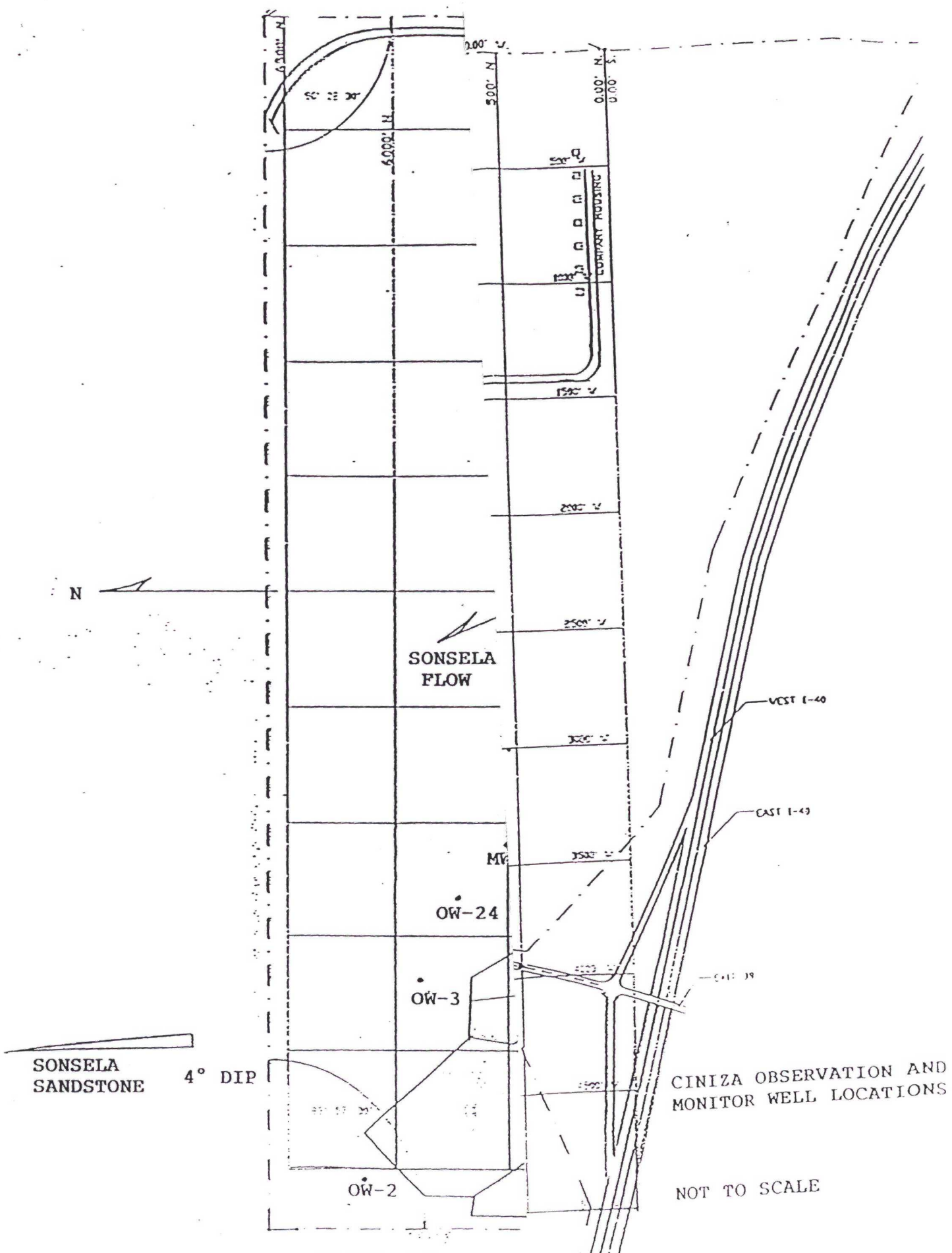

N
SONSELA
FLOW
OW-24
OW-3
OW-2
SONSELA
SANDSTONE
4° DIP
CINIZA OBSERVATION AND
MONITOR WELL LOCATIONS
NOT TO SCALE

FIGURE 2

The down gradient borings will be made on either side of a 35° fan shaped area in anticipation that a plume may extend north beyond the bluff area. Although Giant believes that four down gradient borings will be sufficient to characterize the extent of hydrocarbon contamination, additional borings will be made as needed to determine the horizontal extent of contamination.

The background boring will be made approximately 50 feet south of tank 569. This boring is to verify that hydrocarbon contamination originates at tank 569, as Giant believes. If contamination is observed in this background boring, additional borings will be made further south southeast against the direction of groundwater flow until the southernmost extent of contamination is determined.

Boring RFI0639 will be drilled 5 ± 2 feet from the previous boring at this location. Giant suspects that the **BTEX** levels seen at 55.0 feet, after observing clean samples at 40.0, 45.0, and 50.0, are likely the result of contamination carrying down the borehole from the interval suspected of being hydrocarbon bearing (41.9 - 43.6 feet). Giant's suspicion is based on the saturated nature of the cuttings and the possibility of water and hydrocarbon infiltrating the borehole during auger flight and split spoon additions. For this reason, Giant plans to drill to 55 feet and then set 10" casing with a 50-50 cement/bentonite grout. After the grout has cured, drilling will continue until total depth is reached. This boring must be drilled deep enough to yield two "clean" samples to comply with **RFI** requirements.

B. <u>Drilling Protocol</u>

All boreholes will be drilled using a CME truck mounted rig with 8½" diameter (12½" on boring RFI0639) auger flights and continuous sampling with a 2½" CME carbon steel split spoon. The split spoon will be set up to advance 6" ahead of the augers to insure clean sampling.

Split spoons will be carefully decontaminated after each core recovery by washing with liquinox soap and then steam cleaning. Auger flights will be cleaned and decontaminated using the same protocol after each boring.

Giant will determine during the course of drilling whether a given borehole will be completed (i.e., cased and screened) depending upon the suitability of that borehole for recovery or remediation activities. Sufficient materials will be available to complete up to four borings if needed. Any boring not cased and

completed will be grouted back to the surface with a cement/bentonite slurry.

Precision Engineering, Incorporated of Las Cruces, New Mexico has been retained to perform all drilling, lithologic logging and well completion activities.

C. **Sampling and Analysis**

Samples will be collected at intervals that are suspected to be contaminated or that are in the same interval that hydrocarbon was previously observed. A photoionization detection meter (PID) will be used for preliminary screening at various intervals along the core. Staining, odors, and PID readings will be noted on the boring logs.

Samples will be recovered directly from the split spoon core barrel with the use of stainless steel spatula and placed into a stainless steel dish for disposition into glass sample bottles.

Sampling will be performed in a manner that is outlined in the **Generic Sampling Plan**, **RFI Project, May 17, 1990**, a copy of which will be available during the sampling project. After the samples have been bottled and labeled, they will be placed in a cooler and taken directly to the mobile laboratory for analysis.

Analytical Technologies, Incorporated (ATI) will provide a mobile laboratory to perform analysis on site. The lab will be capable of performing 20 BTEX and 20 TPH analyses per day. ATI will perform all analyses and quality assurance/quality control.

Each sample will be analyzed for BTEX or total petroleum hydrocarbons.

D. **Lithology**

Each boring will be logged for lithology, including odors and staining, by William Kingsley, P.E. of Precision Engineering.

The information obtained with the lithologic logs will be used to determine specific intervals that may affect transmissivity or pooling and will be instrumental in determining the extent of contamination and the projection of future migration. This, coupled with the immediate availability of analytical results, will allow Giant to make timely decisions regarding boring location,

number of boreholes, and depth.

4.0 Remediation Options

Designing the optimal remediation plan will depend on the characteristics of the hydrocarbon contamination. Giant prefers to propose a remediation plan after characterization of the hydrocarbon contamination is complete. However, some remediation options are discussed in the following sections.

A. Confined Contamination

Considering the geologic and hydrogeologic information available for this site, Giant is reasonably confident that the hydrocarbon contamination is confined to local fractured shale and sand intervals approximately 41 to 43 feet deep. These intervals are most likely fed by percolation from the surface.

If this assumption is shown to be accurate by the characterization project, then Giant will propose to install a product recovery well in the area immediately north of tank 569 and adjacent to boring RFI0639. A dedicated submersible pump would be installed to recover product and water, which would be pumped into the process wastewater system. The pump would be controlled by a timer to pump on an ongoing basis. Water samples could be taken on a periodic basis to determine the rate of reduction of hydrocarbon.

If a considerable confined area was determined to be contaminated, an additional recovery well could be installed if found to be necessary to expedite remediation.

Giant does not believe that vapor extraction or air sparging would be candidates for remediation due to low permeability and transmissivity rates. This will be confirmed with the characterization.

B. Contamination Plume

The characterization project may demonstrate that a hydrocarbon plume exists. This is possible if a

continuous interval of shale and sand extends from the bluff area to under the surface of the lower flatland area to the north of tank 569.

It would be necessary to install at least two or three recovery wells in order to enhance product recovery and remediation. One well would be adjacent to boring RFI0639, and the remaining recovery well(s) would be at the northernmost edge of the plume. A "clean" monitor well would then be installed outside the hydrocarbon plume to assure that no additional horizontal migration occurs.

Sampling activities would be essentially the same as previously described, differing only in the number of samples to collect.

5.0 Conclusions

Since discovering the presence of hydrocarbon with water in boring RFI0639, Giant has investigated factors that may have caused the contamination and may help delineate the extent of contamination.

As recommended by OCD, Giant has checked observation and monitor wells for an immiscible layer. The results of that investigation indicated no contaminants in any of those wells (see Figure 3).

Giant has also studied the geology underlying the Ciniza facility. Observations of potential conductive intervals (such as sands and fractured shales), permeability of those intervals and the presence of discontinuous erosional deposits indicates that the contamination is most likely confined within a relatively small area beneath tank 569.

Considering that no loss of inventory has occurred from tank 569, Giant believes that the source of contamination is the past practice of tank cleaning.

Giant submits that the characterization plan presented in this document should fully demonstrate the extent of the hydrocarbon contamination. Implementation of this plan will provide enough information for development of a plan best suited for expeditious remediation of the hydrocarbon contamination.

FIGURE 3

IMMISCIBLE LAYER

Well #	0W-3	OW-2	OW-1	MW-1	MW-2
Date	2-21	2-21	2-21	2-21	2-21
Time	9:12	9:29	9:02	9:40	9:48
Water Depth	31.34	28.89	0	5.18	7.39
Immisc. Layer	NO	NO	NO	NO	NO

Well #	MW-5	MW-4	OW-11	OW-10	OW-9
Date	2-21	2-21	2-21	2-21	2-21
Time	10:00	10:09	10:20	10:40	10:50
Water Depth	9.57	5.82	18.16	0	0
Immisc. Layer	NO	NO	NO	NO	NO

Well #	0W-14	OW-13	OW-20		
Date	2-21	2-21	2-21		
Time	3:35	3:50	4:05		
Water Depth	25.88	22.81	41.16		
Immisc. Layer	NO	NO	NO		

TLS/95

ATTACHMENT I

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location _____

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 0639

Water Level NOT ENCOUNT. Date: 08/09/94

LAB #	DEPTH	BLOWS/N	PLOT	SAMPLE	SAMPLE TYPE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			0/00/0		C	GRAVEL, CLAYEY, MOIST, DENSE, FILL				
			0/00/0		C					
	1.5		0/00/0		C					
			/*//*/		C	CLAY, SANDY, WET, STIFF, BROWN				
			/*//*/	2.5	C					
			/*//*/		C					
			/*//*/		C					
			/*//*/		C					
			/*//*/		C					
			/*//*/	5.0	C					
			/*//*/		C	SAND SEAMS AT 5'(GREY)				
	6.0		/*//*/		C					
			/-//-/		C	CLAY, SILTY, WET, STIFF, BROWN				
	7.0		/-//-/		C					
			/*//*/	7.5	C	CLAY, SANDY, WET, SOFT, BROWN				
			/*//*/		C					
	8.4		/*//*/		C					
			/-//-/		C	CLAY, SILTY, WET, STIFF, BROWN				
			/-//-/		C					
			/-//-/	10	C					
			/-//-/		C					
	11.1		/-//-/		C					
			//////		C	CLAY, WET, STIFF, BROWN				
			//////		C					
			//////		C					
	12.9		//////		C					
			/*/*/*		C	CLAY, VERY SANDY, SILTY, WET, STIFF				
			/*/*/*		C					
	20.0		/*/*/*		C					
			*-**-*	15	C	SAND, FINE, SILTY, MOIST, OCCASIONAL THIN CLAY				
			*-**-*		C	ZONES, BROWN				
			*-**-*		C					
			*-**-*		C					
			*-**-*		C					
			*-**-*		C					
			*-**-*		C					
			*-**-*		C					
			*-**-*		C					
			*-**-*		C					
			*-**-*		C					
	20.0		*-**-*	20	C					
			*0**0*		C	SAND, MEDIUM, GRAVELLY(FINE) MOIST, DENSE,				
			*0**0*		C	LIGHT BROWN				
			*0**0*		C					
			*0**0*		C					
			*0**0*		C					
			*0**0*		C					
			*0**0*		C					
			*0**0*		C					
			*0**0*		C					
	25.0		*0**0*	25	C					
	TOTAL DEPTH									

PRECISION ENGINEERING, INC.

PROJECT: GIANT RFI
TANK FARM #569

LOG OF TEST BORINGS

FILE #: 94-158
ELEVATION:
TOTAL DEPTH:
LOGGED BY: WHK
DATE: 10-28-94
STATIC WATER: 34'
BORING ID: RFI 0639
PAGE: 1 of 3

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
0-25				drill in auger plug, refer to previous drill log, this location	
25-25.5	*********	25	C	**Sand**, fine, wet, dense, hydrocarbon odor	
25.5-25.8	*********		C	**Sandstone**, rock, dense, white, medium not bedrock, moist, odor	
25.8-27.3	*********	26	C	**Sand**, clayey, dense, wet, red brown	
	*********		C		
27.3-28.2	000000000	27	C	**Gravel**, dense, mainly broken sandstone, multicolored, moist	
	000000000		C		
28.2-29.2		28		sample refusal, pulled sampler, drilled 1', replaced sampler - sandstone?	
29.2-29.6	*********	29	C	**Sandstone**, light yellow, medium, weathered(as a rock) not bedrock, moist, odor	
29.6-29.8	*********		C	**Sand**, brown red, loose, moist, gravelly,	
29.8-30.1	*********	30	C	**Sandstone**, light yellow, medium, weathered, moist	
30.1-33.5	000000000		C	**Gravel**, coarse sandy, dense, moist, grey brown, fetted hydrocarbon odor	
	000000000		C		
	000000000		C		
	000000000		C		
	000000000		C		
	000000000	33	C		
33.5-34.7	/////////		C	**Clay**, hard, wet, brown, <sharp contact with above>, weak odor	
	/////////	34	C		
34.7-35.4	////oo///		C	**Clay**, slightly gravelly(1/2"), wet, hard, brown, weak odor	
	////oo///	35	C		
35.4-39.2	ooo***ooo		C	**Gravel**, sand and cobbles of sandstone, wet, hydrocarbon odor	
	ooo***ooo		C		
	ooo***ooo		C		
	ooo***ooo		C		
	ooo***ooo		C		
	ooo***ooo		C		
	ooo***ooo		C		
39.2-41.9	---///---	39	C	**Shale**, interbedded red brown and light green, very clayey, hard, moist, weak odor	
	---///---		C		
	---///---		C		
	---///---		C		
	---///---		C		
	---///---		C		
41.9-43.6	---**-----	42	C	**Shale**, fissle, some sandy, water bearing through fissures, hard, red brown	
	---**-----		C	very weak odor	
	---**-----	43	C		
43.6-45.2	---///---		C	**Shale**, blocky, fine, wet, not water bearing, hard, clayey, red brown	
	---///---		C		
	---///---		C		
45.2-46.2		45		too hard to push continuous sampler, no recoverory, pulled, drilled, replaced sampler to 46.2	
46.2-47.1	---------	46	C	**Shale**, blocky, hard, moist, red brown, green bands at 3" intervals each	
	---------		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" HSA

PRECISION ENGINEERING, INC.

PROJECT: GIANT RFI
TANK FARM #569

LOG OF TEST BORINGS

FILE #: 94-158
ELEVATION:
TOTAL DEPTH:
LOGGED BY: WHK
DATE: 10-28-94
STATIC WATER: 34'
BORING ID: RFI 0639(A)
PAGE: 2 of 3

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID
47.1-47.3	---***---	47	C	**Shale**, sandy, blocky, water bearing	
47.3-47.8	---------		C	**Shale**, blocky, hard, moist, red brown, green banding at 3" intervals each	
47.8-48.9	---**-----	48	C	**Shale**, green, hard, moist, slightly sandy, no odor	
	---**-----		C		
48.9-55.3	---///---	49	C	**Shale**, clayey, very fine blocky, hard, moist brown fissle, slightly drier>50	
	---///---		C		
	---///---		C		
	---///---		C		
	---///---		C		
	---///---		C		
	---///---		C		
	---///---		C		
	---///---		C		
	---///---		C		
	---///---		C		
	---///---		C		
	---///---	55	C		
TD				Grouted boring with 15% Bentonite-Cement	

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" HSA

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location _____

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 0640

Water Level NOT ENCOUNT. Date: 08/09/94

LAB #	DEPTH	BLOWS/N	PLOT	SAMPLE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			/-0/-0		C	CLAY, SILTY, GRAVELLY, DRY, SOFT, RED BROWN				
	1.0		/-0/-0		C					
			/-//-/		C	CLAY, SILTY, SLIGHTLY GRAVELLY, WET, VERY SOFT				
			/-/0-/		C	RED BROWN				
			/-//-/	2.5	C					
			/-/0-/		C					
			/-//-/		C					
			/-/0-/		C					
			/-//-/		C					
			/-/0-/	5.0	C					
			/-//-/		C					
	6.0		/-//-/		C					
			/-//-/		C	CLAY, SILTY, SLIGHTLY SANDY, WET, VERY SOFT,				
			/-/*-/		C	BLACK/GREY MOTTLING				
			/-//-/	7.5	C					
			/-/*-/		C					
			/-//-/		C					
			/-/*-/		C					
			/-//-/		C					
			/-/*-/	10	C					
			/-//-/		C					
	10.9		/-//-/		C					
			/*-/*-		C	CLAY, SANDY, SILTY, WET, SOFT TO FIRM, GREY				
			/*-/*-		C	BROWN, OCCASIONAL FINE SAND INTERBEDS				
			/*-/*-		C					
			/*-/*-		C					
	13.8		/*-/*-		C					
			/-//-/		C	CLAY, SILTY, WET, FIRM, RED BROWN				
	14.5		/-//-/		C					
			*-**-*	15	C	SAND, SILTY, MOIST, MODERATELY DENSE, GREY				
	15.9		*-**-*		C					
			/-//-/		C	CLAY, SILTY, WET, STIFF, RED BROWN				
			/-//-/		C					
	17.6		/-//-/		C					
			/*//*/		C	CLAY, SANDY, WET, FIRM, RED BROWN				
	19.2		/*//*/		C					
	19.7		//////		C	CLAY, WET, STIFF, RED BROWN				
	20.0		*/**/*	20	C	SAND, FINE, CLAYEY, MODERATELY DENSE,RED BROWN				
			/-//-/		C	CLAY, SILTY, WET, STIFF, RED BROWN,FINE BLOCKY				
	21.2		/-//-/		C					
			*/**/*		C	SAND, CLAYEY, MOIST, MODERATELY DENSE, RED				
			*/**/*		C	BROWN, OCCASIONAL INTERBEDDED(<1 CM)CLAY SEAMS				
			*/**/*		C					
			*/**/*		C					
			*/**/*		C					
	25.0		*/**/*	25	C					
			/-//-/		C	CLAY, SILTY, WET, STIFF, BROWN, FINE BLOCKY				
			/-//-/		C					
	27.0		/-//-/		C					
			*/**/*		C	SAND, MEDIUM, CLAYEY, OCCASIONAL FINE GRAVEL,				
			*/**/*		C	MOIST, DENSE, RED BROWN				
			*/**/*		C					
			*/**/*		C					
	30.0		*/**/*	30	C					
	TOTAL DEPTH									

PRECISION ENGINEERING, INC.

PROJECT: GIANT RFI
TANK FARM #570

LOG OF TEST BORINGS

FILE #: 94-158
ELEVATION:
TOTAL DEPTH:
LOGGED BY: WHK
DATE: 10-27-94
STATIC WATER:
BORING ID: RFI 0640
PAGE: 3 OF 3

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
0-25				drill with auger plug, refer to previous drill log, this location	
25.0-27.8	/////////	25	C	**Clay**, wet, stiff, brown	
	/////////		C		
	/////////		C		
	/////////		C		
	/////////		C		
27.8-28.2	///***///		C	**Clay**, sandy, wet, firm, brown, hydrocarbon odor	
28.2-28.9	*********	28	C	**Sand**, medium, laminar bedded, light multicolored, dense, moist	
	*********		C		
28.9-30.1	/////////	29	C	**Clay**, stiff, brown, wet, hydrocarbon odor	
	/////////		C		
30.1-32.6	***///***	30	C	**Sand**, very clayey, water bearing, loose, light brown laminar, no odor	
	///		C		
	///		C		
	///		C		
	///	32	C		
32.6-33.8	///***///		C	**Clay**, sandy, firm, wet, brown	
	///***///		C		
	///***///		C		
33.8-34.7	/////////	34	C	**Clay**, stiff, brown, wet	
34.7-35.3	000//**00		C	**Gravel**, fine, clayey, sandy, dark brown, dense, wet	
	000//**00	35	C		
35.3-40.1	///00+///		C	**Clay**, stiff wet, occasional fine gravel, dark brown, weak carbonate nodules	
	///00+///		C		
	///00+///		C		
	///00+///		C		
	///00+///		C		
	///00+///		C		
	///00+///		C		
	///00+///		C		
	///00+///		C		
	///00+///	40	C		
TD				Backfilled with Bentonite-Cement grout	

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" HSA

ATTACHMENT II

Westech Laboratories Inc.
The Quality People
Since 1955

10737 Gateway West, No. 100
El Paso, Texas 79935-4906
(915) 592-3591 • fax 592-3594

CLIENT GIANT REFINING
I 40 EXIT 39
RT 3 BOX 7
JAMESTOWN, NM 87347

SAMPLE NO. : 6404955
INVOICE NO.: 62141217
REPORT DATE: 11-17-94
REVIEWED BY:
PAGE : 1 OF 1

CLIENT SAMPLE ID : RFI0639V 30.0
SAMPLE TYPE .....: Soil
SAMPLED BY .....: W. Toomer
SUBMITTED BY ....: W. Toomer
SAMPLE SOURCE ...: Giant Refining
ANALYST .....: M. Woodhouse

AUTHORIZED BY : L. Shelton
CLIENT P.O. : --
SAMPLE DATE ...: 10-28-94
SUBMITTAL DATE : 11-03-94
EXTRACTION DATE: 11-07-94
ANALYSIS DATE .: 11-07-94

Method 8020 - BTEX + MTBE

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
Benzene	<10	ug/Kg	10.
Toluene	<10	ug/Kg	10.
Ethylbenzene	27	ug/Kg	10.
Total Xylenes	31	ug/Kg	3.0
Methyl Tert-Butyl Ether	<20	ug/Kg	20.

(Work File Copy)

Managing Director

Westech Laboratories Inc.
The Quality People
Since 1955

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El Paso, Texas 79935-4906
(915) 592-3591 • fax 592-3594

CLIENT GIANT REFINING
I 40 EXIT 39
RT 3 BOX 7
JAMESTOWN, NM 87347

SAMPLE NO. : 6404956
INVOICE NO.: 62141217
REPORT DATE: 11-17-94
REVIEWED BY:
PAGE : 1 OF 1

CLIENT SAMPLE ID : RFI0639V 35.0
SAMPLE TYPE .....: Soil
SAMPLED BY .....: W. Toomer
SUBMITTED BY ....: W. Toomer
SAMPLE SOURCE ...: Giant Refining
ANALYST .....: M. Woodhouse

AUTHORIZED BY : L. Shelton
CLIENT P.O. : --
SAMPLE DATE ...: 10-28-94
SUBMITTAL DATE : 11-03-94
EXTRACTION DATE: 11-07-94
ANALYSIS DATE .: 11-07-94

Method 8020 - BTEX + MTBE

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
Benzene .....:	360	ug/Kg	10.
Toluene .....:	210	ug/Kg	10.
Ethylbenzene .....:	170	ug/Kg	10.
Total Xylenes .....:	220	ug/Kg	3.0
Methyl Tert-Butyl Ether .....:	<20	ug/Kg	20.

(Work File Copy)

Managing Director

Westech Laboratories Inc.
The Quality People
Since 1955

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El Paso, Texas 79935-4906
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CLIENT GIANT REFINING
I 40 EXIT 39
RT 3 BOX 7
JAMESTOWN, NM 87347

SAMPLE NO. : 6404957
INVOICE NO.: 62141217
REPORT DATE: 11-17-94
REVIEWED BY:
PAGE : 1 OF 1

CLIENT SAMPLE ID : RFI0639V 40.0
SAMPLE TYPE .....: Soil
SAMPLED BY .....: W. Toomer
SUBMITTED BY ....: W. Toomer
SAMPLE SOURCE ...: Giant Refining
ANALYST .....: M. Woodhouse

AUTHORIZED BY : L. Shelton
CLIENT P.O. : --
SAMPLE DATE ...: 10-28-94
SUBMITTAL DATE : 11-03-94
EXTRACTION DATE: 11-07-94
ANALYSIS DATE .: 11-07-94

Method 8020 - BTEX + MTBE

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
Benzene	<10	ug/Kg	10.
Toluene	<10	ug/Kg	10.
Ethylbenzene	<10	ug/Kg	10.
Total Xylenes	<3.0	ug/Kg	3.0
Methyl Tert-Butyl Ether	<20	ug/Kg	20.

(Work File Copy)

Managing Director

Westech Laboratories Inc.
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Since 1955

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El Paso, Texas 79935-4906
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CLIENT GIANT REFINING
I 40 EXIT 39
RT 3 BOX 7
JAMESTOWN, NM 87347

SAMPLE NO. : 6404958
INVOICE NO.: 62141217
REPORT DATE: 11-17-94
REVIEWED BY:
PAGE : 1 OF 1

CLIENT SAMPLE ID : RFI0639V 45.0
SAMPLE TYPE .....: Soil
SAMPLED BY .....: W. Toomer
SUBMITTED BY ....: W. Toomer
SAMPLE SOURCE ...: Giant Reffining
ANALYST .....: M. Woodhouse

AUTHORIZED BY : L. Shelton
CLIENT P.O. : --
SAMPLE DATE ...: 10-28-94
SUBMITTAL DATE : 11-03-94
EXTRACTION DATE: 11-07-94
ANALYSIS DATE .: 11-07-94

Method 8020 - BTEX + MTBE

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
Benzene .....:	<10	ug/Kg	10.
Toluene .....:	<10	ug/Kg	10.
Ethylbenzene .....:	<10	ug/Kg	10.
Total Xylenes .....:	<3.0	ug/Kg	3.0
Methyl Tert-Butyl Ether .....:	<20	ug/Kg	20.

(Work File Copy)

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CLIENT GIANT REFINING
I 40 EXIT 39
RT 3 BOX 7
JAMESTOWN, NM 87347

SAMPLE NO. : 6404959
INVOICE NO.: 62141217
REPORT DATE: 11-17-94
REVIEWED BY:
PAGE : 1 OF 1

CLIENT SAMPLE ID : RFI0639V 50.0
SAMPLE TYPE .....: Soil
SAMPLED BY .....: W. Toomer
SUBMITTED BY ....: W. Toomer
SAMPLE SOURCE ...: Giant Refining
ANALYST .....: M. Woodhouse

AUTHORIZED BY : L. Shelton
CLIENT P.O. : --
SAMPLE DATE ...: 10-28-94
SUBMITTAL DATE : 11-03-94
EXTRACTION DATE: --
ANALYSIS DATE .: 11-07-94

Method 8020 - BTEX + MTBE

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
Benzene .....:	<10	ug/Kg	10.
Toluene .....:	<10	ug/Kg	10.
Ethylbenzene .....:	<10	ug/Kg	10.
Total Xylenes .....:	<3.0	ug/Kg	3.0
Methyl Tert-Butyl Ether .....:	<20	ug/Kg	20.

(Work File Copy)

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El Paso, Texas 79935-4906
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CLIENT GIANT REFINING
I 40 EXIT 39
RT 3 BOX 7
JAMESTOWN, NM 87347

SAMPLE NO. : 6404960
INVOICE NO.: 62141217
REPORT DATE: 11-17-94
REVIEWED BY:
PAGE : 1 OF 1

CLIENT SAMPLE ID : RFI0639V 55.0
SAMPLE TYPE .....: Soil
SAMPLED BY .....: W. Toomer
SUBMITTED BY ....: W. Toomer
SAMPLE SOURCE ...: Giant Refining
ANALYST .....: M. Woodhouse

AUTHORIZED BY : L. Shelton
CLIENT P.O. : --
SAMPLE DATE ...: 10-28-94
SUBMITTAL DATE : 11-03-94
EXTRACTION DATE: 11-07-94
ANALYSIS DATE .: 11-07-94

Method 8020 - BTEX + MTBE

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
Benzene	1500	ug/Kg	10.
Toluene	660	ug/Kg	10.
Ethylbenzene	400	ug/Kg	10.
Total Xylenes	520	ug/Kg	3.0
Methyl Tert-Butyl Ether	<20	ug/Kg	20.

(Work File Copy)

Managing Director

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Since 1955

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El Paso, Texas 79935-4906
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CLIENT GIANT REFINING
I 40 EXIT 39
RT 3 BOX 7
JAMESTOWN, NM 87347

SAMPLE NO. : 6404961
INVOICE NO.: 62141217
REPORT DATE: 11-17-94
REVIEWED BY:
PAGE : 1 OF 1

CLIENT SAMPLE ID : RFI0640V 30.0
SAMPLE TYPE .....: Soil
SAMPLED BY .....: W. Toomer
SUBMITTED BY ....: W. Toomer
SAMPLE SOURCE ...: Giant Refining
ANALYST .....: M. Woodhouse

AUTHORIZED BY : L. Shelton
CLIENT P.O. : --
SAMPLE DATE ...: 10-27-94
SUBMITTAL DATE : 11-03-94
EXTRACTION DATE: 11-07-94
ANALYSIS DATE .: 11-07-94

Method 8020 - BTEX + MTBE

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
Benzene	50	ug/Kg	10.
Toluene	34	ug/Kg	10.
Ethylbenzene	<10	ug/Kg	10.
Total Xylenes	<3.0	ug/Kg	3.0
Methyl Tert-Butyl Ether	<20	ug/Kg	20.

(Work File Copy)

Managing Director

Westech Laboratories Inc.
The Quality People
Since 1955

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El Paso, Texas 79935-4906
(915) 592-3591 • fax 592-3594

CLIENT GIANT REFINING
I 40 EXIT 39
RT 3 BOX 7
JAMESTOWN, NM 87347

SAMPLE NO. : 6404962
INVOICE NO.: 62141217
REPORT DATE: 11-17-94
REVIEWED BY:
PAGE : 1 OF 1

CLIENT SAMPLE ID : RFI0640V 35.0
SAMPLE TYPE .....: Soil
SAMPLED BY .....: W. Toomer
SUBMITTED BY ....: W. Toomer
SAMPLE SOURCE ...: Giant Refining
ANALYST .....: M. Woodhouse

AUTHORIZED BY : L. Shelton
CLIENT P.O. : --
SAMPLE DATE ...: 10-27-94
SUBMITTAL DATE : 11-03-94
EXTRACTION DATE: 11-07-94
ANALYSIS DATE .: 11-07-94

Method 8020 - BTEX + MTBE

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
Benzene	<10	ug/Kg	10.
Toluene	<10	ug/Kg	10.
Ethylbenzene	<10	ug/Kg	10.
Total Xylenes	<3.0	ug/Kg	3.0
Methyl Tert-Butyl Ether	<20	ug/Kg	20.

(Work File Copy)

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CLIENT GIANT REFINING
I 40 EXIT 39
RT 3 BOX 7
JAMESTOWN, NM 87347

SAMPLE NO. : 6404963
INVOICE NO.: 62141217
REPORT DATE: 11-17-94
REVIEWED BY:
PAGE : 1 OF 1

CLIENT SAMPLE ID : RFI0640V 40.0
SAMPLE TYPE .....: Soil
SAMPLED BY .....: W. Toomer
SUBMITTED BY ....: W. Toomer
SAMPLE SOURCE ...: Giant Refining
ANALYST .....: M. Woodhouse

AUTHORIZED BY : L. Shelton
CLIENT P.O. : --
SAMPLE DATE ...: 10-27-94
SUBMITTAL DATE : 11-03-94
EXTRACTION DATE: 11-07-94
ANALYSIS DATE .: 11-07-94

Method 8020 - BTEX + MTBE

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
Benzene	<10	ug/Kg	10.
Toluene	<10	ug/Kg	10.
Ethylbenzene	<10	ug/Kg	10.
Total Xylenes	<3.0	ug/Kg	3.0
Methyl Tert-Butyl Ether	<20	ug/Kg	20.

(Work File Copy)

Managing Director

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

AnalyticalTechnologies, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 11/02/94 PAGE 1 OF 1

ATI LAB I.D. [illegible]

PROJECT MANAGER:

COMPANY: GIANT REFINING
ADDRESS: ROUTE 3, BOX 7
GALLUP, NM 87301
PHONE: (505) 722-0212
FAX: (505) 722-0210

BILL TO: WALT TOOMER
COMPANY: SAME
ADDRESS: SAME

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	BTXE/MTBE (8020)	Lab #	NUMBER OF CONTAINERS
RFI0639V30.0	10/26/94	1006	SOIL	4955	X	6404955	1
RFI0639V35.0	10/26/94	1016	SOIL	4956	X	4956	1
RFI0639V40.0	10/26/94	1030	SOIL	4957	X	4957	1
RFI0639V45.0	10/26/94	1048	SOIL	4958	X	4958	1
RFI0639V50.0	10/26/94	1127	SOIL	4959	X	4959	1
RFI0639V55.0	10/26/94	1212	SOIL	4960	X	4960	1
RFI0640V30.0	10/27/94	1632	SOIL	4961	X	4961	1
RFI0640V35.0	10/27/94	1650	SOIL	4962	X	4962	1
RFI0640V40.0	10/27/94	1702	SOIL	4963	X	4963	1

ANALYSIS REQUEST: Petroleum Hydrocarbons (418.1); (MOD 8015) Gas/Diesel; Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020); BTXE/MTBE (8020); Chlorinated Hydrocarbons (601/8010); Aromatic Hydrocarbons (602/8020); SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.; Pesticides/PCB (608/8080); Herbicides (615/8150); Base/Neutral/Acid Compounds GC/MS (625/8270); Volatile Organics GC/MS (624/8240); Polynuclear Aromatics (610/8310); SDWA Primary Standards - Arizona; SDWA Secondary Standards - Arizona; SDWA Primary Standards - Federal; SDWA Secondary Standards - Federal; The 13 Priority Pollutant Metals; RCRA Metals by Total Digestion; RCRA Metals by TCLP (1311); NUMBER OF CONTAINERS

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.:	RFI	NO. CONTAINERS	
PROJ. NAME:	RFI	CUSTODY SEALS	Y/N/NA
P.O. NO.:	997-9023-05	RECEIVED INTACT	
SHIPPED VIA:	FED EX	RECEIVED COLD	

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS
(RUSH) ☐24hr ☐48hr ☐72hr ☐1 WEEK (NORMAL) ☒2 WEEK

Comments: sample RFI0639V35.0 - broken - transferred into another bottle

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: [signature] Time: 1000	Signature: Time:	Signature: FEDX Time:
Printed Name: WALT TOOMER Date: 11/2/94	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: (505) 722-0212	Company:	Company: FEDX 0116549344

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: [signature] Time: [illegible]
Printed Name: Date:	Printed Name: Date:	Printed Name: [illegible] Date: [illegible]
Company:	Company:	0116549344

ATTACHMENT III

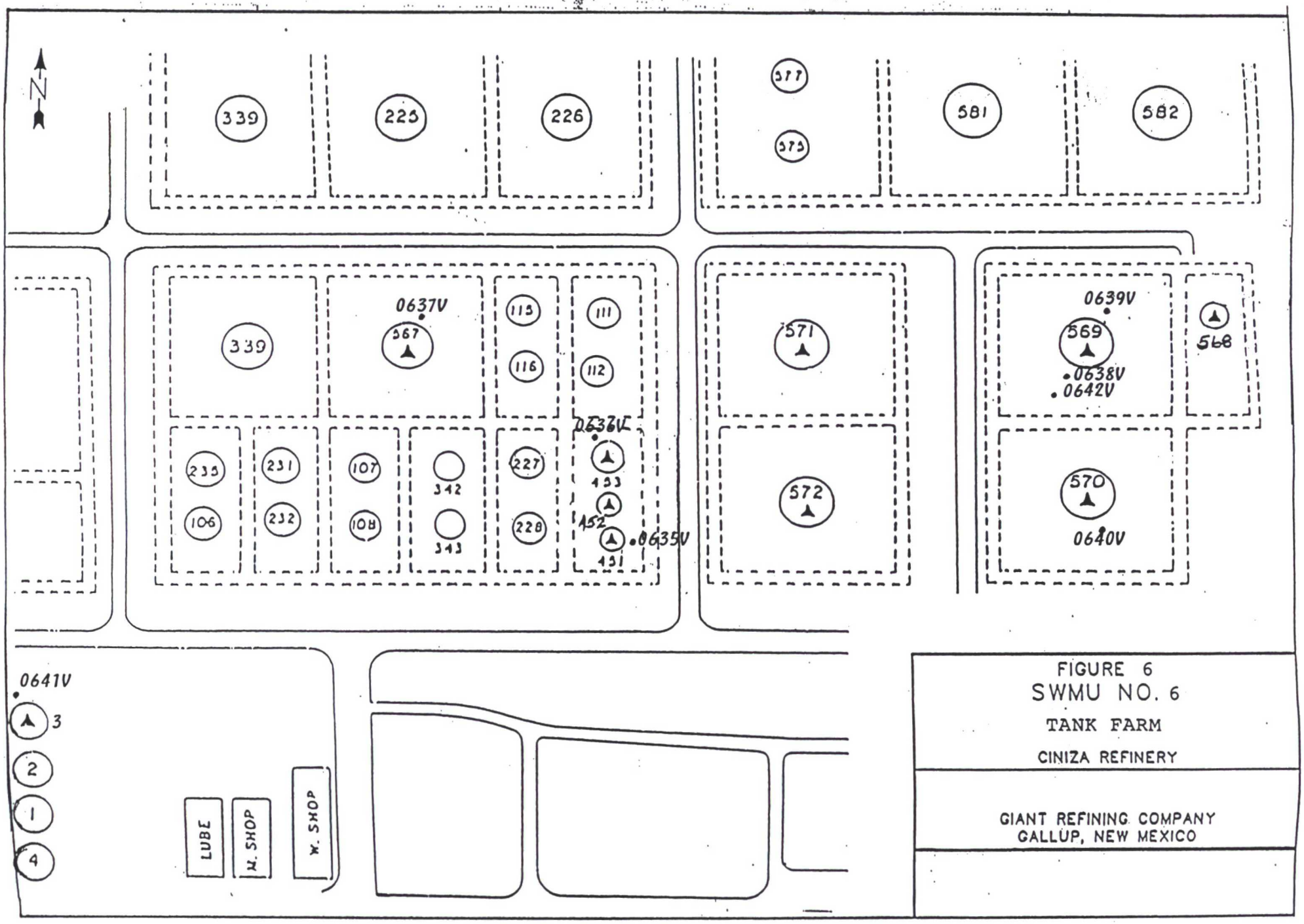

FIGURE 6
SWMU NO. 6
TANK FARM
CINIZA REFINERY

GIANT REFINING COMPANY
GALLUP, NEW MEXICO