1R - 273

# REPORTS

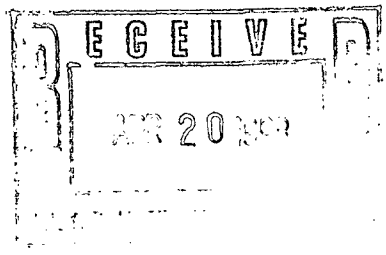
# DATE:

1998

# *Highlander Environmental Corp.*

*Midland, Texas*


April 9, 1998




Mr. Wayne Price
Environmental Engineer
State of New Mexico
Oil Conservation Division
100 W. Broadway
Hobbs, New Mexico 88240

**Re: Report on Investigation of the Landfarm Located in the Loving Paddock / San Andres Unit, Lea County, New Mexico.**

Dear Mr. Price:

Enclosed is a copy of a report for the above-mentioned site. Please review and notify us if you are in concurrence with our findings and recommendations. Also enclosed for your review is a copy of the work plan submitted for the two open pits which we discussed during our field visit.

If you have any questions or require any additional information, please advise. Thank you for your cooperation in this matter.

Sincerely,
*Highlander Environmental Corp.*

Tim Reed

Timothy M. Reed, REM
Vice President


*1910 N. Big Spring • Midland, Texas 79705 • (915) 682-4559 • Fax (915) 682-3946*

*Highlander Environmental Corp.*

*Midland, Texas*

April 9, 1998



Mr. William C. Olson
Environmental Bureau
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505

Re: Preliminary Investigation Work Plan for Open Pits Designated as ATB 1-1 in Lovington Paddock/Lovington San Andres Unit and ATB 33-1 in West Lovington Unit, Operated by Titan Resources, L.P., Lea County, New Mexico.

Dear Mr. Olson:

Highlander Environmental Corp. (Highlander) has been retained by Titan Resources, L.P. (Titan) to conduct a subsurface investigation of the above referenced abandoned pit locations. Abandoned Tank Battery (ATB) 1-1 is located in the SE/4, Section 1, Township 17 South, Range 36 East, Lea County, NM. ATB 33-1 is located in the SW/4, Section 33, Township16 South, Range 36 East, Lea County, NM.

**BACKGROUND**

During the course of an Environmental Site Assessment, Highlander personnel discovered two open unlined pits at abandoned tank battery locations. These abandoned pits are located on the Lovington Paddock / San Andres Unit and the West Lovington Unit. These responsibility for these pits was transferred to Titan in a property acquisition from Pioneer Natural Resources. Once the property transferred into the possession of Titan, Highlander was contracted to close

the pit.

**Abandoned Tank Battery 1-1 Pit.**

The ATB 1-1 pit is located approximately 150 feet east of Satellite #7 in the Lovington Paddock /San Andres Unit. The pit is fenced and measures approximately 75' x 75'. The operating depth of this pit is uncertain. The surface of the pit has crusted over, however it does appear that there may be some fluid retained underneath the crust.

**Abandoned Tank Battery 33-1 Pit.**

The ATB 33-1 pit is located at plugged and abandoned well #1 in the West Lovington Unit. The pit is fenced and measures approximately 25' x 25'.

## PRELIMINARY INVESTIGATION RESULTS

**Abandoned Tank Battery 1-1 Pit.**

During the course of the initial Environmental Site Assessment on the production in this unit a Naturally Occurring Radioactive Materials (NORM) survey was performed on this pit. Background levels in this area ranged from 8-9 micro Roentgens per hour (uR/hr). Readings on the pit ranged from background to 175 uR/hr. The highest levels were on scale and sludge located on the south edge of the pit. A sample of this material; was collected and submitted to American Radiation Services, Baton Rouge, LA for analysis by gamma spectroscopy. The results of the sampling showed Radium 226 levels of 146.46 picoCuries per gram (pCi/gm). A sample was collected from the pit near the south wall and analyzed. This sample showed Ra-226 levels to be below 2 pCi/gm. This further investigation indicates that the NORM is confined to a small area of scale on the south edge of the pit.

**Abandoned Tank Battery 33-1 Pit.**

This pit measures approximately 25' x 25'. A NORM survey performed during the initial environmental site assessment did not reveal any elevated levels.

## PROPOSED WORK PLAN

Highlander proposes to collect representative samples of the contents of both pits for waste characterization purposes. Boreholes are proposed for placement around the pit in order to define the vertical and horizontal extent of subsurface impact. The number and depths of the proposed boreholes will be based on the field evaluation of soil samples collected with a split spoon or core sampler. The boreholes will be drilled at least 3 feet into the undisturbed native soils beneath the bottom of the pit. An organic vapor meter (OVM) will be utilized to field screen the soil samples for petroleum hydrocarbon vapors. The proposed work plan is more specifically described as follows:

**Abandoned Tank Battery 1-1 Pit:**

1. Highlander proposes to evaluate the extent of NORM contamination on the south wall of the pit utilizing a backhoe. Based on the preliminary investigations it appears that NORM contamination is confined to a small area in the vicinity of the original NORM sample location. The NORM contaminated soil will be segregated and a composite sample will be collected and analyzed to determine the disposal options.
2. Highlander proposes to install 4 to 6 boreholes around the pit to determine the horizontal and vertical extent of impact. Groundwater is reported to be at a depth of 75 to 85 feet below ground surface in the vicinity of the site. The boreholes will be initially drilled to a depth of 20 to 30 feet. Split spoon or core samples will be collected at 5 feet intervals for field screening with the OVM. If the field screening results indicate that hydrocarbon impact extends deeper than the drilled depth of the soil borings, the borings may be advanced to depths greater than 30'. If groundwater is encountered, temporary monitor wells will be installed, developed and sampled.

**Abandoned Tank Battery 33-1 Pit:**

1. Highlander proposes to install four boreholes around the pit to evaluate the horizontal and vertical extent of impact. The boreholes will be drilled to a depth

of 20 to 30 feet. Split spoon or core samples will be collected at 5 feet intervals and field screened for petroleum hydrocarbon vapors.

At least two soil samples from each borehole will be collected and analyzed for chlorides, total petroleum hydrocarbons (TPH) and benzene, toluene, ethyl-benzene and xylene (BTEX). A representative sample from the pit contents/waste will be collected and analyzed for hazardous waste characterization. The samples will be analyzed for TPH by EPA method Modified 8015 and BTEX by EPA method SW846/8020 within the specified holding times. Soil samples will be analyzed for chloride by method SM 4500-Cl-B (standard methods, 18th edition). All samples will be collected in laboratory supplied containers and properly preserved. The samples will be submitted to the laboratory under standard Chain of Custody control.

All sampling and down-hole equipment used in connection with the investigation will be thoroughly decontaminated between the sampling events. Soil cuttings from drilling will be stockpiled next to the borehole until disposal is arranged.

## DATA EVALUATION AND REPORTING

Upon receipt of analytical data from the laboratory, Highlander will assemble all data in tables for presentation in a report. The report will contain discussions of field sampling techniques and laboratory results. Highlander will compare the laboratory test results for soil samples to applicable New Mexico OCD or WQCC action levels. Detailed Site drawings will be presented in the report. The report will also detail the remedial plan or closure plan for the pits depending on the results of the investigation.

Highlander will schedule the proposed field activities following your review and approval.

Please advise if you have any questions or require any additional information.

Sincerely,
Highlander Environmental Corp.

Tim Reed

Timothy M. Reed, REM
Vice President

Encl.

cc: Mr. Ron Lechwar, Titan Resources, Inc.
Mr. Bill Hearne, Titan Resources, Inc.
Mr. Wayne Price, OCD-Hobbs District

# *Highlander Environmental Corp.*

*Midland, Texas*


Called TIM REED
THESE ARE OLD
GREENHILL PITS
NMOCD I TO HANDLE!
4/28/98 JP

April 9, 1998

Mr. William C. Olson
Environmental Bureau
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505

Gary mail to Denise
2 old dark pits &
Landfarms! 5/1/98
JP

Re: Preliminary Investigation Work Plan for Open Pits Designated as ATB 1-1 in Lovington Paddock/Lovington San Andres Unit and ATB 33-1 in West Lovington Unit, Operated by Titan Resources, L.P., Lea County, New Mexico.

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## BACKGROUND

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**Abandoned Tank Battery 33-1 Pit.**

The ATB 33-1 pit is located at plugged and abandoned well #1 in the West Lovington Unit. The pit is fenced and measures approximately 25' x 25'.

## PRELIMINARY INVESTIGATION RESULTS

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Sincerely,
Highlander Environmental Corp.

Tim Reed

Timothy M. Reed, REM
Vice President

Encl.
cc: Mr. Ron Lechwar, Titan Resources, Inc.
Mr. Bill Hearne, Titan Resources, Inc.
Mr. Wayne Price, OCD-Hobbs District

To Roger Anderson

From

Wayne Price

Energy & Minerals Department

18 pages (cover included)

Telephone Number

- ☐ For Your Files
- ☐ Prepare a Reply for My Signature
- ☐ For Your Review and Return
- ☐ For Your Information
- ☐ For Your Handling
- ☐ For Your Approval
- ☐ As Per Your Request
- ☐ For Your Signature
- ☐ Please Advise
- ☐ For Your Attention

TRACEANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

ANALYTICAL RESULTS FOR
ARCO PERMIAN
Attention: Nathan J. Binau
P. O. Box 1610
Midland, TX 79702

September 02, 1994
Receiving Date: 08/27/94
Sample Type: Soil
Project No: NA
Project Location: Jal, New Mexico

Analysis Date: 08/30/94
Sampling Date: 08/25/94
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: South Justis Unit Soil

| TA# | Field Code | TRPHC (%) | TRPHC (ppm) | BENZENE (ppm) | TOLUENE (ppm) | ETHYL-BENZENE (ppm) | M,P,O XYLENE (ppm) | TOTAL BTEX (ppm) |
|---|---|---|---|---|---|---|---|---|
| T25103 | #1-Arco SJU-East Pile Composite | 2.32 | 23,185 | <0.001 | <0.001 | <0.001 | 0.225 | 0.225 |
| T25104 | #2-Arco SJU-West Pile Composite | 0.80 | 7,986 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| T25105 | #3-Arco SJU-Tank Battery Site 0-12" Composite | 0.93 | 9,324 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| QC | Quality Control | --- | 167 | 0.218 | 0.222 | 0.201 | 0.623 | |
| Detection Limit | | --- | 5 | 0.001 | 0.001 | 0.001 | 0.001 | |
| % Precision | | --- | 100 | 100 | 99 | 99 | 99 | |
| % Extraction Accuracy | | --- | 105 | 109 | 108 | 97 | 102 | |
| % Instrument Accuracy | | --- | 102 | 109 | 111 | 101 | 105 | |

METHODS: EPA SW 846-8020; EPA 418.1.
BTEX SPIKE AND QC: Sample and Blank Spiked with 0.200 ppm EACH VOLATILE ORGANICS.
TRPHC SPIKE AND QC: Sample Spiked with 327.760 ppm TRPHC and Blank spiked with 163.880 ppm TRPHC.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

9-7-94
Date

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

ANALYTICAL RESULTS FOR
ARCO PERMIAN
Attention: Nathan J. Binau
P. O. Box 1610
Midland, TX 79702

September 07, 1994
Receiving Date: 08/27/94
Sample Type: Soil
Project No: NA
Project Location: Jal, New Mexico

Extraction Date: 08/29/94
Analysis Date: 09/03/94
Sampling Date: 08/25/94
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: South Justis Unit Soil

TCLP METALS

| TA# | Field Code | As (ppm) | Se (ppm) | Cr (ppm) | Cd (ppm) | Pb (ppm) | Ag (ppm) | Ba (ppm) | Hg (ppm) |
|---|---|---|---|---|---|---|---|---|---|
| | EPA LIMIT = | 5.0 | 1.0 | 5.0 | 1.0 | 5.0 | 5.0 | 100.0 | 0.20 |
| T25103 | #1-Arco SJU-East Pile Composite | 0.1 | <0.2 | <0.1 | <0.1 | 0.4 | <0.01 | <1.0 | <0.001 |
| QC | Quality Control | 9.6 | 2.0 | 9.9 | 2.0 | 9.8 | 10.0 | 200.4 | 0.02 |
| Detection Limit | | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.01 | 1.0 | 0.001 |
| % Precision | | 103 | 103 | 102 | 100 | 100 | 101 | 98 | 100 |
| % Extraction Accuracy | | 125 | 150 | 103 | 100 | 98 | 98 | 103 | 100 |
| % Instrument Accuracy | | 96 | 100 | 99 | 100 | 98 | 100 | 100 | 100 |

METHODS: EPA SW 846-1311, 6010, 7471.
TCLP METALS QC: Blank Spiked with 10.0 ppm As, Cr, Pb, Ag; 2.0 ppm Se, Cd; 200.0 ppm Ba; 0.020 ppm Hg.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

9-7-94
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
ARCO PERMIAN
Attention: Nathan J. Binau
P. O. Box 1610
Midland, TX 79702

September 07, 1994
Receiving Date: 08/27/94
Sample Type: Soil
Project No: NA
Project Location: Jal, New Mexico

Extraction Date: 08/29/94
Analysis Date: 09/04/94
Sampling Date: 08/25/94
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: South Justis Unit Soil

| TCLP VOLATILES (ppm) | EPA LIMIT | T25103 #1-Arco SJU-East Pile Composite | Detection Limit | QC | %P | %RA | %IA |
|---|---|---|---|---|---|---|---|
| Vinyl chloride | 0.20 | ND | 0.002 | 0.057 | 98 | 160 | 114 |
| 1,1-Dichloroethene | 0.70 | ND | 0.002 | 0.054 | 98 | 94 | 108 |
| Methyl Ethyl Ketone | 200.0 | ND | 0.020 | 0.051 | 81 | 168 | 102 |
| Chloroform | 6.00 | ND | 0.020 | 0.057 | 112 | 98 | 114 |
| 1,2-Dichloroethane | 0.50 | ND | 0.002 | 0.044 | 114 | 96 | 88 |
| Benzene | 0.50 | ND | 0.002 | 0.074 | 99 | 142 | 148 |
| Carbon Tetrachloride | 0.50 | ND | 0.020 | 0.047 | 100 | 90 | 94 |
| Trichloroethene | 0.50 | ND | 0.002 | 0.053 | 97 | 88 | 106 |
| Tetrachloroethene | 0.70 | ND | 0.002 | 0.055 | 105 | 108 | 110 |
| Chlorobenzene | 100.00 | ND | 0.002 | 0.046 | 104 | 92 | 92 |
| 1,4-Dichlorobenzene | 7.50 | 0.003 | 0.002 | 0.045 | 102 | 94 | 90 |

| | % Recovery |
|---|---|
| 1,2-Dichloroethane | 92 |
| Toluene-d8 | 108 |
| 4-Bromofluorobenzene | 108 |

ND = Not Detected

METHODS: EPA SW 846-1311, 8240.

9-7-94

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

DATE

TRACE ANALYSIS, INC.
A Laboratory for Advanced Environmental Research and Analysis

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
ARCO PERMIAN
Attention: Nathan J. Binau
P. O. Box 1610
Midland, TX 79702

September 07, 1994
Receiving Date: 08/27/94
Sample Type: Soil
Project No: NA
Project Location: Jal, New Mexico

Extraction Date: 08/30/94
Analysis Date: 09/01/94
Sampling Date: 08/25/94
Sample Condition: I & C
Sample Received by: McD
Project Name: South Justis Unit Soil

| TCLP Semi-Volatiles (mg/L) | EPA Limit | Detection Limit | T25103 #1-Arco SJU-East Pile Composite | %P | %EA | QC | %IA |
|---|---|---|---|---|---|---|---|
| Pyridine | 5.0 | 0.001 | ND | 94 | 82 | 0.481 | 96 |
| 1,4-Dichlorobenzene | 7.5 | 0.001 | ND | 95 | 84 | 0.472 | 94 |
| o-Cresol | 200.0 | 0.001 | ND | 95 | 80 | 0.459 | 92 |
| m,p-Cresol | 200.0 | 0.001 | ND | 95 | 78 | 0.861 | 86 |
| Total Cresol | 200.0 | 0.001 | ND | 89 | 78 | 1.320 | 88 |
| Hexachloroethane | 3.0 | 0.001 | ND | 95 | 84 | 0.478 | 96 |
| Nitrobenzene | 2.0 | 0.001 | ND | 94 | 78 | 0.455 | 91 |
| Hexachlorobutadiene | 0.5 | 0.001 | ND | 95 | 88 | 0.507 | 101 |
| 2,4,6-Trichlorophenol | 2.0 | 0.001 | ND | 97 | 59 | 0.347 | 69 |
| 2,4,5-Trichlorophenol | 400.0 | 0.001 | ND | 98 | 72 | 0.400 | 80 |
| 2,4-Dinitrotoluene | 0.13 | 0.001 | ND | 97 | 72 | 0.388 | 78 |
| 2,4-D | 10.0 | 0.01 | ND | 94 | 73 | 0.440 | 88 |
| Hexachlorobenzene | 0.13 | 0.001 | ND | 97 | 109 | 0.529 | 106 |
| 2,4,5-TP | 1.0 | 0.01 | ND | 88 | 75 | 0.503 | 101 |
| Pentachlorophenol | 100.0 | 0.001 | ND | 97 | 106 | 0.404 | 81 |
| Lindane | 0.4 | 0.001 | ND | 98 | 105 | 0.553 | 111 |
| Total Heptachlor | 0.008 | 0.001 | ND | 97 | 97 | 1.014 | 101 |
| Endrin | 0.02 | 0.001 | ND | 100 | 53 | 0.609 | 122 |
| Methoxychlor | 10.0 | 0.001 | ND | 96 | 68 | 0.513 | 103 |
| Chlordane | 0.03 | 0.0002 | ND | 92 | 110 | 0.0017 | 85 |
| Toxaphene | 0.5 | 0.005 | ND | 94 | 93 | 0.0197 | 99 |

| | % RECOVERY |
|---|---|
| 2-Fluorophenol SURR | 108 |
| Phenol-d5 SURR | 99 |
| Nitrobenzene-d5 SURR | 97 |
| 2-Fluorobiphenyl SURR | 95 |
| 2,4,6-Tribromophenol SURR | 105 |
| Terphenyl-d14 SURR | 91 |

Methods: EPA SW 846-1311, 8270, 8080.
ND - Not Detected

9-7-94

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

DATE

TRACEANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

ANALYTICAL RESULTS FOR
ARCO PERMIAN
Attention: Nathan J. Binau
P. O. Box 1610
Midland, TX 79702

September 02, 1994
Receiving Date: 08/27/94
Sample Type: Soil
Project No: NA
Project Location: Jal, New Mexico

Analysis Date: 08/30/94
Sampling Date: 08/25/94
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: South Justis Unit Soil

| TA# | Field Code | REACTIVITY | SULFIDES (ppm) | CYANIDES (ppm) | CORROSIVITY | pH (s.u.) | IGNITABILITY |
|---|---|---|---|---|---|---|---|
| T25103 | #1-Arco SJU-East Pile Comp. | Non-reactive | <10.0 | <2.5 | Noncorrosive | 6.73 | Nonignitable |
| T25104 | #2-Arco SJU-West Pile Comp. | Non-reactive | <10.0 | <2.5 | Noncorrosive | 6.95 | Nonignitable |
| QC | Quality Control | --- | --- | --- | --- | 7.00 | --- |
| % Precision | | 100 | 100 | 100 | 100 | 100 | 100 |
| % Extraction Accuracy | | --- | --- | --- | --- | --- | --- |
| % Instrument Accuracy | | --- | --- | --- | --- | 100 | --- |

METHODS: EPA SW 846-2.1.3, 2.1.2, 2.1.1.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

9-7-94
DATE

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

ANALYTICAL RESULTS FOR
ARCO PERMIAN
Attention: Nathan J. Binau
P. O. Box 1610
Midland, TX 79702

September 07, 1994
Receiving Date: 08/27/94
Sample Type: Soil
Project No: NA
Project Location: Jal, New Mexico

Extraction Date: 08/29/94
Analysis Date: 09/03/94
Sampling Date: 08/25/94
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: South Justis Unit Soil

TCLP METALS

| TA# | Field Code | As (ppm) | Se (ppm) | Cr (ppm) | Cd (ppm) | Pb (ppm) | Ag (ppm) | Ba (ppm) | Hg (ppm) |
|---|---|---|---|---|---|---|---|---|---|
| | EPA LIMIT = | 5.0 | 1.0 | 5.0 | 1.0 | 5.0 | 5.0 | 100.0 | 0.20 |
| T25104 | #2-Arco SJU-West Pile Composite | <0.1 | <0.2 | <0.1 | <0.1 | <0.1 | <0.01 | <1.0 | <0.001 |
| QC | Quality Control | 9.6 | 2.0 | 9.9 | 2.0 | 9.8 | 10.0 | 200.4 | 0.02 |
| Detection Limit | | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.01 | 1.0 | 0.001 |
| % Precision | | 103 | 103 | 102 | 100 | 100 | 101 | 98 | 100 |
| % Extraction Accuracy | | 120 | 142 | 102 | 100 | 97 | 99 | 109 | 100 |
| % Instrument Accuracy | | 96 | 100 | 99 | 100 | 98 | 100 | 100 | 100 |

METHODS: EPA SW 846-1311, 6010, 7471.
TCLP METALS QC: Blank Spiked with 10.0 ppm As, Cr, Pb, Ag; 2.0 ppm Se, Cd; 200.0 ppm Ba; 0.020 ppm Hg.

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Analysis Date: 09/04/94
Sampling Date: 08/25/94
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: South Justis Unit Soil

| TCLP VOLATILES (ppm) | EPA LIMIT | T25104 #2-Arco SJU-West Pile Composite | Detection Limit | QC | %P | %EA | %IA |
|---|---|---|---|---|---|---|---|
| Vinyl chloride | 0.20 | ND | 0.002 | 0.057 | 98 | 138 | 114 |
| 1,1-Dichloroethene | 0.70 | ND | 0.002 | 0.054 | 98 | 92 | 108 |
| Methyl Ethyl Ketone | 200.0 | ND | 0.020 | 0.051 | 81 | 82 | 102 |
| Chloroform | 6.00 | ND | 0.020 | 0.057 | 112 | 124 | 114 |
| 1,2-Dichloroethane | 0.50 | ND | 0.002 | 0.044 | 114 | 126 | 88 |
| Benzene | 0.50 | ND | 0.002 | 0.074 | 99 | 148 | 148 |
| Carbon Tetrachloride | 0.50 | ND | 0.020 | 0.047 | 100 | 110 | 94 |
| Trichloroethene | 0.50 | ND | 0.002 | 0.053 | 97 | 84 | 106 |
| Tetrachloroethene | 0.70 | ND | 0.002 | 0.055 | 105 | 112 | 110 |
| Chlorobenzene | 100.00 | ND | 0.002 | 0.046 | 104 | 98 | 92 |
| 1,4-Dichlorobenzene | 7.50 | 0.003 | 0.002 | 0.045 | 102 | 98 | 90 |

| | % Recovery |
|---|---|
| 1,2-Dichloroethane | 86 |
| Toluene-d8 | 107 |
| 4-Bromofluorobenzene | 114 |

ND = Not Detected

METHODS: EPA SW 846-1311, 8240.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

9-7-94
DATE

TRACE ANALYSIS, INC.
A Laboratory for Advanced Environmental Research and Analysis

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
ARCO PERMIAN
Attention: Nathan J. Binau
P. O. Box 1610
Midland, TX 79702

September 07, 1994
Receiving Date: 08/27/94
Sample Type: Soil
Project No: NA
Project Location: Jal, New Mexico

Extraction Date: 08/30/94
Analysis Date: 09/01/94
Sampling Date: 08/25/94
Sample Condition: I & C
Sample Received by: MoD
Project Name: South Justis Unit Soil

| TCLP Semi-Volatiles (mg/L) | EPA Limit | Detection Limit | T25104 #2-Arco SJU-West Pile Composite | %P | %EA | QC | %IA |
|---|---|---|---|---|---|---|---|
| Pyridine | 5.0 | 0.001 | ND | 106 | 92 | 0.481 | 96 |
| 1,4-Dichlorobenzene | 7.5 | 0.001 | ND | 106 | 95 | 0.472 | 94 |
| o-Cresol | 200.0 | 0.001 | ND | 105 | 91 | 0.459 | 92 |
| m,p-Cresol | 200.0 | 0.001 | ND | 105 | 86 | 0.861 | 86 |
| Total Cresol | 200.0 | 0.001 | ND | 105 | 88 | 1.320 | 88 |
| Hexachloroethane | 3.0 | 0.001 | ND | 106 | 93 | 0.478 | 96 |
| Nitrobenzene | 2.0 | 0.001 | ND | 106 | 90 | 0.455 | 91 |
| Hexachlorobutadiene | 0.5 | 0.001 | ND | 105 | 94 | 0.507 | 101 |
| 2,4,6-Trichlorophenol | 2.0 | 0.001 | ND | 103 | 60 | 0.347 | 69 |
| 2,4,5-Trichlorophenol | 400.0 | 0.001 | ND | 102 | 73 | 0.400 | 80 |
| 2,4-Dinitrotoluene | 0.13 | 0.001 | ND | 103 | 74 | 0.388 | 78 |
| 2,4-D | 10.0 | 0.01 | ND | 93 | 53 | 0.440 | 88 |
| Hexachlorobenzene | 0.13 | 0.001 | ND | 103 | 113 | 0.529 | 106 |
| 2,4,5-TP | 1.0 | 0.01 | ND | 87 | 55 | 0.503 | 101 |
| Pentachlorophenol | 100.0 | 0.001 | ND | 103 | 99 | 0.404 | 81 |
| Lindane | 0.4 | 0.001 | ND | 102 | 104 | 0.553 | 111 |
| Total Heptachlor | 0.008 | 0.001 | ND | 104 | 97 | 1.014 | 101 |
| Endrin | 0.02 | 0.001 | ND | 100 | 53 | 0.609 | 122 |
| Methoxychlor | 10.0 | 0.001 | ND | 104 | 62 | 0.513 | 103 |
| Chlordane | 0.03 | 0.0002 | ND | 92 | 120 | 0.0017 | 85 |
| Toxaphene | 0.5 | 0.005 | ND | 94 | 102 | 0.0197 | 99 |

| | % RECOVERY |
|---|---|
| 2-Fluorophenol SURR | 109 |
| Phenol-d5 SURR | 92 |
| Nitrobenzene-d5 SURR | 94 |
| 2-Fluorobiphenyl SURR | 94 |
| 2,4,6-Tribromophenol SURR | 96 |
| Terphenyl-d14 SURR | 87 |

Methods: EPA SW 846-1311, 8270, 8080.
ND - Not Detected

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

9-7-94
DATE

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

ANALYTICAL RESULTS FOR
ARCO PERMIAN
Attention: Nathan J. Binau
P. O. Box 1610
Midland, TX 79702

September 02, 1994
Receiving Date: 08/27/94
Sample Type: Soil
Project No: NA
Project Location: Jal, New Mexico

Analysis Date: 08/30/94
Sampling Date: 08/25/94
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: South Justis Unit Soil

| TA# | Field Code | [illegible] | (ppm) | [illegible] (ppm) | CORROSIVITY | (s.u.) | |
|---|---|---|---|---|---|---|---|
| T25103 | #1-Arco SJU-East Pile Comp. | Non-reactive | <10.0 | <2.5 | Noncorrosive | 6.73 | Nonignitable |
| T25104 | #2-Arco SJU-West Pile Comp. | Non-reactive | <10.0 | <2.5 | Noncorrosive | 6.95 | Nonignitable |
| QC | Quality Control | --- | --- | --- | --- | 7.00 | --- |
| % Precision | | 100 | 100 | 100 | 100 | 100 | 100 |
| % Extraction Accuracy | | --- | --- | --- | --- | --- | --- |
| % Instrument Accuracy | | --- | --- | --- | --- | 100 | --- |

METHODS: EPA SW 846-2.1.3, 2.1.2, 2.1.1.

9-2-94

Director, Dr. [illegible]
Director, Dr. Blair Leftwich

SEP-19 94 MON 14:15 1 505 393 0720 P.18

# TraceAnalysis, Inc.

6701 Aberdeen Avenue Lubbock, Texas 79424
Tel (806) 794 1296 Fax (806) 794 1298

## CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

**Project Manager:** Nathan J. Binau

**Phone #:** (915) 688-5799

**FAX #:** (915) 688-5602

**Company Name & Address:** ARCO Permian
P.O. Box 1610
Midland, TX 79702

**Project #:** —

**Project Name:** Seven Rivers Unit Soil

**Project Location:** Jal, New Mexico

**Sampler Signature:** Nathan J. Binau

| LAB # (LAB USE ONLY) | FIELD CODE | # CONTAINERS | Volume/Amount | MATRIX: WATER | SOIL | AIR | SLUDGE | OTHER | PRESERVATIVE METHOD: HCL | HNO3 | ICE | NONE | OTHER | SAMPLING: DATE | TIME |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25103 | #1 - ARCO SJU - East Pit Composite | 1 | 1L | | X | | | | | | X | | | 8/25/94 | 12:00 |
| 04 | #2 - ARCO SJU - West Pit Composite | 1 | 1L | | X | | | | | | X | | | 8/25/94 | 12:15 |
| 05 | #3 - ARCO SJU - Tank Battery Site 0-12" Composite | 1 | 1L | | X | | | | | | X | | | 8/25/94 | 12:30 |

**ANALYSIS REQUEST**

| BTEX 8020 | TPH | TCLP Metals Ag As Ba Cd Cr Pb Hg Se | Total Metals Ag As Ba Cd Cr Pb Hg Se | TCLP Volatiles | TCLP Semi Volatiles | TDS | RCI | pH | Ammonia - N | Nitrate - N | Phosphate |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | | | | |
| ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | | | | |
| ✓ | ✓ | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |

**SPECIAL HANDLING**

| Turn around # of days | Fax ASAP | Report TWC direct | Hold |
|---|---|---|---|
| 3 | X | | |
| 3 | X | | |
| 3 | X | | |

| Relinquished by: | Date: | Times: | Received by: |
|---|---|---|---|
| Nathan J. Binau | 8/26/94 | 1:45 pm | Helen Shelton |
| Helen Shelton | 8/26/94 | 5:00 P.M | |
| | | | Received by Laboratory: 8/27/94 |

**REMARKS**