

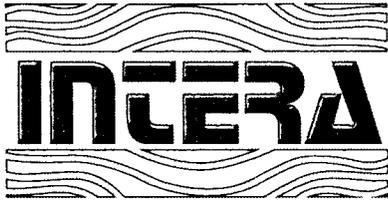
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# REPORTS

YEAR(S):

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2002 - 2000



**Intera Incorporated**  
One Park Square  
6501 Americas Parkway NE  
Suite 820  
Albuquerque, NM 87110  
Telephone: 505 246 1600  
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RECEIVED

DEC 24 2003  
Environmental Bureau  
Oil Conservation Division

December 22, 2003

Ms. Martyne J. Kieling  
Environmental Geologist  
New Mexico Oil Conservation Division  
1220 South Saint Francis Drive  
Santa Fe, NM 87505

**RE: Phase I Investigation and Remediation – Araho, Inc. Former Injection Well Disposal Facility - Final Report**

Ms. Kieling:

INTERA Inc. (INTERA) appreciates the opportunity to work with the New Mexico Oil Conservation Division. Enclosed you will find three original copies of the final letter report "*Phase I Investigation and Remediation – Araho, Inc. Former Injection Well Disposal Facility*". INTERA does not anticipate any other project activities after the completion of the enclosed report and considers the project completed at this time.

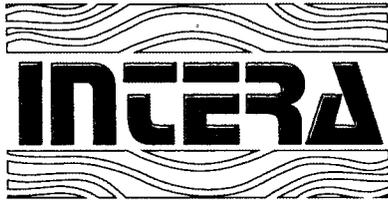
If you have any questions regarding the enclosed report, please do not hesitate to contact me at (505) 246-1600 ext. 219. Thank you very much.

Sincerely,  
**INTERA Inc.**

A handwritten signature in black ink, appearing to read "J. Tracy". The signature is fluid and cursive, with a large, sweeping flourish at the end.

Joseph Tracy, RG  
Project Manager

Enclosure: Summary Report – Araho, Facility in Lea County, New Mexico (3 copies)



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Environmental Bureau  
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December 19, 2003

Ms. Martyne J. Kieling  
Environmental Geologist  
New Mexico Oil Conservation Division  
1220 South Saint Francis Drive  
Santa Fe, NM 87505

**RE: Phase I Investigation and Remediation – Araho, Inc. Former Injection Well Disposal Facility, Lea County, New Mexico**

Ms. Kieling:

The New Mexico Oil Conservation Division (NMOCD) contracted INTERA Incorporated (INTERA) to perform a Phase I Environmental Site Investigation and Preliminary Remediation Measures at the Araho, Inc. former injection well disposal facility (Site) located in Lea County, New Mexico. The location of the Site is shown on Figure 1. INTERA performed the work under the State of New Mexico General Services Department Purchasing Division Price Agreement No. 30-805-09-18056. The original INTERA Scope of Work (SOW) as authorized by NMOCD included the following action items:

- Contact One-Call (New Mexico underground utility locating service) and map the buried pipelines and electrical hazards on the Site based upon the One-Call service markings;
- Perform a naturally occurring radioactive materials (NORM) survey of all pipes and equipment prior to disposal. A registered NORM surveyor must perform the NORM surveys;
- Remove material within the tanks for recycling, approximately 1,600 barrels (bbl);
- Remove the tanks for recycling or disposal;
- Remove trash at the Site to include barrels, buckets, batteries, pipes (buried and surface), electrical meters, and other trash items;
- Investigate the nature and extent of contamination beneath the tank footprints by trenching with a backhoe;
- Investigate the extent of chloride contamination in the surface soils at the Site (per the NMOCD SOW, 10 6-inch compost samples will be taken);
- Provide an estimate for the volume and cost to remove the contaminated soil material (based on the results of the trenching and sample analysis);



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New Mexico Oil Conservation Division  
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- Provide an estimate for the volume and cost to excavate and construct compost piles on the Site (according to NMOCD SOW specifications);
- Propose any additional remediation techniques which would be cost effective (based on Phase I findings); and
- Prepare a final report.

## **SUMMARY OF ACTIVITIES**

### **Task 1 – Project Development and Coordination**

INTERA developed a project schedule, site-specific health and safety plan (HASP), and an internal work plan in order to safely and effectively complete the project. The project planning was coordinated with the NMOCD Project Manager, Ms. Martyne Kieling. A complete copy of INTERA's HASP is included in Attachment A.

### **Task 2 - Utility Locate**

INTERA contacted New Mexico One-Call on September 29 and October 9, 2003, to perform utility markings of buried utilities located at the Site. (A second utility locate was requested because of a delay in the start date of the remediation work. Utility markings are only valid for a period of two weeks after the markings have been made on the ground surface). INTERA was issued the following ticket numbers from the New Mexico One-Call Center:

**2003400562** – September 29, 2003  
**2003413085** – October 9, 2003

The New Mexico One-Call Center contacted utility owners EOTT-Texas/New Mexico, Gasco of Lovington, and Duke Energy Field Services. These companies are registered with New Mexico One-Call Center as owning and operating underground utilities in the area of the Site. INTERA was not advised of other utilities companies which may have subsurface utilities in the area by the New Mexico One-Call Center.

No subsurface utilities were observed to be present at the Site or transecting it. One buried natural gas line is located adjacent to the east boundary of the Site and is orient parallel to it. The location of the buried natural line is shown on Figure 2. It is believed that this natural gas line is operated by PNM. No other subsurface utilities were located on or near the Site.



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### **Task 2 - NORM Survey**

INTERA was authorized by the NMOCD to perform a NORM survey of all "pipes and equipment" scheduled to be removed from the Site. INTERA subcontracted the NORM Survey work to Mr. James Allen of Safety and Environmental Solutions, Inc. (SESI), located in Hobbs, New Mexico, to perform the NORM Survey. Mr. Allen is registered in accordance with Part 2 of the New Mexico Radiation Control Bureau Protection Regulations (New Mexico Administrative Code [NMAC] 20.3.2). Mr. Allen's Registration Numbers are No. 398-6N (Radiation Safety Consultant to Oil and Gas NORM) and No. 434-9N (Radiation Safety Training and Oil and Gas NORM).

Mr. Konrad Clark of INTERA mobilized to the Site on October 8, 2003 to oversee Mr. Allen as he performed the NORM survey. During this initial mobilization to the Site, only the tanks located at the Site were surveyed; other equipment and piping was surveyed at a later date. A total of eight tanks were surveyed. The locations of Tank 1 through Tank 8 are shown on Figure 2. The results of the initial NORM survey are shown on Table 1.

**Table 1 – Initial NORM Survey Results  
October 8, 2003**

<b>Tank Designation</b>	<b>NORM Survey Reading (mR)</b>
Tank 1, 3000 bbl	58
Tank 2, 210 bbl	24
Tank 3, 750 bbl	52
Tank 4, 500 bbl	18
Tank 5, 500 bbl	28
Tank 6, 200 bbl	46
Tank 7, 200 bbl	26
Tank 8, 750 bbl	30

All NORM Survey results shown in microroentgens per hour (mR/hr)

Initial NORM Survey results showed relatively elevated levels of NORM within Tank 1, Tank 3, and Tank 6. The background NORM Survey readings taken by Mr. Allen on October 8, 2003, were between 10 -14 microroentgens per hour (mR/hr). The background readings were taken 10-feet within the southern fence line. Sludges and scales contained in oil, gas, and water production equipment containing more than 50 mR/hr are required to be handled and disposed of as NORM regulated waste (New Mexico Administrative Code [NMAC] 20.3.14.1403.A). Because the tanks which showed elevated readings still contained liquids, it was assumed that the presence of these liquids caused NORM levels to increase in these specific tanks. Mr. Allen stated that these NORM levels would most likely decrease once all fluids were removed from the



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tanks. The NORM Survey was scheduled to continue once the fluid from these tanks was removed. The NORM Survey was also scheduled to be conducted on all underground piping (associated with the disposal injection facility) after it was removed from the subsurface and placed in a staging area.

Mr. Allen returned to the Site on October 22, 2003. At that time, all subsurface piping had been removed and staged in one area. Also, all fluids and sludges had been removed from the on-site tanks. Mr. Allen performed a NORM survey of the piping and scrap metal and indicated the level of radiation to be <20 mR/hr. Tank 1, Tank 3, and Tank 6 were also re-surveyed by Mr. Allen. The radiation levels of Tank 1 and Tank 6 was indicated to be <20 mR/hr. The radiation level of Tank 3 indicated the level of radiation to be 46 mR/hr.

On October 22, 2003, Mr. Allen also performed a NORM survey of the sludge material removed from Tank 1 for disposal at the Rhino Facility. The sludge/soil mix contained a reading of 25 mR/hr, which is below the regulatory level, and therefore the sludge/soil material was determined to be suitable for land farming.

On October 23, 2003, Mr. Allen returned to the Site and performed an external NORM survey of two 6-inch diameter PVC pipes. These pipes were removed from the subsurface after Mr. Allen left the Site on October 22, 2003. The survey results indicated the level of radiation to be <20 mR/hr. The results of the NORM Survey conducted on October 22 and October 23, 2003, are outlined below. A complete copy of the NORM survey report is included in Attachment B.

**Table 2 – Additional NORM Survey Results  
October 22 and 23, 2003**

<b>Tank Designation</b>	<b>NORM Survey Reading (mR)</b>
Tank 1, 3000 bbl	<20
Tank 3, 750 bbl	46
Tank 6, 200 bbl	<20
All piping, scrap metal*	<20
Sludge (disposal – landfarming)	25

All NORM Survey results shown in microroentgens per hour (mR/hr)

\* - scrap metal survey consisted of small pieces of piping and miscellaneous metal pieces

### **Task 3 – Field Investigation and Phase I Site Remediation**

INTERA conducted the field investigation and Phase I Site Remediation at the Araho Facility in October 2003. A photograph log depicting the various field activities conducted is included in Attachment C.



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### **Removal of Material from Tanks**

Approximately 3,565 bbls of liquid (petroleum product mixed with water) were removed from the Site and disposed of at the Sundance Services in Eunice, Lea County, New Mexico. The waste material was classified as "produced water/tank bottoms" and complete copies of each liquid waste manifest are included in Attachment D. Sundance Services is an OCD-approved facility and the 3,565 bbls of liquid were disposed of in accordance with the regulations of NMOCD.

The liquid waste material accepted at Sundance Services is processed by heating the waste before it is sent through a centrifuge. The centrifuge separates waste and generates reclaimable oil, waste water, and solids. The reclaimable oils are re-used, the waste water is evaporated in evaporation ponds, and the solids are landfilled.

Approximately 500 bbls of a semi-solid liquid located in the bottom of Tank 1 (3,000 bbl tank) proved too viscous to be pumped from the tank, and was also unable to be liquefied by adding high-pressure water and/or hot water. It was determined that this material would have to be mixed with sand and disposed of as a sludge. The semi-solid petroleum liquid was mixed with sand within the tank (the top of the tank was removed and the bottom third of the tank remained in place) using a Trackhoe excavator. This semi-solid petroleum material was mixed with sand until it was near a solid state and then transported from the Site. A total of 443 cubic yards of sludge (petroleum semi-solid/sand mixture) was transported from the Site to the Rhino Goo Yea South Disposal Facility eight miles south of Hobbs, New Mexico. The waste material is disposed of by the process of landfarming at the Rhino Goo Yea South Disposal Facility. The waste material was classified as "mix bottom soils", "dry-mixed bottoms", "mixed soil dry" or "hydrocarbon impacted soils"; and copies of each manifest are included in Attachment E.

It should be noted that the tank bottoms of Tank 1 (3,000 bbl) and Tank 3 (750 bbl) contained 12- to 14-inches of concrete in the bottom of each tank. It is believed that the elevated NORM Survey results observed at the bottoms of these tanks was caused by the presence of the concrete. Tank 1 and Tank 3 were disassembled on Site, and the concrete was removed from the bottom of each tank and disposed of separately.

### **Removal and Disposal of Tanks**

A total of eight tanks were present at the Site at the initiation of the remediation work. The tanks present at the Site, the size of each tank, and the approximate volume estimates of waste material contained in each tank at the beginning of remedial activities are outlined in Table 3.



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**Table 3 – Tank Designation and Size**

<b>Tank Designation</b>	<b>Size</b>	<b>Initial Contents NMOCD Volume Estimates</b>
Tank 1	3000 bbl	2000 bbls of material
Tank 2	210 bbl	50 bbls of material
Tank 3	750 bbl	250 bbls of material
Tank 4	500 bbl	empty
Tank 5	500 bbl	100 bbls of material
Tank 6 (fiberglass)	200 bbl	200 bbls of material
Tank 7	200 bbl	empty
Tank 8	750 bbl	empty

The tanks were removed from the Site on October 22 and October 23, 2003, following the removal of petroleum material (if applicable). In addition, the interior of tanks containing residues were steam-cleaned prior to removal from the Site. The steel tanks were transported from the Site to Hobbs Iron & Metal, Inc. of Hobbs, New Mexico. A complete copy of the tank acceptance manifest is included in Attachment F. These tanks are scheduled to be recycled. The fiberglass tank was demolished on-site and disposed of with the miscellaneous waste taken from the Site in roll-off dumpsters.

Prior to disposal, NMOCD has sampled the paint on the tanks for the presence of lead-based paint (LBP). Copies of the LBP analytical results were provided to Rhino for use during consideration of disposal options for the tanks. A complete copy of the LBP analytical results are included in Attachment G.

#### **Removal and Disposal of Piping**

Figure 3 is a Site facility map showing the locations of the subsurface piping removed from the Site. The amount of piping removed is a substantial increase from NMOCD's estimated amount of piping present at the facility prior to remedial work. The piping was removed from the surface and subsurface and placed in a stockpile for the NORM Survey prior to placement in roll-off waste containers. All piping present on the ground surface was removed from the Site. Where indications of piping entering the ground surface were observed, the piping runs were excavated and removed from the subsurface for disposal. The NMOCD provided a map of subsurface piping that was used as a guide, as well as visual observations of subsurface piping identified in the field. All above- and below-ground piping associated with the former Araho Injection Well Disposal facility was removed from the Site in roll-off dumpsters. The majority of the steel piping was removed from the Site to be recycled.



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### **Removal of Trash (barrels, buckets, pipes, electric meters, miscellaneous debris)**

A total of 44 cubic yards of miscellaneous debris were removed from the Site and transported for disposal. The waste material was classified as "below grade pipe and associated trash from pipe and tank removal" and disposed of at Controlled Recovery, Inc. of Hobbs, New Mexico and Camino Real Environmental Center of Sunland Park, New Mexico. The majority of this waste was a non-metallic type of waste (i.e. plastics, rags, paper, wood, etc.). Copies of the waste tickets are included in Attachment H.

### **Task 3 – Investigate the Nature and Extent of Contamination**

INTERA documented the locations of the heavy surface soil-stained areas at the Site (see Figure 4). The stained areas, as well as the tank footprints, were investigated by backhoe trenching. Trenches were constructed across the diameters of the tank footprints as well as through heavily stained areas.

The locations and depth of the petroleum-impacted soil samples are shown on Figure 5. Efforts were made to collect representative samples of the conditions within each tank footprint as well as within each stained area and along the former major piping runs.

Prior to sample submission to the analytical laboratory, the samples were split and analyzed with a photoionization detector (PID). The PID was equipped with a 10.5 electron-volt (eV) ionization potential electron-volt (eV) lamp and was used to screen the subsurface soil samples for total volatile organic compounds (VOCs) following heated headspace techniques.

INTERA followed the New Mexico Environment Department (NMED) Petroleum Storage Tank Bureau (PSTB) Standard Operating Procedure (SOP) for heated headspace reading collection. The 10.5 eV lamp gave the PID the sensitivity required to identify the kinds of organic compounds suspected of being present in Site soils. The PID screens ionizable organic compound concentrations in air and gives direct measurement readouts in parts per million (ppm). The PID determines the concentration of total ionizable organic compounds, but does not differentiate between specific compounds. The operational range of the PID is 0 to 2,000 ppm, with a minimum instrument detection of 0.1 ppm. Soil samples were placed in glass jars and covered with aluminum foil. The aluminum foil was secured on each jar with a rubber band. The jars were placed in direct sunlight to warm to ambient air temperature. The tip of the PID probe was then used to pierce the foil and inserted into the jar above the soil sample. The VOC concentration in the air above the soil sample (or headspace) was analyzed using the PID. No PID headspace readings were detected in any of the subsurface soil samples screened, with the



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exception of soil samples T3-4' and T1-3'. The PID detected VOCs at concentrations of 65 ppm in soil sample T3-4' and 650 ppm in soil sample T1-3'.

An approximate 80-foot x 120-foot 10 point grid was constructed and 10 sample points were plotted at the Site for the collection of chloride samples. Per the NMOCD SOW, INTERA was to construct a grid and collect 10 6-inch "compost" (i.e., composite) soil samples and submit them for chloride analysis. The chloride samplings locations are shown in Figure 6.

A total of 23 (20 primary samples and 3 duplicate samples) soil samples were submitted for laboratory analysis. Each soil sample was submitted for analysis of total petroleum hydrocarbons (TPH) by EPA Method 8015; modified for diesel fuel and for benzene, toluene, ethyl benzene, and total xylenes (BTEX) by EPA Method 8021; and chloride content by EPA Method 325.2. An additional 12 (10 primary samples and 2 duplicate samples) soil samples were submitted for chloride analysis only. The soil samples were submitted to Pinnacle Laboratories, Inc. in Albuquerque, New Mexico, for analysis. The soil sample analytical results are outlined in Table 4 and Table 5. A complete copy of the laboratory analytical report is included in Attachment I. Collection of the soils samples on October 25, 2003, was witnessed by Mr. Eddie Seay of Consulting Services, Hobbs, New Mexico. Mr. Seay is a consultant representing the City of Lovington, New Mexico.

**Table 4 – Soil Sample Results**  
**EPA Method 8015 – Total Petroleum Hydrocarbons**

<b>Sample Designation</b>	<b>Results EPA Method 8015 Total Petroleum Hydrocarbons</b>
T3-2'	3880
T3-4'	480
T1W-1'	4050
T1E-1'	338
RS1-3'	106
RS2-2'	2923
T2-3'	7270
T1/3-3'	177
RS3-3'	470
T4-2'	898
T4-2B' (duplicate)	180
T5-2'	1228
T6-3'	32
T6-3B' (duplicate)	63
S6-2'	10,970



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Sample Designation	Results EPA Method 8015 Total Petroleum Hydrocarbons
RS4-3.5'	<10
RS5-1'	1200
DL1-2'	7490
DL1-2B' (duplicate)	9770
S9-2'	1150
S1-0.5'	4800
S1-1N'	440
S8-0.5'	1000
NMED TPH Industrial Direct Exposure Guideline (NMED, 2003)	2000
NMOCD TPH Remediation Guideline (NMOCD, 1993)*	100

Table Notes: All TPH results shown in milligrams per kilogram (mg/Kg)  
\* - TPH Remediation Guideline based on a total ranking score of 30

NMED has developed TPH soil screening guidelines (*NMED TPH Screening Guidelines*, dated June 24, 2003) to assess areas of soil contamination that are the result of the releases of petroleum products. The TPH analysis conducted on soil samples from the Site are to be used to delineate the extent of petroleum-related contamination at the Site that could represent an unacceptable risk to the future users of the Site. Laboratory analysis of the soil samples showed that the petroleum carbon range indicated petroleum products present; including mineral oil, diesel fuel, No. 3 and No. 6 fuel oil, kerosene, and unknown oil. The majority of the soil samples indicated the petroleum hydrocarbon range for diesel fuel/kerosene, but because other potential petroleum products were indicated to be present, the most conservative TPH soil screening guideline will be used to evaluate TPH contaminated soils. A TPH soil screening Industrial Direct Exposure guideline of 2,000 mg/Kg will be used.

NMOCD established "*Guidelines for Remediation of Leaks, Spills, and Releases*", dated August 13, 1993, to guide the remediation of contaminants on all federal, state, and fee lands resulting from leaks, spills and releases of oilfield wastes or products. According to the document, NMOCD requires that corrective actions be taken for leaks, spills, or releases of any material which has a reasonable probability to injure or be detrimental to public health, fresh waters, animal or plant life, or property or unreasonably interfere with the public welfare or use of the property (NMOCD, 1993). NMOCD guidelines recommend that all highly-contaminated/saturated soils be remediated in place or excavated to the maximum extent practicable. Since none of the petroleum-impacted soil was observed to be saturated, INTERA



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followed the NMOCD guidelines for unsaturated contaminated soils to determine the appropriate soil remediation action levels. The NMOCD established a ranking criteria to determine the relative threat to public health, fresh waters, and the environment.

<u>Depth to Ground Water:</u>	<u>Ranking Score</u>
<50 feet	20
50 – 99 feet	10
>100 feet	0

Based on conversations with the NMOCD Project Manger, ground water at the Site is known to be approximately 72-feet bgs. This would give the Site a score of **10** for the depth to ground water criteria.

<u>Wellhead Protection Area:</u>	<u>Ranking Score</u>
<1000 feet from a water source	Yes = 20, No = 0
<200 feet from a private domestic water source	Yes = 20, No = 0

INTERA performed a search of the New Mexico State Engineer "WATERS" database and determined that several irrigation wells were located within the immediate area of the Site and that two irrigation wells were within a 1,000 foot radius of the Site. See Attachment J for a Site map which plots nearby wells based on New Mexico State Engineer well location information. The location of the irrigation wells (within 1,000 feet) would give the Site a score of **20** for the wellhead protection area criteria.

<u>Distance to a Surface Water Body:</u>	<u>Ranking Score</u>
<200 horizontal feet	20
200 – 1,000 horizontal feet	10
>1,000 horizontal feet	0

No surface water body are known to be present within 1,000 horizontal feet of the Site, therefore, this would give the Site a score of **0** for the distance to a surface water body criteria.

The cumulative NMOCD remediation guideline ranking score for the Site is **30**. According to the NMOCD guidelines, a ranking score of great than 19 equals a TPH remediation guideline of 100 ppm. NMOCD states that the TPH concentration is the concentration above "background",



# NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

**BILL RICHARDSON**  
Governor  
**Joanna Prukop**  
Cabinet Secretary

**Lori Wrotenbery**  
Director  
**Oil Conservation Division**

December 30, 2003

Mr. Pat Wise  
City Manager  
City of Lovington  
P.O. Box 1269  
Lovington, NM 88260

**RE: Araho, Inc. Former Injection Well Disposal Facility –  
Phase I Investigation and Remediation Final Report.**

Dear Mr. Wise:

The New Mexico Oil Conservation Division (OCD) has completed the Phase I investigation and remediation of the Araho, Inc. former injection well disposal facility. Enclosed please find a copy of the final report for Phase I. If you should have any questions regarding this report please give me a call at 505-476-3488.

Sincerely,

Martyne J. Kieling  
Environmental Geologist

cc: File GW-037



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however; background is not defined by NMOCD. It is understood that “natural background” for TPH would be zero, and since contamination is not attributable to a trespassing plume, INTERA assumes background to be zero for TPH. This score also results in a benzene remediation guideline of 10 ppm and a total BTEX remediation guideline of 50 ppm.

A total of 7 of the 23 soil samples submitted for laboratory analysis were identified to contain concentrations of TPH above the NMED TPH soil screening Industrial Direct Exposure guideline of 2,000 mg/Kg. Soil samples T3-2', T1W-1', RS2-2', T2-3', S6-2', DL1-2', and S1-0.5' were identified to contain TPH concentrations greater than 2,000 mg/Kg. However, a greater area is contaminated above the NMOCD guideline, resulting in a larger, more conservative area to be remediated. A total of 21 of the 23 soil samples submitted for laboratory analysis were identified to contain concentration of TPH above the NMOCD guideline of 100 ppm. The only soil samples identified with TPH concentrations of less than 100 ppm were soil samples T6-3' and RS4-3.5'; all others exceeded 100 ppm. The areas from which these soil samples were collected should be remediated by the removal of the petroleum-contaminated soils. Confirmation soil samples should be taken and submitted for analysis to assure that the subsurface soils remaining in place have TPH concentrations of less than 100 ppm.

**Table 5 – Soil Sample Results**  
**EPA Method 8021 – Benzene, Toluene, Ethyl Benzene, Total Xylenes (BTEX)**

Sample Designation	Benzene	Toluene	Ethyl Benzene	Total Xylenes
T6-3B' (duplicate)	<0.025	<0.025	<0.025	<0.050
T3-2'	0.15	0.24	0.78	0.73
T3-4'	<0.025	<0.025	<0.025	<0.050
T1W-1'	<0.025	<0.025	<0.025	<0.050
T1E-1'	<0.025	<0.025	0.030	<0.050
RS1-3'	<0.050	<0.050	<0.050	<0.10
RS2-2'	<0.025	<0.025	<0.025	<0.050
T2-3'	0.43	0.17	3.6	8.6
T1/3-3'	<0.025	<0.025	<0.025	<0.050
T4-2B' (duplicate)	<0.050	<0.050	<0.050	<0.10
RS3-3'	<0.025	<0.025	<0.025	<0.050
T4-2'	<0.050	<0.050	<0.050	<0.10
T5-2'	<0.050	<0.050	0.074	<0.10
T6-3'	<0.050	<0.050	<0.050	<0.10
S6-2'	<0.025	<0.025	0.046	0.12
RS4-3.5'	<0.025	<0.025	<0.025	<0.050
RS5-1'	<0.025	<0.025	<0.025	<0.050
DL1-2'	<0.13	<0.13	0.61	1.8



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Sample Designation	Benzene	Toluene	Ethyl Benzene	Total Xylenes
S9-2'	<0.025	<0.025	<0.025	<0.050
S1-0.5'	<0.025	<0.025	<0.025	<0.050
S1-1N'	<0.025	<0.025	<0.025	<0.050
S8-0.5'	<0.025	<0.025	<0.025	<0.050
DL1-2B' (duplicate)	<0.13	<0.13	1.9	5.8
NMED BTEX Industrial Direct Exposure Guideline (NMED, 2003)	14.0	180.0	68.0	63.0
NMOCD Benzene Remediation Guideline (NMOCD, 1993)*	10.0	N/A	N/A	N/A
NMED Industrial Soil Screening Levels (NMED, 2000)	5.6	180.0	68.0	63.0

Table Notes: All TPH results shown in milligrams per kilogram (mg/Kg)

Table 5 outlines the results of the soil samples submitted for analysis of total BTEX by EPA Method 8021. NMED has developed "Petroleum-Related Contaminants Screening Guidelines" for use pertaining to petroleum-impacted soils, and outlines soil screening levels for benzene, toluene, ethyl benzene, and total xylenes (NMED, 2003). In addition, NMED has established a "Soil Screening Guidance Technical Background Document", (NMED, 2000) which establishes soil screening levels to be used at remediation sites. These levels are similar to the "Petroleum-Related Contaminants Screening Guidelines" with the exception of the industrial soil screening level for benzene. The latest NMED guidance increases the soil screening level for benzene. The NMOCD remediation guideline for benzene is also included in the table. This value is outlined in the NMOCD remediation guidance document discussed earlier (NMOCD, 1993). All remediation guidance discussed herein and soil screening levels for BTEX are outlined in Table 5. No BTEX compounds were identified in any of the soil samples submitted for laboratory BTEX analysis above the NMED BTEX Industrial Soil Screening Guidelines, the NMED Soil Screening Levels, or the NMOCD remediation guidance for benzene concentrations and/or total BTEX.



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**Table 6 – Soil Sample Results  
 EPA Method 325.2 - Chloride**

Sample Designation	Chloride Results – EPA Method 325.2
T6-3B' (duplicate)	7300
T3-2'	2700
T3-4'	5800
T1W-1'	990
T1E-1'	2700
RS1-3'	1300
RS2-2'	2800
T2-3'	3600
T1/3-3'	5600
T4-2B' (duplicate)	9700
RS3-3'	6500
T4-2'	11,000
T5-2'	6300
T6-3'	8000
S6-2'	2800
RS4-3.5'	2100
RS5-1'	630
DL1-2'	1500
S9-2'	5400
S1-0.5'	11,000
S1-1N'	3400
S8-0.5'	1100
DL1-2B' (duplicate)	1400
C-1	1800
C-2	11,000
C-3	4100
C-4	3000
C-5	9300
C-6	3900
C-7	730
C-8	2400
C-9	820
C-10	3000
C-11 (duplicate of C-8)	2600
C-13 (duplicate of C-2)	8900

Table Notes: All TPH results shown in milligrams per kilogram (mg/Kg)



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There are no NMED soil screening levels and/or NMOCD remediation guidance for concentrations of chloride in surface and subsurface soils. No other regulated or suggested levels for chloride content in soils are recognized by New Mexico state regulatory agencies. Based on discussions with the NMOCD Project Manager, the New Mexico Water Quality Control Commission Standard for chloride in ground water (250 milligrams per liter [mg/L]) has been used as a guideline for chloride in soils remediation. Background chloride concentrations in soil are not known; however, chloride soil samples C-1 and C-7 were taken in areas believed to be representative of "background" (i.e. areas believed to not have been impacted by past Site operations). The chloride concentration identified in soil sample C-1 was 1,800 mg/Kg, and the chloride concentration identified in soil sample C-7 was 730 mg/Kg. All chloride analytical results indicated that the soil samples contain more than 250 mg/Kg of chloride, and 25 soil samples were identified above the concentrations believed to be "background" levels (i.e. greater than 1,800 mg/Kg) for chloride in soils.

#### **Quality Assurance/Quality Control (QA/QC)**

QA samples were collected to measure precision and accuracy. For this project, five duplicate soil samples were collected (sample designations T6-3B', T4-2B', DL1-2B', C-11, and C-13).

Duplicates for soil samples were collected to assess sampling and analytical reproducibility. Three soil duplicate samples were analyzed for TPH and BTEX and NMWQCC-regulated metals, via the EPA Methods used for the primary samples. Five duplicate soil samples were analyzed for chloride, via the EPA Method used for the primary samples. The duplicate surface soil samples were collected from T6-3', T4-2B', DL1-2', C-8, and C-2. The relative percent difference (RPD) between the original sample and the duplicate sample for T6-3' TPH analysis was 65%. The RPD between the original sample and the duplicate sample for T4-2' TPH analysis was 133%. The RPD between the original sample and the duplicate sample for DL1-2' TPH analysis was 26%, for ethyl benzene it was 103%, and for total xylenes it was 105%. A RPD above 25% is normally considered inadequate, and therefore, the sample date should be considered estimated due to poor laboratory precision. This phenomenon may be attributable to uneven distribution of petroleum-contamination throughout the soil samples. RPDs between the original samples and the duplicate samples for chloride analysis were at a minimum 7% and at a maximum of 21%; the reproducibility for these analyses is considered adequate.

#### **Remedial Option 1 – Removal of Petroleum-Impacted Soil and Placement of Clean Fill**

An estimated 5,300 cubic yards of petroleum-impacted soil is present at the Site. This is based on the soil sample analytical results for those soil samples collected in October 2003. This is also based on using a value of 100 mg/Kg total TPH as a site remediation value (based on the NMOCD remediation guidance). It is proposed that all soils containing total TPH above 100



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mg/Kg be removed from the Site and be transported to an OCD-approved facility for disposal. An estimated 6,095 cubic yards of clean fill will be needed to be transported to the Site and placed in the areas of soil excavation. The clean fill will be required to be compacted and the Site contoured to the original grade (pre-remedial activities). A map showing the approximate location of the proposed excavated area is included in Attachment K.

Excavation of Petroleum-Impacted Soil - \$18,550  
Loading - \$7,950  
Transportation, Treatment and Disposal - \$103,350  
Backfill, Placement, and Wheel Rolled Compaction - \$22,856  
**Total Estimated Cost – Remedial Option 1 - \$152,706**

These costs assume the following:

- A total of 5,300 cubic yards of petroleum-contaminated soil will be removed from the Site. The average depth of all excavations of petroleum-contaminated soil is four feet. Any excavation exceeding this depth will be considered a change in scope.
- All petroleum-contaminated soil removed from the Site is “exempted oilfield impacted soil” and can be disposed of by landfarming at the Rhino Goo Yea South Disposal Facility located eight miles south of Hobbs, New Mexico.
- The excavation area to address the petroleum-contaminated soil at the Site is assumed to be approximately 35,575 square feet. Any additional area excavated will be considered a change in scope.
- Construction testing practices will be implemented during the backfill of the excavation with clean fill to assure that subsidence will not occur. Construction testing costs are not included in the above costs.
- It is assumed that an additional 15% of material will be required in order to backfill the excavated area. An estimated 6,095 cubic yards of clean fill material will be required.
- New Mexico Gross Receipts Tax (NMGRT) is not applied to these costs.

These costs are preliminary only and do not include costs to develop a site-specific work plan and/or conduct excavation contractor oversight. INTERA assumed NMOCD would perform these duties. In addition, other remedial options (soil vapor extraction, treatment in place, etc.) were not considered when developing these costs.



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**Remedial Option 2 – Excavate Petroleum-Impacted Soils and Construct Compost Piles**

An estimated 5,300 cubic yards of petroleum-impacted soil is present at the Site. Originally, INTERA was to generate costs to excavate all contaminated soil at the Site and to construct compost piles at the Site. The City of Lovington, the Site owner, has communicated to the NMOCD Project Manager that the City of Lovington will not permit compost piles to be constructed at the Site. Therefore, this option was not considered and costs were not generated to perform this original Remedial Option as outlined in the NMOCD SOW.

INTERA appreciates the opportunity to work with the New Mexico Oil Conservation Division. If you have any questions please do not hesitate to contact us at (505) 246-1600. Thank you very much.

Sincerely,  
**INTERA Inc.**

A handwritten signature in black ink, appearing to read "J. Tracy".

Joseph Tracy, RG  
Project Manager

A handwritten signature in black ink, appearing to read "Stacy Sabol".

Stacy Sabol  
Sector Manager

**Figures:**

Figures 1 – Site Location Map

Figure 2 – Site Map

Figure 3 – Removed Piping Map

Figure 4 – Heavy Surface Staining Map

Figure 5 – Soil Sample Location Map

Figure 6 – Chloride Grid Sample Location Map

**Attachments:** Attachment A – Site-Specific Health and Safety Plan (HASP)

Attachment B – NORM Survey Report

Attachment C - Photograph Log

Attachment D – Waste Disposal Manifests – Tank Contents - Liquid

Attachment E – Waste Disposal Manifests – Tank Contents - Solids

Attachment F – Tank (Steel) Receipt

Attachment G – Lead-Based Paint Sampling Results (paint samples from Site tanks)

Attachment H – Miscellaneous Debris Waste Tickets

Attachment I – Laboratory Analytical Results

Attachment J – Wellhead Protection Area Map

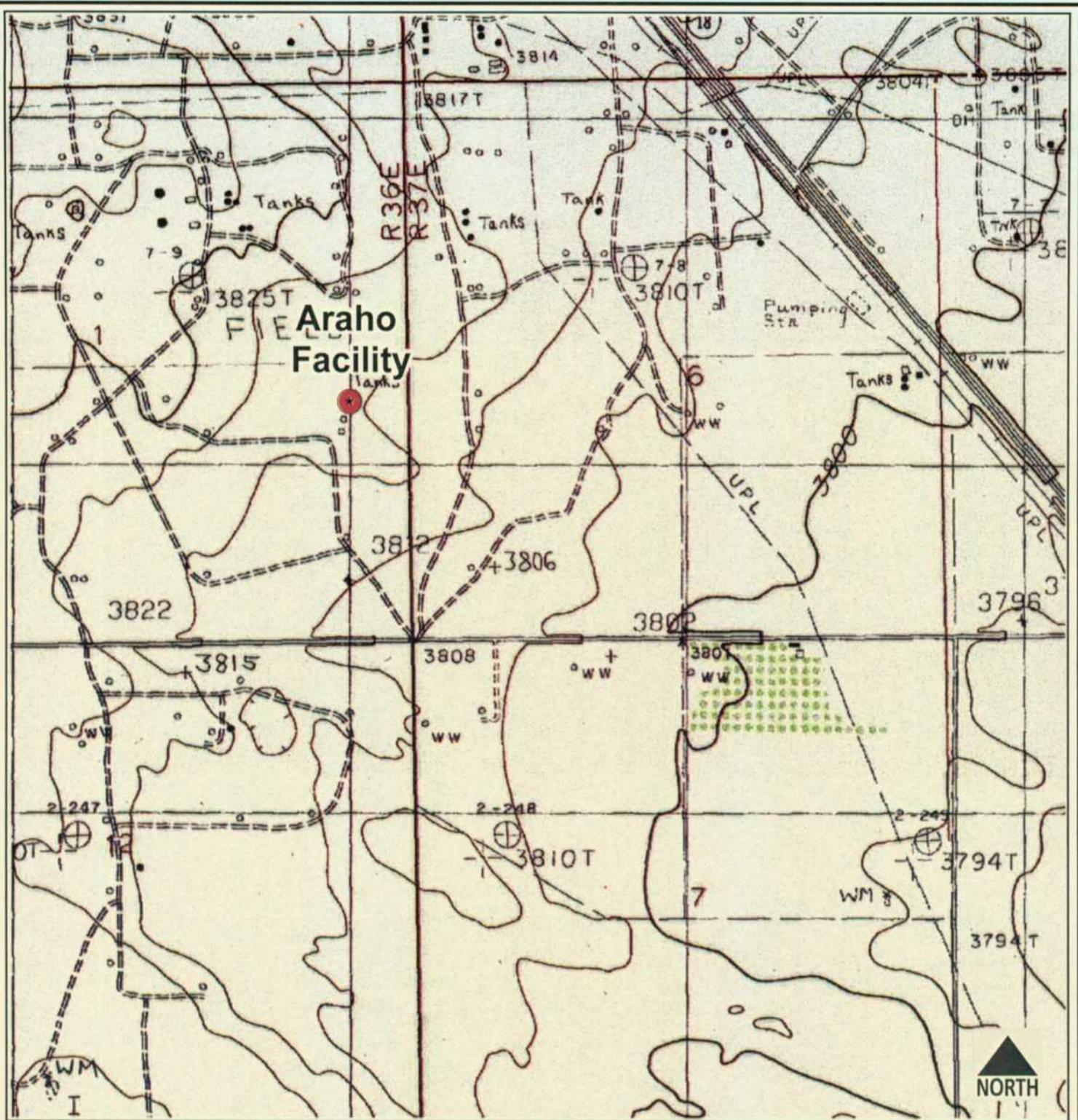
Attachment K – Estimated Area of Petroleum-Contaminated Soil

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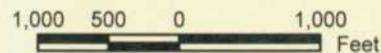
## Figures

**Figures**



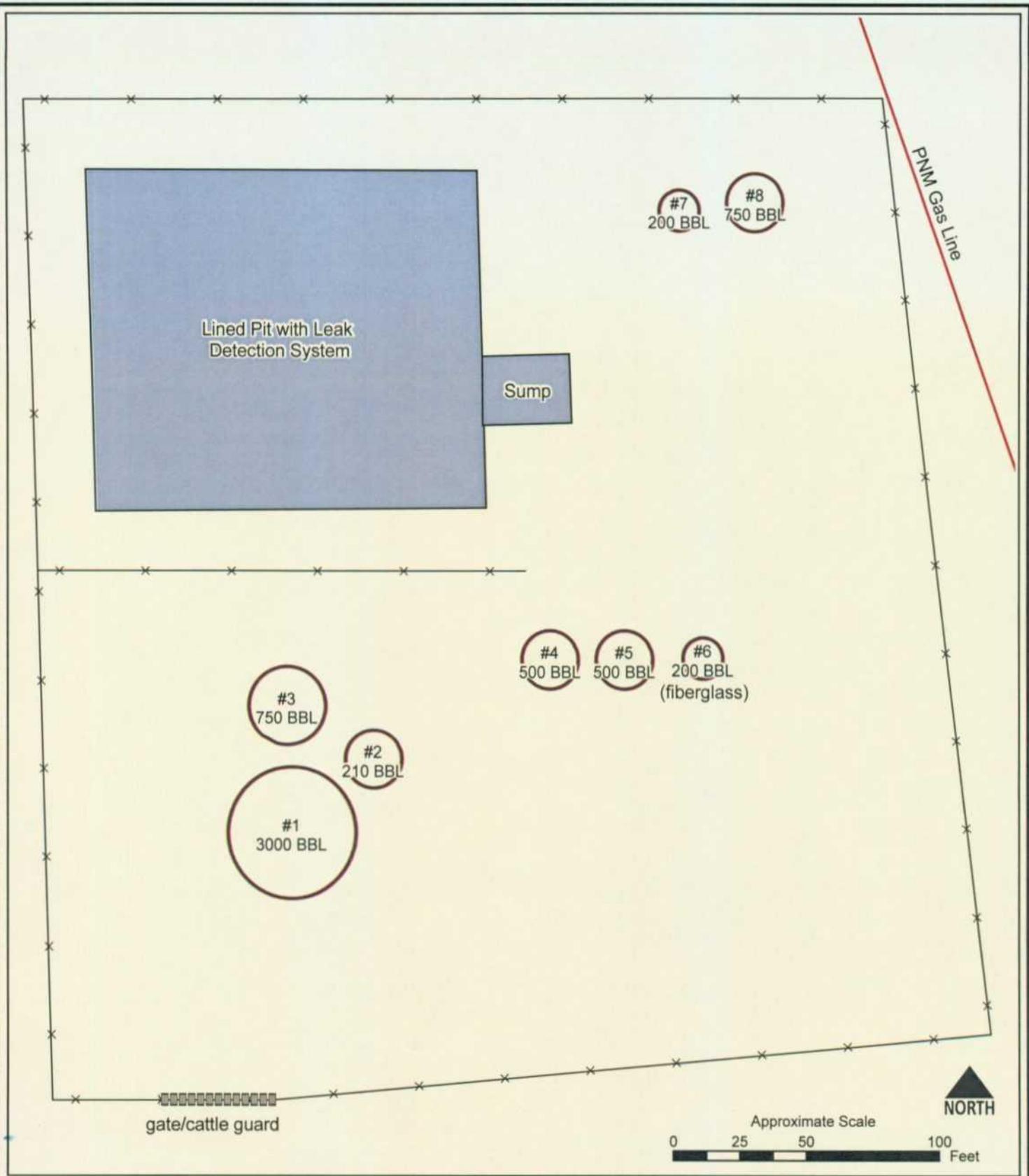


Map source: NM RGIS website.



Site Location Map	
Phase I Investigation and Remediation Araho, Inc., Former Injection Well Disposal Facility Lea County, New Mexico	
Projection: UTM NAD83 Zone 13 meters	
Date: 11/10/03	Figure 1



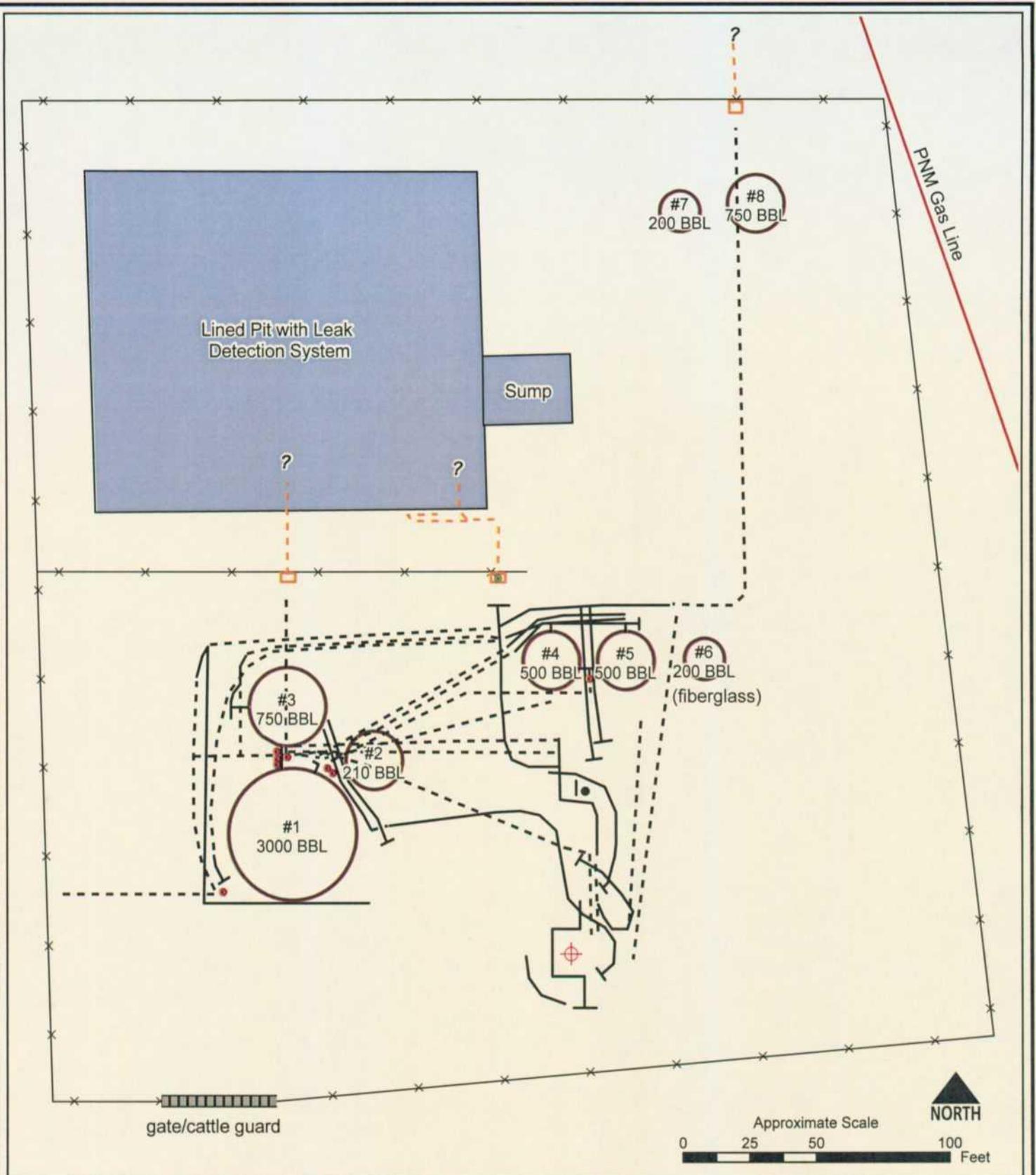


Notes: Map developed from NMOCD sketch and INTERA field observations/GPS coordinates. All objects are approximate size and/or location.

Legend	
	Former AST (BBL = barrels)
	Pit/Sump
	Fence

Site Map	
Phase I Investigation and Remediation Araho, Inc., Former Injection Well Disposal Facility Lea County, New Mexico	
Date: 12/08/03	Figure 2



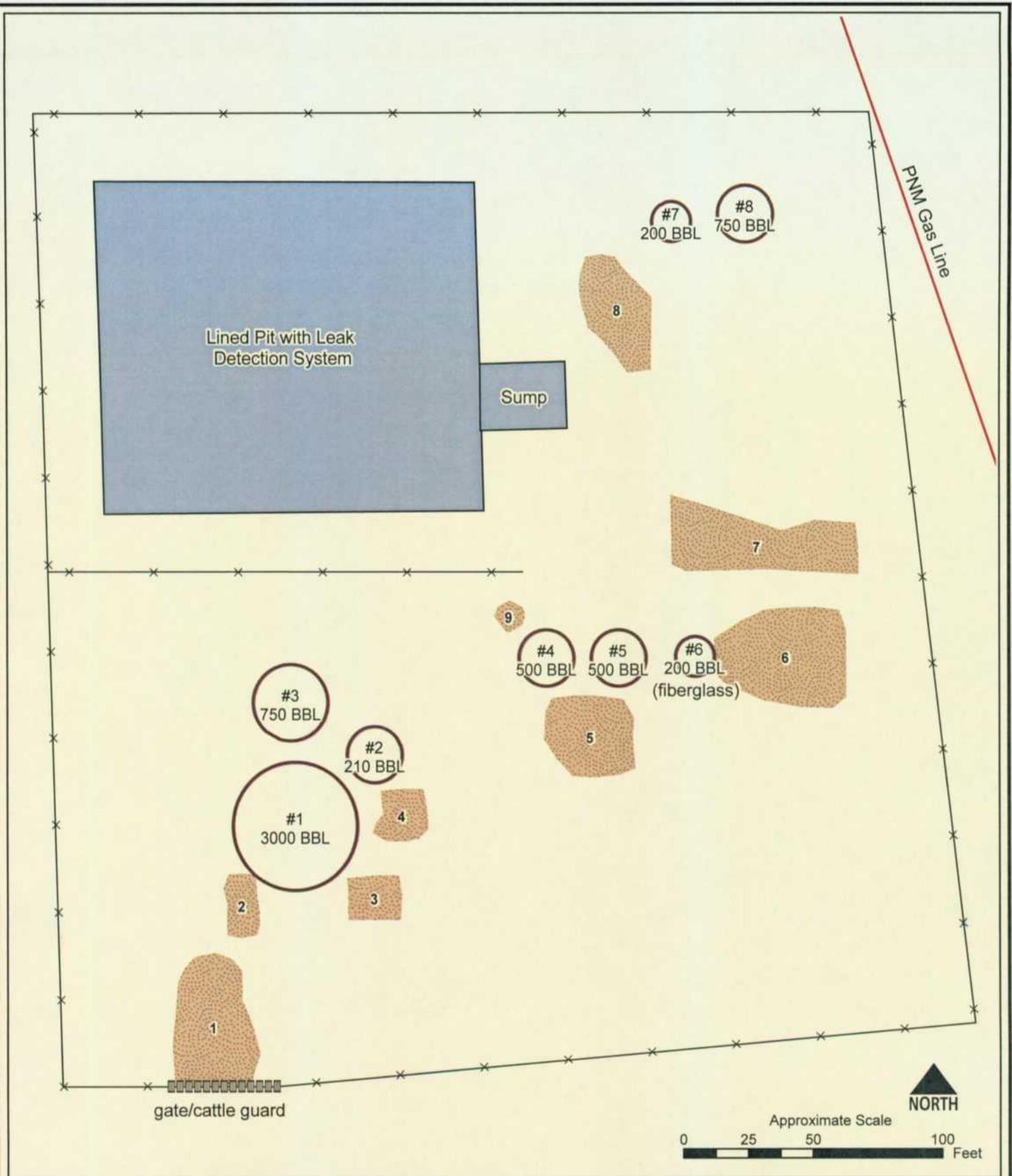


Notes: Map developed from NMOCD sketch and INTERA field observations/GPS coordinates. All objects are approximate size and/or location.

Legend	
	Former AST (BBL = barrels)
	Pit/Sump
	Fence
	Disposal Well #1
	Electrical Pole
	Above Ground Pipe (removed)
	Below Ground Pipe (removed)
	Below Ground Pipe (existing)
	Capped Below Ground Pipe (existing)
	Vertical Pipe (removed)
	Vertical Pipe (existing)

Removed Piping Map	
Phase I Investigation and Remediation Araho, Inc., Former Injection Well Disposal Facility Lea County, New Mexico	
Date: 12/08/03	Figure 3



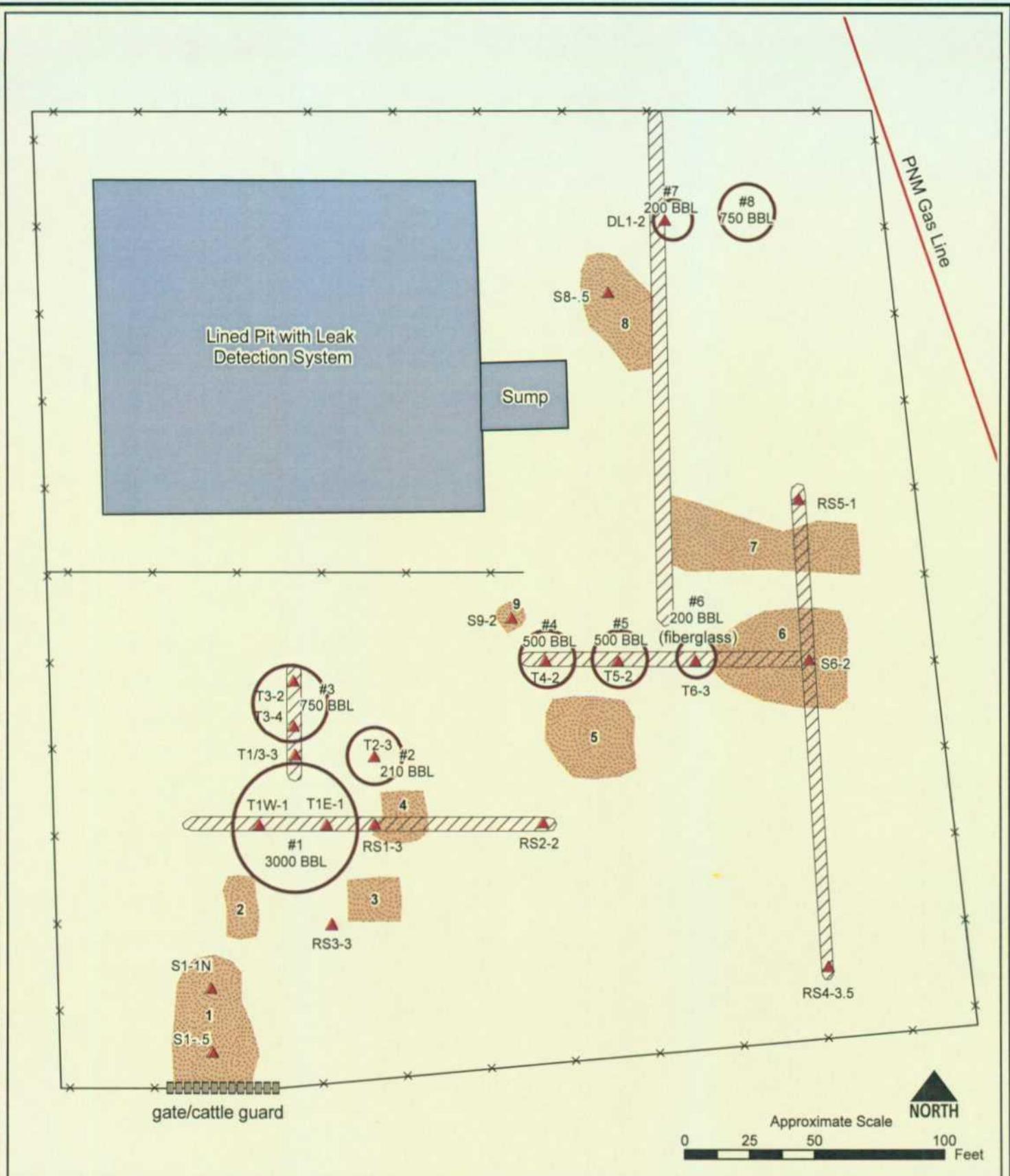


Notes: Map developed from NMOCD sketch and INTERA field observations/GPS coordinates. All objects are approximate size and/or location.

Legend	
	Former AST (BBL = barrels)
	Pit/Sump
	Fence
	Soil Stain

Heavy Surface Staining Map	
Phase I Investigation and Remediation Araho, Inc., Former Injection Well Disposal Facility Lea County, New Mexico	
Date: 12/08/03	Figure 4



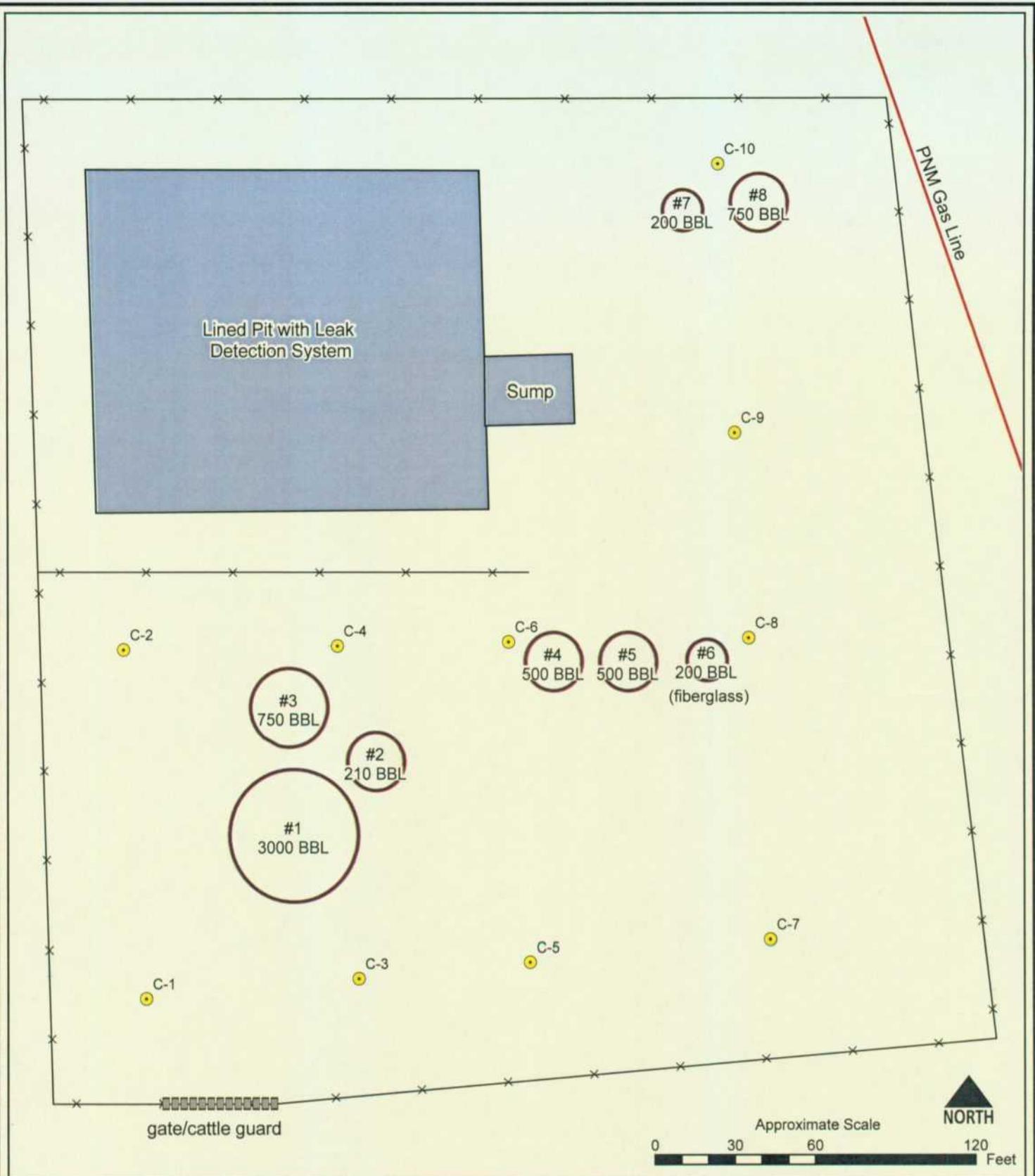


Notes: Map developed from NMOCD sketch and INTERA field observations/GPS coordinates. All objects are approximate size and/or location.

Legend	
▲	Sample Location
T3-2	Name / Depth in Feet
□ (with diagonal lines)	Former AST (BBL = barrels)
□ (blue)	Pit/Sump
▨ (with diagonal lines)	Trench
✕	Fence
■ (stippled)	Soil Stain Area

Soil Sample Location Map	
Phase I Investigation and Remediation Araho, Inc., Former Injection Well Disposal Facility Lea County, New Mexico	
Date: 11/17/03	Figure 5





Notes: Map developed from NMOCD sketch and INTERA field observations/GPS coordinates. All objects are approximate size and/or location.

Legend	
	Chloride Grid Sample Location
	Former AST (BBL = barrels)
	Pit/Sump
	Fence

Chloride Grid Sample Location Map	
Phase I Investigation and Remediation Araho, Inc., Former Injection Well Disposal Facility Lea County, New Mexico	
Date: 12/08/03	Figure 6

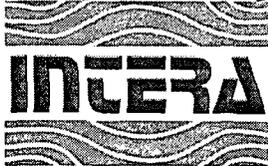


Attachment A

**Attachment A**  
**Site-Specific Health and Safety Plan (HASP)**

**Health and Safety Plan  
for  
Fluid Removal, Tank  
Decommissioning,  
Excavation and Soil  
Sampling Activities  
at  
Araho Inc. Former Injection  
Well Disposal Facility, Lea  
County, New Mexico**

*Prepared by:*



One Park Square  
6501 Americas Parkway NE  
Suite 820  
Albuquerque, New Mexico 87110

October 2003

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## Attachments

- Attachment A Site Personnel Acknowledgement
- Attachment B Site Visitor Log
- Attachment C Hospital Location Map
- Attachment D Air Monitoring Log
- Attachment E Safety Meeting Attendance Form

## Appendices

- Appendix A Excavation Safety
- Appendix B Respirator Fit Testing Information
- Appendix D Material Safety Data Sheets (MSDSs)

**ARAHO FACILITY  
SITE SPECIFIC  
HEALTH AND SAFETY PLAN**

This plan applies to the Araho Inc. Former Injection Well Facility, Lea County New Mexico. This Site Specific Health and Safety Plan (SHSP) is a dynamic document and is subject to change during the performance of the scope of work. This SHSP applies to all personnel involved activities performed at the Former Injection Well Facility Site. Site activities under this SHSP include removal of fluid from tanks, removal of tanks, removal of surface and buried piping, Conduct Naturally Occurring Radioactive Materials Survey (NORM), exploratory excavation of soils and soil sampling. A new SHSP must be in place before any activities out of the scope of this SHSP occur. If at any time an employee is not following the guidelines of this SHSP, they may be escorted off the site and further investigation or action will be taken.

**Sector Manager:** Stacy Sabol – INTERA - Albuquerque (505) 246-1600

**Project Manager:** Joe Tracy – INTERA Albuquerque 505/246-1600

**On-Site Project Manager/Site Health and Safety Officer:** Konrad Clark  
**Mobile:** 505-239-7978

**Health and Safety Officer:** Tricia Johnson – INTERA Albuquerque 505/246-1600

**Site Location:** Located in the NE quarter of the SE quarter of section 1, township 17 south, range 36 east, Lea County NM

**Site Description:** The site operated from 1974 to 1993 as an injection well disposal facility

## **1.0 SCOPE OF WORK**

The contaminants of concern at the site are:

- Crude Oils, gasoline, diesel fuels, and possibly oils and grease.

The following activities will be performed during site work:

- Removal of the tank fluids, tanks, equipment and piping, trash, and excavation for delineation of contamination
- Conduct NORM Survey
- Soil sampling

**ALL EXCAVATION ACTIVITIES SHALL BE PERFORMED ACCORDING TO THE REGULATIONS AND REQUIREMENTS FOUND IN APPENDIX A AND BY OSHA 29 CFR PART 1926.650, SUBPART P (EXCAVATION UNDER THE OSHA CONSTRUCTION STANDARDS).**

### **WORK PROCEDURES:**

- Begin working in LEVEL D (standard work clothes, boots, hard hat, safety glasses).
- No smoking, eating or drinking in exclusion zone and contamination reduction zone.

- Wear hearing protection if operating or working near heavy equipment or other source of loud noise (Safety procedures associated with working on or near heavy equipment is included as Appendix C).
- Wear chemical resistant gloves when handling soil samples and/or contaminated soil.
- Monitor soils and breathing zones with the PID or OVM.
- If soils contaminated with oil and/or gasoline at or above the Action Levels in Section 7 are encountered, discontinue work or proceed with MODIFIED LEVEL C protection, as appropriate (Tyvek suit, latex gloves, cartridge respirator, etc.), and monitor the breathing zone as well as soils with the OVM or PID (record air monitoring readings on the Air Monitoring Log included as Attachment D).
- No personnel are to enter the excavation hole unless the walls meet excavation safety requirements.

## **2.0 SITE HAZARDS**

### **CHEMICAL HAZARDS:**

- possibility of gasoline/diesel fuel, crude oil contaminated soil and petroleum hydrocarbon vapors.

### **SOURCE AND EXPECTED LOCATION OF CHEMICAL CONTAMINATION:**

- Above ground storage tanks and associated piping

### **ROUTES OF EXPOSURE, SYMPTOMS, HEALTH EFFECTS:**

- Fuel oils are generally low in toxicity, they have low volatility, and are not readily absorbed through the skin, however they may cause skin irritation, or "dermatitis", upon contact. Waste oils may contain certain cancer-causing components such as heavy metals and oil derivatives which can be absorbed through the skin. Precautions should be taken and gloves should be worn when handling either fuel oils or waste oils.
- Gasoline is considered more toxic than oils, it has relatively high volatility, and certain components are readily absorbed through the skin. Gasoline contains certain components, such as benzene, which are classified as potential carcinogens. Inhalation of vapors and contact with gasoline contaminated soils should be avoided and proper personal protective equipment will be worn to avoid contact with these soils.
- The symptoms of inhalation over-exposure to petroleum products include dizziness, loss of coordination, general malaise, headaches, and nausea. If any of these symptoms occur, the project manager and the nearest hospital should be contacted. The dangers associated with over exposure to petroleum products should be acknowledged and taken seriously.

**IMPORTANT NOTE: IF SITE OBSERVATIONS, SAMPLING RESULTS, OR OTHER INFORMATION INDICATES THE PRESENCE OF CHEMICAL CONTAMINANTS OTHER THAN PETROLEUM PRODUCTS, THIS HEALTH & SAFETY PLAN BECOMES VOID, AND A NEW PLAN MUST BE PREPARED AND APPROVED!**

### **PHYSICAL HAZARDS:**

- Construction zone and excavation area conditions (slips, trips and falls),
- Heavy equipment traffic,
- Underground utilities,
- Overhead Utilities,

- Biological hazards - insect stings and snakes, and
- Adverse weather conditions.

**NOISE HAZARDS:**

- Operation of heavy equipment (drill rig, track hoes, loaders, tandem trucks, etc.).  
Hearing protection is to be worn when working near heavy equipment.

**3.0 HEAVY/LIGHT EQUIPMENT**

Possible Hazards	Personal injury Property damage Equipment damage
------------------	--

**General**

- Ensure operators have demonstrated skills and/or have attended training on the safe operation of heavy/light equipment.
- Operate equipment according to Department of Transportation (DOT) regulations.
- Meet manufacturer's minimum requirements for safe operation of equipment.
- Daily inspect heavy/light equipment before use. Identify defective equipment, remove it from service, and do not use it until repaired.
- Before operating heavy/light equipment, inspect work areas, and provide safeguards for identified hazards.
- Ensure operator's manual is accessible for all heavy/light equipment.
- Before operating heavy/light equipment greater than 20 horsepower with an operator's seat (excluding trucks), ensure it is equipped with approved roll over protection safety (ROPS), if required.
- Ensure heavy/light equipment with an operator's seat and equipped with roll over protection safety (ROPS) is equipped with a seat belt.
- When operating heavy/light equipment, wear a seat belt where provided.
- Before exiting operator's seat from all heavy/light equipment, lower attachments to the ground and apply parking brake.
- When riding on heavy/light equipment, ride only on designated positions.
- Do not use heavy/light equipment as a lifting device unless the equipment and rigging have been load-tested.
- Ensure all equipment operated during poor visibility or inclement weather is equipped with proper lighting and appropriate safety devices (e.g., windshield wipers, defroster).
- If it creates a hazard to persons in the immediate work area, do not operate equipment.
- Operate all heavy/light equipment within manufacturer's recommended operating parameters.
- When digging, drilling, driving objects, or trenching close to energized circuits, locate underground utilities (e.g., electrical lines, telephone, water, natural gas, and other piping systems) and take measures to prevent damage.
- Be careful when using ladders, handrails, steps, etc., to climb on or off heavy/light equipment.
- Chock all vehicles with dual wheels. Chock medium-and heavy-duty vehicles (one ton or greater) and, on extremely hilly and mountainous terrain, chock smaller vehicles (1/2-ton pickups and ¾-ton service vehicles).
- Wear footwear appropriate for the environment and for the equipment being used.

**Operation of Light Equipment (Mowers, Tractors, Chain Saws, Tamps, Etc.)**

- For manual opening of tailgates on dump trucks, install and use handgrips.
- Ensure farm tractors used with bush hogs are equipped with heavy-metal mesh guards for personal protection.
- When engaged in a winching operation with light equipment, be positioned safely (e.g., behind the door).
- When working in the bucket of an aerial lift, wear a fall protection harness.
- When operating a chain saw, wear eye and face protection and, except when working from a bucket truck or wood pole, wear chaps.
- When operating a weedeater with a blade (brushsaw), wear leggings or chaps and eye and face protection.
- When operating a tamp (except for pole tamps), wear foot protection including toe and metatarsal guards.
- Use the following required personal protective equipment:
  - Hard hats
  - Hearing protection
  - Safety glasses
  - Work gloves

**Operation of Heavy Equipment (Bulldozers, Motor Graders, Packers, Core Drills, Etc.)**

- When engaged in a winching operation, use heavy equipment equipped with heavy-metal mesh guards for protection.
- Ensure all heavy equipment is equipped with back-up alarms and warning devices.
- Ensure all heavy equipment is equipped with a fire extinguisher.
- When clearing wooded areas, use heavy equipment equipped with closed clearing cab.
- Safety glasses and hard hat are not required in the enclosed cab of bulldozers.
- Use the following required personal protective equipment:
  - Hard hats
  - Hearing protection
  - Safety glasses

**4.0 MOTOR VEHICLE SAFETY**

Possible Hazards	Vehicle accidents Personal injury
------------------	--------------------------------------

**Operation**

- Operate all vehicles according to applicable Department of Transportation (DOT) regulations.
- Do not operate a vehicle until windows are free of dirt, ice, snow, frost, or anything that obstructs clear vision.
- Do not operate a motor vehicle without authorization and a valid state operators license or permit applicable for the type of vehicle operated.
- Before operating a vehicle, visually inspect it to determine whether the vehicle is safe to operate.
- Before operating a vehicle, become familiar with the vehicle's controls.
- When driving a commercial motor vehicle, perform and document a pre-operational and

## Health and Safety Plan for Activities at Araho Facility

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- post-operational inspections according to current DOT regulations.
- When riding in a vehicle, use the provided seats, and wear seat belts.
- Ensure all passengers are secured (e.g., seat belts fastened, doors closed) before moving vehicle.
- While operating a motor vehicle, observe all traffic rules and regulations.
- Before opening doors, observe traffic conditions.
- Do not carry loose items on front floors, front seat, rear window, or dash.
- Do not ride in trailers or other similar equipment being towed.
- Report any defects noted while operating a vehicle. Correct unsafe operating conditions before further use.
- Do not tow mobile equipment without using a approved hitch and safety chains adequate for the load.
- Always remain alert to other vehicle movements.
- During refueling, turn vehicle ignition off, and do not smoke.
- During refueling, attend the gas nozzle.
- When possible, position vehicle to eliminate need to back up.
- When backing is necessary, back slowly, check blind areas and clearances, and seek aid of another when possible.
- Set the parking brake on all parked vehicles.
- If you are involved in an accident while on company business or while operating a company vehicle, immediately notify your supervisor/management. Management shall notify the INTERA Safety Officer.
- Chock all vehicles with dual wheels. Chock medium-and heavy-duty vehicles (one ton or greater) and, on extremely hilly and mountainous terrains, chock smaller vehicles (1/2-ton pickups and 3/4-ton service vehicles).

### **Emergencies**

- In case of any vehicle trouble (e.g., a flat tire), pull off to the right side of the road, if possible, and use emergency flashers and warning signals.
- In case of an accident:
  - Stop the vehicle immediately or as near the accident as practical.
  - Put on a traffic vest if one is available.
  - Give assistance, and obtain medical aid.
  - Call the police, and notify supervisor as soon as possible.
  - Exchange names, addresses, and vehicle insurance information.
  - Do not discuss who is at fault.
  - Get names of any witnesses to the accident.
  - Remain at the scene until you are no longer needed.

### **Truck Operators**

- Ensure all required flags (18 x 18 in. minimum), lights, and other warning devices are properly placed on loads and vehicles.

### **Work Zone Safety**

- Follow the Work Zone Safety Program when performing work within or over:
  - The right-of-way of city, county, state, or federal streets and highways.
  - Any street or access road where potential exposure to vehicular traffic exists.

## 5.0 USE OF TOOLS

Possible Hazards	Personal Injury Tool and equipment damage
------------------	--

### General

- Before they use tools, ensure users are qualified and/or have demonstrated skills.
- Use tools only for their intended purposes.
- Inspect tools before and after each use, and clean them as required.
- Immediately tag and remove defective tools from service, and do not use until they are repaired.
- Do not bypass or disable safety devices on any tools (See Welding/Cutting/Brazing/Grinding" on page 122.)
- Disconnect portable power tools from their energy sources when **either** the:
  - Tools are not in use, left unattended, cleaned, or being serviced.
  - Tool components are being changed (e.g., drill bits, saw blades).
- When working inclined, elevated, or grated surfaces, safeguard tools to prevent their falling to a lower level.
- Use appropriate personal protection equipment to avoid the hazards associated with the use of the tool and work materials. (See "Personal Protective Equipment" on page 74.) Note: *Exercise extreme caution to prevent PPE and clothing from getting entangled in rotary equipment, e.g., saws, grinders, etc.*
- Properly secure any work piece so that both hands are free to control the tool.
- Ensure only qualified persons sharpen, adjust, and repair tools.
- Store tools to prevent damage or degradation.
- Make manufacturer instructions available to the user.
- Do not use electrically conductive hoses near energized equipment.

### Hand Tools

- Always use a tool designed for the job.
- Ensure all hand files have protective handles.
- Keep impact tools (e.g., drift ping chisels, wedges) properly dressed and free of mushroom heads.
- When one tool is held by an employee and struck by another (e.g., chisels, drills), hold the tool with a suitable holder, not with the hands.
- Ensure wooden handles are free of cracks and splinters and fit tightly in the tool.
- Do not use hand/palms to strike tools.
- Direct cutting edges away from the body.
- Use the following required personal protective equipment:
  - Safety glasses
  - Work gloves

### Power-Operated Hand Tools

- Use only electrical power-operated tools that are **either**:
  - Approved double-insulated
  - Properly grounded

## Health and Safety Plan for Activities at Araho Facility

- Do not use electrical cords to transport, suspend, hoist, or lower tools
- Use the proper tools (e.g., chuck key, wrench) to change components.
- In a flammable or explosive atmosphere, use UL/FM-approved (explosion proof) tools.
- In wet locations, use only tools approved for those locations, or use a GFCI (ground fault circuit interrupter).
- During welding operations, ensure portable electrical equipment does not provide ground paths. Remove or unplug equipment.
- Test portable and plug-connected tools for assured grounding.
- Use only approved attachments (e.g., sockets, grinding wheels, bits) on tools.
- Use the following required personal protective equipment:
  - Safety glasses
  - Work gloves

### **Pneumatic Power Tools**

- Secure tools to the hose or whip by some positive means to prevent accidental disconnection.
- Securely install and maintain safety clips or retainers on pneumatic impact or percussion tools to prevent attachments from being accidentally expelled.
- Do not use supply hoses to hoist or lower tools.
- Ensure all hoses exceeding ½ in. inside diameter have **either**:
  - A safety device at the source of supply to reduce pressure
  - In case of hose failure, an anti-whipping device and an anti-whipping device at each additional connection
- Do not exceed manufacturer's recommended operating pressure.
- Use only compressed air to operate tools.
- Ensure portable air manifolds (sow bellies) have appropriate safety devices (e.g., outlet cutoffs, relief valves).
- Use only approved attachments (e.g., sockets, grinding wheels, bits) on tools.
- Use only proper tools (e.g., chuck keys, wrench) to change attachments (e.g., sockets, grinding wheels, bits).
- Do not use compressed air to clean persons.
- Before using compressed air to clean equipment, do the following:
  - Evaluate for airborne hazards and safeguard against.
  - Wear appropriate personal protective equipment.
  - Control access to work area.
  - Reduce air pressure to <30 PSI.
- Use the following required personal protective equipment.
  - Safety glasses
  - Hearing protection
  - Work gloves

### **Fuel-Powered Tools**

- Before refueling, servicing, or maintenance, stop and cool engine.
- Use tools in well-ventilated areas to eliminate accumulation of toxic or noxious fumes.
- Do not use tools in a flammable or explosive atmosphere.
- Equip engines with spark-arresting mufflers.
- Avoid contact with hot engine components.
- Use the following required personal protective equipment:
  - Safety glasses

- Hearing protection
- Work gloves

### **Hydraulic Power Tools**

- Ensure all components meet or exceed manufacturer's recommended capacities for the job.
- Before and during operation, inspect all hoses and connections for kinks and leakage.
- Keep hands clear of moving components.
- When tool design does not protect the operator, wear a full-face shield to protect from hydraulic failure.
- After the load is raised, immediately crib, block, or otherwise secure it.
- Restrict personnel access to work areas where high-pressure hydraulics are being used.
- Use the following required personal protective equipment:
  - Safety glasses
  - Work gloves

### **Power-Actuated Tools**

- Train operators in the proper use of power-actuated tools
- Do not use tools in a flammable or explosive atmosphere.
- Do not load tools unless preparing them for immediate use.
- Do not leave tools unattended where they would be available to unauthorized persons.
- Do not point loaded/unloaded tools at any person, and keep hands clear of open barrel end.
- Do not drive fasteners into easily penetrated materials unless properly safeguarded.
- Before disposing of misfired cartridges, submerge them in water for 24 hours.
- Use the following required personal protective equipment:
  - Full-face shields
  - Safety glasses
  - Hard hats
  - Hearing protection
  - Gloves

### **Wood-Working Tools**

- Ensure operator controls the saw until the blade comes to a complete stop.
- To keep hands away from the blade, use push blocks on table saws when needed.
- Adjust blade to minimum height required to cut the work piece.
- Use the following required personal protective equipment:
  - Safety glasses
  - Hearing protection
  - Work gloves

### **Portable Machine/Power Tools**

- Do not wear loose clothing and jewelry around operating rotating tools.
- Secure long hair so that it will not become a hazard around rotating tools.
- In case a power failure occurs, use a secondary means to restrain magnetic-based tools.
- Do not service or clean tools while operating them.
- Before relocating, servicing, or cleaning, disconnect rotating tools from the power source.
- Use the following required personal protective equipment.
  - Safety gloves
  - Work gloves (when cleaning metal shavings/cuttings from machining processes).

**High Pressure Water Cleaning Devices**

- Before leaving the nozzle of pressure washers or hydrolazers unattended, do the following:
  - De-energize the machine.
  - Relieve all stored energy.
  - Always keep two hands on the nozzle where designed to ensure positive control of the nozzle.
- Before operating, safeguard the area to:
  - Keep persons out of the danger area.
  - During blasting operations, prevent projectiles from endangering or injuring persons.
- Do not use high pressure water cleaning devices on energized, electrical equipment where water spray can contact energized conductors.
- If chemical additives are used during the cleaning process, be aware of all hazards associated with the chemical, and take the necessary precautions to prevent injury to anyone who may contact the chemical.
- Use the following required personal protective equipment:
  - Protective gloves
  - Hard hats
  - Safety glasses
  - Face shields

**Special Tools**

- Ensure shop-built or modified tools made to fit special applications are designed by a qualified person designated by management.

**6.0 TRENCHING/EXCAVATIONS**

Possible Hazards	Entrapment Asphyxiation Poor air quality Trauma
------------------	--

**General**

- Before doing any work, conduct a pre-job safety meeting, and communicate with all parties.
- Before performing any work within the trench or excavation deeper than 5 ft., ensure a competent person has inspected the trench.
- Ensure a competent person:
  - Makes daily inspections
  - Inspects after significant events such as rainstorms
  - Specifies use of shoring, shield, or sloping.
- To keep soil piles from falling into the trench, clear edges of excavations back to at least 2 ft.
- Ensure underground utilities are identified and measures are taken to prevent possible damage.
- For trenches less than 5 ft. deep, ensure a competent person assures no potential injury from cave-in exists.
- Barricade open, unattended excavations. Warning tape alone may be used only temporarily until adequate physical protection is installed.
- If an excavation is 6 feet or more deep and cannot be readily seen because of plant growth

or other visual barrier, protect employees near the edge from falling by using guardrails, barricades, or covers.

**Definition**

**Competent person** – A person who:

- Is capable of identifying existing and predictable unsanitary or hazardous conditions in the work environment
- Is authorized to initiate the corrective measures to eliminate hazards
- Has been trained in the correct trenching applications and rules and whose training has been documented.

**7.0 WELDING/CUTTING/BRAZING/GRINDING**

Possible Hazards	Electrical shock Burns Radiant burns Fires Physical illness
------------------	---

**General**

- Before performing welding, cutting, or grinding, evaluate and safeguard the work area for combustible items.
- Assign a fire watch with a suitable fire extinguisher to welding, cutting, and grinding operations in work areas with combustible materials or where fire or sparks cannot be contained in the immediate work area.
- When using a fire watch, maintain it for 30 minutes after the work is complete.
- When welding, cutting, or grinding in elevated areas, cover the grating as much as possible and post a fire watch below as needed.
- Before applying heat, thoroughly clean, decontaminate, and/or purge machinery, tanks, drums, etc. that could contain explosives or combustible/flammable materials.
- Use welding screens whenever other persons could be exposed to welding, cutting, or grinding operations.
- Keep welding, cutting, and grinding areas clean and free from accumulations of trash, rags, and other combustible items.
- For all hot-work processes in congested areas, (e.g., boilers, preheaters, feed-water heaters, moisture-separator reheaters) wear clothing appropriate for welding.
- When extreme conditions exist, wear leather sleeves, aprons, and welding coats.
- Note: *Clothing that is **not** appropriate for welding includes:*
  - *Synthetics such as nylon, polyester, acetate, and rayon*
  - *Blends of these synthetics such as polyester/cotton*
  - *Flame-resistant clothing intended for electrical work (including light weight Nomex and PBI-Kevlar)*
- While performing any hot-work operation, dress appropriately to protect exposed skin from sparks, radiant heat, and hot surfaces.
- When performing welding/cutting operations, eliminate the possibility of sparks being caught in cuffed pants.
- When welding on a crane or suspended load, establish an independent ground.
- Where air contaminants exceed permissible exposure limits, use proper

ventilation/respiratory protection.

- For stationary manifold systems, follow manufacturer system design criteria.

### Grinding

- Inspect grinders before use to ensure the grinder is in good repair and all safety guard devices are properly attached.
- Ensure guards on 90-degree grinders are between the user and the wheel.
- Before operating a grinder, ensure guards are in place unless you are guarded from the wheel by the work object.
- Before installing a grinding wheel, check the grinder to ensure the spindle speed does not exceed the maximum operating speed indicated on the wheel.
- Before changing wheels or rocks, disconnect grinders from energy source.
- Keep hand-held grinders in control until the wheel or rock comes to a complete stop.
- Operate and control grinders according to manufacturer's recommendations (1 hand-2 hand-operations).
- Do not make adjustments to tool rests while the wheel is in motion.
- Where tool rests are required, adjust them to a maximum of 1/8 in. from the wheel. Ensure the distance between the wheel periphery and the adjustable tongue on the end of the peripheral member at the top never exceeds ¼ in.
- Before installing wheels on stationary grinders, ring-test them to ensure integrity.
- On pedestal or bench grinders, ensure wheel or rock comes to a complete stop before you leave the area.
- Use the following required personal protective equipment:
  - Gloves (except when grinding tooling bits too small to be handled with gloves)
  - Full-face shields
  - Hearing protection
  - Safety glasses

Note: *Wear monogoggles if the severity of the tasks requires additional protection to ensure against eye injury. See "Personal Protective Equipment" on page 74.*

### Arc and Tig Welding

- Inspect electrical welding equipment before and after each use. Immediately remove defective electrical welding equipment from service, identify it, and do not use it until repaired.
- Use manufacturer's approved methods to repair damaged welding cables.
- Do not use cables with splices within 10 ft. of the electrode holder.
- When electrode holders are not in use, place them so that they cannot make electrical contact with persons or conducting objects.
- When filler wire is not in use, remove it from the electrode holder.
- When tungsten is not in use, push it inside the cup, or remove it.
- Dispose of all used filler material in a designated container.
- When tig welding in a confined or congested area, wear clothing appropriate for welding.
- When arc welding in an overhead position or in a confined area, wear clothing appropriate for welding.
- When air arcing, wear hearing protection and clothing appropriate for welding.
- Note: *Clothing that is **not** appropriate for welding includes:*
  - *Synthetics such as nylon, polyester, acetate, and rayon*
  - *Blends of these synthetics such as polyester/cotton*

## Health and Safety Plan for Activities at Araho Facility

- *Flame-resistant clothing intended for electrical work (including light weight Nomex and PBI-Kevlar).*
- When ventilation does not reduce airborne contaminants below the permissible exposure limits, wear respiratory protection.
- Wear welding gloves in all welding operations.
- Wear full-face welding hoods. (Other shields may be used if the work cannot be performed with a full-face hood.)
- When in a confined space or area, ventilate space as needed to maintain a safe atmosphere.
- Note: *Welding in a confined space involving the following metals require mechanical ventilation: zinc-bearing base or filler metals, zinc-coated metals, lead base metals, cadmium-bearing filler materials, chromium-bearing metals or metals coated with chromium-bearing materials.*
- *Welding in a confined space involving the following metals require local exhaust ventilation: metals containing lead, other than as an impurity, metals coated with lead-bearing materials, cadmium-bearing metals, cadmium-coated base metals, metals coated with mercury-bearing materials, beryllium-containing base or filler metals. An airline respirator shall also be used when welding on metal involving beryllium.*
- Use the following required personal protective equipment:
  - Welding gloves
  - Safety glasses
  - Approved welding shields

### **Oxy/Acetylene Safety**

- Inspect oxy/acetylene equipment before use. Immediately remove defective equipment from service, identify it and do not use it until repaired.
- Do not permit oil or grease to come in contact with regulators, fittings, valves, gauges, and the torch assembly.
- Ensure the pressure of the oxygen and the acetylene does not exceed manufacturer's recommendation for the particular cutting or brazing operation being performed.
- When opening the valves on a regulator, always stand to one side and away from the valve opening.
- Before installing a regulator, crack the valve to remove any dirt or trash that could damage the regulator.
- When installing regulators, use the proper tool and do not over-tighten connections.
- Before opening the cylinder valve, back out the regulator handle. Then slowly adjust the regulator pressure.
- Before removing a regulator, close the cylinder valve and release all gas from the hose and regulator.
- When oxy/acetylene equipment is not in use, close cylinder valves and release the pressure in the hose.
- Always open the oxygen cylinder valve slowly, allowing it to backseat.
- Do not use acetylene at pressure exceeding 15 psig (pounds per square inch gauge).
- Always use and store acetylene cylinders in an upright position.
- Use a friction or stationary striker to light a torch. Do not light torches with matches, cigarette lighters, or hot work.
- To protect against flashback, ensure all oxy/acetylene equipment is equipped with flashback arresters at the regulator outlet and at the torch for both gases.
- Remove gauges and replace caps on oxy/acetylene cylinders when they are not in use if the

- valve may be damaged by being bumped or knocked over.
- Ensure valve handles and/or wrenches are in place and use.
- When ventilation does not reduce airborne contaminants below the permissible exposure limits, wear respiratory protection.
- Use the following required personal protective equipment.
- Burning goggles
- Welding gloves

#### Compressed Gas Safety

- Securely store compressed gas cylinders upright with the valve caps in place. Use substantial means suitable for the conditions. (Tape, string, cord, or ribbons are not acceptable for securing.)
- When using compressed gas cylinders, keep them far enough away from actual welding or cutting operations to prevent hog slag or flames from reaching them.
- Do not store oxygen cylinders within 20 ft. of acetylene cylinders unless they are separated by a ½-hour fire-resistant barrier 5 ft. high.
- Tag empty cylinders **EMPTY**, and keep valves closed and protective caps in place.
- Before lifting or moving cylinders, ensure valve protection caps are in place.
- Note: *Cylinders secured in carts may be moved short distances over level surfaces without removing the regulator and adding valve protection caps.*

## 8.0 SITE PERSONNEL REQUIREMENTS

**HEALTH & SAFETY TRAINING:** Site personnel must have had 40 hour OSHA 1910.120 HAZWOPER training and experience which included coverage of hazard recognition, use of site monitoring instruments, use of personal protective equipment, etc. Proof of this training shall be submitted to the Site Project Manager or Site Safety Officer before commencement of work. If the donning of a respirator is necessary, proof of participation in a medical monitoring program shall be submitted to the on-site safety officer.

## 9.0 SITE HEALTH & SAFETY PROCEDURES

Prior to beginning on-site field work the following will occur:

- All personnel (INTERA and any associated subcontractors) will review INTERA's Site Health and Safety Plan (SHSP) and sign a consent form (included as Attachment A) stating the plan has been read and understood.
- All training certification and documentation of personnel will be submitted to the Site Manager.

Upon arrival at the site:

- General site orientation and walk-over.
- Locate ONE-CALL identification of underground utilities.
- **ONE-CALL NOTIFICATION: Location of power, gas, phone, and cable lines will be verified with the individual utility departments.**
- Site work zones and control measures will be discussed and identified if necessary (exclusion zone, contamination reduction zone, support zone, and location of emergency equipment),

- Establish a command center, and
- A Site Health and Safety meeting will be held to answer any questions concerning the SHSP. (A Safety Meeting Attendance Form, included as Attachment E, will be filled out during the meeting)
- All personnel will be informed of the locations of the following safety items: first-aid equipment, mobile phone, map to the hospital, copies of the SHSP, eye wash station, drinking water source, and Material Safety Data Sheets (MSDS) for any chemicals brought on site for use in operations. The referenced safety items will be available to all personnel while working on site.
- Review emergency procedures and the location of the hospital map.
- Discuss location and use of nearest phone(s).
- Determine soil type (for slope requirements in excavation area).

Daily activities:

- A health and safety meeting will be held at the beginning of each day during which all personnel will sign a meeting form (included as Attachment E) acknowledging attendance and understanding of topics discussed.
- Breathing zone monitoring with organic vapor meter (OVM) and recording of those readings on the air Monitoring Log (Attachment D).

## 10.0 HAZARD COMMUNICATION PLAN (HAZCOM)

Possible Hazards	Burns Spills Respiratory Explosion Poison Combustible Trauma Acute/chronic illness
------------------	---

### General Statement

- Guidance given for hazardous chemicals/substances and atmospheric hazards is based on good industrial hygiene practices. Consult specific work procedures, Material Data Safety Sheets (MSDS), labels, and/or safety and IH professionals. In each case, individuals and supervisors ensure hazards are eliminated if possible and at a minimum safeguarded.

### MSDSs are located in Appendix D.

### General

- Before starting work, identify **ALL** hazardous substances involved with the work task. (Hazardous substances can be chemicals involved in the work process, materials used, or coatings and insulation to be installed or removed.)
- Observe the following work practices where hazardous substances (materials and chemicals) are present:
  - Do not eat or drink; do not use tobacco products.
  - Wash hands and face at breaks. (When appropriate, shower at the end of work task or shift.)
  - Never blow on or shake off contaminated clothing, and never use compressed air to clean it.

## Health and Safety Plan for Activities at Araho Facility

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- Using approved methods to reduce/eliminate the spread of contamination, clean contaminated work area.
- To prevent unnecessary personnel exposure, mark off the work area as necessary with ribbons, tapes, signs, or barriers.
- When a splash hazard exists, verify availability and location of eye-wash water, and shower before performing tasks.
- When working with hazardous materials/chemicals, be able to perform the following in an emergency situation.
  - Identify an emergency situation.
  - Know how and when to report the chemical emergency.
  - Know local places of refuge/how to evacuate the area.
  - Know appropriate decontamination procedures.
  - Conduct atmospheric monitoring as necessary to ensure a safe work environment.
- Where hazardous chemicals/materials are used, stored, or disposed of in the work place, use engineering controls (e.g., natural, forced, or local exhaust ventilation) to eliminate or reduce airborne concentrations of hazardous substances.
- Ensure respiratory protection equipment and personal protective equipment (including clothing) are specified by work procedures or trained and qualified persons based on an evaluation of the hazard and the exposure levels.

### **Hazard Communication**

- Ensure individuals are trained and have demonstrated appropriate knowledge of:
  - Key elements of the Hazard Communication Program.
  - Specific hazards of substances (e.g., chemicals/materials) to which individuals may be exposed.
- Before using hazardous substances be aware of the following:
  - Exposure effects
  - Physical hazards (e.g., flammable, explosives)
  - Health hazards
  - Routes of entry
  - Emergency procedures (e.g., first aid, spills, releases)
  - Personal protective equipment requirements
- Use only materials/chemicals that are appropriately labeled, and follow the label instructions for chemical use and storage.
- Ensure individuals know how and where to obtain MSDS.
- Use (e.g., handle/transport/store/dispose of) hazardous substances according to Material Safety Data Sheets or specific work practices.
- If a real or suspected exposure to hazardous substances exists:
  - Evacuate and isolate area.
  - Notify appropriate location personnel.

### **Definitions:**

- Hazardous material—Any substance (e.g., material/chemical) with a health or physical hazard
- Exposure—To submit or subject an individual to a hazardous substance (e.g., material/chemical) through inhaling, ingesting, injecting, skin contact, or absorption. The occurrence may be suspected or confirmed.

### **Exposure to Lead**

- Some work tasks including, but not limited to, the following may increase lead exposure above acceptable limits:
- Scraping, painting, or cleaning surfaces with lead coating
- Welding, cutting, or abrasive blasting of lead-containing metals or materials and/or coatings.
- Contact your supervisor or location Safety/Industrial Hygiene professional to determine whether tasks you perform cause lead exposure to exceed acceptable limits.
- Note: *Certain regulatory standards have specific training requirements beyond Hazard Communication. Consult with your SST representative or Safety and Industrial Hygiene.*

### **Refrigerant Safety**

- Note: *Work with refrigerants only if you have the appropriate EPA certifications.*
- Observe the safe work practices below when working with refrigerants.
- Use safety glasses and protective gloves.
- Avoid inhaling refrigerant vapors.
- Ensure adequate ventilation in the area and forced ventilation at the service location to disperse all remaining refrigerant vapors.
- Do not use oxygen or compressed air to pressurize appliances to check for leaks.
- Use only nitrogen when purging equipment to remove remaining refrigerant and lubricant.
- Always use a pressure regulator when charging a system with nitrogen.
- Do not light torches or use open flames in areas where refrigerant vapors are present.
- Refer to the Material Safety Data Sheet and equipment manufacturer's recommendations for detailed information.
- Know the proper operating and limits of refrigerant recovery machines.
- Ensure refrigerant charging lines/hoses are constructed of materials compatible with refrigerant used.
- Store containers in a cool place away from direct sunlight and other heat sources and weather conditions.
- Avoid placing containers in positions where falling could cause ruptures.
- Close container valve and replace outlet with cap and gasket when not in use.
- Do not reuse disposable containers for any purpose.
- To prevent rupture, ensure that when charging, refrigerant containers are not connected to any system of higher pressure to prevent backflow and overfilling.
- Do not use direct heating (e.g., flames, radiant heaters) to increase the rate of discharge of refrigerant from a container. Use only approved methods such as controlled blanket heaters.
- Do not overfill storage containers. Leave room for expansion.
- Do not mix refrigerants. Put in only containers marked for that particular refrigerant.
- Transfer/store refrigerant only in a container structurally suitable for that refrigerant.
- Before transferring a refrigerant, inspect container for corrosion or damage that may weaken it.
- Never leave refrigerant cylinders exposed to direct sunlight.
- Recover liquid trapped in tank liquid line used with recovery unit to prevent rupture of line and to prevent injuries from accidental liquid release.

## **11.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)**

**MODIFIED LEVEL D:** hard hat, work boots, long sleeves, and long pants will be required at all times. Gloves are required any time direct contact with contaminated soils is expected. Hearing protection is required for equipment operators and anyone working near heavy equipment.

**CONTINGENCY LEVEL OF PROTECTION:** All site personnel shall be prepared for MODIFIED LEVEL C which includes MODIFIED LEVEL D PPE plus a cartridge respirator (with cartridges intended for work with volatiles). Personnel will go to MODIFIED LEVEL C when the action levels in section VII are detected with a PID/OVM. To fulfill this requirement, respirator training and fit testing should have been completed by personnel before work commences. In the instance that a respirator is required to be worn, in addition to the prior fit testing, on-site daily fit testing will be performed on personnel and recorded in the log book. Appendix B outlines the requirements for the fit testing of a respirator. Each employee shall have his/her own respirator to ensure proper fit. Proof of prior respirator training and fit testing should be submitted to the site project manager.

**PPE AND EQUIPMENT DECONTAMINATION:**

- Remove gross contamination from tools, respirator, monitoring equipment, boots, etc. prior to leaving the work-site, using Alconox/water solution,
- Either completely decontaminate soiled equipment at the work-site using detergent & water (if possible), or wrap equipment in plastic bag for transport until complete decontamination is possible,
- Dispose of contaminated gloves, Tyvek suits, used cartridges, paper towels, etc. by placing in a plastic bag and discarding in a designated waste container for the site, and
- Wash hands and face thoroughly with soap and water before lunch or coffee breaks, and after finishing work for the day.

## **12.0 MONITORING EQUIPMENT**

The following specifications for air monitoring will be followed during all field activities including:

- vapor sampling activities,
- trenching,
- excavation

**ORGANIC VAPOR METER (OVM):**

The OVM meter will be used to monitor the breathing zones of personnel, the soils, and the contamination reduction zone for volatiles. These measurements will be recorded in the field logbook or on the Air Monitoring Log included as Attachment D.

**ACTION LEVELS:**

1. Organic Vapor Meter (OVM)- breathing zone readings:
  - 0 to 25 parts per million (ppm) - remain in MODIFIED LEVEL D.
  - Greater than 25 ppm and less than 100 ppm - discontinue work until personnel working in exposure areas are prepared in MODIFIED LEVEL C PPE.
  - At levels consistently above 100 ppm in the breathing zone, discontinue work and wait for notification to either proceed or evacuate site. (Site Project Manager shall notify the Corporate Health and Safety Officer of OVM readings of more than 100 ppm).
2. Detection through senses -  
If soils contaminated with oil and/or gasoline are detected with visual or olfactory senses by an employee, personnel shall move upwind of the odor and inform the Site Project Manager of the location of the odor.

### **13.0 CONFINED SPACES**

Confined spaces are not anticipated on-site. If a confined space is encountered, a sign stating that "Entry is Prohibited" will be posted and the Project Manager and Health and Safety Officer will be notified. No one shall enter a confined space without the proper training and documentation needed to perform confined space work activities. **If the excavation area is not sloped for entry and exit, personnel shall consider the excavation area a confined space and shall NOT enter the area.**

### **14.0 SITE CONTROL**

All site visitors will sign in on a SITE VISITOR LOG (included as Attachment B). Site visitors are allowed in the support zone and command center only. Material suppliers will have a designated area for delivery of material. Exclusion zones will be marked off with CAUTION tape. Excavation areas will be designated and entered into by authorized personnel only. No visitors shall enter the exclusion zone or excavation area without prior approval of the site project manager. A sign reading "Authorized Personnel Only" shall be posted at the entry area of the site during work and off-work hours. Entry and exit to the site area will be controlled during work and off-work hours.

### **15.0 TRANSPORTATION OF SITE MATERIALS**

Waste and contaminated site materials shall be disposed of and transported in the proper manner and shall not be transported by site personnel.

### **16.0 EMERGENCY CONTACTS/PROCEDURES:**

#### **EMERGENCY PHONE NUMBERS:**

**AMBULANCE: 911**

**FIRE: 911**

**POLICE: 911**

#### **HOSPITAL:**

Lea Regional Medical Center

5419 N Lovington Hwy, Hobbs NM (map to hospital included as Attachment C)

Hospital Phone Number: 492-5000

**LOCATION OF NEAREST PHONE:** (on-Site) INTERA cellular phone 505/239-7987

**INTERA Office in Albuquerque 505/246-1600**

**INTERA Health and Safety Officer - Tricia Johnson 505/246-1600**

**Any incident or accident must be reported to the Project Manager and the Health and Safety Officer immediately.**

## Health and Safety Plan for Activities at Araho Facility

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**PERSONAL INJURY** - Administer appropriate first aid. If injury is serious, transport the victim to the nearest hospital. If possible, notify hospital in advance of incoming patient and nature of injury. If there is a question about whether it is safe to move the victim, **DO NOT** move the victim; instead, make him/her as comfortable as possible, and summon emergency assistance.

**CHEMICAL EXPOSURE** - If site personnel show signs of inhalation exposure, retreat to fresh air for recovery. If symptoms are serious, such as nausea or fainting, bring the victim to the nearest hospital for observation, and discontinue work at that location until further notice.

In case of skin or eye irritation due to chemical contact, wash affected skin with soap and water, or flush eyes with generous amounts of water. Seek medical attention if deemed necessary.

**FIRE** - If fire occurs, the fire department shall be notified immediately. If the fire can be easily contained and extinguished, do so with fire extinguisher. If explosion risk is present, evacuate all personnel to a safe area and call fire department.

**EMERGENCY SITUATIONS:** If an emergency exists, notify local emergency facilities immediately.

**IMPORTANT:**

**IF SITE PERSONNEL SHOW SIGNS AND SYMPTOMS OF CHEMICAL EXPOSURE, DISCONTINUE WORK AND FOLLOW APPROPRIATE EMERGENCY PROCEDURES!**

**IF SITE OBSERVATIONS, ODORS, OR ANY OTHER INFORMATION INDICATES THAT CONTAMINANTS OTHER THAN PETROLEUM PRODUCTS ARE PRESENT, STOP WORK, AND DISCONTINUE WORK UNTIL FURTHER NOTICE.**

**ATTACHMENT A  
SITE PERSONNEL ACKNOWLEDGMENT**

By signing the following I acknowledge that I have read, understood, and agree to comply with the provided site specific Health and Safety Plan.

Printed Name	Signature	Date
Justin Roberts	<i>Justin Roberts</i>	10/15/03
Mike Jennings	<i>Mike Jennings</i>	10-15-03
Sergio Garcia	<i>Sergio Garcia</i>	10/15/03
Gene Cervantes	<i>Gene Cervantes</i>	10-15-03
Dusty Quirk	<i>Dusty Quirk</i>	10-15-03
Brian Ellis	<i>Brian Ellis</i>	10-15-03
Luis Herrera	<i>Luis Herrera</i>	10-15-03
Marylene Kieling	<i>Marylene Kieling</i>	10-15-03
Jenny Rivera	<i>Jenny Rivera</i>	10-15-03
Paul Sheeley	<i>Paul Sheeley</i>	10-15-03
LARRY JOHNSON	<i>Larry Johnson</i>	10-15-03
Silvia Cervantes	<i>Silvia Cervantes</i>	10-17-03
Peter Franco	<i>Peter Franco</i>	10-17-03
PATRICK McMAHON	<i>Patrick McMahon</i>	10-17-03



**ATTACHMENT C  
MAP TO HOSPITAL**



[Send To Printer](#) [Back to Map](#)

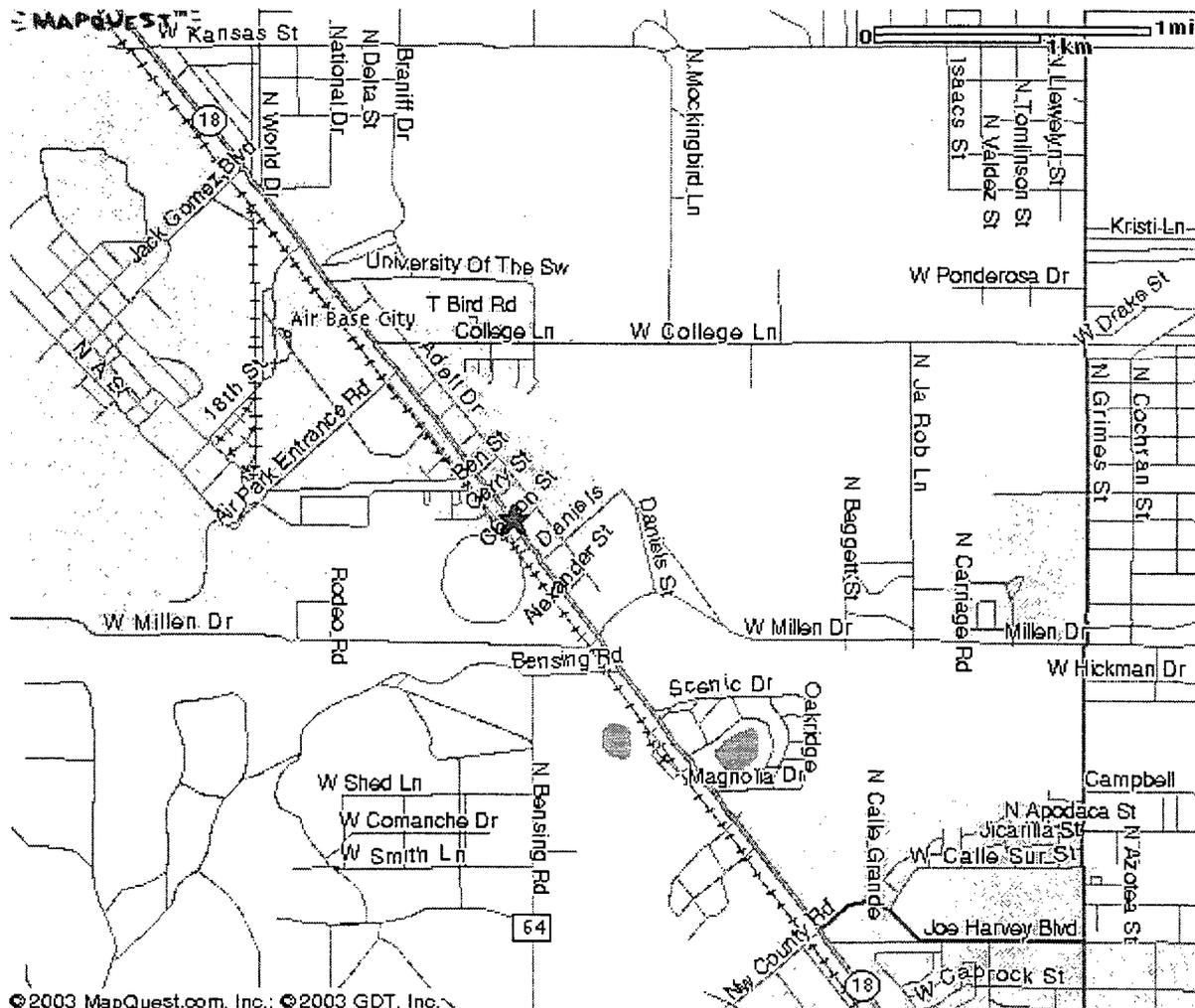
5419 N Lovington Hwy  
Hobbs NM  
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**ATTACHMENT E**  
**SAFETY MEETING ATTENDANCE FORM**

DATE: \_\_\_\_\_ PROJECT NO.: \_\_\_\_\_

PROJECT TITLE: \_\_\_\_\_

PROJECT TASK: \_\_\_\_\_

**SAFETY TOPICS PRESENTED:**

- Protective Clothing/Equipment \_\_\_\_\_
- Emergency Procedures \_\_\_\_\_
- Chemical Hazards \_\_\_\_\_
- Location of Nearest Hospital \_\_\_\_\_
- Physical Hazards \_\_\_\_\_
- Location of Mobile Phone \_\_\_\_\_
- Special Equipment \_\_\_\_\_
- Other \_\_\_\_\_

**ATTENDEES:**

NAME (PRINTED)

SIGNATURE

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Meeting Conducted by:

\_\_\_\_\_  
Name Printed

\_\_\_\_\_  
Signature

**APPENDIX A**  
**EXCAVATION SAFETY**

## Trenching/Excavations Category

Trenching/Excavations	
Intent	Prevent injury when working in or around any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal.
Applicability	Employees and suppliers who dig or work in trenches
Hazards	<ul style="list-style-type: none"> <li>• Entrapment</li> <li>• Asphyxiation</li> <li>• Poor air quality</li> <li>• Trauma</li> </ul>
Subcategory	General Safe Work Practices

### General Safe Work Practices

1. Before doing any work, conduct a pre-job safety meeting, and communicate with all parties.

*Note:* In Power Generation, refer to the trench permit.

2. Before performing any work within the trench or excavation deeper than 5 ft., ensure a competent person has inspected the trench.
3. Ensure a competent person:
  - Makes daily inspections
  - Inspects after significant events such as rainstorms
  - Specifies use of shoring, shielding, or sloping
4. To keep soil piles from falling into the trench, clear edges of excavations back to at least 2 ft.
5. Ensure underground utilities are identified and measures are taken to prevent possible damage.
6. For trenches less than 5 ft. deep, ensure a competent person assures no potential injury from cave-in exists.
7. Barricade open excavations.

**Definition:** Competent person – A person who:

- Is capable of identifying existing and predictable unsanitary or hazardous conditions in the work environment
- Is authorized to initiate the corrective measures to eliminate hazards
- Has been trained in the correct trenching applications and rules and whose training has been documented

*Note:* Follow Duke Power Trenching Guidelines.



(iii) Structural members used for ramps and runways shall be of uniform thickness.

(iv) Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

(v) Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

(2) *Means of egress from trench excavations.* A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

(d) *Exposure to vehicular traffic.* Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

(e) *Exposure to falling loads.* No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with § 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.

(f) *Warning system for mobile equipment.* When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

(g) *Hazardous atmospheres.* (1) *Testing and controls.* In addition to the requirements set forth in subparts D and E of this part (29 CFR 1926.50—1926.107) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

(i) Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

(ii) Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of this part respectively.

(iii) Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

(iv) When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

(2) *Emergency rescue equipment.* (i) Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

(ii) Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

(h) *Protection from hazards associated with water accumulation.* (1) Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

(2) If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

(3) If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with paragraphs (h)(1) and (h)(2) of this section.

(i) *Stability of adjacent structures.* (1) Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

(2) Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

(i) A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

(ii) The excavation is in stable rock; or

(iii) A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

(iv) A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

(3) Sidewalks, pavements and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

(j) *Protection of employees from loose rock or soil.* (1) Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

(2) Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

(k) *Inspections.* (1) Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

(2) Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

(l) *Fall protection.* (1) Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with § 1926.502(b) shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.

(2) Adequate barrier physical protection shall be provided at all remotely located excavations. All wells, pits, shafts, etc., shall be barricaded or covered. Upon completion of exploration and other similar operations, temporary wells, pits, shafts, etc., shall be backfilled.

#### § 1926.652 Requirements for protective systems.

(a) *Protection of employees in excavations.* (1) Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section except when:

(i) Excavations are made in stable rock; or

(ii) Excavations are less than 5 feet (1.5 m) in depth and examination by a competent person provides evidence of a potential cave-in.

(2) Protective systems shall be designed to resist without fail that are intended or could reasonably be expected to be applied or transmitted to this subpart.

(b) *Design of sloping and shoring systems.* The slopes and conditions of sloping and shoring systems shall be designed and constructed by the competent person and shall be in accordance with the requirements of paragraph (b)(1) of this section, paragraph (b)(2) of this section, or paragraph (b)(3) of this section, as applicable.

(1) *Option (1)—Allowable slopes.* (i) Excavations shall be sloped at an angle not steeper than 1 to 1 (horizontal to vertical) measured from the horizontal unless the competent person uses one of the other options of this subpart.

(ii) Slopes specified in paragraph (b)(1) of this section, shall be excavated in configurations that are in accordance with the slopes shown for Type C soil in appendix B to this subpart.

(2) *Option (2)—Determination of configurations using Appendix B.* Maximum allowable slopes, shoring configurations for sloping systems, shall be determined in accordance with the conditions and requirements set forth in appendices A and B to this subpart.

(3) *Option (3)—Designs based on tabulated data.* (i) Designs of sloping systems shall be selected in accordance with tabulated data and charts.

(ii) The tabulated data shall be in accordance with the form and shall include all of the following:

(A) Identification of the parameters that affect the selection of a sloping system drawn from such data;

(B) Identification of the limits of the data, to include the magnitude of the slopes determined from the data;

(C) Explanatory information necessary to aid the user in the correct selection of a protective system.

(iii) At least one copy of the data which identifies the registered professional engineer who approved the design shall be maintained at the job construction of the protective system, but a copy of the data shall be available to the Secretary upon request.

(4) *Option (4)—Design by a registered professional engineer.* (i) Sloping systems not utilizing Option (2) or Option (3) under paragraph (b) of this section shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include at least the following:

(A) The magnitude of the slopes to be determined to be safe for the project;

(1) Excavations are made entirely in stable rock.

(2) Excavations are less than 5 feet (1.52 m) in depth and examination of the ground by a competent person provides no indication of a potential hazard.

(3) Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

(b) **Design of sloping and benching systems.** The slopes and configurations of sloping and benching systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (b)(1), or, in the alternative, paragraph (b)(2), or, in the alternative, paragraph (b)(3), or, in the alternative, paragraph (b)(4), as follows:

(1) **Option (1)—Allowable configurations and slopes.** Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

(ii) Slopes specified in paragraph (b)(1)(i) of this section shall be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B to this subpart.

(2) **Option (2)—Determination of slopes and configurations using Appendices A and B.** Maximum allowable slopes and allowable configurations for sloping and benching systems shall be determined in accordance with the conditions and requirements set forth in appendices A and B to this subpart.

(3) **Option (3)—Designs using other tabulated data.** (i) Designs of sloping or benching systems shall be selected from and in accordance with tabulated data, such as tables and charts.

(ii) The tabulated data shall be in written form and shall include all of the following:

(A) Identification of the parameters that affect the selection of a sloping or benching system drawn from such data.

(B) Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe.

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

(4) **Option (4)—Design by a registered professional engineer.** (i) Sloping and benching systems not utilizing Option (1) or Option (2) or Option (3) under paragraph (b) of this section shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include at least the following:

(A) The magnitude of the slopes that were determined to be safe for the particular project;

(B) The soil conditions that were determined to be safe for the particular project; and

(C) The identity of the registered professional engineer approving the design.

(iii) At least one copy of the design shall be maintained at the jobsite while the design is being constructed. After that time the design need not be at the jobsite, but a copy shall be made available to the Secretary upon request.

(c) **Design of support systems, shield systems, and other protective systems.** Designs of support systems, shield systems, and other protective systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (c)(1), or, in the alternative, paragraph (c)(2), or, in the alternative, paragraph (c)(3), or, in the alternative, paragraph (c)(4), as follows:

(1) **Option (1)—Designs using appendices A, C and D.** Heights for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in appendices A and C to this subpart. Designs for aluminum hydraulic shoring shall be in accordance with paragraph (c)(2) of this section, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with appendix D.

(2) **Option (2)—Designs Using Manufacturer's Tabulated Data.** (i) Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations stated or made by the manufacturer.

(ii) Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.

(iii) Manufacturer's identifications, recommendations, and limitations and manufacturer's approval certificate from the specifications, recommendations, and limitations shall be in written form at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy shall be made available to the Secretary upon request.

(3) **Option (3)—Designs using other tabulated data.** (i) Heights of support systems, shield systems, or other protective systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

(ii) The tabulated data shall be in written form and include all of the following:

(A) Identification of the parameters that affect the selection of a protective system drawn from such data;

(B) Identification of the limits of use of the data;

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the

jobsite, but a copy of the data shall be made available to the Secretary upon request.

(4) **Option (4)—Design by a registered professional engineer.** (i) Support systems, shield systems, and other protective systems not utilizing Option (1), Option (2) or Option (3) above, shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include the following:

(A) A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and

(B) The identity of the registered professional engineer approving the design.

(iii) At least one copy of the design shall be maintained at the jobsite during construction of the protective system. After that time the design may be stored off the jobsite, but a copy of the design shall be made available to the Secretary upon request.

(d) **Materials and equipment.** (1) Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.

(2) Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent unnecessary exposure to hazards.

(3) When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is safe to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer before being returned to service.

(4) **Installation and removal of support systems.** (i) General. (ii) Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other injurious failure.

(iii) Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

(iv) Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

(v) Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

(vi) Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible expansion of the sides of the excavation.

(vii) Backfilling shall progress together with the removal of support systems from excavations.

(2) **Additional requirements for support systems for trench excavations.** (i) Excavation of material to a level no greater than 2

feet (.61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

(ii) Installation of a support system shall be closely coordinated with the excavation of trenches.

(f) *Sloping and benching systems.* Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

(g) *Shield systems.* (1) *General.* (i) Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

(ii) Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

(iii) Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

(iv) Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.

(2) *Additional requirement for shield systems used in trench excavations.* Excavations of earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

#### Appendix A to § 1926 Subpart P—Soil Classification

(a) *Scope and application—(1) Scope.* This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. The appendix contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soils.

(2) *Application.* This appendix applies when a sloping or benching system is designed in accordance with the requirements set forth in § 1926.652(b)(2) as a method of protection for employees from cave-ins. This appendix also applies when timber shoring for excavations is designed as a method of protection from cave-ins in accordance with appendix C to subpart P of part 1926, and when aluminum hydraulic shoring is designed in accordance with appendix D. This Appendix also applies if other protective systems are designed and selected for use from data prepared in accordance with the requirements set forth in § 1926.652(c), and the use of the data is predicated on the use of the soil classification system set forth in this appendix.

(b) *Definitions.* The definitions and examples given below are based on, in whole or in part, the following: American Society for Testing Materials (ASTM) Standards D653-45 and D2488; The Unified Soils Classification System; The U.S. Department of Agriculture (USDA) Textural Clas-

sification Scheme; and The National Bureau of Standards Report BSS-121.

*Cemented soil* means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

*Cohesive soil* means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

*Dry soil* means soil that does not exhibit visible signs of moisture content.

*Fissured* means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

*Granular soil* means gravel, sand, or silt, (course grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

*Layered system* means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

*Moist soil* means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

*Plastic* means a property of a soil which allows the soil to be deformed or molded without cracking, or appreciable volume change.

*Saturated soil* means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or shear vane.

*Soil classification system* means, for the purpose of this subpart, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the environmental conditions of exposure.

*Stable rock* means natural solid mineral matter that can be excavated with vertical shales and remain intact while exposed.

*Submerged soil* means soil which is under water or is free seeping.

*Type A* means cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:

(i) The soil is fissured; or

(ii) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or

(iii) The soil has been previously disturbed; or

(iv) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or

(v) The material is subject to other factors that would require it to be classified as a less stable material.

#### Type B means:

(i) Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or

(ii) Granular cohesionless soils including angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.

(iii) Previously disturbed soils except those which would otherwise be classed as Type C soil.

(iv) Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or

(v) Dry rock that is not stable; or

(vi) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

#### Type C means:

(i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or

(ii) Granular soils including gravel, sand, and loamy sand; or

(iii) Submerged soil or soil from which water is freely seeping; or

(iv) Submerged rock that is not stable; or

(v) Material in a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or steeper.

*Unconfined compressive strength* means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

*Wet soil* means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

(c) *Requirements—(1) Classification of soil and rock deposits.* Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions set forth in paragraph (b) of this appendix.

(2) *Basis of classification.* The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests described in paragraph (d) below, or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture Textural classification system.

(3) *Visual and manual analysis.* Visual and manual analyses noted as being acceptable of this appendix, shall be conducted to provide sufficient and qualitative information necessary to identify proper factors, and conditions affecting the deposits.

(4) *Layered systems.* In a layered system, the system shall be classified with its weakest layer. Each layer may be classified where a more stable layer is present.

(5) *Reclassification.* If, after excavation, the properties, conditions affecting its classification in any way, the changes shall be made by a competent person. The soil shall be reclassified as necessary changed circumstances.

(d) *Acceptable visual tests—(1) Visual tests.* Visual tests shall be conducted to determine information regarding the excavation, the soil adjacent to the soil forming the sides of the excavation, and the soil taken from an excavated material.

(i) Observe samples of soil and soil in the sides of the excavation. Estimate the range of particle relative amounts of the soil that is primarily composed of material is cohesive material primarily of coarse-grained granular material.

(ii) Observe soil as it is excavated. Soil that remains in clumps when excavated, soil that breaks up, soil that does not stay in clumps is granular.

(iii) Observe the side of the excavation and the surface area of the excavation. Crack-like opening cracks could indicate fissured soil. If chunks of soil spill off a soil could be fissured. Small pieces of moving ground and of potentially hazardous situations.

(iv) Observe the area adjacent to the excavation and the excavation of existing utility underground structures, a previously disturbed soil.

(v) Observe the opened excavation to identify layered systems to identify slope toward the excavation degree of slope of the layers.

(vi) Observe the area adjacent to the excavation and the sides of the excavation for evidence of surface seeping from the sides of the excavation or the level of the excavation.

(vii) Observe the area adjacent to the excavation and the area with vibration for sources of vibration that affect the stability of the excavation.

(2) *Manual tests.* Manual tests shall be conducted to determine soil and to provide more information to classify soil properly.

(3) Visual and manual analyses. The visual and manual analyses, such as those noted as being acceptable in paragraph (d) of this appendix, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.

(4) Layered systems. In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.

(5) Reclassification. If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a competent person. The deposit shall be reclassified as necessary to reflect the changed circumstances.

(d) Acceptable visual and manual tests.—(1) Visual tests. Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

(i) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

(ii) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive soil that breaks apart and does not stay in clumps is granular.

(iii) Observe the side of the open excavation and the surface area adjacent to the excavation. Cracks of various sizes such as tension cracks could indicate massive material. If chunks of soil spill off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.

(iv) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.

(v) Observe the exposed side of the excavation to identify layered systems. Examine layers toward the excavation. Estimate the degree of slope of the layers.

(vi) Observe the area adjacent to the excavation and the sides of the open excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.

(vii) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

(2) Manual tests. Manual analysis of soil samples is conducted to determine qualitative as well as quantitative information on soil and to provide more information in order to classify soil properly.

(i) Plasticity. Mold a moist or wet sample of soil into a ball of 100 mm to 150 mm diameter as thin as possible in a meter. Cohesive material can be successfully rolled into threads, without crumbling. For example, if at least a 1/2 inch (12.5 mm) length of thread thread can be rolled from one end without breaking, the soil is clayey.

(ii) Dry strength. If the soil is dry and crumbles on its own or with moderate pressure into either a mass of fine powder, or a granular sandy combination of gravel, sand, or silt. If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand, or silt. If the dry soil breaks into clumps which do not break up into small clumps and when can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.

(iii) Thumb penetration. The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designation D2485—Standard Recommended Practice for Description of Soils (Visual—Manual Procedures) Type A soils with an unconfined compressive strength of 1.2 bar or less, as determined by the thumb test, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 1.2 bar or less, as determined by the thumb test, they can be penetrated by the thumb only with great pressure. This test should be conducted on an undisturbed soil surface, such as a large clump of soil, or soil as it remains after excavation or deep to a minimum in the effects of exposure to drying. However, if the excavation is later exposed to setting influences, such as drying, the actual nature of the soil must be changed accordingly.

(iv) Other strength tests. Estimates of unconfined compressive strength of soils can also be determined by use of a penetrometer or by using a hand-operated shearbox.

(v) Drying test. The basic purpose of the drying test is to determine between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying one such thick (2.54 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry.

(A) If the sample develops cracks as it dries, significant fissures are indicated.

(B) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as an unfissured cohesive material and the unconfined compressive strength should be determined.

(C) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. If both fissures between the two pulverized soil clumps of the sample are noted in the sample, or if there is

the clumps do not separate easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

Appendix B to § 1926 Subpart P—Sloping and Benching

(a) Scope and application. This appendix contains specifications for sloping and benching when soil is excavated in protective embankments or in excavations from overburden. The requirements of this appendix apply when the design of sloping and benching protective systems is to be performed in accordance with the requirements set forth in § 1926.62(b)(2).

(b) Definitions.

Actual slope means the slope to which an excavation face is excavated.

Distress means that the soil is in a condition where a cave-in is imminent or is likely to occur. Distress is evidenced by such phenomena as the development of fissures in the face of or at a cut to an open excavation, the subsidence of the edge of an excavation, the slumping or heaving of material from the bottom of an excavation, the spalling of material from the face of an excavation, and raveling, i.e., small amounts of material such as pebbles or little clumps of material suddenly separating from the face of an excavation and falling or sliding down into the excavation.

Maximum allowable slope means the steepest slope which excavation face is to be excavated for the soil classification, site conditions, as indicated in appendix A to subpart P of part 1926, and is determined as a ratio of horizontal distance to vertical rise (H:V).

Short term exposure means a period of time less than 24 hours that an excavation is open.

(c) Requirements.—(1) Soil classification. Soil and rock deposits shall be classified in accordance with appendix A to subpart P of part 1926.

(2) Maximum allowable slope. The maximum allowable slope for a soil or rock deposit shall be determined from Table B-1 of this appendix.

(3) Actual slope. The actual slope shall not be steeper than the maximum allowable slope.

(4) The actual slope shall be less steep than the maximum allowable slope when there are signs of distress. If that situation occurs, the slope shall be cut back to an actual slope which is at least 1/2 horizontal to one vertical (1:2 H:V) less steep than the maximum allowable slope.

(5) When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a competent person shall determine the degree to which the actual slope must be reduced below the maximum allowable slope, and shall assure that such reduction is achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with § 1926.62(b)(2).

(6) Configuration of configurations of slope and benching systems shall be in accordance with appendix B-1.

TABLE B-1  
MAXIMUM ALLOWABLE SLOPES

Soil or Rock Type	Maximum Allowable Slopes (H:V) <sup>(1)</sup> For Excavations Less Than 20 Feet Deep <sup>(3)</sup>
Stable Rock .....	Vertical (90°)
Type A <sup>(2)</sup> .....	3/4:1 (53°)
Type B .....	1:1 (45°)
Type C .....	1 1/2:1 (34°)

NOTES:

- <sup>1</sup> Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.
- <sup>2</sup> A short-term maximum allowable slope of 1/2 H:1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4 H:1V (53°).
- <sup>3</sup> Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

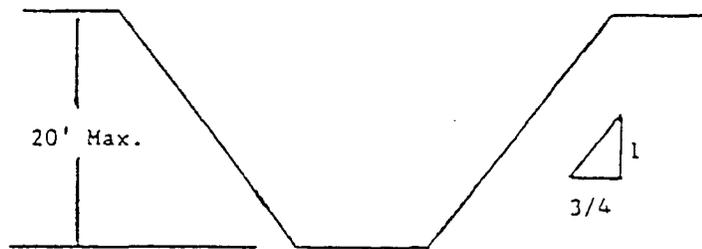
Figure B-1

Slope Configurations

(All slopes stated below are in the horizontal to vertical ratio)

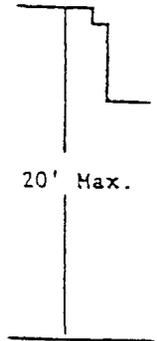
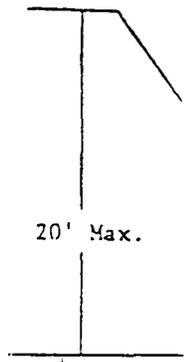
B-1.1 Excavations made in Type A soil.

- 1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of 3/4:1.



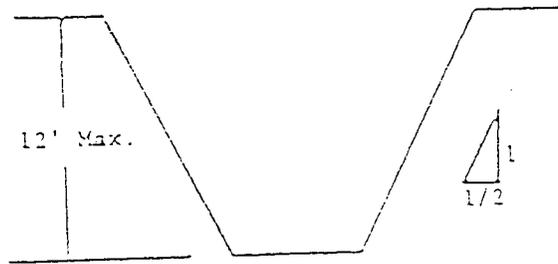
Exception: Simple  
are 12 feet or less in c

- 2. All benched exca  
of 3/4 to 1 and maximu



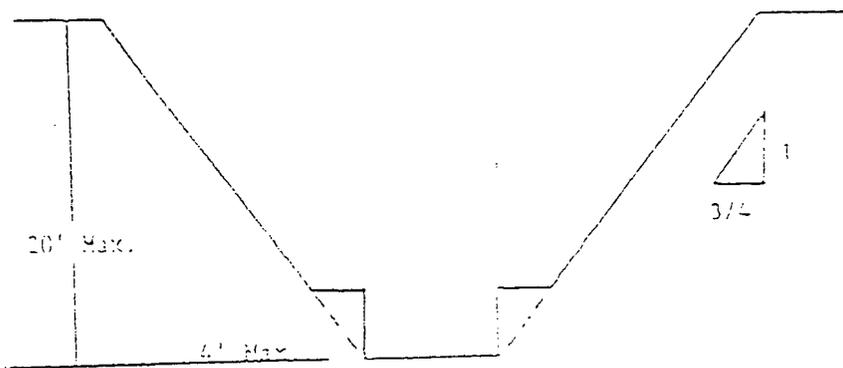
SIMPLE SLOPE—GENERAL

Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of 1/2 to 1.

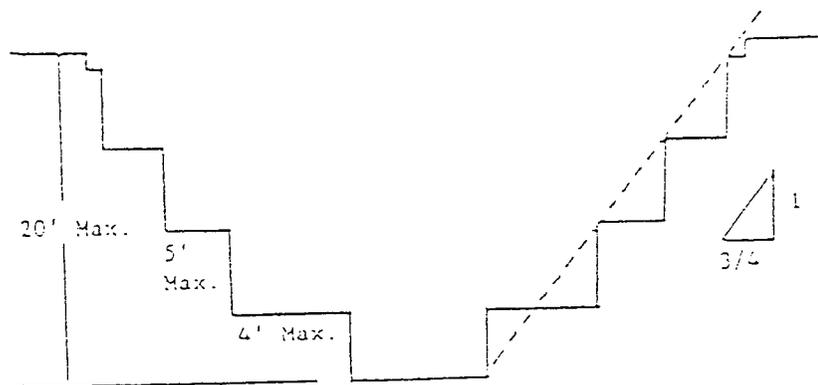


SIMPLE SLOPE—SHORT TERM

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimensions as follows:

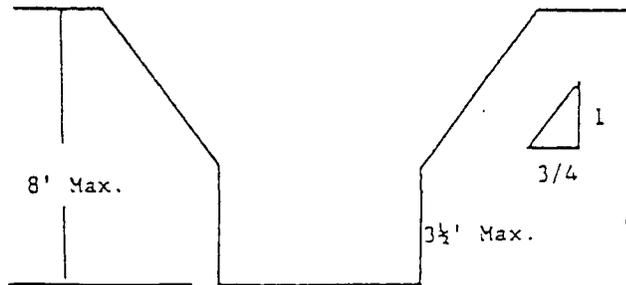


SIMPLE BENCH



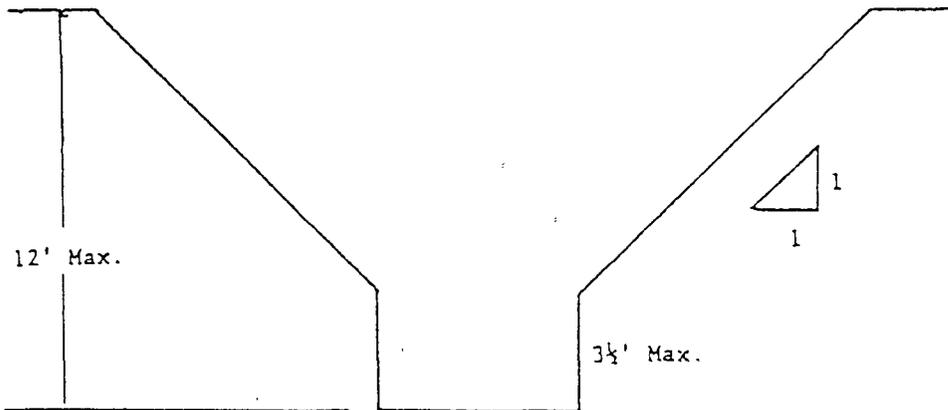
MULTIPLE BENCH

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3 1/2 feet.



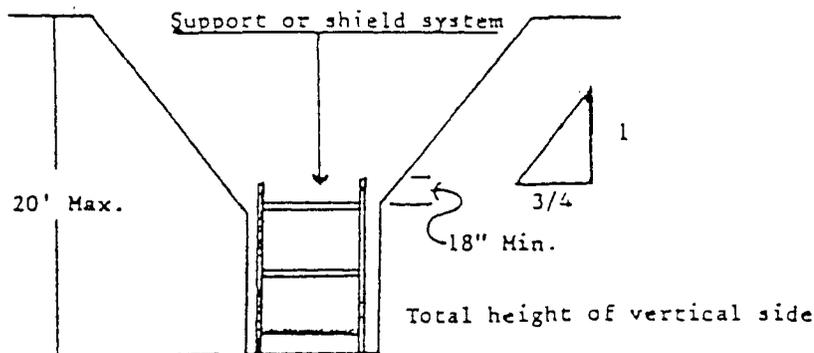
UNSUPPORTED VERTICALLY SIDED LOWER PORTION—MAXIMUM 8 FEET IN DEPTH

All excavations more than 8 feet but not more than 12 feet in depth which unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3 1/2 feet.



UNSUPPORTED VERTICALLY SIDED LOWER PORTION—MAXIMUM 12 FEET IN DEPTH

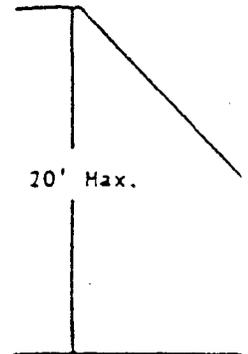
All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 3/4:1. The support or shield system must extend at least 18 inches above the top of the vertical side.



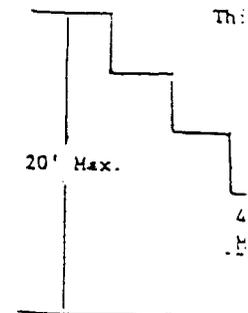
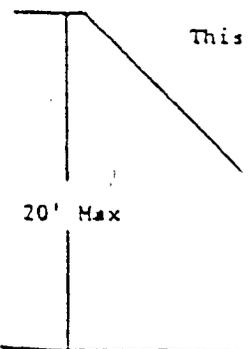
SUPORTE

4. All other simple si shall be in accordance w

1. All simple slope e: slope of 1:1.



2. All benched excava of 1:1 and maximum ben

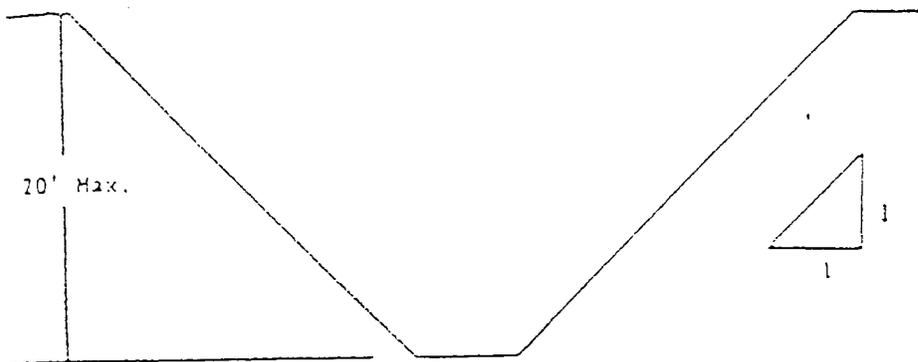


SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under §1925.653(b).

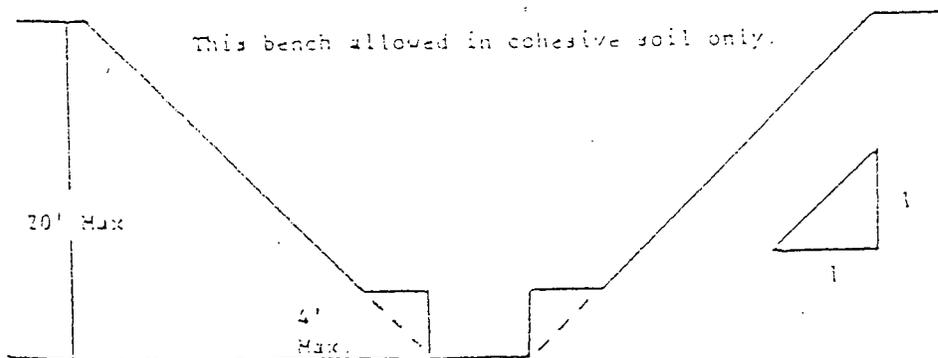
B-1.2 Excavations Made in Type B Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

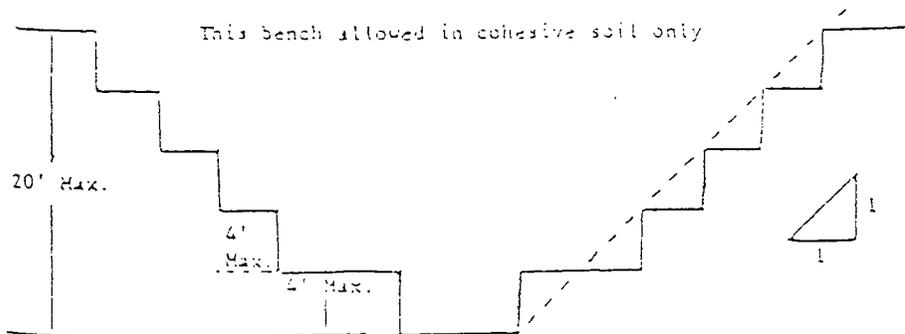


SIMPLE SLOPE

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:



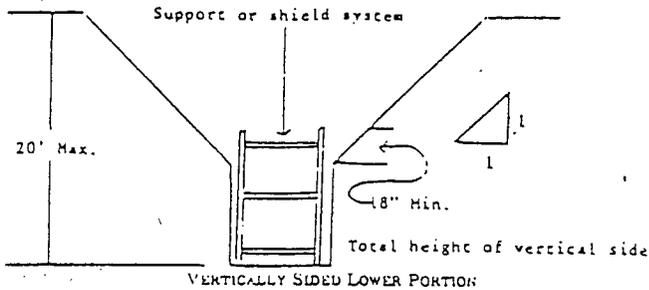
SINGLE BENCH



## Construction Standards

## MULTIPLE BENCH

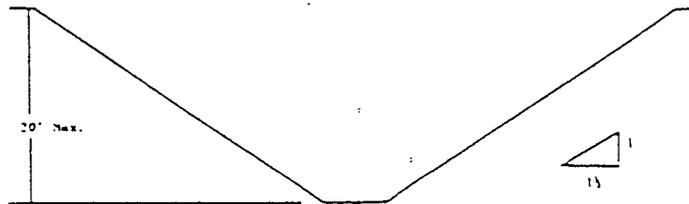
3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.



4. All other sloped excavations shall be in accordance with the other options permitted in §1926.652(b).

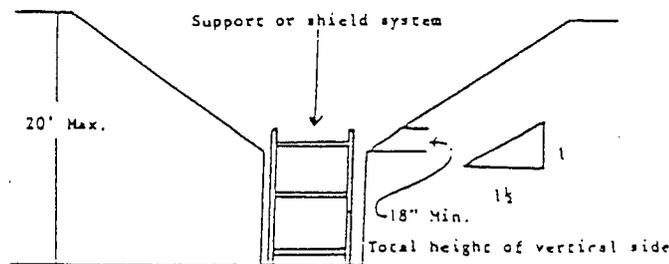
## B-1.3 Excavations Made in Type C Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



## SIMPLE SLOPE

2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1½:1.



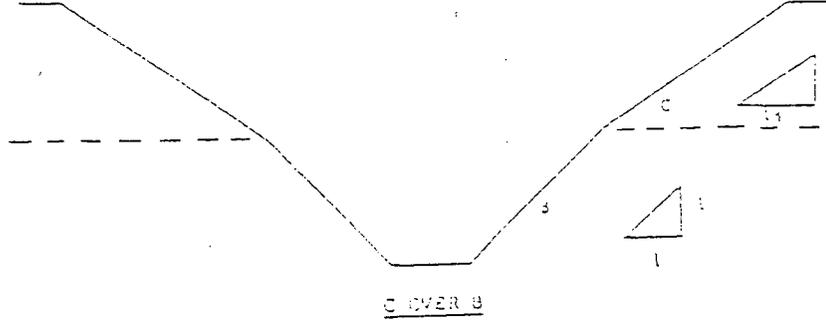
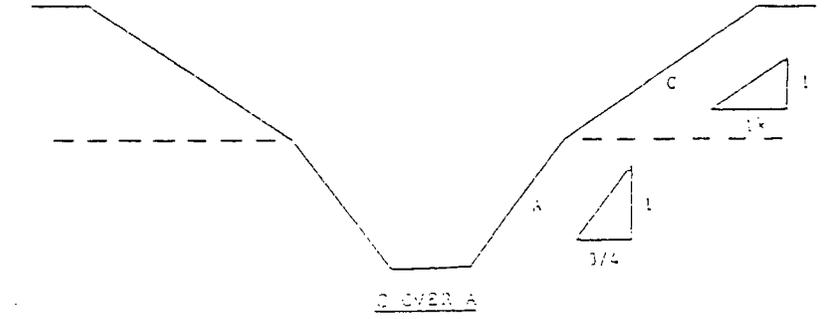
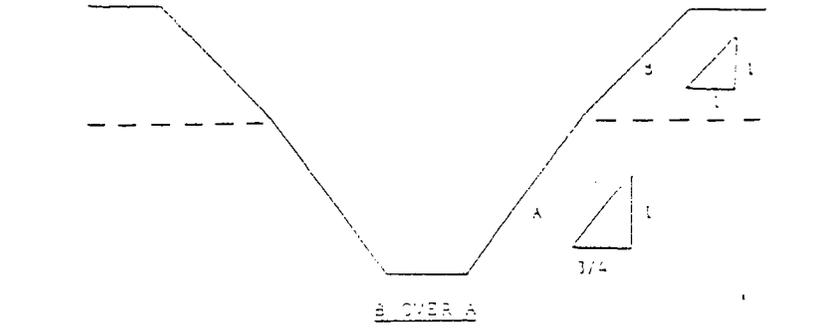
## VERTICAL SIDED LOWER PORTION

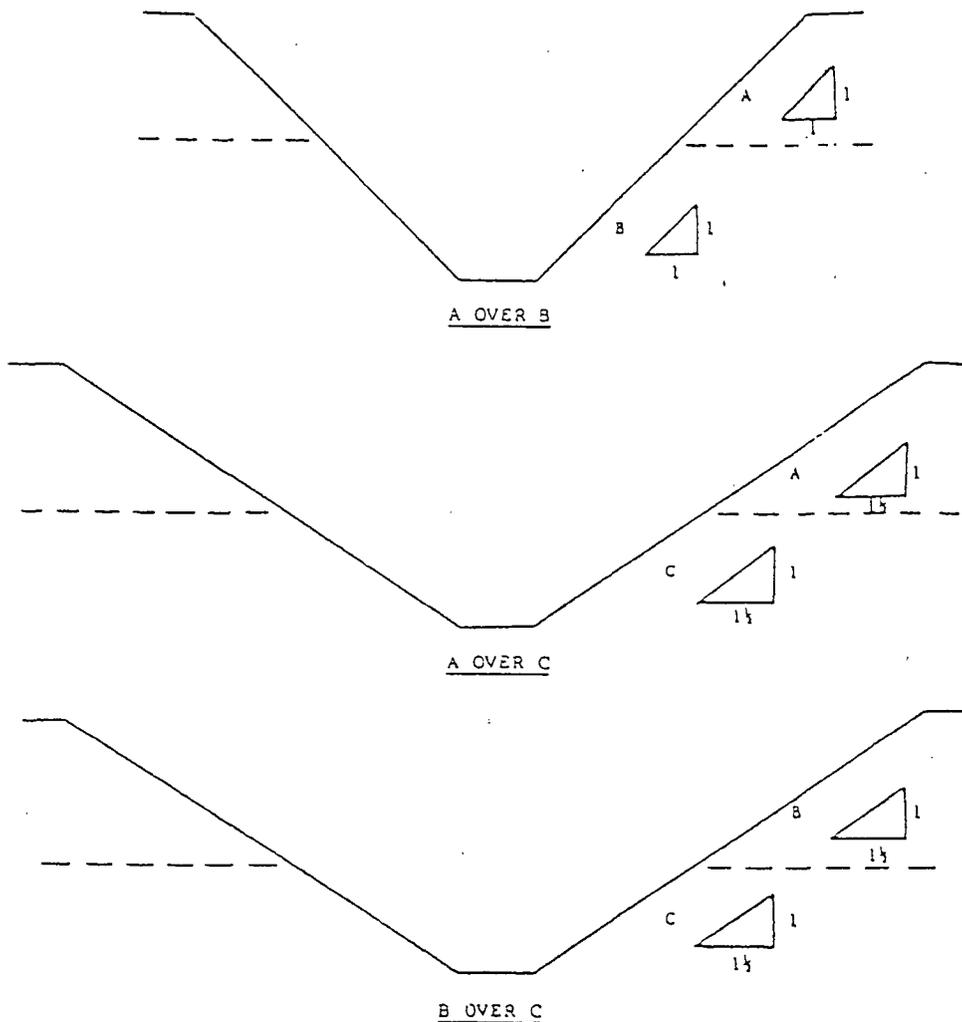
3. All other sloped excavations shall be in accordance with the other options permitted in §1926.652(b).

## B-1.4 Excavations Made in Layered Soils

1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.

2.





§ 1926 Subpart P App. B

Appendix C to § 1926 Subpart P  
Timber Shoring For

(a) Scope. This appendix provides information that can be used when designing timber shoring for trench cave-ins in trenches that are 20 feet (6.1 m) in depth. The design of protective systems is to be in accordance with § 1926.652. Timber shoring configurations of support systems such as pneumatic systems; and other systems such as sloping, benching, and freezing systems may be used in accordance with the requirements in § 1926.652(b) and §

(b) Soil Classification. In the data presented in this appendix, the soil types or types in which the data was made must first be determined using the soil classification method set forth in Appendix A of subpart P of this part.

(c) Presentation of Information. Information is presented in several figures.

(1) Information is presented in Tables C-1.1, C-1.2, C-2.1, C-2.2 and C-2.3. Figure (g) of the appendix presents the minimum sizes of members to use in a shoring system. The table contains data only for soil types in which the excavation is made. The data is arranged to allow the user to select from among several configurations of members based on the horizontal spacing of the members. Stable rock is exempt from the requirements and therefore, no data is provided for this condition.

(2) Information concerning the tabular data and the list of data is presented in paragraphs (a) through (c) of this appendix, and on the tables.

(3) Information explaining the tabular data is presented in paragraphs (d) through (f) of this appendix.

(4) Information illustrating the tabular data is presented in figures (g) through (i) of this appendix.

(5) Miscellaneous notations in Tables C-1.1 through C-1.3 and C-2.1 through C-2.3 are presented in paragraph (g) of this Appendix.

(d) Basis and limitations  
(1) Dimensions of timber members. The sizes of the timber members listed in Tables C-1.1 through C-1.3 are taken from the American National Bureau of Standards "Recommended Technical Practice in Shoring of Trenches and Excavation," where NBS dimensions are specific sizes of members, based on an analysis of the members for use by existing codes and practice.

(ii) The required dimensions listed in Tables C-1.1 through C-1.3 refer to actual dimensions of the timber. Engineering to use nominal size should refer to Tables C-2.1 through C-2.3 for choice under § 1926.652(c) referred to The Corps of Engineers, Bureau of Reclamation or other acceptable sources.

(2) Limitation of application. It is intended that the timber shoring apply to every situation

Appendix C to § 1926 Subpart P—  
Timber Shoring For Trenches

(a) Scope. This appendix contains information that can be used when timber shoring is provided as a method of protection from cave-ins in trenches that do not exceed 20 feet (6.1 m) in depth. This appendix must be used when design of timber shoring protective systems is to be performed in accordance with § 1926.652(c)(1). Other timber shoring configurations, other systems of support such as hydraulic and pneumatic systems, and other protective systems such as sloping, benching, shielding, and freezing systems must be designed in accordance with the requirements set forth in § 1926.652(b) and § 1926.652(c).

(b) Soil Classification. In order to use the data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of subpart P of this part.

(c) Presentation of Information. Information is presented in several forms as follows:

(1) Information is presented in tabular form in Tables C-1.1, C-1.2 and C-1.3, and Tables C-2.1, C-2.2 and C-2.3 following paragraph (g) of the appendix. Each table presents the minimum sizes of timber members to use in a shoring system, and each table contains data only for the particular soil type in which the excavation is made. The data are arranged to allow the user the flexibility to select from among several acceptable configurations of members based on varying the horizontal spacing of the crossbraces. Stake lock is exempt from shoring requirements and therefore, no data are presented for this condition.

(2) Information concerning the basis of the tabular data and the limitations of the data is presented in paragraph (e) of this appendix, and on the tables themselves.

(3) Information explaining the use of the tabular data is presented in paragraph (d) of this appendix.

(4) Information illustrating the use of the tabular data is presented in paragraph (f) of this appendix.

(5) Miscellaneous notations regarding Tables C-1.1 through C-1.3 and Tables C-2.1 through C-2.3 are presented in paragraph (g) of this Appendix.

(d) Basis and limitations of the data.—  
(1) Dimensions of timber members.—The sizes of the timber members listed in Tables C-1.1 through C-1.3 are taken from the National Bureau of Standards (NBS) report, "Recommended Technical Provisions for Construction Practice in Shoring and Shoring of Trenches and Excavations." In addition, where NBS did not recommend specific sizes of members, member sizes are based on an analysis of the sizes required for use by existing codes and on empirical practice.

(2) The required dimensions of the members listed in Tables C-1.1 through C-1.3 refer to actual dimensions and not nominal dimensions of the timber. Employers wanting to use nominal size shoring are directed to Tables C-2.1 through C-2.3, or have this choice under § 1926.652(c)(3), and are referred to The Corps of Engineers, The Bureau of Reclamation or data from other acceptable sources.

(3) Limitation of application.—It is not intended that the timber shoring specifications apply to every situation that may be

experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be designed as specified in § 1926.652(c).

(ii) When any of the following conditions are present, the members specified in the tables are not considered adequate. Either an alternate timber shoring system must be designed or another type of protective system designed in accordance with § 1926.652.

(A) When loads imposed by structures or by stored material adjacent to the trench weigh in excess of the load imposed by a two-foot soil surcharge. The term "adjacent" as used here means the area within a horizontal distance from the edge of the trench equal to the depth of the trench.

(B) When vertical loads imposed on crossbraces exceed a 240-pound gravity load distributed on a one-foot section at the center of the crossbraces.

(C) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(D) When only the lower portion of a trench is shored or braced unless: The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench and not from the toe of the sloped portion.

(e) Use of Tables. The members of the shoring system that are to be selected using this information are the crossbraces, the uprights, and the wales, where wales are required. Minimum sizes of members are specified for use in different types of soil. There are six tables of information, two for each soil type. The soil type must first be determined in accordance with the soil classification system described in appendix A to subpart P of part 1926. Using the appropriate table, the selection of the size and spacing of the members is then made. The selection is based on the depth and width of the trench where the members are to be installed and, in most instances, the selection is also based on the horizontal spacing of the crossbraces. Instances where a choice of horizontal spacing of crossbracing is available, the horizontal spacing of the crossbraces must be chosen by the user before the size of any member can be determined. When the soil type, the width and depth of the trench, and the horizontal spacing of the crossbraces are known, the size and vertical spacing of the crossbraces are known, the size and vertical spacing of the wales, and the size and horizontal spacing of the uprights can be read from the appropriate table.

(f) Examples to illustrate the Use of Tables C-1.1 through C-1.3

(1) Example 1.

A trench dug in Type A soil is 13 feet deep and five feet wide.

From Table C-1.1, for acceptable arrangements of timber can be used.

Arrangement #1

Space 4 x 4 crossbraces at six feet horizontally and five feet vertically.

Wales are not required.

Space 3 x 8 uprights at six feet horizontally. This arrangement is commonly called "skip shoring."

Arrangement #2

Space 4 x 6 crossbraces at eight feet horizontally and four feet vertically.

Space 2 x 6 wales at four feet vertically.

Space 2 x 6 uprights at four feet horizontally.

Arrangement #3

Space 5 x 8 crossbraces at 10 feet horizontally and four feet vertically.

Space 4 x 10 wales at four feet vertically.

Space 2 x 6 uprights at five feet horizontally.

Arrangement #4

Space 6 x 8 crossbraces at 12 feet horizontally and four feet vertically.

Space 10 x 10 wales at four feet vertically.

Space 3 x 8 uprights at six feet horizontally.

(2) Example 2.

A trench dug in Type B soil is 13 feet deep and five feet wide. From Table C-1.2 three acceptable arrangements of members are listed.

Arrangement #1

Space 6 x 8 crossbraces at six feet horizontally and five feet vertically.

Space 2 x 6 wales at five feet vertically.

Space 2 x 6 uprights at two feet horizontally.

Arrangement #2

Space 6 x 8 crossbraces at eight feet horizontally and five feet vertically.

Space 12 x 10 wales at five feet vertically.

Space 2 x 6 uprights at two feet horizontally.

Arrangement #3

Space 5 x 8 crossbraces at 10 feet horizontally and five feet vertically.

Space 12 x 12 wales at five feet vertically.

Space 2 x 6 uprights at two feet vertically.

(3) Example 3.

A trench dug in Type C soil is 13 feet deep and five feet wide.

From Table C-1.3 two acceptable arrangements of members can be used.

Arrangement #1

Space 6 x 8 crossbraces at six feet horizontally and five feet vertically.

Space 10 x 12 wales at five feet vertically.

Position 2 x 6 uprights as closely together as possible.

If water must be retained use special tongue and groove uprights to form tight sheeting.

Arrangement #2

Space 6 x 10 crossbraces at eight feet horizontally and five feet vertically.

Space 12 x 12 wales at five feet vertically.

Position 2 x 6 uprights in a close sheeting configuration unless water pressure must be resisted. Tight sheeting must be used where water must be retained.

(4) Example 4.

A trench dug in Type C soil is 20 feet deep and 11 feet wide. The size and spacing of members for the section of trench that is

over 15 feet in depth is determined using Table C-1.3. Only one arrangement of members is provided.

Space 8x10 crossbraces at six feet horizontally and five feet vertically.

Space 12x12 wales at five feet vertically.

Use 3x6 tight sheeting.

Use of Tables C-2.1 through C-2.3 would follow the same procedures.

(g) Notes for all Tables.

1. Member sizes at spacings other than indicated are to be determined as specified in § 1926.652(c), "Design of Protective Systems."

2. When conditions are saturated or submerged use Tight Sheeting. Tight Sheeting refers to the use of specially-edged timber

planks (e.g., tongue and groove) at least three inches thick, steel sheet piling, or similar construction that when driven or placed in position provide a tight wall to resist the lateral pressure of water and to prevent the loss of backfill material. Close Sheeting refers to the placement of planks side-by-side allowing as little space as possible between them.

3. All spacing indicated is measured center to center.

4. Wales to be installed with greater dimension horizontal.

5. If the vertical distance from the center of the lowest crossbrace to the bottom of the trench exceeds two and one-half feet, uprights shall be firmly embedded or a

mudsill shall be used. Where uprights are embedded, the vertical distance from the center of the lowest crossbrace to the bottom of the trench shall not exceed 36 inches. When mudsills are used, the vertical distance shall not exceed 42 inches. Mudsills are wales that are installed at the tow of the trench side.

6. Trench jacks may be used in lieu of or in combination with timber crossbraces.

7. Placement of crossbraces. When the vertical spacing of crossbraces is four feet, place the top crossbrace no more than two feet below the top of the trench. When the vertical spacing of crossbraces is five feet, place the top crossbrace no more than 2.5 feet below the top of the trench.

Table C-1.1  
Timber Trench Shoring—Minimum Timber Requirements \*  
Soil Type A  $P_u = 25 \times H + 72$  psf (2 ft Surcharge)

Depth of Trench (feet)	Size (Actual) and Spacing of Members **													
	Horiz. Spacing (feet)	Cross Braces					Vert. Spacing (feet)	Size (in)	Vert. Spacing (feet)	Uprights				
		Width of Trench (feet)								Maximum Allowable Horizontal Spacing (feet)				
		Up to 4	Up to 6	Up to 9	Up to 12	Up to 15				Close	4	5	6	8
5	Up to 6	4x4	4x4	4x6	6x6	6x6	4	Not Req'd	—				2x6	
	Up to 8	4x4	4x4	4x6	6x6	6x6	4	Not Req'd	—					2x8
10	Up to 10	4x6	4x6	4x6	6x6	6x6	4	8x8	4			2x6		
	Up to 12	4x6	4x4	4x6	6x6	6x6	4	8x8	4				2x6	
10	Up to 6	4x4	4x4	4x6	6x6	6x6	4	Not Req'd	—					3x8
	Up to 8	4x6	4x6	6x6	6x6	6x6	4	8x8	4			2x6		
15	Up to 10	6x6	6x5	6x6	6x8	6x8	4	8x10	4			2x6		
	Up to 12	6x6	6x6	6x6	6x8	6x8	4	10x10	4				3x8	
15	Up to 6	6x6	6x6	6x6	6x8	6x8	4	6x8	4	3x6				
	Up to 8	6x6	6x6	6x6	6x8	6x8	4	8x8	4	3x6				
20	Up to 10	8x8	8x8	8x8	8x8	8x10	4	8x10	4	3x6				
	Up to 12	8x8	8x8	8x8	8x8	8x10	4	10x10	4	3x6				
Over 20	See Note 1													

\* Mixed oak or equivalent with a bending strength not less than 850 psi.  
\*\* Manufactured members of equivalent strength may be substituted for wood.

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Depth of Trench (feet)	Horiz. Spacing (feet)	Uprights
		Up to 4
5	Up to 6	4x6
	Up to 8	6x6
10	Up to 10	6x6
	See Note 1	
10	Up to 6	6x6
	Up to 8	6x8
15	Up to 10	8x8
	See Note 1	
15	Up to 6	6x8
	Up to 8	8x8
20	Up to 10	8x10
	See Note 1	
Over 20	See Note 1	

\* Mixed oak or equivalent  
\*\* Manufactured

Table C-1.2  
 Timber Trench Shoring—Minimum Timber Requirements\*  
 Soil Type B P<sub>1</sub> = 45 × H + 72 psf (2 ft Surcharge)

Depth of Trench (feet)	Size (Actual) and Spacing of Members**											
	Horiz. Spacing (feet)	Cross Braces					Vert. Spacing (feet)	Wales		Uprights		
		Width of Trench (feet)						Size (in.)	Vert. Spacing (feet)	Maximum Allowable Horizontal Spacing (feet)		
	Up to 4	Up to 6	Up to 9	Up to 12	Up to 15					1	2	3
5	Up to 6	4×6	4×6	6×6	6×6	6×6	5	6×3	5	2×6		
To	Up to 8	6×6	6×6	6×6	6×8	6×8	5	8×3	5	2×6		
10	Up to 10	6×6	6×6	6×6	6×8	6×8	5	10×10	5	2×6		
	See Note 1											
10	Up to 6	6×6	6×6	6×6	6×8	6×8	5	8×8	5	2×6		
To	Up to 8	6×6	6×8	6×8	8×8	8×8	5	10×10	5	2×6		
15	Up to 10	8×8	8×8	8×8	8×8	8×10	5	10×12	5	2×6		
	See Note 1											
15	Up to 6	6×8	6×8	6×8	6×8	6×8	5	8×10	5	3×6		
To	Up to 8	8×8	8×8	8×8	8×8	8×10	5	10×12	5	3×6		
20	Up to 10	8×10	8×10	8×10	8×10	10×10	5	12×12	5	3×6		
	See Note 1											
Over 20	See Note 1											

\* Mixed oak or equivalent with a bending strength not less than 650 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood.

Table C-1.3  
 Timber Trench Shoring—Minimum Timber Requirements \*  
 Soil Type C P<sub>s</sub> = 80 × H + 72 psf (2 ft Surcharge)

Depth of Trench (feet)	Size (Actual) and Spacing of Members **												
	Horiz. Spacing (feet)	Cross Braces					Vert. Spacing (feet)	Wales		Uprights			
		Width of Trench (feet)						Size (in)	Vert. Spacing (feet)	Maximum Allowable Horizontal Spacing (feet) (See Note 2)			
		Up to 4	Up to 6	Up to 9	Up to 12	Up to 15				Close			
5 To 10	Up to 6	6x8	6x8	6x8	8x8	8x8	5	8x10	5	2x6			
	Up to 8	8x8	8x8	8x8	8x8	8x10	5	10x12	5	2x6			
	Up to 10	8x10	8x10	8x10	8x10	10x10	5	12x12	5	2x6			
	See Note 1												
10 To 15	Up to 6	8x8	8x8	8x8	8x8	8x10	5	10x12	5	2x6			
	Up to 8	8x10	8x10	8x10	8x10	10x10	5	12x12	5	2x6			
	See Note 1												
	See Note 1												
15 To 20	Up to 6	8x10	8x10	8x10	8x10	10x10	5	12x12	5	3x6			
	See Note 1												
	See Note 1												
	See Note 1												
Over 20	See Note 1												

\* Mixed oak or equivalent with a bending strength not less than 850 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood.

Depth of Trench (feet)	Horiz. Spacing (feet)	Up to			
			5	Up to 6	4x
				Up to 8	4x
10	Up to 10	4x			
	Up to 12	4x			
10	Up to 6	4x			
	Up to 8	4x			
15	Up to 10	6x			
	Up to 12	6x			
15	Up to 6	6x			
	Up to 8	6x			
20	Up to 10	6x			
	Up to 12	6x			
Over 20	See Note 1				

\* Douglas fir  
 \*\* Manufactur

Table C-2.1  
 Timber Trench Shoring—Minimum Timber Requirements \*  
 Soil Type A  $P_s = 25 \times H + 72$  psf (2 ft Surcharge)

Depth of Trench (feet)	Size (S+S) and Spacing of Members **													
	Horiz. Spacing (feet)	Cross Braces					Vert. Spacing (feet)	Wales		Uprights				
		Width of Trench (feet)						Size (in)	Vert. Spacing (feet)	Maximum Allowable Horizontal Spacing (feet)				
		Up to 4	Up to 6	Up to 9	Up to 12	Up to 15				Close	4	5	6	8
5	Up to 6	4x4	4x4	4x4	4x4	4x6	4	Not Req'd	Not Req'd				4x6	
	Up to 8	4x4	4x4	4x4	4x6	4x6	4	Not Req'd	Not Req'd					4x8
10	Up to 10	4x6	4x6	4x6	6x6	6x6	4	8x8	4			4x6		
	Up to 12	4x6	4x6	4x6	6x6	6x6	4	8x8	4				4x6	
10	Up to 6	4x4	4x4	4x4	6x6	6x6	4	Not Req'd	Not Req'd				4x10	
	Up to 8	4x6	4x6	4x6	6x6	6x6	4	6x8	4		4x6			
15	Up to 10	6x6	6x6	6x6	6x6	6x6	4	8x8	4			4x8		
	Up to 12	6x6	6x6	6x6	6x6	6x6	4	8x10	4		4x6		4x10	
15	Up to 6	6x6	6x6	6x6	6x6	6x6	4	6x8	4	3x6				
	Up to 8	6x6	6x6	6x6	6x6	6x6	4	8x8	4	3x6	4x12			
20	Up to 10	6x6	6x6	6x6	6x6	6x8	4	8x10	4	3x6				
	Up to 12	6x6	6x6	6x6	6x8	6x8	4	8x12	4	3x6	4x12			
Over 20	See Note 1													

\* Douglas fir or equivalent with a bending strength not less than 1500 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood

Table C-2.2  
 Timber Trench Shoring—Minimum Timber Requirements \*  
 Soil Type B  $P_s = 45 \times H + 72$  psf (2 ft Surcharge)

Depth of Trench (feet)	Size (S4S) and Spacing of Members **													
	Horiz. Spacing (feet)	Cross Braces					Vert. Spacing (feet)	Wales		Uprights				
		Width of Trench (feet)						Size (in)	Vert. Spacing (feet)	Maximum Allowable Horizontal Spacing (feet)				
		Up to 4	Up to 6	Up to 9	Up to 12	Up to 15				Close	2	3	4	6
5	Up to 6	4x6	4x6	4x6	6x6	6x6	5	6x8	5			3x12 4x8		4x12
	To 8	4x6	4x6	6x6	6x6	6x6	5	8x8	5		3x8		4x8	
10	Up to 10	4x6	4x6	6x6	6x6	6x8	5	8x10	5			4x8		
	See Note 1													
10	Up to 6	6x6	6x6	6x6	6x8	6x8	5	8x8	5	3x6	4x10			
	To 8	6x8	6x8	6x8	8x8	8x8	5	10x10	5	3x6	4x10			
15	Up to 10	6x8	6x8	8x8	8x8	8x8	5	10x12	5	3x6	4x10			
	See Note 1													
15	Up to 6	6x8	6x8	6x8	6x8	8x8	5	8x10	5	4x6				
	To 8	6x8	6x8	6x8	8x8	8x8	5	10x12	5	4x6				
20	Up to 10	8x8	8x8	8x8	8x8	8x8	5	12x12	5	4x6				
	See Note 1													
Over 20	See Note 1													

\* Douglas fir or equivalent with a bending strength not less than 1500 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood.

Depth of Trench (feet)	Horiz. Spacing (feet)	Up to 4			
			5	Up to 6	6x6
				Up to 8	6x6
10	Up to 10	6x6			
	See Note 1				
10	Up to 6	6x8			
	To 8	8x8			
15	See Note 1				
	See Note 1				
15	Up to 6	8x8			
	To 8	See Note 1			
20	See Note 1				
	See Note 1				
Over 20	See Note 1				

\* Douglas fir or  
 \*\* Manufactured

Table C-2.3  
 Timber Trench Shoring—Minimum Timber Requirements \*  
 Soil Type C  $P_s = 80 \times H + 72$  psf (2 ft Surcharge)

Depth of Trench (feet)	Size (S+S) and Spacing of Members **													
	Horiz. Spacing (feet)	Cross Braces					Vert. Spacing (feet)	Wales		Uprights				
		Width of Trench (feet)						Size (in)	Vert. Spacing (feet)	Maximum Allowable Horizontal Spacing (feet)				
		Up to 4	Up to 6	Up to 9	Up to 12	Up to 15				Close				
5	Up to 6	6x6	6x6	6x6	6x6	8x8	5	8x8	5	3x6				
	To 8	6x6	6x6	6x6	8x8	8x8	5	10x10	5	3x6				
10	Up to 10	6x6	6x6	8x8	8x8	8x8	5	10x12	5	3x6				
	See Note 1													
10	Up to 6	6x8	6x8	6x8	8x8	8x8	5	10x10	5	4x6				
	To 8	8x8	8x8	8x8	8x8	8x8	5	12x12	5	4x6				
15	See Note 1													
	See Note 1													
15	Up to 6	8x8	8x8	8x8	8x10	8x10	5	10x12	5	4x6				
	See Note 1													
20	See Note 1													
	See Note 1													
Over 20	See Note 1													

\* Douglas fir or equivalent with a bending strength not less than 1500 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood.

Appendix D to § 1926 Subpart P—  
Aluminum Hydraulic Shoring for  
Trenches

(a) Scope. This appendix contains information that can be used when aluminum hydraulic shoring is provided as a method of protection against cave-ins in trenches that do not exceed 20 feet (6.1m) in depth. This appendix must be used when design of the aluminum hydraulic protective system cannot be performed in accordance with § 1926.652(c)(2).

(b) Soil Classification. In order to use data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of subpart P of part 1926.

(c) Presentation of Information. Information is presented in several forms as follows:

(1) Information is presented in tabular form in Tables D-1.1, D-1.2, D-1.3 and D-1.4. Each table presents the maximum vertical and horizontal spacings that may be used with various aluminum member sizes and various hydraulic cylinder sizes. Each table contains data only for the particular soil type in which the excavation or portion of the excavation is made. Tables D-1.1 and D-1.2 are for vertical shores in Types A and B soil. Tables D-1.3 and D-1.4 are for horizontal waler systems in Types B and C soil.

(2) Information concerning the basis of the tabular data and the limitations of the data is presented in paragraph (d) of this appendix.

(3) Information explaining the use of the tabular data is presented in paragraph (e) of this appendix.

(4) Information illustrating the use of the tabular data is presented in paragraph (f) of this appendix.

(5) Miscellaneous notations (Footnotes) regarding Table D-1.1 through D-1.4 are presented in paragraph (g) of this appendix.

(6) Figures, illustrating typical installations of hydraulic shoring, are included just prior to the Tables. The illustrations page is entitled "Aluminum Hydraulic Shoring: Typical Installations."

(d) Basis and limitations of the data.

(1) Vertical shore rails and horizontal walers are those that meet the Section Modulus requirements in the D-1 Tables. Aluminum material is 6061-T6 or material of equivalent strength and properties.

(2) Hydraulic cylinders specifications. (i) 2-inch cylinders shall be a minimum 2-inch inside diameter with a minimum safe working capacity of not less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe working capacity of not less than 30,000 pounds axial compressive load at extensions as recommended by product manufacturer.

(3) Limitation of application.

(i) It is not intended that the aluminum hydraulic specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix

must be otherwise designed as specified in § 1926.652(c).

(ii) When any of the following conditions are present, the members specified in the Tables are not considered adequate. In this case, an alternative aluminum hydraulic shoring system or other type of protective system must be designed in accordance with § 1926.652.

(A) When vertical loads imposed on cross braces exceed a 100 Pound gravity load distributed on a one foot section of the center of the hydraulic cylinder.

(B) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(C) When only the lower portion of a trench is shored and the remaining portion of the trench is sloped or benched unless: The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(e) Use of Tables D-1.1, D-1.2, D-1.3 and D-1.4. The members of the shoring system that are to be selected using this information are the hydraulic cylinders, and either the vertical shores or the horizontal walers. When a waler system is used the vertical timber sheeting to be used is also selected from these tables. The Tables D-1.1 and D-1.2 for vertical shores are used in Type A and B soils that do not require sheeting, Type B soils that may require sheeting, and Type C soils that always require sheeting, are found in the horizontal waler Tables D-1.3 and D-1.4. The soil type must first be determined in accordance with the soil classification system described in appendix A to subpart P of part 1926. Using the appropriate table, the selection of the size and spacing of the members is made. The selection is based on the depth and width of the trench where the members are to be installed. In these tables the vertical spacing is held constant at four feet on center. The tables show the maximum horizontal spacing of cylinders allowed for each size of wale in the waler system tables, and in the vertical shore tables, the hydraulic cylinder horizontal spacing is the same as the vertical shore spacing.

(f) Example to Illustrate the Use of the Tables:

(1) Example 1:

A trench dug in Type A soil is 6 feet deep and 3 feet wide. From Table D-1.1: Find vertical shores and 2 inch diameter cylinders spaced 8 feet on center (o.c.) horizontally and 4 feet on center (o.c.) vertically. (See Figures 1 & 3 for typical installations.)

(2) Example 2:

A trench is dug in Type B soil that does not require sheeting, 13 feet deep and 5 feet wide. From Table D-1.2: Find vertical shores and 2 inch diameter cylinders spaced 6.5 feet o.c. horizontally and 4 feet o.c. vertically. (See Figures 1 & 3 for typical installations.)

(3) A trench is dug in Type B soil that does not require sheeting, but does experience some minor raveling of the trench face. The trench is 16 feet deep and 9 feet wide. From Table D-1.2: Find vertical shores and 2 inch diameter cylinder (with special oversleeves as designated by Footnote #2) spaced 5.5 feet o.c. horizontally and 4 feet

o.c. vertically. Plywood (per Footnote (g)(7) to the D-1 Table) should be used behind the shores. (See Figures 2 & 3 for typical installations.)

(4) Example 4: A trench is dug in previously disturbed Type B soil, with characteristics of a Type C soil, and will require sheeting. The trench is 18 feet deep, and 12 feet wide 8 foot horizontal spacing between cylinders is desired for working space. From Table D-1.3: Find horizontal wale with a section modulus of 14.0 spaced at 4 feet o.c. vertically and 3 inch diameter cylinder spaced at 9 feet maximum o.c. horizontally. 3 x 12 timber sheeting is required at close spacing vertically. (See Figure 4 for typical installation.)

(5) Example 5: A trench is dug in Type C soil, 9 feet deep and 4 feet wide. Horizontal cylinder spacing in excess of 6 feet is desired for working space. From Table D-1.4: Find horizontal wale with a section modulus of 7.0 and 2 inch diameter cylinders spaced at 6.5 feet o.c. horizontally. Or, find horizontal wale with a 14.0 section modulus and 3 inch diameter cylinder spaced at 10 feet o.c. horizontally. Both wales are spaced 4 feet o.c. vertically. 3 x 12 timber sheeting is required at close spacing vertically. (See Figure 4 for typical installation.)

(g) Footnotes, and general notes, for Tables D-1.1, D-1.2, D-1.3, and D-1.4.

(1) For applications other than those listed in the tables, refer to § 1926.652(c)(2) for use of manufacturer's tabulated data. For trench depths in excess of 20 feet, refer to § 1926.652(c)(2) and § 1926.652(c)(3).

(2) 2-inch diameter cylinders, at this width, shall have structural steel tube (3.5 x 3.5 x 0.1875) oversleeves, or structural oversleeves of manufacturer's specification, extending the full, collapsed length.

(3) Hydraulic cylinders capacities. (i) 2-inch cylinders shall be a minimum 2-inch inside diameter with a safe working capacity of not less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe working capacity of not less than 30,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(4) All spacing indicated is measured center to center.

(5) Vertical shoring rails shall have a minimum section modulus of 0.40 inch.

(6) When vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.

(7) Plywood shall be 1.125 inch thick softwood or 0.75 inch thick, 14 ply, arctic white birch (Finland form). Please note that plywood is not intended as a structural member, but only for prevention of local raveling (sloughing of the trench face) between shores.

(8) See appendix C for timber specifications.

(9) Wales are calculated for simple span conditions.

(10) See appendix D, item (d), for basis and limitations of the data.

FIGURE NO. 1  
VERTICAL ALUMINUM  
HYDRAULIC SHORING  
(NOT SHEETING)

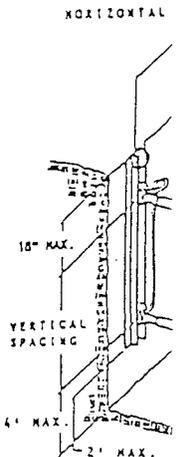
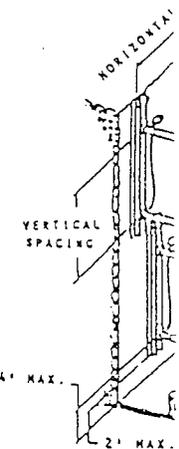


FIGURE NO. 2  
VERTICAL ALUMINUM  
HYDRAULIC SHORING  
(SHEETING)



ALUMINUM HYDRAULIC SHORING  
TYPICAL INSTALLATIONS

FIGURE NO. 1  
VERTICAL ALUMINUM  
HYDRAULIC SHORING  
(SPOT BRACED)

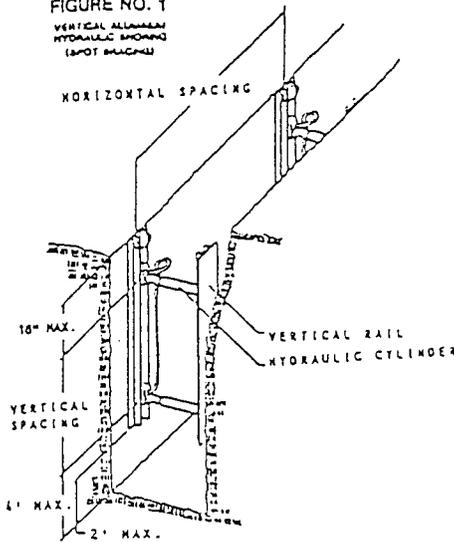


FIGURE NO. 2  
VERTICAL ALUMINUM  
HYDRAULIC SHORING  
(WITH PLYWOOD)

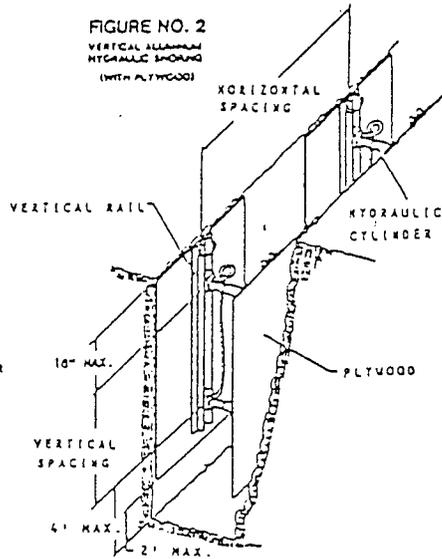


FIGURE NO. 3  
VERTICAL ALUMINUM  
HYDRAULIC SHORING  
(STACKED)

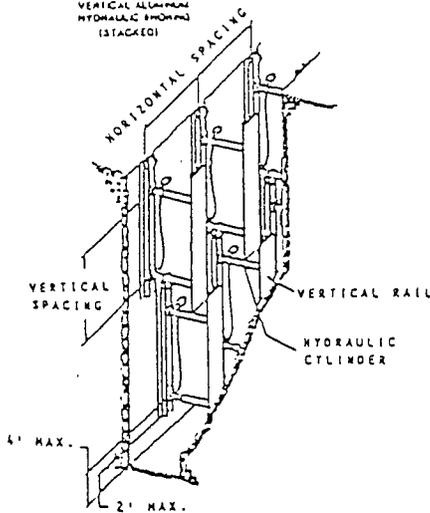
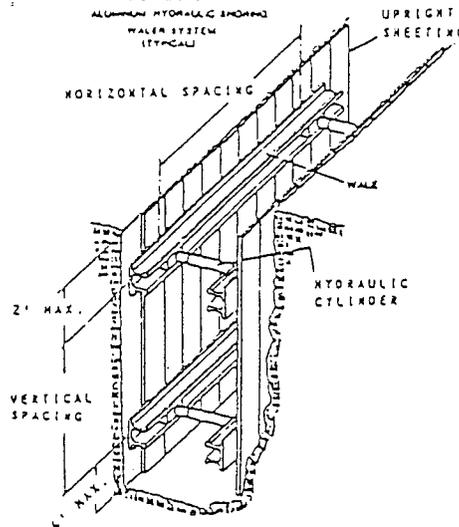


FIGURE NO. 4  
ALUMINUM HYDRAULIC SHORING  
WATER SYSTEM  
(TYPICAL)



plywood (per Footnote (g)(7) of Table) should be used behind the Figures 2 & 3 for typical instal-

FIGURE 4: A trench is dug in previously Type B soil, with characteristic Type C soil, and will require The trench is 18 feet deep, and 12 feet horizontal spacing between shores is required for working space. From 1 to 10 feet depth, find horizontal wale with a section modulus of 14.0 spaced at 4 feet o.c. and 3 inch diameter cylinder spaced at 9 feet maximum o.c. horizontally. Timber sheeting is required at close intervals. (See Figure 4 for typical installation.)

FIGURE 5: A trench is dug in Type C soil, 6 feet deep and 4 feet wide. Horizontal spacing in excess of 6 feet is disallowed. From Table D-1.4, find horizontal wale with a section modulus of 14.0 spaced at 4 feet o.c. horizontally. Or, find horizontal wale with a 14.0 section modulus and 3 inch diameter cylinder spaced at 10 feet o.c. horizontally. Both wales are spaced 4 feet vertically. 3 x 12 timber sheeting is required at close spacing vertically. (See Figure 5 for typical installation.)

Notes, and general notes, for Tables D-1.1, D-1.2, D-1.3, and D-1.4.

For applications other than those shown in the tables, refer to § 1926.652(c)(2) for manufacturer's tabulated data. For trench depths in excess of 20 feet, refer to § 1926.652(c)(2) and § 1926.652(c)(3).

For hydraulic cylinders, at this time, use structural steel tube (3.5 x 3.5) or sleeves, or structural over-alls, as specified by manufacturer, except full, collapsed length.

Hydraulic cylinders capacities. (1) Hydraulic cylinders shall be a minimum 2-inch diameter with a safe working capacity of not less than 18,000 pounds axial compressive load at maximum extension. (2) Extension is to include full range of extensions as recommended by manufacturer.

Hydraulic cylinders shall be a minimum 2-inch diameter with a safe working capacity of not less than 30,000 pounds compressive load at maximum extension. Extension is to include full range of extensions as recommended by manufacturer.

Horizontal spacing indicated is measured center-to-center.

Vertical shoring rails shall have a section modulus of 0.40 inch.

When vertical shores are used, there shall be a minimum of three shores spaced horizontally, in a group.

Plywood shall be 1.125 inch thick (1.75 inch thick, 14 ply, arctic grade, Finland form). Please note that plywood is not intended as a structural member, but only for prevention of local buckling (sloughing of the trench face) behaviors.

Refer to Appendix C for timber specifications.

Wales are calculated for simple span conditions.

See Appendix D, item (d), for basis of calculations of the data.

Table D-1.1  
Aluminum Hydraulic Shoring  
Vertical Shores  
For Soil Type A

Depth of Trench (feet)	Hydraulic Cylinders				
	Maximum Horizontal Spacing (feet)	Maximum Vertical Spacing (feet)	Width of Trench (feet)		
			Up to 8	Over 8 Up to 12	Over 12 Up to 15
Over 5 Up to 10	8	4	2 inch Diameter	2 inch Diameter Note (2)	3 inch Diameter
Over 10 Up to 15	8				
Over 15 Up to 20	7				
Over 20	Note (1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)  
 Note (1): See Appendix D, Item (gX1)  
 Note (2): See Appendix D, Item (gX2)

Table D-1.2  
Aluminum Hydraulic Shoring  
Vertical Shores  
For Soil Type B

Depth of Trench (feet)	Hydraulic Cylinders				
	Maximum Horizontal Spacing (feet)	Maximum Vertical Spacing (feet)	Width of Trench (feet)		
			Up to 8	Over 8 Up to 12	Over 12 Up to 15
Over 5 Up to 10	8	4	2 inch Diameter	2 inch Diameter Note (2)	3 inch Diameter
Over 10 Up to 15	6.5				
Over 15 Up to 20	5.5				
Over 20	Note (1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)  
 Note (1): See Appendix D, Item (gX1)  
 Note (2): See Appendix D, Item (gX2)

Table D-1.3  
Aluminum Hydraulic Shoring  
Water Systems  
For Soil Type B

Timber Uprights  
Hydraulic Cylinders  
Wales

Table D-1.3  
Aluminum Hydraulic Shoring  
Water Systems  
For Soil Type B

Depth of Trench (feet)	Wales		Hydraulic Cylinders						Timber Uprights		
	Vertical Spacing (feet)	Section Modulus (in <sup>3</sup> )	Width of Trench (feet)						Max. Horiz. Spacing (on Center)	Solid Sheet	
			Up to 8		Over 8 Up to 12		Over 12 Up to 15				
			Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter			
Over 5 Up to 10	4	3.5	8.0	2 in	8.0	2 in Note(2)	8.0	3 in	3x12	2 ft.	3 ft.
			9.0	2 in	9.0	2 in Note(2)	9.0	3 in			
			12.0	3 in	12.0	3 in	12.0	3 in			
Over 10 Up to 15	4	3.5	6.0	2 in	6.0	2 in Note(2)	6.0	3 in	3x12	2 ft.	3 ft.
			8.0	3 in	8.0	3 in	8.0	3 in			
			10.0	3 in	10.0	3 in	10.0	3 in			
Over 15 Up to 20	4	3.5	5.5	2 in	5.5	2 in Note(2)	5.5	3 in	3x12	2 ft.	3 ft.
			6.0	3 in	6.0	3 in	6.0	3 in			
			9.0	3 in	9.0	3 in	9.0	3 in			
Over 20			Note(1)								

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g).  
 Notes (1) See Appendix D, Item (681)  
 Notes (2) See Appendix D, Item (682)  
 \* Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

Table D-1.4  
Aluminum Hydraulic Shoring  
Water Systems  
For Soil Type C

Depth of Trench (feet)	Wales		Hydraulic Cylinders						Timber Uprights				
	Vertical Spacing (feet)	Section Modulus (in <sup>3</sup> )	Width of Trench (feet)						Max. Horiz. Spacing (on Center)	Solid Sheet			
			Up to 8		Over 8 Up to 12		Over 12 Up to 15						
Over 5 Up to 10	4	3.5	Horiz. Spacing	6.0	2 in	Horiz. Spacing	6.0	2 in	Horiz. Spacing	6.0	3 in	2 ft.	3 ft.
			Cylinder Diameter	2 in	Note(2)	Cylinder Diameter	2 in	Note(2)	Cylinder Diameter	3 in			
			Horiz. Spacing	6.5	2 in	Horiz. Spacing	6.5	Note(2)	Horiz. Spacing	6.5	3 in		
Over 10 Up to 15	4	7.0	Horiz. Spacing	10.0	3 in	Horiz. Spacing	10.0	3 in	Horiz. Spacing	10.0	3 in	3x12	—
			Cylinder Diameter	2 in	Note(2)	Cylinder Diameter	2 in	Note(2)	Cylinder Diameter	3 in			
			Horiz. Spacing	4.0	2 in	Horiz. Spacing	4.0	Note(2)	Horiz. Spacing	4.0	3 in		
Over 15 Up to 20	4	14.0	Horiz. Spacing	8.0	3 in	Horiz. Spacing	8.0	3 in	Horiz. Spacing	8.0	3 in	3x12	—
			Cylinder Diameter	2 in	Note(2)	Cylinder Diameter	2 in	Note(2)	Cylinder Diameter	3 in			
			Horiz. Spacing	3.5	3 in	Horiz. Spacing	3.5	Note(2)	Horiz. Spacing	3.5	3 in		
Over 20	4	14.0	Horiz. Spacing	6.0	3 in	Horiz. Spacing	6.0	3 in	Horiz. Spacing	6.0	3 in	3x12	—
			Cylinder Diameter	3 in	Note(2)	Cylinder Diameter	3 in	Note(2)	Cylinder Diameter	3 in			
			Horiz. Spacing	5.0	3 in	Horiz. Spacing	5.0	Note(2)	Horiz. Spacing	5.0	3 in		

Note(1)  
Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)  
Notes (1): See Appendix D, Item (g)(1)  
Notes (2): See Appendix D, Item (g)(2)  
\* Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

APPENDIX E TO SUBPART P—ALTERNATIVES TO TIMBER SHORING

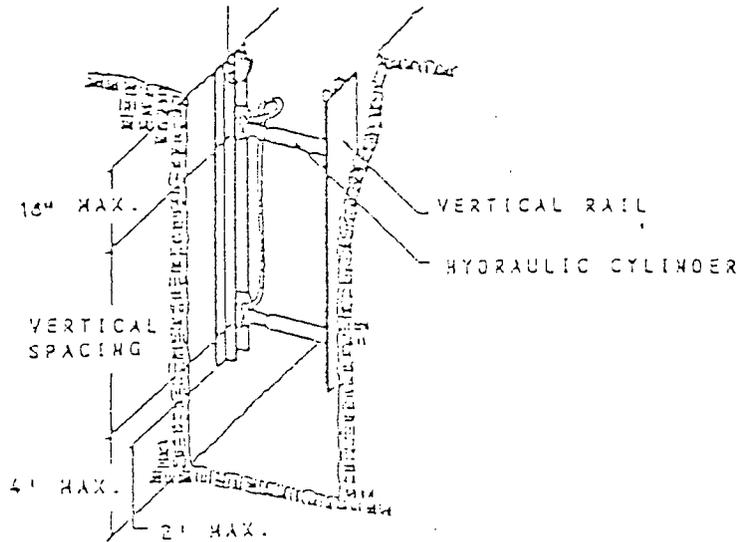


Figure 1. Aluminum Hydraulic Shoring

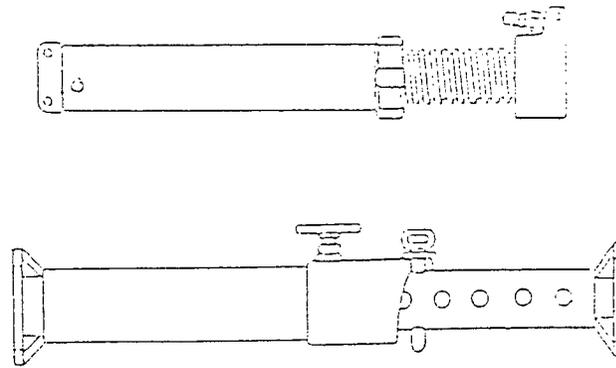


Figure 2. Pneumatic/hydraulic Shoring

Over 20  
 Note 1  
 Positions, tables, and special notes on hydraulic shoring are found in Appendix D, Item (g)  
 Notes (1) See Appendix D, Item (8)(1)  
 Notes (2) See Appendix D, Item (8)(2)  
 \* Consult product manufacturer and/or qualified engineer for Section M status of available walls.

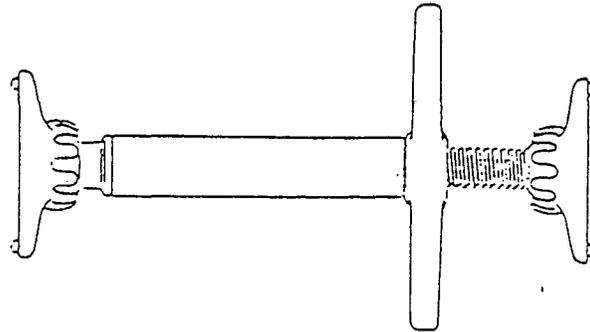


Figure 3. Trench Jacks (Screw Jacks)

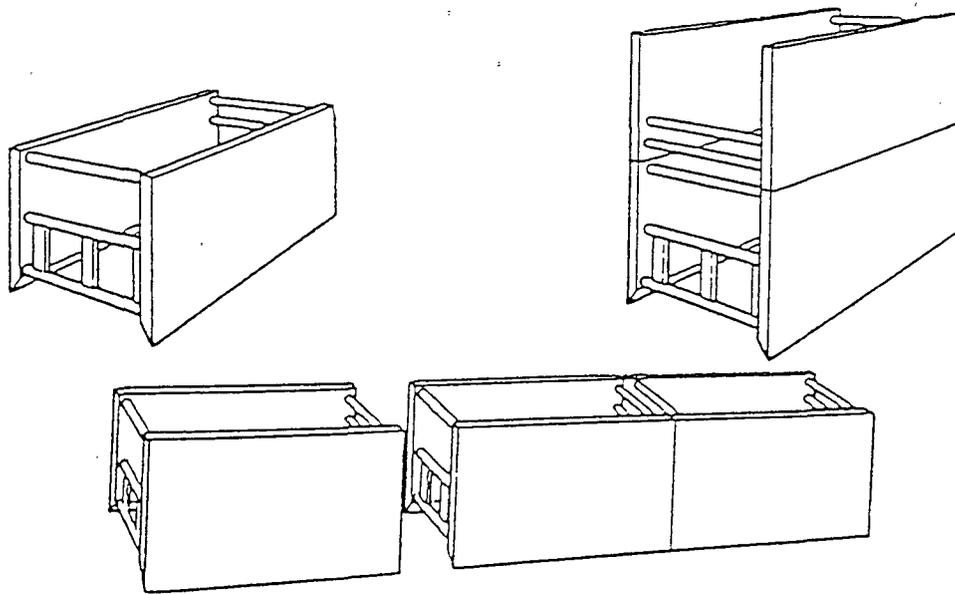


Figure 4. Trench Shields

Appendix F to § 1926 Subpart P  
Selection of Protective Equipment  
The following figures are  
many of the requirements of

Is there potential  
for cave-in?

Slopes  
select

Go to Figure

Appendix F to § 1926 Subpart P—  
Selection of Protective Systems

The following figures are a graphic summary of the requirements contained in sub-

part P for excavations 20 feet or less in depth. Protective systems for use in excavations more than 20 feet in depth must be

designed by a registered professional engineer in accordance with § 1926.652(b) and (c).

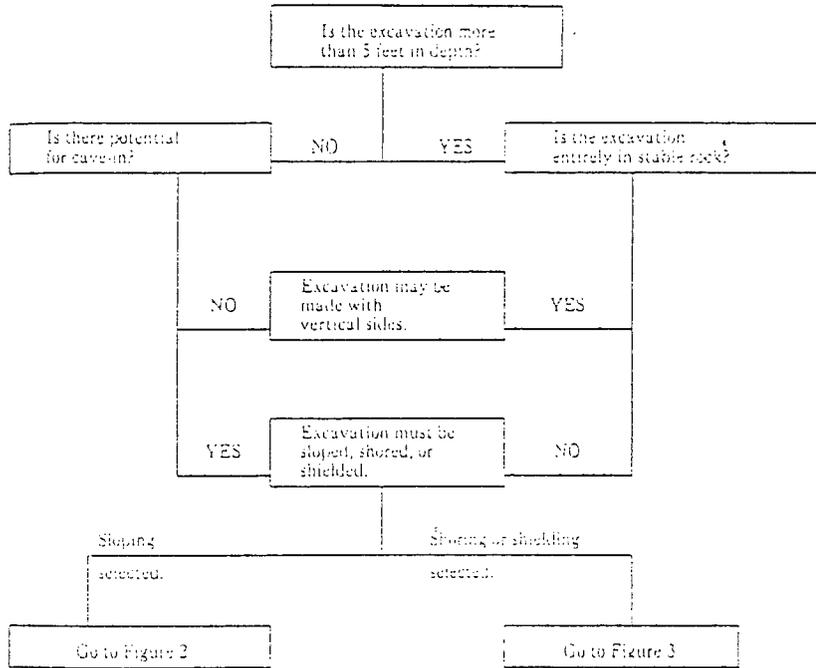


FIGURE 1—PRELIMINARY DECISIONS

Construction Standards

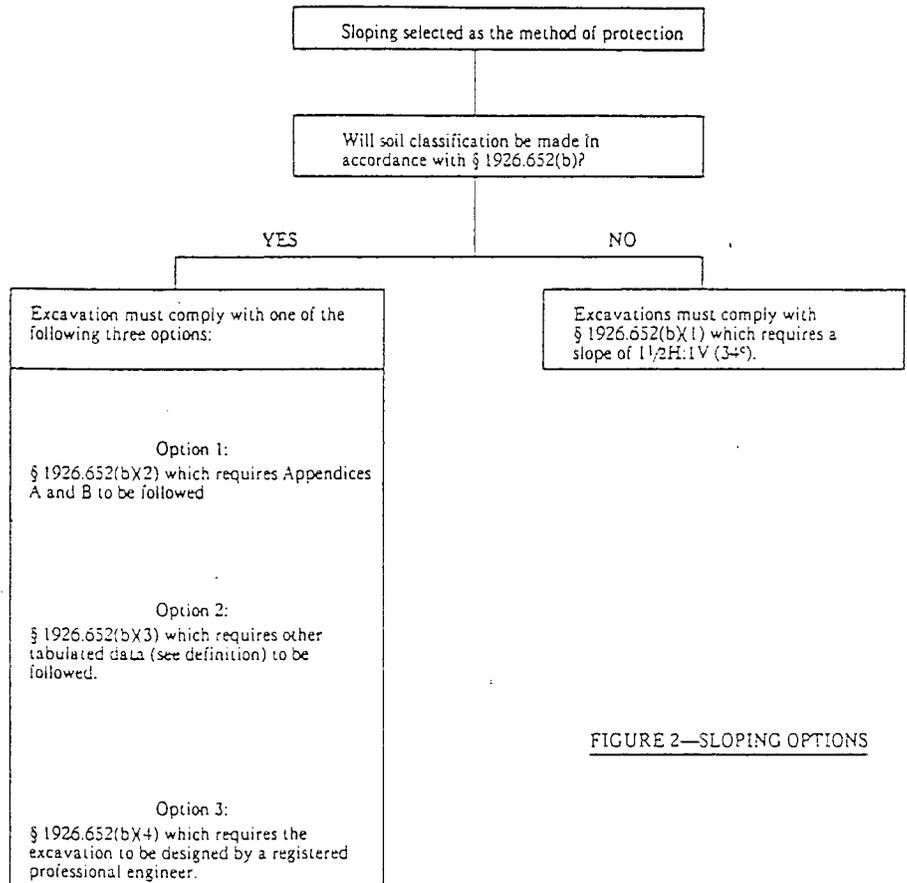


FIGURE 2—SLOPING OPTIONS

Shoring or shielcing selected as the method of protection.

Soil classification is required when shoring or shielcing is used. The excavation must comply with one of the following four options:

Option 1  
§ 1926.652(c)(1) which requires Appendices A and C to be followed (e.g. timber shoring).

Option 2  
§ 1926.652(c)(2) which requires manufacturers data to be followed (e.g. hydraulic shoring, trench jacks, air shores, shields).

Option 3  
§ 1926.652(c)(3) which requires tabulated data (see definition) to be followed (e.g. any system as per the tabulated data).

Option 4  
§ 1926.652(c)(4) which requires the excavation to be designed by a registered professional engineer (in any designed system).

Figure No. 3—Shoring and Shielcing Options

**APPENDIX B**  
**RESPIRATOR FIT TESTING**

# RESPIRATOR FIT TEST FORM

This form is used to document the results of a respirator fit test. The wearer must first read the attached pages, which are a copy of the OSHA Qualitative and Quantitative Fit Testing Procedures [Appendix E to 29 CFR 1910.1028 (Ch. XVII, 7-1-91 Edition, pp. 213-219)]. The guidelines listed below should be followed for the Irritant Smoke and Banana Oil fit testing methods. Use the bottom section of this form to document the respirator fit test results. Give this completed form to the INTERA corporate Health and Safety Officer for placement in your file.

## Irritant Smoke

1. The wearer must don a respirator equipped with HEPA (high efficiency) filters.
2. The wearer must close eyes tightly.
3. The tester must bread the ends of the smoke tube and insert one end of the tube into a squeeze bulb.
4. Squeeze the bulb to create a cloud of smoke near the wearer's face. The wearer should perform the exercises listed below for 60 seconds each. If the wearer coughs, sneezes; or complains of irritation, try repositioning the facepiece and headband to eliminate the leak.
5. If, in two attempts, the wearer has not stopped the leak, the test has failed and the wearer must try another size.

## Banana Oil

1. The wearer must don a respirator equipped with organic vapor cartridges.
2. The tester must crush the ampoule between thumb and forefinger.
3. Hold ampoule approximately 1 to 2 inches from the wearer's face. Pass ampoule around the face seal area and exhalation valve. The wearer should perform the exercises listed below for 60 seconds each.
4. Leakage will be noted by a 'banana-like' odor in the facepiece.
5. If, in two attempts, the wearer has not stopped the leak, the test has failed and the wearer must try another size.

## FIT TEST RESULTS

Employee (wearer): \_\_\_\_\_

Company: \_\_\_\_\_

Fit Test Method: Irritant Smoke \_\_\_\_\_ Banana Oil \_\_\_\_\_ Other \_\_\_\_\_

Respirator: Manufacturer & Model No. \_\_\_\_\_ Size \_\_\_\_\_

Positive Pressure Test: \_\_\_\_\_ Negative Pressure Test: \_\_\_\_\_

Move Head Up & Down: \_\_\_\_\_ Move Head Side to Side: \_\_\_\_\_ Normal Breath: \_\_\_\_\_

Bend At Waist: \_\_\_\_\_ Deep Breath: \_\_\_\_\_ Talk: \_\_\_\_\_ Grimace: \_\_\_\_\_

Fit Test Results: Pass \_\_\_\_\_ Fail \_\_\_\_\_

Comments: \_\_\_\_\_

Employee's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Tester's Printed Name & Signature: \_\_\_\_\_ Date: \_\_\_\_\_

If other fit test method is used, describe method including testing substance and cartridges/filters used on the back of this form.  
The Employee's signature states that the attached two pages have been read and the above tests have been completed.

## 8.1. Detection limit—Bulk Samples

The detection limit for the analytical procedure for bulk samples is 0.88 µg, with a coefficient of variation of 0.019 at this level. This amount provided a chromatographic peak that could be identifiable in the presence of possible interferences. The detection limit data were obtained by making 10 µL injections of a 0.10% by volume standard.

Injection	Area Count	
1	45386	
2	44214	
3	43822	$\bar{x} = 44042$
4	44062	$SD = 52.5$
6	42724	$CV = 0.019$

## 8.2. Pooled coefficient of variation—Bulk Samples

The pooled coefficient of variation for analytical procedure was determined by 50 µL replicate injections of analytical standards. The standards were 0.01, 0.02, 0.04, 0.10, 1.0, and 2.0% benzene by volume.

AREA COUNT (PERCENT)

Injection No.	0.01	0.02	0.04	0.10	1.0	2.0
1	45386	84737	166097	448497	4395340	9339150
2	44214	84000	170632	441299	4590800	9484900
3	43822	83825	164160	443719	4582000	9557580
4	44062	84381	164445	444542	4642250	9677060
5	44006	83012	165298	442584	4646450	9768240
6	42724	81957	173002	443975	4646260	
7	44040.1	83703.6	167372	444149	4565767	9564986
8	832.5	1042.2	2569.3	2459.1	96839.3	168233
9	0.0194	0.0125	0.0213	0.0055	0.0211	0.0174
10	0.017					

## APPENDIX E to § 1910.1028—QUALITATIVE AND QUANTITATIVE FIT TESTING PROCEDURES

## I. Fit Test Protocols

A. The employer shall include the following provisions in the fit test procedure. These provisions apply to both qualitative fit testing (QLFT) and quantitative fit testing (QNFT).

1. The test subject shall be allowed to pick the most comfortable respirator from a selection including respirators of various sizes from different manufacturers. The selection shall include at least three sizes of elastomeric facepieces of the type of respirator that is to be tested, i.e., three sizes of half mask or three sizes of full facepiece; and sizes from at least two manufacturers.

2. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine a comfortable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning the respirator. This instruction may not constitute the subject's formal training on respirator use, as it is only a review.

3. The test subject shall be informed that he/she is being asked to select the respirator which provides the most comfortable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

4. The test subject shall be instructed to hold each facepiece up to the face and eliminate those which obviously do not give a comfortable fit.

5. The more comfortable facepieces are noted; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in item 6 below. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

6. Assessment of comfort shall include reviewing the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

- Position of the mask on the nose.
- Room for eye protection.
- Room to talk.
- Position of mask on face and cheeks.

7. The following criteria shall be used to help determine the adequacy of the respirator fit:

- Chin properly placed;
- Adequate strap tension, not overly tightened;
- Fit across nose bridge;
- Respirator of proper size to span distance from nose to chin;
- Tendency of respirator to slip;

(f) Self-observation in mirror to evaluate fit and respirator position.

8. The test subject shall conduct the negative and positive pressure fit checks as described below or ANSI Z88.2-1980. Before conducting the negative or positive pressure test, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the fit check tests.

(a) Positive pressure test. Close off the exhalation valve and exhale gently onto the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

(b) Negative pressure test. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s). Inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

9. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard, growth, beard, or long sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

10. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respiratory disease or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

11. The test subject shall be given the opportunity to wear the successfully fitted respirator for a period of two weeks. If at any time during this period the respirator becomes uncomfortable, the test subject shall be given the opportunity to select a different facepiece and to be retested.

12. The employer shall certify that a successful fit test has been administered to the employee. The certification shall include the following information:

- (a) Name of employee;
- (b) Type, brand and size of respirator; and
- (c) Date of test.

Where QNFT is used, the fit factor, strip chart, or other recording of the results of the test, shall be retained with the certification. The certification shall be maintained until the next fit test is administered.

13. Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

14. Test Exercises. The test subject shall perform exercises in the test environment in the manner described below:

(a) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.

(b) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as to not hyperventilate.

(c) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

(d) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

(e) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

(f) Grimace. The test subject shall grimace by smiling or frowning.

(g) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT units which prohibit bending at the waist.

(h) Normal breathing. Same as exercise 1. Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds.

The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become uncomfortable, another model of respirator shall be tried.

B. Qualitative Fit Test (QLFT) Protocols

1. General

(a) The employer shall assign specific individuals who shall assume full responsibility for implementing the respirator qualitative fit test program.

(b) The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid

see attached

11. At the beginning of each exercise, the aerosol concentration shall be replenished using one-half the number of squeezes as initially described in C9.

12. The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected.

13. If the saccharin is detected the fit is deemed unsatisfactory and a different respirator shall be tried.

14. At least two facepieces shall be selected by the saccharin solution aerosol test protocol. The test subject shall be given the opportunity to wear them for one week to choose the one which is more comfortable to wear.

15. Successful completion of the test protocol shall allow the use of the half mask tested respirator in contaminated atmospheres up to 10 times the PEL of asbestos. In other words this protocol may be used to assign protection factors no higher than ten.

16. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

17. If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator, such as powered air-purifying respirator, supplied air respirator, or self-contained breathing apparatus.

18. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respiratory diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

19. Qualitative fit testing shall be repeated at least every six months.

20. In addition, because the sealing of the respirator may be affected, qualitative fit testing shall be repeated immediately when the test subject has:

- (1) Weight change of 20 pounds or more.
- (2) Significant facial scarring in the area of the facepiece seal.
- (3) Significant dental changes, i.e., multiple extractions without prothesis, or acquiring dentures.
- (4) Reconstructive or cosmetic surgery.
- (5) Any other condition that may interfere with facepiece sealing.

#### D. Recordkeeping

A summary of all test results shall be maintained in each office for 3 years. The summary shall include:

- (1) Name of test subject.
- (2) Date of testing.
- (3) Name of test conductor.
- (4) Respirators selected (indicate manufacturer, model, size and approval number).
- (5) Testing agent.

#### III. Irritant Fume Protocol

##### A. Respirator selection

Respirators shall be selected as described in section IB above, except that each respirator shall be equipped with a high-efficiency cartridge.

##### B. Fit test

The test subject shall be allowed to smell a weak concentration of the irritant

smoke to familiarize the subject with the characteristic odor.

2. The test subject shall properly don the respirator selected as above, and wear it for at least 10 minutes before starting the fit test.

3. The test conductor shall review this protocol with the test subject before testing.

4. The test subject shall perform the conventional positive pressure and negative pressure fit checks (see ANSI Z89.2 1980). Failure of either check shall be cause to select an alternate respirator.

5. Break both ends of a ventilation smoke tube containing stannic arachloride, such as the MSA part #5645, or equivalent. Attach a short length of tubing to one end of the smoke tube. Attach the other end of the smoke tube to a low pressure air pump set to deliver 200 milliliters per minute.

6. Advise the test subject that the smoke can be irritating to the eyes and instruct the subject to keep the eyes closed while the test is performed.

7. The test conductor shall direct the stream of irritant smoke from the tube towards the facepiece area of the test subject. The person conducting the test shall begin with the tube at least 12 inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.

8. The test subject shall be instructed to do the following exercises while the respirator is being challenged by the smoke. Each exercise shall be performed for one minute.

i. Breathe normally.  
ii. Breathe deeply. Be certain breaths are deep and regular.

iii. Turn head all the way from one side to the other. Be certain movement is complete. Inhale on each side. Do not bump the respirator against the shoulders.

iv. Nod head up-and-down. Be certain motions are complete and made every second. Inhale when head is in the full up position (looking toward ceiling). Do not bump the respirator against the chest.

v. Talking. Talk aloud and slowly for several minutes. The following paragraph is called the Rainbow Passage. Repeating it after the test conductor (keeping eyes closed) will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

#### Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

vi. Jogging in Place.

vii. Breathe normally.

9. The test subject shall indicate to the test conductor if the irritant smoke is detected. If smoke is detected, the test conductor shall stop the test. In this case, the tested respirator is rejected and another respirator shall be selected.

10. Each test subject passing the smoke test (i.e. without detecting the smoke) shall be given a sensitivity check of smoke from the same tube to determine if the test subject reacts to the smoke. Failure to evoke a response shall void the fit test.

11. Steps B4, B9, B10 of this fit test protocol shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the test agents.

12. At least two facepieces shall be selected by the irritant fume test protocol. The test subject shall be given the opportunity to wear them for one week to choose the one which is more comfortable to wear.

13. Respirators successfully tested by the protocol may be used in contaminated atmospheres up to ten times the PEL of asbestos.

14. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

15. If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator, such as powered air-purifying respirator, supplied air respirator, or self-contained breathing apparatus.

16. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respiratory diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

17. Qualitative fit testing shall be repeated at least every six months.

18. In addition, because the sealing of the respirator may be affected, qualitative fit testing shall be repeated immediately when the test subject has a:

- (1) Weight change of 20 pounds or more.
- (2) Significant facial scarring in the area of the facepiece seal.
- (3) Significant dental changes, i.e., multiple extractions without prothesis, or acquiring dentures.
- (4) Reconstructive or cosmetic surgery, or
- (5) Any other condition that may interfere with facepiece sealing.

#### C. Recordkeeping

A summary of all test results shall be maintained in each office for 3 years. The summary shall include:

- (1) Name of test subject.
- (2) Date of testing.
- (3) Name of test conductor.
- (4) Respirators selected (indicate manufacturer, model, size and approval number).
- (5) Testing agent.

#### Quantitative Fit Test Procedures

##### 1. General

a. The method applies to the negative-pressure nonpowered air-purifying respirators only.

b. The employer shall assign one individual who shall assume the full responsibility for implementing the respirator quantitative fit test program.

##### 2. Definition

§ 1910.1001 App. C

1. "Quantitative Fit Test" means the measurement of the effectiveness of a respirator seal in excluding the ambient atmosphere. The test is performed by dividing the measured concentration of challenge agent in a test chamber by the measured concentration of the challenge agent inside the respirator facepiece when the normal air purifying element has been replaced by an essentially perfect purifying element.

b. "Challenge Agent" means the air contaminant introduced into a test chamber so that its concentration inside and outside the respirator may be compared.

c. "Test Subject" means the person wearing the respirator for quantitative fit testing.

d. "Normal Standing Position" means standing erect and straight with arms down along the sides and looking straight ahead.

e. "Fit Factor" means the ratio of challenge agent concentration outside with respect to the inside of a respirator inlet covering facepiece or enclosure.

### 3. Apparatus

a. **Instrumentation.** Corn oil, sodium chloride or other appropriate aerosol generation, dilution, and measurement systems shall be used for quantitative fit test.

b. **Test chamber.** The test chamber shall be large enough to permit all test subjects to freely perform all required exercises without disturbing the challenge agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the challenge agent is effectively isolated from the ambient air yet uniform in concentration throughout the chamber.

c. When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high-efficiency particulate filter supplied by the same manufacturer.

d. The sampling instrument shall be selected so that a strip chart record may be made of the test showing the rise and fall of challenge agent concentration with each inspiration and expiration at fit factors of at least 2,000.

e. The combination of substitute air-purifying elements (if any), challenge agent, and challenge agent concentration in the test chamber shall be such that the test subject is not exposed in excess of PEL to the challenge agent at any time during the testing process.

f. The sampling port on the test specimen respirator shall be placed and constructed so that there is no detectable leak around the port, a free air flow is allowed into the sampling line at all times and so there is no interference with the fit or performance of the respirator.

g. The test chamber and test set-up shall permit the person administering the test to observe one test subject inside the chamber during the test.

h. The equipment generating the challenge atmosphere shall maintain the concentration of challenge agent constant within a 10 percent variation for the duration of the test.

i. The time lag (interval between an event and its being recorded on the strip chart) of the instrumentation may not exceed 2 seconds.

j. The tubing for the test chamber atmosphere and for the respirator sampling port

shall be the same diameter, length and material. It shall be kept as short as possible. The smallest diameter tubing recommended by the manufacturer shall be used.

k. The exhaust flow from the test chamber shall pass through a high-efficiency filter before release to the room.

l. When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.

### 4. Procedural Requirements

a. The fitting of half-mask respirators should be started with those having multiple sizes and a variety of interchangeable cartridges and canisters such as the MSA Cumul-H-M, North M, Survival M, A-O M, or Scott-M. Use either of the tests outlined below to assure that the facepiece is properly adjusted.

(1) **Positive pressure test.** With the exhaust port(s) blocked, the negative pressure of slight inhalation should remain constant for several seconds.

(2) **Negative pressure test.** With the intake port(s) blocked, the negative pressure slight inhalation should remain constant for several seconds.

b. After a facepiece is adjusted, the test subject shall wear the facepiece for at least 5 minutes before conducting a qualitative test by using either of the methods described below and using the exercise regime described in 5.a, b, c, d, and e.

(1) **Isoamyl acetate test.** When using organic vapor cartridges, the test subject who can smell the odor should be unable to detect the odor of isoamyl acetate squirited into the air near the most vulnerable portions of the facepiece seal. In a location which is separated from the test area, the test subject shall be instructed to close her/his eyes during the test period. A combination cartridge or canister with organic vapor and high-efficiency filters shall be used when available for the particular mask being tested. The test subject shall be given an opportunity to smell the odor of isoamyl acetate before the test is conducted.

(2) **Irritant fume test.** When using high-efficiency filters, the test subject should be unable to detect the odor of irritant fume (stannic chloride or titanium tetrachloride ventilation smoke tubes) squirited into the air near the most vulnerable portions of the facepiece seal. The test subject shall be instructed to close her/his eyes during the test period.

c. The test subject may enter the quantitative testing chamber only if she or he has obtained a satisfactory fit as stated in 4.b. of this Appendix.

d. Before the subject enters the test chamber, a reasonably stable challenge agent concentration shall be measured in the test chamber.

e. Immediately after the subject enters the test chamber, the challenge agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed 5 percent for a half-mask and 1 percent for a full facepiece.

f. A stable challenge agent concentration shall be obtained prior to the actual start of testing.

(1) Respirator restraining straps may not be overtightened for testing. The straps shall be adjusted by the wearer to give a reasonably comfortable fit typical of normal use.

5. **Exercise Regime.** Prior to entering the test chamber, the test subject shall be given complete instructions as to her/his part in the test procedure. The test subject shall perform the following exercises, in the order given, for each independent test.

a. **Normal Breathing (NB).** In the normal standing position, without talking, the subject shall breathe normally for at least one minute.

b. **Deep Breathing (DB).** In the normal standing position the subject shall do deep breathing for at least one minute passing so as not to hyperventilate.

c. **Turning head side to side (SS).** Standing in place the subject shall slowly turn his/her head from side between the extreme positions to each side. The head shall be held at each extreme position for at least 5 seconds. Perform for at least three complete cycles.

d. **Moving head up and down (UD).** Standing in place, the subject shall slowly move his/her head up and down between the extreme position straight up and the extreme position straight down. The head shall be held at each extreme position for at least 5 seconds. Perform for at least three complete cycles.

e. **Reading (R).** The test subject (keeping eyes closed) shall repeat after the test conductor the "rainbow passage" at the end of this section. The subject shall talk slowly and aloud so as to be heard clearly by the test conductor or monitor.

f. **Grimace (G).** The test subject shall grimace, smile, frown, and generally contort the face using the facial muscles. Continue for at least 15 seconds.

g. **Bend over and touch toes (B).** The test subject shall bend at the waist and touch toes and return to upright position. Repeat for at least 30 seconds.

h. **Jogging in place (J).** The test subject shall perform jog in place for at least 30 seconds.

i. **Normal Breathing (NB).** Same as in 5.a.

j. **Rainbow Passage (RP).**

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These are the steps of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

6. The test shall be terminated whenever any single peak penetration exceeds 5 percent for half-masks and 1 percent for full facepieces. The test subject may be refitted and retested. If two of the three required tests are terminated, the fit shall be deemed inadequate.

### 7. Calculation of Fit Factors

a. The fit factor determined by the quantitative fit test equals the average concentration inside the respirator.

b. The average test chamber concentration is the arithmetic average of the test chamber concentration at the beginning and of the end of the test.

c. The average peak concentration of the challenge agent inside the respirator shall be the arithmetic average peak concentration

**APPENDIX C**  
**Material Safety Data Sheets**  
**MSDSs**



Compliance Today and Beyond

First Aid Measures  
Personal Protection  
Handling/Storage

Fire Fighting Measures  
Physical-Chemical Properties  
Chemical Ingredients

Manufacturer/Responsible Party  
Accidental Release Measures  
HAZCOM Label

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### Product Identification

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**Product ID: DIESEL FUEL**

MSDS Date: 12/12/1993 Tech Review: 12/25/1994

FSC: 9140 NIIN: 00-000-0185 LIIN: MSDS Number: 154825

Submitter: D DG

Status Cd: C

MFN: 01

Article: N

Kit Part: N

---

### Manufacturer-Responsible Party

---

**Company Name: MOBIL OIL CORP**

**Address: 3225 GALLONS ROAD**

**Box: N/K**

**City: FAIRFAX State: VA ZIP: 22037-0001 Country: US**

**Info Phone Num: 800-662-4525/800-227-0707 X3265**

**Emergency Phone Num: 609-737-4411/CHEMTREC 800-424-9300**

**Resp. Party Other MSDS Num.:**

**Preparer's Name: N/P**

**Chemtrec Ind/Phone:**

**Proprietary Ind: N**

**Review Ind: Y**

**Published: Y**

**CAGE: 3U728**

**Special Project Cd: N**

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### Contractor Identification

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**Company Name: MOBIL OIL CORP**

**Address: 3225 GALLOWS ROAD**

**Box:**

**City: FAIRFAX State: VA ZIP: 22037 Country: US**

**Phone: 800-662-4525**

**Contract Num:**

**CAGE: 3U728**

**Item Description Information**

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**Item Name:** USED TO BE 26648  
**Item Manager:** NK  
**Specification Num:** NK  
**Type/Grade/Class:** NK  
**Unit of Issue:** GL **Quantitative Expression:** NK  
**UI Container Qty:** NK  
**Type of Container:**

---

**CHEMICAL INGREDIENTS**

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**Ingred Name:** NO. 2 DIESEL FUEL  
**CAS:** 68334-30-5 **Cd:** M  
**RTECS #:** HZ1800000 **Cd:** M  
**= Wt:** Cd:  
**= Vol:** Cd:  
**> Wt:** Cd:  
**>Vol:** Cd:  
**< Wt:** Cd:  
**<Vol:** Cd:  
**% Low Wt:** Cd:  
**% High Wt:** Cd:  
**% Low Vol:** Cd:  
**% High Vol:** Cd:  
**% Text:** 100  
**Environmental Wt:**  
**Other REC Limits:** NONE RECOMMENDED  
**OSHA PEL:** NOT ESTABLISHED **Cd:** M  
**OSHA STEL:** Cd:  
**ACGIH TLV:** NOT ESTABLISHED **Cd:** M  
**ACGIH STEL:** N/P **Cd:**  
**EPA Rpt Qty:**  
**DOT Rpt Qty:**  
**Ozone Depleting Chemical:** N

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**Hazards Identification**

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**LD50 LC50 Mixture :** ORAL LD50 (RAT) IS >2000 MG/KG  
**Route of Entry Inds -**  
**Inhalation:** YES  
**Skin:** YES  
**Ingestion:** YES  
**Carcinogenicity Inds -**  
**NTP:** NO  
**IARC:** NO  
**OSHA:** NO  
**Health Hazards Acute and Chronic**

PRODUCT IS MILDLY IRRITATING TO BODY TISSUES. BREATHING VAPORS MAY PRODUCE CENTRAL NERVOUS SYSTEM DEPRESSION, AND PROLONGED AND/OR REPEATED SKIN CONTACT MAY CAUSE DERMATITIS.

**Explanation of Carcinogenicity**

THE COMPONENTS OF THIS PRODUCT HAVE NOT SHOWN ANY EVIDENCE OF BEING CARCINOGENIC.

**Signs and Symptoms of Overexposure**

EYE:IRRITATION, SKIN:MILD IRRITATION,POSSIBLE DERMATITIS WITH PROLONGED/REPEATED CONTACT. INHALED:RESPIRATORY IRRITATION, NAUSEA, DIZZINESS, HEADACHE. ASPIRATION OF LIQUID INTO LUNGS MAY CAUSE CHEMICAL PNEUMONIA. INGESTED:G/I IRRITATION, NAUSEA, VOMITIN.

**Medical Cond Aggravated by Exposure**

NONE SPECIFIED BY MANUFACTURER.

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**First Aid Measures**

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**First Aid**

EYE:FLUSH W/WATER 15 MIN, HOLD LIDS OPEN. SKIN:WASH WITH SOAP & WATER. REMOVE CONTAMINATED CLOTHING AND LAUNDRER BEFORE REUSE. INHALED:REMOVE TO FRESH AIR. RESTORE BREATHING IF NECESSARY. INGESTED:DO NOT INDUCE VOMITING. GIVE 11 TO 2 OF WA TER AND GET IMEDIATE MEDICAL CARE. GIVE NOTHING BY MOUTH IF UNCONSCIOUS. IF IRRITATION PERSISTS OR IS SEVERE,SEE A DOCTOR.

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**Accidental Release Measures**

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**Spill Release Procedures**

ELIMINATE SOURCES OF IGNITION. MINOR: ABSORB MATERIAL WITH CLAY, VERMICULITE, OR SIMILAR ABSORBENT MATERIAL. PLACE IN DISPOSAL CONTAINERS. MAJOR: DIKE & CONTAIN SPILL. SHUT OFF LEAKS. RECOVER LIQUID FOR RECLAIM. ABSORB REMAINDDER FOR DISPOSAL.

**Neutralizing Agent**

NOT APPLICABLE

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**Disposal Considerations**

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**Waste Disposal Methods**

DISPOSE I/A/W ALL FEDERAL, STATE AND LOCAL REGULATIONS. MANUFACTURER SUGGESTS THAT DISPOSAL MAY BE DONE BY INCINERATION.

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**Handling and Storage**

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**Handling and Storage Precautions**

STORE IN FLAMMABLE/COMBUSTIBLE LIQUIDS AREA. KEEP CONTAINERS CLOSED WHEN NOT IN USE.

**Other Precautions**

'EMPTY' CONTAINERS MAY CONTAIN RESIDUE OR VAPOR. TREATTHEM WITH THE RESPECT DUE FULL ONES. DO NOT CUT,WELD,ETC. ON THEM. GROUNDCONTAINERS

BEFORE TRANSFERRING LIQUID. AVOID HAVING OPEN ELECTRICAL EQUIPMENT IN VAPOR AREAS.

---

### Fire Fighting Measures

---

**Flash Point Method:** PMCC

**Flash Point:** Flash Point Text: >125F,>52C

**Autoignition Temp:** Autoignition Temp Text: N/A

**Lower Limits:** 0.6

**Upper Limits:** 7.0

**Extinguishing Media**

USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.

**Fire Fighting Procedures**

WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A FULL FACED SELF CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY. PREVENT RUNOFF.

**Unusual Fire/Explosion Hazard**

COMBUSTION OR HEAT OF FIRE MAY PRODUCE HAZARDOUS DECOMPOSITION PRODUCTS AND VAPORS. USE SCBA GEAR.

---

### Personal Protection

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**Respiratory Protection**

RESPIRATOR WILL NOT NORMALLY BE NECESSARY. USE NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR OR RESPIRATOR FOR ORGANIC VAPOR IF EXPOSURE IS ABOVE THE TLV/PEL. SEE 29 CFR 1910.134 FOR REGULATIONS PERTAINING TO RESPIRATOR USE.

**Ventilation**

USE EXPLOSION PROOF LOCAL AND MECHANICAL EXHAUST TO MAINTAIN EXPOSURES BELOW PEL/TLV.

**Protective Gloves**

NEOPRENE, OR OTHER IMPERVIOUS

**Eye Protection**

USE CHEMICAL SAFETY GOGGLES & FACESHIELD

**Other Protective Equipment**

## AMERADA HESS -- REGULAR UNLEADED GASOLINE

## MATERIAL SAFETY DATA SHEET

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NSN: 913000N023616

Manufacturer's CAGE: 4N717

Part No. Indicator: A

Part Number/Trade Name: REGULAR UNLEADED GASOLINE

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General Information

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Company's Name: AMERADA HESS CORP

Company's Street: 1 HESS PLAZA

Company's City: WOODBRIDGE

Company's State: NJ

Company's Country: US

Company's Zip Code: 07095

Company's Emerg Ph #: 800-424-9300(CHEMTREC)

Company's Info Ph #: 201-750-6000

Record No. For Safety Entry: 001

Tot Safety Entries This Stk#: 001

Status: SMJ

Date MSDS Prepared: 13JAN89

Safety Data Review Date: 08JAN92

MSDS Serial Number: BLZXH

Hazard Characteristic Code: F2

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Ingredients/Identity Information

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Proprietary: NO

Ingredient: GASOLINE

Ingredient Sequence Number: 01

Percent: 100

NIOSH (RTECS) Number: LX3300000

CAS Number: 8006-61-9

OSHA PEL: 300 PPM;500 PPM STEL

ACGIH TLV: 300 PPM;500 PPM STEL

-----

Proprietary: NO

Ingredient: TERT-AMYL METHYL ETHER (BLEND OF ING 2&3 FOR A TOTAL OF 15% OF PRODUCT)

Ingredient Sequence Number: 02

Percent: MIX

NIOSH (RTECS) Number: 1007422AM

CAS Number: 994-05-8

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: ETHER,TERT-BUTYL METHYL; (METHYL TERT-BUTYL ETHER)

Ingredient Sequence Number: 03

Percent: MIX

NIOSH (RTECS) Number: KNS525000

CAS Number: 1634-04-4

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: TOLUENE

Ingredient Sequence Number: 04

Percent: 6-<3015

NIOSH (RTECS) Number: XS5250000

CAS Number: 108-88-3

OSHA PEL: 200 PPM/150 STEL

ACGIH TLV: 50 PPM; 9293

-----

Proprietary: NO

Ingredient: XYLENE

Ingredient Sequence Number: 05

Percent: 8.5-<15

NIOSH (RTECS) Number: ZE2100000

CAS Number: 1330-20-7

OSHA PEL: 100 PPM;150 PPM STEL

ACGIH TLV: 100 PPM;150 PPM STE

-----

Proprietary: NO

Ingredient: BENZENE

Ingredient Sequence Number: 06

Percent: 0.1-<5

NIOSH (RTECS) Number: CY1400000

CAS Number: 71-43-2

OSHA PEL: 1 PPM; 5 STEL (MFR)

ACGIH TLV: 10 PPM

-----

Proprietary: NO

Ingredient: BENZENE, ETHYL; (ETHYL BENZENE)

Ingredient Sequence Number: 07

Percent: <3

NIOSH (RTECS) Number: DA0700000

CAS Number: 100-41-4

OSHA PEL: 100 PPM;125 PPM STEL

ACGIH TLV: 100 PPM;125 PPM STEL

-----

Proprietary: NO

Ingredient: BENZENE,1,2,4-TRIMETHYL-; (1,2,4-TRIMETHYLBENZENE)

Ingredient Sequence Number: 08

NIOSH (RTECS) Number: DC3325000

CAS Number: 95-63-6

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: SUPPORT DATA:IN AIR. HEAVIER/AIR VAPOR CAN FLOW ALONG SURFACES TO DISTANT SOURCES OF IGNITION AND FLASHBACK. FLOW GASOLINE CAN BE (ING 10)

Ingredient Sequence Number: 09

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: ING 9:IGNITED BY SELF-GENERATED STATIC ELECTRICITY RUNOFF TO SEWERS MAY CREATE FIRE &/OR EXPLOSION HAZARD

Ingredient Sequence Number: 10

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: EFFECTS OF OVEREXPOSURE:WILL FATIGUE OLFACTORY SENSES. IMMEDIATELY DANGEROUS TO HEALTH/LIFE IS REPRESENTED BY 2 THOUSANDS(2000) PPM. (ING 12)

Ingredient Sequence Number: 11

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: ING 11:INGESTION/INHALATION OF LIQUID &/OR EXCESS VAPOR CANHAVE

AN ANESTHETIZING EFFECT, CAUSING VERTIGO, BLURRED VISION, VOMIT & (ING 13)

Ingredient Sequence Number: 12

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: ING 12:CYANOSIS. OVEREXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION.

Ingredient Sequence Number: 13

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: SPILL PROCEDURES :ACQUATIC LIFE. CAUTION-EVACUATE ALL NON-ESSENTIAL PERSONNEL SPILLED MATERIAL MAY CAUSE SLIPPERY CONDITION. OPEN (ING 15)

Ingredient Sequence Number: 14

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: ING 14:SPILLS MAY EMIT FLAMMABLE VAPOR APPROACH FROM UPWIND IF POSSIBLE. AVOID BREATHING EMITTED VAPOR WEAR SCBA IF REQUIRED TO PREVENT (ING 16)

Ingredient Sequence Number: 15

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: ING 15:INHAL OF VAPORS.

Ingredient Sequence Number: 16

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: WASTE DISPOSAL METHOD:FLAMMABLE, VAPORS.

Ingredient Sequence Number: 17

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: HANDLING/STORAGE PRECAUTIONS :BONDED/GROUNDED TO PREVENT POTENTIAL ACCUMULATION OF STATIC ELECTRICITY. NO SMOKING IN AREAS OF HANDLING/STORAGE (ING 19)

Ingredient Sequence Number: 18

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: ING 18:STORAGE SHOULD BE TIGHTLY CLOSED CONTAINER IN COOL/DRY/ISOLATED & WELL VENTED AREA AWAY FROM POTENTIAL SOURCES OF IGNITION.

Ingredient Sequence Number: 19

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: OTHER PRECAUTIONS :REGULAR/FREQUENT BASIS. VENTILATION MUST BE SUFFICIENT TO PREVENT ACCUMULATION OF TOXIC/FLAMMABLE CONCENTRATION OF VAPOR IN AIR. (ING 21)

Ingredient Sequence Number: 20

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----

Proprietary: NO

Ingredient: ING 20:EMPTY CONTAINER MAY CONTAIN TOXIC/FLAMMABLE COMBUSTION RESIDUE/VAPOR. DO NOT CUT/GRIND/DRILL/WELD OR REUSE CONTAINER UNLESS ADEQUATE (ING 22)

Ingredient Sequence Number: 21

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

-----  
Proprietary: NO

Ingredient: ING 21:PRECAUTIONS AGAINST THESE HAZARDS ARE TAKEN.

Ingredient Sequence Number: 22

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE  
-----

Proprietary: NO

Ingredient: HYGIENE PRACTICES: UPPWIND OF VAPOR OR MIST RELEASE, SPILL OR  
LEAK.

Ingredient Sequence Number: 23

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE  
=====

Physical/Chemical Characteristics  
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Appearance And Odor: CLEAR LIQUID W/STRONG AROMATIC HYDROCARBON ODOR. MAY  
BE DYED CHARACTERISTIC(SUPDAT)

Boiling Point: 85.0F,29.4C

Vapor Pressure (MM Hg/70 F): SUPP DATA

Vapor Density (Air=1): 3.0-4.0

Specific Gravity: 0.76

Evaporation Rate And Ref: 10-11(BUTYL ACETATE=1)

Solubility In Water: SLIGHT

Percent Volatiles By Volume: 100

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#### Fire and Explosion Hazard Data

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Flash Point: -40F,-40C

Flash Point Method: TCC

Lower Explosive Limit: 1.4%

Upper Explosive Limit: 7.4%

Extinguishing Media: ANY APPROVED EXTINGUISHING AGENT FOR CLASS B FIRES/DRY CHEM/FOAM/CO\*2 OR HALON. H\*2O IS NOT ORDINARILY EFFECTIVE HOWEVER, H\*2O FOG(SUPP DATA)

Special Fire Fighting Proc: NIOSH/MSHA APPRVD SCBA & FULL PROTECTION EQUIPMENT (FPN). AVOID INHALATION OF VAPOR. H\*2O SHOULD BE USED TO KEEP EXPOSURE CONTROL COOL. APPROACH FROM UPWIND IF POSSIBLE.

Unusual Fire And Expl Hazrds: CLASS 1A FLAMMABLE LIQUID. KEEP AWAY FROM HEAT/SOURCES OF IGNITION/OXIDIZERS. BURN MAY CAUSE EMISSION OF TOXIC PRODUCTION OF COMBUSTION.

EMPTY PRODUCT CONTROL/VESSELS MAY CONTAIN (SUPP DATA)

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#### Reactivity Data

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Stability: YES

Cond To Avoid (Stability): AVOID HANDLING OR STORING NEAR HEAT, SPARKS OR OPEN FLAME.

Materials To Avoid: OXIDIZING AGENTS. COMBUSTION OF NITRIC AND SULFURIC ACIDS.

Hazardous Decomp Products: CONTACT W/NITRIC & SULFURIC ACIDS WILL FORM

NITROCRESOLS THAT CAN DECOMPOSE VIOLENTLY.

Hazardous Poly Occur: NO

Conditions To Avoid (Poly): NOT RELEVANT.

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#### Health Hazard Data

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LD50-LC50 Mixture: LD50:ORAL(RBT)5 ML/KG

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: NO

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: ACUTE/CHRONIC:HARMFUL/FATAL IF SWALLOW/

ASPIRATED. LONG TERM EXPOS TO VAP HAS CAUSED CANCER IN SOME LAB ANIMALS. INGEST MAY CAUSE GI DISTURB. ASPIR INTO LUNGS MAY CAUSE PNEUMONIA PROLONGED CONTACT W/SKIN MAY RESULT IN DEFAT/RED/ITCH/INFLAM/CRACK & POSS SECONDARY INFECTION.

HAS LOW ORDER OF ACUTE ORAL TOXICITY IF (EFFECTS OF OVEREXPOSURE)

Carcinogenicity - NTP: YES

Carcinogenicity - IARC: YES

Carcinogenicity - OSHA: YES

Explanation Carcinogenicity: GASOLINE - IARC 2B; BENZENE, A CONSTITUENT OF

GASOLINE:OSHA REGULATED, GROUP 1 (IARC,NTP).

Signs/Symptoms Of Overexp: HEALTH HAZARD :INGESTED, BUT MINIMUM AMOUNT ASPIR DURING SUCH INGEST MAY CAUSE DEATH. HIGH PRESS SKIN INJECTIONS ARE SERIOUS MEDICAL EMERGENCY REPEATED/PROLONGED EXPOSURE TO VAPOR CONTAIN HIGH CONCENTRATION OF BENZENE MAY CAUSE ANEMIA &

OTHER BLOOD DISEASES, INCLUDING LEUKEMIA. INHALATION TO 100PPM MAY CAUSE SLIGHT DROWSINESS/HEADACHE. 100-200PPM MAY CAUSE FATIGUE/NAUSEA/ITCH & (ING 11)

Medical Conditions Aggravated By Exposure: OPEN WOUNDS, SKIN DISORDERS, CHRONIC RESPIRATORY DISEASE OR PRE-EXISTING CENTRAL NERVOUS SYSTEM DISEASE.

Emergency/First Aid Proc: INHALATION :REMOVE TO FRESH AIR, PROVIDE O\*2 THERAPY &/OR RESUSCITATION AS INDICATED. SKIN: REMOVE CONTAMINATED CLOTHING AND FLUSH WITH SOAP AND WATER. EYE: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. INGEST: RINSE MOUTH WITH WATER. KEEP CALM AND WARM. DO NOT INDUCE VOMIT! ASPIRATION OF MATERIAL INTO LUNGS MAY CAUSE CHEMICAL PNEUMONIA. CALL PHYSICIAN IMMEDIATELY

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#### Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: CONTAIN ALL SPILLS. ABSORB ALL FREE LIQUID. REMOVE ALL IGNITION SOURCES/SAFELY STOP FLOW OF SPILL. PREVENT FROM ENTER ALL BODIES OF H\*2O. COMPLY W/ALL APPLICABLE LAWS/REGS. ABSORBENT MATERIAL/PADS/SAND/EARTH MAY BE USED. CONTAMINATED H\*2O/SOIL MAY BE HAZARD TO ANIMAL/ (ING 14)

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: DISPOSE OF PRODUCT/CONTAMINATED MATERIAL AS EPA "IGNITABLE HAZARDOUS WASTE". USE ONLY APPROVED TREATMENT TRANSPORTERS & DISPOSAL SITES IN COMPLIANCE W/ALL APPLICABLE FEDERAL/STATE/LOCAL REGULATIONS MAINTAIN SURVEILLANCE OF ABSORBED MATERIAL UNTIL FINAL DISPOSAL TO OBSERVE FOR EMISSION OF VOLATILE, (ING 17)

Precautions-Handling/Storing: KEEP AWAY FROM HEAT/SPARKS/OPEN FLAME. AVOID

BREATHING VAPOR/MIST. AVOID SKIN/EYE CONTACT. KEEP CONTAINER CLOSED & PLAINLY LABELED.

TRANSFER LINES MUST BE (ING 17)

Other Precautions: USE ONLY AS MOTOR FUEL. HANDLE/TRANSPORT/STORE IN ACCORDANCE W/APPLICABLE LAWS/REGULAITONS. ELECTRICAL EQUIPMENT SHOULD BE APPROVED FOR CLASSIFIED AREA. REMOVE SOILED CLTHG/LAUNDER BEFORE RE-USE. DISCARD OIL SOAKED SHOES. WEAR FULL

LENGTH CLOTHING/LAUNDER ON (ING 18)

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#### Control Measures

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Respiratory Protection: USE NIOSH/MSHA APPROVED SCBA IN CONFINED SPACES OR WHEN EXPOSED TO HEAVY MIST.

Ventilation: LOCAL EXHAUST:GENERALLY NOT REQUIRED. MECHANICAL (GENERAL):  
EXPLOSION PROOF(APPROVED FOR CLASSIFIED AREA).

Protective Gloves: IMPERVIOUS GLOVES.

Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).

Other Protective Equipment: IMPERVIOUS CLOTHING, EYEWASH/BATH.

Work Hygienic Practices: WASH SKIN THOROUGHLY W/SOAP/H\*20 BEFORE  
EAT/DRINK/SMOKING. VENTILATION MAY BE USED TO CONTROL/REDUCE AIRBORNE  
CONCENTRATIONS STAND (ING 23)

Suppl. Safety & Health Data: VP: 275-475@68F. APPEAR/ODOR:COLOR FOR

IDENTIFICATION(CLEAR RED/BRONZE/YELLOW ARE TYPICAL). EXTINGUISHING  
MEDIA:MAY BE USED BY EXPERIENCED FIRE FIGHTER FOR INTENSITY CONTROL/TO  
COOL EXPOSED AREAS.

EXPLOSION HAZARD:EXPLOSIVE VAPOR DO NOT PRESSURIZE/CUT/HEAT/WELD/EXPOSE  
SUCH CONTROL OR VESSELS TO SOURCES OF IGNITION. VAPOR CAN READILY FORM  
EXPLOSIVE MIXTURE(ING 9)

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Transportation Data

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Trans Data Review Date: 92072

DOT PSN Code: GTN

DOT Proper Shipping Name: GASOLINE

DOT Class: 3

DOT ID Number: UN1203

DOT Pack Group: II

DOT Label: FLAMMABLE LIQUID

IMO PSN Code: HRV

IMO Proper Shipping Name: GASOLINE

IMO Regulations Page Number: 3141

IMO UN Number: 1203

IMO UN Class: 3.1

IMO Subsidiary Risk Label: -

IATA PSN Code: RMF

IATA UN ID Number: 1203

IATA Proper Shipping Name: MOTOR SPIRIT

IATA UN Class: 3

IATA Label: FLAMMABLE LIQUID

AFI PSN Code: MUC

AFI Prop. Shipping Name: GASOLINE

AFI Class: 3

AFI ID Number: UN1203

AFI Pack Group: II

AFI Basic Pac Ref: 7-7

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Disposal Data

=====

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Label Data

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Label Required: YES

Label Status: G

Common Name: REGULAR UNLEADED GASOLINE

Special Hazard Precautions: ACUTE/CHRONIC:HARMFUL/FATAL IF SWALLOW/

ASPIRATED. LONG TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN SOME LAB

ANIMALS. INGESTION MAY CAUSE GI DISTURBANCE. ASPIRATE INTO LUNGS MAY CAUSE PNEUMONIA PROLONG CONTACT W/SKIN MAY RESULT IN DEFAT/RED/ITCH/INFLAM/CRACK & POSSIBLY SECONDARY INFECTION.

HAS LOW ORDER OF ACUTE ORAL TOXICITY IF (EFFECTS OF OVEREXPOSURE) HEALTH HAZARD: INGESTED, BUT MINIMUM AMOUNT ASPIRATED DURING SUCH INGEST MAY CAUSE DEATH. HIGH PRESS SKIN INJECTIONS ARE SERIOUS MEDICAL EMERGENCOES REPEATED/PROLONGED EXPOSURE TO VAPOR CONTAINING HIGH CONCENTRATION OF BENZENE MAY CAUSE ANEMIA & OTHER BLOOD DISEASES, INCLUDING LEUKEMIA. INHALATION TO 100PPM MAY CAUSE SLIGHT DROWSINESS/HEADACHE. 100-200PPM MAY CAUSE FATIGUE/NAUSEA/ ITCH & (ING 11)

Label Name: AMERADA HESS CORP

Label Street: 1 HESS PLAZA

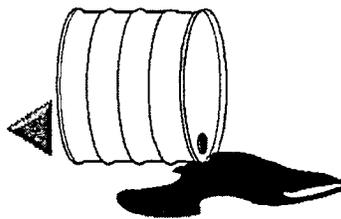
Label City: WOODBRIDGE

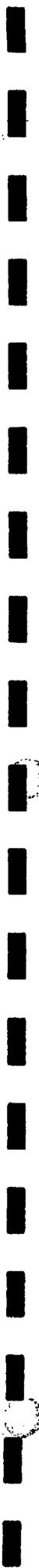
Label State: NJ

Label Zip Code: 07095

Label Country: US

Label Emergency Number: 00-424-9300(CHEMTREC)







AIR LIQUIDE

# MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

## 1. PRODUCT IDENTIFICATION

**CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE**

Containing One or More of the Following Components in a Nitrogen Balance Gas:  
Oxygen 0-23.5%; Isobutylene, 0.0005-0.9%

SYNONYMS: Not Applicable  
CHEMICAL FAMILY NAME: Not Applicable  
FORMULA: Not Applicable  
Document Number: 50054

Note: The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.

<b>PRODUCT USE:</b>	Calibration of Monitoring and Research Equipment
<b>SUPPLIER/MANUFACTURER'S NAME:</b>	AIR LIQUIDE AMERICA CORPORATION
<b>ADDRESS:</b>	821 Chesapeake Drive Cambridge, MD 21613
<b>EMERGENCY PHONE:</b>	CHEMTREC: 1-800-424-9300
<b>BUSINESS PHONE:</b>	1-410-228-6400 General MSDS Information 1-713/868-0440 Fax on Demand: 1-800/231-1366

## 2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			OTHER
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	
Oxygen	7782-44-7	0 - 23.5%	There are no specific exposure limits for Oxygen.					
Isobutylene	115-11-7	0.0005 - 0.9%	There are no specific exposure limits for Isobutylene.					
Nitrogen	7727-37-9	Balance	There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.

NOTE : All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

### 3. HAZARD IDENTIFICATION

**EMERGENCY OVERVIEW:** This product is a colorless, odorless gas. Releases of this product may produce oxygen-deficient atmospheres (especially in confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated. Isobutylene, a component of this gas mixture, may cause drowsiness and other central nervous system effects in high concentrations; however, due to its low concentration in this gas mixture, this is unlikely to occur.

**SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE:** The most significant route of over-exposure for this product is by inhalation.

**INHALATION:** Due to the small size of an individual cylinder of this product, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. The chief health hazard associated with this gas mixture is when this product contains less than 19.5% Oxygen and is released in a small, poorly-ventilated area (i.e. an enclosed or confined space). Under this circumstance, an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The effects associated with various levels of oxygen are as follows:

<u>CONCENTRATION OF OXYGEN</u>	<u>OBSERVED EFFECT</u>
12-16% Oxygen:	Breathing and pulse rate increase, muscular coordination slightly disturbed.
10-14% Oxygen:	Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen:	Nausea, vomiting, collapse, or loss of consciousness.
Below 6%:	Convulsive movements, possible respiratory collapse, and death.

**HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms.** Over-exposure to this gas mixture may cause the following health effects:

**ACUTE:** Due to the small size of the individual cylinder of this product, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. The most significant hazard associated with this gas mixture when it contains less than 19.5% oxygen is the potential for exposure to oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, ringing in ears, headaches, shortness of breath, wheezing, headache, dizziness, indigestion, nausea, unconsciousness, and death. The skin of a victim of over-exposure may have a blue color. Additionally, Isobutylene, a component of this gas mixture, may cause drowsiness or central nervous system effects in high concentrations; however, due to its low concentration in this gas mixture, this is unlikely to occur.

**CHRONIC:** There are currently no known adverse health effects associated with chronic exposure to this gas mixture.

**TARGET ORGANS:** Respiratory system.

HAZARDOUS MATERIAL INFORMATION SYSTEM			
<b>HEALTH</b>		(BLUE)	1
<b>FLAMMABILITY</b>		(RED)	0
<b>REACTIVITY</b>		(YELLOW)	0
<b>PROTECTIVE EQUIPMENT</b>			B
EYES	RESPIRATORY	HANDS	BODY
See Section 8			
For routine industrial applications			

### 4. FIRST-AID MEASURES

**RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn.**

No unusual health effects are anticipated after exposure to this product, due to the small cylinder size. If any adverse symptom develops after over-exposure to this product, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary.

## 4. FIRST-AID MEASURES (Continued)

Victim(s) who experience any adverse effect after over-exposure to this product must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

## 5. FIRE-FIGHTING MEASURES

**FLASH POINT, (method):** Not applicable.

**AUTOIGNITION TEMPERATURE:** Not applicable.

**FLAMMABLE LIMITS (in air by volume, %):**

**Lower (LEL):** Not applicable.

**Upper (UEL):** Not applicable.

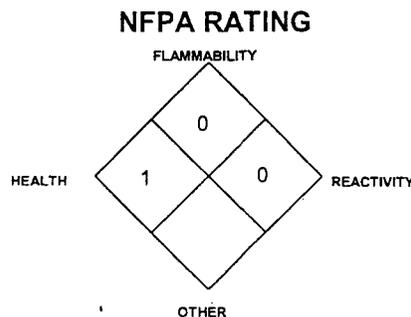
**FIRE EXTINGUISHING MATERIALS:** Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire.

**Explosion Sensitivity to Mechanical Impact:** Not sensitive.

**Explosion Sensitivity to Static Discharge:** Not sensitive.

**SPECIAL FIRE-FIGHTING PROCEDURES:** Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.



## 6. ACCIDENTAL RELEASE MEASURES

**LEAK RESPONSE:** Due to the small size and content of the cylinder, an accidental release of this product presents significantly less risk of an oxygen deficient environment and other safety hazards than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediate area. Such releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel.

Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for oxygen. Oxygen levels must be above 19.5% before non-emergency personnel are allowed to re-enter area.

If leaking incidentally from the cylinder, contact your supplier.

## 7. HANDLING and USE

**WORK PRACTICES AND HYGIENE PRACTICES:** Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly-ventilated area; exposures to fatal concentrations of this product could occur without any significant warning symptoms, due to oxygen deficiency. Do not attempt to repair, adjust, or in any other way modify cylinders containing this gas mixture. If there is a malfunction or another type of operational problem, contact nearest distributor immediately.

**STORAGE AND HANDLING PRACTICES:** Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21°C; 70°F). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage.

Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. **WARNING! Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.**

**SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: WARNING!** Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure.

**PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:** Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use product in areas where adequate ventilation is provided.

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

**VENTILATION AND ENGINEERING CONTROLS:** No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this product in well-ventilated areas. If this product is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of oxygen.

**RESPIRATORY PROTECTION:** No special respiratory protection is required under normal circumstances of use. Use supplied air respiratory protection if oxygen levels are below 19.5% or unknown during emergency response to a release of this product. If respiratory protection is required for emergency response to this product, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards.

**EYE PROTECTION:** Safety glasses.

**HAND PROTECTION:** No special protection is needed under normal circumstances of use.

**BODY PROTECTION:** No special protection is needed under normal circumstances of use.

## 9. PHYSICAL and CHEMICAL PROPERTIES

Unless otherwise specified, the following information is for Nitrogen, the main component of this gas mixture.

**GAS DENSITY @ 32°F (0°C) and 1 atm:** 0.072 lbs/ ft<sup>3</sup> (1.153 kg/m<sup>3</sup>)

**BOILING POINT:** -195.8°C (-320.4 °F)

**FREEZING/MELTING POINT @ 10 psig** -210°C (-345.8°F)

**SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C):** 0.906

**pH:** Not applicable.

**SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm:** 0.023

**MOLECULAR WEIGHT:** 28.01

**EVAPORATION RATE (nBuAc = 1):** Not applicable.

**EXPANSION RATIO:** Not applicable.

**ODOR THRESHOLD:** Not applicable.

**SPECIFIC VOLUME (ft<sup>3</sup>/lb):** 13.8

**VAPOR PRESSURE @ 70°F (21.1°C) psig:** Not applicable.

**COEFFICIENT WATER/OIL DISTRIBUTION:** Not applicable.

The following information is for this gas mixture.

**APPEARANCE AND COLOR:** This product is a colorless, odorless gas.

**HOW TO DETECT THIS SUBSTANCE (warning properties):** There are no unusual warning properties associated with a release of this product.

## 10. STABILITY and REACTIVITY

**STABILITY:** Normally stable in gaseous state.

**DECOMPOSITION PRODUCTS:** The thermal decomposition products of Isobutylene include carbon oxides. The other components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire.

**MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** Titanium will burn in Nitrogen (the main component of this product). Lithium reacts slowly with Nitrogen at ambient temperatures. A component of this product (Isobutylene) are also incompatible with strong oxidizers (i.e. chlorine, bromine pentafluoride, oxygen difluoride, and nitrogen trifluoride).

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

## 11. TOXICOLOGICAL INFORMATION

**TOXICITY DATA:** The following toxicology data are available for the components of this product:

**NITROGEN:** There are no specific toxicology data for Nitrogen. Nitrogen is a simple asphyxiant, which acts to displace oxygen in the environment.

**ISOBUTYLENE:**  
LC<sub>50</sub> (inhalation, rat) = 620,000 mg/kg/4 hours  
LC<sub>50</sub> (inhalation, mouse) = 415,000 mg/kg

## 11. TOXICOLOGICAL INFORMATION (Continued)

**SUSPECTED CANCER AGENT:** The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

**IRRITANCY OF PRODUCT:** Not applicable.

**SENSITIZATION TO THE PRODUCT:** This gas mixture is not known to cause sensitization in humans.

**REPRODUCTIVE TOXICITY INFORMATION:** Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: No mutagenicity effects have been described for this gas mixture.

Embryotoxicity: No embryotoxic effects have been described for this gas mixture.

Teratogenicity: No teratogenicity effects have been described for this gas mixture.

Reproductive Toxicity: No reproductive toxicity effects have been described for gas mixture.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Acute or chronic respiratory conditions may be aggravated by over-exposure to the components of this product.

**RECOMMENDATIONS TO PHYSICIANS:** Administer oxygen, if necessary; treat symptoms; eliminate exposure.

**BIOLOGICAL EXPOSURE INDICES (BEIs):** Currently, Biological Exposure Indices (BEIs) are not applicable for the components of this gas mixture.

## 12. ECOLOGICAL INFORMATION

**ENVIRONMENTAL STABILITY:** The components of this gas mixture occur naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to the components of this product.

**OXYGEN:** Water Solubility = 1 volume Oxygen/32 volumes water at 20°C. Log  $K_{ow}$  = -0.65

**NITROGEN:** Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0°C. 1.6 volumes Nitrogen/100 volumes water at 20°C.

**EFFECT OF MATERIAL ON PLANTS or ANIMALS:** No evidence is currently available on this product's effects on plant and animal life.

**EFFECT OF CHEMICAL ON AQUATIC LIFE:** No evidence is currently available on this product's effects on aquatic life.

## 13. DISPOSAL CONSIDERATIONS

**PREPARING WASTES FOR DISPOSAL PREPARING WASTES FOR DISPOSAL:** Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information).

## 14. TRANSPORTATION INFORMATION

**THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.**

**PROPER SHIPPING NAME:** Compressed gases, n.o.s. (Nitrogen, Oxygen)

**HAZARD CLASS NUMBER and DESCRIPTION:** 2.2 (Non-Flammable Gas)

**UN IDENTIFICATION NUMBER:** UN 1956

**PACKING GROUP:** Not applicable.

**DOT LABEL(S) REQUIRED:** Non-Flammable Gas

**NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996):** 126

**MARINE POLLUTANT:** The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

## 14. TRANSPORTATION INFORMATION (Continued)

**SPECIAL SHIPPING INFORMATION:** Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

**Note:** DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.

**TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:** THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

## 15. REGULATORY INFORMATION

**SARA REPORTING REQUIREMENTS:** This product is subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

COMPONENT	SARA 302	SARA 304	SARA 313
Oxygen	NO	NO	NO
Nitrogen	NO	NO	NO
Isobutylene	NO	NO	NO

**SARA THRESHOLD PLANNING QUANTITY:** Not applicable.

**TSCA INVENTORY STATUS:** The components of this gas mixture are listed on the TSCA Inventory.

**CERCLA REPORTABLE QUANTITY (RQ):** Not applicable.

**OTHER U.S. FEDERAL REGULATIONS:**

- No component of this product is subject to the requirements of CFR 29 1910.1000 (under the 1989 PELs).
- Isobutylene is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for this gas is 10,000 pounds.
- The regulations of the Process Safety Management of Highly Hazardous Chemicals are not applicable (29 CFR 1910.119).
- This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR Part 82).
- Nitrogen and Oxygen are not listed as Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Isobutylene is listed under this regulation in Table 3 as Regulated Substances (Flammable Substances), in quantities of 10,000 lbs (4,553 kg) or greater.

**OTHER CANADIAN REGULATIONS:** This gas mixture is categorized as a Controlled Product, Hazard Class A, as per the Controlled Product Regulations.

**STATE REGULATORY INFORMATION:** The components of this gas mixture are covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: No.  
 California - Permissible Exposure Limits for Chemical Contaminants: Nitrogen.  
 Florida - Substance List: Oxygen, Isobutylene.  
 Illinois - Toxic Substance List: No.  
 Kansas - Section 302/313 List: No.  
 Massachusetts - Substance List: Oxygen, Isobutylene.

Michigan - Critical Materials Register: No.  
 Minnesota - List of Hazardous Substances: No.  
 Missouri - Employer Information/Toxic Substance List: No.  
 New Jersey - Right to Know Hazardous Substance List: Oxygen, Nitrogen, Isobutylene.  
 North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.

Pennsylvania - Hazardous Substance List: Oxygen, Nitrogen, Isobutylene.  
 Rhode Island - Hazardous Substance List: Oxygen, Nitrogen.  
 Texas - Hazardous Substance List: No.  
 West Virginia - Hazardous Substance List: No.  
 Wisconsin - Toxic and Hazardous Substances: : No.

**CALIFORNIA PROPOSITION 65:** No component of this product is on the California Proposition 65 lists.

## 16. OTHER INFORMATION

### INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.

For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content. Air Liquide America will do this for any customer that wishes to return cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival. Scrapping cylinders involves some preparation before the metal dealer may accept them. We perform this operation as a service to valued customers who want to participate.

**MIXTURES:** When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about the handling of compressed gases can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

P-1 "Safe Handling of Compressed Gases in Containers"  
AV-1 "Safe Handling and Storage of Compressed Gases"  
"Handbook of Compressed Gases"

**PREPARED BY:** CHEMICAL SAFETY ASSOCIATES, Inc.  
9163 Chesapeake Drive, San Diego, CA 92123-1002  
619/565-0302  
Fax on Demand: 1-800/231-1366



This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Air Liquide America Corporation's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

information/emergency telephone no. 616.726.3171  
chemtrec telephone no. 800.424.9300  
canadian emergency telephone no. 613.996.6666

**MATERIAL SAFETY  
DATA SHEET**

**METHANOL**

**I. Identification**

chemical name Methanol molecular weight 32.04  
chemical family Alcohol formula CH<sub>4</sub>O  
synonyms Carbinol, Methyl Alcohol, Wood Alcohol  
DOT proper shipping name Methyl Alcohol or Methanol  
DOT hazard class Flammable Liquid  
DOT identification no. UN1230 CAS no. 67-56-1

**II. Physical and Chemical Data**

boiling point, 760mm Hg. 64.7°C freezing point -97.7°C evaporation rate (BuAc=1) ca 5  
vapor pressure at 20°C 97 mm Hg vapor density (air=1) 1.11 solubility in water @ 20°C complete  
% volatiles by volume ca 100 specific gravity (H<sub>2</sub>O=1) @ 20°C 0.792 stability Stable  
hazardous polymerization Not expected to occur.  
appearance and odor A clear, colorless liquid with a slight alcoholic odor.  
conditions to avoid Heat, sparks, open flame, open containers, and poor ventilation.

materials to avoid Strong oxidizing agents and reactive metals which will displace hydrogen.

hazardous decomposition products Incomplete combustion can generate carbon monoxide and other toxic vapors such as formaldehyde.

**III. Fire and Explosion Hazard Data**

flash point, (test method) 12°C (Tag closed cup) auto ignition temperature 385°C  
flammable limits in air % by volume: lower limit 6.7 upper limit 36.5  
unusual fire and explosion hazards May burn with an invisible flame. Mixtures with water as low as 21% by volume are still flammable (flash point below 37.8°C). Under some circumstances can corrode certain metals, including aluminum and zinc, and generate hydrogen gas.  
extinguishing media Carbon dioxide, dry chemical, alcohol foam, water mist or fog.  
special fire fighting procedures Wear full protective clothing and self-contained breathing apparatus. Heat will build pressure and may rupture closed storage containers. Keep fire-exposed containers cool with water spray.

**IV. Hazardous Components**

Methanol % ca 100 TLV 200 ppm (skin) CAS no. 67-56-1

**Burdick & Jackson's Disclaimer:** The information and recommendations presented in this Material Safety Data Sheet are based on sources believed to be reliable on the date hereof. Burdick & Jackson makes no representation on its completeness or accuracy. It is the user's responsibility to determine the product's suitability for its intended use, the product's safe use, and the product's proper disposal. No representations or warranties, either express or implied, of merchantability or fitness for a particular purpose or of any other nature are made with respect to the information provided in this Material Safety Data Sheet or to the product to which such information refers. Burdick & Jackson neither assumes nor authorizes any other person to assume for it, any other or additional liability or responsibility resulting from the use of, or reliance upon, this information.

✓

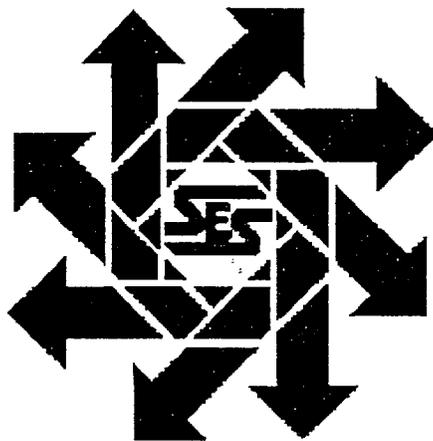
**Attachment B**

**Attachment B**  
**NORM Survey Report**

***Intera, Inc.  
Araho Facility  
Norm Survey***

***Section 1, Township 17 South, Range 36 East  
Lea County, New Mexico***

***November 4, 2003***



***prepared for:***

***Intera, Inc.  
One Park Square  
6501 Americas Parkway NE Suite 820  
Albuquerque, New Mexico 87110***

***By:***

***Safety & Environmental Solutions, Inc.  
703 E. Clinton  
Hobbs, New Mexico 88240  
(505) 397-0510***

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I. Background

Safety & Environmental Solutions, Inc. (SESI) was contracted by Intera, Inc. to perform a Naturally Occurring Radioactive Material (NORM) Survey on tanks and piping located at the Arahoe Facility. The facility is located in Section 1, Township 17 South, Range 36 East, Lea County, New Mexico. SESI is authorized by the New Mexico Environment Department (NMED) to decontaminate and survey pits, land and equipment under Radioactive Material License (RML) # NO333-02. (See Appendix A) This license requires that James R. Allen of SESI designate in writing the persons to perform decontamination and associated activities for each project. The authorized personnel for this project are as follows:

Radiation Safety Officer (RSO) (See Appendix B)	James R. Allen	Registration # 398-6N
--	----------------	-----------------------

II. Radiation Protection

All personnel involved in radiation projects wear thermoluminescent dosimeter badges while conducting any procedures that may cause contact with NORM contaminated material. The badges are sent to the supplier each quarter and analyzed for levels of radiation exposure. Each participant in the project is protected with the appropriate respiratory and eye protection equipment. Protective boots or covers, gloves, and tyvek coveralls are worn at any time while moving, handling, or transporting any NORM contaminated equipment or material.

III. Work Performed

On October 8, 2003, James R. Allen arrived on site at 8:00 A.M. and performed an external NORM survey of Tanks #1, #2, #3, #4, #5, #6, #7, and #8. The survey was conducted using a Ludlum Measurements, Inc. Model 3 Survey Meter, serial # 135453, which was last calibrated on July 26, 2003. The probe used was Ludlum Gamma Scintillation Probe Model 44-2, serial # RN 012537. The survey indicated Tank #1 to have a level of radiation of 58 uR/hr. The reading of Tank #2 indicated the level of radiation to be 24 uR/hr. The reading of Tank #3 indicated the level of radiation to be 52 uR/hr. The reading of Tank #4 indicated the level of radiation to be 18 uR/hr. The reading of Tank #5 indicated the level of radiation to be 28 uR/hr. The reading of Tank #6 indicated the level of radiation to be 46 uR/hr. The reading of Tank #7 indicated the level of radiation to be 26 uR/hr. The reading of Tank #8 indicated the level of radiation to be 30 uR/hr. (See Appendix C)

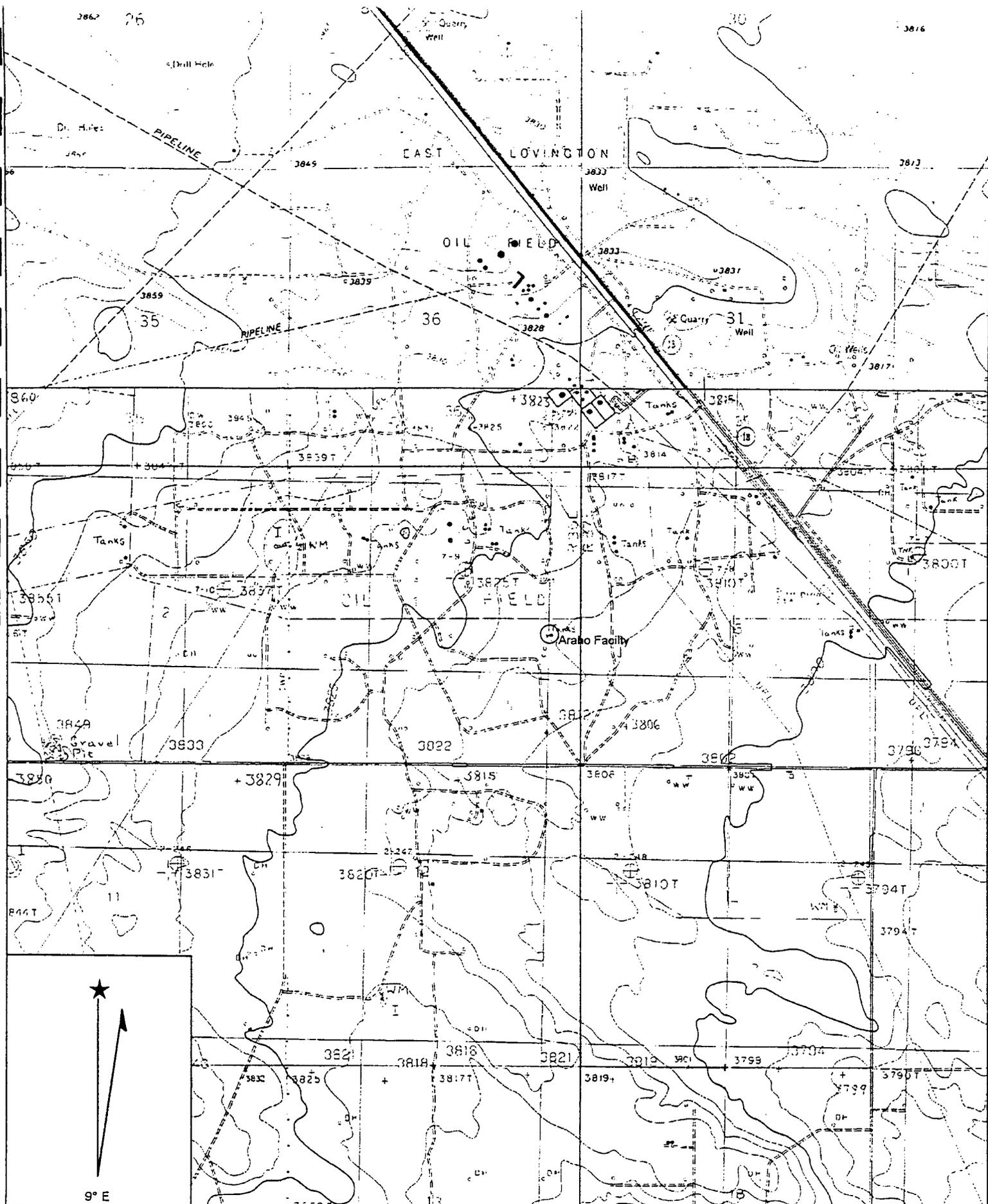
On October 22, 2003, James R. Allen arrived on site at 10:15 A.M. and performed an external NORM survey of miscellaneous metal piping, PVC piping, and scrap metal, Tank # 1, and Tank #6. The survey was conducted using a Ludlum Measurements, Inc. Model 3 Survey Meter, serial # 155994, which was last calibrated on July 26, 2003. The probe used was Ludlum Gamma Scintillation Probe Model 44-2, serial # RN 013125. The survey indicated the level of radiation of the pvc piping and scrap metal to be <20 uR/hr. The reading of Tank #6 indicated the level of radiation to be <20 uR/hr. Mr. Allen returned at the site at 5:00 P.M. and performed an external NORM survey of the disassembled Tank # 1 and Tank #3. The reading of the disassembled Tank #1 indicated the level of radiation to be <20 uR/hr. The reading of Tank #3 indicated the level of radiation to be 46 uR/hr. (See Appendix C)

On October 23, 2003 James R. Allen arrived on site at 2:00 P.M. to perform an external NORM survey of 2 - 6" PVC pipes. The readings indicated the level of radiation to be <20 uR/hr. (See Appendix C)

IV. Figures & Appendices

- Figure 1 – Vicinity Map
- Appendix A – Radioactive Material License
- Appendix B – Personnel Registration
- Appendix C – Norm Survey Data Sheets

Figure 1  
Vicinity Map



Name: LOVINGTON SE  
 Date: 11/4/2003  
 Scale: 1 inch equals 2222 feet

Location: 032° 51' 51.7" N 103° 18' 13.7" W  
 Caption: Araho Facility  
 Sec 1, T17S, R36E  
 Lea County, New Mexico

# Appendix A

## Radioactive Material License



GARY E. JOHNSON  
GOVERNOR

State of New Mexico  
**ENVIRONMENT DEPARTMENT**

Radiation Control Bureau  
1190 St. Francis Drive P.O. Box 26110  
Santa Fe, New Mexico 87502-6110  
Telephone (505) 476-3236  
Fax (505) 476-3232



PETER MAGGIORE  
SECRETARY

PAUL R. RITZMA  
DEPUTY SECRETARY



**RADIOACTIVE MATERIAL LICENSE**

Pursuant to Sections 74-3-1 through 74-3-16 NMSA 1978, and 20 NMAC 3.1, Subpart 3, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material(s) designated in this license; and to use said radioactive material(s) for the purpose(s) and at the place(s) designated herein. This license is subject to all applicable rules, regulations, and orders now or hereafter in effect, of the New Mexico Environment Department and to any conditions specified herein.

1. License Name Safety & Environmental Solutions, Inc.	2. License Number NO333-02
3a. Address 703 E. Clinton, Suite 103 Hobbs, NM 88240	3b. Actual Location of Operation 703 E. Clinton, Suite 103 Hobbs, New Mexico, 88240, and temporary job sites throughout NM not under exclusive Federal jurisdiction.
4. Telephone (505) 397-0510	5. Expiration Date January 30, 2007

Date: February 8, 2002

For the New Mexico Environment Department

William M. Floyd, Program Manager (mml)  
Radiation Control Bureau

Attachments:

- 1) Radioactive Material Specifications
- 2) Authorized Use(s) and License Conditions

NO333-02

ATTACHMENT 1 - RADIOACTIVE MATERIAL SPECIFICATIONS



LICENSE NUMBER NO333-02

6. RADIOACTIVE MATERIALS (element and mass number)	7. FORM (chemical or physical)	8. MAXIMUM QUANTITY (Licensee may possess at any one time)
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A. Any naturally occurring radioactive material as defined in the New Mexico Radiation Protection Regulations.	A. Any.	A. As needed for each job.
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END OF THIS SECTION



## ATTACHMENT 2 - AUTHORIZED USE(S) AND LICENSE CONDITIONS



LICENSE NUMBER NO333-02

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### 9. Authorized Use:

A. For decontamination of NORM contaminated pits, land and equipment and for its temporary handling and storage at temporary job sites in New Mexico under customer control.

For the purpose of this license, decontamination means the removal of media containing regulated NORM from equipment or facilities solely for the intended purpose of reducing levels of radiation to levels below regulated NORM levels in order to release equipment, materials or lands from restricted use in accordance with Subpart 14, 20 NMAC3.1.

10. The licensee shall comply with the provisions of Subparts 3, 4, and 10 of the New Mexico Radiation Protection Regulations.

11. Decontamination and associated activities shall be performed by persons designated in writing by Bob Allen, Radiation Safety Officer. Names and evidence of training of these individuals shall be kept on file for inspection by the Department.

12. Radiation workers must have successfully completed training specified in the license application. This training must be certified by the Department.

13. The Secretary of the Department or the Secretary's authorized representatives shall be allowed to enter the premises and inspect the radiation related activities at all reasonable times. Failure of the licensee to admit the Secretary or the Secretary's authorized representatives shall constitute grounds for issuance of an immediate cease and desist order.

### 14. Surveys:

14.A. Contamination surveys, appropriate to the job site, shall be performed at the temporary job site at the beginning and conclusion of every job, including the vicinity of waterways, if they exist.

14.B. The licensee shall assure by surveys that equipment and premises used in decontamination activities does not exceed 50 uR/hr. on contact at any accessible point prior to release from a customer NORM decontamination site. Soil surveys shall be conducted as outlined in Section 3.1.3 of API Bulletin E2, as outlined in the license application.

14.C. The licensee shall record survey results performed for compliance with this condition. The records shall identify the equipment items used in the decontamination process.

14.D. Survey equipment shall conform to Subpart 14, Section 1404, 20NMAC3.1.

15. A. The licensee shall provide written notification to the Department at least three (3) days prior to commencing NORM decontamination activities at customers sites. This notification shall specify the following:



## ATTACHMENT 2 - AUTHORIZED USE(S) AND LICENSE CONDITIONS



LICENSE NUMBER NO333-02

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- 15.(1). Type of operation;
  - 15.(2). Mode of decontamination;
  - 15.(3). Address and physical location of decontamination;
  - 15.(4). Dates activities are conducted;
  - 15.(5). Name of person in charge of the operation at the site.
- 15.B. If contaminated material is left in the possession of the customer, the licensee shall also submit the following information:
- 15.(1). Method of storage of contaminated material;
  - 15.(2). Site of storage (map required if street address is not available);
  - 15.(3). Location on site of material;
  - 15.(4). Storage conditions (metal shed, pallets on open ground, etc.).
16. Each container holding NORM contaminated waste must be permanently marked with an identification number traceable to records documenting the original source of the contents.
17. Transfer of NORM, NORM waste and NORM contaminated equipment shall only be to persons specifically licensed to receive such materials, or to persons generally licensed under New Mexico Radiation Protection Regulations, 20NMAC3.1.
18. All incidents shall be reported to the Department in accordance with Subpart 4, paragraph 452, New Mexico Radiation Protection Regulations.
19. Whenever equipment has contained frac sand, or other materials that could have been contaminated with radioactive tracer materials, and the surface readings exceed 50 uR/hr, including background, an analysis must be done before decontamination procedures are initiated to determine that radioactive tracer materials are not present and that only NORM materials are being removed. Copies of these analyses should become a permanent part of the facility documentation files and should direct the decontamination activities carried out by the licensee.
20. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material for Transportation Under Certain Conditions". A properly marked shipping container of the type supplied with the device shall be used whenever the device is shipped by commercial carrier.
21. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6., 7., and 8., of the license in accordance with statements, representations and procedures contained in, referenced in, or enclosed with the documents listed below. The most recent statements, representations, and procedures shall govern if they conflict with previously submitted documents:

\* Application dated November 8, 1996, and addendum dated January 1, 1997;



ATTACHMENT 2 - AUTHORIZED USE(S) AND LICENSE CONDITIONS



LICENSE NUMBER NO333-02

---

- \* Administrative amendment dated August 27, 1998, signed by William M. Floyd, Program Manager;
- \* Telefax dated February 6, 2002, signed by James R. Allen.

END OF THIS SECTION



## Appendix B Personnel Registration



# Certificate of Registration

Name	James R. Allen	Street Address	P.O. Box 1613
Organization	Safety & Environmental Solutions, Inc.	City	Hobbs
		State/Province	NM
		Zip/Postal Code	88240

Registration Number(s) **398 - 6N** Radiological Service Specialty(s) For Which Certification is Issued **398 - 6N Radiation Safety Consultant for Oil & Gas NORM** Expiration Date(s) **Oct 31, 2006**

Radiation safety services and consultation regarding naturally occurring radioactive material (NORM) in the oil and gas industries.

1) The registrant is responsible for ensuring that all personnel performing service under this registration do so under the direct supervision and oversight of the registrant, and that they possess adequate credentials to discharge their duties.

2) The provisions of this registration do not relieve the registrant from the requirements of the radioactive material license also held by the registrant (license #NO333-02).

434 - 9N Radiation Safety Training in Oil & Gas NORM Oct 31, 2006

Radiation safety training services regarding naturally occurring radioactive material (NORM) in the oil and gas industries.

1) This training includes classroom instruction together with actual hands on field training regarding radiation safety, and how to perform NORM radiation surveys.

2) The registrant is responsible for ensuring that all personnel performing service under this registration possess adequate credentials to provide proper instruction on the hazards and mitigation of radiation and contaminants created by oil and gas NORM.

3) The training shall follow a standardized format which at a minimum addresses the following topics affecting workers:

- a) The use of radiation and/or radioactive material in the work place
- b) health protection problems associated with exposure to radiation and/or radioactive material
- c) precautions or procedures to minimize exposure, and in the purposes and functions of protective devices employed;
- d) the applicable provisions of applicable regulations for the protection of personnel from exposure to radiation and/or radioactive material;
- e) the appropriate response to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to radiation and/or radioactive material; and
- f) advised as to the radiation exposure reports which workers may request pursuant to Section 1003 of the New Mexico Radiation Protection Regulations.

4) The provisions of this registration do not relieve the registrant from the requirements of the radioactive material license also held by the registrant (license #NO333-02).

In accordance with Part 2 of the New Mexico Radiation Protection Regulations (20.3.2 NMAC), the above named person or organization is registered with the New Mexico Radiation Control Bureau as having the necessary training and knowledge to provide radiological services in the specialty(s) indicated above. These services will be provided in New Mexico to both public and private concerns, and to licensees and registrants of the New Mexico Radiation Control Bureau. The registrant shall not perform services which are not specifically indicated by this certificate and its provisions, and is subject to all applicable requirements of the New Mexico Radiation Protection Regulations (20.3 NMAC). The registrant is responsible for applying for timely renewal of registration(s) as they expire individually, and shall notify this Bureau in writing before making any changes which would render the information contained in this certificate to be inaccurate. New Mexico Radiation Control Bureau, PO Box 26110, Santa Fe, New Mexico-87502-6110, phone (505)476-3236.

**POST OR FILE.**  
This certificate and its provisions must be available for inspection.

Stanley Fitch  
Radiation Control Bureau  
New Mexico Environment Department  
10/9/2002  
(Date)



# Certificate of Registration

for  
Training

Radiation Licensing & Registration Section  
NM Environment Department

(Registration does not imply approval by this agency)

Name	James R. Allen	P.O. Box	1613	434-9N					
Profession/Business	Safety & Environmental	Street Address	Hobbs, New Mexico 88240	Registration Number	10-31-2002				
		City	Hobbs	State	New Mexico	Zip Code	88240	Expiration Date	10-31-2002
		Telephone	505/397-0510	Certifying Official	<i>[Signature]</i>				

### PROVISIONS OF CERTIFICATE

THE PERSON NAMED IN THIS CERTIFICATE IS REGISTERED WITH THE NEW MEXICO RADIATION LICENSING AND REGISTRATION SECTION AS HAVING THE KNOWLEDGE AND TRAINING PERTAINING TO RADIATION PROTECTION AND SAFETY TO PROVIDE SERVICES AND CONSULTATION TO PERSONNEL PERFORMING NORM SURVEYS FOR PROPERTIES UTILIZED IN THE OIL AND GAS INDUSTRIES. THIS TRAINING INCLUDES CLASSROOM INSTRUCTION TOGETHER WITH ACTUAL HANDS-ON FIELD SURVEY TRAINING.

THE ABOVE NAMED REGISTRANT SHALL NOT PERFORM SERVICES WHICH ARE NOT SPECIFICALLY INDICATED BY THIS CERTIFICATE.

POST or FILE. Certificate must be available for inspection.

CERTIFICATE OF ATTENDANCE

This confirms that

*James R. Allen*

has successfully completed the below listed  
State of Texas recognized course:

INDUSTRIAL RADIATION SAFETY OFFICER  
TRAINING COURSE

and has fulfilled the requirements of the two-day training on

April 02 & 03, 1998

Training Coordinator

Instructor

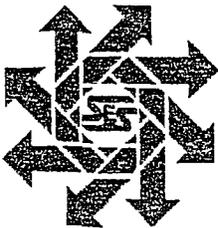


SUNTRAC Services, Inc., 1818 E. Main St., League City, TX 77573 (281) 338-2133

Rev. 2-12-96

# Appendix C

## Norm Survey Data Sheets



# Safety & Environmental Solutions, Inc.

## NORM Survey Data Sheet

Facility/Location Arahoe Disposal Date 10-8-03

Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453

( ) Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537

Battery Check: OK Source Check: OK

Calibration Date: July 26, 2003

Source Type: Cs 137 Date: 12/96 Serial Number: 4317

Background Radiation Level: 11  $\mu$ R/hr Location: 10' Inside South Fenceline

Description of Equipment/Material Surveyed: Tank # 1 - 3,000 BBL Steel Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter

Item/Material Surveyed: \_\_\_\_\_

Maximum  $\mu$ R/hr: 58  $\mu$ R/hr

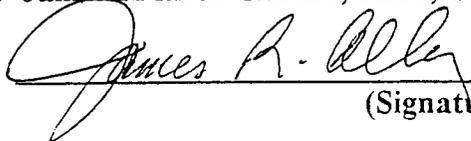
Maximum Kcpm: \_\_\_\_\_

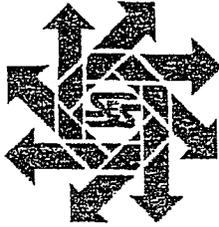
Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Survey Conducted By: James R. Allen CHMM, REM, CES

  
(Signature)



# Safety & Environmental Solutions, Inc.

## NORM Survey Data Sheet

Facility/Location Arahoe Disposal Date 10-8-03

Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453

( ) Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537

Battery Check: OK Source Check: OK

Calibration Date: July 26, 2003

Source Type: Cs 137 Date: 12/96 Serial Number: 4317

Background Radiation Level: 11  $\mu$ R/hr Location: 10' Inside South Fenceline

Description of Equipment/Material Surveyed: Tank # 2 - 210 BBL Steel Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter

Item/Material Surveyed: \_\_\_\_\_

Maximum  $\mu$ R/hr: 24  $\mu$ R/hr

Maximum Kcpm: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Survey Conducted By: James R. Allen CHMM, REM, CES

  
\_\_\_\_\_  
(Signature)



# Safety & Environmental Solutions, Inc.

## NORM Survey Data Sheet

Facility/Location Arahoe Disposal Date 10-8-03

Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453

( ) Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537

Battery Check: OK Source Check: OK

Calibration Date: July 26, 2003

Source Type: Cs 137 Date: 12/96 Serial Number: 4317

Background Radiation Level: 11  $\mu$ R/hr Location: 10' Inside South Fenceline

Description of Equipment/Material Surveyed: Tank # 3 - 750 BBL Steel Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter

Item/Material Surveyed: \_\_\_\_\_

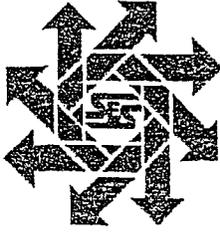
Maximum  $\mu$ R/hr: 52  $\mu$ R/hr

Maximum Kcpm: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Survey Conducted By: James R. Allen CHMM, REM, CES

  
\_\_\_\_\_  
(Signature)



# Safety & Environmental Solutions, Inc.

## NORM Survey Data Sheet

Facility/Location Arahoe Disposal Date 10-8-03

Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453

( ) Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537

Battery Check: OK Source Check: OK

Calibration Date: July 26, 2003

Source Type: Cs 137 Date: 12/96 Serial Number: 4317

Background Radiation Level: 11  $\mu$ R/hr Location: 10' Inside South Fenceline

Description of Equipment/Material Surveyed: Tank # 4 - 500 BBL Steel Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter

Item/Material Surveyed: \_\_\_\_\_

Maximum  $\mu$ R/hr: 18  $\mu$ R/hr

Maximum Kcpm: \_\_\_\_\_

Comments: \_\_\_\_\_

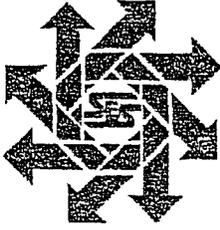
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Survey Conducted By: James R. Allen CHMM, REM, CES

(Signature)



# Safety & Environmental Solutions, Inc.

## NORM Survey Data Sheet

Facility/Location Arahoe Disposal Date 10-8-03

Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453

( ) Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537

Battery Check: OK Source Check: OK

Calibration Date: July 26, 2003

Source Type: Cs 137 Date: 12/96 Serial Number: 4317

Background Radiation Level: 11  $\mu$ R/hr Location: 10' Inside South Fenceline

Description of Equipment/Material Surveyed: Tank # 5 - 500 BBL Steel Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter

Item/Material Surveyed: \_\_\_\_\_

Maximum  $\mu$ R/hr: 28  $\mu$ R/hr

Maximum Kcpm: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Survey Conducted By: James R. Allen CHMM, REM, CES

(Signature)



# Safety & Environmental Solutions, Inc.

## NORM Survey Data Sheet

Facility/Location Arahoe Disposal Date 10-8-03

Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453

( ) Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537

Battery Check: OK Source Check: OK

Calibration Date: July 26, 2003

Source Type: Cs 137 Date: 12/96 Serial Number: 4317

Background Radiation Level: 11  $\mu$ R/hr Location: 10' Inside South Fenceline

Description of Equipment/Material Surveyed: Tank # 6 - Fiberglass Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter

Item/Material Surveyed: \_\_\_\_\_

Maximum  $\mu$ R/hr: 46  $\mu$ R/hr

Maximum Kcpm: \_\_\_\_\_

Comments: \_\_\_\_\_

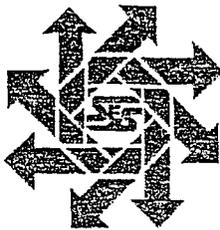
\_\_\_\_\_

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\_\_\_\_\_

Survey Conducted By: James R. Allen CHMM, REM, CES

(Signature)



# Safety & Environmental Solutions, Inc.

## NORM Survey Data Sheet

Facility/Location Arahoe Disposal Date 10-8-03

Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453

( ) Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537

Battery Check: OK Source Check: OK

Calibration Date: July 26, 2003

Source Type: Cs 137 Date: 12/96 Serial Number: 4317

Background Radiation Level: 11  $\mu$ R/hr Location: 10' Inside South Fenceline

Description of Equipment/Material Surveyed: Tank # 7 - 200 BBL Steel Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter

Item/Material Surveyed: \_\_\_\_\_

Maximum  $\mu$ R/hr: 26  $\mu$ R/hr

Maximum Kcpm: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Survey Conducted By: James R. Allen CHMM, REM, CES

(Signature)



# Safety & Environmental Solutions, Inc.

## NORM Survey Data Sheet

Facility/Location Arahoe Disposal Date 10-8-03

Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453

( ) Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537

Battery Check: OK Source Check: OK

Calibration Date: July 26, 2003

Source Type: Cs 137 Date: 12/96 Serial Number: 4317

Background Radiation Level: 11  $\mu$ R/hr Location: 10' Inside South Fenceline

Description of Equipment/Material Surveyed: Tank # 8 - 500 BBL Steel Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter

Item/Material Surveyed: \_\_\_\_\_

Maximum  $\mu$ R/hr: 30  $\mu$ R/hr

Maximum Kcpm: \_\_\_\_\_

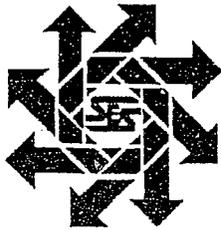
Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Survey Conducted By: James R. Allen CHMM, REM, CES

(Signature)



# Safety & Environmental Solutions, Inc.

## NORM Survey Data Sheet

Facility/Location Arahoe Disposal Date 10-22-03

Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 155994

( ) Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN013125

Battery Check: OK Source Check: OK

Calibration Date: July 26, 2003

Source Type: Cs 137 Date: 10/93 Serial Number: 2861

Background Radiation Level: 11  $\mu$ R/hr Location: 10' Inside South Fence line

Description of Equipment/Material Surveyed: Miscellaneous PVC Piping and Scrap Metal

Item/Material Surveyed: \_\_\_\_\_

Maximum  $\mu$ R/hr: <20

Maximum Kcpm: \_\_\_\_\_

Comments: \_\_\_\_\_

Survey Conducted By: James R. Allen CHMM, REM, CES

(Print Name)

(Signature)



# Safety & Environmental Solutions, Inc.

## NORM Survey Data Sheet

Facility/Location Arahoe Disposal Date 10-22-03

Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 155994

( ) Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN013125

Battery Check: OK Source Check: OK

Calibration Date: July 26, 2003

Source Type: Cs 137 Date: 10/93 Serial Number: 2861

Background Radiation Level: 11  $\mu$ R/hr Location: 10' Inside South Fence line

Description of Equipment/Material Surveyed: # 6 Fiberglass Tank

Item/Material Surveyed: \_\_\_\_\_

Maximum  $\mu$ R/hr: <20

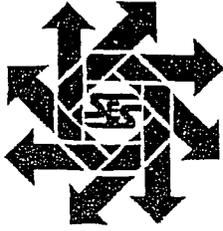
Maximum Kcpm: \_\_\_\_\_

Comments: \_\_\_\_\_

Survey Conducted By: James R. Allen CHMM, REM, CES

(Print Name)

(Signature)



# Safety & Environmental Solutions, Inc.

## NORM Survey Data Sheet

Facility/Location Arahoe Disposal Date 10-22-03

Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 155994

( ) Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN013125

Battery Check: OK Source Check: OK

Calibration Date: July 26, 2003

Source Type: Cs 137 Date: 10/93 Serial Number: 2861

Background Radiation Level: 11  $\mu$ R/hr Location: 10' Inside South Fence line

Description of Equipment/Material Surveyed: #3-750 bbl. Steel Tank

Item/Material Surveyed: \_\_\_\_\_

Maximum  $\mu$ R/hr: 46

Maximum Kcpm: \_\_\_\_\_

Comments: 5:15 P.M.

Survey Conducted By: James R. Allen CHMM, REM, CES

(Print Name)

(Signature)

Attachment C

**Attachment C**  
**Photograph Log**



*No. 1 – Tanks #7 & #8.*



*No. 2 – Tanks on site prior to starting work.*



*No. 3 – Tanks 4, 5 & 6 with above ground piping still in place.*



*No. 4 – Looking north towards tanks 7 & 8 and the lined pit.*



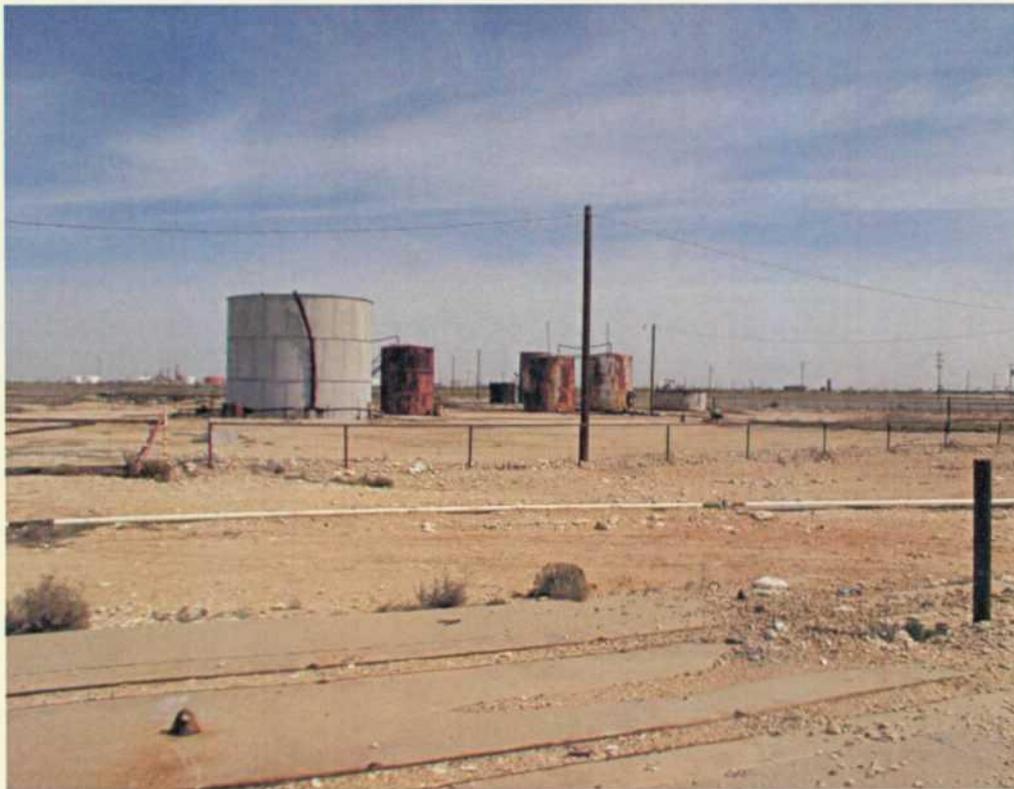
*No. 5 – The 200 bbl fiberglass tank that has overflowed onto surrounding area.*



*No. 6 – Heavily stained soil at tank #6 and pvc piping.*



*No. 7 – Stained soil areas and above ground piping.*



*No. 8 – View of site looking north prior to starting work.*



*No. 9 – Areas of staining on site.*



*No. 10 – Ground staining with traffic and piping around the site.*



*No. 11 – Hot oil and water transport truck setting up.*



*No. 12 – Piping found that leads to Navajo Refinery.*



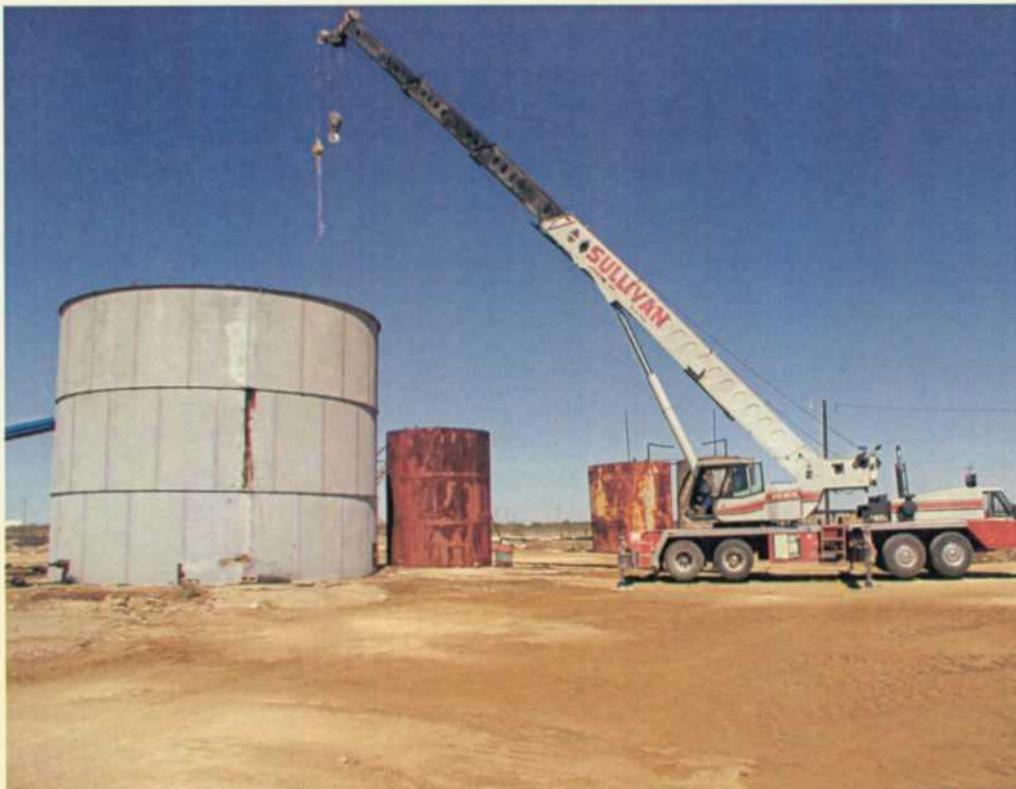
*No. 13 – Digging up lines by hand.*



*No. 14 – Using the hot oil truck to jet fluid in the fiberglass tank.*



*No. 15 – Removing trash including a bird from the valve of the 3000 bbl tank.*



*No. 16 – Crane set up to remove tank rings.*



*No. 17 – Buried piping between tanks 1 & 3 as it continues to be dug up.*



*No. 18 – The pit and plastic used for drained fluid from welded tanks.*



*No. 19 – Jetting and removal of fluid from 3000 bbl tank.*



*No. 20 – Approximately 500 bbls left in the 3000 bbl tank.*



*No. 21 – Ariel view of site and piping being removed.*



*No. 22 – Area of stockpiled piping that has been excavated.*



*No. 23 – Rings of the 3000 bbl tank being taken apart.*



*No. 24 – Mixing sand inside the 3000 bbl tank.*



*No. 25 – Mixing of the thick fluid with sand.*



*No. 26 – Using track hoe to remove walls of 3000 bbl tank.*



*No. 27 – The bigger chunks of concrete from the floor of the 3000 bbl tank.*



*No. 28 – Loading the smashed tank # 3 on flatbed trailer.*



No. 29 – The site after work was completed.



No. 30 – The site after work was completed.



**Attachment D**  
**Waste Disposal Manifests – Tank Contents - Liquid**

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone 505 476-3488

5. Transporter 1 Company Name  
Chaparral Services, Inc.

6. US EPA ID Number  
N/A

A. Transporter's Phone 505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number  
N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

a. Produced H<sub>2</sub>O / Tank Bottoms

12. Containers  
No. Type 13. Total Quantity 14. Unit Wt/Vol

1 Tank 130 BBL

11. Waste Shipping Name and Description		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. Produced H <sub>2</sub> O / Tank Bottoms		1	Tank	130	BBL
b.					
c.					
d.					

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name: *Thy 754* Signature: \_\_\_\_\_ Month Day Year: 10/15/03

17. Transporter 1 Acknowledgement of Receipt of Materials  
Printed/Typed Name: *Rene Covantes* Signature: \_\_\_\_\_ Month Day Year: 10/15/03

18. Transporter 2 Acknowledgement of Receipt of Materials  
Printed/Typed Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Month Day Year: \_\_\_\_\_

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: *Sundance Services* Signature: *Kelly Rouch* Month Day Year: 10/15/03

GENERATOR  
TRANSPORTER  
FACILITY

# Sundance Services, Inc. WZ 69923

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: *Sundance Services, Inc.*

LEASE NAME: *White - Sundance*

TRANSPORTER COMPANY: *Canary - Sundance*

DATE: *10/15/95*

VEHICLE NO.: *741*

DRIVER NO.:

TIME

AM/PM

CHARGE TO: *Completion Fluids*

## TYPE OF MATERIAL

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BSAW Content:
- Completion Fluids
- C-117 No.:

Description: *White*

VOLUME OF MATERIAL [ ] BBLs. *100* : [ ] YARD : [ ]

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HERewith IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.**

DRIVER:

(SIGNATURE)

FACILITY REPRESENTATIVE:

(SIGNATURE)

White - Sundance  
Revised 12/27/95

Canary - Sundance Act #1

Pink - Sundance Act #2

Gold - Transporter

Superior Printing Service, Inc.

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
2

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone  
505 476-3488

5. Transporter 1 Company Name

Chaparral Services, Inc.

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

a. Produced H<sub>2</sub>O / Tank Bottoms

12. Containers  
No. Type

1 Tank

13. Total  
Quantity

130

14. Unit  
Wt/Vol

832

GENERATOR

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

27  
8/24

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

*Mary Beth*

Signature

Month Day Year

10/15/03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

*Gene Cervantes*

Signature

*[Signature]*

Month Day Year

10/15/03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

*Kelly Roach*

Signature

*[Signature]*

Month Day Year

10/15/03

FACILITY

ORIGINAL - RETURN TO GENERATOR

12-BLS-C6 Rev. 2/88

**Sundance Services, Inc.** A-12 65314

6th Street P. O. Box 1737 ★ Eunice, New Mexico 88231 (505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: *Plaza Transport*

LEASE NAME: *Archie*

TRANSPORTER COMPANY: *Archie*

DATE: *4/15/83* VEHICLE NO.: *74*

CHARGE TO: *Plaza*

TIME AM/PM

DRIVER NO.:

**TYPE OF MATERIAL**

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content:
- Completion Fluids
- C-117 No.:

Description: *Solids*

VOLUME OF MATERIAL  BBLs. *110* :  YARD :

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.**

DRIVER: *[Signature]*

FACILITY REPRESENTATIVE: *[Signature]*

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.

N/A

Manifest Doc. No.

3

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone

505 476-3488

5. Transporter 1 Company Name

Chaparral Services, Inc.

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

12. Containers  
No. Type

13. Total  
Quantity

14. Unit  
Wt/Vol

a. Produced H<sub>2</sub>O / Tank Bottoms

1 Tank

130

BB

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

*[Signature]*

Signature

Month Day Year

10 15 03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

*[Signature]*

Signature

Month Day Year

10 15 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Sundance Serv.  
*[Signature]*

Signature

*[Signature]*

Month Day Year

10 15 03

GENERATOR

TRANSPORTER

FACILITY

ORIGINAL - RETURN TO GENERATOR

12-BLS-05 Rev. 12-06

# Sundance Services, Inc. #12 69903

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: *King L...*

LEASE NAME: *Wells*

TRANSPORTER COMPANY: *Chaparral*

DATE: *11/15/03* VEHICLE NO.: *74*

CHARGE TO: *Chaparral Drilling & Tool*

TIME AM/PM

DRIVER NO.:

## TYPE OF MATERIAL

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content:
- Completion Fluids
- C-117 No.:

Description: *oil*

VOLUME OF MATERIAL  BBLs *1300* :  YARD :

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HERewith IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.**

DRIVER: \_\_\_\_\_ (SIGNATURE)

FACILITY REPRESENTATIVE: \_\_\_\_\_ (SIGNATURE)

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
4

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone (505) 476-3488

5. Transporter 1 Company Name  
Chaparral Services, Inc.

6. US EPA ID Number  
N/A

A. Transporter's Phone  
505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18

10. US EPA ID Number  
N/A

C. Facility's Phone  
505-394-2511

11. Waste Shipping Name and Description  
Lea County

12. Containers  
No. Type  
13. Total  
Quantity  
14. Unit  
Wt/Vol

a. Produced H<sub>2</sub>O / Tank Bottoms

1 1 Tank 130 BBL

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

*[Signature]*

10 | 15 | 03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

Dustin Rankin

*[Signature]*

10 | 15 | 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

Sundance Services  
Kelly Roach

*[Signature]*  
Kelly Roach

10 | 15 | 03

GENERATOR

TRANSPORTER

FACILITY

# Sundance Services, Inc. No 69905

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: *Thru Cementation*

LEASE NAME: *Archer 500*

TRANSPORTER COMPANY: *Thompson* TIME AM/PM

DATE: *1/25/95* VEHICLE NO.: *52* DRIVER NO.:

CHARGE TO: *Diamond Pad*

## TYPE OF MATERIAL

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content:
- Completion Fluids
- C-117 No.:

Description: *1000 Gall water*

VOLUME OF MATERIAL  BBLs. *1000* :  YARD :

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFOREFED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY** that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.

DRIVER: *[Signature]* (SIGNATURE)

FACILITY REPRESENTATIVE: *[Signature]* (SIGNATURE)

White - Sundance    Canary - Sundance Acct #1    Pink - Sundance Acct #2    Gold - Transporter  
Revised 12/27/95

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.

N/A

Manifest Doc. No.

5

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone  
505 476-3488

5. Transporter 1 Company Name

Chaparral Services, Inc.

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

12. Containers

No.

Type

13. Total  
Quantity

14. Unit  
Wt/Vol

a. Produced H<sub>2</sub>O / Tank Bottoms

1

Tank

130

BBL

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

1 0 15 03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

1 0 15 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

10 15 03

GENERATOR

TRANSPORTER

FACILITY

**Sundance Services, Inc. M2 69917**

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

5

LEASE OPERATOR/SHIPPER/COMPANY: WINDY OIL

LEASE NAME: WINDY OIL

TRANSPORTER COMPANY: CHAMPARAL TIME \_\_\_\_\_ AM/PM

DATE: 10/15/95 VEHICLE NO.: 52 DRIVER NO.:

CHARGE TO: CHAMPARAL

**TYPE OF MATERIAL**

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content
- Completion Fluids
- C-117 No.:

Description: 1272/5

VOLUME OF MATERIAL  BBLs. 150 :  YARD \_\_\_\_\_ :  \_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.**

DRIVER: [Signature]  
(SIGNATURE)

FACILITY REPRESENTATIVE: [Signature]  
(SIGNATURE)

White - Sundance    Canary - Sundance Acct #1    Pink - Sundance Acct #2    Gold - Transporter  
Revised 12/27/95    Superior Printing Service, Inc.

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
6

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone 505 476-3488

5. Transporter 1 Company Name  
Chaparral Services, Inc.

6. US EPA ID Number  
N/A

A. Transporter's Phone  
505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number  
N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

12. Containers

13. Total  
Quantity

14. Unit  
Wt/Vol

a. Produced H<sub>2</sub>O / Tank Bottoms

No.	Type	Quantity	Unit Wt/Vol
1	Tank	130	BALE
b.			
c.			
d.			

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year  
10 15 03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year  
10 15 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year  
10 15 03

ORIGINAL - RETURN TO GENERATOR

# Sundance Services, Inc. NE 69926

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: 5741 W. 2100 N

LEASE NAME: 4900 W. 2500 N

TRANSPORTER COMPANY: 11100 W. 42 TIME \_\_\_\_\_ AM/PM

DATE: 10/15/05 VEHICLE NO.: 152 DRIVER NO.:

CHARGE TO: 11100 W. 42

## TYPE OF MATERIAL

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content:
- Completion Fluids
- C-117 No.:

Description:

VOLUME OF MATERIAL  BBLs. 130 :  YARD :

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.**

DRIVER:

(SIGNATURE)

FACILITY REPRESENTATIVE:

(SIGNATURE)

White - Sundance Revised 12/27/95

Canary - Sundance Acct #1

Pink - Sundance Acct #2

Gold - Transporter

Superior Printing Service, Inc.

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No. **N/A** Manifest Doc. No. **7** 2. Page 1 of

3. Generator's Name and Mailing Address  
**New Mexico Oil Conservation Division  
 1220 South St. Francis Drive  
 Santa Fe, New Mexico 87505**

Araho Disposal Facility  
 WE/4, SE/4, Sec 1, T17S, R31E  
 Lea County, NM

4. Generator's Phone **505 476-3488**

5. Transporter 1 Company Name **Chaparral Services, Inc.** 6. US EPA ID Number **N/A** A. Transporter's Phone **505-397-3044**

7. Transporter 2 Company Name 8. US EPA ID Number B. Transporter's Phone

9. Designated Facility Name and Site Address **Sundance Services  
 2 miles East on Hwy 18  
 Lea County** 10. US EPA ID Number **N/A** C. Facility's Phone **505-394-2511**

11. Waste Shipping Name and Description	12. Containers		13. Total Quantity	14. Unit Wt/Vol
	No.	Type		
a. <b>Produced H<sub>2</sub>O / Tank Bottoms</b>	<b>1</b>	<b>Tank</b>	<b>130</b>	<b>BA1</b>
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above **Non Hazardous** E. Handling Codes for Wastes Listed Above **N/A**

15. Special Handling Instructions and Additional Information  
**#5 Address: PO Drawer 1769, Eunice, NM 88231**

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name **[Signature]** Signature **[Signature]** Month Day Year **10 15 03**

17. Transporter 1 Acknowledgement of Receipt of Materials  
 Printed/Typed Name **Bergo Garcia** Signature **[Signature]** Month Day Year **10 15 03**

18. Transporter 2 Acknowledgement of Receipt of Materials  
 Printed/Typed Name Signature Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.  
 Printed/Typed Name **Kelly Roach** Signature **Kelly Roach** Month Day Year **10 15 03**



**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No. **N/A.** Manifest Doc. No. **8** 2. Page 1 of

3. Generator's Name and Mailing Address **New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505**

4. Generator's Phone **505 476-3488**

**Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM**

5. Transporter 1 Company Name **Chaparral Services, Inc.** 6. US EPA ID Number **N/A** A. Transporter's Phone **505-397-3044**

7. Transporter 2 Company Name 8. US EPA ID Number B. Transporter's Phone

9. Designated Facility Name and Site Address **Sundance Services  
2 miles East on Hwy 18  
Lea County** 10. US EPA ID Number **N/A** C. Facility's Phone **505-394-2511**

11. Waste Shipping Name and Description	12. Containers		13. Total Quantity	14. Unit Wt/Vol
	No.	Type		
a. <b>Produced H<sub>2</sub>O / Tank Bottoms</b>	<b>1</b>	<b>Tank</b>	<b>130</b>	<b>BA</b>
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above **Non Hazardous** E. Handling Codes for Wastes Listed Above **N/A**

15. Special Handling Instructions and Additional Information  
**#5 Address: PO Drawer 1769, Eunice, NM 88231**

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name **[Signature]** Signature **[Signature]** Month Day Year **11/15/03**

17. Transporter 1 Acknowledgement of Receipt of Materials  
Printed/Typed Name **SERGEY GARCIA** Signature **[Signature]** Month Day Year **11/15/03**

18. Transporter 2 Acknowledgement of Receipt of Materials  
Printed/Typed Name Signature Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name **Kelly Roach** Signature **Kelly Roach** Month Day Year **10/15/03**

GENERATOR

TRANSPORTER

C-1

# Sundance Services, Inc. MS 69916

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: *White Sundance*

LEASE NAME: *40 110 Disposal*

TRANSPORTER COMPANY: *Happyway* TIME AM/PM

DATE: *10/15/95* VEHICLE NO.: *71* DRIVER NO.:

CHARGE TO: *Disposal*

## TYPE OF MATERIAL

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content:
- Completion Fluids
- C-117 No.:

Description:

*Waste material*

VOLUME OF MATERIAL [ ] BBLs. [ ] YARD : [ ]

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter. Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.**

DRIVER:

(SIGNATURE)

FACILITY REPRESENTATIVE:

(SIGNATURE)

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.

N/A

Manifest Doc. No.

9

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of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone (505) 476-3488

5. Transporter 1 Company Name

Chaparral Services, Inc.

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

a. Produced H<sub>2</sub>O / Tank Bottoms

12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
1	Tank	130	BB1

GENERATOR

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name  
*M. J. [Signature]*

Signature  
Month Day Year  
10 15 03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name  
SERGIO GARCIA

Signature  
Month Day Year  
10 15 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature  
Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name  
Kelly Roach

Signature  
Month Day Year  
10 15 03

TRANSPORTER

FACILITY

ORIGINAL - RETURN TO GENERATOR

2003-05-05 12:03

# Sundance Services, Inc. MC 69927

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: *White Sundance*

LEASE NAME: *White Sundance*

TRANSPORTER COMPANY: *White Sundance*

DATE: *10/16/92*

VEHICLE NO.: *192 92*

DRIVER NO.:

TIME

AM/PM

CHARGE TO: *Wainwright Head*

## TYPE OF MATERIAL

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content:
- Completion Fluids
- C-117 No.:

Description: *solid*

VOLUME OF MATERIAL  BBLs *120* :  YARD :

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was rendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.**

DRIVER: *[Signature]*  
(SIGNATURE)

FACILITY REPRESENTATIVE: *[Signature]*  
(SIGNATURE)

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No. N/A

Manifest Doc. No. 10

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of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone (505) 476-3488

5. Transporter 1 Company Name

Chaparral Services, Inc

6. US EPA ID Number N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

12. Containers

No.

Type

13. Total Quantity

14. Unit Wt/Vol

a. Produced H<sub>2</sub>O / Tank Bottoms

1

Tanks

130

RB

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

*[Signature]*

Signature

Month Day Year

10 15 03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

*Rene Cervantes*

Signature

*[Signature]*

Month Day Year

10 15 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Sundance Services  
*ZACH RAMOS*

Signature

*[Signature]*

Month Day Year

10 15 03

GENERATOR

TRANSPORTER

FACILITY

# Sundance Services, Inc. No. 69936

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

10

LEASE OPERATOR/SHIPPER/COMPANY: Field

LEASE NAME: APRIL 2000

TRANSPORTER COMPANY: Whisper

DATE: 10/1/05 VEHICLE NO.: 5111

DRIVER NO.: \_\_\_\_\_

CHARGE TO: Whisper / Donny Barber

## TYPE OF MATERIAL

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content:
- Completion Fluids
- C-117 No.:

Description: SOIL

VOLUME OF MATERIAL  BBLs 120 :  YARD :

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HERE WITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.**

DRIVER: \_\_\_\_\_ (SIGNATURE)

FACILITY REPRESENTATIVE: \_\_\_\_\_ (SIGNATURE)

White - Sundance    Canary - Sundance Act #1    Pink - Sundance Act #2    Gold - Transporter

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.

N/A

Manifest Doc. No.

11

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone ( )  
505 476-3488

5. Transporter 1 Company Name

Chaparral Services, Inc.

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18

10. US EPA ID Number

N/A

C. Facility's Phone

505-394-2511

11. Waste Shipment Description

a. Produced H<sub>2</sub>O / Tank Bottoms

b.

c.

d.

12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
1	Tank	130	BBL
		35	10/15/03

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

*Marty White*

Signature

*Marty White*

Month Day Year

10/15/03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

*Austin Jenkins*

Signature

*Austin Jenkins*

Month Day Year

10/15/03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

*line 13: correct quantity*

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

*ZACH KAVES*

Signature

*Zach Kaves*

Month Day Year

10/15/03

GENERATOR

TRANSPORTER

FACILITY

# Sundance Services, Inc. ME 69940

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: *Phon*

LEASE NAME: *Apex*

TRANSPORTER COMPANY: *Phon*

DATE: *11/14/94* VEHICLE NO.: *10155*

CHARGE TO: *Donald Paul Scott*

TIME AM/PM

DRIVER NO.:

## TYPE OF MATERIAL

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content:
- Completion Fluids
- C-117 No.:

Description: *slit*

*Slit*

VOLUME OF MATERIAL [ ] BBLs : [ ] YARD : [ ]

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFOREFED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.**

DRIVER: *[Signature]*  
(SIGNATURE)

FACILITY REPRESENTATIVE: *[Signature]*  
(SIGNATURE)

White - Sundance    Canary - Sundance Acct #1    Pink - Sundance Acct #2    Gold - Transporter

Revised 12/27/95    Superior Printing Service, Inc.

**NON-HAZARDOUS WASTE MANIFEST**

1. Generator's US EPA ID No. *N/A* Manifest Doc. No. *12* 2. Page 1 of

3. Generator's Name and Mailing Address  
 New Mexico Oil Conservation Division  
 1220 South St. Francis Drive  
 Santa Fe, New Mexico 87505  
 Araho Disposal Facility  
 WE/4, SE/4, Sec 1, T17S, R31E  
 Lea County, NM

4. Generator's Phone (Chaparral Services, Inc.) *505 476-3488*

5. Transporter 1 Company Name  
 Chaparral Services, Inc. 6. US EPA ID Number *N/A* A. Transporter's Phone *505-397-3044*

7. Transporter 2 Company Name 8. US EPA ID Number B. Transporter's Phone

9. Designated Facility Name and Site Address  
 Stundance Services  
 2 miles East on Hwy 18  
 Lea County 10. US EPA ID Number *N/A* C. Facility's Phone *505-394-2511*

11. Waste Shipping Name and Description 12. Containers No. Type 13. Total Quantity 14. Unit Wt/Vol

a. *Produced H<sub>2</sub>O / Tank Bottoms* 1 Tank 130 881

b.

c.

d.

D. Additional Descriptions for Materials Listed Above  
 Non Hazardous E. Handling Codes for Wastes Listed Above  
 N/A

15. Special Handling Instructions and Additional Information  
 #5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name *Tracy* Signature *[Signature]* Month Day Year *12/01/03*

17. Transporter 1 Acknowledgement of Receipt of Materials  
 Printed/Typed Name *SERGIO GARCIA* Signature *[Signature]* Month Day Year *10/15/03*

18. Transporter 2 Acknowledgement of Receipt of Materials  
 Printed/Typed Name Signature Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name *EACH RAMOS* Signature *[Signature]* Month Day Year *10/15/03*

GENERATOR

TRANSPORTER

FACILITY

# Sundance Services, Inc. NC 69339

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

*R2*

LEASE OPERATOR/SHIPPER/COMPANY: *Phibs*

LEASE NAME: *Paul D. ...*

TRANSPORTER COMPANY: *Chaparral* TIME AM/PM

DATE: *7/1/82* VEHICLE NO.: *7-7* DRIVER NO.:

CHARGE TO: *Chaparral* *Daniel Pinkney*

## TYPE OF MATERIAL

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content:
- Completion Fluids
- C-117 No.:

Description: *oil*

VOLUME OF MATERIAL  BBLs *1200* :  YARD :

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.**

DRIVER: *[Signature]* (SIGNATURE)

FACILITY REPRESENTATIVE: *[Signature]* (SIGNATURE)

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
13

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone ( 505 476-3488 )

5. Transporter 1 Company Name  
Chaparral Services, Inc.

6. US EPA ID Number  
N/A

A. Transporter's Phone  
505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number  
N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

12. Containers

13. Total Quantity

14. Unit Wt/Vol

a. Produced H<sub>2</sub>O / Tank Bottoms

No. 1

Type Tank

130

BB1

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name  
*[Signature]*

Signature  
Month Day Year  
10 | 17 | 03

17. Transporter 1 Acknowledgement of Receipt of Materials  
Printed/Typed Name  
SERGIO GARCIA

Signature  
Month Day Year  
10 | 17 | 03

18. Transporter 2 Acknowledgement of Receipt of Materials  
Printed/Typed Name

Signature  
Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name  
Fabian Fabian

Signature  
Month Day Year  
10 | 17 | 03

GENERATOR

TRANSPORTER

FACILITY

# Sundance Services, Inc. NE 69973

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: Alma DRIVER NO.: 13

LEASE NAME: Alma TIME AM/PM

TRANSPORTER COMPANY: Chapman

DATE: 12/17/93 VEHICLE NO.: 131763

CHARGE TO: Deming Park Sub

## TYPE OF MATERIAL

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content:
- Completion Fluids
- C-117 No.:

Description: SK

VOLUME OF MATERIAL  BBLs. 130 :  YARD :

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW/DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY** that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.

DRIVER: [Signature] (SIGNATURE)

FACILITY REPRESENTATIVE: [Signature] (SIGNATURE)

White - Sundance    Canary - Sundance Acct #1    Pink - Sundance Acct #2    Gold - Transporter  
Revised 12/27/95

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
14

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone (505) 476-3488

5. Transporter 1 Company Name  
Chaparral Services, Inc.

6. US EPA ID Number  
N/A

A. Transporter's Phone  
505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number  
N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

12. Containers  
No. Type

13. Total  
Quantity

14. Unit  
Wt/Vol

a. Produced H<sub>2</sub>O / Tank Bottoms

1

Tank

130

BB

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

11 01 03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

10 17 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

10 17 03

ORIGINAL - RETURN TO GENERATOR

# Sundance Services, Inc. No 69976

P. O. Box 1737 \* Eunice, New Mexico 88231  
(505) 394-2511

*K*

LEASE OPERATOR/SHIPPER/COMPANY: *Plino*

LEASE NAME: *Hobbs Diesel*

TRANSPORTER COMPANY: *Abogard*

DATE: *10/10/85* VEHICLE NO.: *2911*

CHARGE TO: *Diesel/Bulk*

TIME AM/PM

DRIVER NO.:

## TYPE OF MATERIAL

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content:
- Completion Fluids
- C-117 No.:

Description: *blends*

VOLUME OF MATERIAL  BBL. *130* :  YARD :

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAFETY CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.**

DRIVER:

(SIGNATURE)

FACILITY REPRESENTATIVE:

(SIGNATURE)

White - Sundance    Canary - Sundance Acct #1    Pink - Sundance Acct #2    Gold - Transporter  
Revised 12/27/95

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
15

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone (505) 476-3488

5. Transporter 1 Company Name  
Chaparral Services, Inc.

6. US EPA ID Number  
N/A

A. Transporter's Phone  
505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number  
N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

a. Produced H<sub>2</sub>O / Tank Bottoms

12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
1	Tank	40	BBJ

b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

GENERATOR

TRANSPORTER

FACILITY

**Sundance Services, Inc. No 69980**

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: ~~Chaparral~~ *Ros*

LEASE NAME: ~~Chaparral~~ *State Dec 25 1981*

TRANSPORTER COMPANY: *Chaparral*

DATE: *10-17-83* VEHICLE NO.: *7* DRIVER NO.:

CHARGE TO: *D. Marshall Knott*

**TYPE OF MATERIAL**

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content:
- Completion Fluids
- C-117 No.:

Description: *400 50 lbs 5-1-80-2*

VOLUME OF MATERIAL  BBLs. *40* :  YARD :

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFOREFD DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

**THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.**

DRIVER: *Scott Anderson*  
(SIGNATURE)

FACILITY REPRESENTATIVE: *Anthony Rose*  
(SIGNATURE)

**NON-HAZARDOUS WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
17

2. Page 1 of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Ilea County, NM

4. Generator's Phone (505) 476-3488

5. Transporter 1 Company Name  
Chaparral Services, Inc.

6. US EPA ID Number  
N/A

A. Transporter's Phone  
505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

San Juan Services  
2 miles East on Hwy 18  
Ilea County

10. US EPA ID Number  
N/A

C. Facility's Phone  
505-394-2511

11. Waste Shipping Name and Description

a. Produced H<sub>2</sub>O / Tank Bottoms

12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
1	Tank	130	RB/1

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

Sundance Server  
Kelly Roach  
Kelly Roach  
11 02 03

GENERATOR

TRANSPORTER

FACILITY

# Sundance Services, Inc.

№ 70029

P. O. Box 1737 ★ Eunice, New Mexico 88231

(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: *Kline Environmental*

LEASE NAME: *Arabo SWD*

TRANSPORTER COMPANY: *Chaparral*

TIME

AM/PM

DATE: *10/21/03*

VEHICLE NO.: *# 74*

DRIVER NO.:

CHARGE TO: *Diamond Back*

## TYPE OF MATERIAL

Production Water

Drilling Fluids

Completion Fluids

Tank Bottoms

Contaminated Soil

C-117 No.:

Other Material:

BS&W Content:

Description: *solids*

VOLUME OF MATERIAL  BBLs.

*130*

:

YARD

:

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

*THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.*

DRIVER:

(SIGNATURE)

FACILITY REPRESENTATIVE:

(SIGNATURE)

White - Sundance  
Revised 12/27/95

Canary - Sundance Acct #1

Pink - Sundance Acct #2

Gold - Transporter

Superior Printing Service, Inc.

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
18

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone 505 476-3488

5. Transporter 1 Company Name

6. US EPA ID Number

A. Transporter's Phone

7. Transporter 2 Company Name  
Chaparral Services, Inc.

8. US EPA ID Number  
N/A

B. Transporter's Phone  
505-397-3044

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number  
N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

12. Containers

13. Total Quantity

14. Unit WW/Vol

a. Produced H<sub>2</sub>O / Tank Bottoms

No.	Type
1	Tank

130

BB1

GENERATOR

D. Additional Descriptions for Materials Listed Above  
Non Hazardous

E. Handling Codes for Wastes Listed Above  
N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

FACILITY

# Sundance Services, Inc. - NO 70034

P. O. Box 1737 ★ Eunice, New Mexico 88231

(505) 394-2511

18

LEASE OPERATOR/SHIPPER/COMPANY: King Turk

LEASE NAME: AVAHO WISPOSED

TRANSPORTER COMPANY: CHADARRAL TIME \_\_\_\_\_ AM/PM

DATE: 10/21/03 VEHICLE NO.: 71 DRIVER NO.:

CHARGE TO: CHADARRAL V. AMITID BACK SWD

## TYPE OF MATERIAL

- Production Water
- Tank Bottoms
- Other Material:
- Drilling Fluids
- Contaminated Soil
- BS&W Content: \_\_\_\_\_
- Completion Fluids
- C-117 No.: \_\_\_\_\_

Description: Solids

VOLUME OF MATERIAL  BBLs. 130 :  YARD \_\_\_\_\_ :  \_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

*THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.*

DRIVER: [Signature]  
(SIGNATURE)

FACILITY REPRESENTATIVE: [Signature]  
(SIGNATURE)

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
19

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone (505) 476-3488

5. Transporter 1 Company Name

*Pate Trucking*  
*Industrial Services, Inc.*

6. US EPA ID Number

N/A

A. Transporter's Phone

6264  
505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

a. *TANK BOTTOMS -*

b.

c.

d.

12. Containers	13. Total	14. Unit
No.	Quantity	Wt/Vol
	<i>110 BBL</i>	
	<i>130</i>	

D. Additional Descriptions for Materials Listed Above  
Non Hazardous

E. Handling Codes for Wastes Listed Above  
N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

*Line 13: corrected quantity*

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

GENERATOR

TRANSPORTER

FACILITY

ORIGINAL - RETURN TO GENERATOR

# Sundance Services, Inc. № 70036

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: Rhino Foundation

LEASE NAME: Arco SWD

TRANSPORTER COMPANY: Pate TIME \_\_\_\_\_ AM/PM

DATE: 11/21/93 VEHICLE NO.: 59 DRIVER NO.: \_\_\_\_\_

CHARGE TO: Diamond Park

## TYPE OF MATERIAL

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Production Water | <input type="checkbox"/> Drilling Fluids     | <input type="checkbox"/> Completion Fluids |
| <input type="checkbox"/> Tank Bottoms     | <input type="checkbox"/> Contaminated Soil   | <input type="checkbox"/> C-117 No.: _____  |
| <input type="checkbox"/> Other Material:  | <input type="checkbox"/> BS&W Content: _____ |  |

Description: Slick

VOLUME OF MATERIAL  BBLs. 170 :  YARD \_\_\_\_\_ :  \_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

*THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.*

DRIVER: \_\_\_\_\_  
(SIGNATURE)

FACILITY REPRESENTATIVE: \_\_\_\_\_  
(SIGNATURE)

White - Sundance  
Revised 12/27/95

Canary - Sundance Acct #1

Pink - Sundance Acct #2

Gold - Transporter

Superior Printing Service, Inc.

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
20

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone ( 505 476-3488

5. Transporter 1 Company Name

6. US EPA ID Number

A. Transporter's Phone

Chaparral Services, Inc.

N/A

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

10. US EPA ID Number

C. Facility's Phone

Sundance Services  
2 miles East on Hwy 18  
Lea County

N/A

505-394-2511

11. Waste Shipping Name and Description

12. Containers

13. Total  
Quantity

14. Unit  
Wt/Vol

a. Produced H<sub>2</sub>O in Tank bottom

1 Tank

130

lb

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

Kene Cervantes

*[Signature]*

10 21 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

Kelly Roach

Sundance Serv.

*[Signature]*

10 21 03

GENERATOR

TRANSPORTER

FACILITY

ORIGINAL - RETURN TO GENERATOR

# Sundance Services, Inc.

№ 70037

P. O. Box 1737 ★ Eunice, New Mexico 88231

(505) 394-2511

20

LEASE OPERATOR/SHIPPER/COMPANY: *Phino Environmental*

LEASE NAME: *Alcho SWB*

TRANSPORTER COMPANY: *Chaparral*

TIME

AM/PM

DATE: *11/21/03*

VEHICLE NO.: *71*

DRIVER NO.:

CHARGE TO: *Diamond Back*

## TYPE OF MATERIAL

Production Water

Drilling Fluids

Completion Fluids

Tank Bottoms

Contaminated Soil

C-117 No.: \_\_\_\_\_

Other Material:

BS&W Content: \_\_\_\_\_

Description: *solids*

VOLUME OF MATERIAL  BBLs

*130*

YARD

:

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HERewith IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

*THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.*

DRIVER: *[Signature]*  
(SIGNATURE)

FACILITY REPRESENTATIVE: *[Signature]*  
(SIGNATURE)

White - Sundance  
Revised 12/27/95

Canary - Sundance Acct #1

Pink - Sundance Acct #2

Gold - Transporter

Superior Printing Service, Inc.

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
21

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone ( 505 476-3488 )

5. Transporter 1 Company Name

~~Chaparral Services, Inc.~~ M+S

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

12. Containers  
No. Type

13. Total  
Quantity

14. Unit  
Wt/Vol

a. Produced H<sub>2</sub>O / Bottom Tank.

1 Tank 130 RBC

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

Kellys Ranch

Sundance Services  
Kellys Ranch

11/9/21/03

GENERATOR

TRANSPORTER

FACILITY

# Sundance Services, Inc.

№ 70040

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: Rhino Environmental

LEASE NAME: Araho SWD

TRANSPORTER COMPANY: M+S (Chapman) TIME \_\_\_\_\_ AM/PM

DATE: 10/21/03 VEHICLE NO.: # 7 DRIVER NO.: \_\_\_\_\_

CHARGE TO: Diamond Beach

## TYPE OF MATERIAL

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Production Water        | <input type="checkbox"/> Drilling Fluids     | <input type="checkbox"/> Completion Fluids |
| <input checked="" type="checkbox"/> Tank Bottoms | <input type="checkbox"/> Contaminated Soil   | <input type="checkbox"/> C-117 No.: _____  |
| <input type="checkbox"/> Other Material:         | <input type="checkbox"/> BS&W Content: _____ |  |

Description: solids Telout

VOLUME OF MATERIAL  BBLs. 130 :  YARD \_\_\_\_\_ :  \_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

*THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.*

DRIVER: Jeff Hernandez  
(SIGNATURE)

FACILITY REPRESENTATIVE: Kelly Koach  
(SIGNATURE)

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
22

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone ( 505 476-3488 )

5. Transporter 1 Company Name

~~Chaparral Services, Inc~~ M+S

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

a. Produced H<sub>2</sub>O / Tank Bottoms

b.

c.

d.

12. Containers No.	13. Total Quantity	14. Unit Wt/Vol	
			Type
1	130	881	TANK

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

*[Signature]*

Signature

Month Day Year

11 01 03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Jeff Hanna

Signature

*[Signature]*

Month Day Year

10 16 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Kelly Roach

Signature

*[Signature]*

Month Day Year

11 01 03

GENERATOR

TRANSPORTER

FACILITY

# Sundance Services, Inc.

№ 69957

P. O. Box 1737 ★ Eunice, New Mexico 88231

(505) 394-2511

22 40684

LEASE OPERATOR/SHIPPER/COMPANY: Rhiad

LEASE NAME: Arabo disposal

TRANSPORTER COMPANY: MHS TIME \_\_\_\_\_ AM/PM

DATE: 12/16/02 VEHICLE NO.: # 7 DRIVER NO.:

CHARGE TO: Diamondback

## TYPE OF MATERIAL

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Production Water | <input type="checkbox"/> Drilling Fluids     | <input type="checkbox"/> Completion Fluids |
| <input type="checkbox"/> Tank Bottoms     | <input type="checkbox"/> Contaminated Soil   | <input type="checkbox"/> C-117 No. _____   |
| <input type="checkbox"/> Other Material:  | <input type="checkbox"/> BS&W Content: _____ |  |

Description: NON/HAZE WATER

VOLUME OF MATERIAL  BBLs. 130 :  YARD :

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HERewith IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

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DRIVER: JOSE HERRERA  
(SIGNATURE)

FACILITY REPRESENTATIVE: [Signature]  
(SIGNATURE)

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
23

2. Page 1  
of

3. Generator's Name and Mailing Address  
New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone ( )  
505-476-3488

5. Transporter 1 Company Name  
Chaparral Services, Inc.

6. US EPA ID Number  
N/A

A. Transporter's Phone  
505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number  
N/A

B. Transporter's Phone

9. Designated Facility Name and Site Address  
Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number  
N/A

C. Facility's Phone  
505-394-2511

11. Waste Shipping Name and Description

12. Containers  
No.

Type

13. Total  
Quantity

14. Unit  
Wt/Vol

a. Produced H<sub>2</sub>O / Tank Bottoms

1

Tank

130

RB/

b.

c.

d.

D. Additional Descriptions for Materials Listed Above  
Non Hazardous

E. Handling Codes for Wastes Listed Above  
N/A

15. Special Handling Instructions and Additional Information  
  
#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name  
Kelly Roach

Signature  
Kelly Roach  
Month Day Year  
10 15 03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name  
Jeff Hanna

Signature  
Jeff Hanna  
Month Day Year  
10 16 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature  
Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name  
Kelly Roach

Signature  
Kelly Roach  
Month Day Year  
11 01 03

GENERATOR

TRANSPORTER

FACILITY

# Sundance Services, Inc. **NO 69971**

P. O. Box 1737 ★ Eunice, New Mexico 88231

(505) 394-2511

23

LEASE OPERATOR/SHIPPER/COMPANY: King Environmental  
LEASE NAME: Alabo SWB  
TRANSPORTER COMPANY: M+S (Chaparral) TIME \_\_\_\_\_ AM/PM  
DATE: 6/17/03 VEHICLE NO.: # 7 DRIVER NO.: \_\_\_\_\_  
CHARGE TO: Diamond Back SWB

### TYPE OF MATERIAL

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Production Water        | <input type="checkbox"/> Drilling Fluids     | <input type="checkbox"/> Completion Fluids |
| <input checked="" type="checkbox"/> Tank Bottoms | <input type="checkbox"/> Contaminated Soil   | <input type="checkbox"/> C-117 No.: _____  |
| <input type="checkbox"/> Other Material:         | <input type="checkbox"/> BS&W Content: _____ |  |

Description: Solids

VOLUME OF MATERIAL  BBLs. 130 :  YARD \_\_\_\_\_ :  \_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HERewith IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

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DRIVER: Jed Hayral  
(SIGNATURE)  
FACILITY REPRESENTATIVE: Betty Roach  
(SIGNATURE)

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No.  
24

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone  
505 476-3488

5. Transporter 1 Company Name  
Chaparral Services, Inc.

6. US EPA ID Number  
N/A

A. Transporter's Phone  
505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address  
Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number  
N/A

C. Facility's Phone  
505-394-2511

11. Waste Shipping Name and Description

12. Containers	13. Total Quantity	14. Unit Wt/Vol		
			No.	Type
a.	1	Trunk	130	BB
b.				
c.				
d.				

a. Tank Bottoms / Produced H<sub>2</sub>O

D. Additional Descriptions for Materials Listed Above  
Non Hazardous

E. Handling Codes for Wastes Listed Above  
N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name <i>[Signature]</i>	Signature <i>[Signature]</i>	Month Day Year 11/01/03
--	---------------------------------	----------------------------

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name Sergio Garcia	Signature <i>[Signature]</i>	Month Day Year 10/16/03
-------------------------------------	---------------------------------	----------------------------

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
--------------------	-----------	----------------

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name <i>[Signature]</i>	Signature <i>[Signature]</i>	Month Day Year 10/16/03
--	---------------------------------	----------------------------

GENERATOR

TRANSPORTER

FACILITY

24

# Sundance Services, Inc. NO 69952

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: *Khina Environmental*

LEASE NAME: *Araho SWD*

TRANSPORTER COMPANY: *Chaparral* TIME \_\_\_\_\_ AM/PM

DATE: *10/16/03* VEHICLE NO.: *# 71* DRIVER NO.:

CHARGE TO: *Diamond Back SWD*

### TYPE OF MATERIAL

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Production Water        | <input type="checkbox"/> Drilling Fluids     | <input type="checkbox"/> Completion Fluids |
| <input checked="" type="checkbox"/> Tank Bottoms | <input type="checkbox"/> Contaminated Soil   | <input type="checkbox"/> C-117 No.: _____  |
| <input type="checkbox"/> Other Material:         | <input type="checkbox"/> BS&W Content: _____ |  |

Description: *solids*

VOLUME OF MATERIAL  BBLs. *130* :  YARD \_\_\_\_\_ :  \_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HERewith IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

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DRIVER: *[Signature]*  
(SIGNATURE)

FACILITY REPRESENTATIVE: *Kelly Roach*  
(SIGNATURE)

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No. *N/A*

Manifest Doc. No. *25*

2. Page 1  
of

3. Generator's Name and Mailing Address

*N/A*

4. Generator's Phone ( )

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

5. Transporter 1 Company Name

*505-476-3488*

*505-476-3488*

6. US EPA ID Number

*N/A*

A. Transporter's Phone

*505-397-3044*

7. Transporter 2 Company Name

*Chaparral Services, Inc.*

8. US EPA ID Number

*N/A*

B. Transporter's Phone

9. Designated Facility Name and Site Address

*Sundance Services  
2 miles East on Hwy 18  
Lea County*

10. US EPA ID Number

*N/A*

C. Facility's Phone

*505-394-2511*

11. Waste Shipping Name and Description

*Lea County*

12. Containers

No.

Type

13. Total Quantity

14. Unit Wt/Vol

a. *Produced H<sub>2</sub>O / Tank Bottoms*

*1*

*Tank*

*130*

*BB*

b.   
c.   
d.

D. Additional Descriptions for Materials Listed Above

*Non Hazardous*

E. Handling Codes for Wastes Listed Above

*N/A*

15. Special Handling Instructions and Additional Information

*#5 Address: PO Drawer 1769, Eunice, NM 88231*

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

*Mark J. [Signature]*

Signature

Month Day Year

*10 | 16 | 03*

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

*SERGIO GARCIA*

Signature

Month Day Year

*[Blank]*

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

*10 | 16 | 03*

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

*Zach Ames*

Signature

*[Signature]*

Month Day Year

*10 | 16 | 03*

GENERATOR

TRANSPORTER

FACILITY

ORIGINAL - RETURN TO GENERATOR

# Sundance Services, Inc.

№ 69966

P. O. Box 1737 ★ Eunice, New Mexico 88231

(505) 394-2511

25

LEASE OPERATOR/SHIPPER/COMPANY: PHUD

LEASE NAME: Archo Disposal

TRANSPORTER COMPANY: Thompson

TIME \_\_\_\_\_ AM/PM

DATE: 10/16/03 VEHICLE NO.: 111

DRIVER NO.:

CHARGE TO: ROAD BUIL

## TYPE OF MATERIAL

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Production Water | <input type="checkbox"/> Drilling Fluids     | <input type="checkbox"/> Completion Fluids |
| <input type="checkbox"/> Tank Bottoms     | <input type="checkbox"/> Contaminated Soil   | <input type="checkbox"/> C-117 No.: _____  |
| <input type="checkbox"/> Other Material:  | <input type="checkbox"/> BS&W Content: _____ |  |

Description: solids

VOLUME OF MATERIAL [] BBLs. 130 : [] YARD \_\_\_\_\_ : [] \_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HERewith IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

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DRIVER: [Signature]  
(SIGNATURE)

FACILITY REPRESENTATIVE: [Signature]  
(SIGNATURE)

**NON-HAZARDOUS WASTE MANIFEST**

1. Generator's US EPA ID No. N/A

Manifest Doc. No. 26

2. Page 1 of

3. Generator's Name and Mailing Address

N/A

4. Generator's Phone ( )

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Ira County, NM

5. Transporter 1 Company Name

505-476-3488

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

Chaparral Services, Inc.

8. US EPA ID Number

N/A

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Ira County

10. US EPA ID Number

N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

Ira County

12. Containers

No.

Type

13. Total Quantity

14. Unit Wt/Vol

a. Produced H<sub>2</sub>O / Tank Bottoms

1

Tank

130

RB/

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

*[Signature]*

Signature

Month Day Year

11 01 03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

*[Signature]*

Signature

Month Day Year

10 16 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in item 19.

Printed/Typed Name

*[Signature]*

Signature

*[Signature]*

Month Day Year

10 16 03

GENERATOR

TRANSPORTER

FACILITY

# Sundance Services, Inc.

№ 69961

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

24

LEASE OPERATOR/SHIPPER/COMPANY: <u>Rhoad</u>	
LEASE NAME: <u>Araba Disposal</u>	
TRANSPORTER COMPANY: <u>Chippewa</u>	TIME _____ AM/PM
DATE: <u>10/16/03</u> VEHICLE NO.: <u>#174</u>	DRIVER NO.:
CHARGE TO: <u>Dredge Rock</u>	

## TYPE OF MATERIAL

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Production Water | <input type="checkbox"/> Drilling Fluids     | <input type="checkbox"/> Completion Fluids |
| <input type="checkbox"/> Tank Bottoms     | <input type="checkbox"/> Contaminated Soil   | <input type="checkbox"/> C-117 No.: _____  |
| <input type="checkbox"/> Other Material:  | <input type="checkbox"/> BS&W Content: _____ |  |

Description: slits

VOLUME OF MATERIAL  BBLs. 130 :  YARD \_\_\_\_\_ :  \_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

*THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.*

DRIVER: \_\_\_\_\_  
(SIGNATURE)

FACILITY REPRESENTATIVE: \_\_\_\_\_  
(SIGNATURE)

White - Sundance  
Revised 12/27/95

Canary - Sundance Acct #1

Pink - Sundance Acct #2

Gold - Transporter

Superior Printing Service, Inc.

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.

N/A

Manifest Doc. No.

27

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone ( )

505 476-3488

5. Transporter 1 Company Name

Chaparral Services, Inc.

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

12. Containers

No.

Type

13. Total  
Quantity

14. Unit  
Wt/Vol

a. Tank Bottom

1 Tank / 30 Bbl

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Kelly Roach

Signature

Kelly Roach

Month Day Year

11/02/03

GENERATOR

TRANSPORTER

FACILITY

ORIGINAL - RETURN TO GENERATOR

# Sundance Services, Inc.

№ 70043

P. O. Box 1737 ★ Eunice, New Mexico 88231

(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: *Kuno Environmental*

LEASE NAME: *Hiabo SW*

TRANSPORTER COMPANY: *Chaparral*

TIME

AM/PM

DATE: *10/21/03*

VEHICLE NO.: *4 21*

DRIVER NO.:

CHARGE TO: *Diamond Back*

## TYPE OF MATERIAL

Production Water

Drilling Fluids

Completion Fluids

Tank Bottoms

Contaminated Soil

C-117 No.:

Other Material:

BS&W Content:

Description: *solids*

VOLUME OF MATERIAL  BBLs. *130*

YARD

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

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DRIVER: *Sergio Garcia*

(SIGNATURE)

FACILITY REPRESENTATIVE: *Terry Roach*

(SIGNATURE)

White - Sundance  
Revised 12/27/95

Canary - Sundance Acct #1

Pink - Sundance Acct #2

Gold - Transporter

Superior Printing Service, Inc.

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.

N/A

Manifest Doc. No.

28

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone  
505 476-3488

5. Transporter 1 Company Name

Chaparral Services, Inc

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

a. Produced H<sub>2</sub>O / Tank bottoms

12. Containers

No.

Type

13. Total  
Quantity

14. Unit  
Wt/Vol

1

TANK  
B

110

BBL

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Abraham Navarrette

Signature

Abraham Navarrette

Month Day Year

10/1/03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Kelly Road

Signature

Kelly Road

Month Day Year

11/01/03

GENERATOR

TRANSPORTER

FACILITY

ORIGINAL - RETURN TO GENERATOR

# Sundance Services, Inc.

№ 70045

P. O. Box 1737 ★ Eunice, New Mexico 88231

(505) 394-2511

28

LEASE OPERATOR/SHIPPER/COMPANY: *Rhino Environmental*

LEASE NAME: *ALIAHO SWD*

TRANSPORTER COMPANY: *Pate*

TIME

AM/PM

DATE: *10/21/03* VEHICLE NO.: *# 59*

DRIVER NO.:

CHARGE TO: *Diamond Back*

## TYPE OF MATERIAL

Production Water

Drilling Fluids

Completion Fluids

Tank Bottoms

Contaminated Soil

C-117 No.: \_\_\_\_\_

Other Material:

BS&W Content: \_\_\_\_\_

Description: *solid*

*Ticket*

VOLUME OF MATERIAL  BBSL. *110* :  YARD :

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HERewith IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

*THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.*

DRIVER: \_\_\_\_\_  
(SIGNATURE)

FACILITY REPRESENTATIVE: *Billy Road*  
(SIGNATURE)

White - Sundance  
Revised 12/27/95

Canary - Sundance Acct #1

Pink - Sundance Acct #2

Gold - Transporter

Superior Printing Service, Inc.

Home

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

Manifest Doc. No. 29

2. Page 1 of

3. Generator's Name and Mailing Address

N/A

4. Generator's Phone ( )

New Mexico Oil Conservation Division  
1220 South St. Francis Drive

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E

5. Transporter 1 Company Name

Santa Fe, New Mexico 87695  
US EPA ID Number

A. Transporter's Phone  
Lea County, NM

7. Transporter 2 Company Name

Chaparral Services, Inc.

8. US EPA ID Number  
N/A

B. Transporter's Phone  
505-397-3044

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Lea County

10. US EPA ID Number  
N/A

C. Facility's Phone  
505-394-2511

11. Waste Shipping Name and Description

Lea County

12. Containers

No.

Type

13. Total Quantity

14. Unit Wt/Vol

a. Hydrocarbon impacted Soil

1

Drum

130

BBL

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Rene Leonides

Signature

Month Day Year

10 21 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Sundance Serv.

Printed/Typed Name

Fabian Fabola

Signature

Month Day Year

10 21 03

GENERATOR

TRANSPORTER

FACILITY

# Sundance Services, Inc.

№ 70051

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

LEASE OPERATOR/SHIPPER/COMPANY: Khina

LEASE NAME: Aruba Disposal

TRANSPORTER COMPANY: Chaparral

TIME

AM/PM

DATE: 10/21/07

VEHICLE NO.: # 741

DRIVER NO.:

CHARGE TO: Diamond Back

## TYPE OF MATERIAL

Production Water

Drilling Fluids

Completion Fluids

Tank Bottoms

Contaminated Soil

C-117 No.: \_\_\_\_\_

Other Material:

BS&W Content: \_\_\_\_\_

Description: Solids

VOLUME OF MATERIAL  BBLs. 130 :

YARD \_\_\_\_\_ :

\_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

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DRIVER: \_\_\_\_\_

(SIGNATURE)

FACILITY REPRESENTATIVE: \_\_\_\_\_

(SIGNATURE)

White - Sundance  
Revised 12/27/95

Canary - Sundance Acct #1

Pink - Sundance Acct #2

Gold - Transporter

Superior Printing Service, Inc.

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.

Manifest Doc. No.

2. Page 1  
of

30

3. Generator's Name and Mailing Address

N/A

4. Generator's Phone ( )

New Mexico Oil Conservation Division  
1220 South St. Francis Drive

Araho Disposal Facility  
WE/4, SE/4, Sec 1, T17S, R31E  
Jea County, NM

5. Transporter 1 Company Name

505-476-3488

Santa Fe, New Mexico 87505

US EPA ID Number

A. Transporter's Phone

7. Transporter 2 Company Name

Chaparral Services, Inc.

8.

US EPA ID Number

N/A

B. Transporter's Phone

505-397-3044

9. Designated Facility Name and Site Address

Sundance Services  
2 miles East on Hwy 18  
Jea County

10.

US EPA ID Number

N/A

C. Facility's Phone

505-394-2511

11. Waste Shipping Name and Description

12. Containers

13. Total Quantity

14. Unit Wt/Vol

a. Produced H<sub>2</sub>O / Tank Bottoms

1

Tank

130

BBL

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

Non Hazardous

N/A

15. Special Handling Instructions and Additional Information

#5 Address: PO Drawer 1769, Eunice, NM 88231

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

*Thyrlis*

Signature

Month Day Year

10 01 03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

*Gene Acosta*

Signature

*[Signature]*

Month Day Year

10 16 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

*Zach Rand*

Signature

*[Signature]*

Month Day Year

10 16 03

GENERATOR

TRANSPORTER

FACILITY

# Sundance Services, Inc.

NO 69949

P. O. Box 1737 ★ Eunice, New Mexico 88231  
(505) 394-2511

30

LEASE OPERATOR/SHIPPER/COMPANY: *Khimo Services*  
LEASE NAME: *Arabo SWD*  
TRANSPORTER COMPANY: *Chaparral* TIME \_\_\_\_\_ AM/PM  
DATE: *10/10/05* VEHICLE NO.: *#74* DRIVER NO.:

CHARGE TO: *Diamond Back SWD*

### TYPE OF MATERIAL

Production Water                       Drilling Fluids                       Completion Fluids  
 Tank Bottoms                               Contaminated Soil                       C-117 No.: \_\_\_\_\_  
 Other Material:                               BS&W Content: \_\_\_\_\_

Description: *sdds*

VOLUME OF MATERIAL  BBLs. *130* :  YARD \_\_\_\_\_ :  \_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

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DRIVER: *[Signature]*  
(SIGNATURE)

FACILITY REPRESENTATIVE: *[Signature]*  
(SIGNATURE)

Attachment E

**Attachment E**  
**Waste Disposal Manifest – Tank Contents - Solids**

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.

N/A

Manifest Doc. No.

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
NE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone ( 476-3488

5. Transporter 1 Company Name

Rhino Environmental Services, Inc.

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Rhino Environmental Services, Inc. OCD  
Goo-Yea South  
8 miles south of Hobbs on hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-247-4646

11. Waste Shipping Name and Description

12. Containers

No. Type

13. Total  
Quantity

14. Unit  
Wt/Vol

a. Mix bottom Soils

1. dump 20 cy

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Jenny Riveno

Signature

*Jenny Riveno*

Month Day Year

10 23 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

#5 Address: PO Box 57180, Albuquerque, NM 87187

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

En Harrison

Signature

*En Harrison*

Month Day Year

10 23 03

GENERATOR

TRANSPORTER

FACILITY

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.

N/A

Manifest Doc. No.

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
NE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone (505) 476-3488

5. Transporter 1 Company Name

Rhino Environmental Services, Inc.

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Rhino Environmental Services, Inc. OCD  
Goo-Yea South  
8 miles south of Hobbs on hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-247-4646

11. Waste Shipping Name and Description

12. Containers

No.

Type

13. Total  
Quantity

14. Unit  
Wt/Vol

a. Mix bottom S&T's

1

Dump

14 yd

b.

1

14 yd

c.

1

14 yd

d.

1

14 cy

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Bryan Ellis

Signature

B Ellis

Month Day Year

11 02 05

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

#5 Address: PO Box 57180, Albuquerque, NM 87187

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Lindsay Dyer

Signature

Lindsay Dyer

Month Day Year

11 02 05

GENERATOR

TRANSPORTER

FACILITY

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.

N/A

Manifest Doc. No.

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
NE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone  
505 476-3488

5. Transporter 1 Company Name

Rhino Environmental Services, Inc.

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Rhino Environmental Services, Inc. OCD  
Goo-Yea South  
8 miles south of Hobbs on hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-247-4646

11. Waste Shipping Name and Description

12. Containers

No.

Type

13. Total  
Quantity

14. Unit  
Wt/Vol

a. Dry Mixed Bottoms

1

20 yd

b.

1

20 yd

c.

d.

D. Additional Descriptions for Materials Listed Above

Non Hazardous

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Jerry Rivers

Signature

Month Day Year

10 23 93

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

#5 Address: PO Box 57180, Albuquerque, NM 87187

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Louise Dyer

Signature

Month Day Year

11 0 23 03

GENERATOR

TRANSPORTER

FACILITY

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No. N/A Manifest Doc. No. 2. Page 1 of

3. Generator's Name and Mailing Address  
**New Mexico Oil Conservation Division  
 1220 South St. Francis Drive  
 Santa Fe, New Mexico 87505**

Araho Disposal Facility  
 NE/4, SE/4, Sec 1, T17S, R31E  
 Lea County, NM

4. Generator's Phone 505 476-3488  
 5. Transporter 1 Company Name **Rhino Environmental Services, Inc.**  
 6. US EPA ID Number N/A  
 A. Transporter's Phone 505-397-3044

7. Transporter 2 Company Name  
 8. US EPA ID Number  
 B. Transporter's Phone

9. Designated Facility Name and Site Address  
**Rhino Environmental Services, Inc. OCD  
 Goo-Yea South  
 8 miles south of Hobbs on hwy 18  
 Lea County**  
 10. US EPA ID Number N/A  
 C. Facility's Phone 505-247-4646

11. Waste Shipping Name and Description	12. Containers		13. Total Quantity	14. Unit Wt/Vol
	No.	Type		
a. <u>Dry Mixed Bottoms</u>			<u>20</u>	<u>90</u>
b. <u>    </u>			<u>20</u>	<u>90</u>
c. <u>    </u>			<u>20</u>	<u>90</u>
d. <u>    </u>			<u>20</u>	<u>90</u>

D. Additional Descriptions for Materials Listed Above  
Non Hazardous

E. Handling Codes for Wastes Listed Above  
N/A

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.  
 Printed/Typed Name \_\_\_\_\_ Signature \_\_\_\_\_ Month Day Year \_\_\_\_\_

17. Transporter 1 Acknowledgement of Receipt of Materials  
 Printed/Typed Name Jenny Riveno Signature \_\_\_\_\_ Month Day Year 10 12 03

18. Transporter 2 Acknowledgement of Receipt of Materials  
 Printed/Typed Name \_\_\_\_\_ Signature \_\_\_\_\_ Month Day Year \_\_\_\_\_

19. Discrepancy Indication Space  
#5 Address: PO Box 57180, Albuquerque, NM 87187

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.  
 Printed/Typed Name Linsay Dyle Signature \_\_\_\_\_ Month Day Year 11 02 03

GENERATOR  
TRANSPORTER  
FACILITY

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
N/A

Manifest Doc. No. 2. Page 1 of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
NE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone 505 476-3488

5. Transporter 1 Company Name

Rhino Environmental Services, Inc.

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Rhino Environmental Services, Inc. OCD  
Goo-Yea South  
8 miles south of Hobbs on hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-247-4646

11. Waste Shipping Name and Description

12. Containers

13. Total Quantity

14. Unit Wt/Vol

a. Dry Mixed Bottom

20

b. c. c.

20

c. d.

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

Non Hazardous

N/A

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

X Raul Alvarado

X Raul Alvarado

11/01/2003

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

#5 Address: PO Box 57180, Albuquerque, NM 87187

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

Linsley Dyer

Linsley Dyer

11/02/2003

GENERATOR

TRANSPORTER

FACILITY

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No. *N/A* Manifest Doc. No. 2. Page 1 of

3. Generator's Name and Mailing Address  
 New Mexico Oil Conservation Division  
 1220 South St. Francis Drive  
 Santa Fe, New Mexico 87505

Araho Disposal Facility  
 NE/4, SE/4, Sec 1, T17S, R31E  
 Lea County, NM

4. Generator's Phone ( *505* ) *476-3488*

5. Transporter 1 Company Name *Rhino Environmental Services, Inc.* 6. US EPA ID Number *N/A* A. Transporter's Phone *505-397-3044*

7. Transporter 2 Company Name 8. US EPA ID Number B. Transporter's Phone

9. Designated Facility Name and Site Address *Rhino Environmental Services, Inc. OCD  
Goo-Yea South  
8 miles south of Hobbs on hwy 18  
Lea County* 10. US EPA ID Number *N/A* C. Facility's Phone *505-247-4646*

11. Waste Shipping Name and Description	12. Containers		13. Total Quantity	14. Unit Wt/Vol
	No.	Type		
a. <i>load of mixed soil dry</i>			<i>15yd</i>	<input checked="" type="checkbox"/>
b. <i>cc a 21</i>			<i>15yd</i>	<input checked="" type="checkbox"/>
c. <i>u 21 11</i>			<i>15yd</i>	<input checked="" type="checkbox"/>
d. <i>u 21 9</i>			<i>15yd</i>	<input checked="" type="checkbox"/>

D. ~~Additional Descriptions for Materials Listed Above~~ *u u u* Non Hazardous

E. ~~Handling Codes for Wastes Listed Above~~ *15yd* N/A

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name \_\_\_\_\_ Signature \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_ Year \_\_\_\_\_

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name \_\_\_\_\_ Signature \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_ Year *11/22/03*

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name *X DAVID CARTER* Signature \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_ Year \_\_\_\_\_

19. Discrepancy Indication Space

*#5 Address: PO Box 57180, Albuquerque, NM 87187*

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name *Stacy Dyer* Signature *Stacy Dyer* Month \_\_\_\_\_ Day \_\_\_\_\_ Year *11/22/03*

GENERATOR  
TRANSPORTER  
FACILITY

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.

N/A

Manifest Doc. No.

2. Page 1  
of

3. Generator's Name and Mailing Address

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Araho Disposal Facility  
NE/4, SE/4, Sec 1, T17S, R31E  
Lea County, NM

4. Generator's Phone

505 476-3488

5. Transporter 1 Company Name

Rhino Environmental Services, Inc.

6. US EPA ID Number

N/A

A. Transporter's Phone

505-397-3044

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Rhino Environmental Services, Inc. OCD  
Goo-Yea South  
8 miles south of Hobbs on hwy 18  
Lea County

10. US EPA ID Number

N/A

C. Facility's Phone

505-247-4646

11. Waste Shipping Name and Description

a. Hydrocarbon impacted soils

12. Containers  
No. Type

6 BD 120 cy

13. Total  
Quantity

14. Unit  
Wt/Vol

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

N/A

15. Special Handling Instructions and Additional Information

Non Hazardous

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

JUAN GARCIA

Signature

Juan Garcia

Month Day Year

11 0 23 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

#5 Address: PO Box 57180, Albuquerque, NM 87187

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

LINSEY DYER

Signature

Linsy Dyer

Month Day Year

11 0 23 03

GENERATOR

TRANSPORTER

FACILITY

Attachment F

**Attachment F**  
**Tank (Steel) Receipt**

NOV-18-2003 TUE 04:50 PM STEEL\_DEPOT

5053939393

P. 02

**Hobbs Iron and Metal, Inc.**

505 393-1726

P. O. BOX 2007

HOBBES, NEW MEXICO 88240

Nov 18, 2003

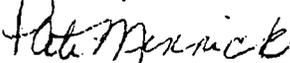
Rhino Environmental  
200 Sunset Dr.  
Suite D  
El Paso, Tx 79922

Re: Scrap Tkts #36216 &amp; #36230

Dear Sir:

We purchased the material that was listed on the above referenced tickets for the sole purpose of recycling. The material was cut in 3' lengths by a shear, loaded on a railcar, and shipped to Chaparral Steel Mills in Dallas. They then melted the material down to form new steel products. I hope this answers the questions you have.

Sincerely, -



Pati Minnick  
Bookkeeper

# HOBBS IRON & METAL, INC.

920 S. GRIMES • P.O. BOX 2007 • 505-393-1726

HOBBS, NEW MEXICO 88241

Date: 10/24/03  
 Name: RHINO ENVIRONMENTAL  
 Address: LOVINGTON HWY  
 City: HOBBS

Ticket Number: 36230  
 License Number: JUSTIN R

KD

ORIGINAL PRINTED 10/24/03

For and in consideration of the sum of \_\_\_\_\_, I hereby bargain, sell, transfer and assign to HOBBS IRON & METAL, INC. the following personal property, to-wit:

ITEM	GROSS	TARE	NET
Unprepared Steel	36540	33780	2760
Unprepared Steel	40740	36850	3890
Unprepared Steel	30380	25330	5050
Unprepared Steel	41070	35740	5330
Unprepared Steel	39150	28360	10790
Unprepared Steel	38130	28270	9860
Unprepared Steel	41930	28220	13710



# NOLAN H. BRUNSON, INC.

P.O. BOX 2390 • HOBBS, NEW MEXICO 88241-2390

TELEPHONE (505) 393-6169

TOLL FREE 1-800-321-8993

N.M.S.C.C. 1300  
TEX. A.R.C. 22000  
I.C.C. MC-216467

**B** RHINO ENVIRONMENTAL SERVICES, INC.  
P. O. BOX 57180  
ALBUQUERQUE NM 87187

INVOICE NO.	2310203
B/L NO.	
DATE BILLED	10/27/03
CUSTOMER'S ORDER NO.	
ORDERED BY	STEVE

LOCATION: ARAJO REINJECTION FACILITY NM TO:

DESCRIPTION OF SERVICES	HOURS OR WEIGHT	RATE	AMOUNT
10/22/03			
PRE-JOB PLANNING & SAFETY BRIEFING PRIOR TO JOB.			
FURNISH LABOR AND EQUIPMENT TO THE ABOVE LOCATION TO LOAD TWO 500 BBL. TANKS AND HAUL TO THE DISPOSAL SITE AND UNLOAD AS DIRECTED.			
SUPERVISOR: ANTHONY ARMIJO	10.00		
EXTRA LABOR: TOMAS GUZMAN	10.00		
DRIVER: EDUARDO MORENO			
NEW MEXICO TRUCK CATEGORY 3	10.00		
ESCORT VEHICLE	4.00		
FUEL SURCHARGE NM	1.00		
REPAIR 750 BBL. SIDE STRAP	1.00		

## ORIGINAL

NET AMOUNT:  
TAX %: 6.125  
GROSS AMOUNT:

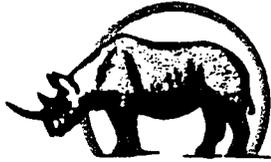
EW/so

STARTED 00:00  
FINISHED 00:00  
OF WORK 10/22/03

CUSTOMER'S SIGNATURE

CONTRACTOR'S SIGNATURE

ACCEPTANCE CONSTITUTES AGREEMENT THAT WEIGHT AND COUNT ARE ACTUAL  
OIL FIELD CONTRACTORS - PRE-CAST UNIT FOUNDATIONS - OIL FIELD TRUCKING



# RHINO

## Environmental Services, Inc.

200 Sunset Drive, Suite D, El Paso, Texas  
Phone (915) 842-9911 • Fax (915) 842-9933  
[www.rhinoservices.net](http://www.rhinoservices.net)

### CERTIFICATE OF DESTRUCTION BILL OF SALE

Date: November 17, 2003

Seller of Tanks

Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87585

Tank Facility

Araho Injection Facility  
Lovington, NM

Buyer of Tanks

Rhino Environmental Services, Inc.  
P.O. Box 57180  
Albuquerque, New Mexico 87187

Tank Identification: (2) - 500 Barrel Steel Tank  
(1) - 200 Barrel Steel Tank

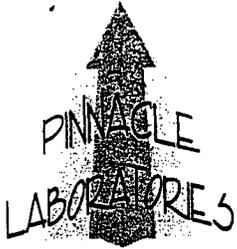
Rhino Environmental Services, Inc. (Rhino) accepts ownership of the above described tanks. The tanks were transported to the Goo Yea South facility just south of Hobbs, New Mexico. Upon transfer of ownership dated October 22, 2003, Rhino relieves the former owner and accepts all future liabilities connected with the tanks.

I certify that any residual solids will be removed from the above described tanks, and that each tank will be cut into scrap and recycled and/or disposed of in accordance with all applicable local, state, and federal regulations.

Steve Dyer  
Project Manager

Attachment G

**Attachment G**  
**Lead-based Paint Sampling Results (paint samples from Site tanks)**



2709-D Pan American Freeway NE  
 Albuquerque, New Mexico 87107  
 Phone (505) 344-3777  
 Fax (505) 344-4413

**COPY**

Bill N.M. Oil Conservation Division  
 To: 1220 South St. Francis Dr.  
 Santa Fe, NM 87505

Date	Invoice
4/30'03	84904

Client #: 810-134

Project #: Araho Site

Original  
 BALANCE DUE: 42.00

PO Number	Terms	Project
	Net 30	PIN ALB-810

Quantity	Description	Rate	Amount
1	Item-045 Lead: AA Method 7421 Non-Aq Item-0083 7-Day Turn Around Surcharge	28.00 50.00 %	28.00 14.00
Remit to: Pinnacle Laboratories, Inc. 2709-D Pan American Freeway NE Albuquerque, NM 87107			
Accession #: 304120 Authorized By: Martyne Kieling		TOTAL:	42.00





2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

PL I.D. 304120

May 1, 2003

NMOCD  
1220 S. St. Francis Drive  
Santa Fe, NM 87505

RESPEC  
4775 Indian School Rd NE  
Suite 300  
Albuquerque, NM 87110

Project Name/Number: ARAHO SITE

Attention: Martyne Kieling/John Bunch

On 04/17/03, Pinnacle Laboratories Inc., (ADHS License No. AZ0643 pending), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

H. Mitchell Rubenstein, Ph.D.  
General Manager

MR:jt

Enclosure



2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

CLIENT : NM OIL CONSERVATION DIVISION      DATE RECEIVED : 04/17/03  
PROJECT # : ARAHO SITE  
PROJECT NAME : (NONE)      REPORT DATE : 05/01/03

PL ID: 304120

PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01 304120-01	PAINT CHIPS FROM SITE TANKS	AQUEOUS	04/14/03

---TOTALS---

MATRIX                      #SAMPLES  
AQUEOUS                      1

LOG NO: C3-04424  
Received: 18 APR 03  
Reported: 24 APR 03

Ms. Jacinta Tenorio  
Pinnacle Laboratories  
2709-D Pan American Freeway Northeast  
Albuquerque, NM 87107

Cl Project No: 304120

Project: 304120, NMOCD ARAHO SITE  
Sampled By: Client  
Code: 121530425  
Page 1

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
04424-1	304120-01	04-14-03/16:05
PARAMETER		04424-1
Lead (6010B), mg/kg		210
Dilution Factor		2
Prep Date		04.21.03
Analysis Date		04.22.03
Batch ID		PS065
Prep Method		3050B
Analyst		GSP

LOG NO: C3-04424  
Received: 18 APR 03  
Reported: 24 APR 03

Ms. Jacinta Tenorio  
Pinnacle Laboratories  
2709-D Pan American Freeway Northeast  
Albuquerque, NM 87107

Cl Project No: 304120

Project: 304120, NMOCD ARAHO SITE  
Sampled By: Client  
Code: 121530425

REPORT OF RESULTS

Page 2

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
04424-2	Method Blank	
04424-3	Lab Control Standard % Recovery	
04424-4	Matrix Spike % Recovery	
04424-5	Matrix Spike Duplicate % Recovery	

PARAMETER	04424-2	04424-3	04424-4	04424-5
Lead (6010B), mg/kg	<0.50	97 %	N/C	N/C
Dilution Factor	1	---	---	---
Prep Date	04.21.03	---	---	---
Analysis Date	04.22.03	---	---	---
Batch ID	PS065	PS065	PS065	PS065
Prep Method	3050B	---	---	---
Analyst	GSP	---	---	---

These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL Project Manager who signed this test report. See the Project Sample Inspection Form (PSIF) to determine if a sample was received that did not meet EPA requirements for sample collection, preservation, or holding time.

*Lance Larson*  
Lance Larson, Project Manager

Final Page Of Report

**STL Pensacola Data Qualifiers for Final Report**

- B The analyte was detected in the associated method blank and in the client's sample.
- C The compound has been quantitated against a one point calibration.
- D Recovery is not calculable due to dilution.
- E Estimated value because the analyte concentration exceeds the upper calibration range of the instrument or method.
- I Estimated value because the analyte concentration is less than the lower calibration range of the instrument but is at the method detection limit or greater than the method detection limit.
- H Sample and/or duplicate is below 5 X (times) the STL Reporting Limit and the absolute difference between the results exceeds the STL Reporting Limit.
- J1 A sample surrogate or an LCS target compound recovered above the upper control limit (UCL). Compounds qualified with a J1 may be biased high.
- J2 A sample surrogate or an LCS target compound recovered outside the lower control limit (LCL). Compounds qualified with a J2 may be biased low.
- M1 A matrix effect was present.
- M2 The MS and/or MSD %R or RPD was outside upper or lower control limits; not necessarily due to matrix effect.
- N/C Not Calculable; Sample spiked is > 4X spike concentration (may use this flag in place of negative numbers).
- R1 Internal standard area exceeds the acceptance criteria
- R2 Calibration verification exceeds the acceptance criteria.
- S1 The Method of Standard Additions (MSA) has been performed on this sample.
- T Second-column or detector confirmation exceeded the SW-846 criteria of 40% RPD for this compound.
- TIC The compound is not included in the initial calibration curve. It is searched for qualitatively or as a Tentatively Identified Compound.
- U or < The analyte was not detected at or above the MDL or the RL, whichever is entered next to the "U" or "<".
- W Post-digestion spike for Furnace AA is out of control limits (85-115%), while sample absorbance is less than 50% spike absorbance.

It is permissible to submit an Out-of-Control Events/Corrective Action form and/or Case Narrative in lieu of using above qualifiers.

When the laboratory receives a sample that does not meet EPA requirements for sample collection, preservation or holding time, the laboratory is required to reject the samples. The client must be notified and asked whether the lab should proceed with analysis. Data from any samples that do not meet sample acceptance criteria (collection, preservation and holding time), must be flagged, or noted on a corrective action form or case narrative, or addressed on the Project Sample Inspection Form (PSIF) in an unambiguous manner clearly defining the nature and substance of the variation. NPDES samples from North Carolina that do not meet EPA requirements for sample collection, preservation or holding time are non-reportable for NPDES compliance monitoring.

Abbreviations

- ND Not Detected at or above the STL Pensacola reporting limit (RL)
- NS Not Submitted
- NA Not Applicable
- MDL STL Pensacola Method Detection Limit
- RL STL Pensacola Reporting Limit
- NoMS Not enough sample provided to prepare and/or analyze a method-required matrix spike (MS) and/or duplicate (MSD)

Florida Projects Inorganic/Organic

Refer to FL DEP 62-160.700(7); Table 7 Data Qualifier Codes. FL DEP Rule 62-160.670(1)(h) states that laboratories shall include the analytical result for each analysis with applicable data qualifiers. FL DEP Rule 62-160.700(7), Table 7 lists the FL DEP data qualifiers. FL DEP Rule 62-160.700(3), Table 3 lists the Florida sites which require data qualifiers.

AFCEE QAPP Projects

Refer to AFCEE QAPP for appropriate data qualifiers (AFCEE QAPP Version will be specified by client for the project).

Arizona DEQ Projects

Any qualified data submitted to Arizona DEQ (ADEQ) after January 1, 2001 must be designated using the Arizona Data Qualifiers as developed by the Arizona ELAC technical subcommittee. Refer to the ADEQ qualifier list.

CLP and CLP-like Projects

Refer to referenced CLP Statement of Work (SOW) for explanation of data qualifiers. CLP SOW to be followed must be specified to client.

# STL Pensacola PROJECT SAMPLE INSPECTION FORM

**SEVERN  
TRENT** **STL**

Lab Order #: C304424

Date Received: 4/18/03

- |  |  |
|--|--|
| <p>1. Was there a Chain of Custody? <input checked="" type="radio"/> Yes <input type="radio"/> No*</p> <p>2. Was Chain of Custody properly filled out and relinquished? <input checked="" type="radio"/> Yes <input type="radio"/> No*</p> <p>3. Were all samples properly labeled and identified? <input checked="" type="radio"/> Yes <input type="radio"/> No*</p> <p>4. Were samples received cold? (Criteria: 2° - 6°C: STL-SOP 1055) <input checked="" type="radio"/> Yes <input type="radio"/> No* <input type="radio"/> N/A</p> <p>5. Did samples require splitting or compositing*? <input type="radio"/> Yes* <input checked="" type="radio"/> No</p> <p>6. Were samples received in proper containers for analysis requested? <input checked="" type="radio"/> Yes <input type="radio"/> No*</p> <p>7. Were all sample containers received intact? <input checked="" type="radio"/> Yes <input type="radio"/> No*</p> | <p>8. Were samples checked for preservative? (Check pH of all H<sub>2</sub>O requiring preservative (STL-PN SOP 917) except VOA vials that require zero headspace)* <input type="radio"/> Yes <input type="radio"/> No* <input checked="" type="radio"/> N/A</p> <p>9. Is there sufficient volume for analysis requested? <input checked="" type="radio"/> Yes <input type="radio"/> No* <input type="radio"/> N/A (Can)</p> <p>10. Were samples received within Holding Time? (REFER TO STL-SOP 1040) <input checked="" type="radio"/> Yes <input type="radio"/> No*</p> <p>11. Is Headspace visible &gt; ¼" in diameter in VOA vials?* <input type="radio"/> Yes* <input type="radio"/> No <input checked="" type="radio"/> N/A</p> <p>12. Were Trip Blanks Received? <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A</p> <p>13. If sent, were matrix spike bottles returned? <input type="radio"/> Yes <input type="radio"/> No* <input checked="" type="radio"/> N/A</p> <p>14. If sent, were T-Handles returned? <input type="radio"/> Yes <input type="radio"/> No* <input checked="" type="radio"/> N/A</p> <p>15. If any issues, how was PM notified? PSIF <input checked="" type="checkbox"/> Verbal <input type="checkbox"/></p> |
|--|--|

Airbill Number(s): 12878168 01 4408 8080 Shipped By:  UPS  FedX  HD  BUS  ABX  
(HD - Hand Delivery)

Cooler Numbers & Temp(s) (°C): Client 4°  
(IE. 340L-4°C-CCK8 - LIST THERMOMETER NUMBER FOR VERIFICATION)

**Out of Control Events and Inspection Comments (list sample IDs/Tests where appropriate):**

1-3. COC/Sample ID/COC discrepancy: The COC Shows the Matrix as HQ but they are Solid Para Chips

4. Insufficient Ice  Delay in delivery  Other

5. Samples were Split  Composited  Requested by: Client  PM  Other: \_\_\_\_\_

6. Improper Containers (ID/Size/desc): \_\_\_\_\_

7. Broken bottles/Test: \_\_\_\_\_

8. Incorrect pH: \_\_\_\_\_

9. Test/Matrix/Volume: \_\_\_\_\_

10. Out of Holding Time/Test: \_\_\_\_\_

11. VOA headspace > 1/4" (list size) \_\_\_\_\_

List additional comments by above number: \_\_\_\_\_

(USE BACK OF PSIF FOR ADDITIONAL NOTES AND COMMENTS)

Inspected By: MHS Date: 4/18/03 Logged By: [Signature] Date: 04/18/03

...on Comment Section of this form. For holding times, the analytical department will flag immediate hold time samples (pH, Dissolved O<sub>2</sub>, Residual Chlorine) and these samples will not be documented on this form. Volatile sample values may be compromised due to sample splitting (compositing) and other reported issues. Refer to the pH log provided (STL-SOP 938).

**STL PENSACOLA**  
**Certifications, Memberships & Affiliations**

Alabama Department of Environmental Management, Laboratory ID No. 40150 (Drinking Water by Reciprocity with FL), expires 06/30/03

Arizona Department of Health Services, Lab ID No. AZ0589 (Hazardous Waste & Wastewater), expires 01/11/04

Arkansas Department of Pollution Control and Ecology, (No Laboratory ID No. assigned by state) (Environmental), expires 02/20/03

California Department of Health Services, ELAP Laboratory ID No. I-2510 (Hazardous Waste and Wastewater), expires 03/31/03

Connecticut Department of Health Services, Connecticut Lab Approval No. PH-0697 (D W, H W and Wastewater), expires 09/30/03

Florida DOH, NELAP Laboratory ID No. E81010 (Drinking Water, Hazardous Waste and Wastewater), expires 06/30/03

Florida DEP/DOH CompQAP # 980156

Iowa Department of Natural Resources, Laboratory ID No. 367 (UST), expires 08/01/04

Kansas Department of Health & Environment, NELAP Laboratory ID No. E10253 (Wastewater and Hazardous Waste), expires 10/31/03

Kentucky NR&EPC, Laboratory ID No. 90043 (Drinking Water), expires 12/31/03.

Louisiana DEQ, LELAP, NELAP Laboratory ID No. 02075, Agency Interest ID 30748 (Environmental, expires 6/30/03)

Maryland DH&MH Laboratory ID No. 233 (Drinking Water by Reciprocity with Florida), expires 09/30/03

Massachusetts DEP, Laboratory ID No. M-FL094 (Wastewater), expires 06/30/03

Michigan Bureau of E&OcCH, Laboratory ID No.9912 (Drinking Water by Reciprocity with Florida), expires 06/30/03

New Hampshire DES ELAP, NELAP Laboratory ID No. 250502 (Drinking Water & Wastewater), expires 08/16/03

New Jersey DEP&E, NELAP Laboratory ID No. FL006 (Wastewater and Hazardous Waster), expires 06/30/03.

New York State Department of Health, NELAP Laboratory ID No. 11503 (WW and Solids/Hazardous Waste), expires 06/16/2003

North Carolina DENR, Laboratory ID No. 314 (Hazardous Waste and Wastewater), expires 12/31/03.

North Dakota DH&Consol Labs, Laboratory ID No. R-108 Wastewater and Hazardous Waste by Reciprocity with Florida), expires 06/30/03

Oklahoma Department of Environmental Quality, Laboratory ID No. 9810 (Hazardous Waste and Wastewater), expires 08/31/03

Pennsylvania Department of Environmental Resources, NELAP Laboratory ID No. 68-467 (Drinking Water & Wastewater), expires 12/01/03

South Carolina DH&EC, Laboratory ID No. 96026 (Wastewater & Solids/Hazardous Waste by Reciprocity with FL), expires 06/30/03

Tennessee Department of Health & Environment, Laboratory ID No. 02907 (Drinking Water), expires 08/03/04

Virginia Department of General Services, Laboratory ID No. 00008 (Drinking Water by Reciprocity with FL), expires 06/30/03.

Washington Department of Ecology, Laboratory ID No. C282 (Hazardous Waste and Wastewater), expires 09/14/03.

West Virginia DOE, Office of Water Resources, Laboratory ID No. 136 (Haz Waste and Wastewater), expires 04/30/02.

AIHA (American Industrial Hygiene Association) Accredited Laboratory, Laboratory ID No. 100704, expires April 1, 2004. Participant in AIHA sponsored Laboratory PAT Rounds

EPA ICR (Information Collection Rule) Approved Laboratory, Laboratory ID No. ICRFL031

NFESC (Naval Facilities Engineering Services Center), expires April 18, 2004/

USACE (United States Army Corps. of Engineers), MRD, expires June 30, 2003.

STL Pensacola also has a foreign soil permit to accept soils from locations other than the continental United States. Permit No. S-37599



SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:  
 COMPANY: Oil Conservation Division  
 ADDRESS: Attn. Martyne Kieling  
 1220 S. St. Francis Drive  
 PHONE: Santa Fe, NM 87505  
 FAX:  
 BILL TO: OCD  
 COMPANY:  
 ADDRESS:

ANALYSIS REQUEST	PETROLEUM HYDROCARBONS (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline) MTBE	8021 (BTEX) □ MTBE □ TMB □ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB □ / DBCP □	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310/8270-SIMS)	General Chemistry:	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals: Pb	NUMBERS CONTAINERS	

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
PAINT CHIPS FROM SITE TANKS	4-14-03	4:05	NAR	01

PROJECT INFORMATION  
 PROJ. NO.: ARAHO SITE  
 PROJ. NAME:  
 P.O. NO.:  
 SHIPPED VIA:  
 SAMPLE RECEIPT  
 NO CONTAINERS  
 CUSTODY SEALS  
 RECEIVED IN AC  
 BY: [Signature]

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS  
 (RUSH)  24hr  48hr  72hr  1 WEEK (NORMAL)   
 CERTIFICATION REQUIRED  NIM  SDWA  OTHER  
 METHANOL PRESERVATION   
 COMMENTS: FIXED FEE   
 Direct Bill to OCD  
 send copy of results to:  
 John Bunch @ RESPEC  
 4775 Indian School Rd NE, Suite 300  
 ABQ, NM 87110

RELINQUISHED BY: 1. Signature: [Signature] Time: 1:06  
 Printed Name: John R Bunch Date: 4-17-03  
 Company: See reverse side (Forca Majeura)  
 RELINQUISHED BY: 2. Signature: [Signature] Time: [Blank]  
 Printed Name: [Blank] Date: [Blank]  
 Company: [Blank]  
 RECEIVED BY: (LAB) 1. Signature: [Signature] Time: [Blank]  
 Printed Name: [Blank] Date: [Blank]  
 Company: Pinnacle Laboratories Inc.

PLEASE FILL THIS FORM IN COMPLETELY.



**Attachment H**  
**Miscellaneous Debris Waste Tickets**

### CONTROLLED RECOVERY, INC.

P.O. Box 388 • Hobbs, New Mexico 88241-0388  
(505) 393-1079

WASTE TICKET  
"AT COST"  
MISC TRASH

Bill to \_\_\_\_\_

Address \_\_\_\_\_

Company/Generator \_\_\_\_\_

Lease Name OC D  
Arabo SWD

Trucking Company Diambal Vehicle Number 503 Driver (Print) M. J. Jennings

Date 11/06/03 Time 1130 a.m. / p.m.

#### Type of Material

- Exempt
- Tank Bottoms
- Fluids
- Non-Exempt
- C117 \_\_\_\_\_
- Other Material
- C138 \_\_\_\_\_
- Soils
- List Description Below

#### DESCRIPTION

OC D  
☆ certificate of waste status  
Below grade  
pipe + associated trash from  
pipe + tank removal

Volume of Material  Bbls.  Yard 10  Gallons

Wash Out  Call Out  After Hours  Debris Charge

This statement applicable to exempt waste only.

I represent and warrant that the wastes are: generated from oil and gas exploration and production operations; exempt from Resource Conservation and Recover Act (RCRA) Subtitle C Regulations; and not mixed with non-exempt wastes.

Agent \_\_\_\_\_  
(Signature)

CRI Representative \_\_\_\_\_  
(Signature)

#### TANK BOTTOMS

	Feet	Inches	BBLS Received	BS&W	%
1st Gauge					
2nd Gauge			Free Water		
Received			Total Received		

NO 49737

White - CRI

Canary - CRI Accounting

Pink - CRI Agent

Gold - Transporter

RHINO ENVIRONMENTAL, INC.

1.365 <sup>966</sup> TRASH Per Steve

WASTE TICKET  
"AT COST"  
MISC TRASH

P2PPE CAMINO REAL ENVIRONMENTAL CENTER F

1000 Camino Real Boulevard  
Sunland Park, NM 88063  
(505) 589-9440

Bill Acct: ERHINO ENVIRONMF Haul Acct: RHINO ENVIRONM Ticket#:E523829F  
E00-0000628F 00-0000628

Vehicle# : 003 PO# : ---In--- ---Out---  
TT = 200-Commercial Date 10/28/03 10/28/03  
PT = 1-Charge Check # : Time 14:28 14:28

M -1E Material Types Rate/UM Vol/QY lbs Tax Tip  
Tot -0F  
MT = 30-Commercial 5 0 \$0.00

E Tip Amt  
ESpec Amt  
EAmt Tend 0.00F  
EExchange 0.00F  
EAmount

VOL/QY/CYD =

5.00

Driver: [Signature] Weighmaster: -1FRANCISCO CELIS -0

PPE F  
PNEW HRS. MON. - FRI. 7AM-4PM  
1-CELL 7

WASTE TICKET  
"AT COST"  
MISC. TRASH

P2PPE CAMINO REAL ENVIRONMENTAL CENTER F

1000 Camino Real Boulevard  
Sunland Park, NM 88063  
(505) 589-9440

Bill Acct: ERHINO ENVIRONMF Haul Acct: RHINO ENVIRONM Ticket#:E526035F  
E00-0000628F 00-0000628

Vehicle# : PO# : ---In--- ---Out---  
TT = 200-Commercial Date 11/06/03 11/06/03  
PT = 1-Charge Check # : Time 14:33 14:33

M -1E Material Types Rate/UM Vol/QY lbs Tax Tip  
Tot -0F  
MT = 30-Commercial 14 0 \$0.00

E Tip Amt  
ESpec Amt 0.00  
EAmt Tend  
EExchange 0.00F  
EAmount

VOL/QY/CYD =

14.00

Driver: [Signature] Weighmaster: -1FRANCISCO CELIS -0

PPE F  
PNEW HRS. MON. - FRI. 7AM-4PM  
1-CELL 7

WASTE TICKET

"At Cost"

Misc. TRASH

P2PPE CAMINO REAL ENVIRONMENTAL CENTERF

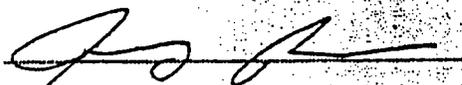
1000 Camino Real Boulevard  
Sunland Park, NM 88063  
(505) 589-9440

Bill Acct: ERHINO ENVIRONMF Haul Acct: RHINO ENVIRONM Ticket#:E525882F  
E00-0000628F 00-0000628

Vehicle# : 502-R PO# : ---In--- ---Out---  
TT = 200-Commercial Date 11/06/03 11/06/03  
PT = 1-Charge Check # : Time 09:29 09:29

M	-1E	Material Types	Rate/UM	Vol/QY	lbs	Tax	Tip
	Tot	-0F					
MT =	30-Commercial		\$5.00/CY	15	0	\$0.00	
			E	Tip Amt		@	F
				ESpec Amt	0.00		F
				E Amt Tend			
				EChange	0.00F		
				E	=====F		
				EAmount			

VOL/QY/CYD = 15.00 F

Driver:  Weighmaster: -MARIANO VALLE -0

PPE F  
PNEW HRS. MON. - FRI. 7AM-4PM  
1-CELL 7

ATTACHMENT I

**Attachment I**  
**Laboratory Analytical Results**

PINNACLE  
LABORATORIES

2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

Pinnacle Lab ID number      310136  
November 17, 2003

INTERA  
6501 AMERICAS PRKWY NE STE.820  
ALBUQUERQUE, NM    87110

NMOCD  
1220 South St. Francis Drive  
Santa Fe,            NM    87505

Project Name            ARAHO  
Project Number        ARAHO

Attention:            JOE TRACY/MARTYNE KIELING

On 10/24/03 Pinnacle Laboratories Inc., (ADHS Lincense No. AZ0643), received a request to analyze **non-aq** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA method 8015/8021 analyses were performed by Pinnacle Laboratories, Inc. Albuquerque, NM.

All remaining analyses were performed by Severn Trent Laboratories, Inc. Pensacola, FL.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.



H. Mitchell Rubenstein, Ph.D.  
General Manager, Pinnacle Laboratories, Inc.

MR: jt

Enclosure

PINNACLE  
LABORATORIES

2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

CLIENT : INTERA PINNACLE ID : 310136  
PROJECT # : ARAHO DATE RECEIVED : 10/24/03  
PROJECT NAME : ARAHO REPORT DATE : 11/17/03

PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
310136 - 01	T6-3B	NON-AQ	10/23/03
310136 - 02	T3-2	NON-AQ	10/23/03
310136 - 03	T3-4	NON-AQ	10/23/03
310136 - 04	T1W-1	NON-AQ	10/23/03
310136 - 05	T1E-1	NON-AQ	10/23/03
310136 - 06	RS1-3	NON-AQ	10/23/03
310136 - 07	RS2-2	NON-AQ	10/23/03
310136 - 08	T2-3	NON-AQ	10/23/03
310136 - 09	T1/3-3	NON-AQ	10/23/03
310136 - 10	T4-2B	NON-AQ	10/23/03
310136 - 11	RS3-3	NON-AQ	10/23/03
310136 - 12	T4-2	NON-AQ	10/23/03
310136 - 13	T5-2	NON-AQ	10/23/03
310136 - 14	T6-3	NON-AQ	10/23/03
310136 - 15	S6-2	NON-AQ	10/23/03
310136 - 16	RS4-3.5	NON-AQ	10/23/03
310136 - 17	RS5-1	NON-AQ	10/23/03
310136 - 18	DL1-2	NON-AQ	10/23/03
310136 - 19	S9-2	NON-AQ	10/23/03
310136 - 20	S1-5	NON-AQ	10/23/03
310136 - 21	S1-1N	NON-AQ	10/23/03
310136 - 22	S8-5	NON-AQ	10/23/03
310136 - 23	DL1-2B	NON-AQ	10/23/03
310136 - 24	C-1	NON-AQ	10/24/03
310136 - 25	C-3	NON-AQ	10/24/03
310136 - 26	C-5	NON-AQ	10/24/03
310136 - 27	C-7	NON-AQ	10/24/03
310136 - 28	C-8	NON-AQ	10/24/03
310136 - 29	C-6	NON-AQ	10/24/03
310136 - 30	C-4	NON-AQ	10/24/03
310136 - 31	C-2	NON-AQ	10/24/03
310136 - 32	C-9	NON-AQ	10/24/03
310136 - 33	C-10	NON-AQ	10/24/03
310136 - 34	C-11	NON-AQ	10/24/03
310136 - 35	C-13	NON-AQ	10/24/03

PINNACLE  
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Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED - METHANOL PRESERVATION  
 CLIENT : INTERA  
 PROJECT # : ARAHO  
 PROJECT NAME : ARAHO  
 PINNACLE I.D. : 310136  
 ANALYST : BP

SAMPLE	DATE	DATE	DATE	DIL.		
ID. #	CLIENT I.D.	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
01	T6-3B	NON-AQ	10/23/03	NA	10/27/03	1
02	T3-2	NON-AQ	10/23/03	NA	10/29/03	5
03	T3-4	NON-AQ	10/23/03	NA	10/27/03	1

PARAMETER	DET. LIMIT	UNITS	T6-3B	T3-2	T3-4
BENZENE	0.025	MG/KG	< 0.025	0.15	< 0.025
TOLUENE	0.025	MG/KG	< 0.025	0.24	< 0.025
ETHYLBENZENE	0.025	MG/KG	< 0.025	0.78	< 0.025
TOTAL XYLENES	0.050	MG/KG	< 0.050	0.73	< 0.050

SURROGATE:  
 BROMOFLUOROBENZENE (%) 102 111 112  
 SURROGATE LIMITS ( 80 - 120 )  
 DRY WEIGHT (%) 79 88 81

CHEMIST NOTES:  
 N/A

PINNACLE  
LABORATORIES

2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED - METHANOL PRESERVATION  
CLIENT : INTERA  
PROJECT # : ARAHO  
PROJECT NAME : ARAHO

PINNACLE I.D. : 310136  
ANALYST : BP

SAMPLE	DATE	DATE	DATE	DIL.
D. #	SAMPLED	EXTRACTED	ANALYZED	FACTOR
04	10/23/03	NA	10/27/03	1
05	10/23/03	NA	10/27/03	1
06	10/23/03	NA	10/29/03	2

PARAMETER	DET. LIMIT	UNITS	T1W-1	T1E-1	RS1-3
BENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.050
TOLUENE	0.025	MG/KG	< 0.025	< 0.025	< 0.050
ETHYLBENZENE	<b>0.025</b>	<b>MG/KG</b>	< 0.025	<b>0.030</b>	< 0.050
TOTAL XYLENES	0.050	MG/KG	< 0.050	< 0.050	< 0.10

SURROGATE:

PROMOFLUOROBENZENE (%)			116	111	106
SURROGATE LIMITS (80 - 120)					
DRY WEIGHT (%)			85	81	92

CHEMIST NOTES:

N/A

PINNACLE  
LABORATORIES

2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED - METHANOL PRESERVATION  
 CLIENT : INTERA PINNACLE I.D. : 310136  
 PROJECT # : ARAHO ANALYST : BP  
 PROJECT NAME : ARAHO

SAMPLE	DATE	DATE	DATE	DIL.		
ID. #	CLIENT I.D.	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
07	RS2-2	NON-AQ	10/23/03	NA	10/27/03	1
08	T2-3	NON-AQ	10/23/03	NA	10/29/03	5
09	T1/3-3	NON-AQ	10/23/03	NA	10/27/03	1

PARAMETER	DET. LIMIT	UNITS	RS2-2	T2-3	T1/3-3
BENZENE	0.025	MG/KG	< 0.025	0.43	< 0.025
TOLUENE	0.025	MG/KG	< 0.025	0.17	< 0.025
ETHYLBENZENE	0.025	MG/KG	< 0.025	3.6	< 0.025
TOTAL XYLENES	0.050	MG/KG	< 0.050	8.6	< 0.050

SURROGATE:  
 PROMOFUOROBEZENE (%) 104 105 99  
 SURROGATE LIMITS ( 80 - 120 )  
 DRY WEIGHT (%) 88 85 84

CHEMIST NOTES:  
 A

PINNACLE  
LABORATORIES

2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED - METHANOL PRESERVATION  
 CLIENT : INTERA PINNACLE I.D. : 310136  
 PROJECT # : ARAHO ANALYST : BP  
 PROJECT NAME : ARAHO

SAMPLE	DATE	DATE	DATE	DIL.		
ID.#	CLIENT I.D.	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
10	T4-2B	NON-AQ	10/23/03	NA	10/29/03	2
11	RS3-3	NON-AQ	10/23/03	NA	10/28/03	1
12	T4-2	NON-AQ	10/23/03	NA	10/29/03	2

PARAMETER	DET. LIMIT	UNITS	T4-2B	RS3-3	T4-2
BENZENE	0.025	MG/KG	< 0.050	< 0.025	< 0.050
TOLUENE	0.025	MG/KG	< 0.050	< 0.025	< 0.050
ETHYLBENZENE	0.025	MG/KG	< 0.050	< 0.025	< 0.050
TOTAL XYLENES	0.050	MG/KG	< 0.10	< 0.050	< 0.10

SURROGATE:

BROMOFLUOROBENZENE (%)			115	98	111
SURROGATE LIMITS ( 80 - 120 )					
DRY WEIGHT (%)			80	87	80

CHEMIST NOTES:

A

PINNACLE  
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Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED - METHANOL PRESERVATION  
 CLIENT : INTERA  
 PROJECT # : ARAHO  
 PROJECT NAME : ARAHO

PINNACLE I.D. : 310136  
 ANALYST : BP

SAMPLE	DATE	DATE	DATE	DIL.		
ID #	CLIENT I.D.	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
13	T5-2	NON-AQ	10/23/03	NA	10/28/03	2
14	T6-3	NON-AQ	10/23/03	NA	10/29/03	2
1	S6-2	NON-AQ	10/23/03	NA	10/29/03	1

PARAMETER	DET. LIMIT	UNITS	T5-2	T6-3	S6-2
BENZENE	0.025	MG/KG	< 0.050	< 0.050	< 0.025
TOLUENE	0.025	MG/KG	< 0.050	< 0.050	< 0.025
ETHYLBENZENE	0.025	MG/KG	0.074	< 0.050	0.046
TOTAL XYLENES	0.050	MG/KG	< 0.10	< 0.10	0.12

SURROGATE:  
 BROMOFLUOROBENZENE (%) 113 115 117  
 SURROGATE LIMITS (80 - 120)  
 DRY WEIGHT (%) 81 80 87

CHEMIST NOTES:  
 NA

PINNACLE  
LABORATORIES

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Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED - METHANOL PRESERVATION  
CLIENT : INTERA  
PROJECT # : ARAHO  
PROJECT NAME : ARAHO

PINNACLE I.D. : 310136  
ANALYST : BP

SAMPLE	DATE	DATE	DATE	DIL.		
ID. #	CLIENT I.D.	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
16	RS4-3.5	NON-AQ	10/23/03	NA	10/28/03	1
17	RS5-1	NON-AQ	10/23/03	NA	10/28/03	1
18	DL1-2	NON-AQ	10/23/03	NA	10/28/03	5

PARAMETER	DET. LIMIT	UNITS	RS4-3.5	RS5-1	DL1-2
BENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.13
TOLUENE	0.025	MG/KG	< 0.025	< 0.025	< 0.13
ETHYLBENZENE	0.025	MG/KG	< 0.025	< 0.025	0.61
TOTAL XYLENES	0.050	MG/KG	< 0.050	< 0.050	1.8

SURROGATE:  
BROMOFLUOROBENZENE (%) 105 108 111  
SURROGATE LIMITS ( 80 - 120 )  
DRY WEIGHT (%) 90 92 81

CHEMIST NOTES:  
A

PINNACLE  
LABORATORIES

2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED - METHANOL PRESERVATION  
CLIENT : INTERA  
PROJECT # : ARAHO  
PROJECT NAME : ARAHO

PINNACLE I.D. : 310136  
ANALYST : BP

SAMPLE #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
19	S9-2	NON-AQ	10/23/03	NA	10/28/03	1
20	S1-.5	NON-AQ	10/23/03	NA	10/28/03	1
21	S1-1N	NON-AQ	10/23/03	NA	10/28/03	1

PARAMETER	DET. LIMIT	UNITS	S9-2	S1-.5	S1-1N
BENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOLUENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
ETHYLBENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOTAL XYLENES	0.050	MG/KG	< 0.050	< 0.050	< 0.050

SURROGATE:  
 PROMOFLUOROBENZENE (%) 105 106 105  
 SURROGATE LIMITS ( 80 - 120 )  
 DRY WEIGHT (%) 84 94 88

CHEMIST NOTES:  
 NA

PINNACLE  
LABORATORIES

2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED - METHANOL PRESERVATION  
CLIENT : INTERA  
PROJECT # : ARAHO  
PROJECT NAME : ARAHO

PINNACLE I.D. : 310136  
ANALYST : BP

SAMPLE #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
22	S8-.5	NON-AQ	10/23/03	NA	10/28/03	1
23	DL1-2B	NON-AQ	10/23/03	NA	10/29/03	5

PARAMETER	DET. LIMIT	UNITS	S8-.5	DL1-2B
BENZENE	0.025	MG/KG	< 0.025	< 0.13
TOLUENE	0.025	MG/KG	< 0.025	< 0.13
METHYLBENZENE	0.025	MG/KG	< 0.025	1.9
TOTAL XYLENES	0.050	MG/KG	< 0.050	5.8

CURROGATE:  
BROMOFLUOROBENZENE (%) 98 118  
CURROGATE LIMITS ( 80 - 120 )  
CURRY WEIGHT (%) 88 83

CHEMIST NOTES:

N/A

PINNACLE  
LABORATORIES

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GAS CHROMATOGRAPHY RESULTS  
REAGENT BLANK

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 310136
BLANK I. D.	: 102703	DATE EXTRACTED	: N/A
CLIENT	: INTERA	DATE ANALYZED	: 10/27/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: FP
PROJECT NAME	: ARAHO	ANALYST	: BP

PARAMETER	UNITS	
BENZENE	MG/KG	<0.025
TOLUENE	MG/KG	<0.025
METHYLBENZENE	MG/KG	<0.025
TOTAL XYLENES	MG/KG	<0.050

SURROGATE:  
BROMOFLUOROBENZENE (%) 99  
SURROGATE LIMITS:  
CHEMIST NOTES:  
N/A

PINNACLE  
LABORATORIES

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GAS CHROMATOGRAPHY RESULTS  
REAGENT BLANK

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 310136
BLANK I. D.	: 102803A	DATE EXTRACTED	: N/A
CLIENT	: INTERA	DATE ANALYZED	: 10/28/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: FP
PROJECT NAME	: ARAHO	ANALYST	: BP

PARAMETER	UNITS	
BENZENE	MG/KG	<0.025
TOLUENE	MG/KG	<0.025
ETHYLBENZENE	MG/KG	<0.025
TOTAL XYLENES	MG/KG	<0.050

SURROGATE:  
BROMOFLUOROBENZENE (%) 96  
SURROGATE LIMITS:  
CHEMIST NOTES:  
N/A

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GAS CHROMATOGRAPHY RESULTS  
REAGENT BLANK

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 310136
BLANK I. D.	: 102803B	DATE EXTRACTED	: N/A
CLIENT	: INTERA	DATE ANALYZED	: 10/29/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: FP
PROJECT NAME	: ARAHO	ANALYST	: BP

PARAMETER	UNITS	
BENZENE	MG/KG	<0.025
TOLUENE	MG/KG	<0.025
ETHYLBENZENE	MG/KG	<0.025
TOTAL XYLENES	MG/KG	<0.050

SURROGATE:  
BROMOFLUOROBENZENE (%) 97  
SURROGATE LIMITS:  
CHEMIST NOTES:  
N/A

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GAS CHROMATOGRAPHY RESULTS  
REAGENT BLANK

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 310136
BLANK I. D.	: 102903	DATE EXTRACTED	: N/A
CLIENT	: INTERA	DATE ANALYZED	: 10/29/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: FP
PROJECT NAME	: ARAHO	ANALYST	: BP

PARAMETER	UNITS	
BENZENE	MG/KG	<0.025
TOLUENE	MG/KG	<0.025
ETHYLBENZENE	MG/KG	<0.025
TOTAL XYLENES	MG/KG	<0.050

SURROGATE:  
BROMOFLUOROBENZENE (%)

103

SURROGATE LIMITS:

CHEMIST NOTES:

N/A

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GAS CHROMATOGRAPHY QUALITY CONTROL  
LCS/LCSD

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 310136
BATCH #	: 102703	DATE EXTRACTED	: N/A
CLIENT	: INTERA	DATE ANALYZED	: 10/27/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: FP
PROJECT NAME	: ARAHO	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	1.05	105	1.04	104	1	( 80 - 120 )	20
TOLUENE	<0.025	1.00	1.03	103	1.03	103	0	( 80 - 120 )	20
ETHYLBENZENE	<0.025	1.00	1.06	106	1.05	105	1	( 80 - 120 )	20
TOTAL XYLENES	<0.050	3.00	3.17	106	3.14	105	1	( 80 - 120 )	20

CHEMIST NOTES:  
N/A

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL  
LCS/LCSD

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 310136
BATCH #	: 102803A	DATE EXTRACTED	: N/A
CLIENT	: INTERA	DATE ANALYZED	: 10/28/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: FP
PROJECT NAME	: ARAHO	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	1.02	102	1.02	102	0	( 80 - 120 )	20
TOLUENE	<0.025	1.00	1.01	101	1.00	100	1	( 80 - 120 )	20
ETHYLBENZENE	<0.025	1.00	1.03	103	1.02	102	1	( 80 - 120 )	20
TOTAL XYLENES	<0.050	3.00	3.06	102	3.03	101	1	( 80 - 120 )	20

CHEMIST NOTES:  
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL  
LCS/LCSD

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 310136
BATCH #	: 102803B	DATE EXTRACTED	: N/A
CLIENT	: INTERA	DATE ANALYZED	: 10/29/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: FP
PROJECT NAME	: ARAHO	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	1.03	103	1.06	106	3	( 80 - 120 )	20
TOLUENE	<0.025	1.00	1.01	101	1.03	103	2	( 80 - 120 )	20
ETHYLBENZENE	<0.025	1.00	1.04	104	1.05	105	1	( 80 - 120 )	20
TOTAL XYLENES	<0.050	3.00	3.10	103	3.14	105	1	( 80 - 120 )	20

CHEMIST NOTES:  
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL  
LCS/LCSD

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 310136
BATCH #	: 102903	DATE EXTRACTED	: N/A
CLIENT	: INTERA	DATE ANALYZED	: 10/29/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: FP
PROJECT NAME	: ARAHO	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	1.02	102	1.03	103	1	( 80 - 120 )	20
TOLUENE	<0.025	1.00	1.01	101	1.01	101	0	( 80 - 120 )	20
ETHYLBENZENE	<0.025	1.00	1.04	104	1.03	103	1	( 80 - 120 )	20
TOTAL XYLENES	<0.050	3.00	3.06	102	3.02	101	1	( 80 - 120 )	20

CHEMIST NOTES:  
N/A

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL  
MS/MSD

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 310136
MSD #	: 310136-01	DATE EXTRACTED	: N/A
CLIENT	: INTERA	DATE ANALYZED	: 10/27/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: FP
PROJECT NAME	: ARAHO	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	1.07	107	1.06	106	1	( 80 - 120 )	20
TOLUENE	<0.025	1.00	1.07	107	1.05	105	2	( 80 - 120 )	20
ETHYLBENZENE	<0.025	1.00	1.10	110	1.08	108	2	( 80 - 120 )	20
TOTAL XYLENES	<0.050	3.00	3.27	109	3.19	106	2	( 80 - 120 )	20

CHEMIST NOTES:  
N/A

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL  
MS/MSD

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 310136
MSD #	: 310136-16	DATE EXTRACTED	: N/A
CLIENT	: INTERA	DATE ANALYZED	: 10/28/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: FP
PROJECT NAME	: ARAHO	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	1.07	107	1.04	104	3	( 80 - 120 )	20
TOLUENE	<0.025	1.00	1.08	108	1.03	103	5	( 80 - 120 )	20
ETHYLBENZENE	<0.025	1.00	1.09	109	1.06	106	3	( 80 - 120 )	20
TOTAL XYLENES	<0.050	3.00	3.26	109	3.17	106	3	( 80 - 120 )	20

CHEMIST NOTES:  
N/A

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)  
CLIENT : INTERA  
PROJECT # : ARAHO  
PROJECT NAME : ARAHO

PINNACLE I.D. : 310136  
ANALYST : VPH

SAMPLE #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
	T6-3B	NON-AQ	10/23/03	10/27/03	10/29/03	1
02	T3-2	NON-AQ	10/23/03	10/27/03	10/29/03	5
	T3-4	NON-AQ	10/23/03	10/27/03	10/29/03	1

PARAMETER	DET. LIMIT	UNITS	T6-3B	T3-2	T3-4
FUEL HYDROCARBONS, C6-C10	10	MG/KG	< 10	380	< 10
FUEL HYDROCARBONS, C10-C22	10	MG/KG	17	2100	120
FUEL HYDROCARBONS, C22-C36	10	MG/KG	46	1400	360
CALCULATED SUM:			63	3880	480

SURROGATE:  
O-TERPHENYL (%) 102 92 89  
SURROGATE LIMITS (70-130)

CHEMIST NOTES:  
A

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)  
CLIENT : INTERA  
PROJECT # : ARAHO  
PROJECT NAME : ARAHO

PINNACLE I.D. : 310136  
ANALYST : VPH

SAMPLE	DATE	DATE	DATE	DIL.
#	SAMPLED	EXTRACTED	ANALYZED	FACTOR
05	10/23/03	10/27/03	10/29/03	5
	10/23/03	10/27/03	10/28/03	1
	10/23/03	10/27/03	10/28/03	1

PARAMETER	DET. LIMIT	UNITS	T1W-1	T1E-1	RS1-3
FUEL HYDROCARBONS, C6-C10	10	MG/KG	150	11	11
FUEL HYDROCARBONS, C10-C22	10	MG/KG	2500	250	50
FUEL HYDROCARBONS, C22-C36	10	MG/KG	1400	77	45
CALCULATED SUM:			4050	338	106

SURROGATE:  
O-TERPHENYL (%) 85 78 102  
SURROGATE LIMITS (70-130)

CHEMIST NOTES:  
A

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)  
CLIENT : INTERA  
PROJECT # : ARAHO  
PROJECT NAME : ARAHO

PINNACLE I.D. : 310136  
ANALYST : VPH

SAMPLE #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
	RS2-2	NON-AQ	10/23/03	10/27/03	10/29/03	2
08	T2-3	NON-AQ	10/23/03	10/27/03	10/29/03	10
	T1/3-3	NON-AQ	10/23/03	10/27/03	10/28/03	1

PARAMETER	DET. LIMIT	UNITS	RS2-2	T2-3	T1/3-3
FUEL HYDROCARBONS, C6-C10	10	MG/KG	23	870	< 10
FUEL HYDROCARBONS, C10-C22	10	MG/KG	1800	4500	57
FUEL HYDROCARBONS, C22-C36	10	MG/KG	1100	1900	120
CALCULATED SUM:			2923	7270	177

SURROGATE:  
O-TERPHENYL (%) 84 110 96  
SURROGATE LIMITS ( 70-130 )

CHEMIST NOTES:  
A

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)  
CLIENT : INTERA  
PROJECT # : ARAHO  
PROJECT NAME : ARAHO

PINNACLE I.D. : 310136  
ANALYST : VPH

SAMPLE #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
0	T4-2B	NON-AQ	10/23/03	10/27/03	10/28/03	1
11	RS3-3	NON-AQ	10/23/03	10/27/03	10/28/03	1
2	T4-2	NON-AQ	10/23/03	10/27/03	10/28/03	1

PARAMETER	DET. LIMIT	UNITS	T4-2B	RS3-3	T4-2
FUEL HYDROCARBONS, C6-C10	10	MG/KG	< 10	< 10	18
FUEL HYDROCARBONS, C10-C22	10	MG/KG	60	180	610
FUEL HYDROCARBONS, C22-C36	10	MG/KG	120	290	270
CALCULATED SUM:			180	470	898

SURROGATE:  
O-TERPHENYL (%) : 99 86 93  
SURROGATE LIMITS ( 70-130 )

CHEMIST NOTES:

PINNACLE  
LABORATORIES

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)  
CLIENT : INTERA  
PROJECT # : ARAHO  
PROJECT NAME : ARAHO

PINNACLE I.D. : 310136  
ANALYST : VPH

SAMPLE #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
	T5-2	NON-AQ	10/23/03	10/28/03	10/29/03	1
14	T6-3	NON-AQ	10/23/03	10/28/03	10/30/03	1
	S6-2	NON-AQ	10/23/03	10/28/03	10/30/03	20

PARAMETER	DET. LIMIT	UNITS	T5-2	T6-3	S6-2
FUEL HYDROCARBONS, C6-C10	10	MG/KG	77	< 10	210
FUEL HYDROCARBONS, C10-C22	10	MG/KG	1100 D2	17	10000
FUEL HYDROCARBONS, C22-C36	10	MG/KG	51	15	760
CALCULATED SUM:			1228	32	10970
SURROGATE: O-TERPHENYL (%)			94	95	S3
SURROGATE LIMITS	( 70-130 )				

CHEMIST NOTES:  
D2 = Reported from a 2x dilution run on 10/30/03.  
S3 = Surrogate diluted out.

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)  
CLIENT : INTERA  
PROJECT # : ARAHO  
PROJECT NAME : ARAHO

PINNACLE I.D. : 310136  
ANALYST : VPH

SAMPLE	DATE	DATE	DATE	DIL.
#	SAMPLED	EXTRACTED	ANALYZED	FACTOR
5	10/23/03	10/28/03	10/29/03	1
17	10/23/03	10/28/03	10/29/03	1
18	10/23/03	10/28/03	10/29/03	1

PARAMETER	DET. LIMIT	UNITS	RS4-3.5	RS5-1	DL1-2
FUEL HYDROCARBONS, C6-C10	10	MG/KG	< 10	< 10	340
FUEL HYDROCARBONS, C10-C22	10	MG/KG	< 10	370	6300 D10
FUEL HYDROCARBONS, C22-C36	10	MG/KG	< 10	830	850
CALCULATED SUM:				1200	7490

SURROGATE:  
P-TERPHENYL (%) 98 88 99  
SURROGATE LIMITS (70-130)

CHEMIST NOTES:  
Reported from a 10x dilution run on 10/30/03.

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PINNACLE  
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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)  
 CLIENT : INTERA  
 PROJECT # : ARAHO  
 PROJECT NAME : ARAHO

PINNACLE I.D. : 310136  
 ANALYST : VPH

SAMPLE #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
19	S9-2	NON-AQ	10/23/03	10/28/03	10/30/03	1
20	S1-5	NON-AQ	10/23/03	10/28/03	10/30/03	10
	S1-1N	NON-AQ	10/23/03	10/28/03	10/30/03	1

PARAMETER	DET. LIMIT	UNITS	S9-2	S1-5	S1-1N
FUEL HYDROCARBONS, C6-C10	10	MG/KG	10	100	< 10
FUEL HYDROCARBONS, C10-C22	10	MG/KG	340	1800	130
FUEL HYDROCARBONS, C22-C36	10	MG/KG	800	2900	310
CALCULATED SUM:			1150	4800	440

SURROGATE:  
 O-TERPHENYL (%) 79 106 81  
 SURROGATE LIMITS ( 70-130 )

CHEMIST NOTES:  
 A

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)  
CLIENT : INTERA  
PROJECT # : ARAHO  
PROJECT NAME : ARAHO

PINNACLE I.D. : 310136  
ANALYST : VPH

SAMPLE #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
	S8-.5	NON-AQ	10/23/03	10/28/03	10/30/03	1
23	DL1-2B	NON-AQ	10/23/03	10/28/03	10/29/03	1

PARAMETER	DET. LIMIT	UNITS	S8-.5	DL1-2B
FUEL HYDROCARBONS, C6-C10	10	MG/KG	< 10	380
FUEL HYDROCARBONS, C10-C22	10	MG/KG	300	8400 D10
FUEL HYDROCARBONS, C22-C36	10	MG/KG	700	990
CALCULATED SUM:			1000	9770

SURROGATE:  
BIPHENYL (%) 81 111  
SURROGATE LIMITS ( 70-130 )

CHEMIST NOTES:  
Reported at a 10x dilution run on 10/30/03.

PINNACLE  
LABORATORIES

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GAS CHROMATOGRAPHY RESULTS  
EXTRACTION BLANK

TEST : EPA 8015 MODIFIED (DIRECT INJECT) PINNACLE I.D. : 310136  
BLANK I.D. : 102803 DATE EXTRACTED : 10/28/03  
CLIENT : INTERA DATE ANALYZED : 10/29/03  
PROJECT # : ARAHO SAMPLE MATRIX : NON-AQ  
PROJECT NAME : ARAHO ANALYST : VPH

PARAMETER	UNITS	
FUEL HYDROCARBONS, C6-C10	MG/KG	< 10
FUEL HYDROCARBONS, C10-C22	MG/KG	< 10
FUEL HYDROCARBONS, C22-C36	MG/KG	< 10
SURROGATE:		
o-TERPHENYL (%)		96
SURROGATE LIMITS	(70-130)	

CHEMIST NOTES:

N/A

PINNACLE  
LABORATORIES

2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS  
EXTRACTION BLANK

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)	PINNACLE I.D.	: 310136
BLANK I.D.	: 102703	DATE EXTRACTED	: 10/27/03
CLIENT	: INTERA	DATE ANALYZED	: 10/28/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: ARAHO	ANALYST	: VPH

PARAMETER	UNITS	
FUEL HYDROCARBONS, C6-C10	MG/KG	< 10
FUEL HYDROCARBONS, C10-C22	MG/KG	< 10
FUEL HYDROCARBONS, C22-C36	MG/KG	< 10

SURROGATE:

ORTERPHENYL (%)		96
SURROGATE LIMITS	(70-130)	

CHEMIST NOTES:

N/A

PINNACLE  
LABORATORIES

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Albuquerque, New Mexico 87107  
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Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL  
LCS/LCSD

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)	PINNACLE I.D.	: 310136
S/LCSD #	: 102703	DATE EXTRACTED	: 10/27/03
CLIENT	: INTERA	DATE ANALYZED	: 10/28/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: ARAHO	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
TEL HYDROCARBONS	<10	200	204	102	203	102	0	(70-130)	20

CHEMIST NOTES:  
N/A

$$\frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINNACLE  
LABORATORIES

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Albuquerque, New Mexico 87107  
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Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL  
LCS/LCSD

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)	PINNACLE I.D.	:	310136
LCS/LCSD #	: 102803	DATE EXTRACTED	:	10/28/03
CLIENT	: INTERA	DATE ANALYZED	:	10/29/03
PROJECT #	: ARAHO	SAMPLE MATRIX	:	NON-AQ
PROJECT NAME	: ARAHO	UNITS	:	MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
FUEL HYDROCARBONS	<10	200	183	92	194	97	6	(70-130)	20

CHEMIST NOTES:  
N/A

$$\frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINNACLE  
LABORATORIES

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Albuquerque, New Mexico 87107  
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Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL  
MSMSD

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)	PINNACLE I.D.	: 310136
MSMSD #	: 310136-01	DATE EXTRACTED	: 10/27/03
CLIENT	: INTERA	DATE ANALYZED	: 10/28/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: ARAHO	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
MUEL HYDROCARBONS	<10	200	196	98	211	106	7	(70-130)	20

CHEMIST NOTES:  
N/A

$$\frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINNACLE  
LABORATORIES

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Albuquerque, New Mexico 87107  
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Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL  
MSMSD

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)	PINNACLE I.D.	: 310136
MSMSD #	: 310136-17	DATE EXTRACTED	: 10/28/03
CLIENT	: INTERA	DATE ANALYZED	: 10/29/03
PROJECT #	: ARAHO	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: ARAHO	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
MUEL HYDROCARBONS	370	200	659	145 M4	607	119	8	(70-130)	20

CHEMIST NOTES:

M4 = % Recovery is outside of PLI criteria.

$$\frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

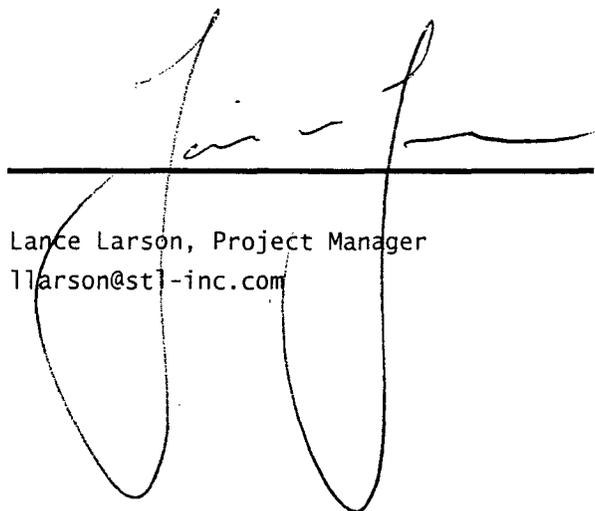
$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

## Analytical Report

For: Ms. Jacinta Tenorio  
Pinnacle Laboratories  
2709-D Pan American Freeway Northeast  
Albuquerque, NM 87107

CC:

Order Number: C310776  
SDG Number:  
Client Project ID:  
Project: 310136, NMOCD-ARAO  
Report Date: 11/12/2003  
Sampled By: Client  
Sample Received Date: 10/28/2003  
Requisition Number:  
Purchase Order: 310136



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Lance Larson, Project Manager  
llarson@stl-inc.com

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

## Sample Summary

Order: C310776  
 Date Received: 10/28/2003

Client: Pinnacle Laboratories  
 Project: 310136, NMOCD-ARAHO

Client Sample ID	Lab Sample ID	Matrix	Date Sampled
T6-3B/310136-01	C310776*1	Solid	10/23/2003 11:44
T3-2/310136-02	C310776*2	Solid	10/23/2003 12:06
T3-4/310136-03	C310776*3	Solid	10/23/2003 12:12
T1W-1/310136-04	C310776*4	Solid	10/23/2003 12:25
T1E-1/310136-05	C310776*5	Solid	10/23/2003 12:48
RS1-3/310136-06	C310776*6	Solid	10/23/2003 13:45
RS2-2/310136-07	C310776*7	Solid	10/23/2003 13:57
T2-3/310136-08	C310776*8	Solid	10/23/2003 14:10
T1/3-3/310136-09	C310776*9	Solid	10/23/2003 14:35
T4-2B/310131-10	C310776*10	Solid	10/23/2003 15:09
RS3-3/310136-11	C310776*11	Solid	10/23/2003 16:41
T4-2/310136-12	C310776*12	Solid	10/23/2003 17:00
T5-2/310136-13	C310776*13	Solid	10/23/2003 17:13
T6-3/310136-14	C310776*14	Solid	10/23/2003 17:27
F6-2/310136-15	C310776*15	Solid	10/23/2003 17:39
RS4-3.5/310136-16	C310776*16	Solid	10/23/2003 17:52
RS5-1/310136-17	C310776*17	Solid	10/23/2003 18:00
DL1-2/310136-18	C310776*18	Solid	10/23/2003 18:20
S9-2/310136-19	C310776*19	Solid	10/23/2003 18:33
S1-.5/310136-20	C310776*20	Solid	10/23/2003 18:47
S1-1N/310136-21	C310776*21	Solid	10/23/2003 18:55
S8-.5/310136-22	C310776*22	Solid	10/23/2003 18:25
DL1-2B/310136-23	C310776*23	Solid	10/23/2003 19:20
C-1/310136-24	C310776*24	Solid	10/24/2003 08:30
C-3/310136-25	C310776*25	Solid	10/24/2003 08:33
C-5/310136-26	C310776*26	Solid	10/24/2003 08:36
C-7/310136-27	C310776*27	Solid	10/24/2003 08:42
C-8/310136-28	C310776*28	Solid	10/24/2003 08:47
C-6/310136-29	C310776*29	Solid	10/24/2003 08:54
C-4/310136-30	C310776*30	Solid	10/24/2003 08:58
C-2/310136-31	C310776*31	Solid	10/24/2003 09:03
C-9/310136-32	C310776*32	Solid	10/24/2003 09:10
C-10/310136-33	C310776*33	Solid	10/24/2003 09:15
C-11/310136-34	C310776*34	Solid	10/24/2003 09:20
C-13/310136-35	C310776*35	Solid	10/24/2003 09:28

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
10776-1	T6-3B/310136-01	Solid	10/28/03	10/23/03 11:44	
10776-2	T3-2/310136-02	Solid	10/28/03	10/23/03 12:06	
10776-3	T3-4/310136-03	Solid	10/28/03	10/23/03 12:12	
10776-4	T1W-1/310136-04	Solid	10/28/03	10/23/03 12:25	
10776-5	T1E-1/310136-05	Solid	10/28/03	10/23/03 12:48	

Parameter	Units	Lab Sample IDs				
		10776-1	10776-2	10776-3	10776-4	10776-5

Chloride (9251)						
Parameter	Units	10776-1	10776-2	10776-3	10776-4	10776-5
Chloride	mg/kg dw	7300	2700	5800	990	2700
Percent Solids		79	86	77	80	80
Dilution Factor		100	50	50	50	50
Prep Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Analysis Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Batch ID		CKS077S	CKS077S	CKS077S	CKS077S	CKS077S
Prep Method		SOP 885				
Analyst		CR	CR	CR	CR	CR

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
10776-6	RS1-3/310136-06	Solid	10/28/03	10/23/03 13:45	
10776-7	RS2-2/310136-07	Solid	10/28/03	10/23/03 13:57	
10776-8	T2-3/310136-08	Solid	10/28/03	10/23/03 14:10	
10776-9	T1/3-3/310136-09	Solid	10/28/03	10/23/03 14:35	
10776-10	T4-2B/310131-10	Solid	10/28/03	10/23/03 15:09	

Parameter	Units	Lab Sample IDs				
		10776-6	10776-7	10776-8	10776-9	10776-10
Chloride (9251)						
Chloride	mg/kg dw	1300	2800	3600	5600	9700
Percent Solids		92	91	86	81	84
Dilution Factor		50	50	50	50	250
Prep Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Analysis Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Batch ID		CKS077S	CKS077S	CKS077S	CKS077S	CKS077S
Prep Method		SOP 885	SOP 885	SOP 885	SOP 885	SOP 885
Analyst		CR	CR	CR	CR	CR

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
10776-11	RS3-3/310136-11	Solid	10/28/03	10/23/03 16:41	
10776-12	T4-2/310136-12	Solid	10/28/03	10/23/03 17:00	
10776-13	T5-2/310136-13	Solid	10/28/03	10/23/03 17:13	
10776-14	T6-3/310136-14	Solid	10/28/03	10/23/03 17:27	
10776-15	F6-2/310136-15	Solid	10/28/03	10/23/03 17:39	

Parameter	Units	Lab Sample IDs				
		10776-11	10776-12	10776-13	10776-14	10776-15

Chloride (9251)

Chloride	mg/kg dw	6500	11000	6300	8000	2800
Percent Solids		88	79	78	80	88
Dilution Factor		100	250	100	100	50
Prep Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Analysis Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Batch ID		CKS077S	CKS077S	CKS077S	CKS077S	CKS077S
Prep Method		SOP 885				
Analyst		CR	CR	CR	CR	CR

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
10776-16	RS4-3.5/310136-16	Solid	10/28/03	10/23/03 17:52	
10776-17	RS5-1/310136-17	Solid	10/28/03	10/23/03 18:00	
10776-18	DL1-2/310136-18	Solid	10/28/03	10/23/03 18:20	
10776-19	S9-2/310136-19	Solid	10/28/03	10/23/03 18:33	
10776-20	S1-.5/310136-20	Solid	10/28/03	10/23/03 18:47	

Parameter	Units	Lab Sample IDs				
		10776-16	10776-17	10776-18	10776-19	10776-20
Chloride (9251)						
Chloride	mg/kg dw	2100	630	1500	5400	11000
Percent Solids		90	92	83	85	94
Dilution Factor		50	50	50	50	250
Prep Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Analysis Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Batch ID		CKS077S	CKS077S	CKS077S	CKS077S	CKS077S
Prep Method		SOP 885	SOP 885	SOP 885	SOP 885	SOP 885
Analyst		CR	CR	CR	CR	CR

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
10776-21	S1-1N/310136-21	Solid	10/28/03	10/23/03 18:55	
10776-22	S8-.5/310136-22	Solid	10/28/03	10/23/03 18:25	
10776-23	DL1-2B/310136-23	Solid	10/28/03	10/23/03 19:20	
10776-24	C-1/310136-24	Solid	10/28/03	10/24/03 08:30	
10776-25	C-3/310136-25	Solid	10/28/03	10/24/03 08:33	

Parameter	Units	Lab Sample IDs				
		10776-21	10776-22	10776-23	10776-24	10776-25
Chloride (9251)						
Chloride	mg/kg dw	3400	1100	1400	1800	4100
Percent Solids		85	87	82	91	91
Dilution Factor		50	50	50	50	50
Prep Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Analysis Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Batch ID		CKS078S	CKS078S	CKS078S	CKS078S	CKS078S
Prep Method		SOP 885	SOP 885	SOP 885	SOP 885	SOP 885
Analyst		CR	CR	CR	CR	CR

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
10776-26	C-5/310136-26	Solid	10/28/03	10/24/03 08:36	
10776-27	C-7/310136-27	Solid	10/28/03	10/24/03 08:42	
10776-28	C-8/310136-28	Solid	10/28/03	10/24/03 08:47	
10776-29	C-6/310136-29	Solid	10/28/03	10/24/03 08:54	
10776-30	C-4/310136-30	Solid	10/28/03	10/24/03 08:58	

Parameter	Units	Lab Sample IDs				
		10776-26	10776-27	10776-28	10776-29	10776-30

Chloride (9251)

Chloride	mg/kg dw	9300	730	2400	3900	3000
Percent Solids		96	95	98	86	95
Dilution Factor		250	50	50	50	50
Prep Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Analysis Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Batch ID		CKS078S	CKS078S	CKS078S	CKS078S	CKS078S
Prep Method		SOP 885				
Analyst		CR	CR	CR	CR	CR

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
10776-31	C-2/310136-31	Solid	10/28/03	10/24/03 09:03	
10776-32	C-9/310136-32	Solid	10/28/03	10/24/03 09:10	
10776-33	C-10/310136-33	Solid	10/28/03	10/24/03 09:15	
10776-34	C-11/310136-34	Solid	10/28/03	10/24/03 09:20	
10776-35	C-13/310136-35	Solid	10/28/03	10/24/03 09:28	

Parameter	Units	Lab Sample IDs				
		10776-31	10776-32	10776-33	10776-34	10776-35

Chloride (9251)

Chloride	mg/kg dw	11000	820	3000	2600	8900
Percent Solids		95	95	85	97	95
Dilution Factor		500	50	50	50	500
Prep Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Analysis Date		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03
Batch ID		CKS078S	CKS078S	CKS078S	CKS078S	CKS078S
Prep Method		SOP 885				
Analyst		CR	CR	CR	CR	CR

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
10776-36	Method Blank	Solid	10/28/03		
10776-37	Lab Control Standard % Recovery	Solid	10/28/03		
10776-38	Matrix Spike % Recovery	Solid	10/28/03		
10776-39	Matrix Spike Duplicate % Recovery	Solid	10/28/03		
10776-40	Method Blank	Solid	10/28/03		

Parameter	Units	Lab Sample IDs				
		10776-36	10776-37	10776-38	10776-39	10776-40
Chloride (9251)						
Chloride	mg/kg dw	<100	100 %	94 %	94 %	<100
Dilution Factor		50				50
Prep Date		10/30/03				10/30/03
Analysis Date		10/30/03				10/30/03
Batch ID		CKS077S	CKS077S	CKS077S	CKS077S	CKS078S
Prep Method		SOP 885				SOP 885
Analyst		CR				CR

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
10776-41	Lab Control Standard % Recovery	Solid	10/28/03		
10776-42	Matrix Spike % Recovery	Solid	10/28/03		
10776-43	Matrix Spike Duplicate % Recovery	Solid	10/28/03		

Lab Sample IDs

Parameter	Units	10776-41	10776-42	10776-43
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Chloride (9251)

Chloride	%	100 %	96 %	97 %
Batch ID		CKS078S	CKS078S	CKS078S

These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL Project Manager who signed this test report.

# STL Pensacola

## PROJECT SAMPLE INSPECTION FORM



# STL

Lab Order #: C310776

Date Received: 10/28/03

- |   |   |
|---|---|
| <p>1. Was there a Chain of Custody? <input checked="" type="radio"/> Yes No<sup>+</sup></p> <p>2. Was Chain of Custody properly filled out and relinquished? <input checked="" type="radio"/> Yes No<sup>+</sup></p> <p>3. Were all samples properly labeled and identified? <input checked="" type="radio"/> Yes No<sup>+</sup></p> <p>4. Were samples received cold? (Criteria: 2° - 6°C: STL-SOP 1055) <input checked="" type="radio"/> Yes No<sup>+</sup> N/A</p> <p>5. Did samples require splitting or compositing*? Yes<sup>+</sup> <input checked="" type="radio"/> No</p> <p>6. Were samples received in proper containers for analysis requested? <input checked="" type="radio"/> Yes No<sup>+</sup></p> <p>7. Were all sample containers received intact? <input checked="" type="radio"/> Yes No<sup>+</sup></p> | <p>8. Were samples checked for preservative? (Check pH of all H<sub>2</sub>O requiring preservative (STL-PN SOP 917) except VOA vials that require zero headspace)* Yes No<sup>+</sup> <input checked="" type="radio"/> N/A</p> <p>9. Is there sufficient volume for analysis requested? <input checked="" type="radio"/> Yes No<sup>+</sup> N/A (Can)</p> <p>10. Were samples received within Holding Time? (REFER TO STL-SOP 1040) <input checked="" type="radio"/> Yes No<sup>+</sup></p> <p>11. Is Headspace visible &gt; 1/4" in diameter in VOA vials?* Yes<sup>+</sup> No <input checked="" type="radio"/> N/A</p> <p>12. Were Trip Blanks Received? Yes No <input checked="" type="radio"/> N/A</p> <p>13. If sent, were matrix spike bottles returned? Yes No<sup>+</sup> <input checked="" type="radio"/> N/A</p> <p>14. If sent, were T-Handles returned? Yes No<sup>+</sup> <input checked="" type="radio"/> N/A</p> <p>15. If any issues, how was PM notified? PSIF <input type="checkbox"/> Verbal <input type="checkbox"/></p> |
|---|---|

Airbill Number(s): 12878168 01 434 0046 Shipped By  UPS FedX HD BUS ABX  
(HD - Hand Delivery)

Cooler Numbers & Temp(s) (°C): Client 4°C cells  
(IE. 340L-4°C-CCK8 -- LIST THERMOMETER NUMBER FOR VERIFICATION)

**Out of Control Events and Inspection Comments (list sample IDs/Tests where appropriate):**

- 1-3. COC/Sample ID/COC discrepancy: \_\_\_\_\_
4. Insufficient Ice  Delay in delivery  Other  \_\_\_\_\_
5. Samples were Split  Composited  Requested by: Client  PM  Other: \_\_\_\_\_
6. Improper Containers (ID/Size/desc): \_\_\_\_\_
7. Broken bottles/Test: \_\_\_\_\_
8. Incorrect pH: \_\_\_\_\_
9. Test/Matrix/Volume: \_\_\_\_\_
10. Out of Holding Time/Test: \_\_\_\_\_
11. VOA headspace > 1/4" (list ~ size) \_\_\_\_\_
- List additional comments by above number: \_\_\_\_\_

(USE BACK OF PSIF FOR ADDITIONAL NOTES AND COMMENTS)

Inspected By: MHS Date: 10/28/03 Logged By: LLK Date: 28-OCT-03

\* Note all Out-of-Control and/or questionable events on Comment Section of this form. For holding times, the analytical department will flag immediate hold time samples (pH, Dissolved O<sub>2</sub>, Residual CL) as out of hold time, therefore, these samples will not be documented on this PSIF.

\* All volatile samples requested to be split or composited must be done in the Volatile Lab. Document: "Volatile sample values may be compromised due to sample splitting (compositing)"

\* All pH results for North Carolina, New York, and other requested samples are to be recorded on the pH log provided (STL-SOP 938).

\* According to EPA, 1/4" of headspace is acceptable in 40 ml vials requiring volatile analysis.

**Organic Data Qualifiers for Final Report**

- B The analyte was detected in the method blank and in the client's sample.
- D The result was obtained from a dilution.
- E The result exceeds the calibration range.
- J Estimated value because the analyte concentration is less than the reporting limit.
- M A matrix effect was present.
- N Presumptive evidence of a compound. The compound was identified qualitatively or as a Tentatively Identified Compound.
- N/C Not Calculable. Either the sample spiked was > 4X spike concentration, or the compound was diluted out, or the results of sample duplicate analysis were <RL.
- P Second-column or detector confirmation exceeded method criteria. Appropriate value is reported and data is flagged/qualified as instructed by method/regulation.
- U or < or ND The analyte was not detected.
- \* The result is not within control limit(s).

**Inorganic Data Qualifiers for Final Report**

- B The analyte was detected in the method blank and in the client's sample.
- E The reported value is estimated because of the presence of interference.
- J Estimated value because the analyte concentration is less than the reporting limit.
- N The spiked sample recovery is not within control limits.
- N/C Not Calculable. Either the sample spiked was > 4X spike concentration, or the compound was diluted out, or the results of sample duplicate analysis were <RL.
- U or < or ND The analyte was not detected.
- \* Duplicate analysis not within control limits
- M The duplicate injection precision was not met.
- S The reported value was determined by the Method of Standard Addition (MSA).
- W Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance and post spike recovery is greater than or equal to 40%, the sample is flagged with a "W" and no further action is required.
- + The Standard Additions Correlation Coefficient is <0.995.

It is permissible to submit an Out-of-Control Events/Corrective Action form and/or Case Narrative in lieu of using above qualifiers.

When the laboratory receives a sample that does not meet EPA requirements for sample collection, preservation or holding time, the laboratory is required to reject the samples. The client must be notified and asked whether the lab should proceed with analysis. Data from any samples that do not meet sample acceptance criteria (collection, preservation and holding time), must be flagged, or noted on a corrective action form or case narrative, or addressed on the Project Sample Inspection Form (PSIF) in an unambiguous manner clearly defining the nature and substance of the variation. NPDES samples from North Carolina that do not meet EPA requirements for sample collection, preservation or holding time are non-reportable for NPDES compliance monitoring.

**Abbreviations**

- ND Not Detected at or above the STL Pensacola reporting limit (RL)
- NS Not Submitted
- NA Not Applicable
- MDL STL Pensacola Method Detection Limit
- RL STL Pensacola Reporting Limit
- NoMS Not enough sample provided to prepare and/or analyze a method-required matrix spike (MS) and/or duplicate (MSD)

**Florida Projects Inorganic/Organic**

Refer to FL DEP 62-160; Table 4 Data Qualifier Codes. FL DEP Rule 62-160, Table 1 lists the Florida sites which require data qualifiers.

**Arizona DEQ Projects**

Any qualified data submitted to Arizona DEQ (ADEQ) after January 1, 2001 must be designated using the Arizona Data Qualifiers as developed by the Arizona ELAC technical subcommittee. Refer to the ADEQ qualifier list.

**Severn Trent Laboratories Inc.**

STL Pensacola • 3355 McLemore Dr • Pensacola, FL 32514  
Tel 850 474 1001 Fax 850 484 5315 • [www.stl-inc.com](http://www.stl-inc.com)

**STL PENSACOLA  
Certifications, Memberships & Affiliations**

*Alabama Department of Environmental Management, Laboratory ID No. 40150 (Drinking Water by Reciprocity with FL)*

*Arizona Department of Health Services, Lab ID No. AZ0589 (Hazardous Waste & Wastewater)*

*Arkansas Department of Pollution Control and Ecology, (88-0689) (Environmental)*

*California Department of Health Services, ELAP Laboratory ID No. I-2510 (Hazardous Waste and Wastewater)*

*Connecticut Department of Health Services, Connecticut Lab Approval No. PH-0697 (D W, H W and Wastewater)*

*Florida DOH, NELAP Laboratory ID No. E81010 (Drinking Water, Hazardous Waste and Wastewater)*

*Florida DEP/DOH CompQAP # 980156*

*Illinois Environmental Laboratory Accreditation Program (ELAP), NELAP Laboratory ID No. 200041 (Wastewater and Hazardous Waste)*

*Iowa Department of Natural Resources, Laboratory ID No. 367 (WW & UST)*

*Kansas Department of Health & Environment, NELAP Laboratory ID No. E10253 (Wastewater and Hazardous Waste)*

*Kentucky NR&EPC, Laboratory ID No. 90043 (Drinking Water)*

*Louisiana DEQ, LELAP, NELAP Laboratory ID No. 02075, Agency Interest ID 30748 (Environmental)*

*Maryland DH&MH Laboratory ID No. 233 (Drinking Water by Reciprocity with Florida)*

*Massachusetts DEP, Laboratory ID No. M-FL094 ( Wastewater)*

*Michigan Bureau of E&Occh, Laboratory ID No.9912 (Drinking Water by Reciprocity with Florida)*

*New Hampshire DES ELAP, NELAP Laboratory ID No. 250502 (Drinking Water & Wastewater)*

*New Jersey DEP&E, NELAP Laboratory ID No. FL006 (Wastewater and Hazardous Waster)*

*North Carolina DENR, Laboratory ID No. 314 (Hazardous Waste and Wastewater)*

*North Dakota DH&Consol Labs, Laboratory ID No. R-108 Wastewater and Hazardous Waste by Reciprocity with Florida)*

*Oklahoma Department of Environmental Quality, Laboratory ID No. 9810 (Hazardous Waste and Wastewater)*

*Pennsylvania Department of Environmental Resources, NELAP Laboratory ID No. 68-467 (Drinking Water & Wastewater)*

*South Carolina DH&EC, Laboratory ID No. 96026 (Wastewater & Solids/Hazardous Waste by Reciprocity with FL)*

*Tennessee Department of Health & Environment, Laboratory ID No. 02907 (Drinking Water)*

*Virginia Department of General Services, Laboratory ID No. 00008 (Drinking Water by Reciprocity with FL)*

*West Virginia DOE, Office of Water Resources, Laboratory ID No. 136 (Haz Waste and Wastewater)*

*AIHA (American Industrial Hygiene Association) Accredited Laboratory, Laboratory ID No. 100704. Participant in AIHA sponsored Laboratory PAT Rounds*

*EPA ICR (Information Collection Rule) Approved Laboratory, Laboratory ID No. ICRFL031*

*NFESC (Naval Facilities Engineering Services Center)*

*USACE (United States Army Corps. of Engineers), MRD*

*STL Pensacola also has a foreign soil permit to accept soils from locations other than the continental United States. Permit No. S-37599*

*certlist\condcert.lst revised 10/15/03*

Total Pages of Report

19

Network Project Manager: Jacinta Tenorio

Pinnacle Laboratories, Inc.  
 2709-D Pan American Freeway, NE  
 Albuquerque, NM 87107  
 (505) 344-3777 Fax (505) 344-4413  
 C310776

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals (8) RCRA	TCLP RCRA (8) Metals	Metals-13 PP List	Metals-TAL (23 Metals)	Dissolved Fe, Mn, Pb (6010)	Chloride 3252	TOC	Gen Chemistry:	Volatle Organics GC/MS (8260)	BOD	COD	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	PNA (8310)/8270 SIMS	8260 (TCLP 1311) ZHE	Base/Neutral Acid Compounds GC/MS (625/8270)	Uranium (ICP-MS)	Radium 226+228	Gross Alpha/Beta	TO-14	NUMBER OF CONTAINERS	
T6-3B / 310136-01	10.23	1144	NAD							X																1
T3-2 / " - 02		1206								X																1
T3-4 / " - 03		1212								X																1
T1W-1 / " - 04		1225								X																1
T1E-1 / " - 05		1228								X																1
RS1-3 / " 06		1315								X																1
RS2-2 / " 07		1357								X																1
T2-3 / " 08		1410								X																1
T1B-3 / " 09		1435								X																1
T4-2B / 310134-10		1509								X																1

PROJECT INFORMATION	SAMPLE RECEIPT	SAMPLES SENT TO:	RELINQUISHED BY:	RECEIVED BY:
PROJECT #: 310136	Total Number of Containers	PENSACOLA - STL-FL	Signature: [Signature]	Signature: [Signature]
PROJ. NAME: GRAD	Chain of Custody Seals	ESL - OR	Printed Name: [Name]	Printed Name: [Name]
QC LEVEL: STD IV	Received Intact?	ATEL - AZ	Date: 10.22.03	Date: 10.22.03
QC REQUIRED: MS MSD BLANK	Received Good Cond./Cold	ATEL - MARION	Company: Pinnacle Laboratories, Inc.	Company: Pinnacle Laboratories, Inc.
TAT: STANDARD RUSH!	LAB NUMBER:	ATEL - MELMORE	RECEIVED BY: 1. [Signature]	RECEIVED BY: 2. [Signature]
DUE DATE: 2 WKS + 2 days		GEL	Signature: [Signature]	Signature: [Signature]
RUSH SURCHARGE:		U OF MIAMI	Printed Name: [Name]	Printed Name: [Name]
CLIENT DISCOUNT:		WCAS	Date: 10/22/03	Date: 10/22/03
SPECIAL CERTIFICATION		WOHL	Company: [Company]	Company: [Company]
REQUIRED: YES NO				

Network Project Manager: Jacinta Tenorio

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 Albuquerque, NM 87107  
 (505) 344-3777 Fax (505) 344-4413  
**C310776**

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals (8) RCRA	TCLP RCRA (8) Metals	Metals-13 PP List	Metals-TAL (23 Metals)	Dissolved Fe, Mn, Pb (6010)	TOC	Gen Chemistry:	Volatle Organics GC/MS (8260)	BOD	COD	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	PNA (8310)/8270 SIMS	8260 (TCLP 1311) ZHE	Base/Neutral Acid Compounds GC/MS (625/8270)	Uranium (ICP-MS)	Radium 226+228	Gross Alpha/Beta	TO-14	NUMBER OF CONTAINERS	
RS3-3/310136-11	10-23	1641	NAB																						1
T4-2/	-12	1700								Chlord 325.2															1
T5-2/	-13	1713																							1
T6-3/	-14	1727																							1
QK-2/	-15	1739																							1
RS4-3.5/	-16	1752																							1
RS5-1/	-17	1800																							1
D1-2/		1820																							1
S9-2/		1853																							1
S1-5/310136-20		1817																							1

PROJECT INFORMATION	SAMPLE RECEIPT	SAMPLES SENT TO:	RELINQUISHED BY:	RELINQUISHED BY:
PROJECT #: 310136	Total Number of Containers	PENSACOLA - STL-FL <input checked="" type="checkbox"/>	Signature: [Signature]	Signature: [Signature]
PROJ. NAME: AROTHO	Chain of Custody Seals	ESL - OR	Time: 1500	Time: [Time]
QC LEVEL: STD IV	Received Intact?	ATEL - AZ	Printed Name: [Name]	Date: [Date]
QC REQUIRED: MS MSD BLANK	Received Good Cond./Cold	ATEL - MARION	Date: 10-27-03	Date: [Date]
TAT: STANDARD RUSH!!	LAB NUMBER:	ATEL - MELMORE	Company: Pinnacle Laboratories, Inc.	Company: [Company]
DUE DATE:	COMMENTS:	EHL	RECEIVED BY: 1.	RECEIVED BY: 2.
RUSH SURCHARGE:		GEL	Signature: [Signature]	Signature: [Signature]
CLIENT DISCOUNT:		U OF MIAMI	Time: 1000	Time: [Time]
SPECIAL CERTIFICATION		WCAS	Date: 10/28/03	Date: [Date]
REQUIRED: YES NO		WOHL	Company: [Company]	Company: [Company]

Network Project Manager: Jacinta Tenorio

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ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals (8) RCRA	TCLP RCRA (8) Metals	Metals-13 PP List	Metals-TAL (23 Metals)	Dissolved Fe, Mn, Pb (6010)	TOC	Gen Chemistry:	Volatle Organics GC/MS (8260)	BOD	COD	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	PNA (8310)/8270 SIMS	8260 (TCLP 1311) ZHE	Base/Neutral Acid Compounds GC/MS (625/8270)	Uranium (ICP-MS)	Radium 226+228	Gross Alpha/Beta	TO-14	NUMBER OF CONTAINERS	
SI-1W/310136-21	10/23	1855	NAFO																						1
SR-5/	10/23	1825							X																1
DI-2B/	10/23	1920							X																1
G-1/	10/24	0830							X																1
C-3		0833							X																1
C-5		0836							X																1
C-7		0842							X																1
C-8		0847							X																1
C-6		0854							X																1
C-4/310136-30		0858							X																1

PROJECT INFORMATION	SAMPLE RECEIPT	SAMPLES SENT TO:	RELINQUISHED BY:	RELINQUISHED BY:
PROJECT #: 310136	Total Number of Containers	PENSACOLA - STL-FL	Signature: [Signature]	Signature: [Signature]
PROJ. NAME: ARATTO	Chain of Custody Seals	ESL - OR	Printed Name: [Name]	Printed Name: [Name]
QC LEVEL: STD. IV	Received Intact?	ATEL - AZ	Date: [Date]	Date: [Date]
QC REQUIRED: MS MSD BLANK	Received Good Cond./Cold	ATEL - MARION	Company: Pinnacle Laboratories, Inc.	Company: [Company]
TAT: STANDARD RUSH!!	LAB NUMBER:	ATEL - MELMORE	RECEIVED BY: [Signature]	RECEIVED BY: [Signature]
COMMENTS:		EHL	Time: 15	Time: 2
DUE DATE:	RUSH SURCHARGE:	GEL	Signature: [Signature]	Signature: [Signature]
CLIENT DISCOUNT:	SPECIAL CERTIFICATION	U OF MIAMI	Printed Name: [Name]	Printed Name: [Name]
REQUIRED: YES NO		WCAS	Date: 10/28/09	Date: [Date]
		WOHL	Company: [Company]	Company: [Company]

Network Project Manager: Jacinta Tenorio

Pinnacle Laboratories, Inc.  
 2709-D Pan American Freeway, NE  
 Albuquerque, NM 87107  
 (505) 344-3777 Fax (505) 344-4413

C310776

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals (8) RCRA	TCLP RCRA (8) Metals	Metals-13 PP List	Metals-TAL (23 Metals)	Dissolved Fe, Mn, Pb (6010)	TOC	Gen Chemistry:	Volatile Organics GC/MS (8260)	BOD	COD	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	PNA (8310)/8270 SIMS	8260 (TCLP 1311) ZHE	Base/Neutral Acid Compounds GC/MS (625/8270)	Uranium (ICP-MS)	Radium 226+228	Gross Alpha/Beta	TO-14	NUMBER OF CONTAINERS	
C-2 / 310136-31	10.24	0903	NA62							XXXXX Chloride 35.2															
C-9 / -32		0910																							
G10 / -33		0915																							
C-11 / -34		0920																							
C-13 / -35		0928																							

PROJECT INFORMATION		SAMPLE RECEIPT		SAMPLES SENT TO:		RELINQUISHED BY:		RECEIVED BY:	
PROJECT #:	310136	Total Number of Containers		PENSACOLA - STL-FL		Signature:		Signature:	
PROJ. NAME:		Chain of Custody Seals		ESL - OR		Printed Name:		Printed Name:	
QC LEVEL:	SD IV	Received Intact?		ATEL - AZ		Date:		Date:	
QC REQUIRED:	MS MSD BLANK	Received Good Cond./Cold		ATEL - MARION		Company:		Company:	
TAT:	STANDARD RUSH!	LAB NUMBER:		ATEL - MELMORE		Signature:		Signature:	
DUE DATE:		COMMENTS:		EHL		Printed Name:		Printed Name:	
RUSH SURCHARGE:				GEL		Date:		Date:	
CLIENT DISCOUNT:				U OF MIAMI		Company:		Company:	
SPECIAL CERTIFICATION				WCAS		Signature:		Signature:	
REQUIRED: YES NO				WOHL		Printed Name:		Printed Name:	

SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: Joe Tracy  
 COMPANY: Intern  
 ADDRESS: 6501 Americas Parkway NE Suite 820  
 One Park Square Albuquerque NM 87110  
 PHONE: 505 246-1600  
 FAX: 505 246-2600  
 BILL TO: OGD Attn: Martine Krieling  
 COMPANY: NMOCD  
 ADDRESS: 1220 South St Francis Drive  
 Santa Fe NM 87505

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline) MTBE	8021 (BTEX) DMTBE DTM B DPC E	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB D/B/C P	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics <input type="checkbox"/> PBMS	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310/8270-SIMS)	General Chemistry:	Chloride 325.2	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	NUMBER OF CONTAINERS	
T6-3B	10/23/03	1144	Soil	01	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
T3-2		1206		02	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
T3-4		1212		03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
T1W-1		1225		04	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
T1E-1		1248		05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
R51-3		1345		06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
R52-2		1351		07	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
T2-3		1410		08	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
T1/3-3		1435		09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
T4-2B		1509		10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4

ANALYSIS REQUEST

WEEKEND ANALYSES MAY RESULT IN AN ADDITIONAL SURCHARGE - PLEASE INQUIRE.

PROJECT INFORMATION	PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS	RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
PROJ. NO.: Archo	(RUSH) <input type="checkbox"/> 24hr* <input type="checkbox"/> 48hr* <input type="checkbox"/> 72hr* <input type="checkbox"/> 1 WEEK (NORMAL) <input checked="" type="checkbox"/>	Signature: <i>Ken Clark</i> Time: 1550	Signature: _____ Time: _____
PROJ. NAME: Archo	CERTIFICATION REQUIRED <input type="checkbox"/> NM <input type="checkbox"/> SDWA <input type="checkbox"/> AZ <input type="checkbox"/> OTHER	Printed Name: <i>Ken Clark</i> Date: 10/24/03	Printed Name: _____ Date: _____
P.O. NO.:	METHANOL PRESERVATION <input checked="" type="checkbox"/> METALS <input type="checkbox"/> TOTAL <input type="checkbox"/> DISSOLVED	Company: _____ See Reverse side (Force Majeure)	Company: _____
SHIPPED VIA: <i>Deliver</i>	COMMENTS:	RECEIVED BY: 1. Signature: _____ Time: _____	RECEIVED BY: 2. Signature: <i>Martine Krieling</i> Time: <i>June 1600</i>
SAMPLE RECEIPT		Printed Name: _____ Date: _____	Printed Name: <i>Martine Krieling</i> Date: <i>10/24/03</i>
NO CONTAINERS: <i>AD</i>		Company: _____	Company: <i>Pinnacle Laboratories Inc.</i>
CUSTODY SEALS: <i>Y/N NA</i>			
RECEIVED INTACT: <i>YES</i>			
BLUE ICE: <i>5.3 c</i>			

PLEASE FILL THIS FORM IN COMPLETELY.

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

PROJECT MANAGER: Joe Tracy  
 COMPANY: Intera  
 ADDRESS: 6501 Americas Parkway NE Suite 820  
 PHONE: One Park Square Albuquerque NM 87110  
 FAX: 505 246-1600  
 BILL TO: OCD AHA Martine Kieling  
 COMPANY: NMOCD  
 ADDRESS: 1220 South St Francis Drive  
 Santa Fe NM 87505

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline) MTBE	8021 (BTEX) DMTBE DTMB DPCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB D/BCP □	Chloride 325.2	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics □PBMS	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310/8270-SIMS)	General Chemistry:	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	NUMBER OF CONTAINERS
R53-3	10/23/03	1641	Soil	11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
T4-2		1700		12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
T5-2		1713		13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
T6-3		1727		14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
S6-2		1739		15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
R54-3.5		1752		16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
R55-1		1800		17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
DLI-2		1820		18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
S9-2		1833		19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
S1-.5		1843		20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4

WEEKEND ANALYSES MAY RESULT IN AN ADDITIONAL SURCHARGE - PLEASE INQUIRE.

PROJECT INFORMATION		PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS	
PROJ. NO.:		(RUSH) <input type="checkbox"/> 24hr <input type="checkbox"/> 48hr <input type="checkbox"/> 72hr <input type="checkbox"/> 1 WEEK <input checked="" type="checkbox"/> (NORMAL)	<input type="checkbox"/> 1 WEEK
PROJ. NAME: Araho		CERTIFICATION REQUIRED <input type="checkbox"/> NM <input type="checkbox"/> SDWA <input type="checkbox"/> AZ <input type="checkbox"/> OTHER	
P.O. NO.:		METHANOL PRESERVATION <input checked="" type="checkbox"/> METALS <input type="checkbox"/> TOTAL <input type="checkbox"/> DISSOLVED	
SHIPPED VIA: Delivered		COMMENTS:	
SAMPLE RECEIPT			
NO CONTAINERS	40		
CUSTODY SEALS	Y/N (NA)		
RECEIVED INTACT	YES		
BLUE ICE/ICE	53c		
RELEINQUISHED BY: 1. Signature: <i>Kend Clark</i> Time: 1:55 Date: 10/24/03		RELEINQUISHED BY: 2. Signature: <i>Manuel Trino</i> Time: 1:00 Date: 10/24/03	
Company: Pinnacle Laboratories Inc.		Company: Pinnacle Laboratories Inc.	

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER: Joe Tracy  
 COMPANY: Intera  
 ADDRESS: 6501 Americas Parkway NE Suite 820  
 One Bell Square Albuquerque NM 87110  
 PHONE: 505 246-1600  
 FAX: 505 246-2600  
 BILL TO: CCD Attn: Montyne Keeliny  
 COMPANY: NMCCD  
 ADDRESS: 1220 South St Francis Drive  
 Santa Fe NM 87505

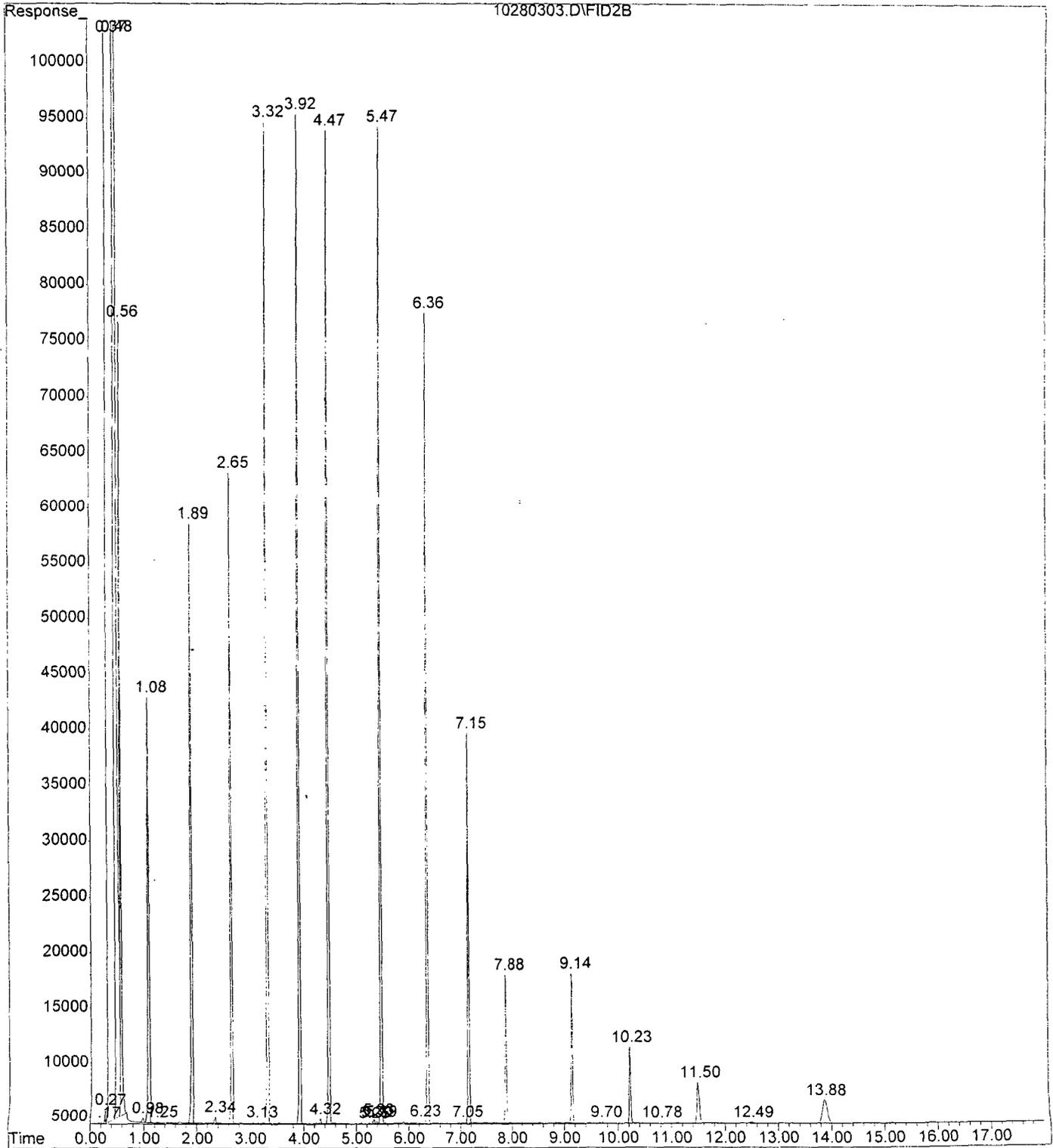
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S1-1N	10/23/03	1855	Soil	21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
S8-1.5	10/23/03	1825		22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
DL1-2B	10/23/03	1920		23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4
C-1	10/24/03	0830		24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1
C-3		0833		25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1
C-5		0836		26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1
C-7		0842		27	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1
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C-4		0858		30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1

WEEKEND ANALYSES MAY RESULT IN AN ADDITIONAL SURCHARGE - PLEASE INQUIRE.

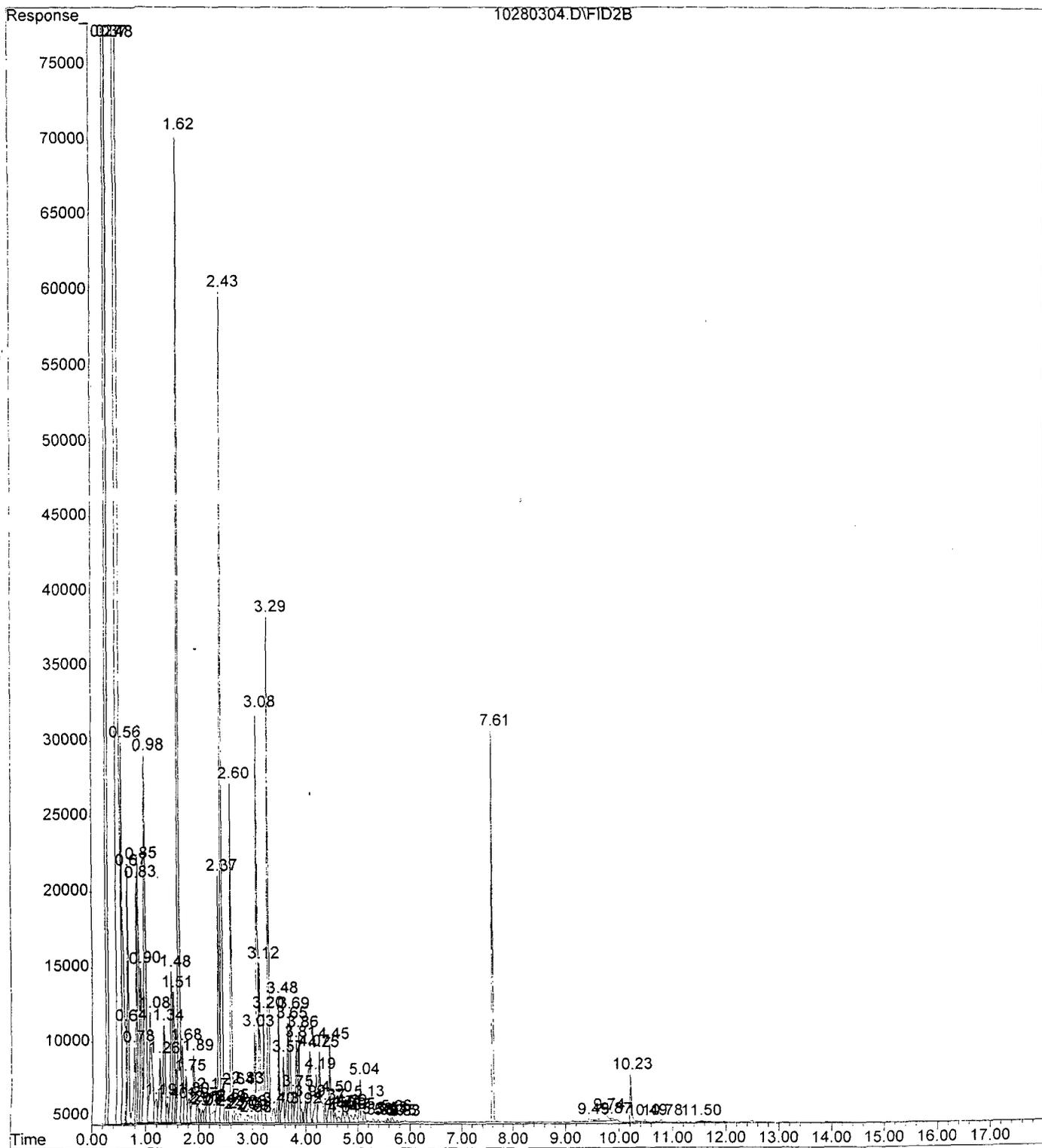
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P.O. NO.:		CERTIFICATION REQUIRED <input type="checkbox"/> NM <input type="checkbox"/> SDWA <input type="checkbox"/> AZ <input type="checkbox"/> OTHER	
SHIPPED VIA: Delivered		METHANOL PRESERVATION <input checked="" type="checkbox"/>	METALS <input type="checkbox"/> TOTAL <input type="checkbox"/> DISSOLVED <input type="checkbox"/>
COMMENTS:			
SAMPLE RECEIPT			
NO CONTAINERS	19		
CUSTODY SEALS	Y/N (NA)		
RECEIVED INTACT	Y/N		
BLUE ICE/COLD	5.3c	6.4c	
RECEIVED BY: 1		RECEIVED BY: 2	
Signature: <i>Kenneth Clark</i>	Time: 1:50	Signature: <i>[Signature]</i>	Time: [Blank]
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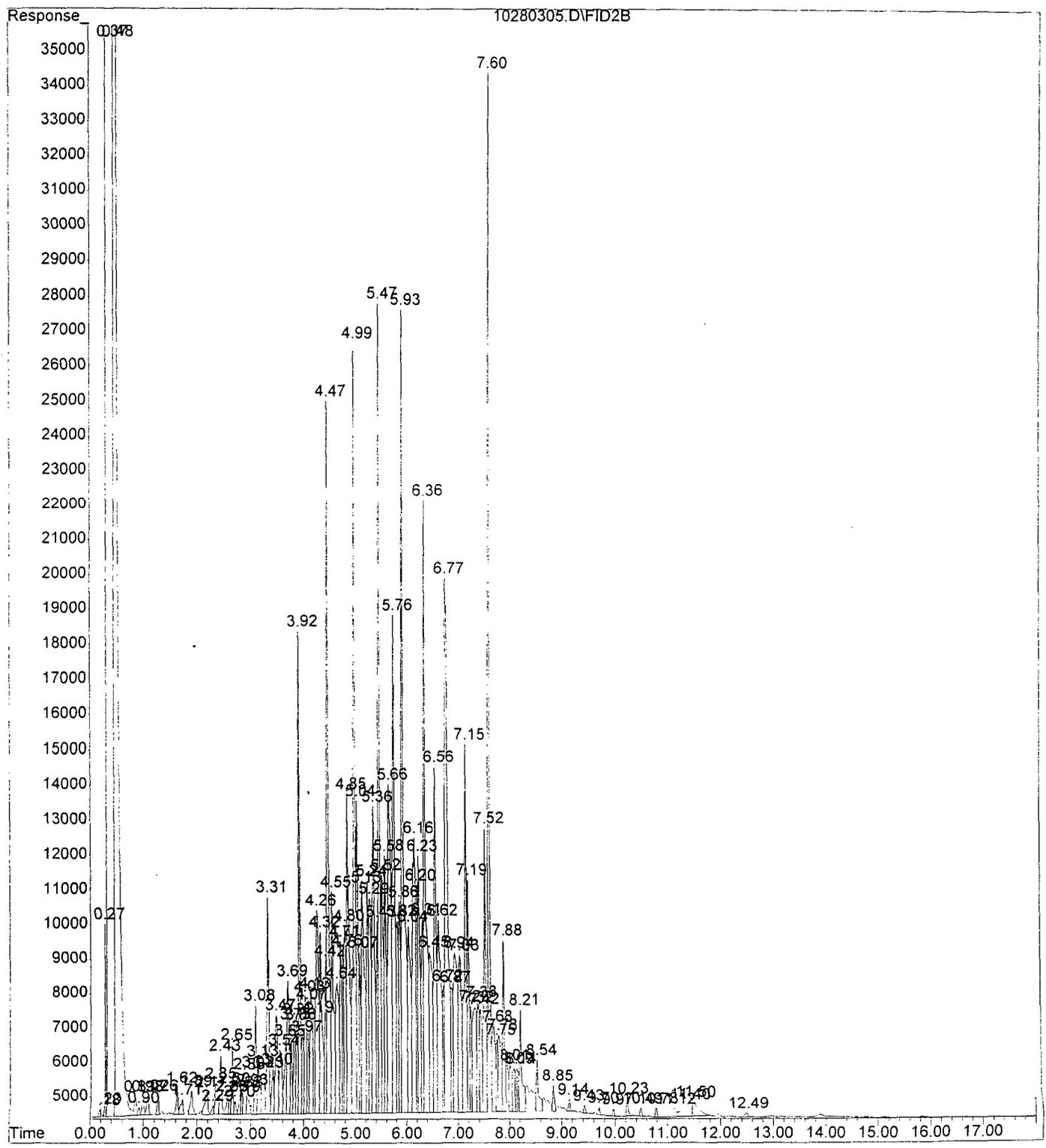
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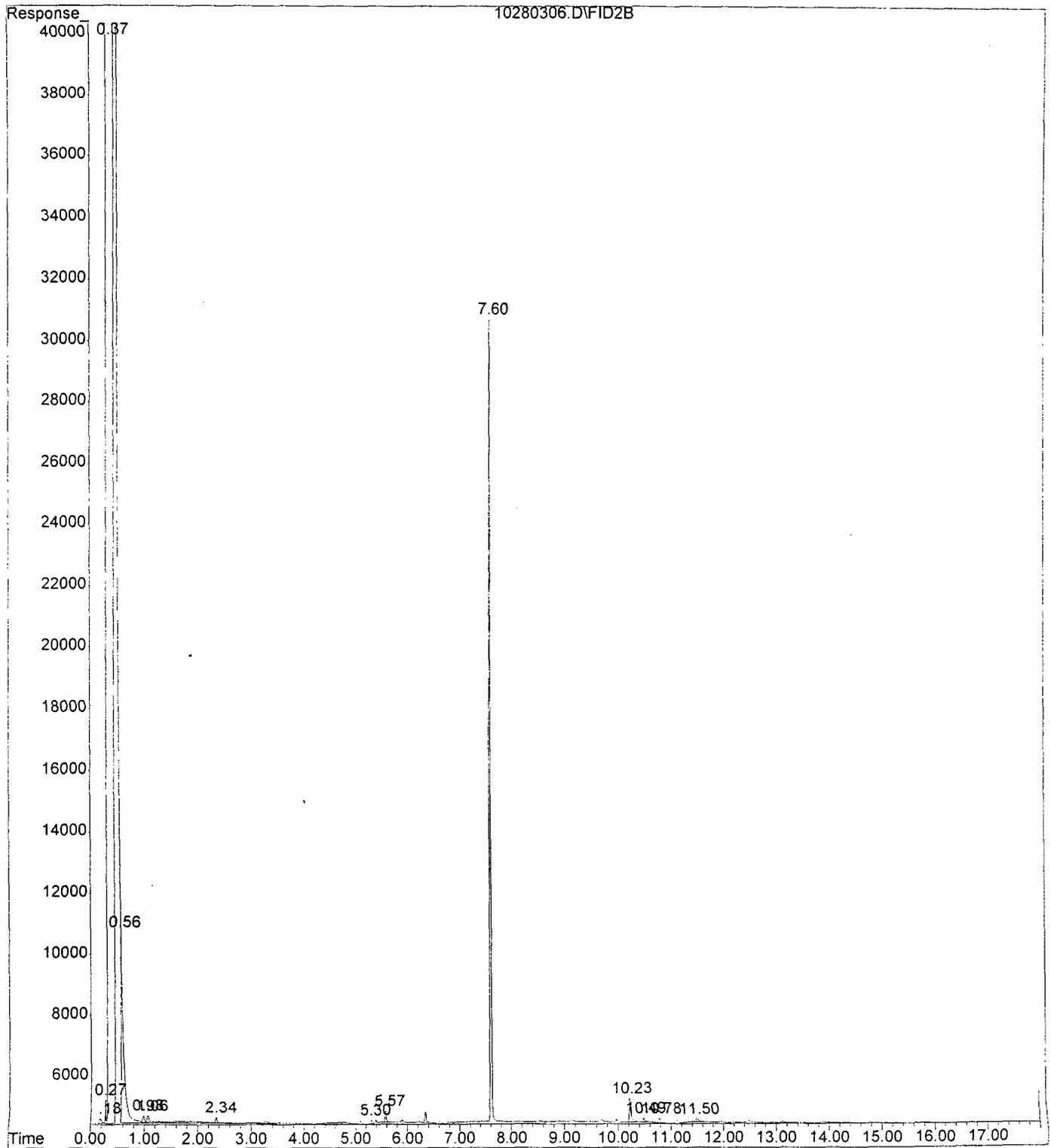
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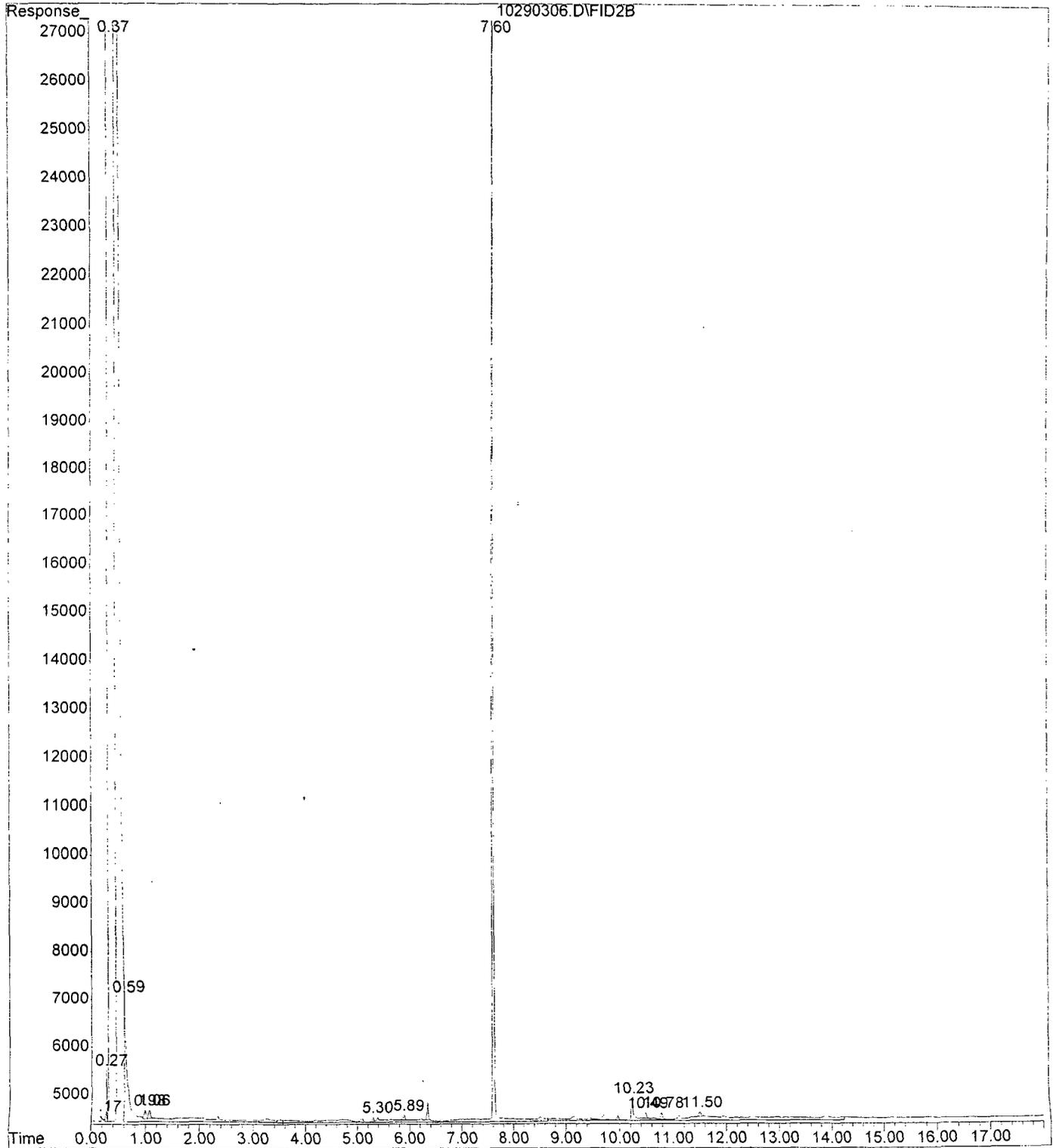
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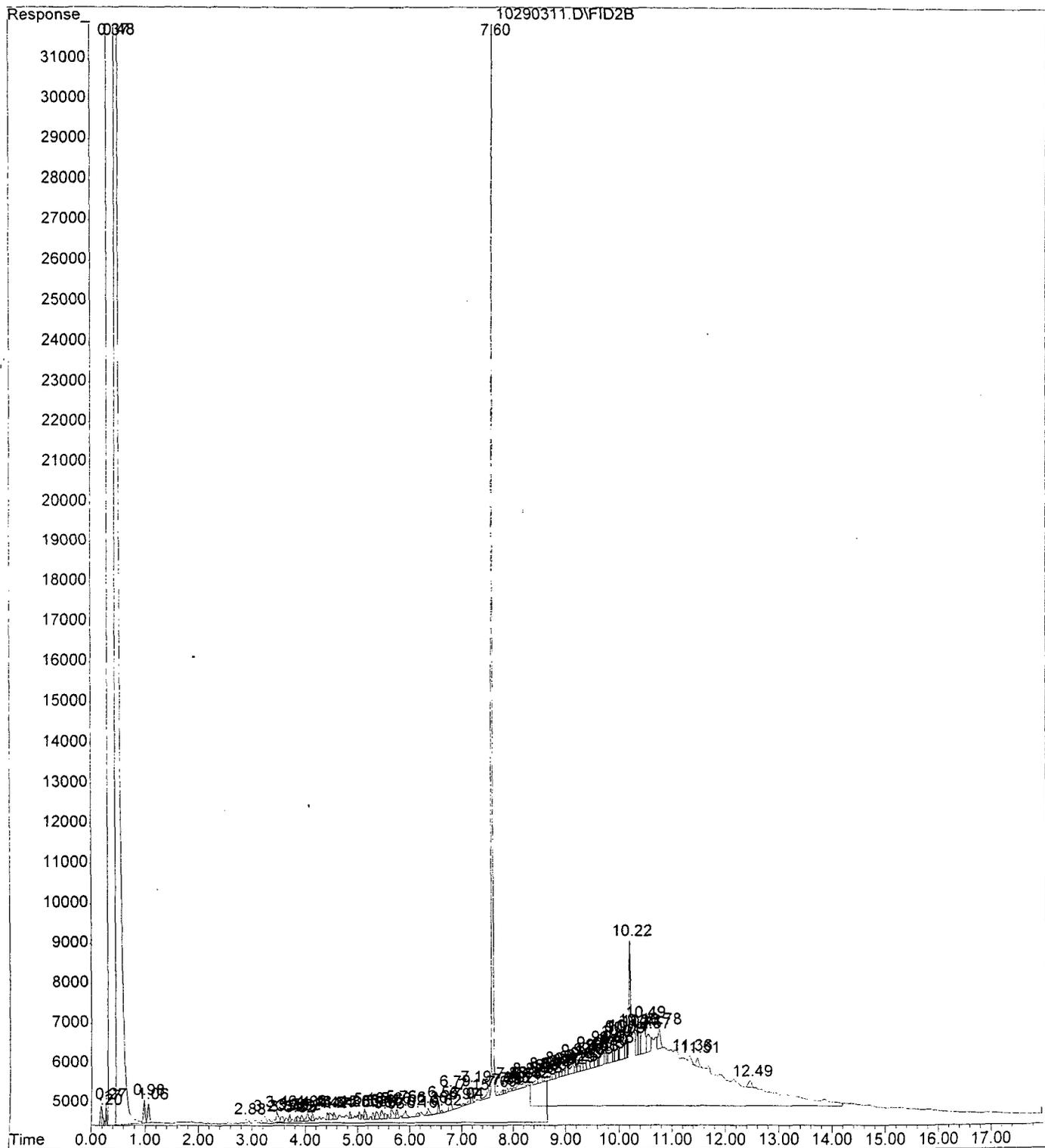
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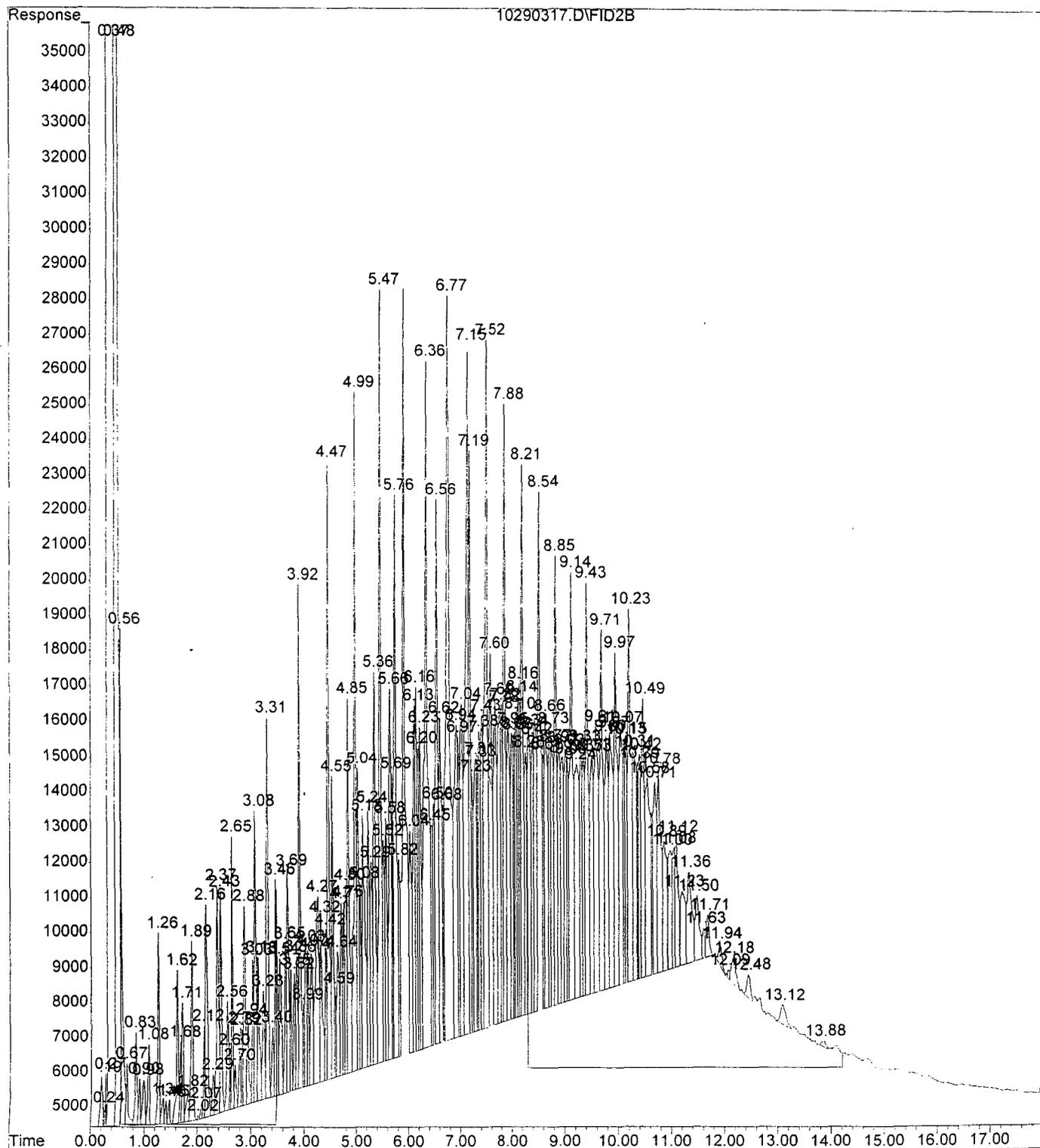
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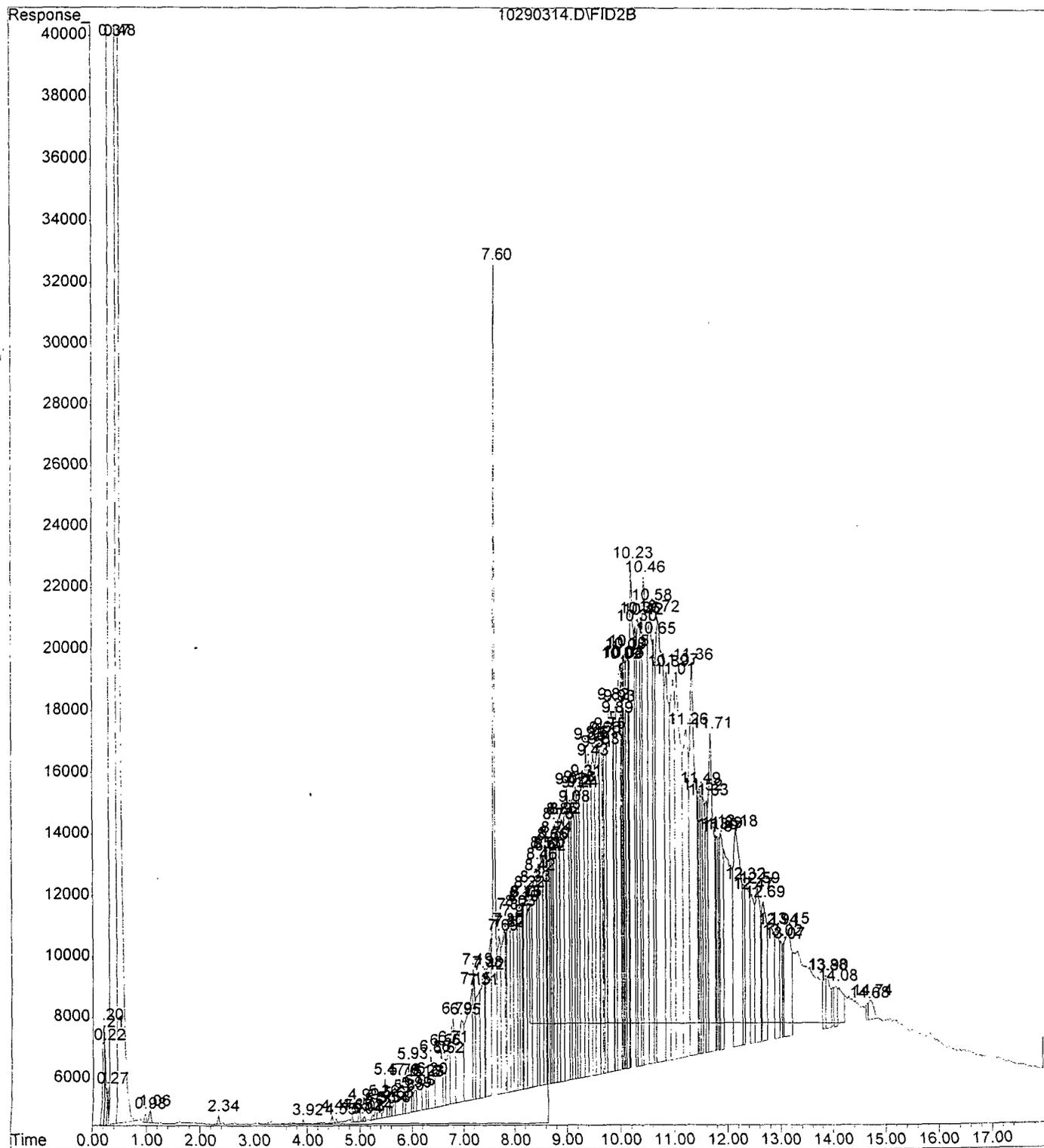
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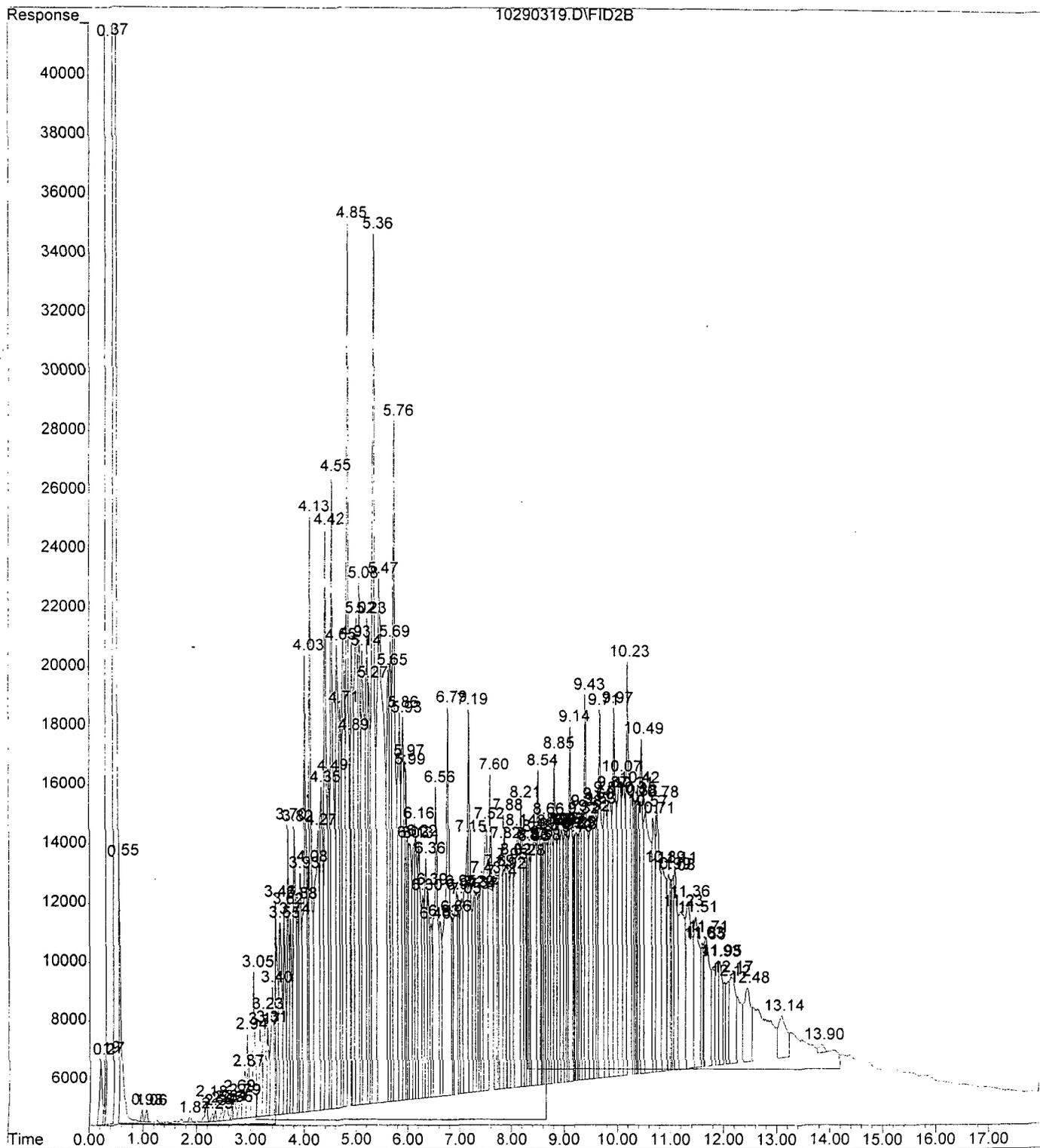
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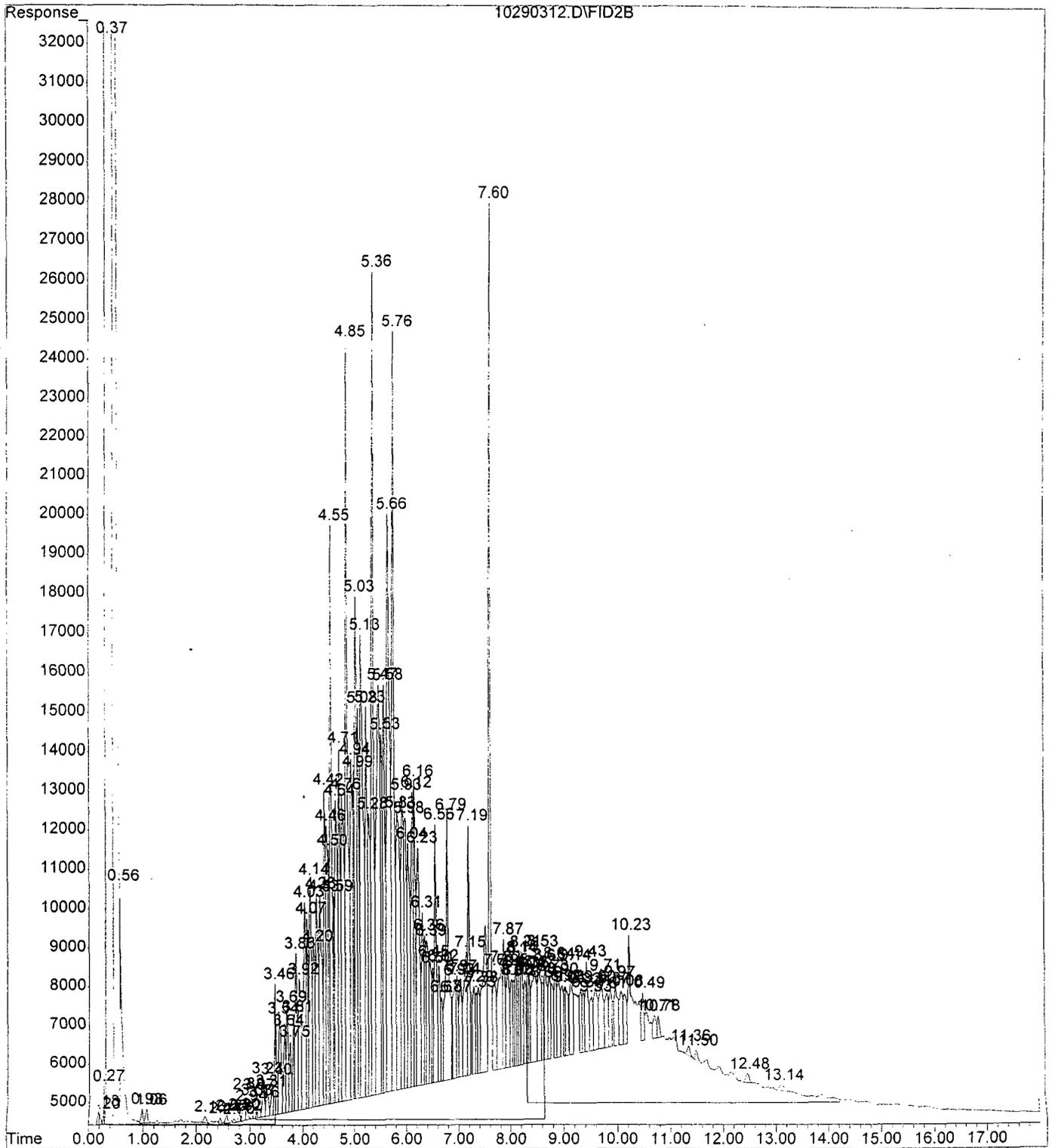
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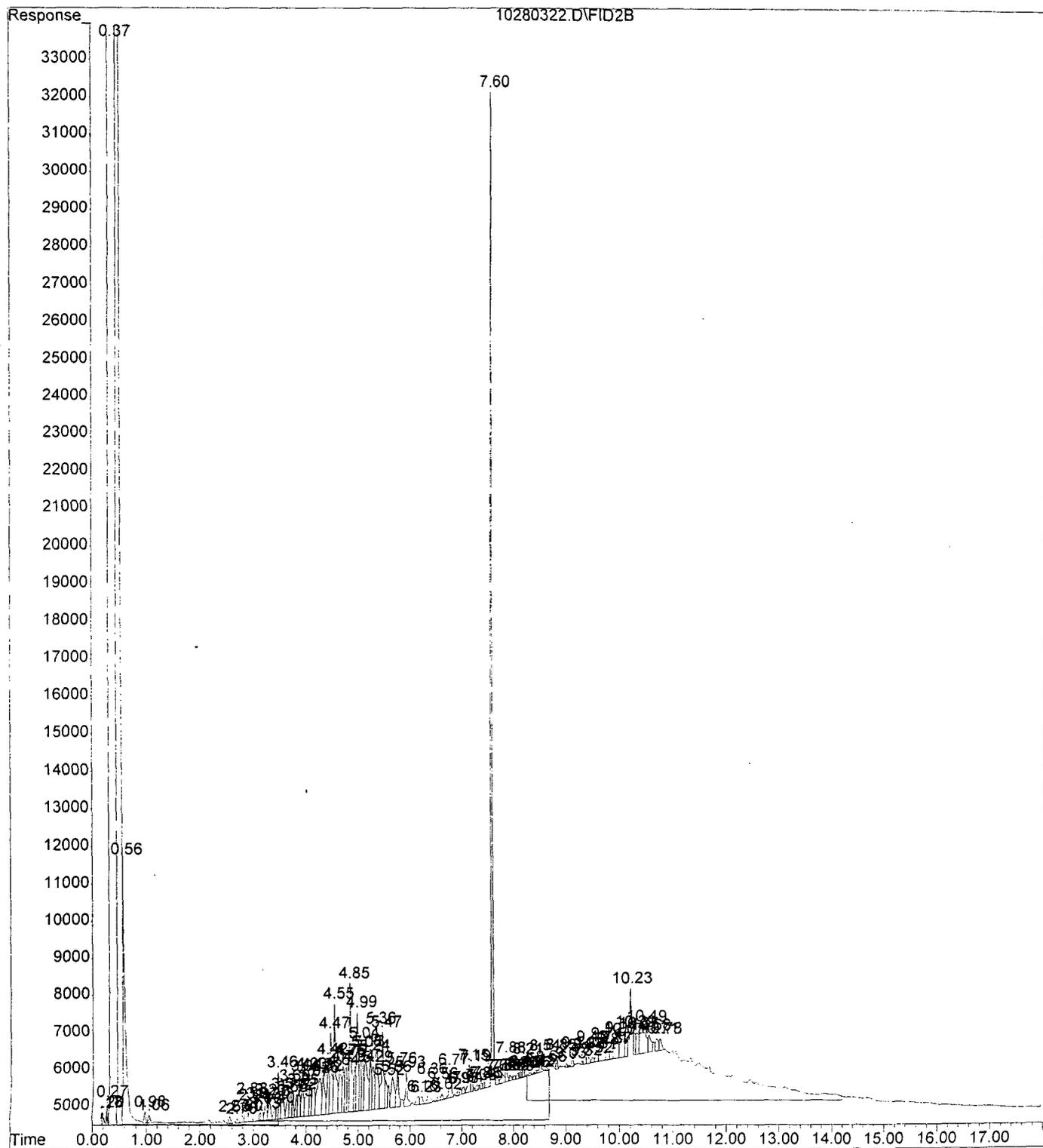
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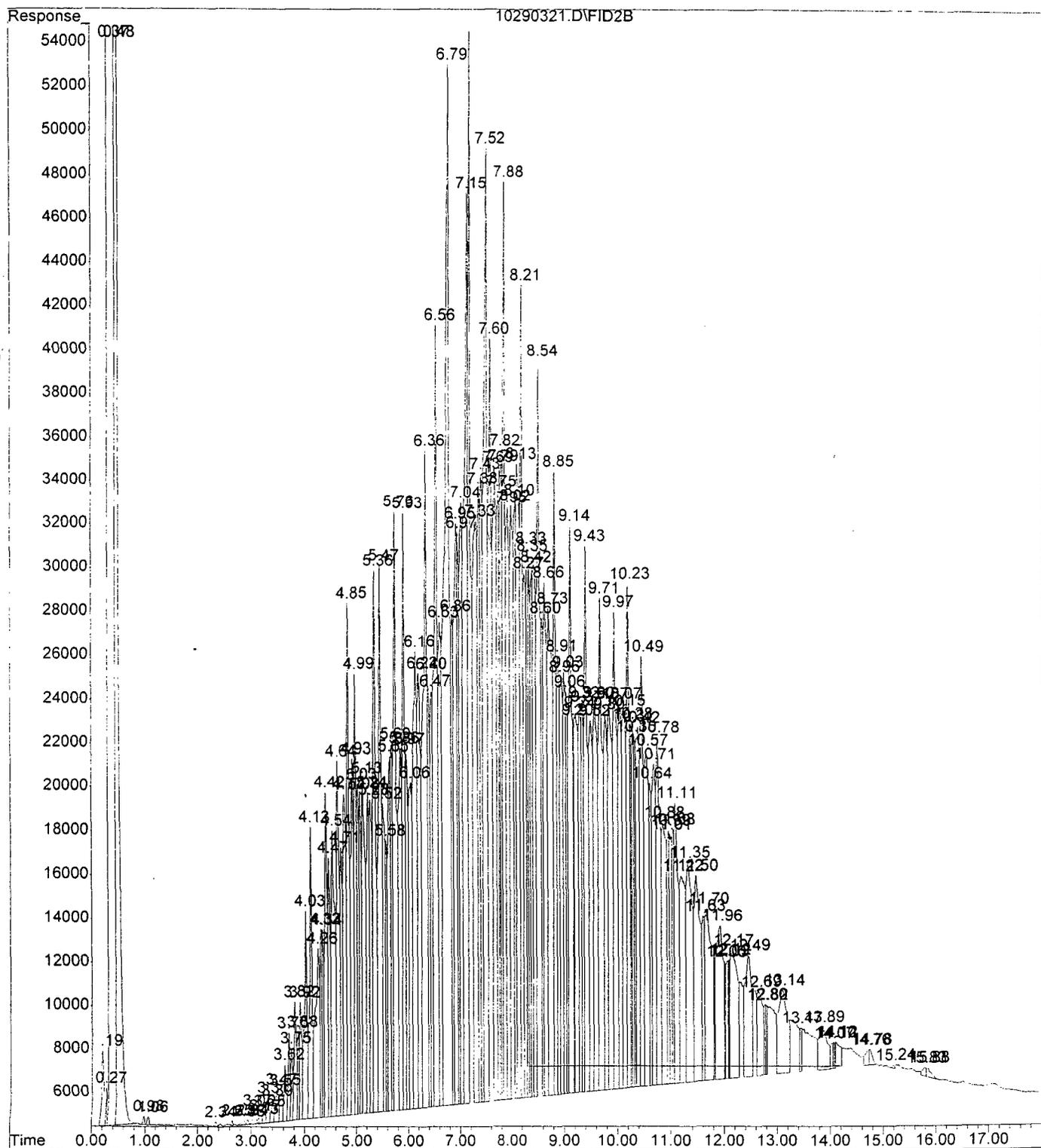
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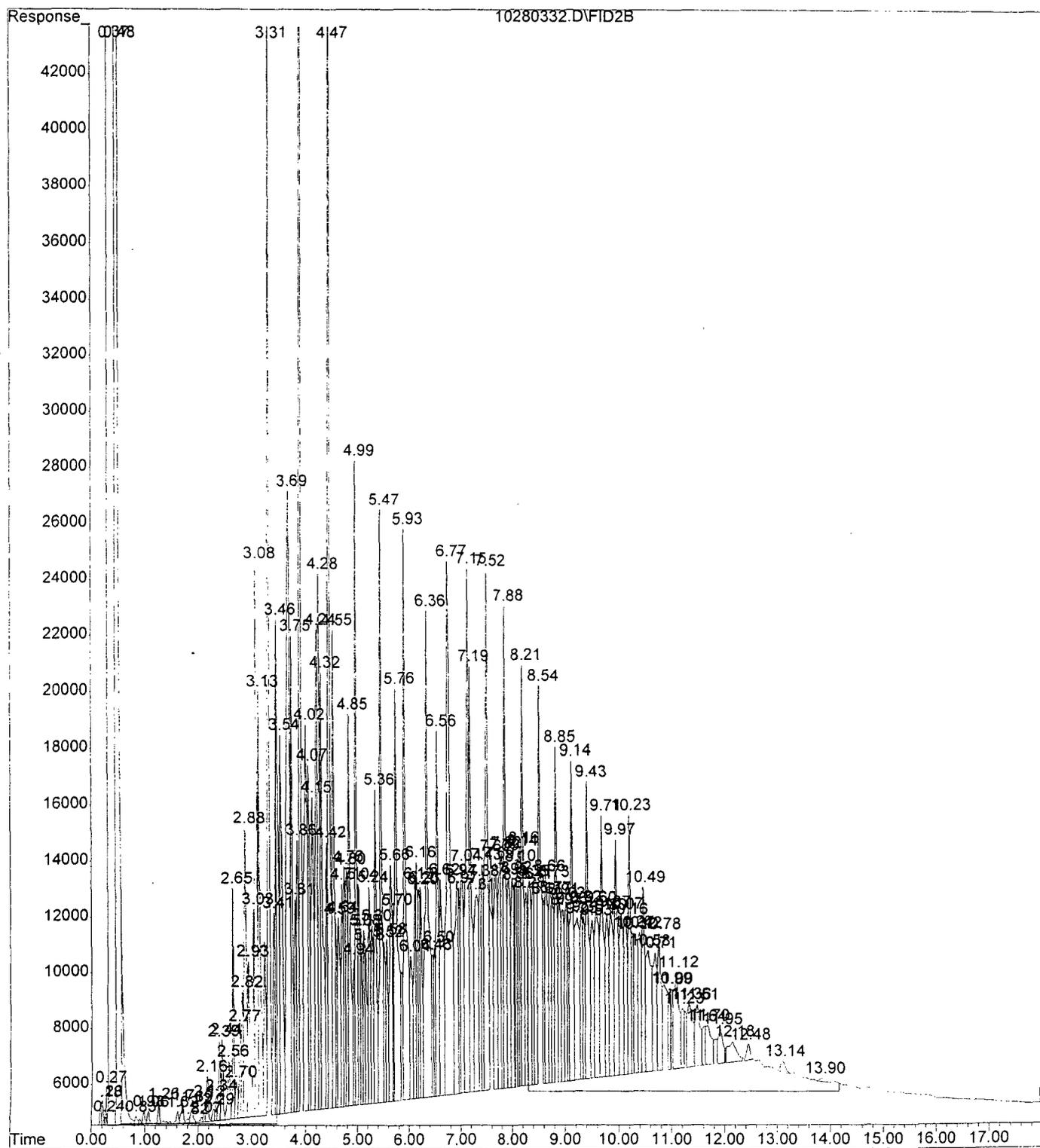
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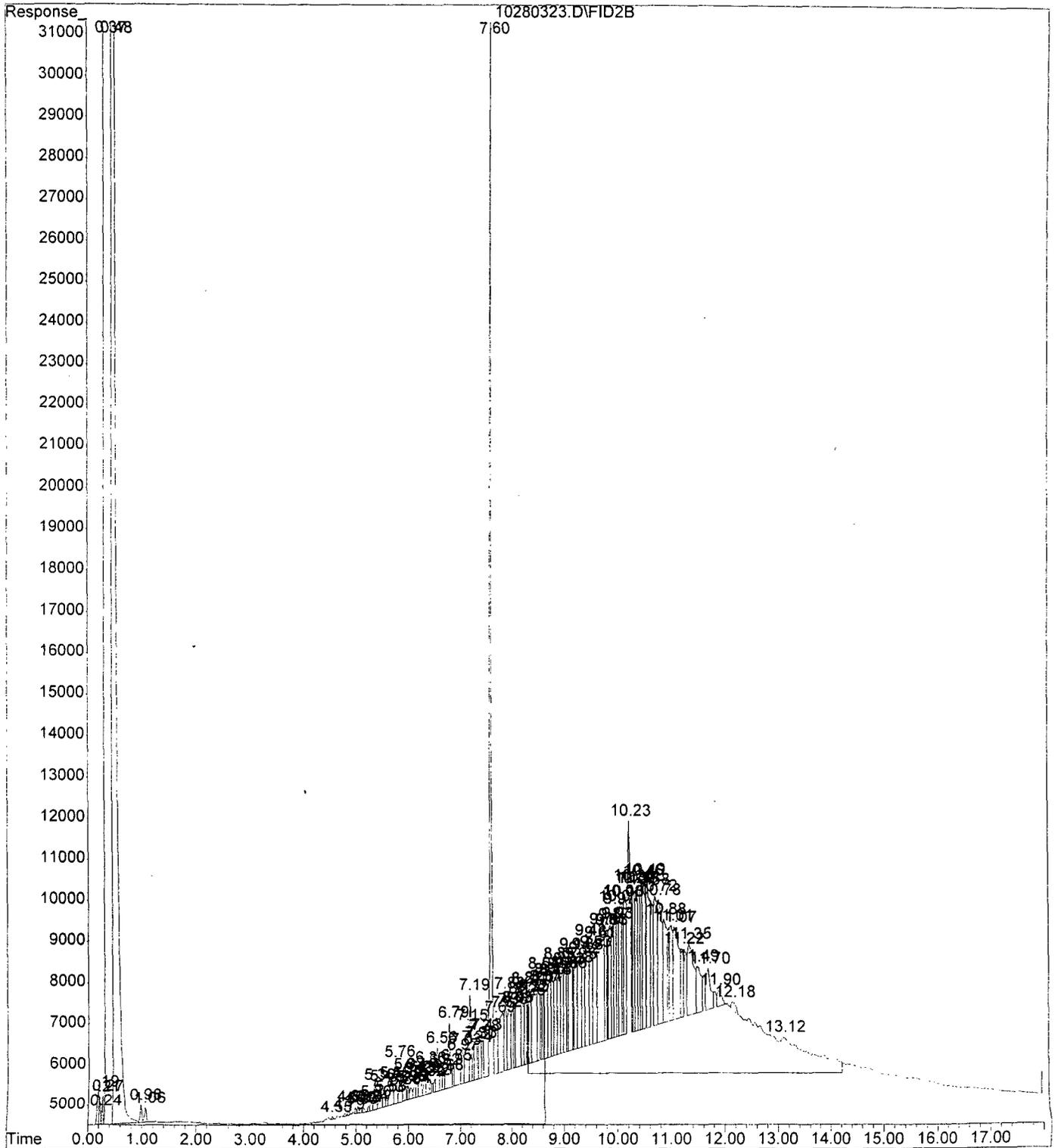
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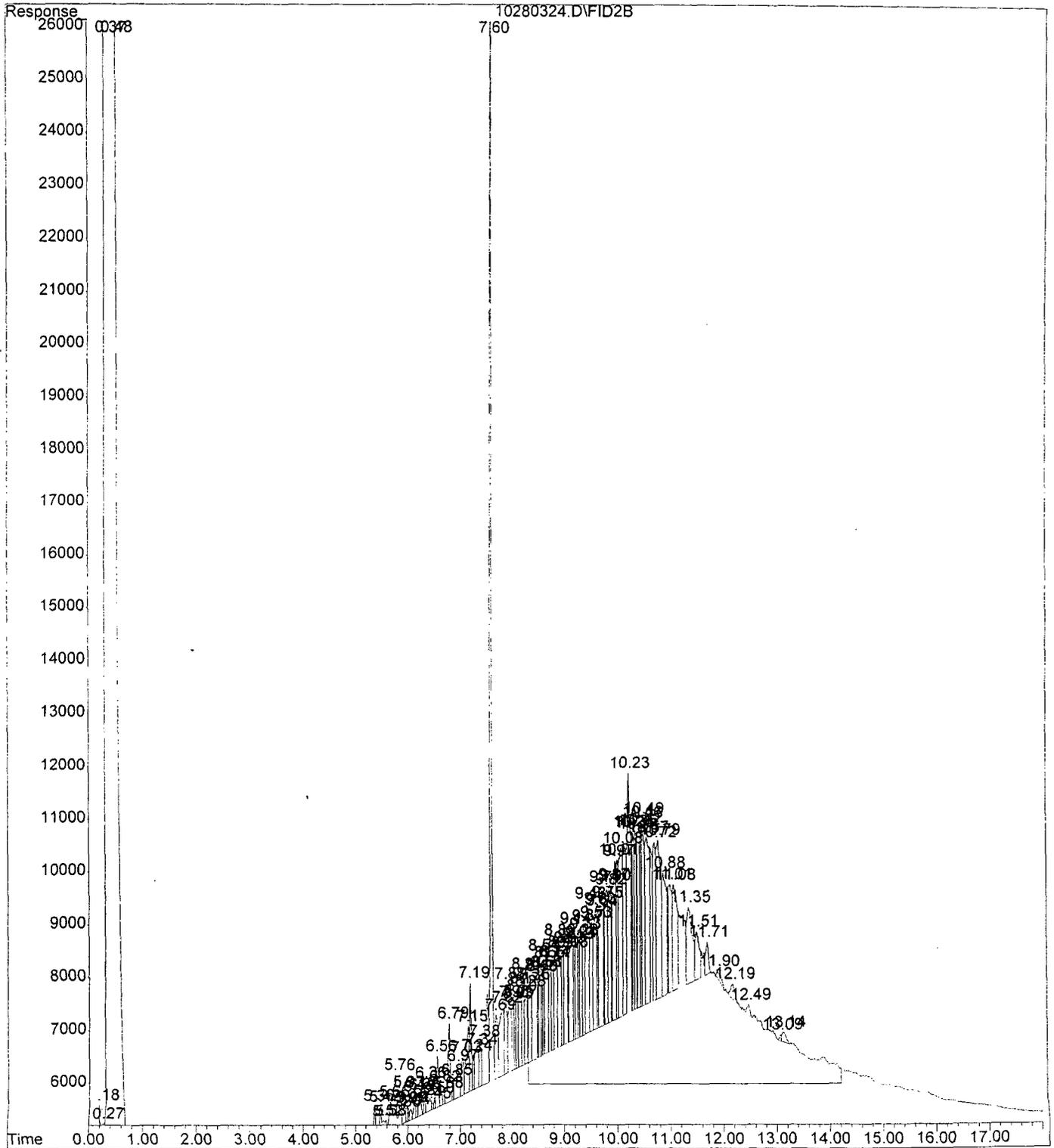
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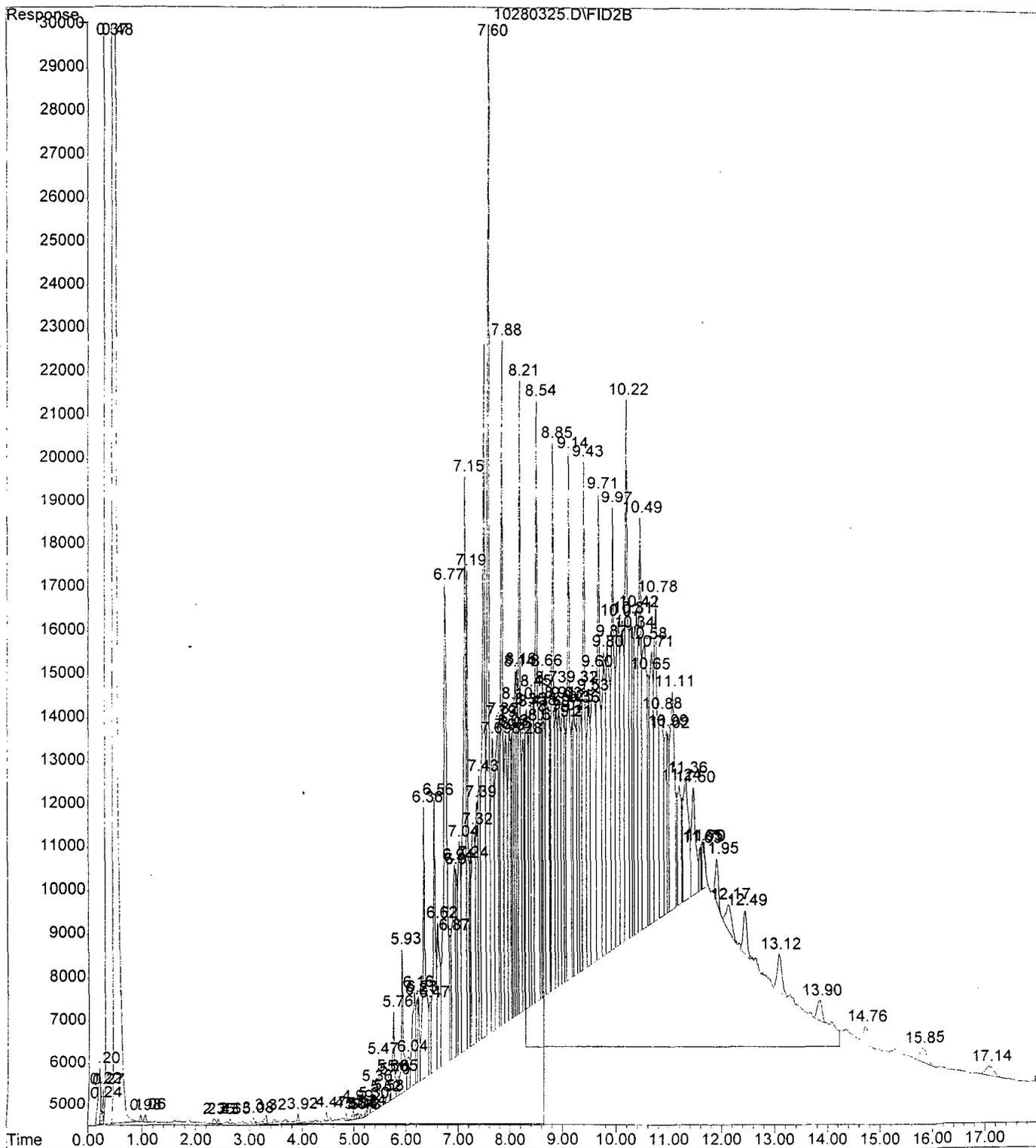
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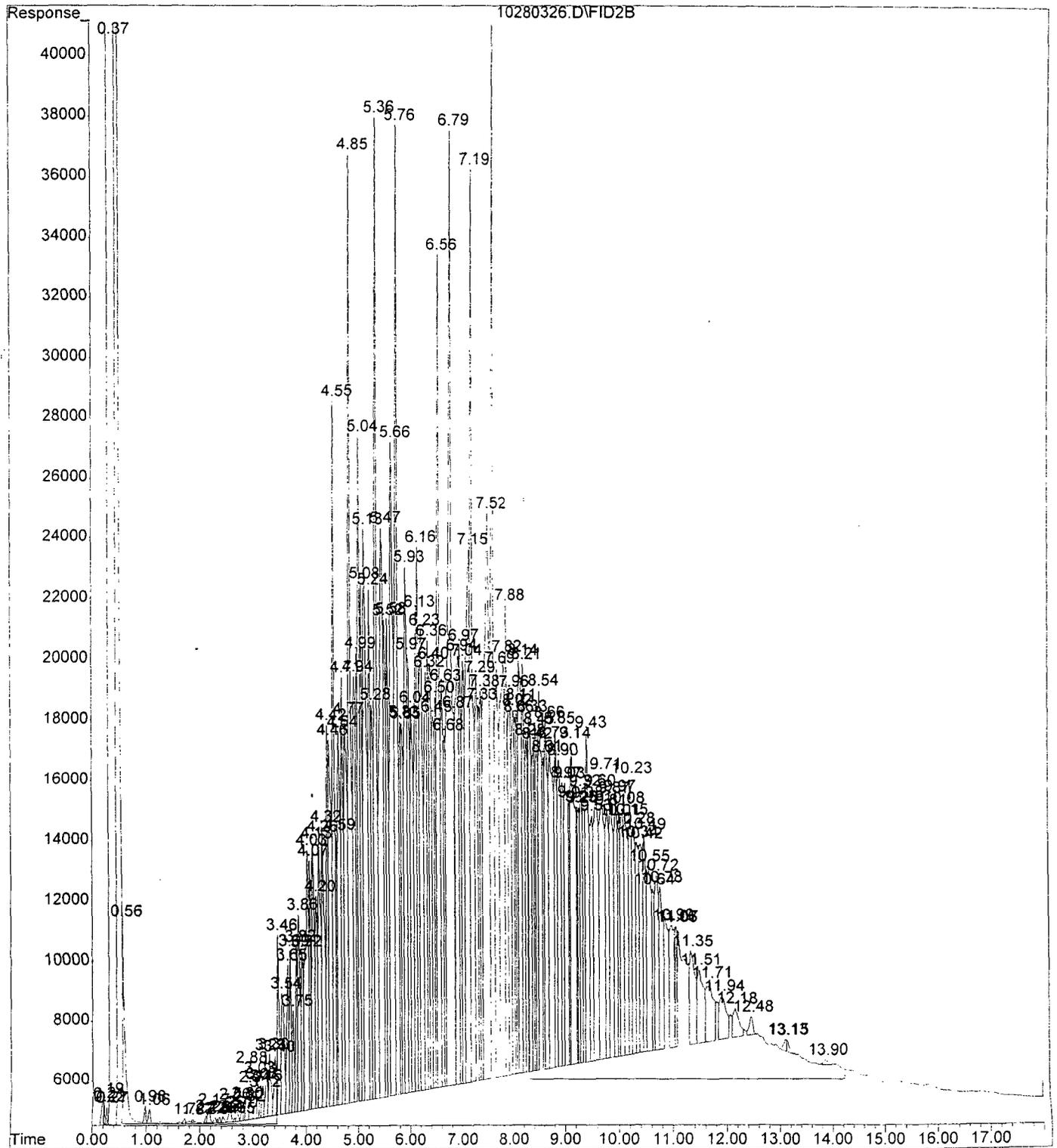
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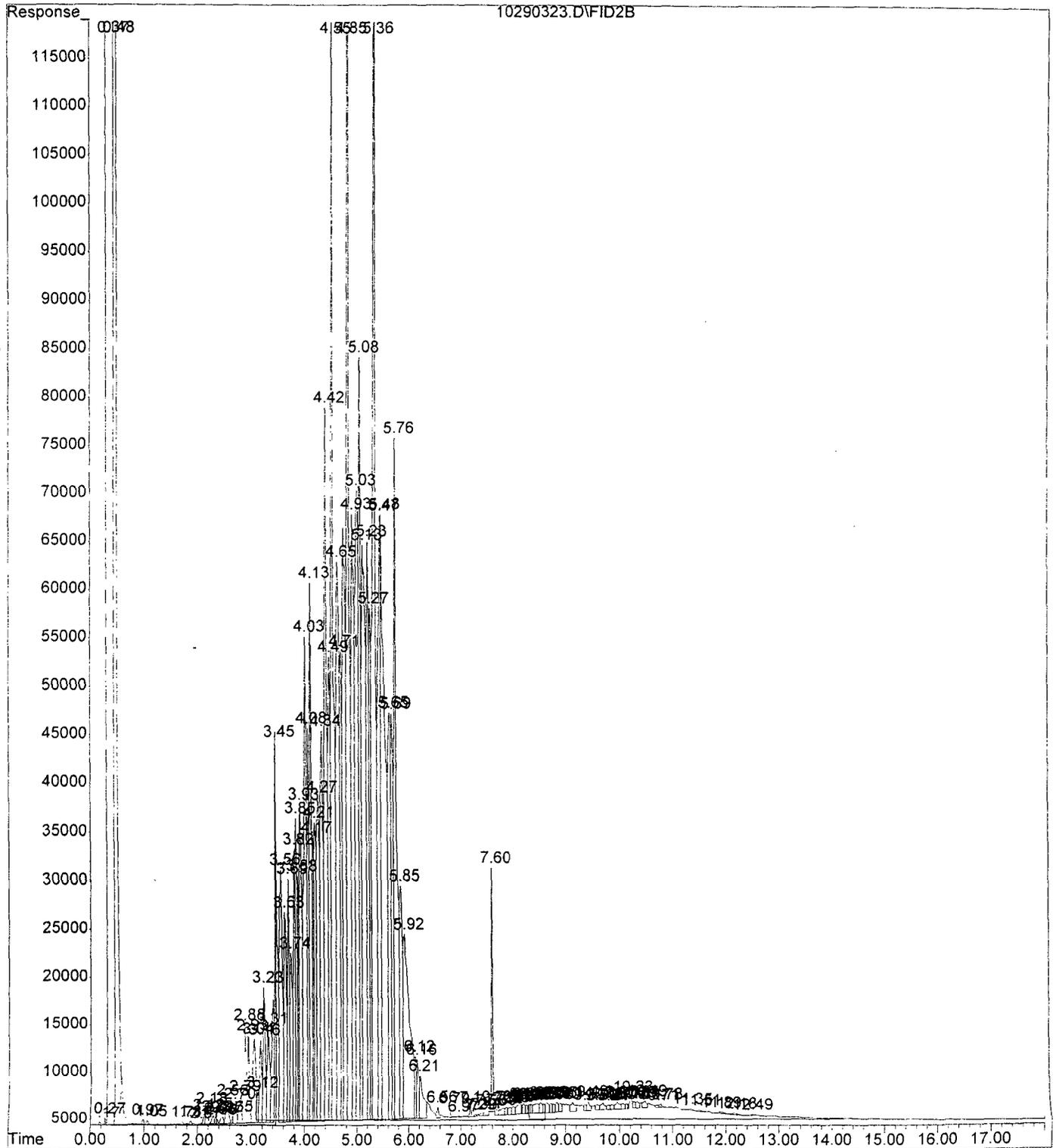
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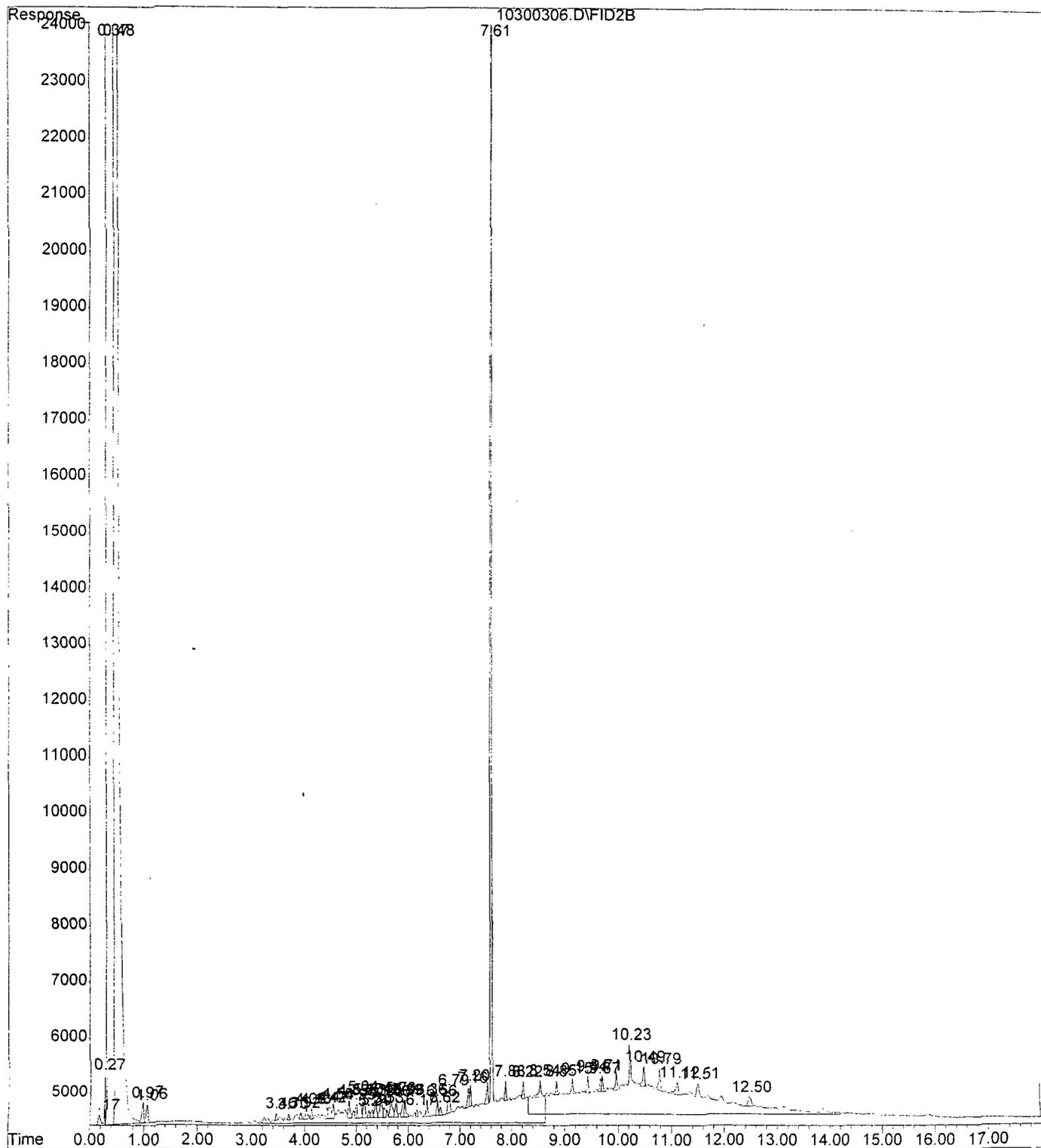
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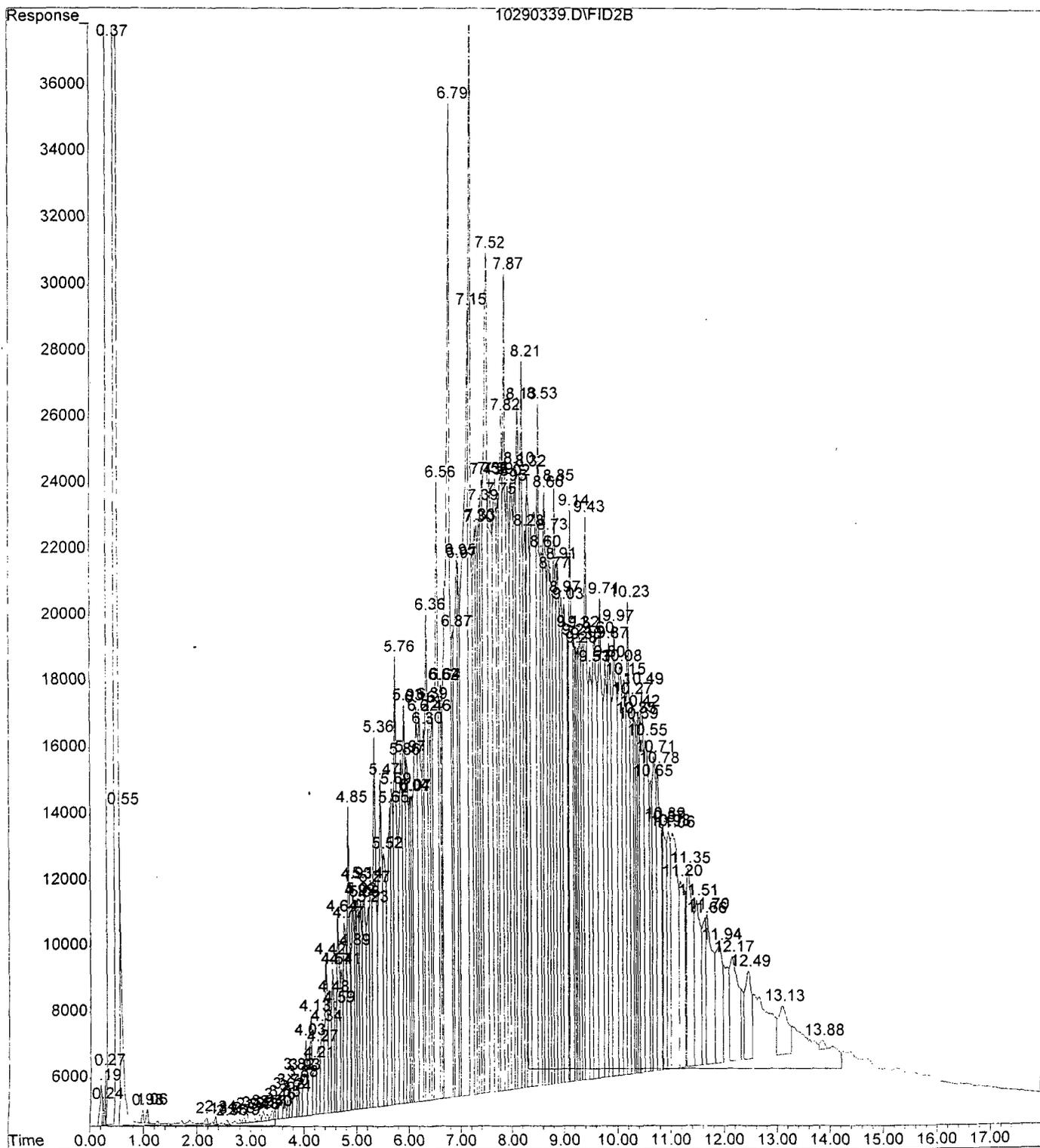
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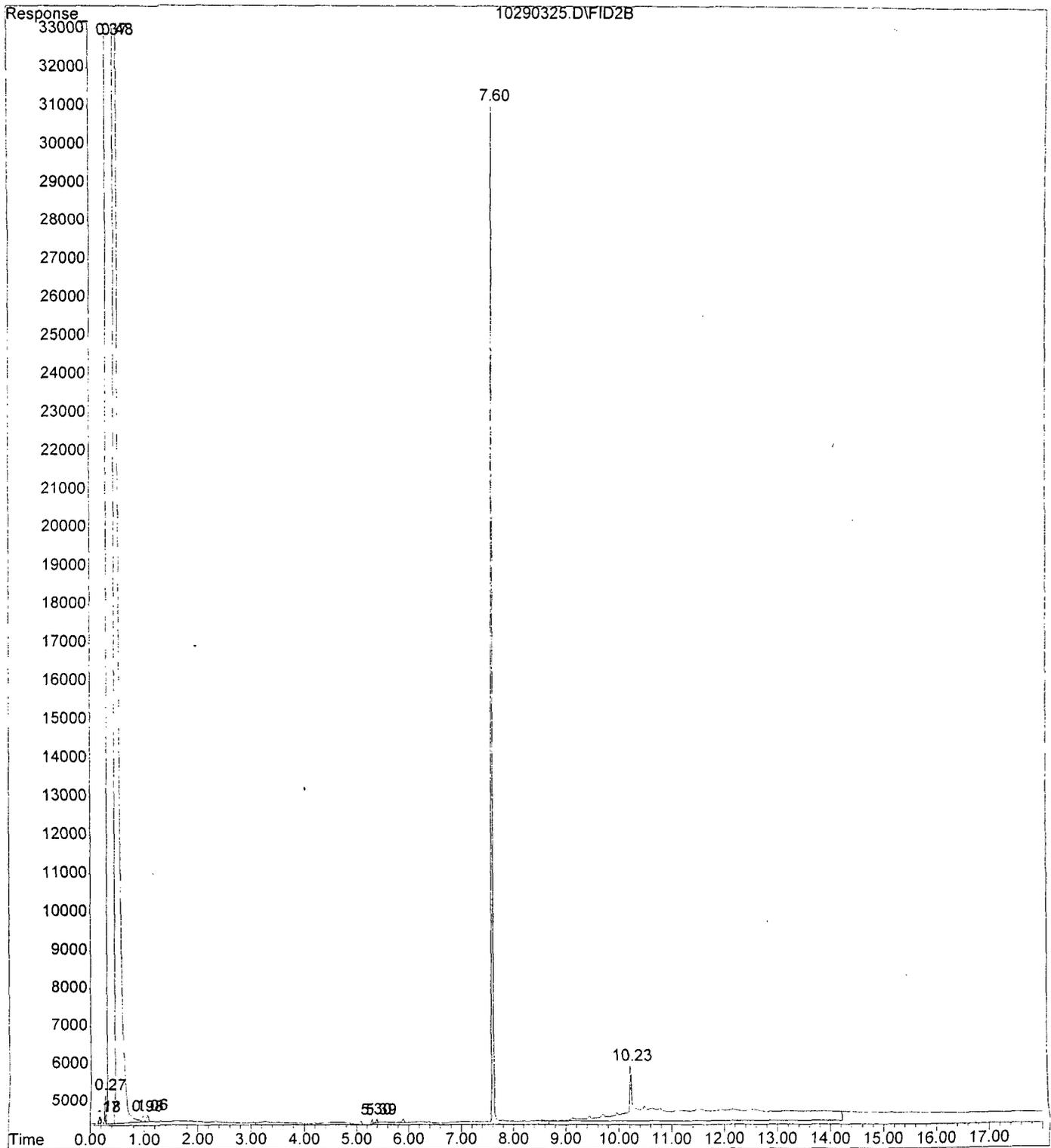
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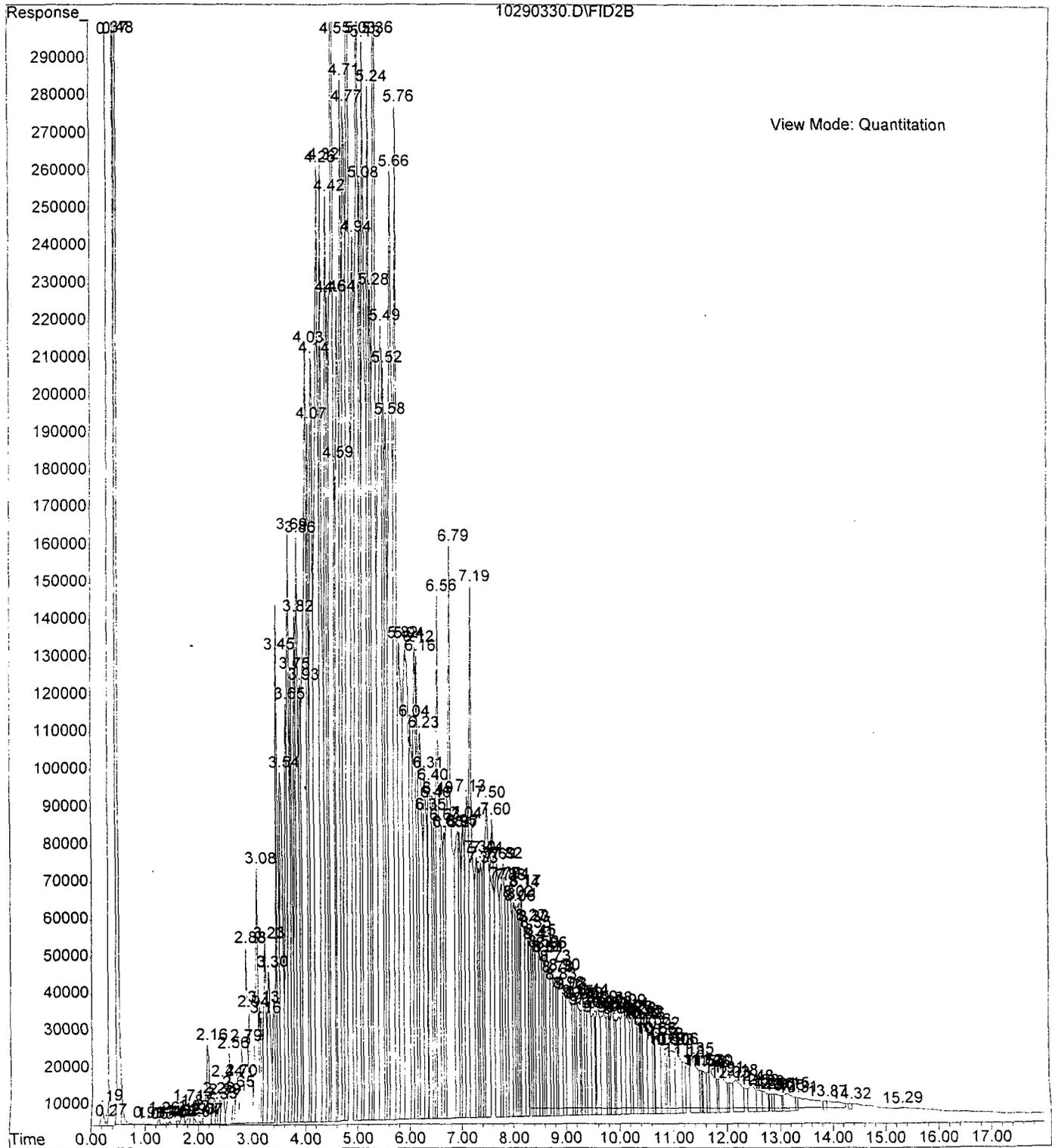


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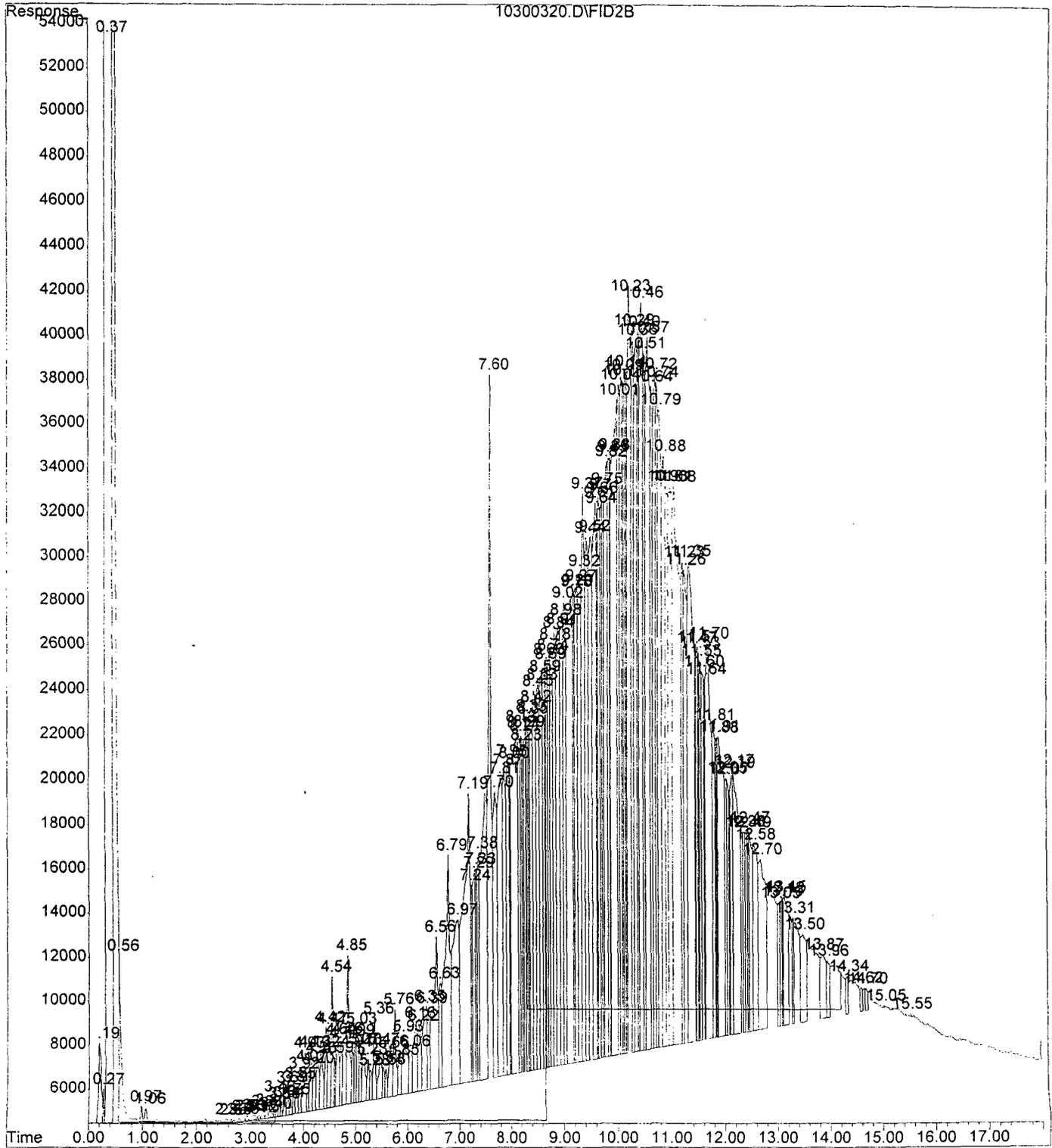




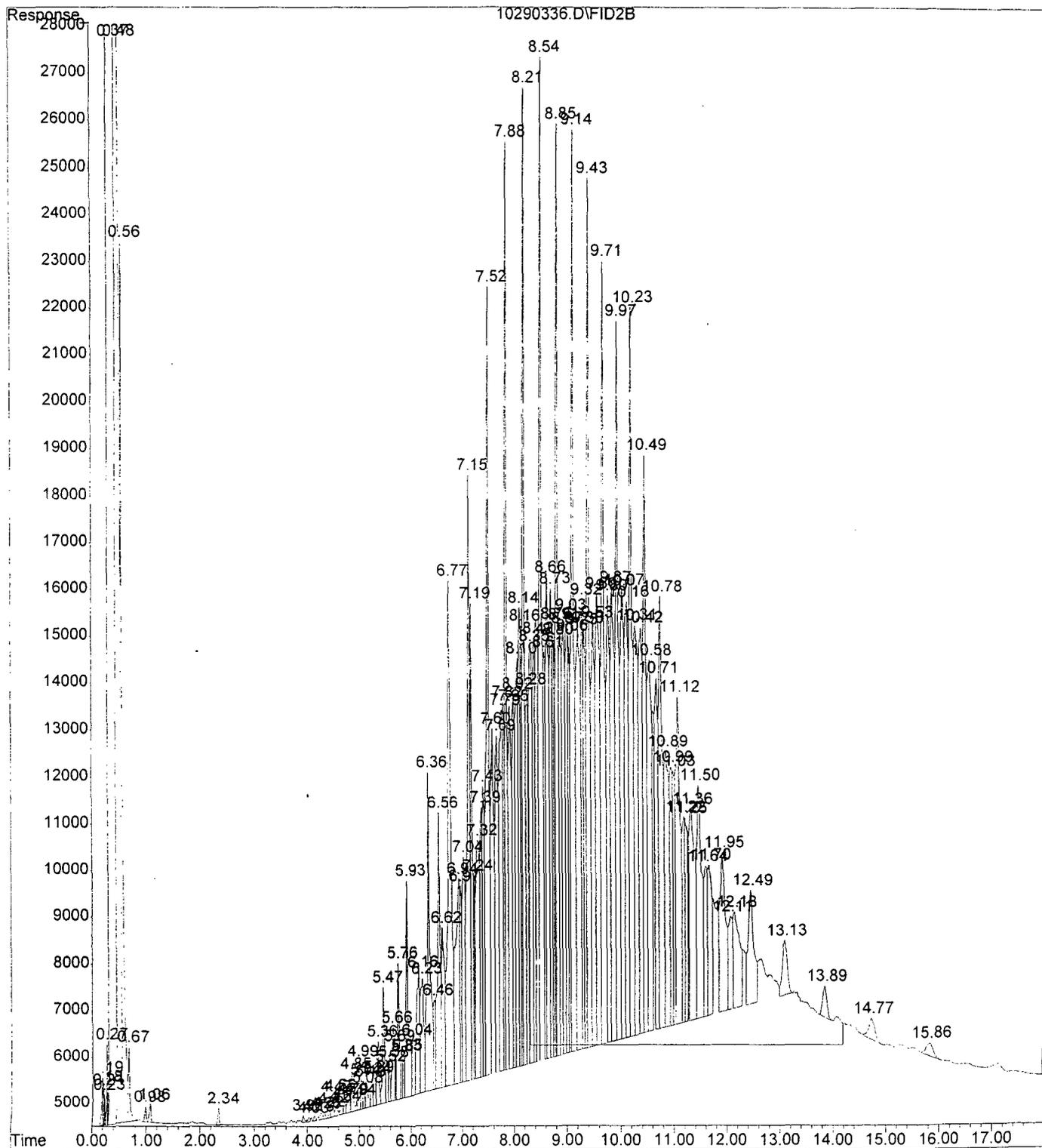
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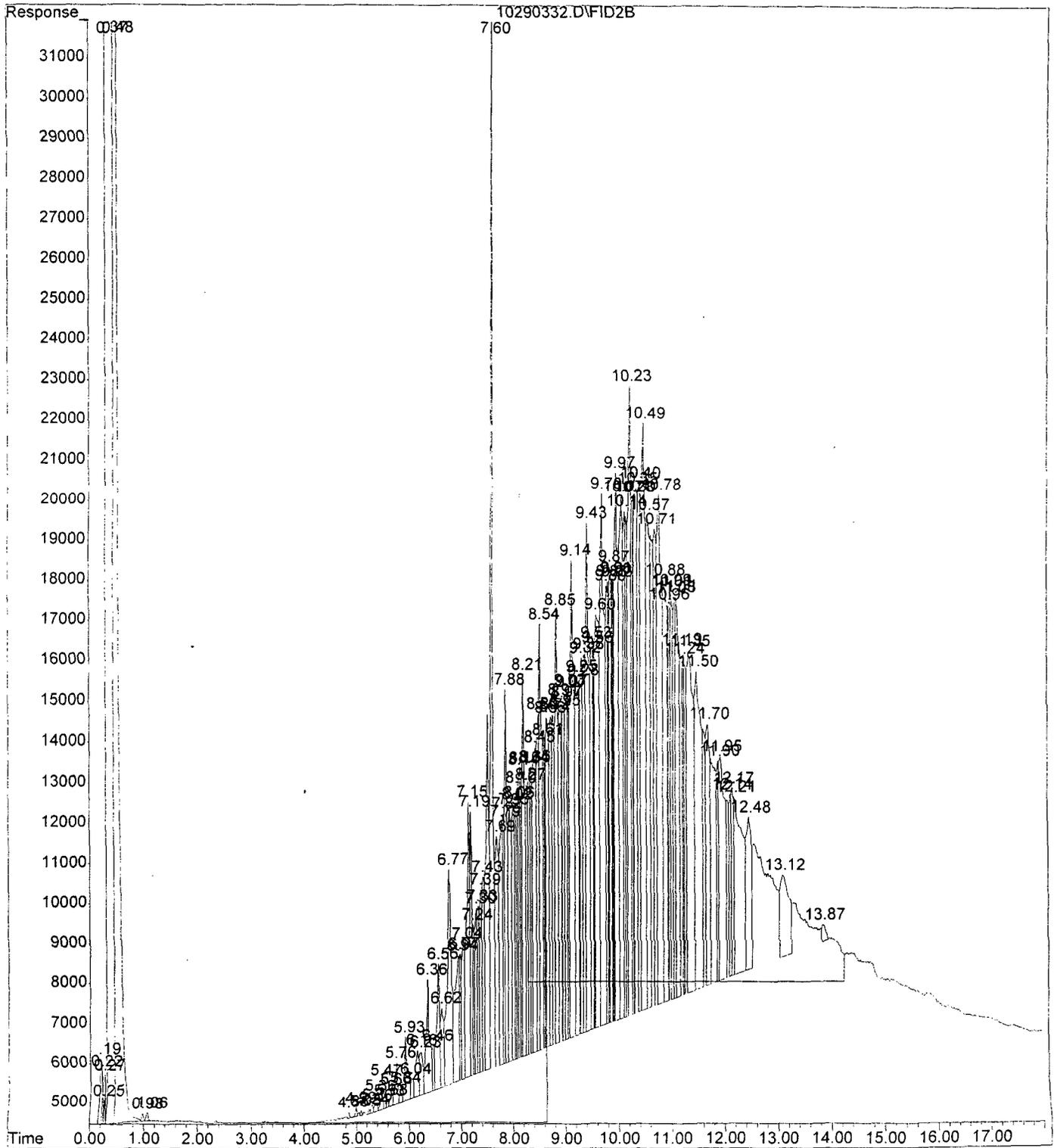
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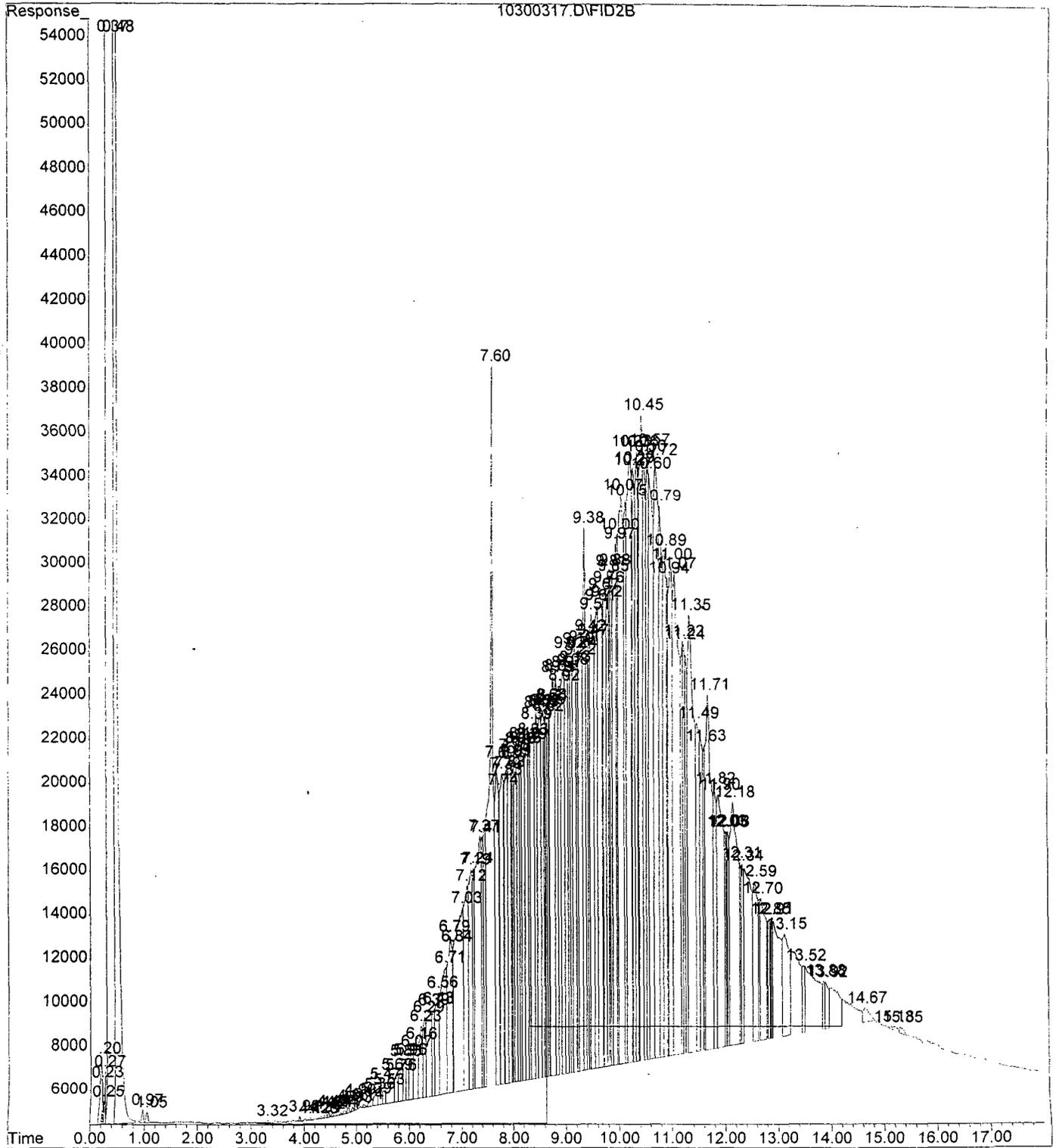
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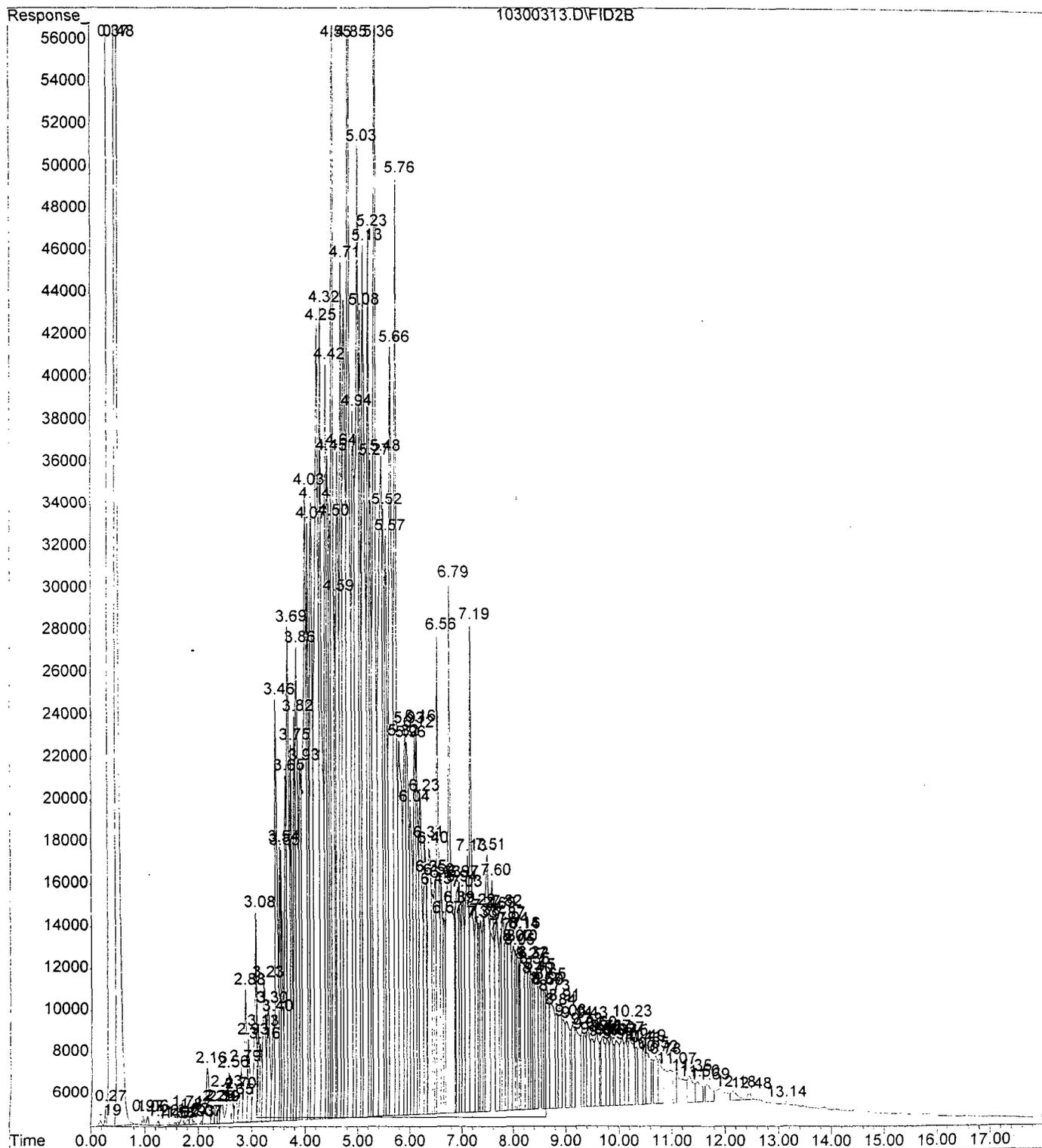
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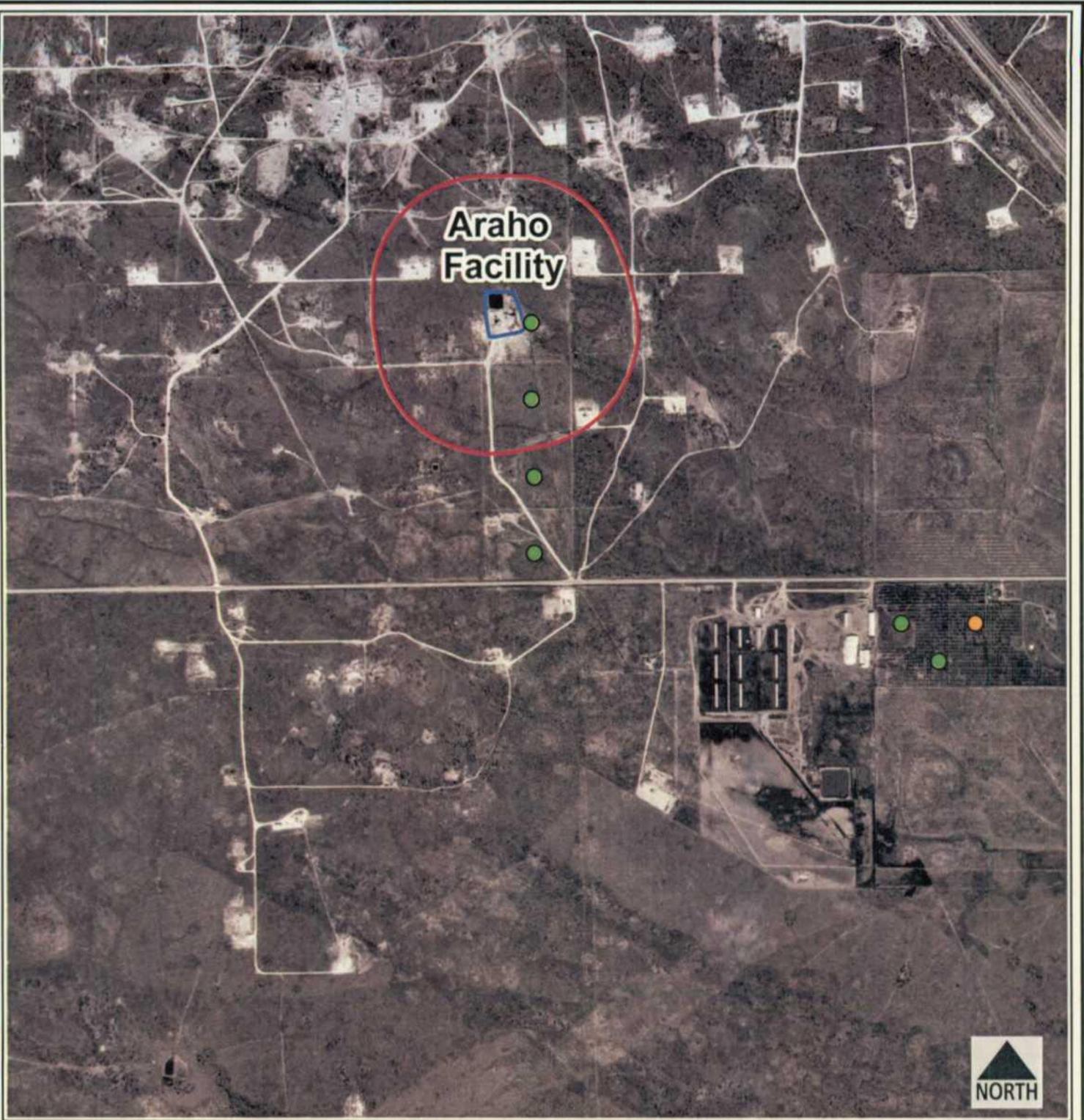


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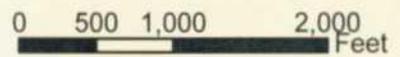


ATTACHMENT J

**Attachment J**  
**Wellhead Protection Area Map**



Map source: NM RGIS website.



1:14,961

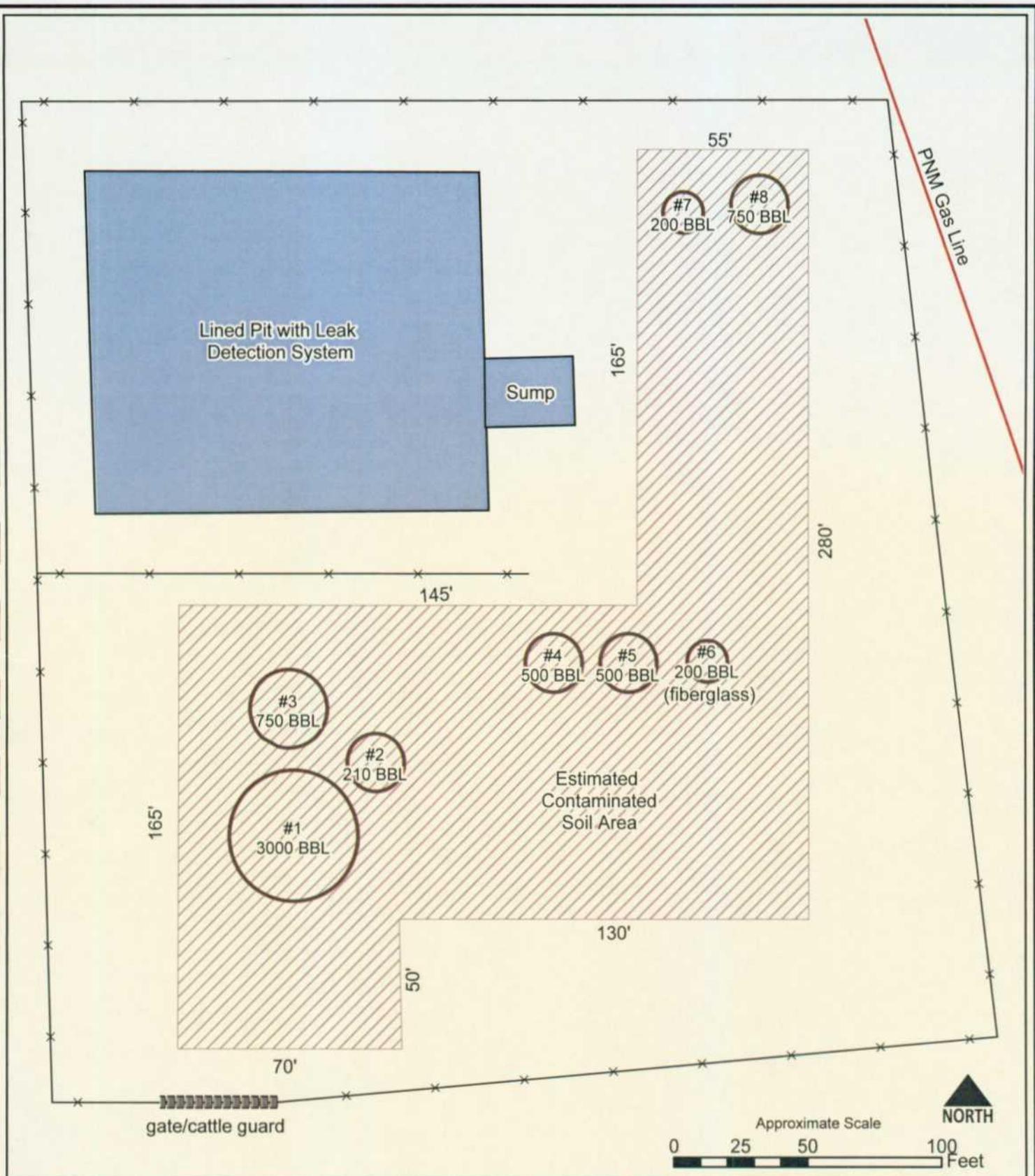
Legend	
	Domestic Well
	Irrigation Well
	Site Boundary
	1000' Buffer of Site

Wellhead Protection Area	
Phase I Investigation and Remediation Araho, Inc., Former Injection Well Disposal Facility Lea County, New Mexico	
Projection: UTM NAD83 Zone 13 meters	
Date: 12/17/03	Attachment to Remediation Report



ATTACHMENT K

**Attachment K**  
**Estimated Area of Petroleum-Contaminated Soil**



Note: All objects are approximate size and/or location.

1. Approximate area: 35,575 sq. feet.
2. Based on 4 foot depth, approximately 5300 cubic yards of petroleum-contaminated soil.

Legend	
	Former AST
	Pit/Sump
	Fence

Estimated Area of Petroleum-Contaminated Soil	
Phase I Investigation and Remediation Araho, Inc., Former Injection Well Disposal Facility Lea County, New Mexico	
Geographic Decimal Degrees	
Date: 12/18/03	Attachment to Remediation Report



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APR 29 2003

Environmental Bureau  
Oil Conservation Division

*Scope of Work and Cost Proposal*

*PHASE I INVESTIGATION AND  
REMEDIATION*

*ARAHO INC. Former Injection Well Disposal  
Facility, Lea County, New Mexico*



**Submitted to:**

**State of New Mexico Energy, Minerals  
& Natural Resources Department  
New Mexico Oil Conservation Division**

**Submitted by:**



**INTERA Incorporated**  
**One Park Square, 6501 Americas Parkway NE, Suite 820**  
**Albuquerque, New Mexico 87110**

**April 30, 2003**

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## 1.0 INTRODUCTION

This scope of work (SOW) and cost estimate are being submitted for a Phase I investigation and cleanup event at the Araho, Inc. former injection well disposal facility (Site) in Lea County, New Mexico. The cleanup is to include removal of the tank fluids, tanks, equipment, piping, and trash (present on the ground surface of the Site). This submittal is in response to an e-mailed SOW dated April 4, 2003, from Ms. Martyne J. Keiling of the New Mexico Oil Conservation Division (NMOCD) to Ms. Stacy Sabol of INTERA Inc. (INTERA).

Basing our assumptions on the SOW, INTERA has identified the following activities that will be performed during the investigation:

- Contact One-Call (New Mexico underground utility locating service) and map the buried pipelines and electrical hazards on the Site based upon the One-Call service markings;
- Perform a naturally occurring radioactive materials (NORM) survey of all pipes and equipment prior to disposal. A registered NORM surveyor must perform the NORM surveys;
- Remove material within the tanks for recycling, approximately 1,600 barrels (bbl);
- Remove the tanks for recycling or disposal;
- Remove trash at the Site to include barrels, buckets, batteries, pipes (buried and surface), electrical meters, and other trash items;
- Investigate the nature and extent of contamination beneath the tank footprints by trenching with a backhoe;
- Investigate the extent of chloride contamination in the surface soils at the Site (per the SOW, 10 6-inch compost samples will be taken);
- Provide an estimate for the volume and cost to remove the contaminated soil material (based on the results of the trenching and sample analysis);
- Provide an estimate for the volume and cost to excavate and construct compost piles on the Site (according to SOW specifications);
- Propose any additional remediation techniques which would be cost effective (based on Phase I findings); and
- Prepare a final report.

These activities are described in greater detail in Section 2.0.

### **Background Information**

According to the SOW, Araho, Inc. operated from 1974 to 1993 as an injection well disposal facility. The Site is located in the NE quarter of the SE quarter of Section 1, Township 17 South,

Range 36 East, Lea County, New Mexico. The surface is owned by the City of Lovington. The NMOCD is in the process of obtaining an access agreement with the City of Lovington in order for contract work to be performed. The facility has a large, lined waste holding pit. This pit is not included in the NMOCD Phase I investigation and cleanup. However, Navajo refining and their contractor will be managing the cleanup of the pit portion of the facility. The two portions of the project may be occurring at the same time or they may be staggered.

Depth to ground water at the Site is estimated to be approximately 80 feet. The local ground water gradient is estimated to be toward the southeast. The NMOCD has provided the following table which lists the major items at the Site and the estimated volume.

ITEM	SIZE / VOLUME ESTIMATES
Facility Dimensions	293' x 410'
Lined Pit 125' x 120' x 4'	Not included in this estimate
Outside Pit Berm 145' x 145' x 4'	Not included in this estimate
3,000-bbl tank	1,000 bbls of material
210-bbl tank	50 bbls of material
750-bbl tank	250 bbls of material
500-bbl tank	empty
500-bbl tank	100 bbls of material
200-bbl tank open top fiberglass	200 bbls and overflowing
200-bbl tank	empty
750-bbl tank	empty
pipe	1,000 feet
55-gallon drum	15 drums
Assorted trash	volume not assessed

INTERA visited the Araho Facility on April 11, 2003, in order to adequately prepare this cost estimate (please see the attached photo log). INTERA met general contractors and NORM surveyors at the facility and provided a walking tour of the facility. Areas of soil staining were identified near valves and piping connections. A leak detection sump was identified to the immediate east of the lined pit. According to the NMOCD, this sump will be removed during the remediation of the lined pit, to be conducted by Navajo Refining (the Navajo Refining remediation may or may not be occurring at the same time as the NMOCD project).

## 2.0 SCOPE OF WORK

Based on the SOW requirements provided by the NMOCD, INTERA has developed the project SOW by dividing the activities into five distinct tasks. Task 1 will include project development

and coordination. Task 2 will consist of contacting One-Call (map the underground pipelines) and conducting a NORM survey of all pipes, tanks, and other equipment prior to disposal. Task 3 will incorporate the field activities of removal of the materials within the tanks and removal of the tanks and other "trash" from the Site (trash includes barrels, buckets, batteries, above- and below-ground pipes, electrical meters, and other miscellaneous items), and also will include the investigation of the nature and extent of contamination below the tank footprints. Task 4 will include the investigation of the extent of chloride contamination in the surface soils using a grid coordinate system. Task 5 will involve the preparation and transmittal of a summary report to the NMOCD.

### **2.1 Task 1: Project Development and Coordination**

A Phase I investigation and remediation event of the magnitude proposed requires adequate preparation and coordination. Task 1 will include the development of a project schedule, project budget tracking, preparation of a health and safety plan, and the preparation of an internal work plan. Task 1 will also include project management tasks and coordination with the NMOCD.

### **2.2 Task 2: Performance of a "One-Call" and a NORM Survey**

INTERA will perform a New Mexico-required "One-Call" contact prior to the performance of any site work. The "One-Call" service should provide the locations of all known underground buried utilities at the Site. In addition, an NMOCD-provided map of the underground piping present at the Site will also be used to ultimately produce a Site utility location map. This map will be used during the trenching work to avoid buried utility lines and to document all known electrical hazards on the Site. A copy of the Site utility location map will be included in the final report.

INTERA will subcontract to perform a NORM survey. INTERA has contacted the New Mexico Environment Department Radiation Control Bureau and obtained a list of qualified NORM surveyors. INTERA will use a NORM surveyor located nearest the Site to reduce mobilization/transportation/per diem costs. The NORM survey will determine if there are any radioactive materials present in the tanks, piping, or other trash to be disposed of. NORM can accumulate in piping bends and/or elbows and tank bases, where petroleum products can accumulate and harden on interior surfaces.

According to NMOCD, the presence of NORM in any tanks would not prohibit the tanks from being transported off site for recycling. A complete copy of the NORM survey results will be included in the final report.

### **2.3 Task 3: Field Investigation**

The field investigation will include those activities described in the NMOCD SOW, and will include:

- An INTERA licensed subcontractor will remove all of the fluids from the tanks located at the Site and will dispose of them accordingly. (This does not include the leak detection sump, which is included in the Navajo Refinery remediation associated with the lined pit

located at the Site.) The material will be recycled if possible. INTERA will record the volume of material disposed of and the company used for disposal/recycling, which shall be NMOCD-approved. The volume of recoverable hydrocarbons will be documented as well.

- An INTERA licensed subcontractor will clean the tanks located on the Site prior to shearing (cutting) the metal for disposal using water jetting. The wash water will be disposed of with the other fluids currently located in the tanks at the Site.
- INTERA and its licensed subcontractor will conduct the health and safety monitoring of ambient air and of air within each tank during removal and demolition. The removed tanks will be disposed/recycled at an NMOCD-approved facility.
- An INTERA licensed subcontractor will conduct the removal of the miscellaneous debris located at the Site (barrels, buckets, buried and surface piping, electrical meters, and other trash items). The perimeter fencing located around the facility is to remain in place and is not considered part of the miscellaneous debris recommended for disposal. INTERA will document the volume/weight of the miscellaneous debris removed at the disposal/recycling company used.
- All testing necessary (which has been assumed to be limited to the NORM survey and the lead-based paint [LBP] survey conducted by NMOCD at the facility) will be conducted prior to the disposal of the metal materials. The paint on the tanks has been sampled for lead content by NMOCD and these results will be provided to the contractor prior to the initiation of fieldwork. A significant amount of LBP will affect the disposal costs and be considered a change in scope and thus a change in costs. INTERA assumes that no further waste characterization (Resource Conservation and Recovery Act [RCRA] requirements) will have to be conducted for waste at the Araho Facility.
- INTERA will investigate the nature and extent of contamination below the tank footprints using trenching, with each trench constructed with a backhoe. Trenches will be constructed along the diameter of each tank as well as in any "stained" soil areas formerly under or around a given tank. Grab soil samples will be retrieved from each trench and INTERA will screen the soil samples via New Mexico Petroleum Storage Tank Bureau headspace screening methods. The photoionization detector readings will be recorded in the field log book. The soil samples selected for laboratory analysis will be submitted to an NMOCD-approved laboratory (either Trace Analysis or Pinnacle Laboratories) at the discretion of the NMOCD project manager. INTERA will not be responsible for sample shipping or analytical costs. In addition, NMOCD agrees to provide INTERA with complete copies of all laboratory analytical results to be included in the final report. Per the NMOCD SOW, each soil sample submitted will be analyzed for total petroleum hydrocarbons, benzene, toluene, ethyl benzene, and total xylenes, and chloride.
- INTERA will investigate the extent of chloride contamination in the surface soils at the Site by constructing a grid as required by the NMOCD SOW. From the grid, INTERA will collect 10 6-inch "compost" (i.e., composite) samples and submit them for chloride analysis. The chloride soil samples will be sent to the laboratory of the NMOCD project manager's choice. INTERA will not be responsible for chloride sample analytical or shipping costs; these costs will be incurred directly by NMOCD.

- All sample locations will be documented using a hand-held GPS receiver and will be provided in the coordinate system specified by the NMOCD Project Manager. The GPS locations will be used to document sampling locations on the final site figures.
- INTERA recommends that quality control/quality assurance (QA/QC) samples (split samples, duplicates, etc.) be collected. The frequency and number of QA/QC samples will be dictated by the NMOCD, and therefore have not been budgeted at this time.

#### **2.4 Task 4: Preparation of an Investigation Report**

Upon the culmination of the field investigation, INTERA will complete a report documenting results of the investigation and summarizing the collected data. The report will include at a minimum:

- A site map showing all buried pipelines, electrical hazards, Site boundaries, and sampling locations;
- NORM survey results;
- The volume of material removed from the tanks, disposal/reclamation company used and the volume of recoverable hydrocarbons retrieved;
- Tank reclamation or scrap iron facility used;
- Volume/weight of miscellaneous debris removed and the disposal/recycling company used;
- Results of all analytical data gathered;
- A map/cross section showing the locations, depths, and concentrations of remaining soil contamination areas;
- Estimates of the volume and cost to remove all material determined to be contaminated based on the trenching and sample analysis. An estimate for the cost of placing clean fill in the excavated areas will also be generated. INTERA will follow the NMOCD suggestion to transport clean fill from a landfarm location to help decrease transportation charges; and
- Estimates of the volume and cost to excavate and construct compost piles on site. The contaminated material should be mixed at a 4:1 ratio with manure and enough water to keep the piles moist, per the NMOCD request. The piles are to be turned every four weeks for at least four turning events. Estimates will include costs to backfill and compact the excavations and contour the Site with the remediated compost material.

#### **2.5 Task 5: Preparation of a Summary Report**

Task 5 will involve the preparation and transmittal of a summary report to the NMOCD. Per the NMOCD SOW, the final report will include:

- A site map showing all buried pipelines and electrical hazards;
- NORM survey results;
- Volume of material removed from the tanks (combined); disposal/reclamation company used and the volume of recoverable hydrocarbons retrieved;
- Tank reclamation or scrap iron facility used;
- Volume/weight of trash removed and the disposal/recycling company used;

- Results of all analytical data gathered;
- A map/cross section showing the locations, depths, and soil contamination areas identified; and
- Phase II remediation techniques/proposals with estimates for further work as outlined in the SOW.

### **3.0 SCHEDULE**

INTERA will begin scheduling and project coordination as soon as possible after the NMOCD has issued a purchase document for the investigation.

The investigation report will be transmitted to the NMOCD within 60 days of completion of the field sampling activities.

### **4.0 PROPOSAL**

The cost estimate is provided in the attached spreadsheet. INTERA's services will be provided on a time and materials basis. INTERA will not exceed these costs without first requesting and then obtaining approval for an amendment to this budget. Assumptions used in developing these costs are provided below.

- A NORM Survey needs to be conducted on the sludge material located on the bottom surface of the 3,000-barrel tank. All material will be pumped from this tank prior to sampling the sludge on the bottom. The NORM Survey will also include surveying all tanks and miscellaneous debris transported from the Site.
- NMOCD will provide the results of the LBP sampling to INTERA prior to commencement of the field investigation/remediation.
- The NMOCD will grant access to the property and INTERA need not obtain or generate any access agreements.
- INTERA will complete the fieldwork for the site remediation/site characterization within a period of 50 hours.
- The fencing around the perimeter of the facility does not need to be removed and will not be included as material characterized in the NORM Survey.
- No confined space entry is required during the completion of the field activities.
- Soil samples will be sent to an NMOCD contract laboratory. Because the contract laboratory will be reimbursed directly through the State of New Mexico, costs for laboratory analyses are not included in the attached estimate. The selected laboratory will provide all sample bottles, coolers, etc. and will be responsible for any cost incurred by INTERA for sample shipping.
- The NORM survey and LBP sampling are the only samples required of material for disposal. RCRA sampling requirements for disposal of certain materials (i.e., batteries, drums with nonpetroleum contents, etc.) have not been included as part of this cost estimate.
- INTERA assumes that the barrels at the facility are empty.

- Laboratory analytical data will be forwarded to INTERA within 21 calendar days of submittal of samples to the laboratory.

INTERA will submit one invoice for services upon transmittal of the investigation report. Terms of payment will be in accordance with INTERA's New Mexico General Services Department Contract No. 30-805-09-18056.

## 5.0 PERSONNEL

The key personnel who will be responsible for completion of the project are listed below along with their areas of responsibility.

Ms. Stacy Sabol – Principal	Client interface, oversight of project management, and technical review of work plan and report documents.
Mr. Joseph J. Tracy, PG – Project Geologist	Project management, contaminant investigation activities, and development of work plan, health and safety plan, and final report.
Mr. James P. Joseph – Project Engineer	Project management, contaminant investigation activities, and development of work plan, health and safety plan, and final report.
Mr. Jerome Marez – Staff Engineer	Background research, site investigation activities, and development of work plan, and final report.
Mr. Konrad Clark – Field Technician II	Coordination, scheduling, and lead technician on field activities. Completion of field forms and final report development.

**COST ESTIMATE**

State of New Mexico  
Oil Conservation Division  
Phase I Investigation and Remediation  
Araho, Inc.  
Former Injection Well Disposal Facility,  
Lea County, New Mexico  
Cost Estimate

Task 1. Project Coordination and Fieldwork Preparation					
Professional Services	Contract Line		Unit	# of Units	Total
	Item	Rate			
Principal	0001	100.00	hour	2	\$ 200.00
Project Scientist/Engineer/Manager	0003	67.00	hour	4	\$ 268.00
Staff Scientist/Engineer	0004	52.00	hour	4	\$ 208.00
Field Technician II	0005	50.00	hour	8	\$ 400.00
<b>Subtotal Professional Labor</b>					<b>\$ 1,076.00</b>
<b>SUBTOTAL TASK 1:</b>					<b>\$ 1,076.00</b>
NMGRT @ 5.8125%					\$ 62.54
<b>GRAND TOTAL TASK 1:</b>					<b>\$ 1,138.54</b>
Task 2. Map Buried Utilities (1-Call) and Perform Naturally Occurring Radioactive Materials (NORM) Survey					
Professional Services	Contract Line		Unit	# of Units	Total
	Item	Rate			
Staff Scientist/Engineer	0004	52.00	hour	2	\$ 104.00
Field Technician II - Mobilization	0005	50.00	hour	16	\$ 800.00
Field Technician II	0005	50.00	hour	8	\$ 400.00
Draftsperson II (Utility Mapping)	0007	50.00	hour	8	\$ 400.00
<b>Subtotal Professional Labor</b>					<b>\$ 1,704.00</b>
Expenses	Contract Line		Unit	# of Units	Total
	Item	Rate			
NORM Survey	"At Cost"	1,300.00	each	1	\$ 1,300.00
<b>Subtotal Expenses</b>					<b>\$ 1,300.00</b>
<b>SUBTOTAL TASK 2:</b>					<b>\$ 3,004.00</b>
NMGRT @ 5.8125%					\$ 174.61
<b>GRAND TOTAL TASK 2:</b>					<b>\$ 3,178.61</b>
Task 3. Field Investigation: Tank Removal/Cleaning/Disposal and Piping Removal/Disposal and Sampling/Trenching					
Professional Services	Contract Line		Unit	# of Units	Total
	Item	Rate			
Project Scientist/Engineer/Manager	0003	67.00	hour	6	\$ 402.00
Staff Scientist/Engineer	0004	52.00	hour	8	\$ 416.00
Field Technician II - Fieldwork*	0005	50.00	hour	50	\$ 2,500.00
Field Technician II - Foreman	0005	50.00	hour	50	\$ 2,500.00
Field Technician I - Equipment Operator Trackhoe	0006	35.00	hour	50	\$ 1,750.00
Field Technician I - Equipment Operator Backhoe	0006	25.00	hour	50	\$ 1,250.00
Field Technician I - Laborer	0006	20.00	hour	50	\$ 1,000.00
Field Technician I - Laborer	0006	20.00	hour	50	\$ 1,000.00
Hourly Secretary	0010	30.00	hour	4	\$ 120.00
<b>Subtotal Professional Labor</b>					<b>\$ 10,938.00</b>
Expenses	Contract Line		Unit	# of Units	Total
	Item	Rate			
Disposal of Contaminated Fluids (Product)	0044	6.55	barrel	1,600	\$ 10,480.00
Disposal of Contaminated Fluids (Cleaning Water)	0044	7.85	barrel	360	\$ 2,826.00
Vacuum/Jet Truck	"At Cost"	750.00	day	4	\$ 3,000.00
Trackhoe Heavy Duty	0030	646.00	day	5	\$ 3,230.00
Disposal of Scrap Metals (Tanks) and Piping	"At Cost"	40.00	ton	12	\$ 480.00
Disposal of Miscellaneous Trash	"At Cost"	35.00	ton	48	\$ 1,680.00
Transportation of Materials (Scrap Metals, Piping, Trash) for Disposal	"At Cost"	19.50	ton	60	\$ 1,170.00
Backhoe Medium Duty	0026	157.00	day	5	\$ 785.00
Combustible Gas Indicator (CGI) with O2, H2S, CO2	0012	50.00	day	5	\$ 250.00
Fresh Air/Safety Trailer/Personal Air Samplers	"At Cost"	300.00	day	3	\$ 900.00
Hand-Held GPS Unit	"At Cost"	5.00	day	3	\$ 15.00
Photoionization Detector (PID)	0021	10.00	day	5	\$ 50.00
Mileage	0042	0.25	mile	800	\$ 200.00
Per Diem	0043	65.00	day	7	\$ 455.00
<b>Subtotal Expenses</b>					<b>\$ 25,521.00</b>
<b>SUBTOTAL TASK 3:</b>					<b>\$ 36,459.00</b>
NMGRT @ 5.8125%					\$ 2,119.18
<b>GRAND TOTAL TASK 3:</b>					<b>\$ 38,578.18</b>
Task 4. Preparation of an Final Report					
Professional Services	Contract Line		Unit	# of Units	Total
	Item	Rate			
Principal	0001	100.00	hour	8	\$ 800.00
Project Scientist/Engineer/Manager	0003	67.00	hour	24	\$ 1,608.00
Staff Scientist/Engineer	0004	52.00	hour	40	\$ 2,080.00
Field Technician II	0005	50.00	hour	24	\$ 1,200.00
Draftsperson II (Figures, Cross Sections)	0007	50.00	hour	16	\$ 800.00
Administrator (Technical Editor)	0009	40.00	hour	6	\$ 240.00
<b>Subtotal Professional Labor</b>					<b>\$ 6,728.00</b>
<b>SUBTOTAL TASK 4:</b>					<b>\$ 6,728.00</b>
NMGRT @ 5.8125%					\$ 391.07
<b>GRAND TOTAL TASK 4:</b>					<b>\$ 7,119.07</b>
<b>PROJECT GRAND TOTAL:</b>					<b>\$ 50,014.39</b>

Notes:

NMGRT = New Mexico Gross Receipts Tax

\* The labor rate shown for "Field Technician II - Fieldwork" is provided on the assumption that a maximum of 50 hours of fieldwork will be required to complete the tank and piping removal and disposal portion of the project. This time estimate also includes sample trenching and sample collection; however, sample analytical costs are not included in this cost estimate. All INTERA costs will be invoiced on a time and materials basis, therefore a reduction of time or materials taken to complete the project results in a reduction of the final costs of the project.

**PHOTO LOG**



*No. 1 – View of the empty tanks located to the northeast of the lined pit.*



*No. 2 – View of the 750 and 3,000 barrel tanks located at the Araho Facility.*



*No. 3 – Concrete slab and former wooden floor located adjacent to the 3,000 barrel tank.*



*No. 4 – Typical view of product lines connected to aboveground tanks.*



*No. 5 – Areas of soil staining located adjacent to the 750 and 3,000 barrel tanks.*



*No. 6 – View of tanks, electrical lines, and surface soil staining.*



*No. 7 – View of the lined pit and sump.*



*No. 8 – 200 barrel tank with product that has overflowed on to the surrounding ground surface.*



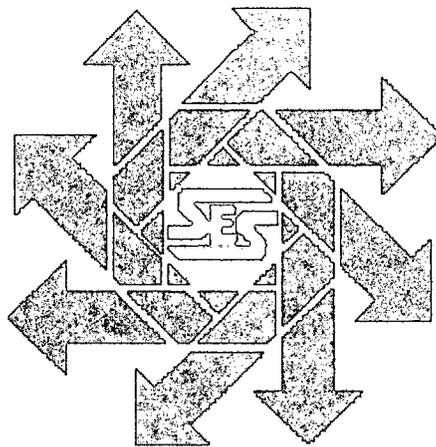
*No. 9 – View of miscellaneous debris and surface soil staining adjacent to the 200 barrel tank.*



*No. 10 – View of the site showing tanks, electrical lines, and above ground piping.*

**Navajo Refining Company  
Arahoie Pit Assessment  
Section 1 Township 17 S Range 36 E  
Lea County, New Mexico**

**October 5, 2000**



**COPY**

**Prepared For:**

*Navajo Refining Company  
501 East Main  
Artesia, New Mexico 88210  
(505) 748-3311*

**Prepared By:**

*Safety & Environmental Solutions, Inc.  
703 E. Clinton Suite 103  
Hobbs, New Mexico 88240  
(505) 397-0510*

## TABLE OF CONTENTS

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<b>Figure &amp; Appendix .....</b>	<b>3</b>

## I. Background

Safety & Environmental Solutions, Inc. (SESI) was engaged on April 27, 1999 to perform a site investigation of the Araho Pit located in Section 1 Township 17S, Range 36E, Lea County, New Mexico (Figure 1). The scope of work for this investigation includes drilling two (2) bore holes to groundwater, one located northwest of the pit and one located southeast of the pit. No soil samples will be taken from surface to the groundwater in either borehole. One groundwater sample from each borehole will be taken and analyzed for TPH and BTEX by a third party laboratory. The boreholes will be grouted and backfilled with cuttings after the sampling is complete. In addition, three (3) boreholes will be drilled on each side of the pit to the bedrock and a single soil sample taken at that point.

## II. Work Performed

SESI performed the drilling and sampling services for this project on October 5, 2000. Cardinal Laboratories of Hobbs, New Mexico was contracted to perform the laboratory analytical testing required for this project. SESI used a hollow stem auger rig for the drilling and a thin wall sampling tube for the extraction of the samples.

Twelve (12) test borings were drilled at even intervals around the pit, as close to the berm as possible, to the first encounter of bedrock. (Figure 2) Samples were taken from the bottom of each borehole at the top of the bedrock and screened with a Photovac Microtip PID, serial number 1128, calibrated on October 5, 2000. The results of the screening are as follows:

SAMPLE ID	DEPTH	PPM
Borehole # 1	5 ½ ft	11.3
Borehole # 2	5 ft	17.4
Borehole # 3	3 ½ ft	16.2
Borehole # 4	3 ft	8.3
Borehole # 5	3 ft	15.9
Borehole # 6	3 ft	11.3
Borehole # 7	4 ft	10.9
Borehole # 8	4 ½ ft	6.3
Borehole # 9	4 ft	8.0
Borehole # 10	4 ft	9.3
Borehole # 11	4 ft	9.5
Borehole # 12	5 ft	10.8

In addition, two (2) boreholes were drilled to the groundwater. The first groundwater test was drilled to the northwest of the pit and the second groundwater test was drilled to the southeast of the pit. Both test borings were approximately 20' from the edge of the berm surrounding the pit. (Figure 2)

A groundwater sample was taken from each test boring and sent under chain of custody to Cardinal Laboratories for Total Petroleum Hydrocarbons (TPH) and Benzene, Toluene, Ethyl Benzene and Xylene (BTEX). (Appendix A) The results of the laboratory analysis are as follows:

SAMPLE	TPH	BENZENE	TOLUENE	ETHYL BENZENE	XYLENE
W-1 NW	< 1.0ppm	<0.002ppm	<0.002ppm	<0.002ppm	<0.006ppm
W-2 SE	<1.0ppm	<0.002ppm	<0.002ppm	<0.002ppm	<0.006ppm

**IV. Summary**

This site investigation has revealed no hydrocarbon contamination present in the groundwater to the northwest and southeast of the subject pit. In addition, there was no contamination identified on the top of the bedrock in any direction from the subject pit.

**V. Figures and Appendix:**

**Figures:**

Figure 1 - Vicinity Map  
Figure 2 - Site Plan

**Appendix:**

Appendix A - Analytical Results

**Kieling, Martyne**

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**From:** David Boyer [dgboyer@sesi-nm.com]

**Sent:** Friday, October 31, 2003 7:26 AM

**To:** mkieling@state.nm.us

**Subject:** Arahoe Pit

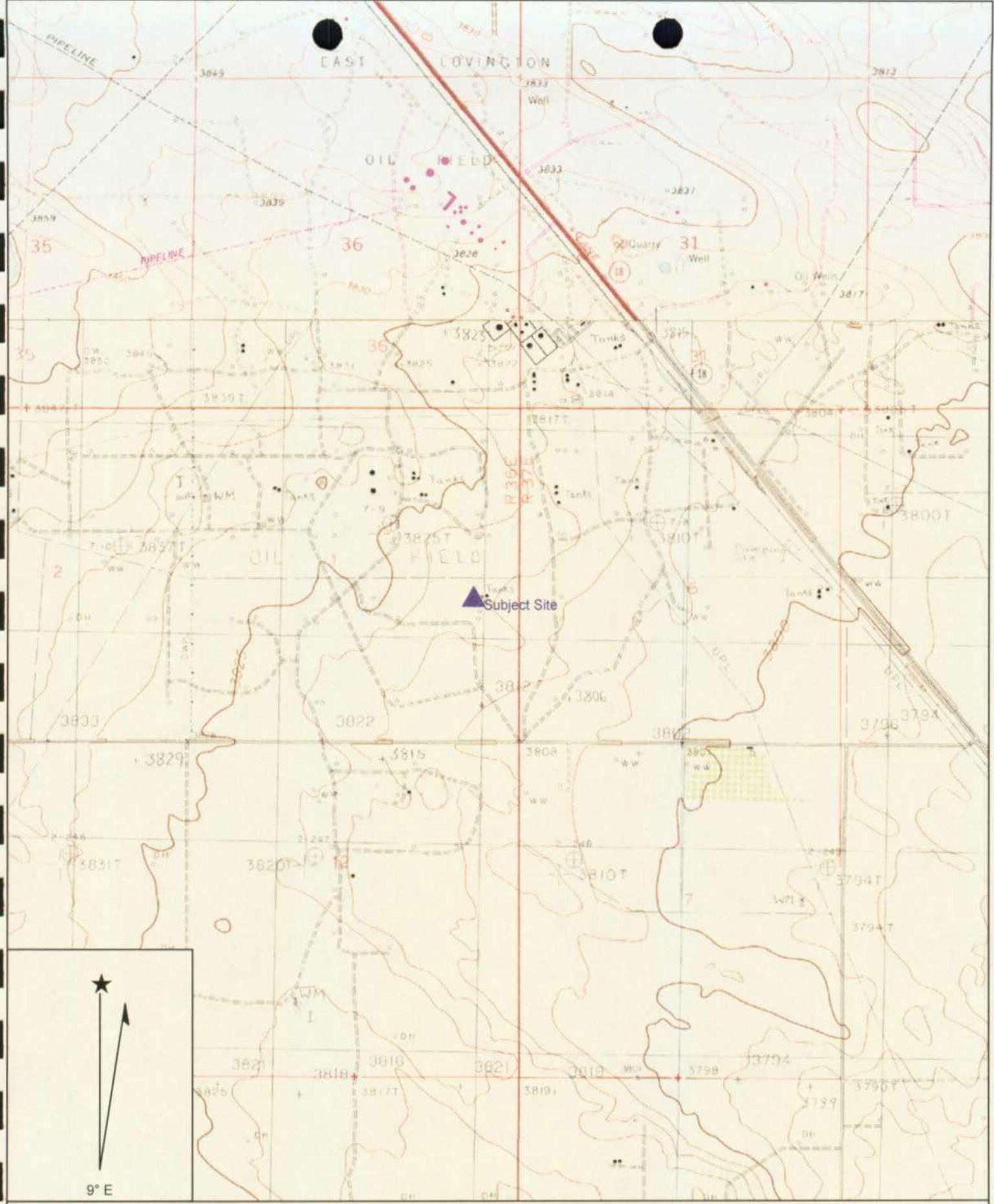
Martyne,

Checked our files for that project and found that two boreholes were completed as temporary monitor wells, one on the northwest corner and one on the southeast corner. W-1 on the NW corner had a TD of 83 ft. with the top of water at 74 ft. W-2 on the SE corner had a TD of 80 ft. also with the top of water at 74 ft. There was no log with this information, although notes indicated a bentonite and grout seal was placed following sampling of the ground water. Bob was in the area yesterday at the time we talked and went by the site; he confirms that there are no current monitor wells at the site.

I will be in the area this morning myself; let me know if you need any other info.

Dave Boyer

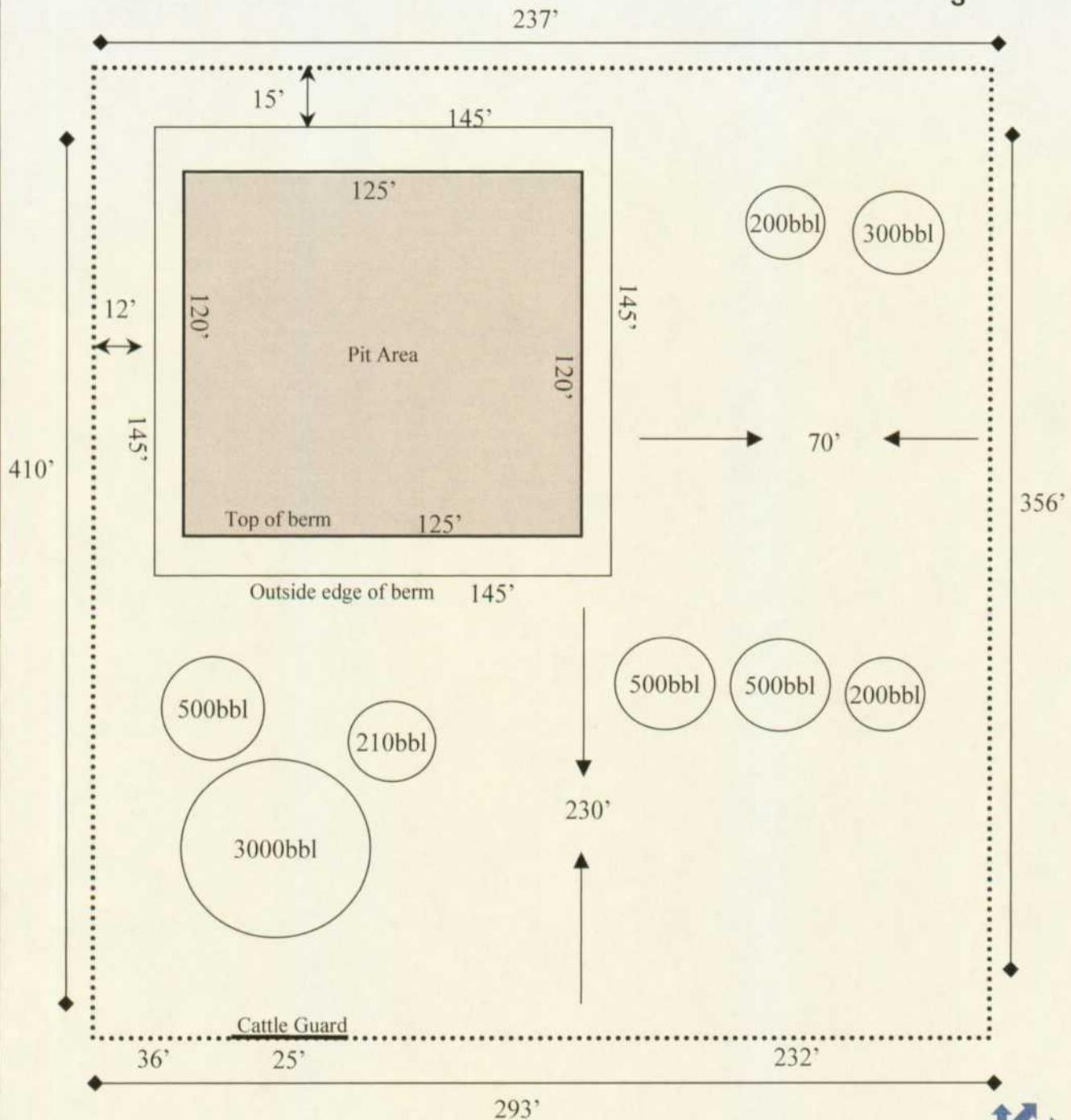
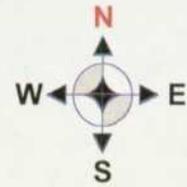
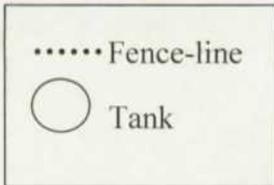
Figure 1  
Vicinity Map



Name: LOVINGTON SE  
 Date: 10/31/2000  
 Scale: 1 inch equals 2000 feet

Location: 032° 51' 46.3" N 103° 17' 59.9" W  
 Caption: Navajo Refining Company  
 Arahoe Pit  
 Vicinity Map

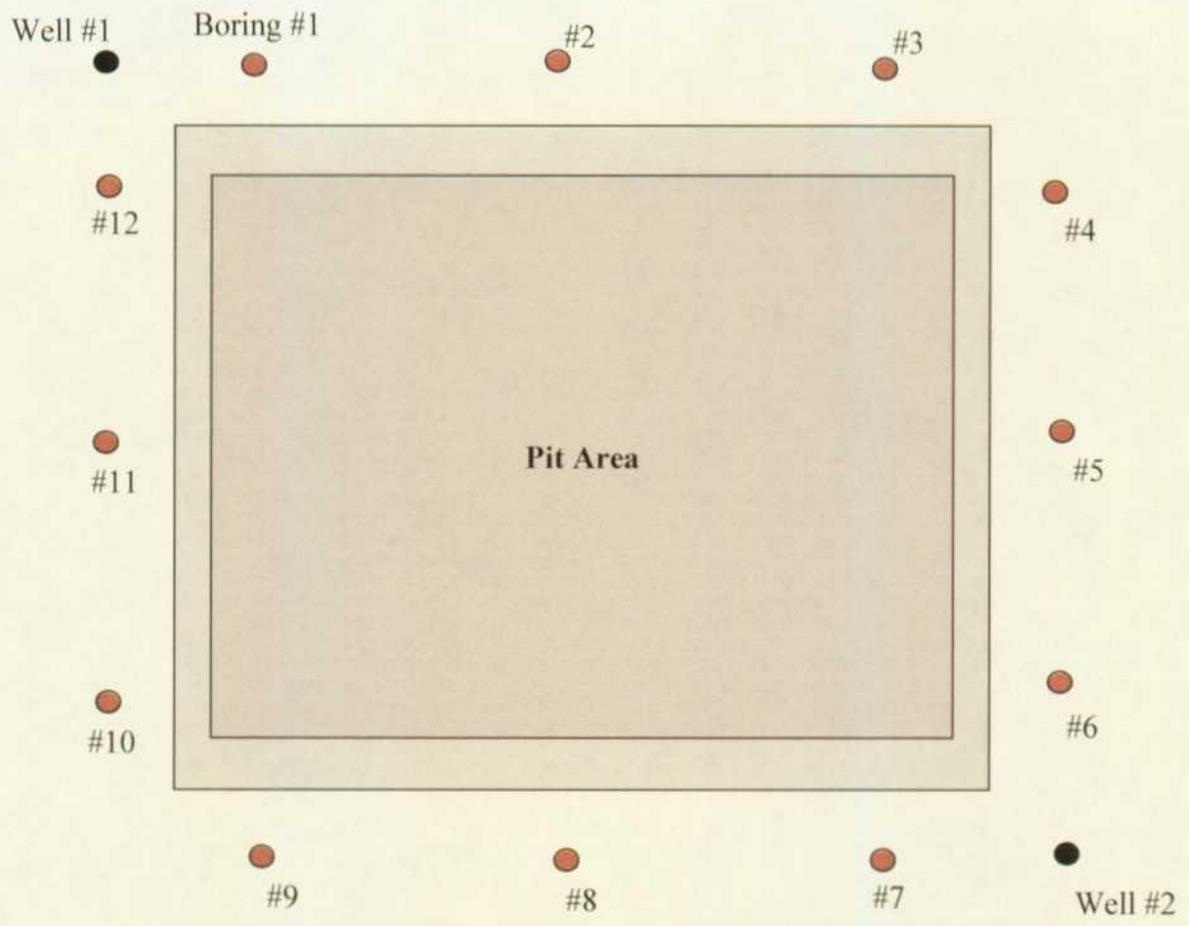
Figure 2  
Site Plan



**Navajo Refining Co**

**Arahoe Pit  
 Site Plan  
 October 5, 2000**

**Safety & Environmental  
 Solutions, Inc.**



**Navajo Refining Co**

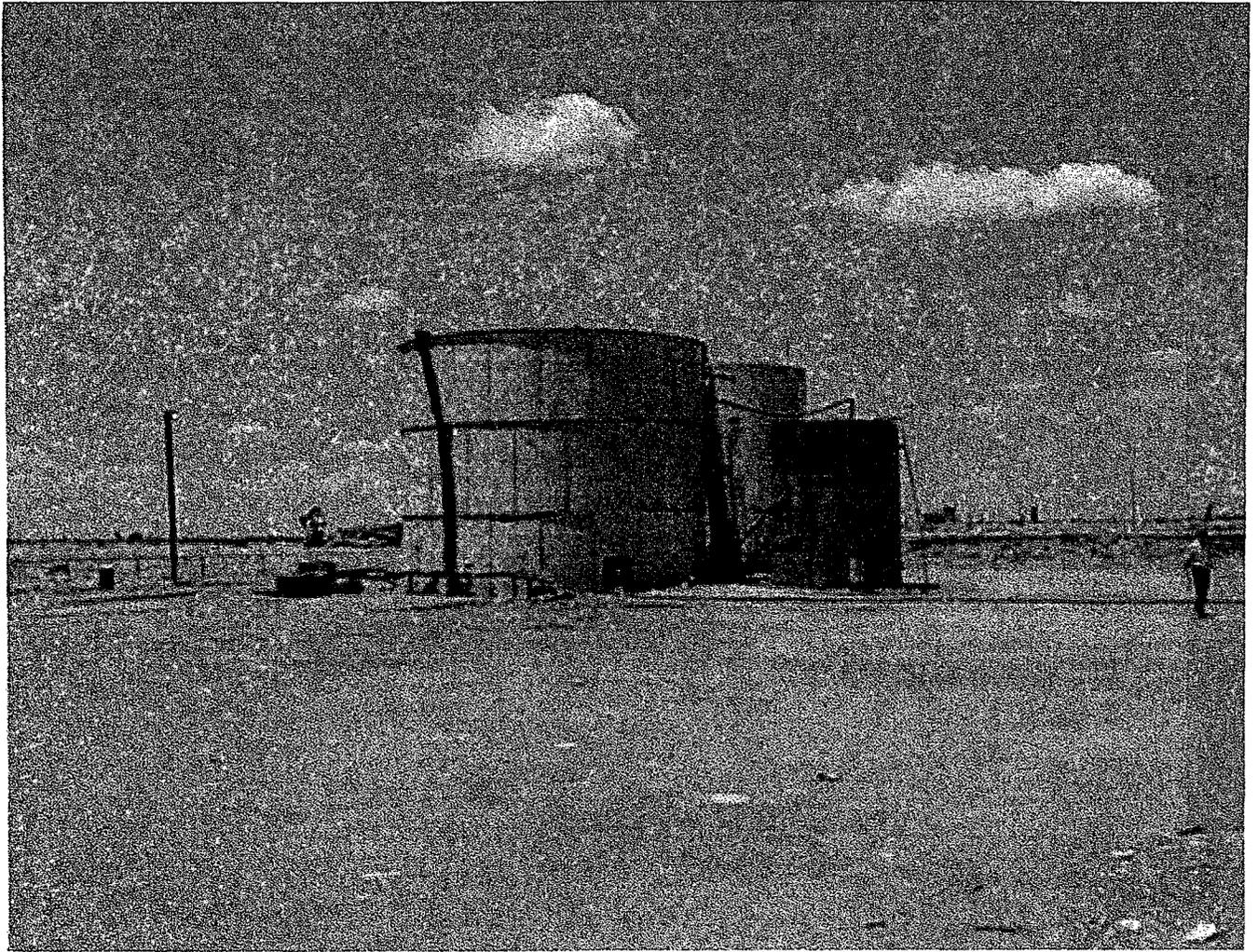
**Araho Pit  
Well Borings  
October 5, 2000**

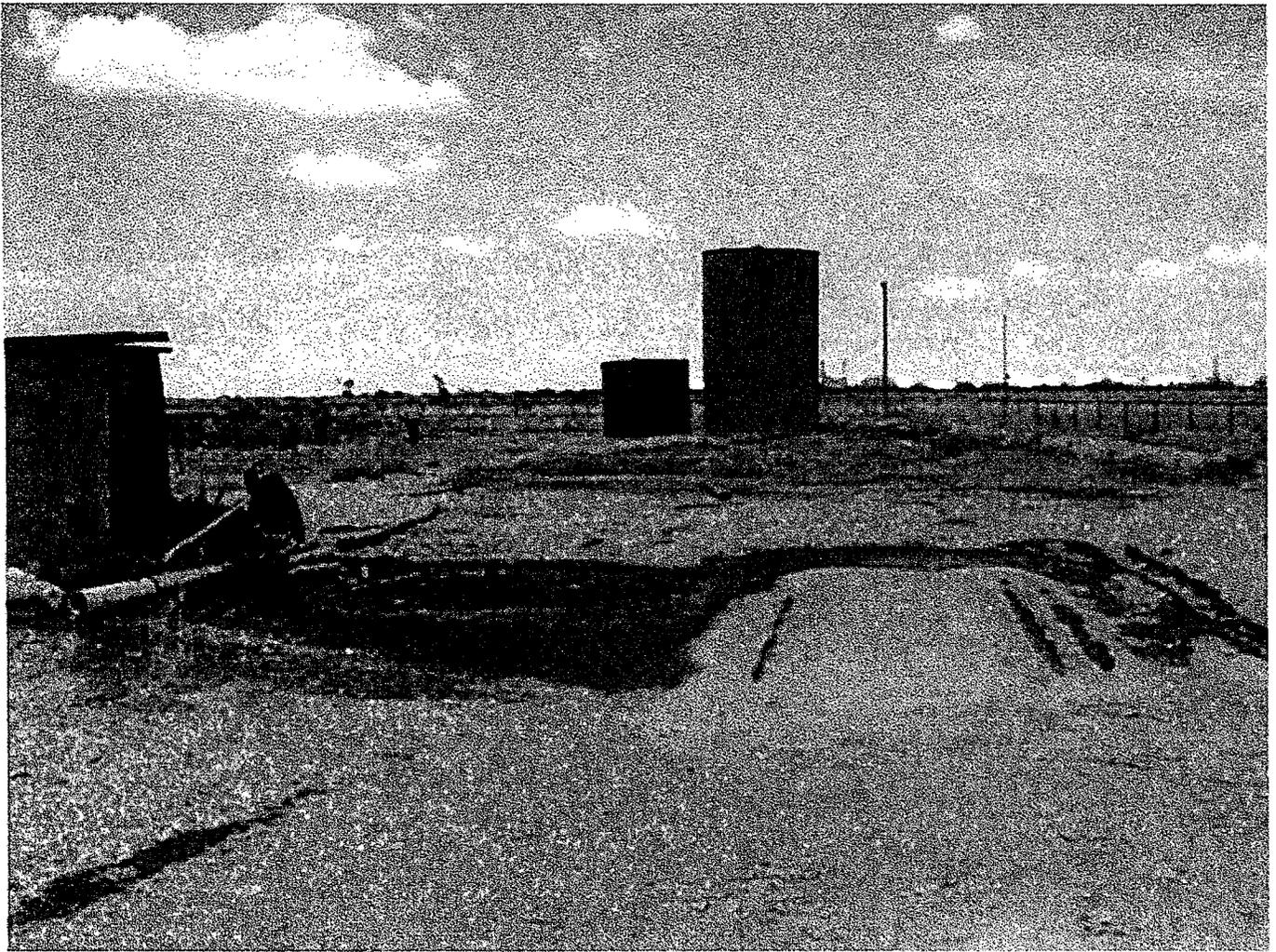
**Safety & Environmental  
Solutions, Inc.**

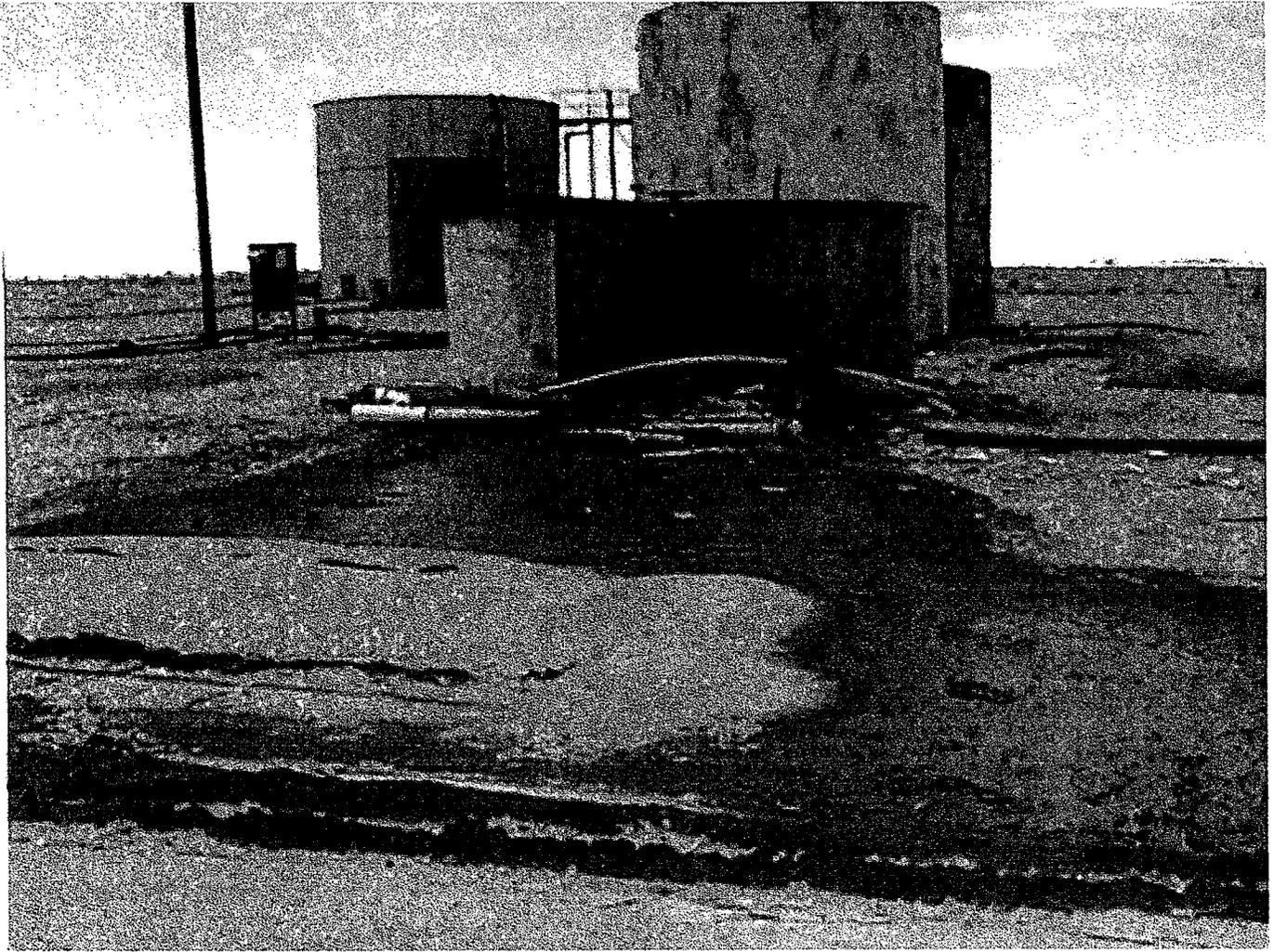
# Appendix A Analytical Results



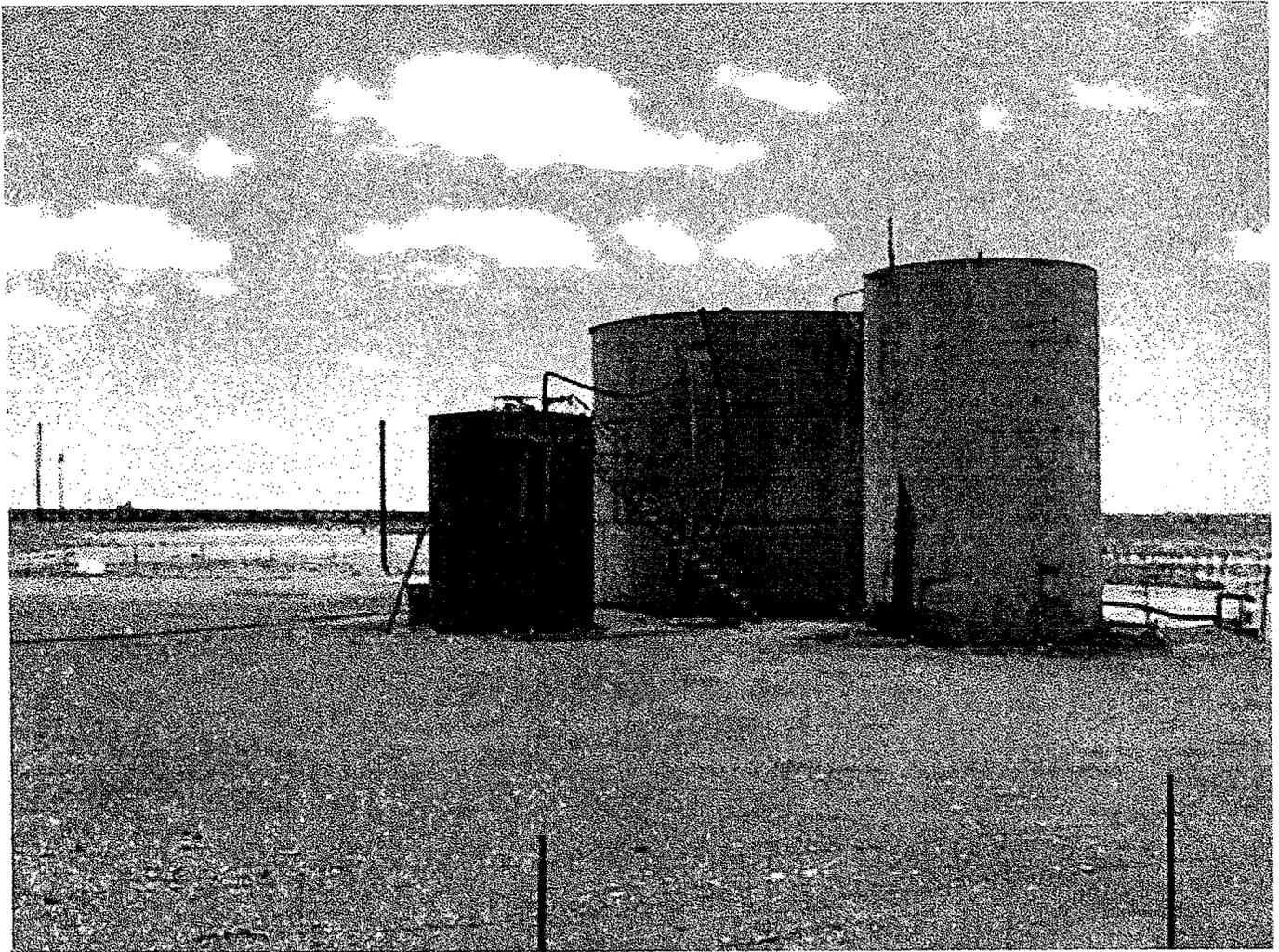


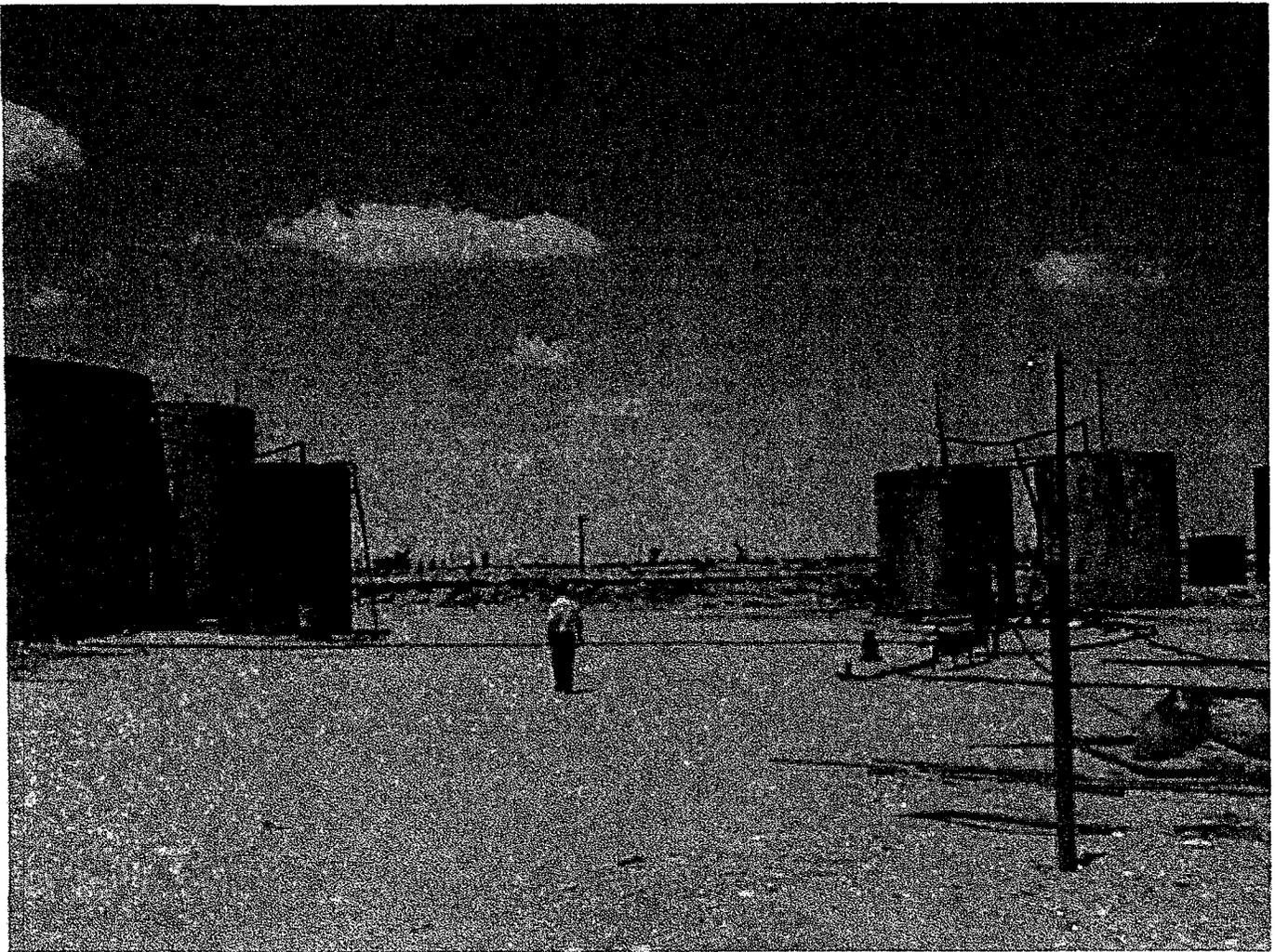




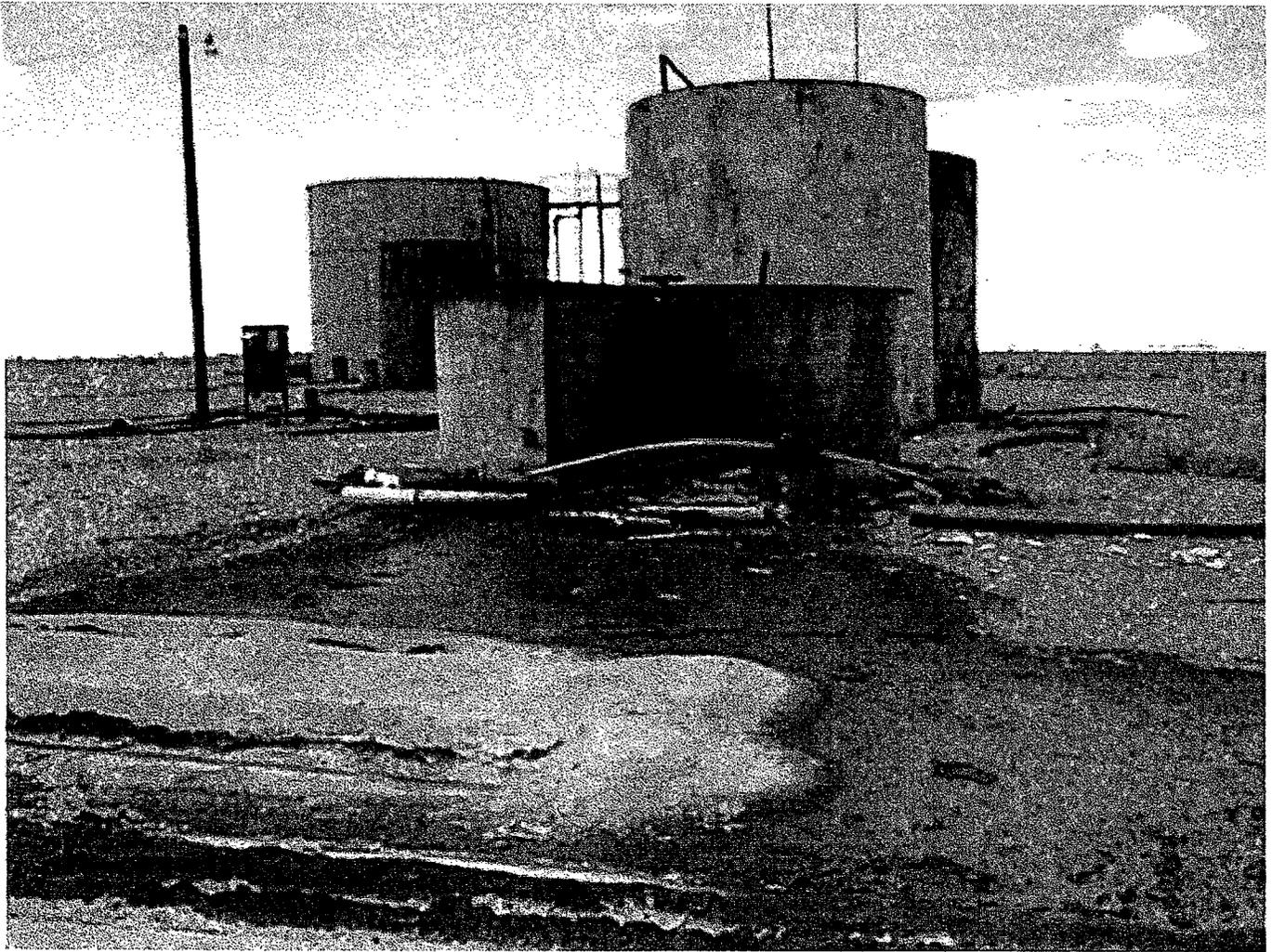






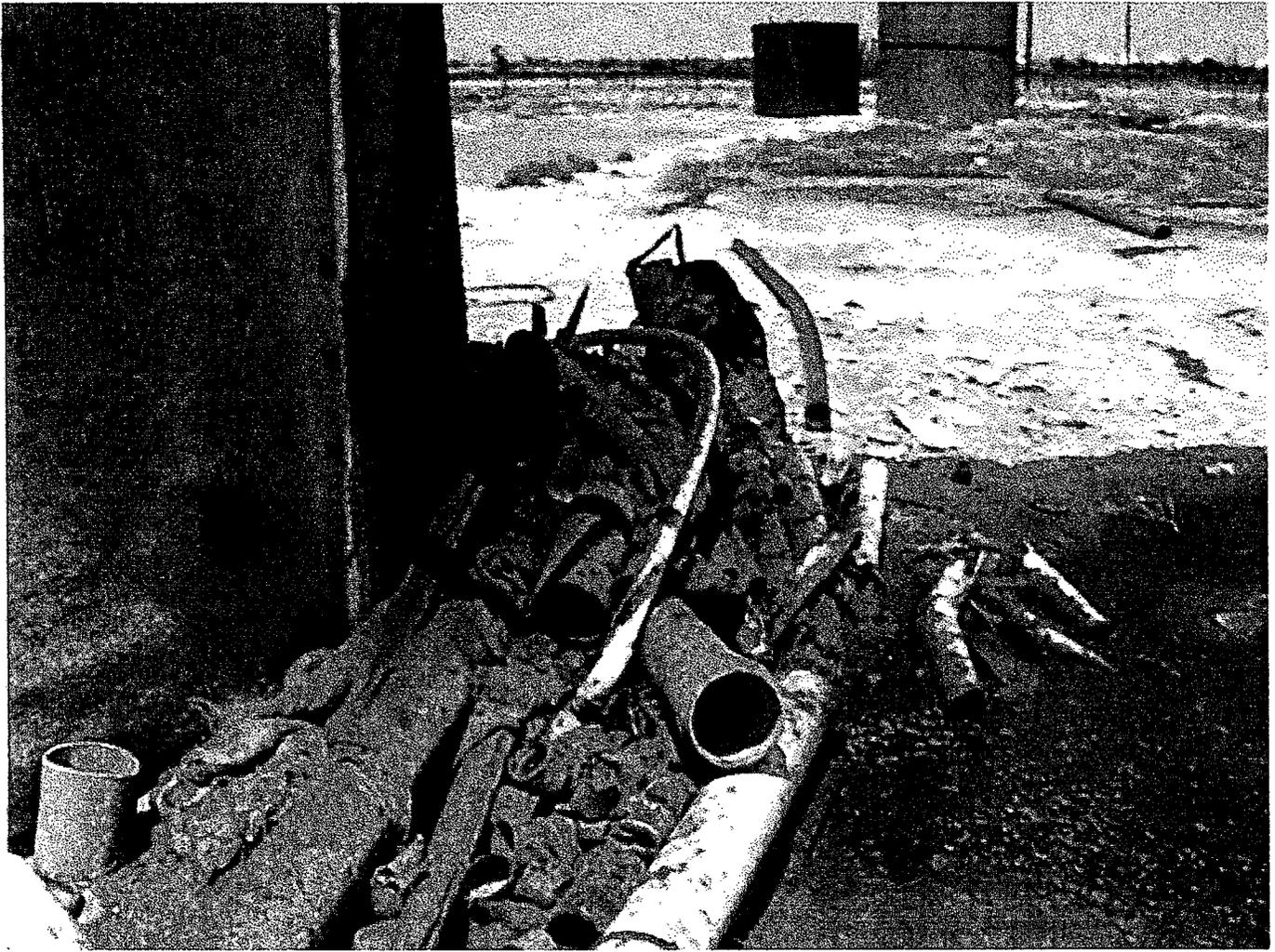


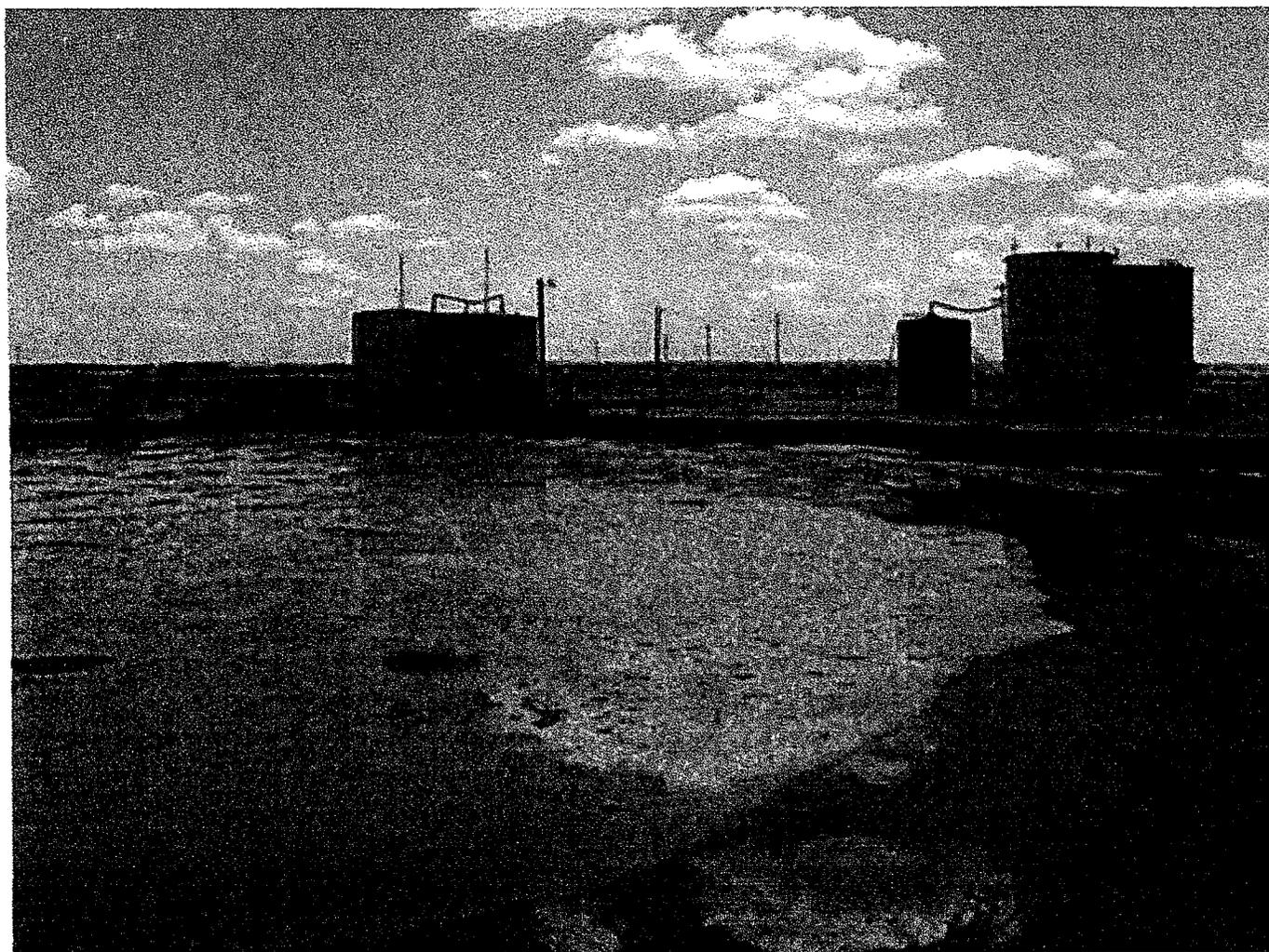




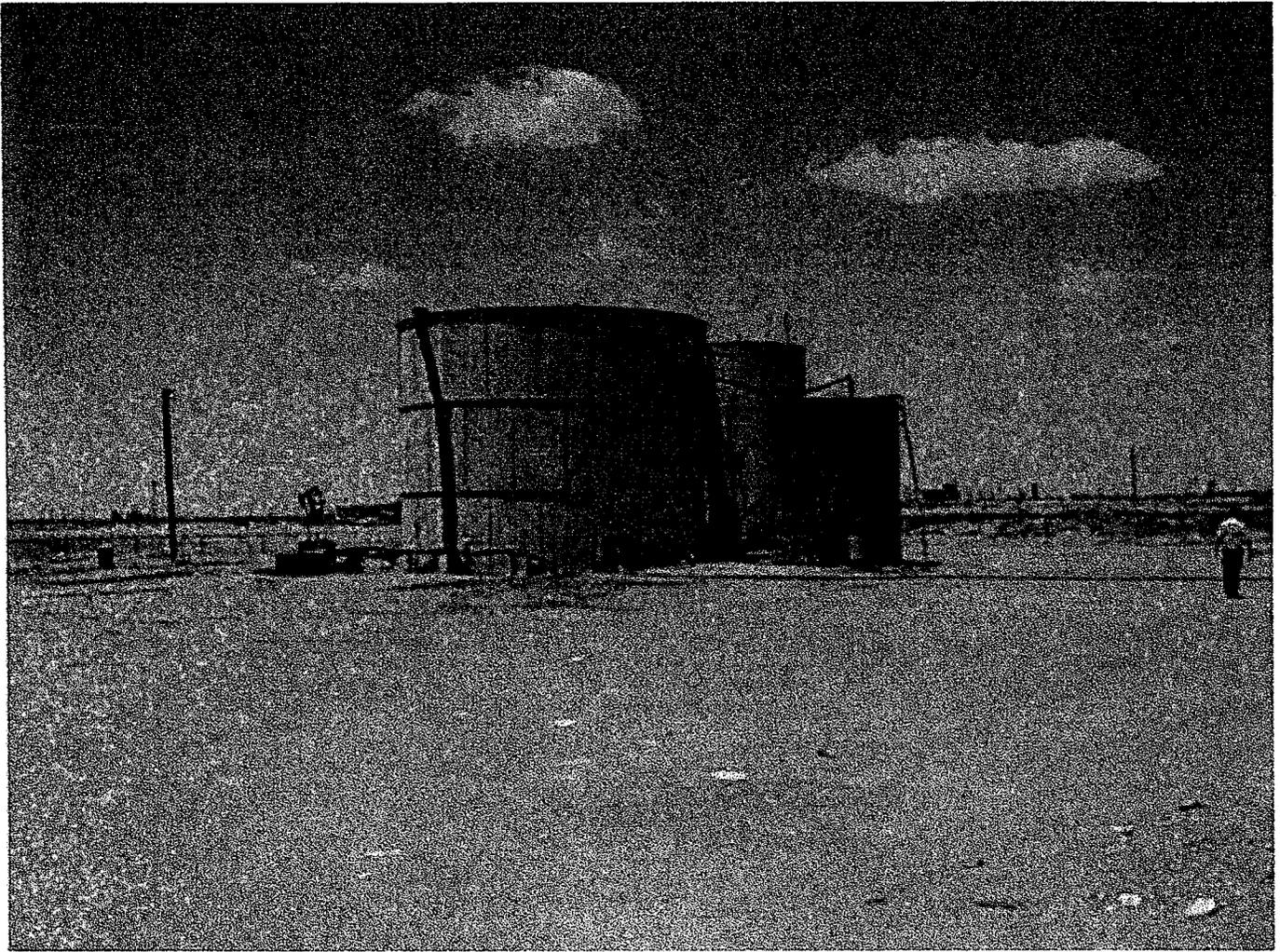


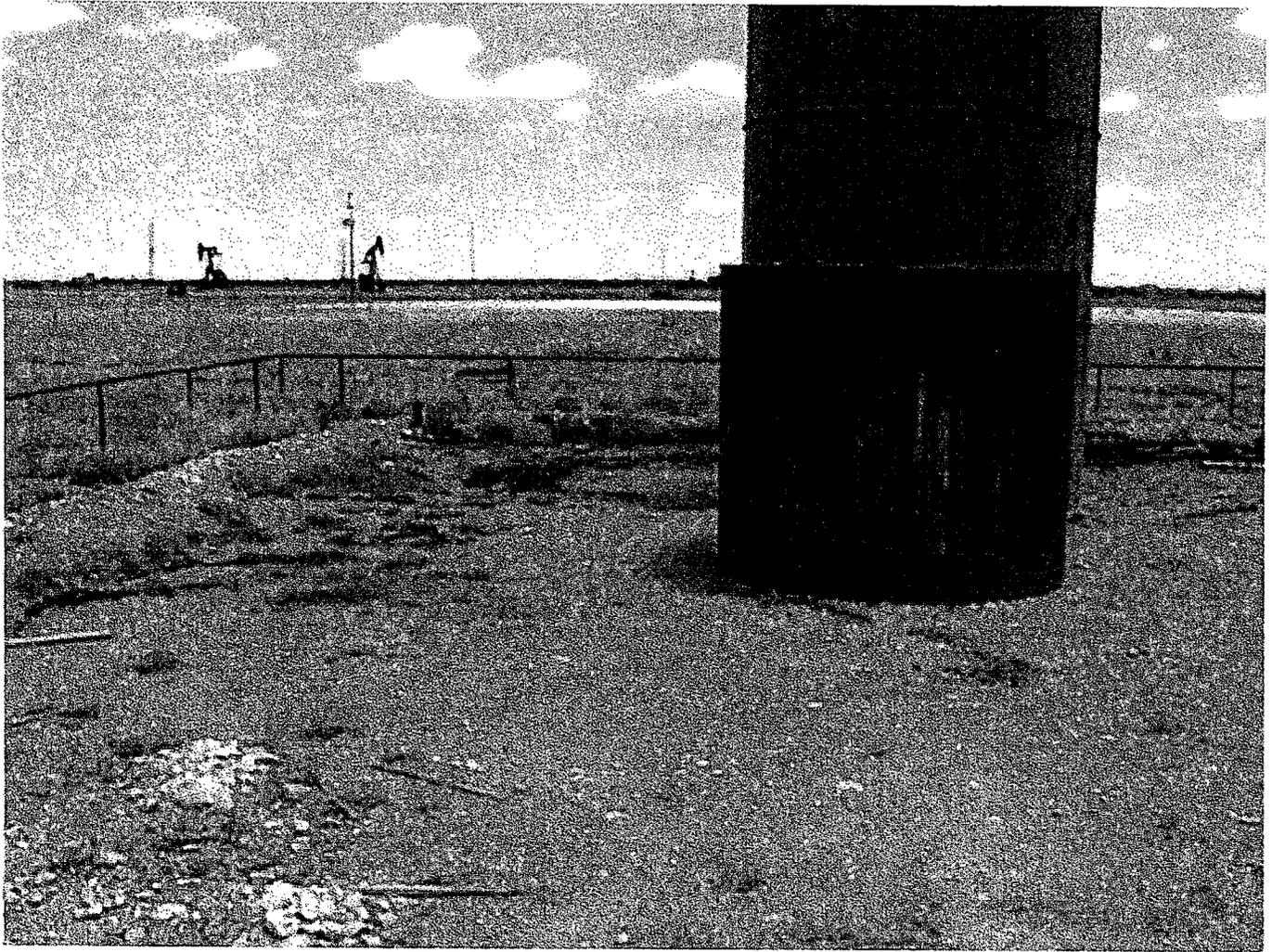




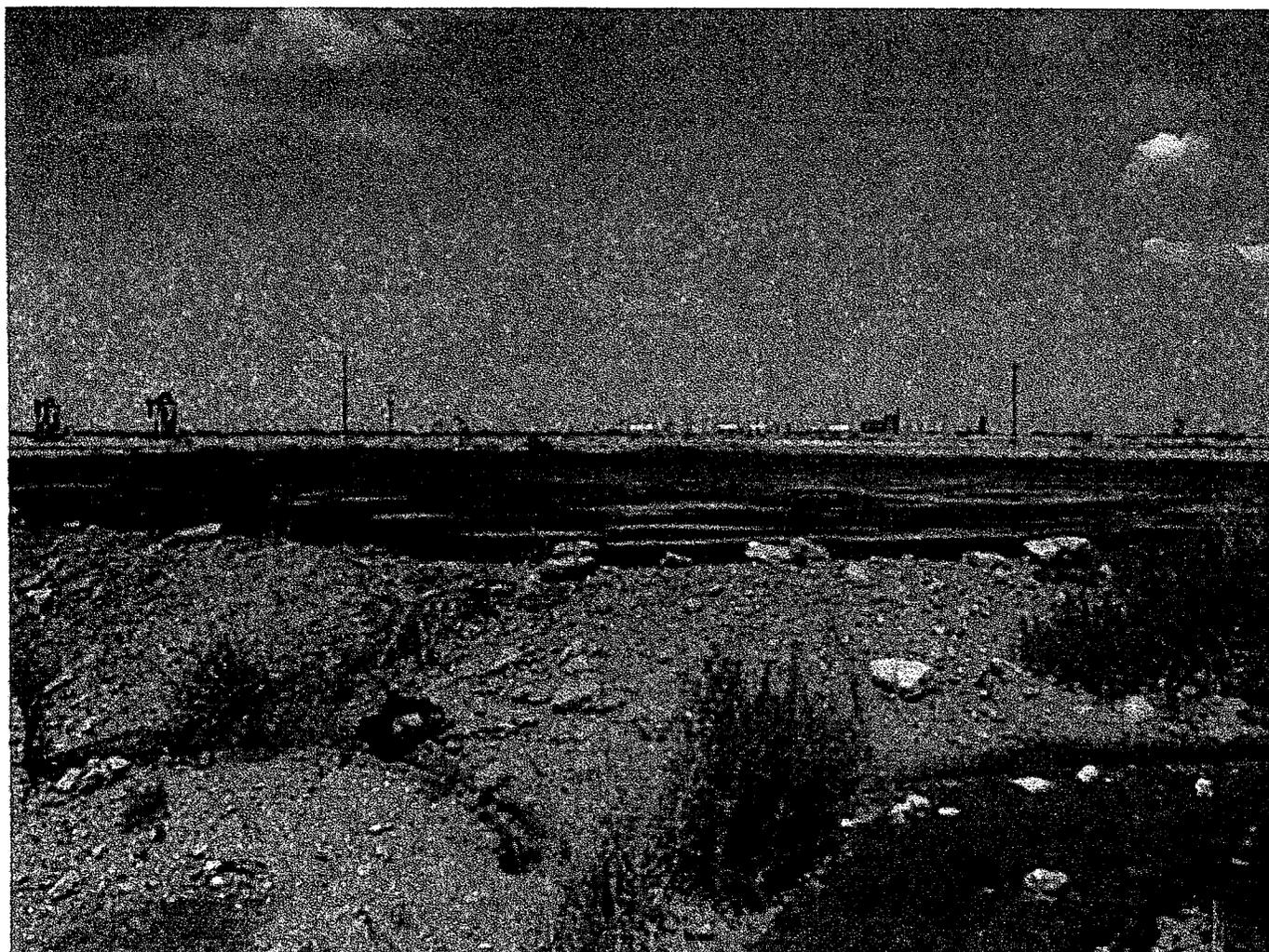


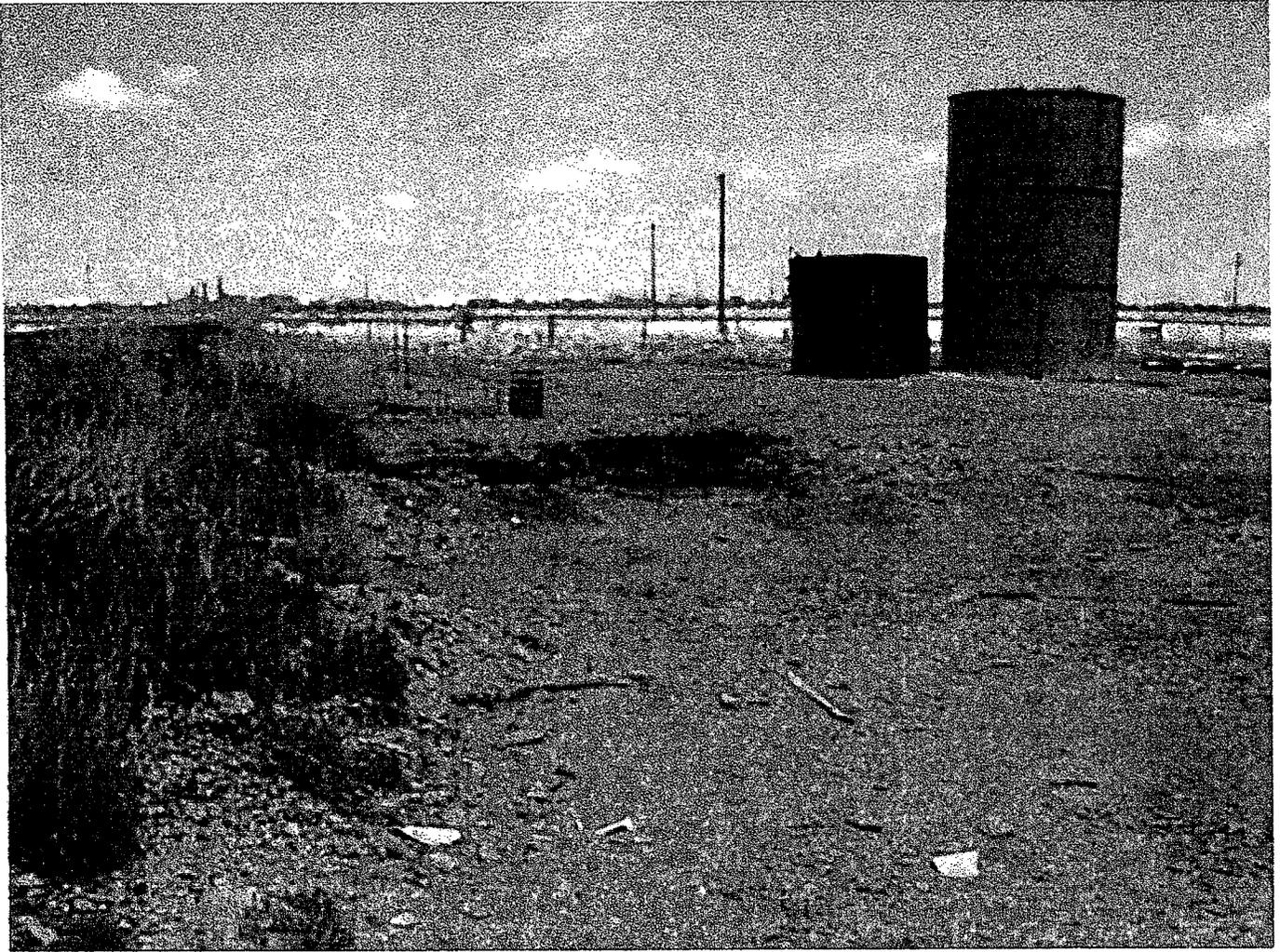


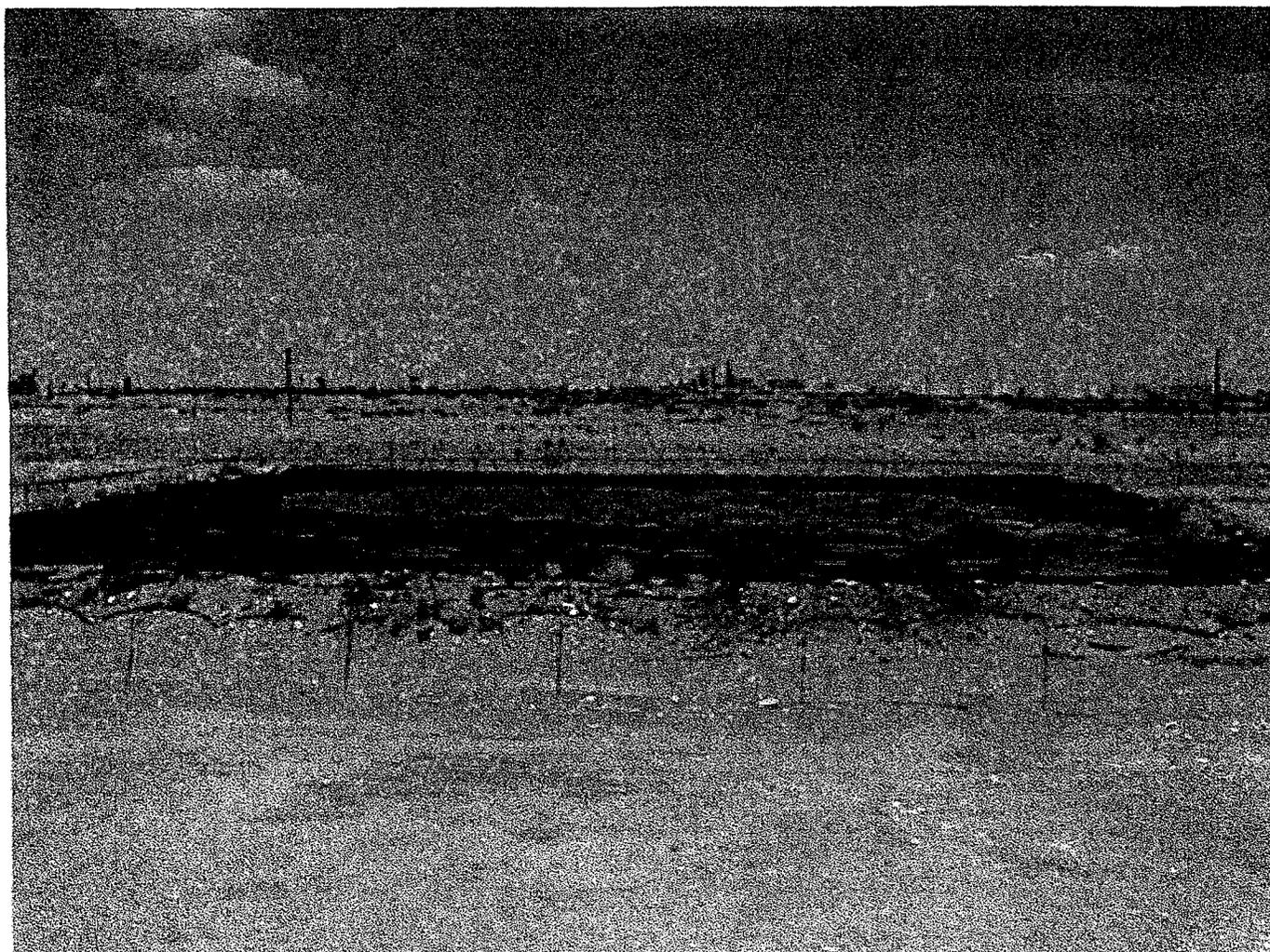












STATE OF NEW MEXICO  
ENERGY MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

Telephone \_\_\_\_\_ Personal \_\_\_\_\_ Time 10:00 Date 5-24-08  
E-Mail

Originating Party Murtye Kielig Other Parties Melissa Smith  
EPA

Subject Araho, Inc.

Discussion Sent Email Copy of May 24<sup>th</sup> 2000 letter

Conclusions or Agreements \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Distribution \_\_\_\_\_ Signed \_\_\_\_\_

STATE OF NEW MEXICO  
ENERGY MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

Telephone     Personal    Time 9:30    Date 5-5-00

Originating Party

Marlyne Kieling

Other Parties

Mark Sanchez  
Attorney For  
Dorothy Rumsels  
Archo

Subject Archo

Discussion Corporation going into liquidation

Gave Lyn Hebert phone number and left file with  
Lyn

Conclusions or Agreements

Distribution

Signed

Marlyne