

3R -

56

REPORTS

DATE:

1995

MW PETROLEUM CORPORATION

April 20, 1995

State Of New Mexico
Energy, Minerals, and Natural Resources Dept.
2040 South Pacheco
Santa Fe, New Mexico

Attention: Patricio W. Sanchez

Mr. Sanchez;

Enclosed please find a copy of the final closure results from the MW Petroleum Corporation's evaporation pond site.

As stated in the report, the samples taken once the liner had been removed were below limits for final closure.

Plans are to continue monitoring treatment cells until below acceptable limits. Reseeding will be completed per BIA and Jicarilla Tribal specifications.

Please call if any additional information is needed.

Sincerely,



MW Petroleum Corporation
Mark McCool

cc: Denny Foutz- Aztec District OCD office

304 NORTH BEHREND SUITE A

FARMINGTON, NM 87401

505-325-0318

Report

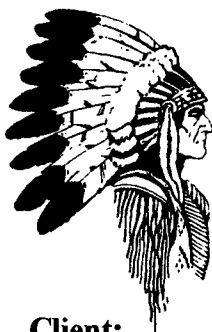
**Remedial Activities
for the
Closure of the Jicarilla Evaporation Pond**

Prepared For: Apache Corporation
Prepared By: **INDIAN**
Fire & Safety, Inc.

Date Prepared: January 23, 1995
Report No: 94004-R1

Table of Contents

Subject	Section/Page
Report	
<i>Introduction</i>	1/1
<i>Scope of Work</i>	1/1-2
<i>Sampling and Discussion of Analysis</i>	1/3-4
<i>Quality Assurance & Quality Control</i>	1/4
<i>Conclusion</i>	1/5
Figures	
<i>Figure 1</i>	2/1
Figure 2	2/2
Photographs	3
Analysis	
<i>TPH</i>	4
<i>BTEX</i>	4
<i>Quality Control</i>	4



INDIAN *Fire & Safety, Inc.*

P. O. Box 1306
Hobbs, NM 88240
Bus: 1-800-530-8693
Fax: 1-505-392-6274

Client: Apache Corporation

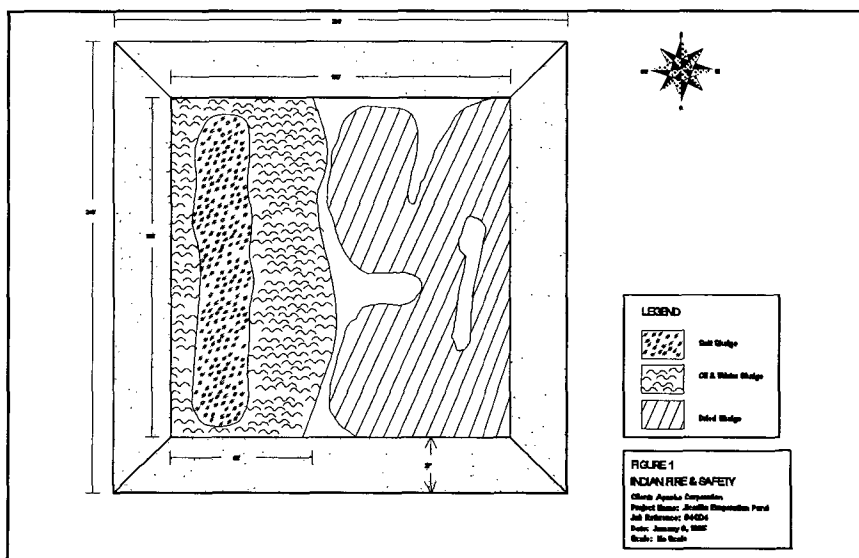
Subject: Remedial Activity Report for the Closure of the Jicarilla Evaporation Pond.
Job No.: 94-004

Introduction

The Jicarilla Evaporation Pond (Site) is situated within the confines of the Apache Corporation (Client) Farmington field office on the Jicarillas Apache Reservation. The site had been used for approximately 8 years for the evaporation of produced water from oil and gas production. In 1989 use of the site was discontinued and closure of the site was initiated. On December 13, 1994, Indian Fire & Safety Inc. (Indian) began the final closure of the site. The following is a report on the activities that have been performed to date.

Scope of Work

Activities began with a general site assessment and confirmation of pre-established goals. The impoundment was situated at the far west edge of the facility, within the fenced boundary of the established field office area. The pit measured 243 feet wide, 230 feet long, and 16 feet deep. Contents of the pit consisted of produced water, hydrocarbons and a mixture of hydrocarbons and blow sand which had dried into a viscous, non-flowing material that coated the sides and part of the bottom of the pit. A diagram (Figure 1) of the pit is been presented below as well as in Section Two for review.



Client: Apache Corporation

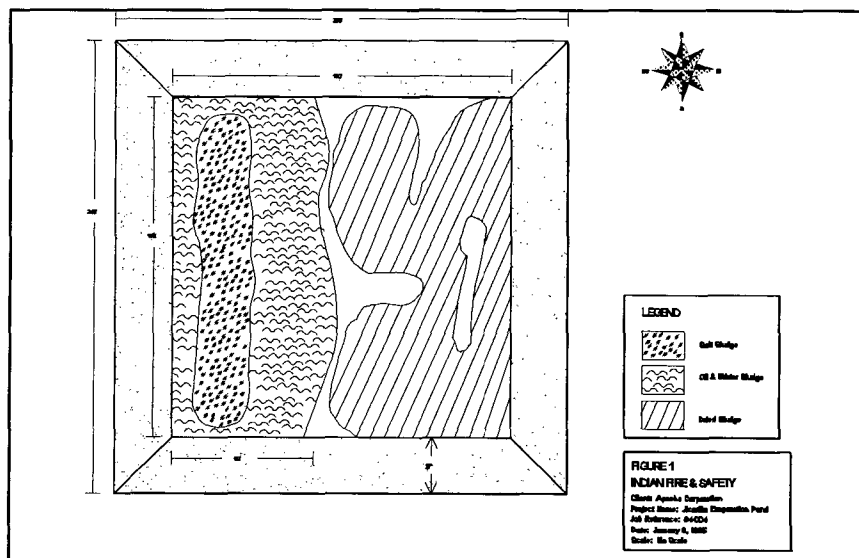
Subject: Remedial Activity Report for the Closure of the Jicarilla Evaporation Pond.
Job No.: 94-004

Introduction

The Jicarilla Evaporation Pond (Site) is situated within the confines of the Apache Corporation (Client) Farmington field office on the Jicarillas Apache Reservation. The site had been used for approximately 8 years for the evaporation of produced water from oil and gas production. In 1989 use of the site was discontinued and closure of the site was initiated. On December 13, 1994, Indian Fire & Safety Inc. (Indian) began the final closure of the site. The following is a report on the activities that have been performed to date.

Scope of Work

Activities began with a general site assessment and confirmation of pre-established goals. The impoundment was situated at the far west edge of the facility, within the fenced boundary of the established field office area. The pit measured 243 feet wide, 230 feet long, and 16 feet deep. Contents of the pit consisted of produced water, hydrocarbons and a mixture of hydrocarbons and blow sand which had dried into a viscous, non-flowing material that coated the sides and part of the bottom of the pit. A diagram (Figure 1) of the pit is been presented below as well as in Section Two for review.



After assessment of the site, the previously established objectives were confirmed and listed are as follows:

1. Treatment and removal of the pit contents and establishing appropriate treatment areas.
2. Removal of all visible pit liner material with the intent to reuse as much as possible in the treatment cells.
3. Take confirmation samples after the completion of objectives 1 and 2.

Treatment and removal of the sludge was achieved by mixing the dried material and compost with the sludge. The sludge was then removed and placed into a specially designed cell for treatment. Construction of the cell consisted of a single layer of 22 mil nylon reinforced PVC plastic liner placed into the bottom of the cell. After installation of the liner was completed, a layer of raw compost was placed on the top of the liner. Four ventilation lines consisting of 4 inch diameter perforated PVC pipe were laid at eight foot intervals traversing the entire length of the treatment cell. After the ventilation lines had been installed, the cell was filled with 2 to 2.5 feet of treated material. Once the cell had been filled, the ventilation lines were extended upward and the cell was covered with two layers of 6 mil plastic and anchored.

The composting and removal of the sludge resulted in the construction of two treatment cells, which were designated as treatment cells one and two. These cells are approximately 100 feet long, 40 feet wide and contain 550 to 600 yds³ of treated material. It is the intention of the Client to allow the material in the cells to sit through the winter in their present covered state. Once winter has passed, the material will be uncovered, rolled and the degradation process allowed to continue until the hydrocarbon levels reduce to satisfactory levels.

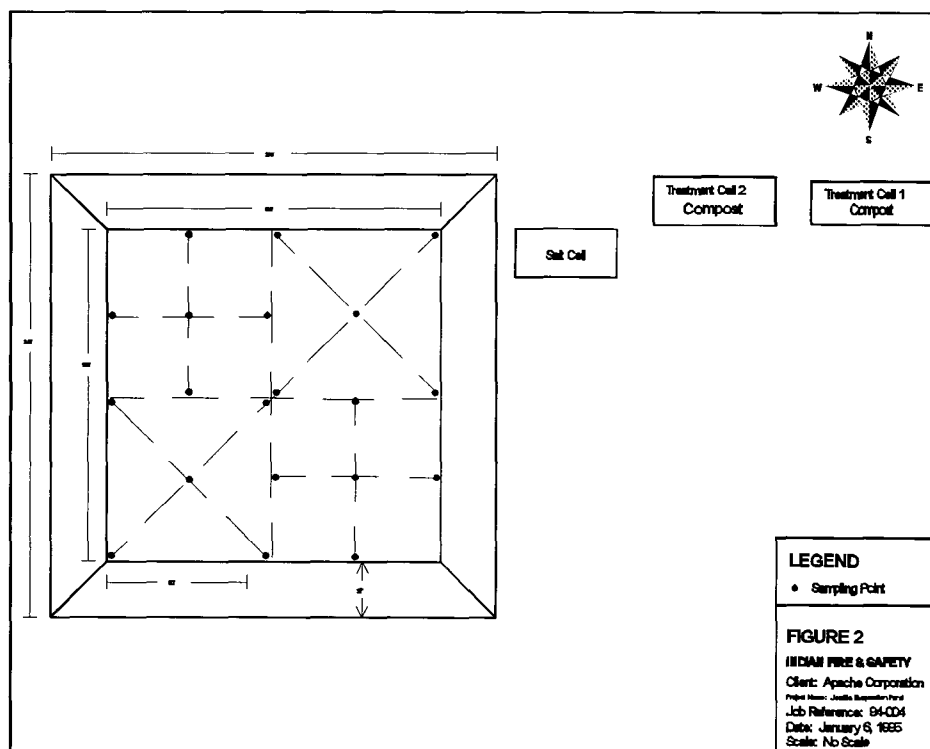
The removal of the salt slurry was achieved by mixing native soil with the material until it had thickened to a state where it could be mechanically removed. The salt/soil mixture was then transferred to a interim storage area until a treatment cell could be constructed that will leach the salt out of the mixture. This storage area is referred to the Salt Cell and contains approximately 395 yds³ of salt/soil mixture.

Removal of the liner was performed concurrently with the removal of the sludge. The mixtures were thickened then pushed aside to allow access to the liner. The cleared liner was then cut and removed in sections. This was repeated until all liner that could be salvaged was used. After that, the liner was removed and stockpiled adjacent to the Salt Cell.

Apache Corporation
Jicarilla Pit Closure
Job No.: 94-004

Sampling and Discussion of Analysis

Once the sludge and liner had been completely removed, the impoundment was divided into four sections. Each section was numbered and labeled with respect to its directional bearing. A diagram (Figure 2) is provided below and in Section Two to illustrate the sections and sampling points.



From each section, a five part composite sample was taken and sent to Intermountain Laboratories in Farmington, New Mexico to be analyzed for Total Petroleum Hydrocarbons (TPH) using USEPA Method 8015, modified for diesel and Benzene, Toluene, Ethyl Benzene and Xylene (BTEX) using USEPA Method 8020. The results of the analyses are presented in Table I on the following page.

Apache Corporation
Jicarilla Pit Closure
Job No.: 94-004

Table I
Results of Analysis

Site: Jicarilla Evaporation Pond		Laboratory: Intermountain Laboratories
Report Number: B9411621		Date of Analysis: 01/02/1995
Sample Number	Parameter	Result
Sec 1 (NE)	TPH	ND
Sec 1 (NE)	BTEX	ND
Sec 2 (SE)	TPH	16 mg/kg
Sec 2 (SE)	BTEX	ND
Sec 3 (NW)	TPH	ND
Sec 3 (NW)	BTEX	ND
Sec 4 (SW)	TPH	62 mg/kg
Sec 4 (SW)	BTEX	ND
ND = Not Detected		
Methodologies: TPH: EPA, 8015 Modified using a Diesel Standard		
BTEX: EPA, 8020		

The results of the analyses show that all samples were well below the acceptable limits. A copy of the analyses and quality control reports are provided in Section Four of this report.

Quality Assurance/Quality Control

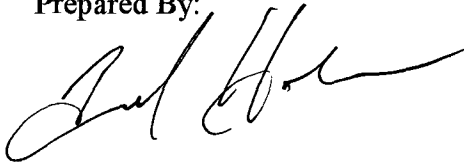
All samples were taken using sterilized, single use, PVC sampling scoops. Each sample was placed into a certified clean, flint glass jar with Teflon seals. After each sample was taken, it was immediately labeled, logged then chilled until analyzed. Laboratory quality control reports are well within acceptable parameters.

Apache Corporation
Jicarilla Pit Closure
Job No.: 94-004

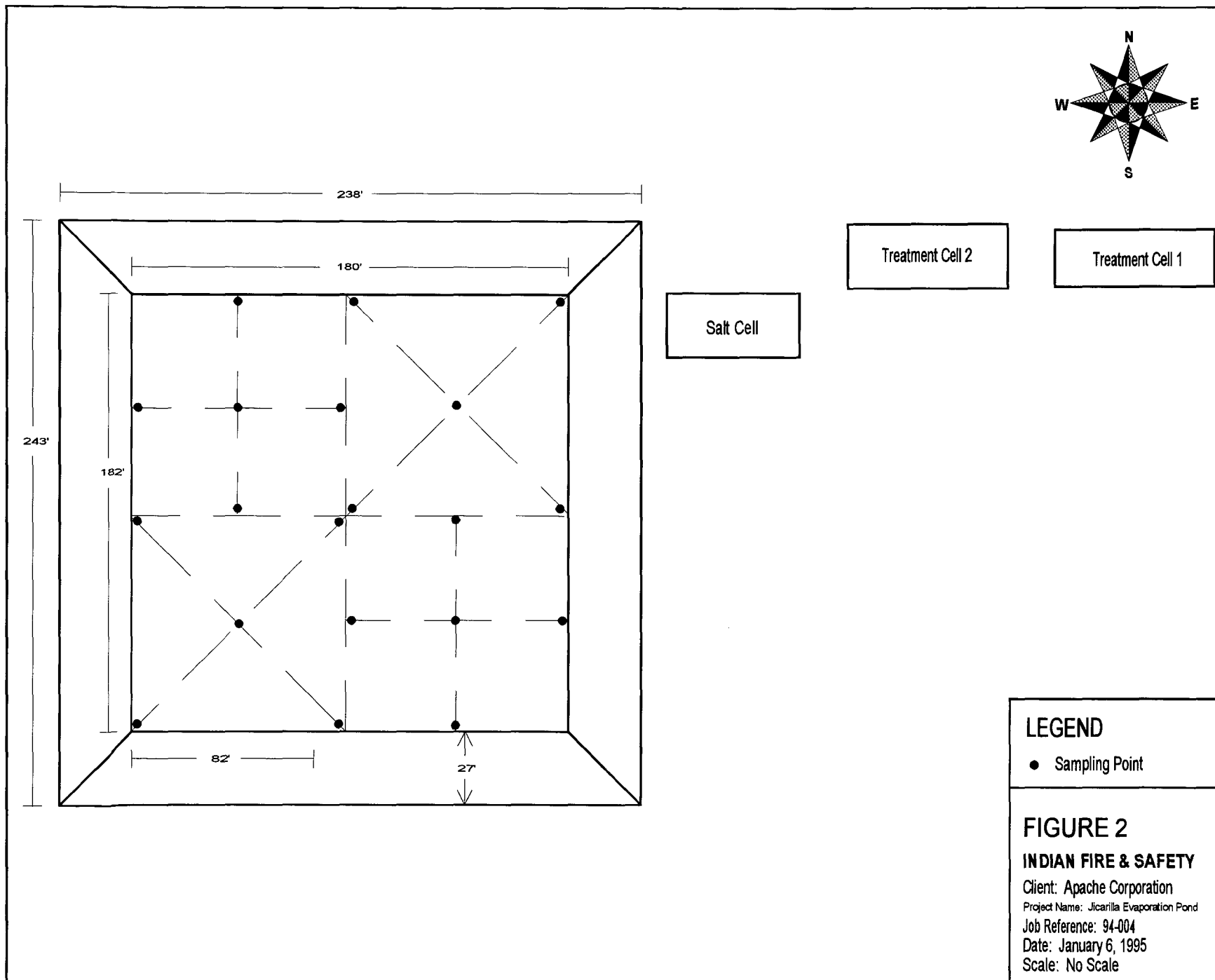
Conclusion

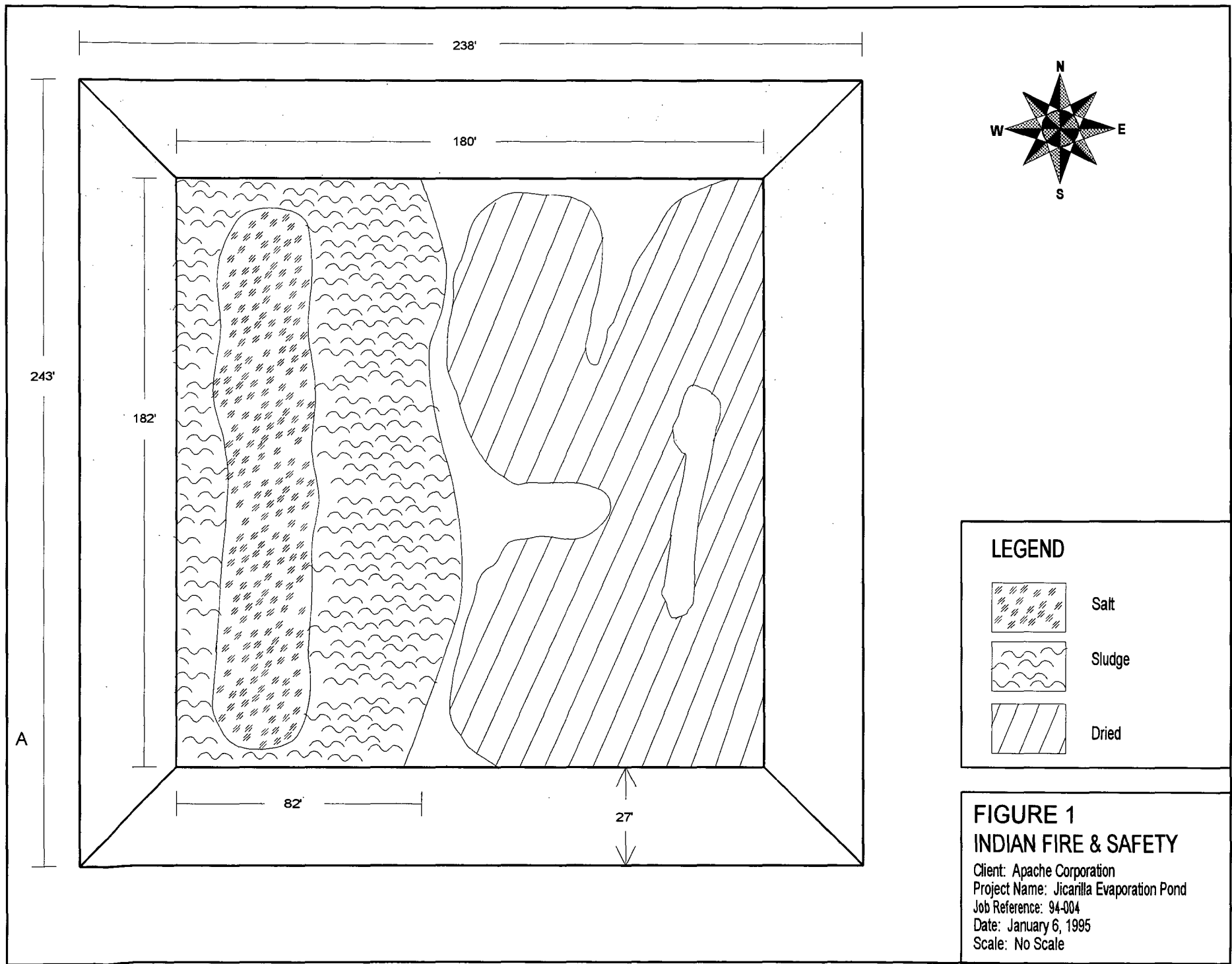
The removal of the contents of the Apaches Corporation Jicarilla Evaporation Pond was successfully achieved and based upon the analyses, no breach of the impoundments liner had occurred. Further closure and restoration of the site should be allowed to proceed without delay. Photographs taken during the course of this project have been provided in Section Three of this report.

Prepared By:

A handwritten signature in cursive script, appearing to read "Fred Holmes", written in black ink.

Fred Holmes B.S., REM 5432
Environmental, Health & Safety Specialist.







1. Northeast view of impoundment before removal of sludge.



2. Mixing of compost material into the sludge before removal.



3. Treated sludge has been stockpiled in the corners of the cell and the liner is being prepared for removal and placement into a treatment cell.



4. A section of the liner has been removed for placement.



5. Constructed treatment cell with lower ventilation lines in place and the treated material being placed into the cell.



6. Northeast view of treatment cell number one after filling and awaiting covering. Treatment cell number two is in the foreground and still being filled.



7. Northeast view of the treatment cells in the process of being covered with PVC liners. Treatment cell number one is in the background and has been covered with vertical vents in place.



8. Northwest view with the treatment cells filled, covered and the covers in the process of being anchored. The salt cell can be seen in the background.



9. Northwest view of the site after the removal of all liner and sludge.

Apache Oil Corporation

Case Narrative

On December 23, 1994, four soil samples were submitted to Inter-Mountain Laboratories - Farmington for analysis. The samples were received intact. Analysis for Benzene-Toluene-Ethylbenzene-Xylenes (BTEX), and Total Petroleum Hydrocarbons as Diesel Range Organics (DRO) and were performed on the samples as per the accompanying Chain of Custody form.

DRO analysis on the sample was performed by Method DRO - USEPA Method for Determination of Diesel Range Organics, Revision 3, 05/08/92. WTPH - D Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State Department of Ecology, Revision 3, October 1991.

This DRO method is accepted by the EPA and actually replaces Modified Method 8015 in certain states. The samples were analyzed at our Bozeman, Montana laboratory and Montana regulations use the DRO method instead of Modified Method 8015. The carbon range that was used by Modified Method 8015 is C6-C28. The number reported for the Total Extractable Hydrocarbons is comparable to the Modified Method 8015 because the carbon range for it is C5-C35. The number reported for Diesel Range Organics uses carbon range C10-C28. This range is typical for diesel fuel.

BTEX analysis on the samples were performed by EPA Method 5030, Purge and Trap, and EPA Method 8020, Aromatic Volatile Hydrocarbons, using an OI Analytical 4560 Purge and Trap and a Hewlett-Packard 5890 Gas Chromatograph, equipped with a photoionization detector. Detectable levels of BTEX analytes were found in the samples, as indicated on the report sheets.

It is the policy of this laboratory to employ, whenever possible, preparatory and analytical methods which have been approved by regulatory agencies. The methods used in the analyses of the samples reported herein are found in Test Methods for Evaluation of Solid Waste, SW-846, USEPA, 1986 and Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, USEPA, 1983.

Quality control reports appear at the end of the analytical package and may be identified by title. If there are any questions regarding the information presented in this package, please feel free to call at your convenience.

Sincerely,



Anna Schaerer
Organic Analyst

DIESEL RANGE ORGANICS - DRO

Client: APACHE OIL CORP.
Sample ID: Sec 1 (NE)
Project ID: Jicarilla Evap. Pond
Lab ID: B9411621 2327
Matrix: Soil

Date Reported: 01/03/95
Date Sampled: 12/22/94
Date Received: 12/28/94
Date Extracted: 12/29/94
Date Analyzed: 01/02/95

Parameter	Result	PQL	Units
Diesel Range Organics	ND	5.0	mg/kg
Diesel Range Organics as Diesel	ND	5.0	mg/kg
Total Extractable Hydrocarbons	ND	5.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL).

Reference: DRO - USEPA Method for Determination of Diesel Range Organics. Revision 3, 05/08/92.
WTPH-D Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State
Department of Ecology, Revision 3, October 1991.

Analyst Shawn Rethig

Reviewed us

DIESEL RANGE ORGANICS - DRO

Client: APACHE OIL CORP.

Sample ID: Sec 2 (SE)

Project ID: Jicarilla Evap. Pond

Lab ID: B9411622

2328

Matrix: Soil

Date Reported: 01/03/95

Date Sampled: 12/22/94

Date Received: 12/28/94

Date Extracted: 12/29/94

Date Analyzed: 01/02/95

Parameter	Result	PQL	Units
Diesel Range Organics	13	5.0	mg/kg
Diesel Range Organics as Diesel	13	5.0	mg/kg
Total Extractable Hydrocarbons	16	5.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL).

Reference: DRO - USEPA Method for Determination of Diesel Range Organics. Revision 3, 05/08/92.
WTPH-D Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State
Department of Ecology, Revision 3, October 1991.

Analyst Shawn RethiReviewed ud

DIESEL RANGE ORGANICS - DRO

Client: APACHE OIL CORP.

Sample ID: Sec 3 (NW)

Project ID: Jicarilla Evap. Pond

Lab ID: B9411623

2329

Matrix: Soil

Date Reported: 01/03/95

Date Sampled: 12/22/94

Date Received: 12/28/94

Date Extracted: 12/29/94

Date Analyzed: 01/02/95

Parameter	Result	PQL	Units
Diesel Range Organics	ND	5.0	mg/kg
Diesel Range Organics as Diesel	ND	5.0	mg/kg
Total Extractable Hydrocarbons	ND	5.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL).

Reference: DRO - USEPA Method for Determination of Diesel Range Organics. Revision 3, 05/08/92.
WTPH-D Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State
Department of Ecology, Revision 3, October 1991.

Analyst Shawn PethigReviewed us

DIESEL RANGE ORGANICS - DRO

Client: APACHE OIL CORP.

Sample ID: Sec 4 (SW)

Project ID: Jicarilla Evap. Pond

Lab ID: B9411624

2330

Matrix: Soil

Date Reported: 01/03/95

Date Sampled: 12/22/94

Date Received: 12/28/94

Date Extracted: 12/29/94

Date Analyzed: 01/02/95

Parameter	Result	PQL	Units
Diesel Range Organics	54	5.0	mg/kg
Diesel Range Organics as Diesel	54	5.0	mg/kg
Total Extractable Hydrocarbons	62	5.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL).

Reference: DRO - USEPA Method for Determination of Diesel Range Organics. Revision 3, 05/08/92.
WTPH-D Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State
Department of Ecology, Revision 3, October 1991.

Analyst Shawn RethisReviewed us

VOLATILE AROMATIC HYDROCARBONS

Apache Oil Corp.

Project ID: Jicarilla Pit Closure
Sample ID: Sec 1 (NE)
Lab ID: 2327
Sample Matrix: Soil
Condition: Cool/Intact

Report Date: 01/03/95
Date Sampled: 12/22/94
Date Received: 12/23/94
Date Extracted: 12/27/94
Date Analyzed: 12/29/94

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	10.0
Toluene	ND	10.0
Ethylbenzene	ND	10.0
m,p-Xylenes	ND	10.0
o-Xylene	ND	10.0

ND - Analyte not detected at the stated detection limit.

Quality Control: Surrogate Percent Recovery Acceptance Limits

Bromofluorobenzene 113.5 74 -121%

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

Comments:

Anna Schauer
Analyst

D. Carman
Review

VOLATILE AROMATIC HYDROCARBONS

Apache Oil Corp.

Project ID: Jicarilla Pit Closure
Sample ID: Sec 2 (SE)
Lab ID: 2328
Sample Matrix: Soil
Condition: Cool/Intact

Report Date: 01/03/95
Date Sampled: 12/22/94
Date Received: 12/23/94
Date Extracted: 12/27/94
Date Analyzed: 12/29/94


Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	10.0
Toluene	ND	10.0
Ethylbenzene	ND	10.0
m,p-Xylenes	ND	10.0
o-Xylene	ND	10.0


ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	115.7	74 -121%

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

Comments:


Analyst


Review

VOLATILE AROMATIC HYDROCARBONS

Apache Oil Corp.

Project ID: Jicarilla Pit Closure
Sample ID: Sec 3 (NW)
Lab ID: 2329
Sample Matrix: Soil
Condition: Cool/Intact

Report Date: 01/03/95
Date Sampled: 12/22/94
Date Received: 12/23/94
Date Extracted: 12/27/94
Date Analyzed: 12/29/94

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	10.0
Toluene	ND	10.0
Ethylbenzene	ND	10.0
m,p-Xylenes	ND	10.0
o-Xylene	ND	10.0

ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	112.4	74 -121%

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

Comments:

Anna Schaefer
Analyst

Scorman
Review

VOLATILE AROMATIC HYDROCARBONS

Apache Oil Corp.

Project ID: Jicarilla Pit Closure
Sample ID: Sec 4 (SW)
Lab ID: 2330
Sample Matrix: Soil
Condition: Cool/Intact

Report Date: 01/03/95
Date Sampled: 12/22/94
Date Received: 12/23/94
Date Extracted: 12/27/94
Date Analyzed: 12/29/94


Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	10.0
Toluene	ND	10.0
Ethylbenzene	ND	10.0
m,p-Xylenes	ND	10.0
o-Xylene	ND	10.0

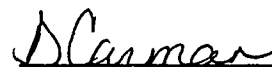
ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	99.1	74 -121%

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

Comments:


Analyst


Review

Quality Assurance / Quality Control

**LAB QA/QC
DIESEL RANGE ORGANICS - DRO
METHOD BLANK**

Date Analyzed: 01/02/95
Lab ID: MBS00363
Matrix: Sand
Date Extracted 12/29/94

Parameter	Result	PQL	Units
Diesel Range Organics	ND	5.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL).

Reference: DRO - USEPA Method for Determination of Diesel Range Organics. Revision 3, 05/08/92.
WTPH-D Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State
Department of Ecology, Revision 3, October 1991.

Analyst

Shawn Pethig

Reviewed

us

LAB QA/QC
DIESEL RANGE ORGANICS - DRO
BLANK SPIKE

Date Analyzed: 01/02/95

Lab ID: BSS00363

Matrix: Sand

Date Extracted: 12/29/94

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	BS Recovery %	QC Limits Rec.
Diesel Range Organics	25	0	19	76	50 -150

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

Spike Recovery: 0 out of 1 outside QC limits:

Analyst Sharon Rethi'sReviewed WS

VOLATILE AROMATIC HYDROCARBONS
QUALITY CONTROL REPORTDuplicate Analysis

Lab ID: 2330
Sample Matrix: Soil
Condition: Cool/Intact

Report Date: 01/03/95
Date Sampled: 12/22/94
Date Received: 12/23/94
Date Extracted: 12/27/94
Date Analyzed: 12/29/94

Target Analyte	Duplicate Concentration (ppb)	Original Concentration (ppb)	% Difference
Benzene	ND	ND	NA
Toluene	ND	ND	NA
Ethylbenzene	ND	ND	NA
m,p-Xylenes	ND	ND	NA
o-Xylene	ND	ND	NA

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.

Quality Control: Surrogate Percent Recovery Acceptance Limits

Bromofluorobenzene 109.0 74 -121%

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

Comments:

Anna Schaefer
Analyst

D Carman
Review

VOLATILE AROMATIC HYDROCARBONS
QUALITY CONTROL REPORTMatrix Spike AnalysisLab ID: 2327
Sample Matrix: Soil
Condition: Cool/IntactReport Date: 01/03/95
Date Sampled: 12/22/94
Date Received: 12/23/94
Date Extracted: 12/27/94
Date Analyzed: 12/29/94

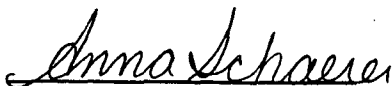
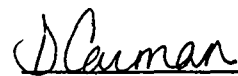
Target Analyte	Spiked Sample Result in ng	Sample result in ng	Spike Added (ng)	% Recovery	Acceptance Limits (%)
Benzene	26.6	0.61	30	86.5%	70-130
Toluene	30.5	0.68	30	99.4%	70-130
Ethylbenzene	30.5	0.00	30	101.6%	70-130
m,p-Xylenes	60.8	0.38	60	100.7%	70-130
o-Xylene	30.7	0.00	30	102.5%	70-130

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	104.5%	74 -121%

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

Comments:


Analyst
Review

VOLATILE AROMATIC HYDROCARBONS
QUALITY CONTROL REPORTMethod Blank AnalysisSample Matrix:
Lab ID:Soil
Method BlankReport Date:
Date Analyzed:01/03/95
12/29/94

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	10.0
Toluene	ND	10.0
Ethylbenzene	ND	10.0
m,p-Xylenes	ND	10.0
o-Xylene	ND	10.0

ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	93.0	74-121%

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

Comments:

Anna Schaefer
Analyst

D. Carman
Review

