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Draft Report

RCRA Facility Investigation
Phase III
Ciniza Refinery
Gallup, New Mexico

Giant Refining Company

Applied Environmental

October, 1992

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1.0 INTRODUCTION

1.1 GENERAL INTRODUCTION TO PHASE III

This report documents Phase III sampling and analysis of Solid Waste Management Units (SWMUs) outlined during the Resource Conservation and Recovery Act (RCRA) Feasibility Investigation (RFI) conducted at Giant Refining Company's (Giant) Ciniza Refinery, located near Gallup, New Mexico. The SWMUs investigated during Phase III include SWMU No. 3, 4, 5, 7, and 11.

Field activities for Phase III of the RFI were conducted from May 5 through May 14, 1992. Soil samples were collected at each SWMU by Giant personnel using a hand auger. The soil samples were then submitted to Westech Laboratories Inc. (Westech) in Phoenix, Arizona for analysis. All sampling, decontamination procedures, and laboratory analysis were conducted according to Giant's approved Generic Sampling Plan.

The remainder of this section includes a discussion of the sample numbering system and Giant's Certification of this document. Section 2.0 contains quarterly progress reports for the RFI. Project notifications are included in Section 3.0. A review of the statistical analysis conducted on background levels of metals in the Ciniza Refinery area compared to analytical results is summarized in Section 4.0. A discussion of the analytical results for each SWMU, including recommendations for further action, is presented in Section 5.0. Sample collection data, field data management forms, tabulated analytical data, and laboratory reports, are presented in the Appendices.

1.2 SAMPLE NUMBERING SYSTEM

A unique system was developed for numbering all samples collected during the RFI. This numbering system when compared with maps of boring locations assures the ability to pinpoint the exact location of each sample. A description of this sample numbering process is as follows:

Note #	1	2	3	4	5
Sample #	RFI	01	04	V	9.0

Note #1 = Sampling event title
Note #2 = SWMU number
Note #3 = Specific boring number in each SWMU
Note #4 = Type sample
V = Vertical
A = Angle
D = Duplicate
E = Equipment rinse
Note #5 = Beginning depth of sample interval

1.3 CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Zeke Sherman, Environmental Manager Date

GIANT
REFINING CO.

Route 3, Box 7
Gallup, New Mexico
87301

505
722-3833

August 11, 1992

Barbara Driscoll
U.S. Environmental Protection Agency
Region VI
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: Quarterly Progress Report

Dear Mr. Driscoll:

Giant Refining Company - Ciniza (GRC) is submitting this quarterly progress report as required by the May 31, 1990 RFI Workplan approval letter and HSWA Permit Condition C.4., Page 11.

GRC finished soil sampling of SWMU's #3, 4, 5, 7, and 11 on May 15, 1992. All samples were sent to Westech Laboratories for analysis. Hard copy of analytical results has been received and tabulated and is currently having statistical analysis done by Mr. Mark Wilson of the University of New Mexico.

The inspection of the remaining process wastewater system (that part not inspected in 1990) is being organized. Please refer to the attached drawings for lines that may be inspected. The lines were identified using the drawings included in the approved RFI Workplan and by using a corrected drawing from a hydroblasting project completed in 1988. Only lines marked in blue may be inspected and will represent what GRC believes will reasonably demonstrate the integrity of the process wastewater system. Some lines may not be inspected due to safety or process considerations.

This inspection is tentatively scheduled to take place in late August, 1992.

If you require additional information, please contact Lynn Shelton, of my staff, at (505) 722-0227.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering

the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Sincerely,

John Stokes
Refinery Manager
Ciniza Refinery

JJS/TLS:sp

cc: Kim Bullerdick - Corporate Counsel
Giant Industries Arizona, Inc.

GIANT
REFINING CO.

Route 3, Box 7
Gallup, New Mexico
87301

505
722-3833

April 8, 1992

Barbara Driscoll
U.S. Environmental Protection Agency
Region VI
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: Quarterly Progress Report

Dear Ms. Driscoll:

Giant Refining Company - Ciniza is submitting this Quarterly Progress Report as required by the May 31, 1990 RFI Workplan approval letter and HSWA Permit Condition C.4., Page 11.

Giant Refining Company - Ciniza will begin the Phase III RFI Project on May 4, 1992. A schedule of the sampling is attached.

Westech Laboratories (3737 East Broadway Road, Phoenix, Arizona, (602) 437-1080, Attention: Barbara Brutton) has been awarded the analytical phase of the RFI sampling event. Westech was selected on the basis of cost and on the QA/QC program.

If you require additional information, please contact Lynn Shelton, of my staff, at (505) 722-0227.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in a system designed to assure that qualified personnel gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Sincerely,

John Stokes
Refinery Manager
Giant Refining Company - Ciniza

TLS:sp

cc w/attachments: Zeke Sherman
Environmental Manager
Ciniza Refinery

Kim Bullerdick
Corporate Counsel
Giant Industries Arizona, Inc.

RFI WORKPLAN PHASE III 1992

May 4, 1992

Training		8:00 - 4:15
Load Equipment		
SWMU Site Tour		

May 5, 1992

SWMU #4	Burn Pit	9 Samples

May 6, 1992

SWMU #3	Empty Container Storage	12 Samples

May 7, 1992

SWMU #7	Fire Training Area	12 Samples
SWMU #11	Secondary Oil Skimmer	4 Samples

May 8, 1992

SWMU #5	Land Fill Area	48 Samples

May 11, 1992

Continue SWMU #5	48 Samples

May 12, 1992

Continue SWMU #5	48 Samples

May 13, 1992

Begin set-up for sewer line inspection

Expect one week to complete

GIANT
REFINING CO.

Route 3, Box 7
Gallup, New Mexico
87301

505
722-3833

January 31, 1992

Rich Mayer
U. S. Environmental Protection Agency
Region VI
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: Quarterly Progress Report

Dear Mr. Mayer:

Giant Refining Company is submitting this quarterly progress report as required by the May 31, 1990 RFE Workplan approval letter and HSWA Permit condition C.4., page 11.

Specific locations for sampling during Phase III of the RCRA Facility Investigation have been identified and numbered individually, using the following system:

1	2	3	4	5
RFI	03	02	V	0.0

#1 = Sampling event
#2 = SWMU number
#3 = Specific sample location in SWMU
#4 = Type of sample
  V = Vertical
  D = Duplicate
  E = Equipment rinse
#5 = Beginning depth of sample interval

These numbers correspond to the SWMU maps (attached) for a positive identification.

Several contract analytical laboratories have been asked to submit cost proposals for the analytical work involved in Phase III, RFI. Their submittals are due by February 29, 1992. At that time, cost and qualifications will be compared.

A tentative schedule of the Phase III, RFI sampling and investigation event is May 4, 1992 through May 22, 1992. Details

of the schedule will be forwarded to you when they are available.

Identification of Contact Wastewater Collection System individual lines for inspection has begun and will be submitted to you when available.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Sincerely,

John Stokes
Refinery Manager
Giant Refining Company - Ciniza

JJS/TLS:sp

cc w/enclosures: Lynn Shelton, Environmental Assistant
Ciniza Refinery

Kim Bullerdick, Corporate Counsel
Giant Industries Arizona, Inc.

14

2975 N

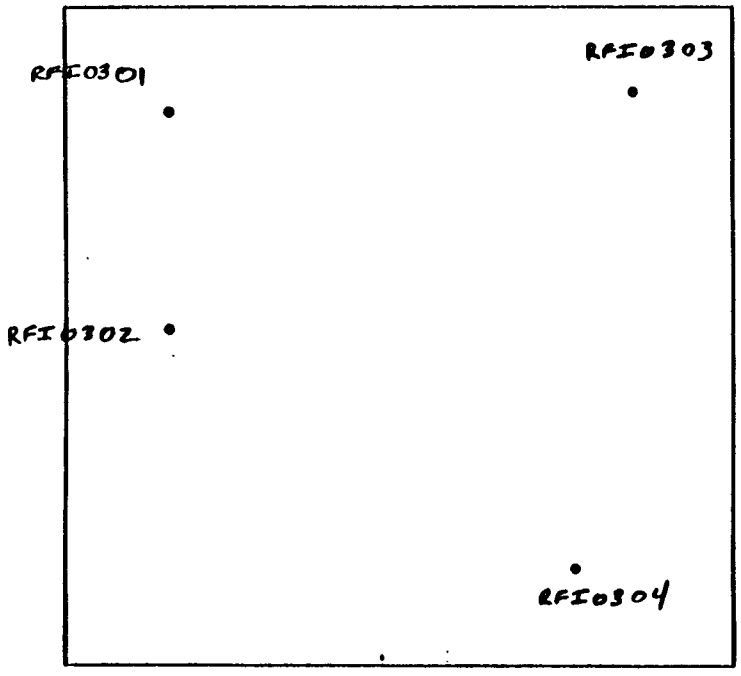
RFI0301 V0.0
RFI0301 V3.0
RFI0301 V4.5

RFI0302 V0.0
RFI0302 V3.0
RFI0302 V4.5

RFI0303 V0.0
RFI0303 V3.0
RFI0303 V4.5

1925 W

RFI0304 V0.0
RFI0304 V3.0
RFI0304 V4.5



LEGEND

● Proposed Soil Boring Locations

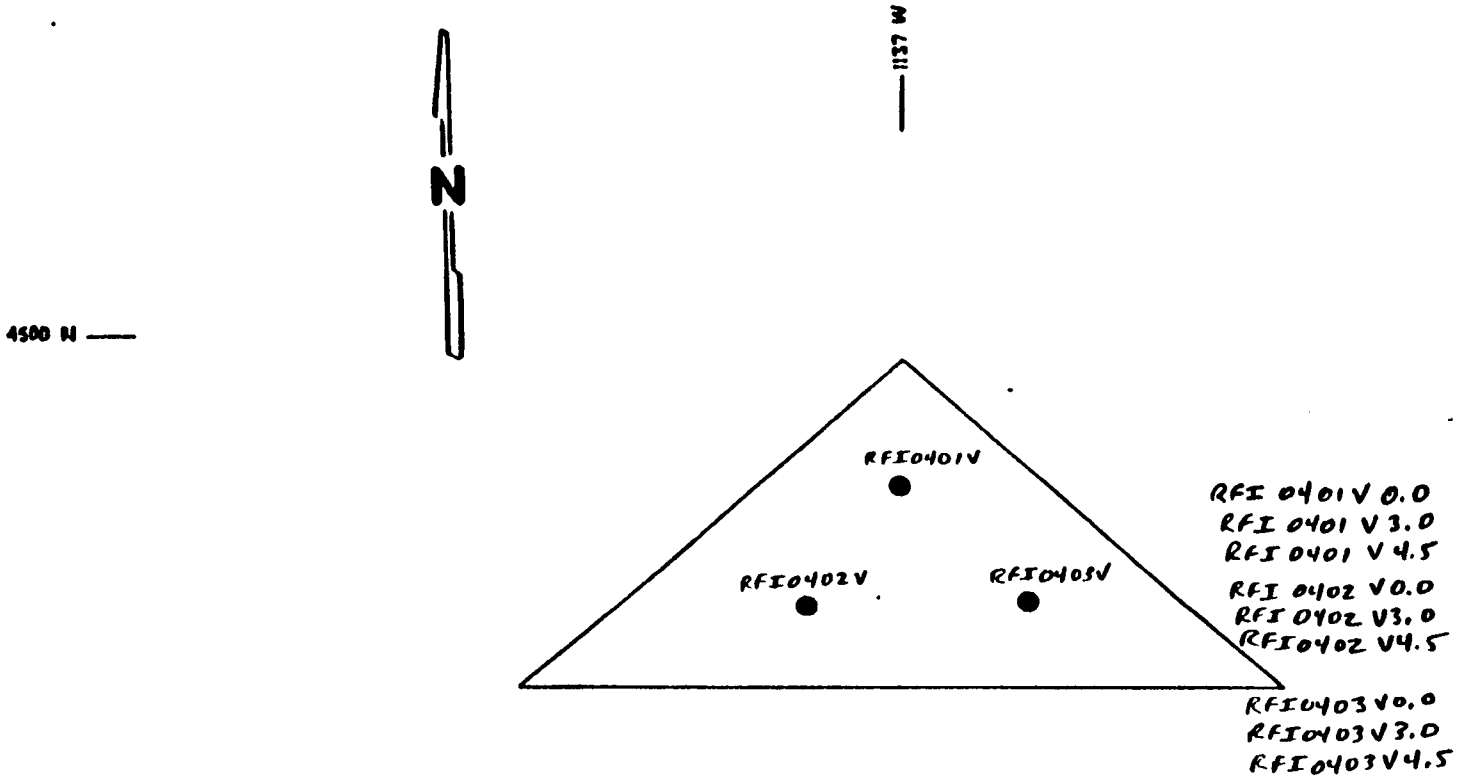
N

10 5 0 10

Scale in Feet

Applied Earth Sciences		NAME		FIGURE
FILE No. 5202	MADE BY: R.G. DATE: 12-5-89 CHECKED BY: DATE:	GIANT REFINERY Gallup, New Mexico	Empty Container Storage	

3(h) 3



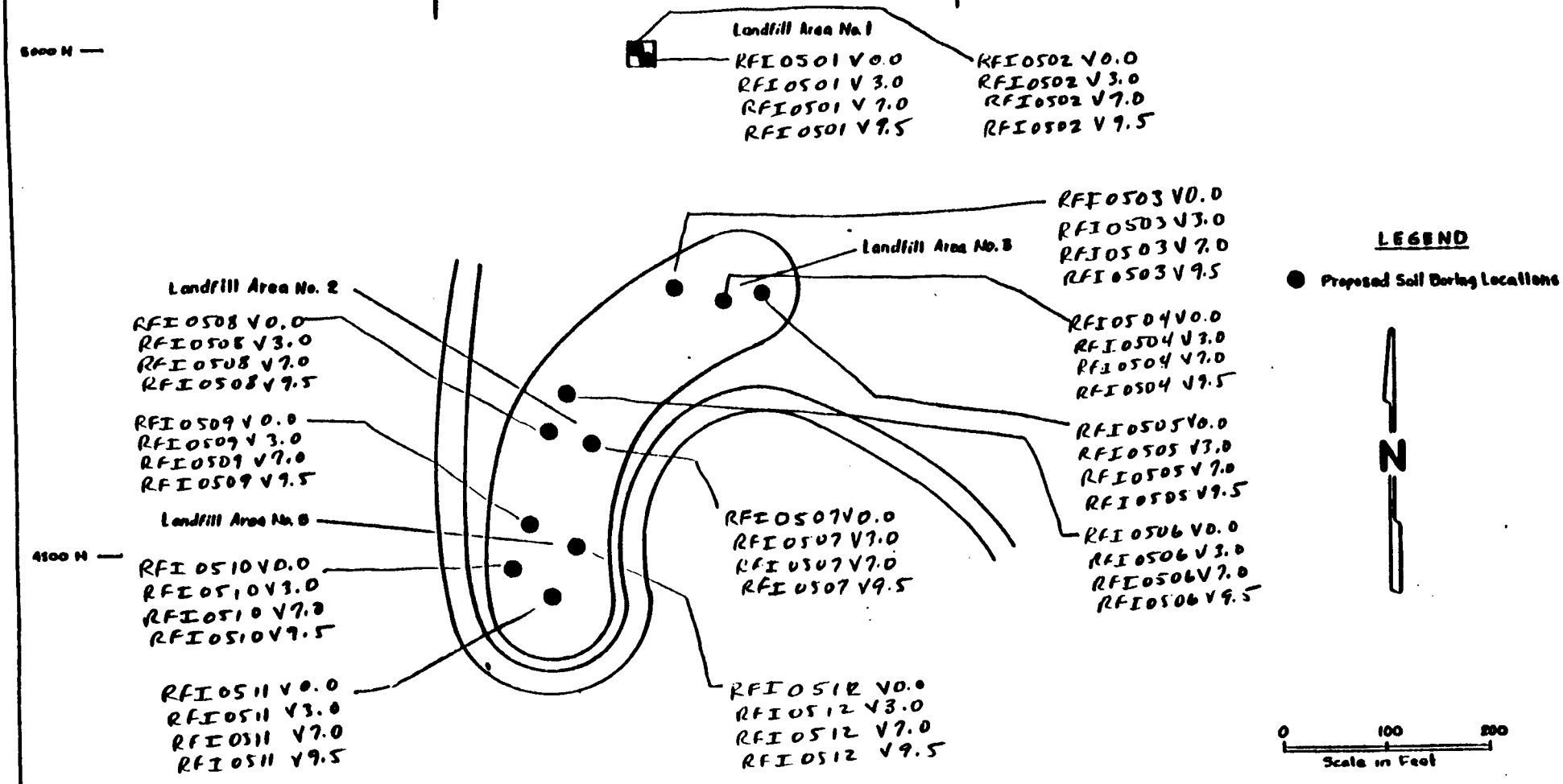
LEGEND

● Proposed Soil Boring Locations

0 5 10
SCALE IN FEET

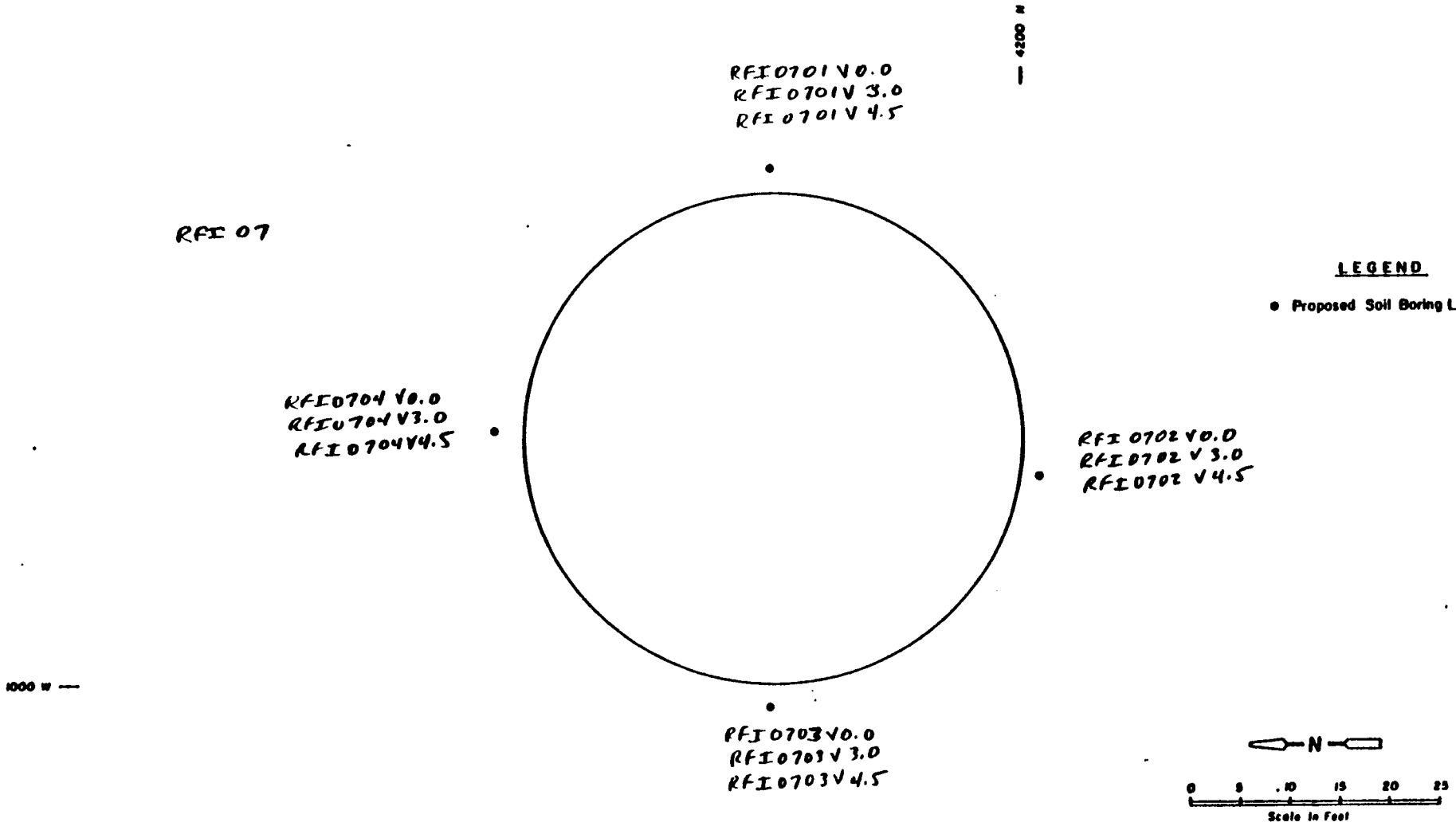
GIANT REFINERY Gallup, New Mexico	Burn Pit	FIG.

4(h) 7

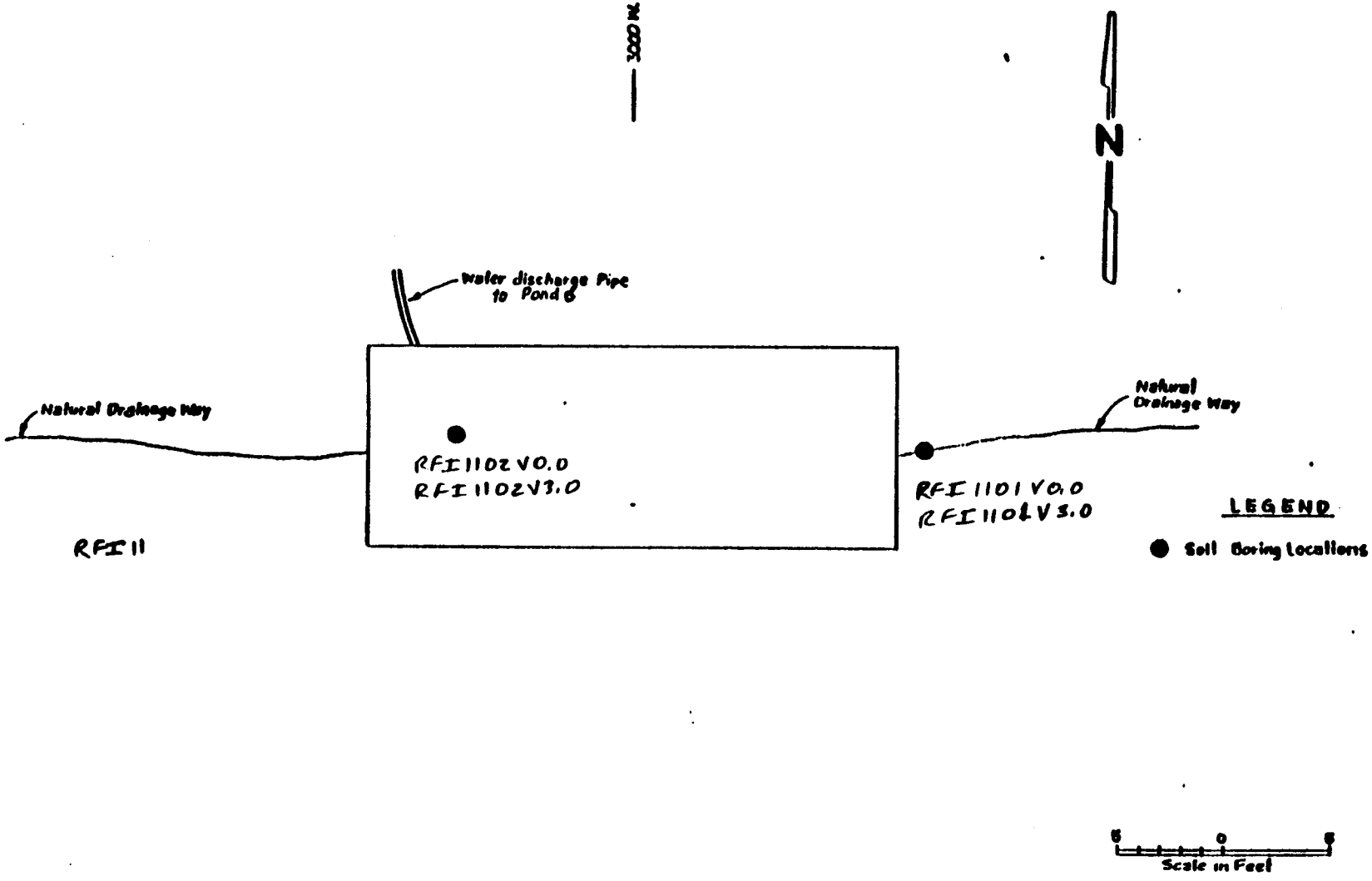


GIANT REFINERY Gallup, New Mexico	Landfill Areas	FIG.

5(h)



Applied Earth Sciences		NAME		FIGURE
FILE No. 6202	MADE BY: R.G. DATE: 12-5-89 CHECKED BY: DATE:	GIANT REFINERY Gallup, New Mexico	Fire Training Area	



3000 N

GIANT REFINERY Gallup, New Mexico	Secondary Oil Skimmer	FIG.

Affidavit of Publication

STATE OF NEW MEXICO
) SS
COUNTY OF McKINLEY

VALERIE De La O being duly sworn upon oath, deposes and says:

As LEGAL CLERK of The Independent, a newspaper published in and having a general circulation in McKinley County, New Mexico and in the City of Gallup, New Mexico and having a general circulation in Cibola County, New Mexico and in the City of Grants, New Mexico and having a general circulation in Apache County, Arizona and in the City of St. Johns and in the City of Window Rock, Arizona therein: that this affiant makes this affidavit based upon personal knowledge of the facts herein sworn to. That the publication, a copy of which is hereto attached was published in said newspaper during the period and time of publication and said notice was published in the newspaper proper, and not in a supplement thereof,

for ONE TIME, the first publication being on the 11TH day of APRIL, 19 92 the second publication being on the _____ day of _____, 19__ the third publication on the _____ day of _____, 19_____.

and the last publication being on the _____ day of _____, 19_____.

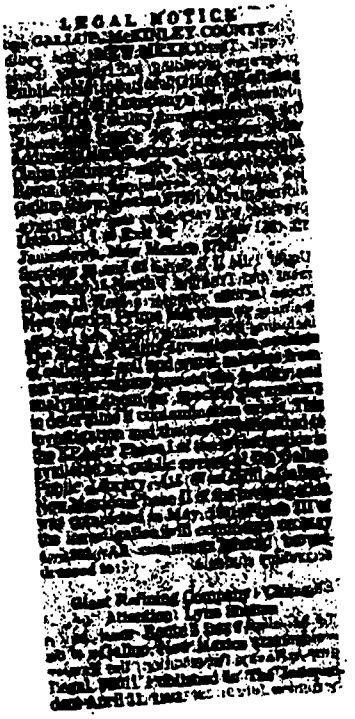
That such newspaper, in which such notice or advertisement was published, is now and has been at all times material hereto, duly qualified for such purpose, and to publish legal notices and advertisements within the meaning of Chapter 12, of the statutes of the State of New Mexico, 1941 compilation.

Valerie D. De La O
Affiant.

Sworn and subscribed to before me this 9TH day of OCTOBER, A.D., 1992.

Diane Chavez
Notary Public

My commission expires
JUNE 22, 1993


LEGAL NOTICE

GIANT
REFINING CO.

Route 3, Box 7
Gallup, New Mexico
87301

505
722-3833

May 18, 1992

Barbara Driscoll
U.S. Environmental Protection Agency
Region VI
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Ms. Driscoll:

As you know, Giant Refining Company will be conducting the third phase of its RCRA Facility Investigation this summer. In preparing for these activities, I have reviewed the reports from the previous two phases and have made the following observations.

In the soil samples taken from the various sites during Phase I and Phase II activities, laboratory analysis indicated that certain metals (Antimony and Selenium) were consistently reported as non-detectable in both the original background plot samples and all soil samples subsequently collected at each of the Phase I and Phase II sites. Based on this information, the two metals (Antimony and Selenium) are not expected to be seen above detection limits in the Phase III soil samples.

Of the metals analyzed for in the background plot and reported above their respective detection limits in samples taken during Phase I and Phase II activities, two did not exceed their statistical tolerance limits in either Phase I or Phase II samples. These two metals are Arsenic and Vanadium. The results indicate that in all previously collected soil samples, the concentration of Arsenic and Vanadium were seen at normal background levels and can be expected to be seen at background levels in Phase III soil samples. Of the remaining metals seen in samples taken from the background and Phase I and Phase II sites, seven exceeded their tolerance limits, only infrequently and by less than five percent. The metals are Barium, Beryllium, Cobalt, Copper, Nickel, Potassium, and Zinc. Most of the above metals are not associated with either refinery activities or refinery waste streams.

Because Giant now has sufficient historical data on the occurrence of these metals in the background plot and various Phase I and Phase II sampling locations, we are proposing to

reduce the list of metals to perform analysis on for the Phase III soil samples based on the following reasons:

1) That the metal constituent was not detected in the background plot or subsequent soil samples, and;

2) That the metal is ubiquitous and not associated with refinery activities, and;

3) That the metal did not significantly exceed the tolerance interval in either Phase I or Phase II samples.

The following is a list of metals that Giant requests to remove from the Phase III soil samples analytical list:

Antimony
Selenium
Arsenic
Barium
Beryllium
Cobalt
Copper
Potassium
Zinc

Removing the above metals from the analytical list would leave the following to be evaluated:

Cadmium
Chromium
Lead
Nickel
Vanadium

We believe that by removing the stated metals from the analytical list, the remaining sites can be adequately and cost effectively characterized for releases.

Please contact me at your earliest convenience to discuss this matter.

Thank you,

Zeke Sherman
Environmental Manager
Ciniza Refinery

cc: John Stokes - Refinery Manager - Ciniza Refinery
Lynn Shelton - Environmental Assistant - Ciniza Refinery

4.0 STATISTICAL ANALYSIS

4.1 STATISTICAL ANALYSIS

The statistical analysis is concerned with the problem of comparing observations of the concentrations of metals from compliance data with observations of concentrations from background data in order to determine if the concentrations of metals from the compliance data exceed, in a statistically significant fashion, the concentrations from the background data. The primary method used is that of the construction of a *tolerance interval* and the use of the resulting *upper tolerance limit*. The analysis was carried out in the following way:

1. The background data consisted, for each of the nine metals analyzed, of from two to twelve values at each of two depths.

2. For each metal, at each of the two depths, the (one-sided) tolerance interval was constructed using the following technique:

   a) Calculate the mean, $\overline{X}$, and the standard deviation, SD, from the background data. (If a measurement was listed non-detectable (nd), then the value used was one-half of the detection limit.)

   b) Construct the one-sided upper tolerance limit as $TL = \overline{X}, + KS$, where K is the one-sided normal tolerance factor.

   c) The tolerance interval is the interval {0,TL}. This interval will contain, with 95% confidence, 95% of random observations from the same distribution as the background data.

3. The observations forming the compliance data (for the same metal at the same depth) are now compared, one by one, with the upper tolerance limit, TL, found above. If an observation exceeds TL, this is interpreted as statistically significant evidence that the observation is from a distribution with

a higher concentration of the metal and that, therefore, contamination has probably occurred.

4.2 NOTES ON THE STATISTICAL ANALYSIS

1. In order to construct the upper tolerance limit, the background data is assumed to be approximately normally distributed. This assumption was checked by calculating the coefficient of variation (CV) for each of the background data sets. If this value exceeds 1, then that fact indicates non-normality. In none of the data sets analyzed did the coefficient of variation exceed 1. It was therefore assumed that the values observed in the background wells were normally distributed. No other tests of normality were carried out.

2. If the standard deviation for the background data is zero, (i.e., all values are the same), then the tolerance interval approach is not particularly useful. In that case the upper tolerance limit is identical to the common value of the background data values and any observation coming from the compliance wells which exceeds that upper tolerance limit must be taken as evidence of contamination. This was the situation for the following metals (and depths):

   (a) Beryllium (shallow) - four measurements of 1.0 each.

   (b) Cadmium (deep) - six measurements all of which were non-detectable.

   (c) Mercury (deep) - six measurements all of which were non-detectable.

   For these metals and depths an analysis of variance would ordinarily be used in place of the tolerance interval method. for the data being reported, however, all of the metals listed above were present in non-detectable amounts in the compliance data. It is obvious that no contamination has occurred and so no additional statistical tests were performed.

   The metals in question are marked on the RFI report on background data with an asterisk, *.

3. The analytical results reported under the sample column are reported in mg/kg.

Background Data for Arsenic: Less than 5 feet levels.

Data: 3.8, 4.4, 0.5, 0.4
Mean: 2.27
SD: 1.84
The Upper Tolerance Limit = 11.73
The Coefficient of Variance = 0.81

Background Data for Arsenic: 5 feet and deeper levels.

Data: 6.2, 5.8, 7, 6, 2.8, 7.2, 0.6, 0.3, 0.3, 0.6, 1.1, 0.3
Mean: 3.18
SD: 2.85
The Upper Tolerance Limit = 10.98
The Coefficient of Variance = 0.89

Background Data for Barium: Less than 5 feet levels.

Data: 300, 250, 280, 230, 300, 370, 300, 300, 280, 300, 380, 290
Mean: 298.33
SD: 46.38
The Upper Tolerance Limit = 408.81
The Coefficient of Variance = 0.14

Background Data for Beryllium: Less than 5 feet levels.

Data: 1,1,1,1
Mean: 1.00
SD: 0.00
The Upper Tolerance Limit = 1.00
The Coefficient of Variance = 0.00

Background Data for Beryllium: 5 feet and deeper levels.

Data: 1.3, 1.2, 1.3, 1, 0.8, 1.3, 1.1, 1.2, 1.2, 1.3, 1.2, 0.8
Mean: 1.14
SD: 0.18
The Upper Tolerance Limit = 1.62
The Coefficient of Variance = 0.15

Background Data for Cadmium: Less than 5 feet levels.

Data: 0.3, 0.3, 0.5
Mean: 0.33
SD: 0.12
The Upper Tolerance Limit = 1.24
The Coefficient of Variance = 0.35

Background Data for Cadmium: 5 feet and deeper levels.

Data: 0.3, 0.3, 0.3, 0.3, 0.3, 0.3
Mean: 0.25
SD: 0.00
The Upper Tolerance Limit = 0.25
The Coefficient of Variance = 0.00

Background Data for Chromium: Less than 5 feet levels.

Data: 7, 7, 3, 5, 5, 6, 6, 5, 4, 4, 4, 4
Mean: 5.00
SD: 1.22
The Upper Tolerance Limit = 8.35
The Coefficient of Variance = 0.24

Background Data for Chromium: 5 feet and deeper levels.

Data: 7, 4, 7, 3, 3, 5, 4, 5, 4, 4, 3, 4
Mean: 4.42
SD: 1.32
The Upper Tolerance Limit = 8.03
The Coefficient of Variance = 0.30

Background Data for Lead: Less than 5 feet levels.

Data: 12, 13, 9, 11, 9, 11, 12, 10, 11, 12, 1, 10
Mean: 10.08
SD: 2.98
The Upper Tolerance Limit = 18.25
The Coefficient of Variance = 0.30

Background Data for Lead: 5 feet and deeper levels.

Data: 12, 11, 12, 9, 9, 10
Mean: 10.50
SD: 1.26

SD: 2.14
The Upper Tolerance Limit = 17.74
The Coefficient of Variance = 0.18

RFI REPORT
COMPLIANCE DATA

GIANT REFINING COMPANY

RFI#	METAL	SAMPLE DATA	NOTE
RFI0401V0.0	Arsenic	ND	Within the tolerance limit.
	Barium	380	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	9.8	Exceeds the tolerance limit by 17.4%.
	Lead	9.5	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	11	Within the tolerance limit.
	Vanadium	7.9	Within the tolerance limit.
RFI0401V3.0	Arsenic	ND	Within the tolerance limit.
	Barium	1300	Exceeds the tolerance limit by 218.0%.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	15	Exceeds the tolerance limit by 79.6%.
	Lead	12	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	12	Within the tolerance limit.
	Vanadium	9.0	Within the tolerance limit.
RFI0401V4.5	Arsenic	ND	Within the tolerance limit.
	Barium	900	Exceeds the tolerance limit by 120.1%.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	6.2	Within the tolerance limit.
	Lead	10	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	9.1	Within the tolerance limit.
	Vanadium	6.8	Within the tolerance limit.
RFI0402V0.0	Arsenic	ND	Within the tolerance limit.
	Barium	480	Exceeds the tolerance limit by 17.4%.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	10	Exceeds the tolerance limit by 19.7%.
	Lead	13	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	11	Within the tolerance limit.
	Vanadium	11	Within the tolerance limit.
RFI0402V3.0	Arsenic	ND	Within the tolerance limit.
	Barium	360	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	3.2	Within the tolerance limit.
	Lead	16	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	6.3	Within the tolerance limit.
	Vanadium	ND	Within the tolerance limit.

RFI REPORT
COMPLIANCE DATA

GIANT REFINING COMPANY

RFI#	METAL	SAMPLE DATA	NOTE
RFI0402V4.5	Arsenic	ND	Within the tolerance limit.
	Barium	160	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	17	Exceeds the tolerance limit by 103.6%.
	Lead	11	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	17	Exceeds the tolerance limit by 35.8%.
	Vanadium	5.7	Within the tolerance limit.
RFI0403V0.0	Arsenic	ND	Within the tolerance limit.
	Barium	120	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	19	Exceeds the tolerance limit by 127.5%.
	Lead	30	Exceeds the tolerance limit by 64.4%.
	Mercury	ND	Within the tolerance limit.
	Nickle	20	Exceeds the tolerance limit by 59.8%.
	Vanadium	58	Exceeds the tolerance limit by 186.1%.
RFI0403V3.0	Arsenic	ND	Within the tolerance limit.
	Barium	290	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	15	Exceeds the tolerance limit by 79.6%.
	Lead	27	Exceeds the tolerance limit by 47.9%.
	Mercury	ND	Within the tolerance limit.
	Nickle	21	Exceeds the tolerance limit by 67.8%.
	Vanadium	ND	Within the tolerance limit.
RFI0403V4.5	Arsenic	ND	Within the tolerance limit.
	Barium	110	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	20	Exceeds the tolerance limit by 139.5%.
	Lead	18	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	36	Exceeds the tolerance limit by 187.6%.
	Vanadium	28	Exceeds the tolerance limit by 38.1%.
RFI0501V0.0	Arsenic	4.3	Within the tolerance limit.
	Barium	290	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	8.7	Exceeds the tolerance limit by 4.2%.
	Lead	10	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	6.8	Within the tolerance limit.
	Vanadium	8.1	Within the tolerance limit.

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RFI#	METAL	SAMPLE DATA	NOTE
RFI0501V3.0	Arsenic	14	Exceeds the tolerance limit by 19.4%.
	Barium	240	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	6.8	Within the tolerance limit.
	Lead	8.1	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	4.9	Within the tolerance limit.
	Vanadium	6.3	Within the tolerance limit.
RFI0501V7.0	Arsenic	9.4	Within the tolerance limit.
	Barium	270	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	8.3	Exceeds the tolerance limit by 3.4%.
	Lead	6.5	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	6.1	Within the tolerance limit.
	Vanadium	7.0	Within the tolerance limit.
RFI0501V9.5	Arsenic	6.6	Within the tolerance limit.
	Barium	120	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	27	Exceeds the tolerance limit by 236.3%.
	Lead	10	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	14	Exceeds the tolerance limit by 18.7%.
	Vanadium	5.1	Within the tolerance limit.
RFI0501D9.5	Arsenic	2.7	Within the tolerance limit.
	Barium	290	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	12	Exceeds the tolerance limit by 49.5%.
	Lead	11	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	10	Within the tolerance limit.
	Vanadium	4.6	Within the tolerance limit.
RFI0502V0.0	Arsenic	12	Exceeds the tolerance limit by 2.3%.
	Barium	340	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	8.2	Within the tolerance limit.
	Lead	7.8	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	7.6	Within the tolerance limit.
	Vanadium	8.1	Within the tolerance limit.

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RFI#	METAL	SAMPLE DATA	NOTE
RFI0502V3.0	Arsenic	6.7	Within the tolerance limit.
	Barium	380	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	5.7	Within the tolerance limit.
	Lead	9	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	4.7	Within the tolerance limit.
	Vanadium	8.6	Within the tolerance limit.
RFI0502V7.0	Arsenic	9.6	Within the tolerance limit.
	Barium	130	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	16	Exceeds the tolerance limit by 99.3%.
	Lead	14	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	7.3	Within the tolerance limit.
	Vanadium	7.3	Within the tolerance limit.
RFI0502V9.5	Arsenic	7.8	Within the tolerance limit.
	Barium	290	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	8.5	Exceeds the tolerance limit by 5.9%.
	Lead	6.5	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	7.3	Within the tolerance limit.
	Vanadium	4.7	Within the tolerance limit.
RFI0503V0.0	Arsenic	19	Exceeds the tolerance limit by 62.0%.
	Barium	260	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	110	Exceeds the tolerance limit by 1217.2%.
	Lead	21	Exceeds the tolerance limit by 15.1%.
	Mercury	ND	Within the tolerance limit.
	Nickle	46	Exceeds the tolerance limit by 267.5%.
	Vanadium	10	Within the tolerance limit.
RFI0503V3.0	Arsenic	16	Exceeds the tolerance limit by 36.4%.
	Barium	110	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	10	Exceeds the tolerance limit by 19.7%.
	Lead	9.4	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	8.8	Within the tolerance limit.
	Vanadium	5.9	Within the tolerance limit.

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RFI#	METAL	SAMPLE DATA	NOTE
RFI0503V7.0	Arsenic	15	Exceeds the tolerance limit by 36.7%.
	Barium	170	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	12	Exceeds the tolerance limit by 49.5%.
	Lead	18	Exceeds the tolerance limit by 18.7%.
	Mercury	ND	Within the tolerance limit. *
	Nickle	9.7	Within the tolerance limit.
	Vanadium	6.2	Within the tolerance limit.
RFI0503V9.5	Arsenic	23	Exceeds the tolerance limit by 109.5%.
	Barium	130	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	11	Exceeds the tolerance limit by 37.0%.
	Lead	ND	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	10	Within the tolerance limit.
	Vanadium	5.1	Within the tolerance limit.
RFI0503D9.5	Arsenic	22	Exceeds the tolerance limit by 100.4%.
	Barium	200	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	5.8	Within the tolerance limit.
	Lead	6.1	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	8.6	Within the tolerance limit.
	Vanadium	6.4	Within the tolerance limit.
RFI0504V0.0	Arsenic	8.5	Within the tolerance limit.
	Barium	460	Exceeds the tolerance limit by 12.5%.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	21	Exceeds the tolerance limit by 151.5%.
	Lead	16	Within the tolerance limit.
	Mercury	0.31	Exceeds the tolerance limit by 42.5%.
	Nickle	23	Exceeds the tolerance limit by 83.8%.
	Vanadium	9.6	Within the tolerance limit.
RFI0504V3.0	Arsenic	22	Exceeds the tolerance limit by 87.6%.
	Barium	230	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	270	Exceeds the tolerance limit by 3133.2%
	Lead	9.6	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	83	Exceeds the tolerance limit by 563.2%.
	Vanadium	13	Within the tolerance limit.

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RFI#	METAL	SAMPLE DATA	NOTE
RFI0504V7.0	Arsenic	14	Exceeds the tolerance limit by 27.5%.
	Barium	170	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	8.9	Exceeds the tolerance limit by 10.9%.
	Lead	9	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	9.7	Within the tolerance limit.
	Vanadium	6.7	Within the tolerance limit.
RFI0504V9.5	Arsenic	24	Exceeds the tolerance limit by 118.7%.
	Barium	320	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	31	Exceeds the tolerance limit by 286.1%.
	Lead	16	Exceeds the tolerance limit by 5.5%.
	Mercury	ND	Within the tolerance limit. *
	Nickle	13	Exceeds the tolerance limit by 10.2%.
	Vanadium	5.3	Within the tolerance limit.
RFI0505V0.0	Arsenic	22	Exceeds the tolerance limit by 87.6%.
	Barium	200	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	9.3	Exceeds the tolerance limit by 11.4%.
	Lead	6.4	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	9	Within the tolerance limit.
	Vanadium	28	Exceeds the tolerance limit by 38.1%.
RFI0505V3.0	Arsenic	20	Exceeds the tolerance limit by 70.5%.
	Barium	730	Exceeds the tolerance limit by 78.6%.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	10	Exceeds the tolerance limit by 19.7%.
	Lead	9.2	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	11	Within the tolerance limit.
	Vanadium	9.1	Within the tolerance limit.
RFI0505V7.0	Arsenic	18	Exceeds the tolerance limit by 64.0%.
	Barium	410	Exceeds the tolerance limit by 6.5%.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	9	Exceeds the tolerance limit by 12.1%.
	Lead	7.8	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	11	Within the tolerance limit.
	Vanadium	5.7	Within the tolerance limit.

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RFI#	METAL	SAMPLE DATA	NOTE
RFI0505V9.5	Arsenic	35	Exceeds the tolerance limit by 218.9%.
	Barium	220	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	9.8	Exceeds the tolerance limit by 22.1%.
	Lead	9.3	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	12	Exceeds the tolerance limit by 1.7%.
	Vanadium	6.3	Within the tolerance limit.
RFI0506V0.0	Arsenic	ND	Within the tolerance limit.
	Barium	390	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	9.6	Exceeds the tolerance limit by 15.0%.
	Lead	13	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	6.8	Within the tolerance limit.
	Vanadium	11	Within the tolerance limit.
RFI0506V3.0	Arsenic	21	Exceeds the tolerance limit by 79.0%.
	Barium	140	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	12	Exceeds the tolerance limit by 43.7%.
	Lead	7.9	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	10	Within the tolerance limit.
	Vanadium	5.7	Within the tolerance limit.
RFI0506V7.0	Arsenic	25	Exceeds the tolerance limit by 127.8%.
	Barium	56	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	8.7	Exceeds the tolerance limit by 8.4%.
	Lead	6.9	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	11	Within the tolerance limit.
	Vanadium	5	Within the tolerance limit.
RFI0506V9.5	Arsenic	20	Exceeds the tolerance limit by 82.2%.
	Barium	89	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	6.4	Within the tolerance limit.
	Lead	7.1	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	7.5	Within the tolerance limit.
	Vanadium	3.9	Within the tolerance limit.

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RFI#	METAL	SAMPLE DATA	NOTE
RFI0507V0.0	Arsenic	7.3	Within the tolerance limit.
	Barium	720	Exceeds the tolerance limit by 76.1%.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	5.6	Within the tolerance limit.
	Lead	ND	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	5.8	Within the tolerance limit.
	Vanadium	8.7	Within the tolerance limit.
RFI0507V3.0	Arsenic	6.1	Within the tolerance limit.
	Barium	340	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	6.1	Within the tolerance limit.
	Lead	7	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	7.5	Within the tolerance limit.
	Vanadium	7.1	Within the tolerance limit.
RFI0507V7.0	Arsenic	4.2	Within the tolerance limit.
	Barium	300	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	5.1	Within the tolerance limit.
	Lead	9.5	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	3.6	Within the tolerance limit.
	Vanadium	6.6	Within the tolerance limit.
RFI0507V9.5	Arsenic	4.1	Within the tolerance limit.
	Barium	520	Exceeds the tolerance limit by 35.0%.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	7.8	Within the tolerance limit.
	Lead	6	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	9.2	Within the tolerance limit.
	Vanadium	8.2	Within the tolerance limit.
RFI0507D9.5	Arsenic	3.7	Within the tolerance limit.
	Barium	760	Exceeds the tolerance limit by 97.3%.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	5.2	Within the tolerance limit.
	Lead	9	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	5.9	Within the tolerance limit.
	Vanadium	6.4	Within the tolerance limit.

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RFI#	METAL	SAMPLE DATA	NOTE
RFI0508V0.0	Arsenic	ND	Within the tolerance limit.
	Barium	590	Exceeds the tolerance limit by 44.3%.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	7.2	Within the tolerance limit.
	Lead	9.6	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	5.5	Within the tolerance limit.
	Vanadium	14	Within the tolerance limit.
RFI0508V3.0	Arsenic	3.4	Within the tolerance limit.
	Barium	440	Exceeds the tolerance limit by 7.6%.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	10	Exceeds the tolerance limit by 19.7%.
	Lead	5.9	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	11	Within the tolerance limit.
	Vanadium	10	Within the tolerance limit.
RFI0508V7.0	Arsenic	5.5	Within the tolerance limit.
	Barium	150	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	4.7	Within the tolerance limit.
	Lead	ND	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	7.1	Within the tolerance limit.
	Vanadium	6.5	Within the tolerance limit.
RFI0508V9.5	Arsenic	ND	Within the tolerance limit.
	Barium	700	Exceeds the tolerance limit by 81.8%.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	7.1	Within the tolerance limit.
	Lead	9.6	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	5.3	Within the tolerance limit.
	Vanadium	20	Exceeds the tolerance limit by 12.8%.
RFI0508D9.5	Arsenic	ND	Within the tolerance limit.
	Barium	490	Exceeds the tolerance limit by 27.2%.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	8.3	Exceeds the tolerance limit by 3.4%.
	Lead	11	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	6.3	Within the tolerance limit.
	Vanadium	16	Within the tolerance limit.

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RFI#	METAL	SAMPLE DATA	NOTE
RFI0509V0.0	Arsenic	ND	Within the tolerance limit.
	Barium	600	Exceeds the tolerance limit by 46.8%.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	15	Exceeds the tolerance limit by 79.6%.
	Lead	17	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	13	Exceeds the tolerance limit by 3.9%.
	Vanadium	14	Within the tolerance limit.
RFI0509V3.0	Arsenic	ND	Within the tolerance limit.
	Barium	680	Exceeds the tolerance limit by 66.3%.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	7.3	Within the tolerance limit.
	Lead	6.2	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	7.1	Within the tolerance limit.
	Vanadium	13	Within the tolerance limit.
RFI0509V7.0	Arsenic	ND	Within the tolerance limit.
	Barium	370	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	7.2	Within the tolerance limit.
	Lead	ND	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	8.6	Within the tolerance limit.
	Vanadium	8.2	Within the tolerance limit.
RFI0508V9.5	Arsenic	ND	Within the tolerance limit.
	Barium	130	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	4.1	Within the tolerance limit.
	Lead	ND	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	5	Within the tolerance limit.
	Vanadium	5.9	Within the tolerance limit.
RFI0509D9.5	Arsenic	2.6	Within the tolerance limit.
	Barium	100	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	8.8	Exceeds the tolerance limit by 9.6%.
	Lead	7.6	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	6.9	Within the tolerance limit.
	Vanadium	27	Exceeds the tolerance limit by 52.2%.

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RFI#	METAL	SAMPLE DATA	NOTE
RFI0510V0.0	Arsenic	ND	Within the tolerance limit.
	Barium	280	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	8.8	Exceeds the tolerance limit by 5.4%.
	Lead	7.6	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	8	Within the tolerance limit.
	Vanadium	11	Within the tolerance limit.
RFI0510V3.0	Arsenic	3.6	Within the tolerance limit.
	Barium	300	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	5.6	Within the tolerance limit.
	Lead	5	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	5.6	Within the tolerance limit.
	Vanadium	6.4	Within the tolerance limit.
RFI0510V7.0	Arsenic	5.4	Within the tolerance limit.
	Barium	370	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	10	Exceeds the tolerance limit by 24.6%.
	Lead	12	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	5.7	Within the tolerance limit.
	Vanadium	8.2	Within the tolerance limit.
RFI0510V9.5	Arsenic	2.6	Within the tolerance limit.
	Barium	100	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	6.2	Within the tolerance limit.
	Lead	7.7	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	6.9	Within the tolerance limit.
	Vanadium	27	Exceeds the tolerance limit by 52.2%.
RFI0511V0.0	Arsenic	ND	Within the tolerance limit.
	Barium	850	Exceeds the tolerance limit by 107.9%.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	7.4	Within the tolerance limit.
	Lead	6.1	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	7.8	Within the tolerance limit.
	Vanadium	12	Within the tolerance limit.

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RFI#	METAL	SAMPLE DATA	NOTE
RFI0511V3.0	Arsenic	ND	Within the tolerance limit.
	Barium	1600	Exceeds the tolerance limit by 291.4%.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	9.1	Exceeds the tolerance limit by 9.0%.
	Lead	9.8	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	7.2	Within the tolerance limit.
	Vanadium	6.5	Within the tolerance limit.
RFI0511V7.0	Arsenic	ND	Within the tolerance limit.
	Barium	710	Exceeds the tolerance limit by 84.4%.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	6.1	Within the tolerance limit.
	Lead	6.2	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	5.4	Within the tolerance limit.
	Vanadium	6.6	Within the tolerance limit.
RFI0511V9.5	Arsenic	ND	Within the tolerance limit.
	Barium	780	Exceeds the tolerance limit by 102.5%.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	7.2	Within the tolerance limit.
	Lead	9.5	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	5.2	Within the tolerance limit.
	Vanadium	11	Within the tolerance limit.
RFI0512V0.0	Arsenic	ND	Within the tolerance limit.
	Barium	460	Exceeds the tolerance limit by 12.5%.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	8.5	Exceeds the tolerance limit by 1.8%.
	Lead	5.5	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	6.6	Within the tolerance limit.
	Vanadium	9.4	Within the tolerance limit.
RFI0512V3.0	Arsenic	ND	Within the tolerance limit.
	Barium	310	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit. *
	Cadmium	ND	Within the tolerance limit.
	Chromium	6.7	Within the tolerance limit.
	Lead	6.4	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit.
	Nickle	4.5	Within the tolerance limit.
	Vanadium	4.8	Within the tolerance limit.

RFI REPORT
COMPLIANCE DATA

GIANT REFINING COMPANY

RFI#	METAL	SAMPLE DATA	NOTE
RFI0512V7.0	Arsenic	ND	Within the tolerance limit.
	Barium	420	Exceeds the tolerance limit by 9.1%.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	7.5	Within the tolerance limit.
	Lead	11	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	6.2	Within the tolerance limit.
	Vanadium	9.2	Within the tolerance limit.
RFI0512V9.5	Arsenic	6.7	Within the tolerance limit.
	Barium	190	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	6.6	Within the tolerance limit.
	Lead	6.3	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	7	Within the tolerance limit.
	Vanadium	4.9	Within the tolerance limit.
RFI0512D9.5	Arsenic	2.7	Within the tolerance limit.
	Barium	200	Within the tolerance limit.
	Beryllium	ND	Within the tolerance limit.
	Cadmium	ND	Within the tolerance limit. *
	Chromium	7.1	Within the tolerance limit.
	Lead	6	Within the tolerance limit.
	Mercury	ND	Within the tolerance limit. *
	Nickle	7.6	Within the tolerance limit.
	Vanadium	4.2	Within the tolerance limit.

5.0 SUMMARY AND DISCUSSION OF SWMUs

This section summarizes the methods used to investigate each of the SWMUs and presents a summary of the field observations and analytical results. Recommendations are also made for future corrective actions.

5.1 SWMU NO. 3 EMPTY CONTAINER STORAGE

SWMU No. 3 consists of the empty container storage area, which is located behind the maintanace buildings (Figure 2). The empty container storage area was used for storage of empty drums awaiting recycle.

5.1.1 Methods

Four soil borings were drilled within the perimeter of the empty container storage area using a hand auger (Figure 3). The borings were drilled to a depth of 4.5 feet (ft). Three soil samples were collected from each of the four borings: one was collected from the surface, and one each was sampled from depths of 3 and 4.5 ft. A visual description of the soil types encountered during augering was recorded on the data management forms. Field headspace measurement of volatile organic concentrations in each soil sample were made with a photoionization detector (PID) and these data were also recorded on the data management forms.

The soil samples were collected directly into laboratory-supplied containers, labeled, and placed into a cooler chilled to approximately 4 degrees (°C) for shipment to Westech Laboratories Inc. (Westech) in Phoenix, Arizona under chain of custody (COC). Samples were collected, labeled, and shipped as required by Sections 3.4, 4.0, and 6.0 of the Generic Sampling Plan. All augers and sampling equipment were decontaminated prior to each use with a steam cleaner as outlined in Section 5.0 of the Generic Sampling Plan.

Westech analyzed each of the soil samples for priority pollutant volatile organic compounds (VOC) using U.S. Environmental Protection Agency (EPA) Method 8240. Analytical results are summarized below and are also presented in the Appendices.

5.1.2 Results

Of the 46 VOCs analyzed using EPA Method 8240, nine were detected in soil collected from the empty container storage area (Table 5.1.2.1). All of the compounds detected were present in surface soil and included: 1,1,1-Trichloroethane; tetrechloroethene; 1,1-Dichloroethane; acetone; benzene; ethylbenzene; styrene; trichloroethene; and total xylenes. Most of the VOCs detected occurred in the surface soil collected from Boring No. 1, located in the northeast corner of the empty container storage area. VOCs were not detected in soil collected from depths of 3 and 4.5 ft in any of the borings.

PID measurements of volatile organic concentrations were relatively highest in surface soil collected at Boring No. 1 (3.2 parts per million, ppm). PID measurements in the remaining soil samples were at or below background levels.

5.1.3 Recommendations

The relatively low concentrations of VOCs detected in surficial soil analyzed from the empty container storage area and the absence of VOCs at depth suggest that no corrective action is required. VOC concentrations in surficial soils could be reduced by disking or tilling to promote aeration, volatilization, and natural degradation of the organics. A corrective action plan for SWMU No. 3 will be developed and submitted for approval.

5.2 SWMU NO. 4 OLD BURN PIT

SWMU No. 4 consists of the old burn pit located just north of the inactive container (Figure 4). The old burn pit was used to burn acid-soluable oils (ASO). ASOs are a heavy molecular weight, asphalt-type cross polymerized hydrocarbon. The landfills have been inactive since the early 1980s.

5.2.1 Methods

Three soil borings were drilled within the perimeter of the old burn pit using a hand auger to a depth of 4.5 ft (Figure 5). Three soil samples were collected from each of the borings: one was collected from the surface, and one each was sampled from depths of 3 and 4.5 ft.

A visual description of the soil types encountered during augering was recorded on the data management forms. Field headspace measurement of volatile organic concentrations in each soil sample were made with a PID and these data were also recorded on the data management forms.

The soil samples were collected directly into laboratory-supplied containers, labeled, and placed into a cooler chilled to approximately 4 °C for shipment to Westech in Phoenix, Arizona under COC. Samples were collected, labeled, and shipped as required by Sections 3.4, 4.0, and 6.0 of the Generic Sampling Plan. All augers and sampling equipment were decontaminated prior to each use with a steam cleaner as outlined in Section 5.0 of the Generic Sampling Plan.

Westech analyzed each of the soil samples collected for: VOCs using EPA Method 8240; semivolatile organic compounds (SVOCs) using EPA Method 8270; total metals; and pH. Analytical results are summarized below and are also presented in the Appendices.

5.2.2 Results

The VOCs toluene, ethylbezene, xylene (TEX), and styrene were detected in soil samples analyzed from Borings No. 2 and 3 at depths of 3 and 4.5 ft (Table 5.2.2.1). VOCs were not detected in soils collected from Boring No. 1 or in any of the surface soils. Total TEX concentrations in these three samples ranged from 1,700 to 3,170 micrograms per kilogram (μg/kg). Styrene was detected in the soil sample collected from a depth of three ft in Boring No. 2. No other VOCs were detected in any of the soil samples analyzed from the old burn pit.

Five SVOCs were detected in the soils analyzed, including: napthalene; Dimethyl phthalate; phenanthrene; Di-n-butyl phthalate; and Bis(2-ethylhexl) phthalate. Of these, Di-n-butyl phthalate was the most widespread, comprising 1,300 to 3,000 μg/kg in five of the nine soil samples collected at depths ranging from the ground surface to 4.5 ft. Dimethyl phthalate was the most concentrated SVOC detected, comprising 18,000 μg/kg in the 3 and 4.5 ft samples collected from Boring No. 3.

Field headspace measurements of volatile organic vapor concentrations made with the PID ranged from 3 to 16 ppm in soil collected from depths of 3 to 4.5 ft at Borings No. 2 and 3. These field PID measurements correspond with analytical detections of VOCs and SVOCs at these locations. PID measurements were at background levels in all surface soils and in those examined from Boring No. 1.

Barium, chromium, lead, nickel, and vanadium were detected in concentrations that exceeded background levels for soil in the Ciniza Refinery area (Table 5.2.2.2). Chromium exceedances were detected in 7 of 9 samples, ranging from 20 to 140% above background levels. Nickel concentrations in 4 of 9 samples ranged from 36 to 188% above background levels. Barium exceedances were detected in 3 of 9 samples, ranging from 17 to 200% above background concentrations. Vanadium and lead exceedances were detected in 2 of 9 samples. In general, the metals exceedances were evenly distributed with depth. Arsenic, beryllium, cadmium, and mercury concentrations were within background levels in all of the samples examined.

pH measured in the soil samples collected ranged from 2.2 to 8.1. Most of the soils were in the 7 to 8 pH range. pH of 2 to 4 were detected in soil from Boring No. 2 and 3.

5.2.3 Recommendations

Soil analyzed from the old burn pit contained elevated concentrations of VOCs, SVOCs, and metals. The VOC and SVOC concentrations could be decreased by tilling the soil to a depth of 4.5 ft to aerate the deeper soil, promoting natural degradation of the organics. The metals could be isolated from possible contact with humans or surface receptors by capping the area. This would also prevent infiltration of surface water into the pits and would limit downward migration of the contaminants. A corrective action plan will be prepared for SWMU No. 4 and submitted to EPA for approval.

5.3 SWMU No. 5 LANDFILL AREAS

SWMU No. 5 consists of the landfill areas one through five, located midway between the tank farm and the air strip (Figure 6). The landfills were used to dispose of nonregulated,

nonhazardous materials from the refinery. The landfills have been inactive since the early 1980s.

5.3.1 Methods

Twelve soil borings were drilled within the five landfill areas using a hand auger to a depth of 9.5 ft (Figure 7). Four soil samples were collected from each of the borings: one was collected from the surface, and one each was sampled from depths of 3, 7, and 9.5 ft. A visual description of the soil types encountered during augering was recorded on the data management forms. Field headspace measurement of volatile organic concentrations in each soil sample were made with a PID and these data were also recorded on the data management forms.

The soil samples were collected directly into laboratory-supplied containers, labeled, and placed into a cooler chilled to approximately 4 °C for shipment to Westech in Phoenix, Arizona under COC. Samples were collected, labeled, and shipped as required by Sections 3.4, 4.0, and 6.0 of the Generic Sampling Plan. All augers and sampling equipment were decontaminated prior to each use with a steam cleaner as outlined in Section 5.0 of the Generic Sampling Plan.

Westech analyzed each of the soil samples collected for: VOCs using EPA Method 8260; total metals; and pH. Analytical results are summarized below and are also presented in the Appendices.

5.3.2 Results

VOCs were not detected in any of the 48 soil samples analyzed from the landfill areas. Field headspace measurements of volatile organic compounds made with a PID were also at or below background levels.

Arsenic, barium, chromium, lead, mercury, nickel, and vanadium were detected in concentrations exceeding background levels in soil from the landfill areas (Table 5.3.2.1). Chromium, arsenic, and barium exceedances were the most common, occurring in

approximately 25 to 50% of the soil samples analyzed. Chromium exceedances were detected in 29 of 44 samples, in concentrations ranging from 3 to 3000% above background levels. Barium exceedances ranged from 7 to 291% above background in 18 of 44 samples. Arsenic exceedances were detected in 17 of 44 samples, ranging from 2 to 219% above background concentrations. Exceedances for lead, nickel, vanadium, and mercury were comparatively rare, with mercury concentrations exceeding background levels in only one sample. The metals exceedances were evenly distributed from the ground surface to a depth of 9.5 ft.

pH levels in soil were in the 7 to 9.5 range throughout the landfill areas.

5.3.3 Recommendations

Elevated concentrations of metals, especially chromium, barium, and arsenic, were detected in soil analyzed from the ground surface to a depth of 9.5 ft in the landfill area. Capping of the landfills would isolate the metals from exposure to surface receptors and would limit infiltration of surface water and downward migration of the contaminants. The cap should be constructed in a manner to allow for drainage away from the cap and to prevent ponding of surface water. A corrective action plan will be prepared for SWMU No. 5 and will be submitted to EPA for approval.

5.4 SWMU NO. 7 FIRE TRAINING AREA

SWMU No. 7 consists of the fire training area located adjacent to the idle process equipment storage area (Figure 8). It consists of a fire water header, a four ft high by 16 ft diameter tank, and an industrial pump on a cement pedestal. The fire training area is used two to three times a year to train the refinery's volunteer fire department.

5.4.1 Methods

Four soil borings were drilled around the perimeter of the fire training area using a hand auger (Figure 9). The borings were advanced to a depth of 4.5 ft. Three to four soil samples were collected from each of the borings: one from the surface, one from a depth of 3 ft, and one to two samples from a depth of 4.5 ft. A visual description of the soil types

encountered during augering was recorded on the data management forms. Field headspace measurements of volatile organic concentrations in each soil sample were made with a PID and these data were also recorded on the data management forms.

The soil samples were collected directly into laboratory-supplied containers, labeled, and placed in a cooler chilled to approximately 4 °C for shipment to Westech in Phoenix, Arizona under COC. Samples were collected, labeled, and shipped as required by Sections 3.4, 4.0, and 6.0 of the Generic Sampling Plan. All augers and sampling equipment were decontaminated prior to each use with a steam cleaner as outlined in Section 5.0 of the Generic Sampling Plan.

Westech analyzed each of the soil samples collected for oil and grease and total petroleum fuel hydrocarbons (TPH). Oil and grease was analyzed using EPA Method 418.1; TPH (C4 to C9) was analyzed using EPA Method 8015 Modified. Analytical results are summarized below and are also presented in the Appendices.

5.4.2 Results

Oil and grease were detected in all but two of the soil samples examined in concentrations ranging from 44 to 29,000 milligrams per kilogram (mg/kg) (Table 8.4.2.1). The highest oil and grease concentrations were detected in samples collected from surface samples in the northern and western edges of the fire training area. Oil and grease concentrations decreased with depth in all borings. Oil and grease concentrations of up to 2,800 mg/kg were detected at a depth of 4.5 ft.

TPH was detected in the surface sample collected from the eastern edge of the fire training area only, where it comprised 75 mg/kg. TPH was not detected in any of the other samples analyzed.

Field headspace PID measurements of organic vapor concentrations ranged from background levels to a maximum of 11 ppm. The highest PID measurement was recorded

in the soil sample in which TPH was detected. PID measurements decreased with depth and were at or below background levels at a depth of 4.5 ft.

5.4.3 Recommendations

Field observations and analytical results suggest that relatively volatile TPH compounds are absent from the fire training area. Oil and grease concentrations of up to 29,000 mg/kg were detected, with the highest oil and grease concentrations occurring in surficial soil in the northwestern part of the area. Oil and grease concentrations could be reduced by tilling the impacted soil, and adding nutrients and moisture to augment natural degradation of the organics. A corrective action plan will be prepared for SWMU No. 7 and will be submitted to EPA for approval.

5.5 SWMU NO. 11 SECONDARY OIL SKIMMER

SWMU No. 11 consists of the secondary oil skimmer located south of the main evaporation ponds (Figure 10). Prior to removal, it was used as a backup oil skimmer during maintenance activities on the primary oil skimmer.

5.5.1 Methods

Two soil borings were drilled in the vicinity of the secondary oil skimmer using a hand auger (Figure 11). One of the borings was drilled within the skimmer and the other was placed along a natural drainage channel immediately east of the skimmer. The borings were advanced to a depth of 3 ft. Three soil samples were collected from each of the borings: one from the surface and two samples from a depth of 3 ft. A visual description of the soil types encountered during augering was recorded on the data management forms. Field headspace measurements of volatile organic concentrations in each soil sample were made with a PID and these data were also recorded on the data management forms.

The soil samples were collected directly into laboratory-supplied containers, labeled, and placed in a cooler chilled to approximately 4 °C for shipment to Westech in Phoenix, Arizona under COC. Samples were collected, labeled, and shipped as required by Sections 3.4, 4.0, and 6.0 of the Generic Sampling Plan. All augers and sampling equipment were

decontaminated prior to each use with a steam cleaner as outlined in Section 5.0 of the Generic Sampling Plan.

Westech analyzed each of the soil samples collected for VOCs using EPA Method 8260 and SVOCs using EPA Method 8270. Analytical results are summarized below and are also presented in the Appendices.

5.5.2 Results

The VOCs benzene, toluene, ethylbenzene, xylene (BTEX), and styrene were detected in the soil sample collected from a depth of 3 ft within the secondary oil skimmer (Table 8.5.2.1). The total BTEX concentration in this sample was 113,640 μg/kg. Styrene composed 830 μg/kg. VOCs were not detected in the surficial soil sample collected from the same location. The only VOC detected in samples collected in the drainage channel outside of the skimmer was xylene, which composed 70 μg/kg in the soil sample collected from the ground surface.

SVOC compounds detected included napthalene, 4-Nitrophenol, Diethyl phthalate, phenanthrene, anthracene, Di-n-butyl phthalate, flouranthene, pyrene, Benzo(a)anthracene, and Benzo(a)pyrene. Most of the SVOCs detected were present in the same sample found to contain the VOCs, collected from a depth of 3 ft within the skimmer. The highest SVOC concentration detected was phenanthrene, which composed 9,200 μg/kg of the soil analyzed. The total SVOC concentration in this sample was 23,700 μg/kg. With the exception of Di-n-butyl phthalate, SVOCs were not detected in the surficial sample collected from the same location Relatively minor concentrations of Di-n-butyl phthalate and pyrene (970 and 260 μg/kg, respectively) were detected in the surficial soil sample collected from the drainage channel outside of the skimmer.

Field headspace organic vapor concentrations measured with the PID were at or below background levels in all of the soil samples examined.

5.5.3 Recommendations

Analytical results suggests that the overall VOC and SVOC concentrations in soil in the secondary oil skimmer are relatively low and no action is required. VOC and SVOC concentrations could be reduced by tilling the upper three ft of soil within the skimmer to volatilize the organics. If tilling is employed, care should be taken to mound the soil in such a manner to prevent ponding and infiltration of surface water. A corrective action plan will be prepared for SWMU No. 11, which will be presented to EPA for approval.

TABLE 5.1.2.1

Volatile Organic Compounds Detected In Soil
SWMU NO. 3
Ciniza Refinery

Sample Point	1	2	4
Sample Depth (ft)	V0.0	V0.0	V0.0
Compound (µg/kg)			
1,1,1-Trichloroethane	160	1,800	ND
Tetrachloroethane (PCE)	340	ND	ND
1,1-Dichloroethane	70	ND	ND
Acetone	ND	980	ND
Benzene	340	ND	ND
Ethylbenzene	490	ND	ND
Styrene	170	ND	ND
Trichloroethene	71	ND	ND
Total Xylenes	8,600	ND	210

ND Not Detected

TABLE 5.2.2.1

Volatile Organic & Semivolatile Organic Compounds Detected in Soil SWMU No. 4 Ciniza Refinery

Sample Point	1	1	1	2	2	2	3	3	3
Sample Depth (ft)	V0.0	V3.0	V4.5	V0.0	V3.0	V4.5	V0.0	V3.0	V4.5
VOCs (μg/kg)									
Toluene	ND	ND	ND	ND	70	ND	ND	67	87
Ethylbenzene	ND	ND	ND	ND	1,000	ND	ND	910	510
Total tylenes	ND	ND	ND	ND	2,100	ND	ND	2,200	1,100
Styrene	ND	ND	ND	ND	420	ND	ND	ND	ND
SVOCs (μg/kg)									
Napthalene	ND	ND	ND	ND	520	ND	ND	ND	ND
Dimethyl phthalate	ND	ND	ND	ND	ND	890	ND	18,000	18,000
Phenanthrene	ND	ND	ND	ND	670	ND	ND	ND	ND
Di-n-bentyl Phthlate	1,500	2,700	1,300	3,000	ND	1,800	ND	ND	ND
Bis (2-ethylhexyl) phthalate	ND	ND	ND	400	ND	ND	ND	ND	ND

ND Not Detected

TABLE 5.2.2.2

Metals Exceedances Detected in Soil
SWMU NO. 4
Ciniza Refinery

		Metals, Exceedances (%)				
Sample Number	**Depth (Ft)**	**Barium**	**Chromium**	**Lead**	**Nickel**	**Vanadium**
RFI0401V0.0	Surface	--	+17	--	--	--
RFI0401V3.0	3	+218	+80	--	--	--
RFI0401V4.5	4.5	+120	--	--	--	--
RFI0402V0.0	Surface	+17	+20	--	--	--
RFI0402V3.0	3	--	--	--	--	--
RFI0402V4.5	4.5	--	+104	--	+36	--
RFI0403V0.0	Surface	--	+128	+64	+60	+186
RFI0403V3.0	3	--	+80	+48	+68	--
RFI0403V4.5	4.5	--	+140	--	+188	+38

-- Concentrations are within tolerance limit based on statistical analysis of background metals concentrations in the Ciniza Refinery area.

1 Arsenic, Beryllium, Cadmium, and Mercury concentrations were all within the tolerance limit for soil samples analyzed from SWMU No. 4. No exceedances were noted.

TABLE 5.3.2.1

Metals Exceedances Detected in Soil[1]
SWMU NO. 5
Ciniza Refinery

Sample Number	Depth (ft)	Metals, Exceedances (%)						
		Arsenic	Barium	Chromium	Lead	Mercury	Nickel	Vanadium
RFI0501V0.0	Surface	--	--	+4	--	--	--	--
RFI0501V3.0	3	+19	--	--	--	--	--	--
RFI0501V7.0	7	--	--	+3	--	--	--	--
RFI0501V9.5	9.5	--	--	+236	--	--	+19	--
RFI0501D9.5	9.5	--	--	+50	--	--	--	--
RFI0502V0.0	Surface	+2	--	--	--	--	--	--
RFI0502V3.0	3	--	--	--	--	--	--	--
RFI0502V7.0	7	--	--	+99	--	--	--	--
RFI0502V9.5	9.5	--	-	+6	--	--	--	--
RFI0503V0.0	Surface	+62	--	+1,200	+15	--	+268	--
RFI0503V3.0	3	+36	--	+20	--	--	--	--
RFI0503V7.0	7	+37	--	+50	+19	--	--	--
RFI0503V9.5	9.5	+110	--	+37	--	--	--	--
RFI0503D9.5	9.5	+100	--	--	--	--	--	--
RFI0504V0.0	Surface	--	+13	+152	--	+43	+84	--
RFI0504V3.0	3	+88	--	+3,130	--	--	+563	--
RFI0504V7.0	7	+28	--	+11	--	--	--	--
RFI0504V9.5	9.5	+119	--	+286	+6	--	+10	--
RFI0505V0.0	Surface	+88	--	+11	--	--	--	+38
RFI0505V3.0	3	+71	+79	+20	--	--	--	--
RFI0505V7.0	7	+64	+7	+12	--	--	--	--
RFI0505V9.5	9.5	+219	--	+22	--	--	+2	--

TABLE 5.3.2.1

Metals Exceedances Detected in Soil[1]
SWMU NO. 5
Ciniza Refinery

		Metals, Exceedances (%)						
Sample Number	Depth (ft)	Arsenic	Barium	Chromium	Lead	Mercury	Nickel	Vanadium
RFI0506V0.0	Surface	--	--	+15	--	--	--	--
RFI0506V3.0	3	+79	--	+44	--	--	--	--
RFI0506V7.0	7	+128	--	+8	--	--	--	--
RFI0506V9.5	9.5	+82	--	--	--	--	--	--
RFI0507V0.0	Surface	--	+76	--	--	--	--	--
RFI0507V3.0	3	--	--	--	--	--	--	--
RFI0507V7.0	7	--	--	--	--	--	--	--
RFI0507V9.5	9.5	--	+35	--	--	--	--	--
RFI0507D9.5	9.5	--	+97	--	--	--	--	--
RFI0508V0.0	Surface	--	+44	--	--	--	--	--
RFI0508V3.0	3	--	+8	+20	--	--	--	--
RFI0508V7.0	7	--	--	--	--	--	--	--
RFI0508V9.5	9.5	--	+82	--	--	--	--	+13
RFI0508D9.5	9.5	--	+27	+3	--	--	--	--
RFI0509V0.0	Surface	--	+47	+80	--	--	+4	--
RFI0509V3.0	3	--	+66	--	--	--	--	--
RFI0509V7.0	7	--	--	--	--	--	--	--
RFI0509V9.5	9.5	--	--	--	--	--	--	--
RFI0509D9.5	9.5	--	--	+10	--	--	--	+52
RFI0510V0.0	Surface	--	--	+5	--	--	--	--
RFI0510V3.0	3	--	--	--	--	--	--	--
RFI0510V7.0	7	--	--	+25	--	--	--	--

TABLE 5.3.2.1

Metals Exceedances Detected in Soil[1]
SWMU NO. 5
Ciniza Refinery

Sample Number	Depth (ft)	Metals, Exceedances (%)						
		Arsenic	Barium	Chromium	Lead	Mercury	Nickel	Vanadium
RFI0510V9.5	9.5	--	--	--	--	--	--	+52
RFI0511V0.0	Surface	--	+108	--	--	--	--	--
RFI0511V3.0	3	--	+291	+9	--	--	--	--
RFI0511V7.0	7	--	+84	--	--	--	--	--
RFI0511V9.5	9.5	--	+103	--	--	--	--	--
RFI0512V0.0	Surface	--	+13	+2	--	--	--	--
RFI0512V3.0	3	--	--	--	--	--	--	--
RFI0512V7.0	7	--	+9	--	--	--	--	--
RFI0512V9.5	9.5	--	--	--	--	--	--	--
RFI0512D9.5	9.5	--	--	--	--	--	--	--

-- Concentrations are within tolerance limit based on statistical analysis of background metals concentrations in the Ciniza Refinery area.

1 Beryllium and cadmium concentrations were all within the tolerance limit for soil samples analyzed from SWMU NO. 5 No exceedances were noted.

TABLE 5.4.2.1

Oil & Grease and Total Petroleum Hydrocarbon Concentrations in Soil SWMU NO. 7 Ciniza Refinery

Sample Point	1	1	1	2	2	2	2	3	3	3	4	4	4
Sample Depth (ft)	V0.0	V3.0	V4.5	V0.0	V3.0	V4.5	D4.5	V0.0	V3.0	V4.5	V0.0	V3.0	V4.5
Oil & Grease (mg/kg)	1,700	150	ND	ND	2,700	2,300	2,000	27,000	44	ND	29,000	8,000	2,800
Total Petroleum Hydrocarbon (mg/kg)	75	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

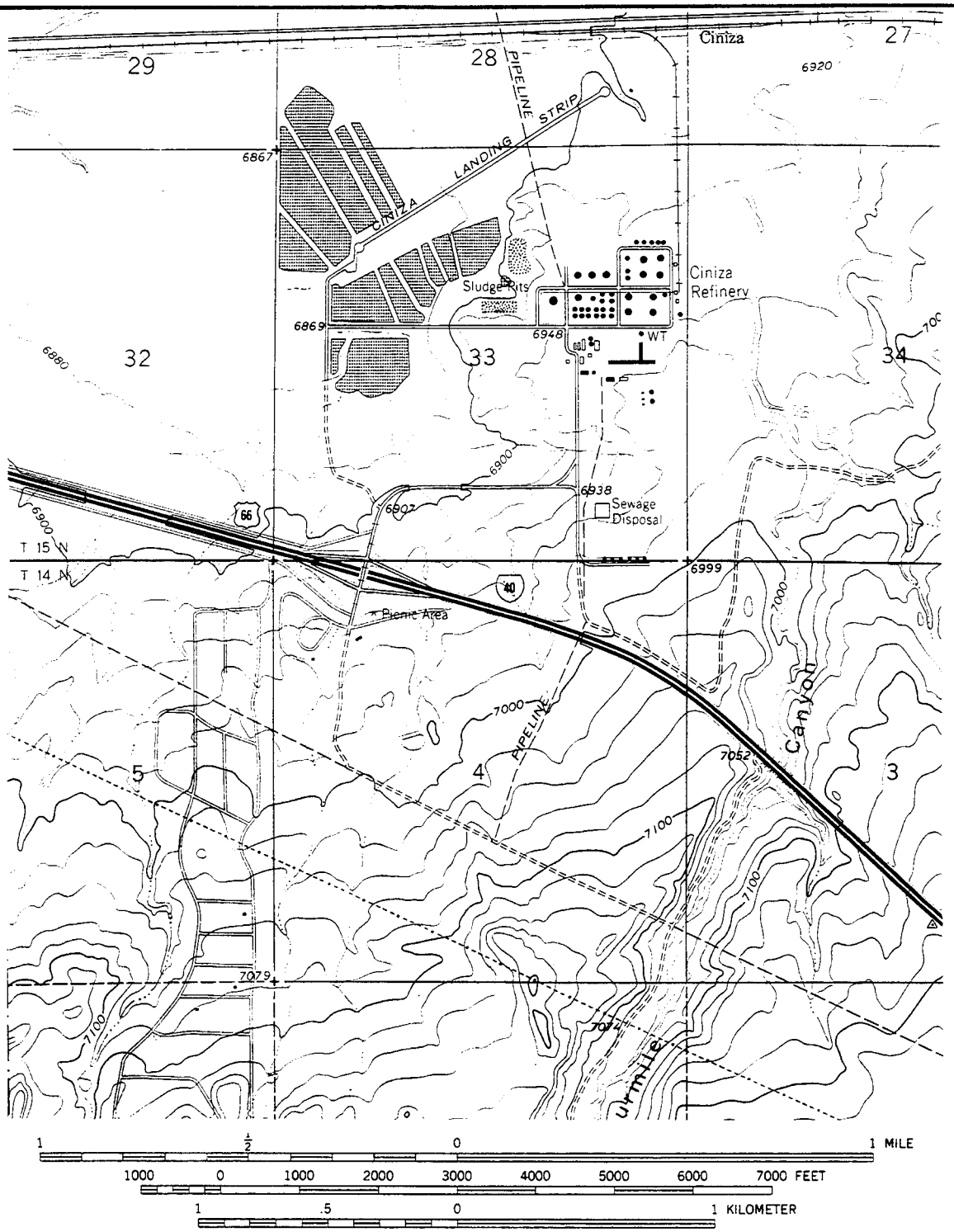
ND Not Detected

TABLE 5.5.2.1

Volatile Organic & Semivolatile Organic Compounds Detected in Soil SWMU NO. 11 Ciniza Refinery

Sample Point	1	1	1	2	2	2
Sample Depth (ft)	V0.0	V3.0	D3.0	V0.0	V3.0	E3.0
VOCs (µg/kg)						
Benzene	ND	540	270	ND	ND	ND
Ethylbenzene	ND	15,000	19,000	ND	ND	ND
Styrene	ND	830	280	ND	ND	ND
Toluene	ND	100	130	ND	ND	ND
Total Xylenes	ND	98,000	740	70	ND	ND
SYOCs (µg/kg)						
Naphthalene	ND	3,500	2,500	ND	ND	NA
4-Nitrophenol	ND	1,900	1,500	ND	ND	NA
Diethyl phthalate	ND	ND	1,700	ND	ND	NA
Phenanthrene	ND	9,200	5,400	ND	ND	NA
Anthracene	ND	520	ND	ND	ND	NA
Di-n-butyl phthalate	530	1,300	1,300	970	ND	NA
Flouranthene	ND	630	ND	ND	ND	NA
Pyrene	ND	1,500	1,200	260	ND	NA
Benzo(a)anthracene	ND	550	550	ND	ND	NA

ND Not Detected.
NA Not Analyzed.



1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CINIZA QUADRANGLE
NEW MEXICO-MC KINLEY CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

QUADRANGLE LOCATION

FIGURE 1

LOCATION MAP

CINIZA REFINERY

PREPARED FOR

GIANT REFINING COMPANY
GALLUP, NEW MEXICO

AppliedEnvironmental

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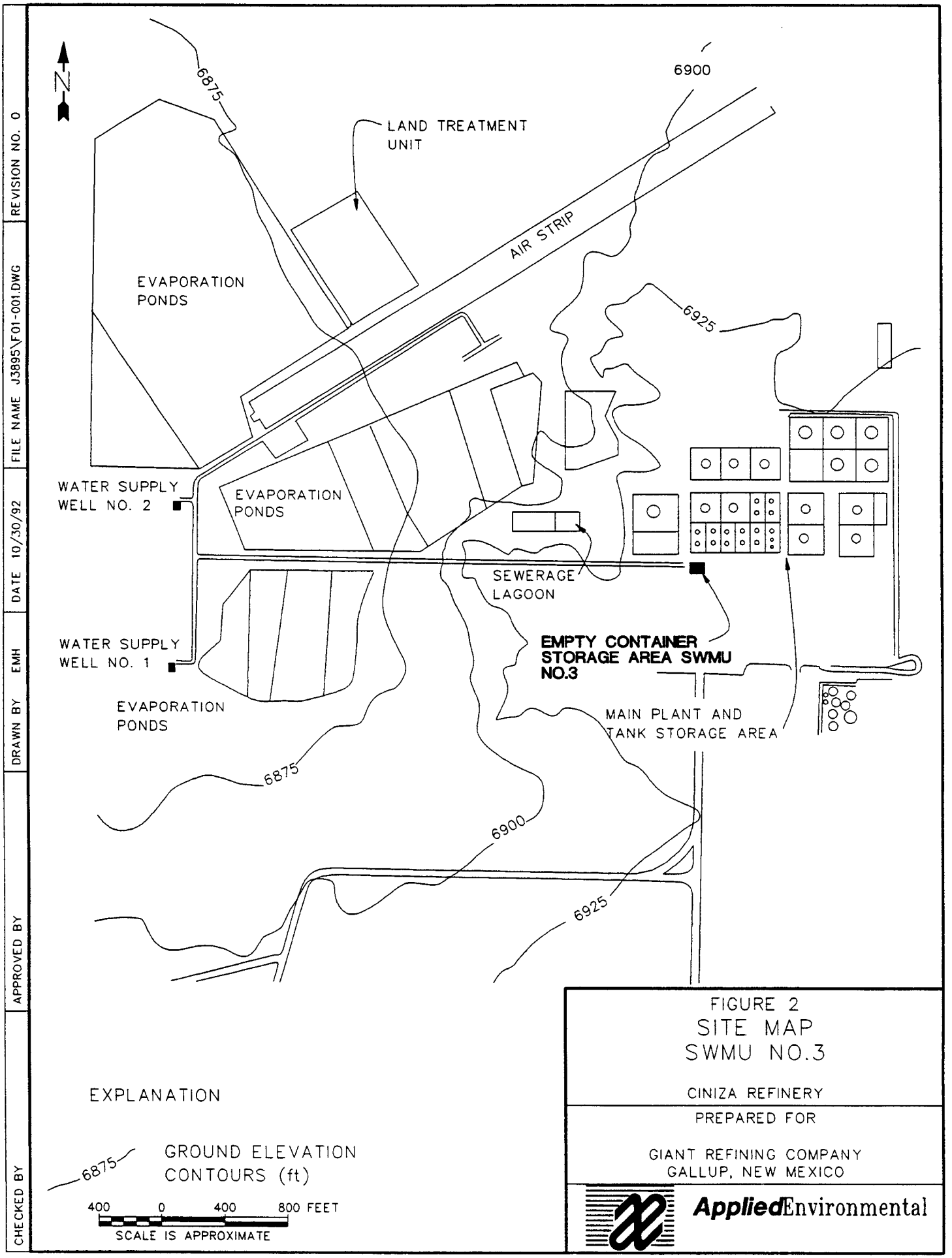
N
6875
6900
LAND TREATMENT UNIT
AIR STRIP
EVAPORATION PONDS
6925
WATER SUPPLY WELL NO. 2
EVAPORATION PONDS
SEWERAGE LAGOON
WATER SUPPLY WELL NO. 1
EMPTY CONTAINER STORAGE AREA SWMU NO.3
EVAPORATION PONDS
MAIN PLANT AND TANK STORAGE AREA
6875
6900
6925
EXPLANATION
6875
GROUND ELEVATION CONTOURS (ft)
400 0 400 800 FEET
SCALE IS APPROXIMATE
FIGURE 2
SITE MAP
SWMU NO.3
CINIZA REFINERY
PREPARED FOR
GIANT REFINING COMPANY
GALLUP, NEW MEXICO
AppliedEnvironmental
REVISION NO. 0
FILE NAME J3895\F01-001.DWG
DATE 10/30/92
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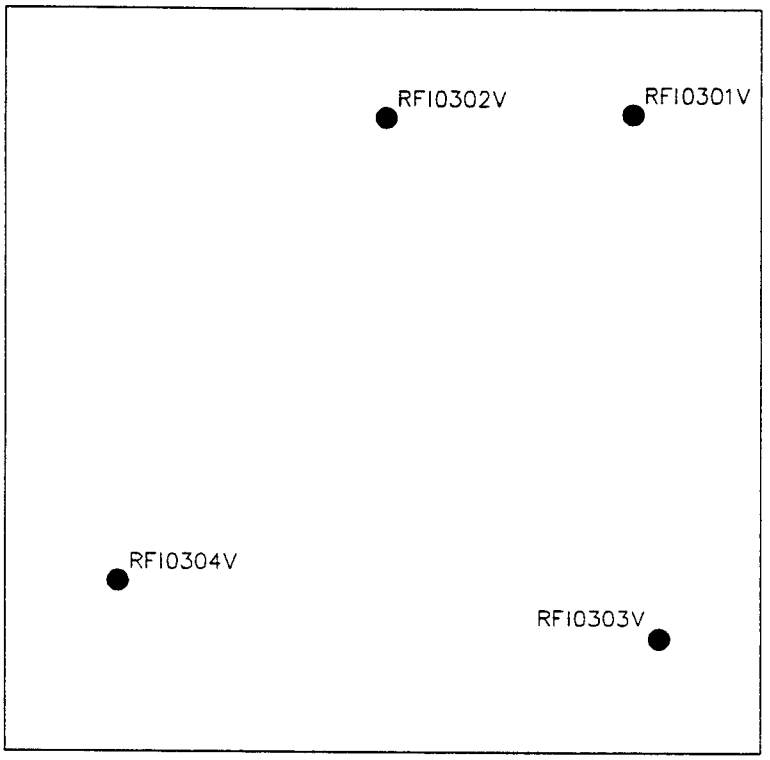
CHECKED BY



N

EXPLANATION

RFI0303 SOIL BORING LOCATIONS

5 0 5 10 FEET

FIGURE 3
SWMU NO. 3 EMPTY CONTAINER STORAGE

CINIZA REFINERY

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GALLUP, NEW MEXICO

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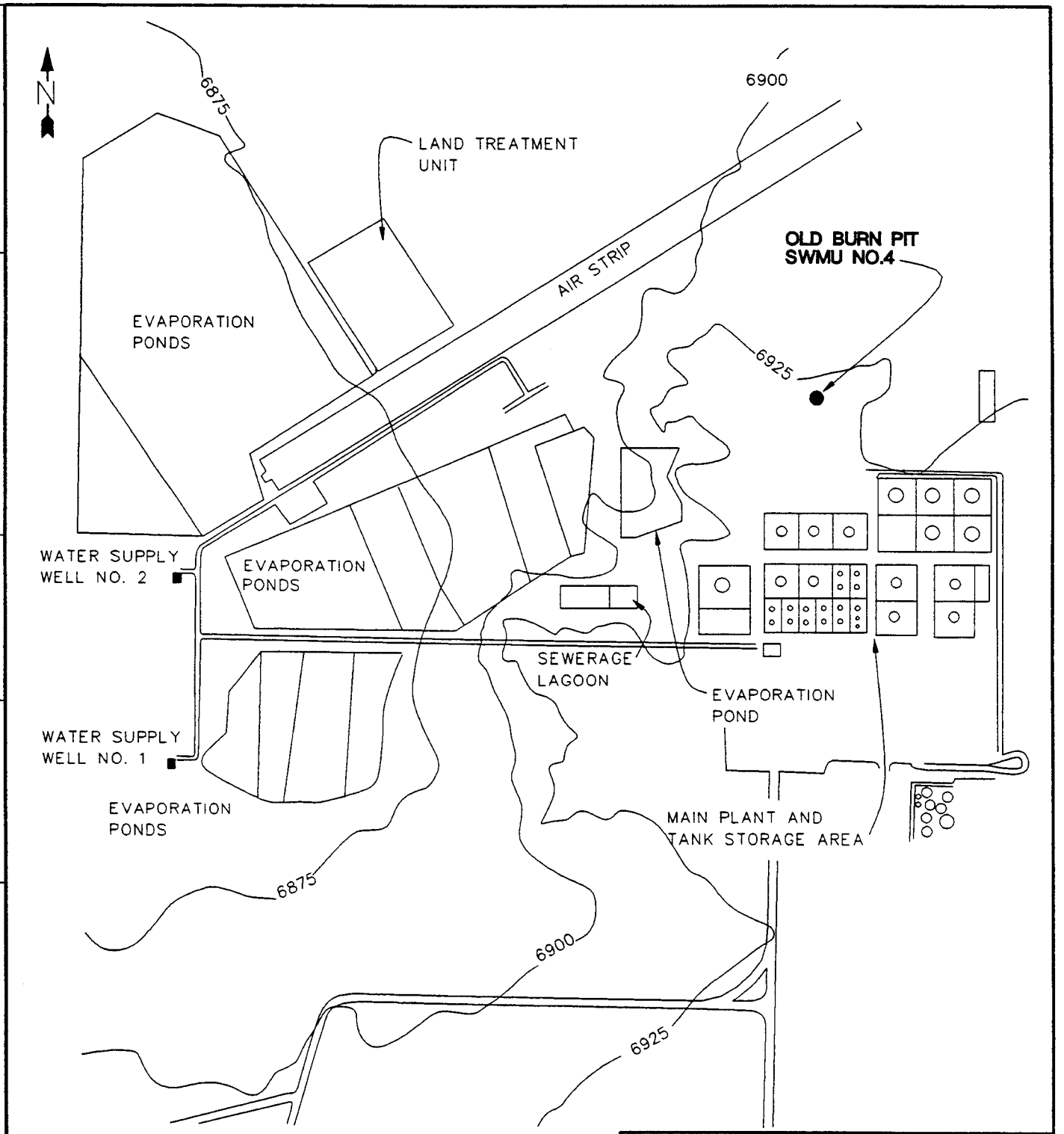

EXPLANATION

6875 GROUND ELEVATION CONTOURS (ft)

400 0 400 800 FEET
SCALE IS APPROXIMATE

FIGURE 4
SITE MAP
SWMU NO.4

CINIZA REFINERY

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GALLUP, NEW MEXICO

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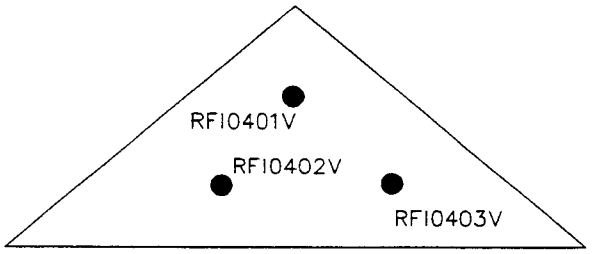

EXPLANATION

RFI0401V SOIL BORING LOCATIONS

5 0 5 10 FEET

FIGURE 5
SWMU NO.4
OLD BURN PIT

CINIZA REFINERY

PREPARED FOR

GIANT REFINING COMPANY
GALLUP, NEW MEXICO

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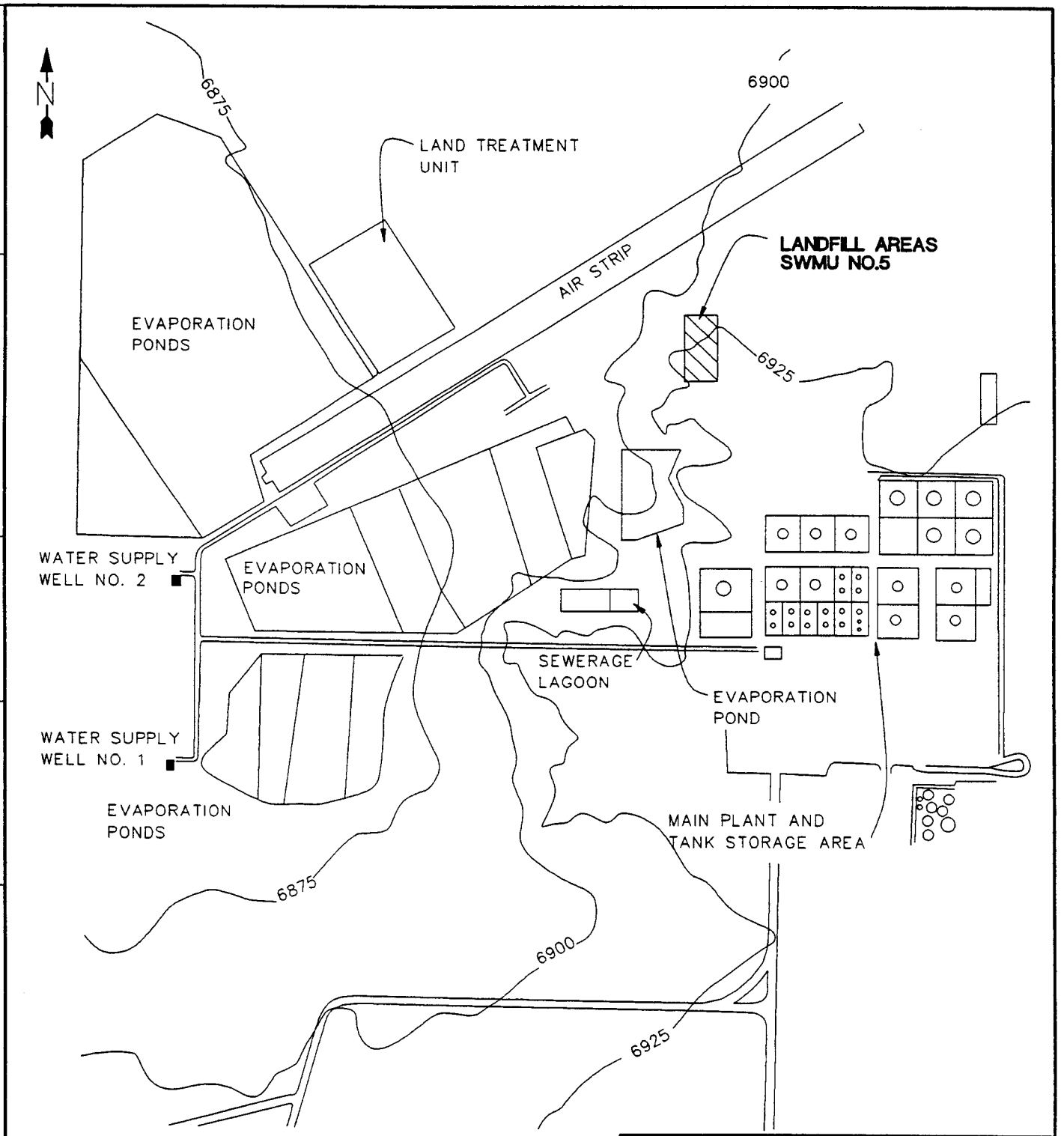
REVISION NO. 0 | FILE NAME J4211\F01-002.DWG | DATE 10/27/92 | DRAWN BY EMH | APPROVED BY | CHECKED BY



EXPLANATION

6875 GROUND ELEVATION CONTOURS (ft)

400 0 400 800 FEET

SCALE IS APPROXIMATE

FIGURE 6
SITE MAP
SWMU NO.5

CINIZA REFINERY

PREPARED FOR

GIANT REFINING COMPANY
GALLUP, NEW MEXICO

AppliedEnvironmental

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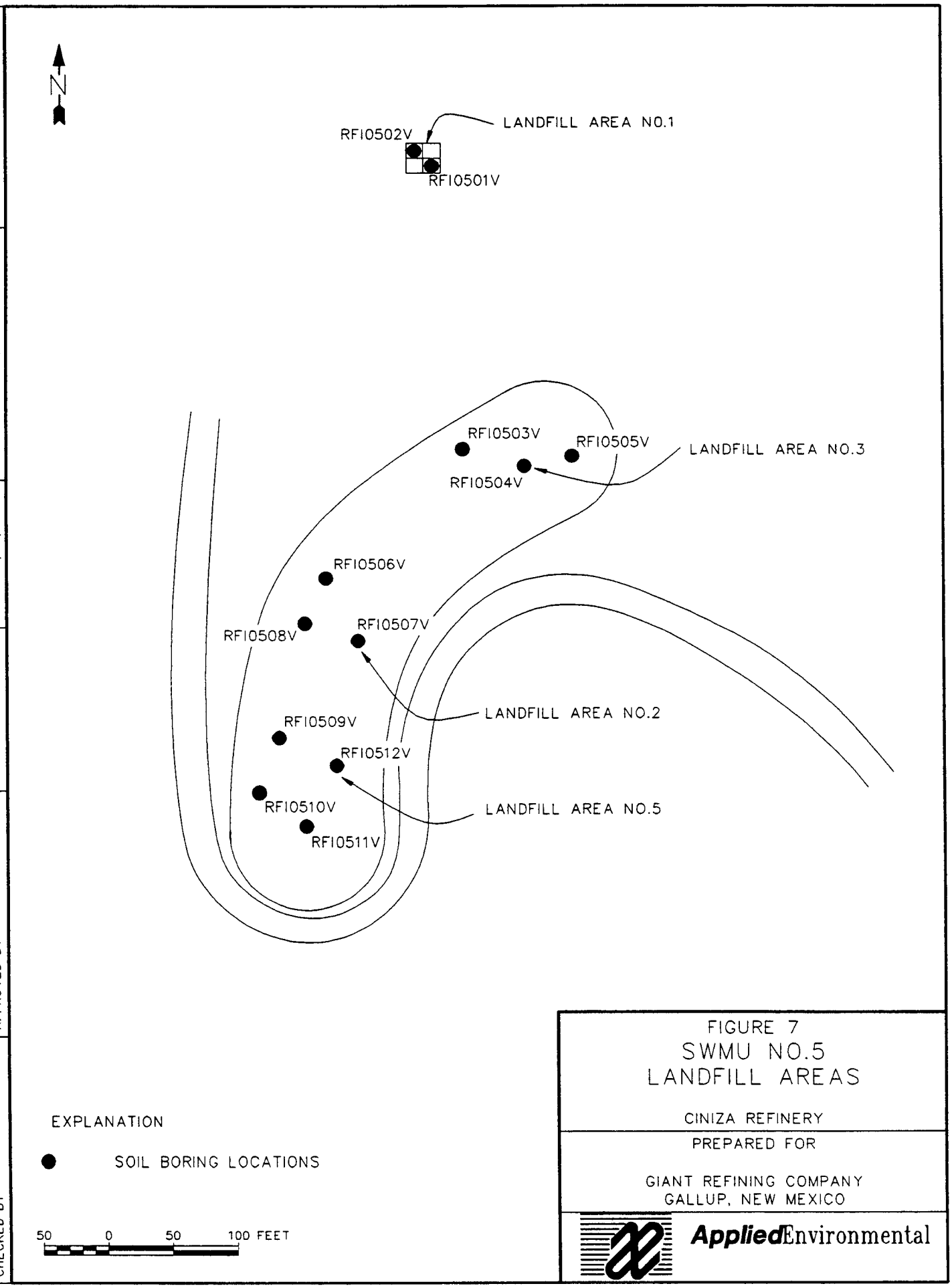


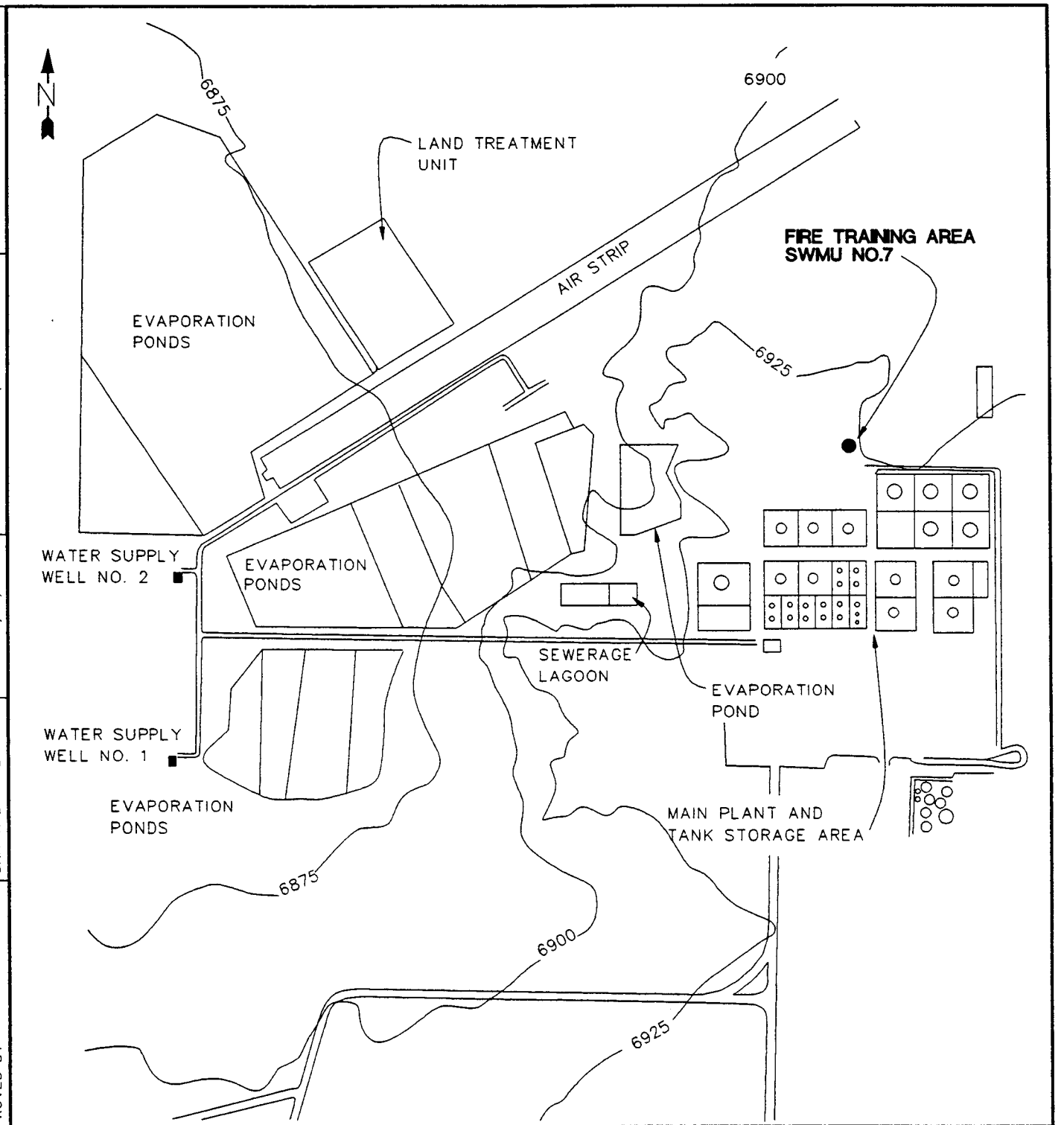
FIGURE 7
SWMU NO.5
LANDFILL AREAS

CINIZA REFINERY

PREPARED FOR

GIANT REFINING COMPANY
GALLUP, NEW MEXICO

AppliedEnvironmental



EXPLANATION

6875 GROUND ELEVATION CONTOURS (ft)

400 0 400 800 FEET

SCALE IS APPROXIMATE

FIGURE 8
SITE MAP
SWMU NO.7

CINIZA REFINERY

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GIANT REFINING COMPANY
GALLUP, NEW MEXICO

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REVISION NO. 0

FILE NAME J4211\F01-003.DWG

DATE 10/27/92

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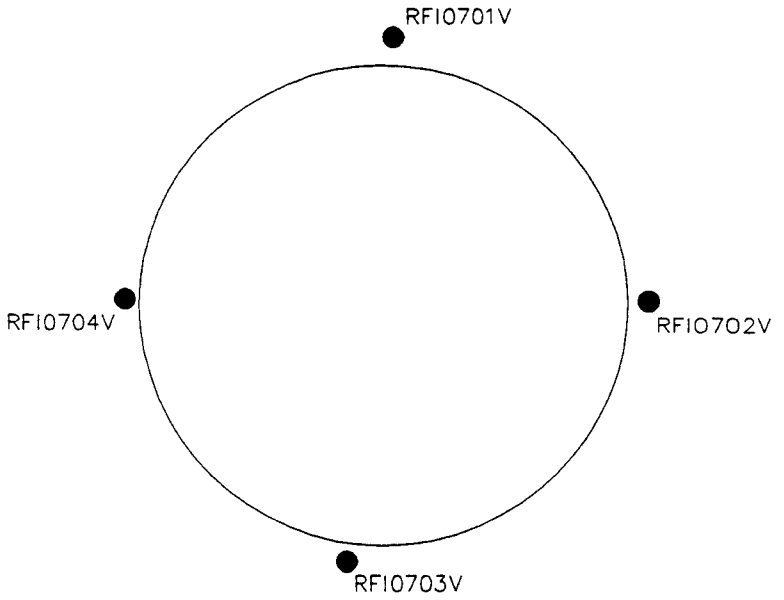
APPROVED BY

CHECKED BY



EXRLANATION

● SOIL BORING LOCATIONS

10 0 10 20 FEET

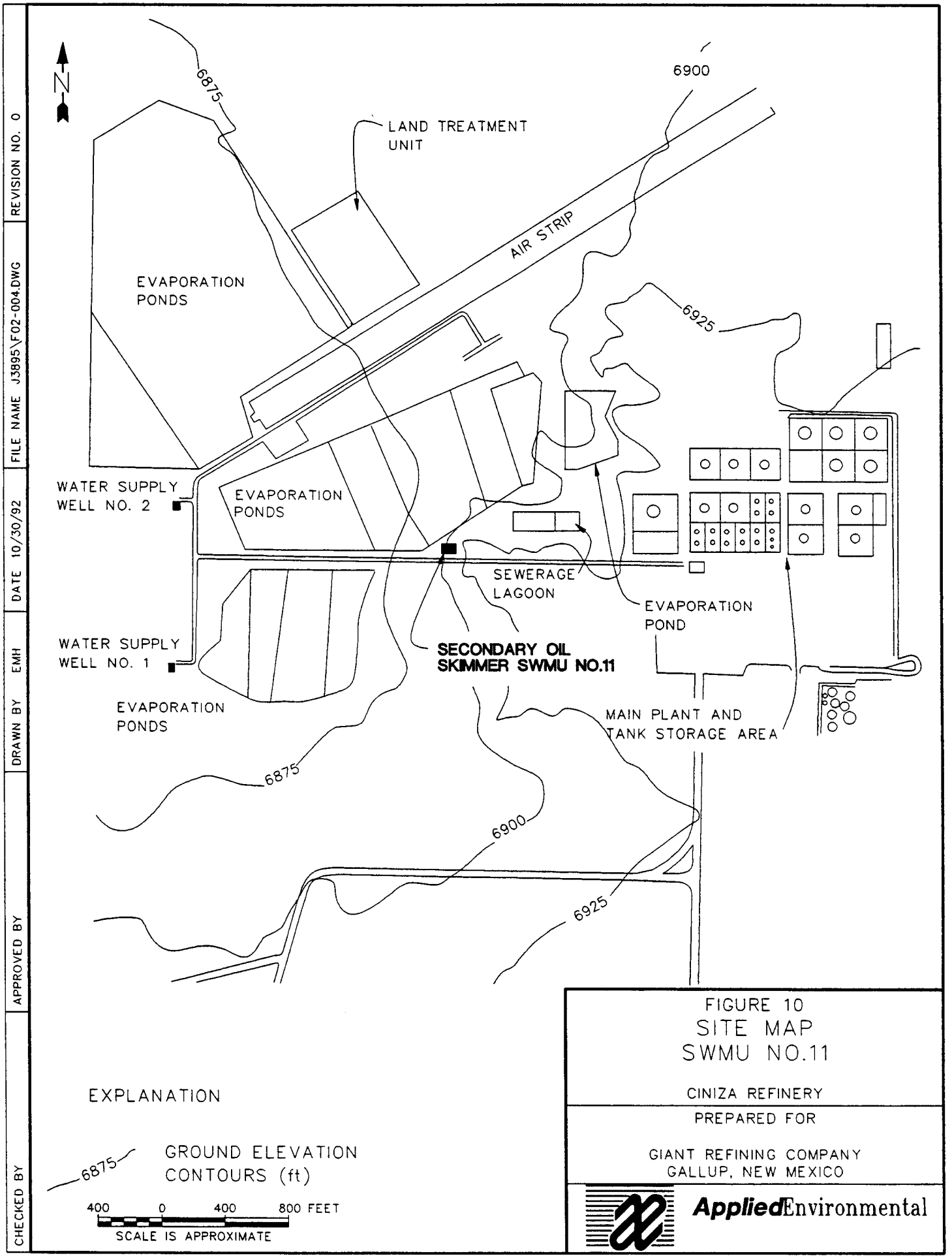
FIGURE 9
SWMU NO.7
FIRE TRAINING AREA

CINIZA REFINERY

PREPARED FOR

GIANT REFINING COMPANY
GALLUP, NEW MEXICO

Applied Environmental


N
6875
6900
LAND TREATMENT UNIT
AIR STRIP
EVAPORATION PONDS
6925
WATER SUPPLY WELL NO. 2
EVAPORATION PONDS
SEWERAGE LAGOON
EVAPORATION POND
WATER SUPPLY WELL NO. 1
SECONDARY OIL SKIMMER SWMU NO.11
EVAPORATION PONDS
MAIN PLANT AND TANK STORAGE AREA
6875
6900
6925
EXPLANATION
6875
GROUND ELEVATION CONTOURS (ft)
400 0 400 800 FEET
SCALE IS APPROXIMATE
FIGURE 10
SITE MAP
SWMU NO.11
CINIZA REFINERY
PREPARED FOR
GIANT REFINING COMPANY
GALLUP, NEW MEXICO
AppliedEnvironmental
REVISION NO. 0
FILE NAME J3895\F02-004.DWG
DATE 10/30/92
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APPROVED BY
CHECKED BY

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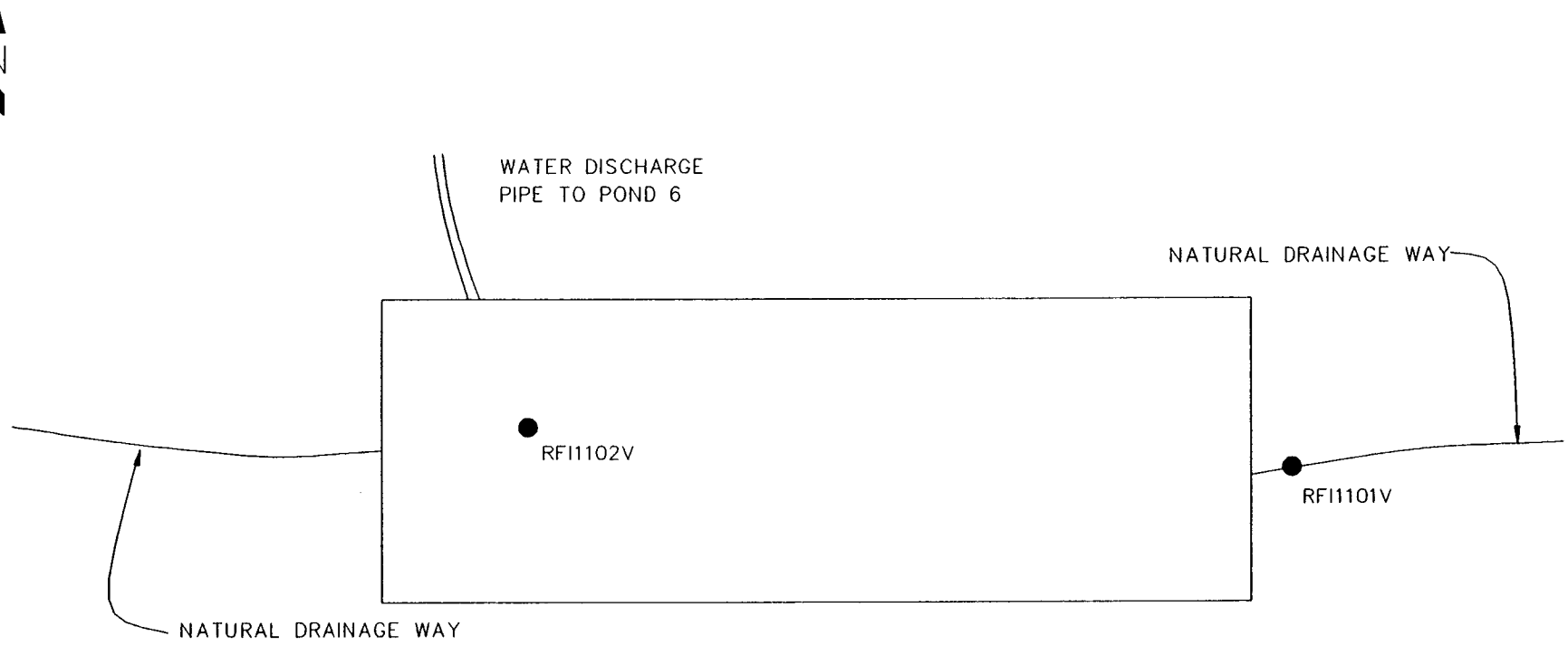

EXPLANATION

● SOIL BORING LOCATIONS

2.5 0 2.5 5 FEET

FIGURE 11
SWMU NO.11
SECONDARY OIL SKIMMER

CINIZA REFINERY

PREPARED FOR

GIANT REFINING COMPANY
GALLUP, NEW MEXICO

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APPENDIX A
FIELD DATA

DATA MANAGEMENT

Sample Location: SWMU #3 Sample Date: 5-6-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0301V0.0 Sample Time/Description: 8:20 AM SOIL
PID - 3.2

Sample No. RFI0301V3.0 Sample Time/Description: 8:45 AM SOIL
PID - Ø

Sample No. RFI0301V4.5 Sample Time/Description: 9:00 AM SOIL
PID - Ø

Sample No. _____ Sample Time/Description: _____

Sample No. _____ Sample Time/Description: _____

Surface Terrain: FLAT, GRAVEL + SOIL, BARREN

Weather Conditions: PARTLY SUNNY, 50°F, ~~EE~~ WIND @ 5 mph

General Field Observations: AUGERING VERY DIFFICULT FOR FIRST 14"

Boring Lithology: 0-1" - UNCONSOLIDATED SOIL, SAND, + GRAVEL. DARK BROWN W/SOME LIGHTER MIXTURE. 1" TO 14" - DISCOLORED SOIL. 14" TO 31" LIGHTER MIXED OR STAINED SOIL. 31" TO 51 RED CLAY W/SOME WHITE SPECKLS

DATA MANAGEMENT

Sample Location: SWMU # 3 Sample Date: 5-6-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0302V0.0 Sample Time/Description: 9:10 AM DRY SOIL
PID - ~~0~~ 1.2 (0-200 SCALE)

Sample No. RFI0302V3.0 Sample Time/Description: 9:20 AM MOIST SOIL
PID - 0

Sample No. RFI0302V4.5 Sample Time/Description: 9:30 AM MOIST SOIL
PID - 0

Sample No. _____ Sample Time/Description: ~~9:30 AM~~

Sample No. _____ Sample Time/Description: _____

Surface Terrain: FLAT, GRAVEL & SOIL, BARREN

Weather Conditions: MOSTLY CLOUDY, 60°F, ESE WIND @ 5mph.

General Field Observations: AUGERING VERY DIFFICULT FOR THE FIRST 14".

Boring Lithology: 0-1' - DISCOLORED MIXED SOIL / 50% GRAVEL FOR FIRST 8", 1' TO 20" DISCOLORED SOIL, SLIGHTLY MOIST. 20" TO 3' - MOIST RED/GRAY CLAY. NO VERIGATION OR SPOTTING / 25% SAND. 3' TO 5' - RED/GRAY CLAY WITH 25% SAND

DATA MANAGEMENT

Sample Location: SWMU #3 Sample Date: 5-6-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0303V0.0 Sample Time/Description: 10:40 AM DRY SOIL PID-Ø

Sample No. RFI0303V3.0 Sample Time/Description: 10:50 AM MOIST SOIL PID-Ø

Sample No. RFI0303V4.5 Sample Time/Description: 11:00 AM MOIST SOIL PID-

Sample No. _____ Sample Time/Description: _____

Sample No. _____ Sample Time/Description: _____

Surface Terrain: FLAT, GRAVEL & SOIL, BARREN

Weather Conditions: CLOUDY, SPRINKLES, 60°F, ESE WIND @ 5-10 MPH

General Field Observations: VERY DIFFICULT TO AUGER TO 12".

Boring Lithology: 0-1' - GRAVEL/SOIL MIX, DISCOLORED SOIL. 1' TO 2' - DISCOLORED CLAY/SAND MIX. 2'-3.5' RED CLAY MIX. 3.5 TO 5.0' RED/GRAY CLAY W/SOME ROCK + SAND (5%)

DATA MANAGEMENT

Sample Location: SWMU #3 Sample Date: 5-6-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0304V0.0 Sample Time/Description: 12:35PM DRY SOIL PID - Ø

Sample No. RFI0304V3.0 Sample Time/Description: 12:55PM MOIST SOIL PID - Ø

Sample No. RFI0304V4.5 Sample Time/Description: 1:20PM MOIST SOIL PID - Ø

Sample No. _____ Sample Time/Description: _____

Sample No. _____ Sample Time/Description: _____

Surface Terrain: FLAT, GRAVEL & SOIL, BARREN

Weather Conditions: PARTLY CLOUDY, 60°F, E WIND AT 5-10 MPH.

General Field Observations: _____

Boring Lithology: 0-6" - GRAVEL / SOIL 6"-1' DISCOLORED SAND / SOIL, 1'-1.5' - SLIGHTLY DISCOLORED SOIL, 1.5-5.0' RED CLAY W/SOME GREY SPECKS.

TABLE 2

Field Equipment Checklist
Soil and Sludge Sampling

ITEM	REMARKS
✓ PID Meter	✓ Calibrated
✓ Site Specific SWMU Work Plan	
✓ Generic Sampling Plan	
✓ Site Map With Sample Locations	
✓ Sample Bottles	
✓ Ice Chests	
✓ Trip Blanks	
✓ ~~Methanol~~ PROPANOL	
✓ Deionized Water	
✓ Squeeze Bottles	
✓ Personal Protective Equipment	
✓ Chain of Custody and Sample Record Forms	
✓ Plastic Bags (To provide clean surfaces)	
✓ Disposable Gloves	
✓ Paper Towels	
✓ Tape (For labels and dispenser)	
✓ Sharpie, Pens, Pencils	
✓ Blue Ice or Ice	
✓ Zip-Lock Bags, 1 Gallon	

5-6-92 JLS

DATA MANAGEMENT

Sample Location: SWMU #4 Sample Date: 5-5-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI04010000 Sample Time/Description: 1:20 PM CLAY
PID Ø

Sample No. RFI04010V3.0 Sample Time/Description: 2:35 PM
PID - Ø

Sample No RFI04010V4.5 Sample Time/Description: 2:50 PM
PID - 6 OUTSIDE Ø SAMPLE

Sample No. _____ Sample Time/Description: _____

Sample No. _____ Sample Time/Description: _____

Surface Terrain: SLOPED, BARREN GROUND

Weather Conditions: OVERCAST, OCCASIONAL SPRINKLES, 65°F, ENE WIND @ 5-10 MPH

General Field Observations: SMOKE FROM FIRE TRAINING AREA HIT ABOUT 2:49 PM WHILE AUGERING AND LASTED FOR 12 MINUTES. PID READING WENT UP ON OUTSIDE AIR, Ø ON SAMPLE.

Boring Lithology: 0-1' SANDY CLAY TURNING TO MOIST RED CLAY. 1-2' VERIGATED CLAY. 2-2.5' LARGE SANDSTONE ROCK + BAKED CLAY. 2.5' - 4.5 RED-GRAY CLAY, MOIST.

DATA MANAGEMENT

Sample Location: SWMU 4 Sample Date: 5-5-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0402V2.0 Sample Time/Description: 10:50 AM DRY SOIL PID-Ø

Sample No. RFI0402V3.0 Sample Time/Description: 11:10 AM BLACK LAYER PID - 4 OUTSIDE 16 SAMPLE

Sample No. RFI0402V4.5 Sample Time/Description: 1:00 PID-4 OUT 8.4 SAMPLE

Sample No. _____ Sample Time/Description: _____

Sample No. _____ Sample Time/Description: _____

Surface Terrain: STEEP SLOPE, MOSTLY BARE, OCCASIONAL GROWTH TO 1.5 FT

Weather Conditions: PARTLY SUNNY, 70°F, 10-15 MPH EAST WIND

General Field Observations: STRICT ATTENTION PAID TO PROPER DECONTAMINATION. ALL PID READINGS @ 0-200 RANGE

BLACK LAYER REQUIRED STEAMING, SOLVENT, STEAMING AGAIN AND THEN REGULAR WASHING AND DECONTAMINATION.

Boring Lithology: 0-1' - LOOSE SANDY SOIL - GRAY TO REDDISH BROWN TURNING TO RED CLAY @ .75'. SOME COLOR VERIGATION FROM ROCKS. BLACK LAYER @ 20". SEMI-BRITTLE SOLID W/SOME TAR LIKE MATERIAL TO 39". 39" TO 51" SAND STONE ROCK. 51" TO 54" - LIGHT RED MOIST CLAY W/SOME GRAY COLOR & SOME SAND

DATA MANAGEMENT

Sample Location: SINMU #4 Sample Date: 5-5-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0403V0.0 Sample Time/Description: 3:05 PM SOIL
PID Ø

Sample No. RFI0403V3.0 Sample Time/Description: 3:20 PM SOIL
PID 0-2000 SCALE 3.2 SAMPLE

Sample No. RFI0403V4.5 Sample Time/Description: 3:35 PM SOIL
PID .8 OUTSIDE 12 SAMPLE

Sample No. _____ Sample Time/Description: _____

Sample No. _____ Sample Time/Description: _____

Surface Terrain: BROKEN TERRAIN, SPARSE VEGETATION

Weather Conditions: OVERCAST, OCCASIONAL SPRINKLES, E WIND @ 5-10 mph. 60°F.

General Field Observations: SPENT FCC CATALYST HAD BLOWN INTO THE LOWLYING AREA AND WAS SCRAPED BACK TO REVEAL ORIGINAL SURFACE FOR SAMPLING. THE BLACK LAYER REQUIRED STEAMING, SOLVENT, STEAMING, AND THEN REGULAR WASHING TO GET AUGERS AND EQUIPMENT CLEAN.

Boring Lithology: 0-1' RED & GRAY SAND/CLAY MIXED. SOME SPENT CATALYST FROM DISPOSAL AREA BLOWN IN AND MIXED WITH SAMPLE. 1'-2' VERIGATED RED SOIL. 2-2.5' ORANGE-RUSTY CLAY. 2.5'-3.25' BLACK LAYER W/SOME TAR LIKE MATERIAL. MIXED BLACK & GRAY SOIL TO 4.5' 4.5' → SOLID SANDSTONE

TABLE 2

Field Equipment Checklist
Soil and Sludge Sampling

5-5-92

ITEM	REMARKS
✓ PID Meter	✓ Calibrated
✓ Site Specific SWMU Work Plan	
✓ Generic Sampling Plan	
✓ Site Map With Sample Locations	
✓ Sample Bottles	
✓ Ice Chests	
✓ Trip Blanks	
✓ ~~Methanol~~ PROPANOL	
✓ Deionized Water	
✓ Squeeze Bottles	
✓ Personal Protective Equipment	
✓ Chain of Custody and Sample Record Forms	
✓ Plastic Bags (To provide clean surfaces)	
✓ Disposable Gloves	
✓ Paper Towels	
✓ Tape (For labels and dispenser)	
✓ Sharpie, Pens, Pencils	
✓ Blue Ice or Ice	
✓ Zip-Lock Bags, 1 Gallon	

JLJ

DATA MANAGEMENT

Sample Location: SWMU #5 Sample Date: 5-12-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI0507V0.0 Sample Time/Description: 12:50 PM DRY SOIL PID-Ø

Sample No. 0507V3.0 Sample Time/Description: 1:00 PM DRY SOIL PID-Ø

Sample No. 0507V7.0 Sample Time/Description: 1:20 PM DRY SOIL PID-Ø

Sample No. 0507V9.5 Sample Time/Description: 1:40 PM DRY SOIL PID-Ø

Sample No. 0507D9.5 Sample Time/Description: 1:40 PM DRY SOIL PID-Ø

Surface Terrain: OPEN, SHALLOW SLOPE, SPARSE SURFACE VEGETATION

Weather Conditions: CLEAR, 70°F, W WIND @ 5 mpH (GUSTS TO 10-15 mpH)

General Field Observations:

Boring Lithology: 0-.5' CLAY/SAND/ROCKS, .5 - 3.5' DARKER BROWN CLAY WITH WHITE (OR GRAY) CLAY MIXED, 3.5-5.0' - RED CLAY W/SOME LIGHTER SPECKS, 5.0-7.0' - CLAY/SAND MIX WITH LOTS ROCK, GRAVEL, AND RUSTY MATERIAL, 7'-9.5' MOSTLY RED CLAY W/SOME LIGHTER COLORING

DATA MANAGEMENT

Sample Location: SWMU #5 Sample Date: 5-12-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI050&V0.0 Sample Time/Description: 2:30 PM DRY SOIL PID - Ø

Sample No. 0506V3.0 Sample Time/Description: 2:45 PM MOIST SOIL PID - Ø

Sample No. 0506V7.0 Sample Time/Description: 3:00 PM MOIST SOIL PID - Ø

Sample No. 0506V9.5 Sample Time/Description: 3:10 PM MOIST SOIL PID - Ø

Sample No. _____ Sample Time/Description: _____

Surface Terrain: OPEN, SLIGHT SLOPE, SCATTERED SURFACE VEGETATION

Weather Conditions: CLEAR, 75°F, WNW WIND @ 5-10 MPH

General Field Observations:

Boring Lithology: 0-2.5' MIXED CLAY/SAND 2.5'-7.5' RED CLAY W/MIXED ROCK AND GRAY CLAY. 2" LAYER OF SAND AT 6.0'. 7.5' TO 9.0' UNCONSOLIDATED CLAY/SAND/ROCK WITH 3 NARROW COLOR BANDS (RUSTY). 9.0-9.5' DENSE RED CLAY.

DATA MANAGEMENT

Sample Location: SWMU #5 Sample Date: 5-12-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. REI0508V0.0 Sample Time/Description: 3:20 PM DAMP SOIL PID-Ø

Sample No. 0508V3.0 Sample Time/Description: 3:25 PM DRY SOIL PID-Ø

Sample No. 0508V7.0 Sample Time/Description: 3:35 PM DRY SOIL PID-Ø

Sample No. 0508V9.5 Sample Time/Description: 3:50 PM DRY SOIL PID-Ø

Sample No. 0508D9.5 Sample Time/Description: 3:50 PM DRY SOIL PID-Ø

Surface Terrain: SLOPE, HEAVY GROWTH.

Weather Conditions: CLEAR, 75°F, W WIND @ 10 mpH

General Field Observations:

Boring Lithology: 0-1.5' - CLAY/SAND MIX. 1.5-4.0' WHITE/RED CLAY MIX WITH SOME ROCK. 4.0-5.0' MIXED COLORED SOIL. 5.0-7.5' MOSTLY RED CLAY/SAND. 7.5-9.5' MIXED CLAY/SAND/ROCK.

TABLE 2

Field Equipment Checklist
Soil and Sludge Sampling

ITEM	REMARKS
✓ PID Meter	✓ Calibrated
✓ Site Specific SWMU Work Plan	
✓ Generic Sampling Plan	
✓ Site Map With Sample Locations	
✓ Sample Bottles	
✓ Ice Chests	
✓ Trip Blanks	
✓ ~~Methanol~~ PROPANOL	
✓ Deionized Water	
✓ Squeeze Bottles	
✓ Personal Protective Equipment	
✓ Chain of Custody and Sample Record Forms	
✓ Plastic Bags (To provide clean surfaces)	
✓ Disposable Gloves	
✓ Paper Towels	
✓ Tape (For labels and dispenser)	
✓ Sharpie, Pens, Pencils	
✓ Blue Ice or Ice	
✓ Zip-Lock Bags, 1 Gallon	

5-12-92
JLS

DATA MANAGEMENT

Sample Location: SWMU #5 **Sample Date:** 5-13-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI0509V0.0 **Sample Time/Description:** 10:40 AM DRY SOIL PID-Ø

Sample No. 0509V3.0 **Sample Time/Description:** 10:50 AM DRY SOIL PID-Ø

Sample No. 0509V7.0 **Sample Time/Description:** 11:00 AM DRY SOIL PID-Ø

Sample No. 0509V9.5 **Sample Time/Description:** 11:10 AM DRY SOIL PID-Ø

Sample No. 0509E9.5 **Sample Time/Description:** 11:20 AM WATER

Surface Terrain: FLAT, SCATTERED SURFACE GROWTH

Weather Conditions: CLEAR, 70°F, W WIND @ 5-10 mpH

General Field Observations:

Boring Lithology: 0-3' RED CLAY w/ SOME SAND, 3-7.5' MIXED SOIL & ROCK, 7.5-8.5' ROCK W SOME SOIL (60-40 mix) 8.5-9.5 RED CLAY.

0-.5' MIXED SOIL & DEBRIS 1/4" LAYER OF BLACK CARBON MATERIAL @ .5'. .5-7.0' MIXED RED/GRAY CLAY.

DATA MANAGEMENT

Sample Location: SWMU #5 **Sample Date:** 5-13-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI0509V0.0 **Sample Time/Description:** 10:40AM DRY SOIL PID-Ø

Sample No. 0509V3.0 **Sample Time/Description:** 10:50AM DRY SOIL PID-Ø

Sample No. 0509V7.0 **Sample Time/Description:** 11:00AM DRY SOIL PID-Ø

Sample No. 0509V9.5 **Sample Time/Description:** 11:10AM DRY SOIL PID-Ø

Sample No. 0509E9.5 **Sample Time/Description:** 11:20AM WATER

Surface Terrain: FLAT, SCATTERED SURFACE GROWTH

Weather Conditions: CLEAR, 70°F, W WIND @ 5-10mpH

General Field Observations:

Boring Lithology: 0-3' RED CLAY w/SOME SAND, 3-7.5' MIXED SOIL & ROCK, 7.5-8.5' ROCK W SOME SOIL (60-40 mix) 8.5-9.5 RED CLAY.

0-.5' MIXED SOIL & DEBRIS 1/4" LAYER OF BLACK CARBON MATERIAL @ .5'. .5-7.0' MIXED RED/GRAY CLAY.

DATA MANAGEMENT

Sample Location: SWMU # 5 **Sample Date:** 5-13-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI0511V0.0 **Sample Time/Description:** 8:30AM DRY SOIL PID-Ø

Sample No. RFI0511V3.0 **Sample Time/Description:** 8:45AM MOIST SOIL PID-Ø

Sample No. 0511V7.0 **Sample Time/Description:** 9:00AM MOIST SOIL PID-Ø

Sample No. 0511V9.5 **Sample Time/Description:** 9:05AM DRY SOIL PID-Ø

Sample No. _____ **Sample Time/Description:** _____

Surface Terrain: SLOPE, OPEN GROUND IN LANDFILL.

Weather Conditions: CLEAR, 60°F, NNW WIND @ 5 mph.

General Field Observations:

Boring Lithology: 0-2' RED/WHITE CLAY W/SOME SAND.
2-7' RED CLAY, SOME THIN LAYERS OF ROCK OR GRAVEL.
7-9.5' BROKEN ROCK/UNCONSOLIDATED SOIL.

TABLE 2

Field Equipment Checklist
Soil and Sludge Sampling

	ITEM		REMARKS
✓	PID Meter	✓	Calibrated
✓	Site Specific SWMU Work Plan		
✓	Generic Sampling Plan		
✓	Site Map With Sample Locations		
✓	Sample Bottles		
✓	Ice Chests		
✓	Trip Blanks		
✓	~~Methanol~~ PROPANOL		
✓	Deionized Water		
✓	Squeeze Bottles		
✓	Personal Protective Equipment		
✓	Chain of Custody and Sample Record Forms		
✓	Plastic Bags (To provide clean surfaces)		
✓	Disposable Gloves		
✓	Paper Towels		
✓	Tape (For labels and dispenser)		
✓	Sharpie, Pens, Pencils		
✓	Blue Ice or Ice		
✓	Zip-Lock Bags, 1 Gallon		

5-13-92 JLS

DATA MANAGEMENT

Sample Location: SWMU #5 Sample Date: 5-14-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI0502V0.0 Sample Time/Description: 9:00 AM DRY SOIL PID-Ø

Sample No. 0502V3.0 Sample Time/Description: 9:20 AM DAMP SOIL PID-Ø

Sample No. 0502V7.0 Sample Time/Description: 9:30 AM MOIST SOIL PID-Ø

Sample No. 0502V9.5 Sample Time/Description: 9:40 AM MOIST SOIL PID-Ø

Sample No. 0502E9.5 Sample Time/Description: 9:45 AM WATER

Surface Terrain: FLAT, DENSE SURFACE VEGETATION. BRUSH AROUND PERIMETER TO 4'.

Weather Conditions: CLEAR, 65°F, ESE WIND @ 2-3 mph.

General Field Observations:

Boring Lithology: 0-1.5' RED CLAY. 1.5-3.5' MULTICOLORED SOIL W/SOME DEBRIS. 3.5-7' RED/GRAY CLAY. 7'-8' GRAVEL W/SOME WATER. 8'-9.5' RED/GRAY CLAY. DISTINCT GRAY BAND AT 9.0'. 3" THICK.

DATA MANAGEMENT

Sample Location: SWMU #5 Sample Date: 5-14-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI0510V0.0 Sample Time/Description: 10:10 AM DRY SOIL PID-0

Sample No. 0510V3.0 Sample Time/Description: 10:20 AM DAMP SOIL PID 0

Sample No. 0510V7.0 Sample Time/Description: 10:30 AM DAMP SOIL PID 0

Sample No. 0510V9.5 Sample Time/Description: 10:40 DAMP SOIL PID

Sample No. _____ Sample Time/Description: _____

Surface Terrain: OPEN, MOSTLY FLAT, SCATTERED DEBRIS

Weather Conditions: CLEAR, 70°F, W WIND @ 5mph

General Field Observations:

Boring Lithology: 0-1.5' MIXED SOIL AND DEBRIS. 1.5'-5' RED CLAY/SAND MIX SOME DEBRIS. 5-5.5' ROCK/GRAVEL/SAND LAYER 5.5-6.5' RED CLAY/SAND. 6.5-7.0' ROCK/GRAVEL/SAND LAYER. 7.0-9.5' RED CLAY/SAND.

DATA MANAGEMENT

Sample Location: SWMU #5 **Sample Date:** 5-14-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI0503V0.0 **Sample Time/Description:** 11:15AM DRY SOIL PID-Ø

Sample No. 0503V3.0 **Sample Time/Description:** 11:25AM DRY SOIL PID-Ø

Sample No. 0503V7.0 **Sample Time/Description:** 11:35AM DRY SOIL PID-Ø

Sample No. 0503V9.5 **Sample Time/Description:** 10:45AM DRY SOIL PID-Ø

Sample No. 0503D9.5 **Sample Time/Description:** 11:45AM DRY SOIL PID-Ø

Surface Terrain: FLAT, SURFACE GROWTH TO 1½'.

Weather Conditions: CLEAR, 75°F, W WIND @ 5-10 mph

General Field Observations:

Boring Lithology: 0-3' DEBRIS/SOIL. 3' TO 5' MIXED RED/WHITE CLAY W/SOME DEBRIS AND ROCK. 5'-9.5' RED CLAY

DATA MANAGEMENT

Sample Location: SWMU #5 **Sample Date:** 5-13-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFE0504V0.0 **Sample Time/Description:** 1:00 DRY SOIL
PID - Ø

Sample No. 0504V3.0 **Sample Time/Description:** 1:10 DRY SOIL
PID - .01

Sample No. 0504V7.0 **Sample Time/Description:** 1:20 DRY SOIL
PID - Ø

Sample No. 0504V9.5 **Sample Time/Description:** 1:30 DRY SOIL
PID - .4

Sample No. 0504E9.5 **Sample Time/Description:** WATER

Surface Terrain: FLAT, SURFACE GROWTH TO 1½'

Weather Conditions: CLEAR, 75°F, W WIND @ 5-10 MPH

General Field Observations: SIDES OF HOLE ARE SLOUGHING BADLY BETWEE 1 & 7'. STRONG CHANCE OF SOME CROSS CONTAMINATION.

Boring Lithology: 0-1' - CLAY/SAND MIX. 1' - 7' DEBRIS & DISCOLORED SOIL (RUSTY & BROWN). 7'-8' MIXED SOIL & CONCRETE. 8'-9.5' RED CLAY

DATA MANAGEMENT

Sample Location: SWMU #5 **Sample Date:** 5-14-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI0505V0.0 **Sample Time/Description:** 1:40 DRY SOIL PID - Ø

Sample No. RFI0505V3.0 **Sample Time/Description:** 1:50 SOIL PID - Ø

Sample No. RFI0505V7.0 **Sample Time/Description:** 2:00 SOIL PID - Ø

Sample No. RFI0505V9.5 **Sample Time/Description:** 2:10 SOIL PID - Ø

Sample No. ~~RFI0505V5~~ **Sample Time/Description:**

Surface Terrain: SHALLOW SLOPE, SURFACE VEGETATION TO 1 1/2'

Weather Conditions: CLEAR, 75°F, W WIND @ 5-10 mph

General Field Observations:

Boring Lithology: 0-1' MIXED CLAY/SAND. 1-1.5' BAND OF SOIL & DEBRIS. 1.5-6' RED CLAY W/SOME SAND. 6'-7' SLIGHTLY RUSTY BAND. 7-9.5' DENSE RED CLAY

DATA MANAGEMENT

Sample Location: SWMU #5 **Sample Date:** 5-15-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. REI0501V0.0 **Sample Time/Description:** 8:30 AM DRY SOIL PID - Ø

Sample No. 0501V3.0 **Sample Time/Description:** 8:40 AM DAMP SOIL PID - Ø

Sample No. 0501V7.0 **Sample Time/Description:** 8:50 AM MOIST SOIL PID - Ø

Sample No. 0501V9.5 **Sample Time/Description:** 9:00 AM MOIST SOIL PID - Ø

Sample No. 0501D9.5 **Sample Time/Description:** 9:00 AM MOIST SOIL PID - Ø

Surface Terrain: FLAT, HEAVY SURFACE VEGETATION. AROUND PERIMETER IS BRUSH 3-4' HIGH

Weather Conditions: CLEAR, 65°F, E WIND @ 2-5 mph

General Field Observations:

Boring Lithology: 0-1' RED CLAY, 1'-3' MULTICOLORED SOIL W/SOME METAL DEBRIS. RUSTY, 3'-7' RED CLAY. VERY MOIST @ 7'-7.5' WITH MOSTLY GRAVEL LAYER. 7.5'-9.0' RED CLAY W/SOME GRAY STREAKING.

TABLE 2

Field Equipment Checklist
Soil and Sludge Sampling

ITEM	REMARKS
✓ PID Meter	✓ Calibrated
✓ Site Specific SWMU Work Plan	
✓ Generic Sampling Plan	
✓ Site Map With Sample Locations	
✓ Sample Bottles	
✓ Ice Chests	
✓ Trip Blanks	
✓ ~~Methanol~~ PROPANOL	
✓ Deionized Water	
✓ Squeeze Bottles	
✓ Personal Protective Equipment	
✓ Chain of Custody and Sample Record Forms	
✓ Plastic Bags (To provide clean surfaces)	
✓ Disposable Gloves	
✓ Paper Towels	
✓ Tape (For labels and dispenser)	
✓ Sharpie, Pens, Pencils	
✓ Blue Ice or Ice	
✓ Zip-Lock Bags, 1 Gallon	

MAY 14, 1992

L Shelton

TABLE 2

Field Equipment Checklist
Soil and Sludge Sampling

ITEM	REMARKS
✓ PID Meter	✓ Calibrated
✓ Site Specific SWMU Work Plan	
✓ Generic Sampling Plan	
✓ Site Map With Sample Locations	
✓ Sample Bottles	
✓ Ice Chests	
✓ Trip Blanks	
✓ ~~Methanol~~ PROPANOL	
✓ Deionized Water	
✓ Squeeze Bottles	
✓ Personal Protective Equipment	
✓ Chain of Custody and Sample Record Forms	
✓ Plastic Bags (To provide clean surfaces)	
✓ Disposable Gloves	
✓ Paper Towels	
✓ Tape (For labels and dispenser)	
✓ Sharpie, Pens, Pencils	
✓ Blue Ice or Ice	
✓ Zip-Lock Bags, 1 Gallon	

5-15-92 JJS

DATA MANAGEMENT

Sample Location: SWMU # 7 Sample Date: 5-7-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0701V0.0 Sample Time/Description: 10:30 AM MOIST SOIL PID - 11

Sample No. RFI0701V3.0 Sample Time/Description: 10:45 AM MOIST SOIL PID - 4.2

Sample No. RFI0701V4.5 Sample Time/Description: 11:00 AM MOIST SOIL PID - .2

Sample No. _____ Sample Time/Description: _____

Sample No. _____ Sample Time/Description: _____

Surface Terrain: SLIGHT SLOPE, GRAVEL & SOIL SURFACE, MINUTE PLANT GROWTH

Weather Conditions: MOSTLY SUNNY, 65°F, LIGHT E WIND @ 1-5 MPH.

General Field Observations:

Boring Lithology: 0-1' - MIXED CLAY/SAND/GRAVEL, 1-27" DARK, MOSTLY CLAY. 27"-4.0' - RED CLAY 4-5 - RED/GRAY CLAY MIX

DATA MANAGEMENT

Sample Location: SWMU #7 Sample Date: 5-7-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0702V0.0 Sample Time/Description: 11:00 AM MOIST SOIL PID - .4

Sample No. RFI0702V3.0 Sample Time/Description: 11:20 AM MOIST SOIL PID - 1.4

Sample No. RFI0702V4.5 Sample Time/Description: 11:30 AM MOIST CLAY PID - .3

Sample No. RFI0702D4.5 Sample Time/Description: 11:30 AM MOIST CLAY

Sample No. _____ Sample Time/Description: _____

Surface Terrain: SLOPE, SOIL & GRAVEL SURFACE

Weather Conditions: SEE 1ST PAGE WIND SWITCHING FROM E TO W

General Field Observations: OLD SMOKE CARTRIDGE FROM FIRE TRAINING, 5-5-92, STARTED SMOKING AGAIN AND COVERED AREA WITH SMOKE FOR ~3 MINUTES. DO NOT BELIEVE IT AFFECTED SAMPLES.

Boring Lithology: 0-1.5' DARK CLAY W/25% SAND AND SOME GRAVEL. 1.5 to 3.0' VERIGATED CLAYS. 3.0-5' RED/GRAY CLAY.

DATA MANAGEMENT

Sample Location: SWMU #7 Sample Date: 5-7-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0703V0.0 Sample Time/Description: 11:40 AM MOIST SOIL PID - .4

Sample No. RFI0703V3.0 Sample Time/Description: 11:50 AM MOIST SOIL PID - Ø

Sample No. RFI0703V4.5 Sample Time/Description: 11:55 AM MOIST SOIL PID - Ø

Sample No. _____ Sample Time/Description: _____

Sample No. _____ Sample Time/Description: _____

Surface Terrain: SLIGHT SLOPE, SOIL & GRAVEL SURFACE

Weather Conditions: PARTLY SUNNY, SSW WIND @ 3-5 MPH. 60°F.

General Field Observations:

Boring Lithology: 0-21" DARK DISCOLORED SOIL WITH SOME GRAVEL. 21" TO 5' RED/GRAY CLAY.

DATA MANAGEMENT

Sample Location: SWMU #7 Sample Date: 5-7-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0704V0.0 Sample Time/Description: 12:50 PM MOIST SOIL PID 1.4

Sample No. RFI0704V3.0 Sample Time/Description: 1:05 PM MOIST SOIL PID .8

Sample No. RFI0704V4.5 Sample Time/Description: 1:20 PM MOIST SOIL PID .9

Sample No. RFI0704E4.5 Sample Time/Description: 1:25 PM WATER

Sample No. _____ Sample Time/Description: _____

Surface Terrain: SLOPE, SOIL + GRAVEL SURFACE

Weather Conditions: CLOUDY, 55°F, WSW @ 5 MPH

General Field Observations: _____

Boring Lithology: 0-1' DISCOLORED SOIL/SAND W/GRAVEL, 14" TO 22" SLIGHTLY DISCOLORED SOIL. 22" TO 5' RED CLAY W/SOME WHITE SPECKING AT 4'-5'. 2" LAYER OF DARKER SOIL @ 4.0' LEVEL.

DATA MANAGEMENT

Sample Location: SWMU #11 Sample Date: 5-7-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI1101V0.0 Sample Time/Description: 2:00 WET SOIL PID - Ø

Sample No. RFI1101V3.0 Sample Time/Description: 2:45 PM WET SOIL PID - Ø.2

Sample No. RFI1101D3.0 Sample Time/Description: 2:45 PM WET SOIL PID Ø.2

Sample No. _____ Sample Time/Description: _____

Sample No. _____ Sample Time/Description: _____

Surface Terrain: WET AREA IN BOTTOM OF ORIGINAL DRAINAGE DITCH

Weather Conditions: CLOUDY, WSW @ 5 mph, 65°F

General Field Observations: _____

Boring Lithology: 0-1' MIXED CLAY & SAND, 1' to 3.5' BLACK LAYER, SMELLS LIKE SEWAGE. VERY WET.

DATA MANAGEMENT

Sample Location: SWMU #11 Sample Date: 5-7-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI1102V0.0 Sample Time/Description: 2:10 PM MOIST SOIL PID - Ø

Sample No. RFI1102V3.0 Sample Time/Description: 2:25 PM MOIST SOIL PID - Ø

Sample No. RFI1102E3.0 Sample Time/Description: 2:35 PM WATER

Sample No. _____ Sample Time/Description: _____

Sample No. _____ Sample Time/Description: _____

Surface Terrain: BENEATH ORIGINAL SKIMMER - VERY MOIST

Weather Conditions: CLOUDY, WSW @ 5 mph, 65°F

General Field Observations: _____

Boring Lithology: 0-4' RED/GRAY CLAY MIX WITH SOME WHITE SPECKLING

TABLE 2

Field Equipment Checklist
Soil and Sludge Sampling

ITEM	REMARKS
✓ PID Meter	✓ Calibrated
✓ Site Specific SWMU Work Plan	
✓ Generic Sampling Plan	
✓ Site Map With Sample Locations	
✓ Sample Bottles	
✓ Ice Chests	
✓ Trip Blanks	
✓ ~~Methanol~~ PROPANOL	
✓ Deionized Water	
✓ Squeeze Bottles	
✓ Personal Protective Equipment	
✓ Chain of Custody and Sample Record Forms	
✓ Plastic Bags (To provide clean surfaces)	
✓ Disposable Gloves	
✓ Paper Towels	
✓ Tape (For labels and dispenser)	
✓ Sharpie, Pens, Pencils	
✓ Blue Ice or Ice	
✓ Zip-Lock Bags, 1 Gallon	

5-7-92 JLS

GIANT
REFINING CO.

Route 3, Box 7
Gallup, New Mexico
87301

505
722-3833

June 9, 1992

Barbara Rutten
Marketing Director
Westech Laboratories
3737 East Broadway Road
Phoenix, Arizona 85040

Re: RFI Phase III Background Metals

Dear Barbara:

With our submittals of soils for analysis, Giant requested analysis of only four of the listed metals for SWMU's #4 and #5 pending approval from the U.S. EPA Region VI.

Giant has received permission to analyze for an abbreviated list of background metals to include:

Arsenic
Barium
Beryllium
* Cadmium
* Chromium
* Lead
Nickel
Vanadium
* Mercury

* Indicates metals already analyzed

Giant requests that Westech Laboratories analyze the soil samples you are holding in cold storage (SWMU #4 and #5) for the balance of the metals on this abbreviated list.

Specific sample numbers to be analyzed are:

RFI0401V0.0	RFI0503D9.5	RFI0590V0.0
RFI0401V3.0	RFI0504V0.0	RFI0509V3.0
RFI0401V4.5	RFI0504V3.0	RFI0509V7.0
RFI0402V0.0	RFI0504V7.0	RFI0509V9.5
RFI0402V3.0	RFI0504V9.5	RFI0510V0.0
RFI0402V4.5	RFI0505V0.0	RFI0510V3.0

RFI0403V0.0	RFI0505V3.0	RFI0510V7.0
RFI0403V3.0	RFI0505V7.0	RFI0510V9.5
RFI0403V4.5	RFI0505V9.5	RFI0511V0.0
RFI0501V0.0	RFI0506V0.0	RFI0511V3.0
RFI0501V3.0	RFI0506V3.0	RFI0511V7.0
RFI0501V7.0	RFI0506V7.0	RFI0511V9.5
RFI0501V9.5	RFI0506V9.5	RFI0512V0.0
RFI0501D9.5	RFI0507V0.0	RFI0512V3.0
RFI0502V0.0	RFI0507V3.0	RFI0512V7.0
RFI0502V3.0	RFI0507V7.0	RFI0512V9.5
RFI0502V7.0	RFI0507V9.5	RFI0512D9.5
RFI0502V9.5	RFI0507D9.5	
RFI0503V0.0	RFI0508V0.0	
RFI0503V3.0	RFI0508V3.0	
RFI0503V7.0	RFI0508V7.0	
RFI0503V9.5	RFI0508V9.5	
	RFI0508D9.5	

If you require additional information about this analysis, please contact mat at (505) 722-0227.

Sincerely,

Lynn Shelton

Lynn Shelton
Environmental Assistant
Ciniza Refinery

TLS:sp

APPENDIX B

TABULATED ANALYTICAL DATA

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

TOTAL METALS

SAMPLE POINT NUMBER		10	10	10	10
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
Arsenic	mg/kg	ND	3.6	5.4	2.6
Barium	mg/kg	280	300	370	100
Beryllium	mg/kg	ND	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND	ND
Chrome	mg/kg	8.8	5.6	10	6.2
Lead	mg/kg	7.6	5.0	12	7.7
Mercury	mg/kg	ND	ND	ND	ND
Nickel	mg/kg	8.0	5.6	5.7	6.9
Vanadium	mg/kg	11	6.4	8.2	27

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

pH

SAMPLE POINT NUMBER		10	10	10	10
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
ph	S.U.	7.5	7.7	7.9	8.2

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #3- "Barrel Storage Area"

8240-PRIORITY POLLUTANT VOLATILES

SAMPLE POINT		01	01	01	02	02	02
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'	V0.0'	V3.0'	V4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	160	ND	ND	1800	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	340	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	70	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	980	ND	ND
Benzene	ug/kg	340	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	490	ND	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND	ND	ND
Styrene	ug/kg	170	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND	ND
Chloroethylvinyl Ether	ug/kg	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	71	ND	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND	ND
Total xylenes	ug/kg	8600	ND	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #3- "Barrel Storage Area"

8240-PRIORITY POLLUTANT VOLATILES

SAMPLE POINT		03	03	03	04	04	04
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'	V0.0'	V3.0'	V4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND	ND
Chloroethylvinyl Ether	ug/kg	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND	ND
Total xylenes	ug/kg	ND	ND	ND	210	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #4- "Old Burn Pit"

8240-Volatile Organics

SAMPLE POINT		01	01	01	02	02	02
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'	V0.0'	V3.0'	V4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND	ND
2-Chloroethylvinyl Ether	ug/kg	ND	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	70	ND
Ethyl Benzene	ug/kg	ND	ND	ND	ND	1000	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND
Total Xylenes	ug/kg	ND	ND	ND	ND	2100	ND
Methyl Ethyl Ketone	ug/kg	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ug/kg	ND	ND	ND	ND	ND	ND
Carbon Disulfide	ug/kg	ND	ND	ND	ND	ND	ND
1,4-Dioxane	ug/kg	ND	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	420	ND

SAMPLE POINT		03	03	03
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT
1,2-Dichloroethane	ug/kg	ND	ND	ND
2-Chloroethylvinyl Ether	ug/kg	ND	ND	ND
Benzene	ug/kg	ND	ND	ND
Toluene	ug/kg	ND	67	87
Ethyl Benzene	ug/kg	ND	910	510
Chlorobenzene	ug/kg	ND	ND	50
Total Xylenes	ug/kg	ND	2200	1100
Methyl Ethyl Ketone	ug/kg	ND	ND	ND
1,2-Dibromoethane	ug/kg	ND	ND	ND
Carbon Disulfide	ug/kg	ND	ND	ND
1,4-Dioxane	ug/kg	ND	ND	ND
Styrene	ug/kg	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #4- "Old Burn Pit"

8270-Semi-Volatiles

SAMPLE POINT		01	01	01	02	02	02
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'	V0.0'	V3.0'	V4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Phenol	ug/kg	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND
2-Methylphenol	ug/kg	ND	ND	ND	ND	ND	ND
3-Methylphenol	ug/kg	ND	ND	ND	ND	ND	ND
4-Methylphenol	ug/kg	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ug/kg	ND	ND	ND	ND	ND	ND
Naphthalene	ug/kg	ND	ND	ND	ND	520	ND
Dimethyl phthalate	ug/kg	ND	ND	ND	ND	ND	890
2,4-Dinitrophenol	ug/kg	ND	ND	ND	ND	ND	ND
4-Nitrophenol	ug/kg	ND	ND	ND	ND	ND	ND
Diethyl phthalate	ug/kg	ND	ND	ND	300	ND	ND
Phenanthrene	ug/kg	ND	ND	ND	ND	670	ND
Anthracene	ug/kg	ND	ND	ND	ND	ND	ND
Di-n-butyl Phthalate	ug/kg	1500	2700	1300	3000	ND	1800
Flouranthene	ug/kg	ND	ND	ND	ND	ND	ND
Pyrene	ug/kg	ND	ND	ND	ND	ND	ND
Butyl benzo phthalate	ug/kg	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ug/kg	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl) phthalate	ug/kg	ND	ND	ND	400	ND	ND
Chrysene	ug/kg	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ug/kg	ND	ND	ND	ND	ND	ND
Benzo(b)flouranthene	ug/kg	ND	ND	ND	ND	ND	ND
Benzo(k)flouranthene	ug/kg	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ug/kg	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	ug/kg	ND	ND	ND	ND	ND	ND
Dibenzo(a,j)acridine	ug/kg	ND	ND	ND	ND	ND	ND
7,12-Dimethylbenz(a)anthracene	ug/kg	ND	ND	ND	ND	ND	ND
Indene	ug/kg	ND	ND	ND	ND	ND	ND
Methylchrysene	ug/kg	ND	ND	ND	ND	ND	ND
Pyridine	ug/kg	ND	ND	ND	ND	ND	ND
Quinoline	ug/kg	ND	ND	ND	ND	ND	ND
Benzenethiol	ug/kg	ND	ND	ND	ND	ND	ND
1-Methylnaphthalene	ug/kg	ND	ND	ND	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #4- "Old Burn Pit"

8270-Semi-Volatiles

SAMPLE POINT		03	03	03
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT
Phenol	ug/kg	ND	ND	ND
1,3-Dichlorobenzene	ug/kg	ND	ND	ND
1,4-Dichlorobenzene	ug/kg	ND	ND	ND
1,2-Dichlorobenzene	ug/kg	ND	ND	ND
2-Methylphenol	ug/kg	ND	ND	ND
3-Methylphenol	ug/kg	ND	ND	ND
4-Methylphenol	ug/kg	ND	ND	ND
2,4-Dimethylphenol	ug/kg	ND	ND	ND
Naphthalene	ug/kg	ND	ND	ND
Dimethyl phthalate	ug/kg	ND	18000	18000
2,4-Dinitrophenol	ug/kg	ND	ND	ND
4-Nitrophenol	ug/kg	ND	ND	ND
Diethyl phthalate	ug/kg	ND	ND	ND
Phenanthrene	ug/kg	ND	ND	ND
Anthracene	ug/kg	ND	ND	ND
Di-n-butyl Phthalate	ug/kg	430	ND	ND
Flouranthene	ug/kg	ND	ND	ND
Pyrene	ug/kg	ND	ND	ND
Butyl benzo phthalate	ug/kg	ND	ND	ND
Benzo(a)anthracene	ug/kg	ND	ND	ND
Bis(2-ethylhexyl) phthalate	ug/kg	ND	ND	ND
Chrysene	ug/kg	ND	ND	ND
Di-n-octyl phthalate	ug/kg	ND	ND	ND
Benzo(b)flouranthene	ug/kg	ND	ND	ND
Benzo(k)flouranthene	ug/kg	ND	ND	ND
Benzo(a)pyrene	ug/kg	ND	ND	ND
Dibenzo(a,h)anthracene	ug/kg	ND	ND	ND
Dibenzo(a,j)acridine	ug/kg	ND	ND	ND
7,12-Dimethylbenz(a)anthracene	ug/kg	ND	ND	ND
Indene	ug/kg	ND	ND	ND
Methylchrysene	ug/kg	ND	ND	ND
Pyridine	ug/kg	ND	ND	ND
Quinoline	ug/kg	ND	ND	ND
Benzenethiol	ug/kg	ND	ND	ND
1-Methylnaphthalene	ug/kg	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #4- "Old Burn Pit"

Total Metals

SAMPLE POINT		01	01	01	02	02	02
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'	V0.0'	V3.0'	V4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Arsenic	mg/kg	ND	MD	ND	ND	ND	ND
Barium	mg/kg	380	1300	900	480	360	160
Beryllium	mg/kg	ND	ND	ND	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND	ND	ND	ND
Chromium	mg/kg	9.8	15	6.2	10.0	3.2	17
Lead	mg/kg	9.5	12	10	13.0	16.0	11
Mercury	mg/kg	ND	ND	ND	ND	ND	ND
Nickel	mg/kg	11	12.0	9.1	11	6.3	17
Vanadium	mg/kg	7.9	9.0	6.8	11	ND	5.7

Total Metals

SAMPLE POINT		03	03	03
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT
Arsenic	mg/kg	ND	ND	ND
Barium	mg/kg	120	290	110
Beryllium	mg/kg	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND
Chromium	mg/kg	19	15	20
Lead	mg/kg	30	27	18
Mercury	mg/kg	ND	ND	ND
Nickel	mg/kg	20	21	36
Vanadium	mg/kg	58	ND	28

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GIANT REFINING
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SOLID WASTE MANAGEMENT UNIT #4- "Old Burn Pit"

pH

SAMPLE POINT		01	01	01	02	02	02
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'	V0.0'	V3.0'	V4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
pH	S.U.	7.5	7.2	7.8	8.1	2.2	7.3

pH

SAMPLE POINT		03	03	03
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT
pH	S.U.	2.2	7.1	4.2

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5-"Old Land Fills"

8260 VOLATILES

SAMPLE POINT NUMBER		01	01	01	01	01
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Total xylenes	ug/kg	ND	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5-"Old Land Fills"

8260 VOLATILES

SAMPLE POINT NUMBER		02	02	02	02	02
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	E9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Total xylenes	ug/kg	ND	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5-"Old Land Fills"

8260 VOLATILES

SAMPLE POINT NUMBER		03	03	03	03	03
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Total xylenes	ug/kg	ND	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5-"Old Land Fills"

8260 VOLATILES

SAMPLE POINT NUMBER		04	04	04	04	04
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	E9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Total xylenes	ug/kg	ND	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
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SOLID WASTE MANAGEMENT UNIT #5-"Old Land Fills"

8260 VOLATILES

SAMPLE POINT NUMBER		05	05	05	05
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND
Trans-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND
Total xylenes	ug/kg	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5-"Old Land Fills"

8260 VOLATILES

SAMPLE POINT NUMBER		06	06	06	06
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND
Trans-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND
Total xylenes	ug/kg	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5-"Old Land Fills"

8260 VOLATILES

SAMPLE POINT NUMBER		07	07	07	07	07
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Total xylenes	ug/kg	ND	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
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SOLID WASTE MANAGEMENT UNIT #5-"Old Land Fills"

8260 VOLATILES

SAMPLE POINT NUMBER		08	08	08	08	08
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Total xylenes	ug/kg	ND	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND

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SOLID WASTE MANAGEMENT UNIT #5-"Old Land Fills"

8260 VOLATILES

SAMPLE POINT NUMBER		09	09	09	09	09
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	E9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Total xylenes	ug/kg	ND	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND

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SOLID WASTE MANAGEMENT UNIT #5-"Old Land Fills"

8260 VOLATILES

SAMPLE POINT NUMBER		10	10	10	10
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND
Trans-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND
Total xylenes	ug/kg	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND

PHASE III, RFI 1992
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SOLID WASTE MANAGEMENT UNIT #5-"Old Land Fills"

8260 VOLATILES

SAMPLE POINT NUMBER		11	11	11	11
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND
Trans-1,3-Dichioropropylene	ug/kg	ND	ND	ND	ND
Total xylenes	ug/kg	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5-"Old Land Fills"

8260 VOLATILES

SAMPLE POINT NUMBER		12	12	12	12	12
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND
Tetrechloroethene (PCE)	ug/kg	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND
Chloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND
Dichlorodiflouromethane	ug/kg	ND	ND	ND	ND	ND
Dichloromethane	ug/kg	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ND
Methyl ethyl ketone	ug/kg	ND	ND	ND	ND	ND
Methyl isobutyl ketone	ug/kg	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ND
Trichloroflouromethane	ug/kg	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropylene	ug/kg	ND	ND	ND	ND	ND
Total xylenes	ug/kg	ND	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND
Cis-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND	ND
Ethylmethacrylate	ug/kg	ND	ND	ND	ND	ND
Iodomethane (Methyliodide)	ug/kg	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

TOTAL METALS

SAMPLE POINT NUMBER		01	01	01	01	01
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
Arsenic	mg/kg	4.3	14	9.4	6.6	2.7
Barium	mg/kg	290	240	270	120	290
Beryllium	mg/kg	ND	ND	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND	ND	ND
Chrome	mg/kg	8.7	6.8	8.3	27	12
Lead	mg/kg	10	8.1	6.5	10	11
Mercury	mg/kg	ND	ND	ND	ND	ND
Nickel	mg/kg	6.8	4.9	6.1	14	10
Vanadium	mg/kg	8.1	6.3	7.0	5.1	4.6

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

pH

SAMPLE POINT NUMBER		01	01	01	01	01
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
ph	S.U.	7.3	7.4	8.3	9.2	9.5

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

TOTAL METALS

SAMPLE POINT NUMBER		02	02	02	02
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
Arsenic	mg/kg	12	6.7	9.6	7.8
Barium	mg/kg	340	380	130	290
Beryllium	mg/kg	ND	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND	ND
Chrome	mg/kg	8.2	5.7	16	8.5
Lead	mg/kg	7.8	9.0	14	6.5
Mercury	mg/kg	ND	ND	ND	ND
Nickel	mg/kg	7.6	4.7	7.3	7.3
Vanadium	mg/kg	8.1	8.6	7.3	4.7

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

pH

SAMPLE POINT NUMBER		02	02	02	02
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
ph	S.U.	8.4	9.2	7.7	8.6

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

TOTAL METALS

SAMPLE POINT NUMBER		03	03	03	03	03
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
Arsenic	mg/kg	19	16	15	23	22
Barium	mg/kg	260	110	170	130	200
Beryllium	mg/kg	ND	ND	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND	ND	ND
Chrome	mg/kg	110	10	12	11	5.8
Lead	mg/kg	21	9.4	18	ND	6.1
Mercury	mg/kg	ND	ND	ND	ND	ND
Nickel	mg/kg	46	8.8	9.7	10	8.6
Vanadium	mg/kg	10	5.9	6.7	5.1	6.4

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

pH

SAMPLE POINT NUMBER		03	03	03	03	03
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
ph	S.U.	8.1	8.8	9.1	9.0	8.8

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

TOTAL METALS

SAMPLE POINT NUMBER		04	04	04	04
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
Arsenic	mg/kg	8.5	22	14	24
Barium	mg/kg	460	230	170	320
Beryllium	mg/kg	ND	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND	ND
Chrome	mg/kg	21	270	8.9	31
Lead	mg/kg	16	9.6	9.0	16
Mercury	mg/kg	0.31	ND	ND	ND
Nickel	mg/kg	23	83	9.7	13
Vanadium	mg/kg	9.6	13	6.7	5.3

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

pH

SAMPLE POINT NUMBER		04	04	04	04
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
ph	S.U.	9.2	8.1	8.5	9.4

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

TOTAL METALS

SAMPLE POINT NUMBER		05	05	05	05
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
Arsenic	mg/kg	22	20	18	35
Barium	mg/kg	200	730	410	220
Beryllium	mg/kg	ND	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND	ND
Chrome	mg/kg	9.3	10	9.0	9.8
Lead	mg/kg	6.4	9.2	7.8	9.3
Mercury	mg/kg	ND	ND	ND	ND
Nickel	mg/kg	9.0	11	11	12
Vanadium	mg/kg	28	9.1	5.7	6.3

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

pH

SAMPLE POINT NUMBER		05	05	05	05
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
ph	S.U.	9.3	7.5	8.0	7.9

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

TOTAL METALS

SAMPLE POINT NUMBER		06	06	06	06
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
Arsenic	mg/kg	ND	21	25	20
Barium	mg/kg	390	140	56	89
Beryllium	mg/kg	ND	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND	ND
Chrome	mg/kg	9.6	12	8.7	6.4
Lead	mg/kg	13	7.9	6.9	7.1
Mercury	mg/kg	ND	ND	ND	ND
Nickel	mg/kg	6.8	10	11	7.5
Vanadium	mg/kg	11	5.7	5	3.9

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

pH

SAMPLE POINT NUMBER		06	06	06	06
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
ph	S.U.	8.7	8.8	8.9	9.3

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

TOTAL METALS

SAMPLE POINT NUMBER		07	07	07	07	07
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
Arsenic	mg/kg	7.3	6.1	4.2	4.1	3.7
Barium	mg/kg	720	340	300	520	760
Beryllium	mg/kg	ND	ND	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND	ND	ND
Chrome	mg/kg	5.6	6.1	5.1	7.8	5.2
Lead	mg/kg	ND	7.0	9.5	6.0	9.0
Mercury	mg/kg	ND	ND	ND	ND	ND
Nickel	mg/kg	5.8	7.5	3.6	9.2	5.9
Vanadium	mg/kg	8.7	7.1	6.6	8.2	6.4

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

pH

SAMPLE POINT NUMBER		07	07	07	07	07
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
ph	S.U.	8.8	8.2	9.1	8.6	8.4

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

TOTAL METALS

SAMPLE POINT NUMBER		08	08	08	08	08
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
Arsenic	mg/kg	ND	3.4	5.5	ND	ND
Barium	mg/kg	590	440	150	700	490
Beryllium	mg/kg	ND	ND	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND	ND	ND
Chrome	mg/kg	7.2	10	4.7	7.1	8.3
Lead	mg/kg	9.6	5.9	ND	9.6	11
Mercury	mg/kg	ND	ND	ND	ND	ND
Nickel	mg/kg	5.5	11	7.1	5.3	6.3
Vanadium	mg/kg	14	10	6.5	20	16

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

pH

SAMPLE POINT NUMBER		08	08	08	08	08
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
ph	S.U.	8.2	8.5	7.7	9.1	9.0

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

TOTAL METALS

SAMPLE POINT NUMBER		09	09	09	09
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
Arsenic	mg/kg	ND	ND	ND	ND
Barium	mg/kg	600	680	370	130
Beryllium	mg/kg	ND	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND	ND
Chrome	mg/kg	15	7.3	7.2	4.1
Lead	mg/kg	17	6.2	ND	ND
Mercury	mg/kg	ND	ND	ND	ND
Nickel	mg/kg	13	7.1	8.6	5.0
Vanadium	mg/kg	14	13	8.2	5.9

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

pH

SAMPLE POINT NUMBER		09	09	09	09
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
ph	S.U.	8.7	7.9	8.3	8.8

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

TOTAL METALS

SAMPLE POINT NUMBER		11	11	11	11
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
Arsenic	mg/kg	ND	ND	ND	ND
Barium	mg/kg	850	1600	710	780
Beryllium	mg/kg	ND	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND	ND
Chrome	mg/kg	7.4	9.1	6.1	7.2
Lead	mg/kg	6.1	9.8	6.2	9.5
Mercury	mg/kg	ND	ND	ND	ND
Nickel	mg/kg	7.8	7.2	5.4	5.2
Vanadium	mg/kg	12	6.5	6.6	11

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

pH

SAMPLE POINT NUMBER		11	11	11	11
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT
ph	S.U.	8.2	7.8	8.3	8.7

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

TOTAL METALS

SAMPLE POINT NUMBER		12	12	12	12	12
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
Arsenic	mg/kg	ND	ND	ND	6.7	2.7
Barium	mg/kg	460	310	420	190	200
Beryllium	mg/kg	ND	ND	ND	ND	ND
Cadmium	mg/kg	ND	ND	ND	ND	ND
Chrome	mg/kg	8.5	6.7	7.5	6.6	7.1
Lead	mg/kg	5.5	6.4	11	6.3	6.0
Mercury	mg/kg	ND	ND	ND	ND	ND
Nickel	mg/kg	6.6	4.5	6.2	7.0	7.6
Vanadium	mg/kg	9.4	4.8	9.2	4.9	4.2

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #5- "Old Land Fills"

pH

SAMPLE POINT NUMBER		12	12	12	12	12
SAMPLE DEPTH NUMBER		V0.0'	V3.0'	V7.0'	V9.5'	D9.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
ph	S.U.	8.3	7.9	8.3	8.5	8.6

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #7- "Fire Training Area"

Oil & Grease

SAMPLE POINT		01	01	01	02	02	02	02
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'	V0.0'	V3.0'	V4.5'	D4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Oil & Grease	mg/kg	1700	150	<10	<10	2700	2300	2000

Oil & Grease

SAMPLE POINT		03	03	03	04	04	04
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'	V0.0'	V3.0'	V4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Oil & Grease	mg/kg	27000	44	<10	29000	8000	2800

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #7- "Fire Training Area"

Total Petroleum Fuel Hydrocarbons

SAMPLE POINT		01	01	01	02	02	02	02
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'	V0.0'	V3.0'	V4.5'	D4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
TPH	mg/kg	75	<10	<10	<10	<10	<10	<10

Total Petroleum Fuel Hydrocarbons

SAMPLE POINT		03	03	03	04	04	04
SAMPLE DEPTH (feet)		V0.0'	V3.0'	V4.5'	V0.0'	V3.0'	V4.5'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
TPH	mg/kg	<10	<10	<10	<10	<10	<10

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #11-"Old Skimmer"

8260 - Volatile Organics

SAMPLE POINT		01	01	01	02	02	02
SAMPLE DEPTH (feet)		V0.0'	V3.0'	D3.0'	V0.0'	V3.0'	E3.0'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	540	270	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	15000	19000	ND	ND	ND
Methyl Ethyl Ketone	ug/kg	ND	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	830	280	ND	ND	ND
Toluene	ug/kg	ND	100	130	ND	ND	ND
Chloroethylviyl Ether	ug/kg	ND	ND	ND	ND	ND	ND
Carbon Disulfide	ug/kg	ND	ND	ND	ND	ND	ND
1,4-Dioxane	ug/kg	ND	ND	ND	ND	ND	ND
Total Xylenes	ug/kg	ND	98000	740	70	ND	ND
1,2-Dibromoethane (EDB)	ug/kg	ND	ND	ND	ND	ND	ND

PHASE III, RFI 1992
GIANT REFINING
CINIZA

SOLID WASTE MANAGEMENT UNIT #11-"Old Skimmer"

8270 - Semi-Volatile Organics

SAMPLE POINT		01	01	01	02	02
SAMPLE DEPTH (feet)		V0.0'	V3.0'	D3.0'	V0.0'	V3.0'
PARAMETER	UNITS	RESULT	RESULT	RESULT	RESULT	RESULT
Phenol	ug/kg	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND
2-Methylphenol	ug/kg	ND	ND	ND	ND	ND
3-Methylphenol	ug/kg	ND	ND	ND	ND	ND
4-Methylphenol	ug/kg	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ug/kg	ND	ND	ND	ND	ND
Naphthalene	ug/kg	ND	3500	2500	ND	ND
Dimethyl phthalate	ug/kg	ND	ND	ND	ND	ND
2,4-Dinitrophenol	ug/kg	ND	ND	ND	ND	ND
4-Nitrophenol	ug/kg	ND	1900	1500	ND	ND
Diethyl phthalate	ug/kg	ND	ND	1700	ND	ND
Phenanthrene	ug/kg	ND	9200	5400	ND	ND
Anthracene	ug/kg	ND	520	ND	ND	ND
Di-n-butyl Phthalate	ug/kg	530	1300	1300	970	ND
Flouranthene	ug/kg	ND	630	ND	ND	ND
Pyrene	ug/kg	ND	1500	1200	260	ND
Butyl benzyl phthalate	ug/kg	ND	ND	ND	ND	ND
Benzo(a)anthracene	ug/kg	ND	4600	1700	ND	ND
Bis(2-ethylhexyl) phthalate	ug/kg	ND	ND	ND	ND	ND
Chrysene	ug/kg	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ug/kg	ND	ND	ND	ND	ND
Benzo(b)flouranthene	ug/kg	ND	ND	ND	ND	ND
Benzo(k)flouranthene	ug/kg	ND	ND	ND	ND	ND
Benzo(a)pyrene	ug/kg	ND	550	ND	ND	ND
Dibenzo(a,h)anthracene	ug/kg	ND	ND	ND	ND	ND
Dibenzo(a,j)acridine	ug/kg	ND	ND	ND	ND	ND
7,12-Dimethylbenz(a)anthracene	ug/kg	ND	ND	ND	ND	ND
Indene	ug/kg	ND	ND	ND	ND	ND
Methylchrysene	ug/kg	ND	ND	ND	ND	ND
Pyridine	ug/kg	ND	ND	ND	ND	ND
Quinoline	ug/kg	ND	ND	ND	ND	ND
Benzenethiol	ug/kg	ND	ND	ND	ND	ND
1-Methylnaphthalene	ug/kg	ND	ND	ND	ND	ND