

**1R -** 236

**GENERAL  
CORRESPONDENCE**

**YEAR(S):**

1995-1993

**NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT**

**OIL CONSERVATION DIVISION**

2040 S. Pacheco  
Santa Fe, New Mexico 87505

September 1, 1995

**CERTIFIED MAIL**  
**RETURN RECEIPT NO. Z-765-962-411**

Mr. Neal Stidham  
Shell Oil Company  
Two Shell Plaza  
P.O. Box 2099  
Houston, Texas 77252-2099

**RE: CLOSURE OF SITE ACTIONS  
SHELL EUNICE CRUDE STATION  
LEA COUNTY, NEW MEXICO**

Dear Mr. Stidham:

The New Mexico Oil Conservation Division (OCD) has completed a review of the Shell Oil Company's August 18, 1995 "EUNICE STATION, LEA COUNTY, NEW MEXICO". This document requests that no further remedial actions be required at the Shell Eunice Crude Station based upon the low levels of volatile contaminants in the soils and the low risk of the contaminants posing a threat to ground water and public health.

Upon a review of the record of the site investigations performed to date, the OCD approves of the above referenced request.

Please be advised that OCD approval does not relieve Shell of liability if remaining contaminants are found to pose a future threat to surface water, ground water, human health or the environment. In addition, OCD approval does not relieve Shell of responsibility for compliance with any other federal, state or local laws and/or regulations.

If you have any questions, please call me at (505) 827-7154.

Sincerely,



William C. Olson  
Hydrogeologist  
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor  
Wayne Price, OCD Hobbs Office



Z 765 962 411

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## Shell Oil Products Company



Two Shell Plaza  
P. O. Box 2099  
Houston, TX 77252-2099

August 18, 1995

William Olson  
State of New Mexico Oil Conservation Division  
Environmental Bureau  
2040 S. Pacheco St.  
Santa Fe, New Mexico 87504

**SUBJECT: EUNICE STATION, LEA COUNTY NEW MEXICO**

Dear Mr. Olson,

By way of this letter I am requesting final closure of this site and that no further action be required. I feel this is justified due to the nature of the contamination, the facilities use and location, and the depth to groundwater. Of the soil samples collected, only 2 had TPH values greater than 100 ppm and only 1 greater than 1,800. All soil benzene concentrations were less than 1.0 part per billion and only 1 total BTEX greater than 1 ppb. As shown in earlier reports, the highest TPH/BTEX was in shallow surface soils from 1-3' deep. We have demonstrated from previous drilling that groundwater is greater than 102' below land surface. This active pump station has no human population in the immediate area. I feel that due to the extremely low concentration of volatile components in the hydrocarbon impacted soil, the depth to groundwater, and the remoteness of the unmanned station, the impacted soils pose no threat to either the public or employee health, safety, or the environment. If I do not hear from you within 45 days I will consider that as agreement with my conclusions. If you have any questions please call me at 713-241-2961.

Sincerely,

Neal Stidham  
Staff Engineer  
Shell Oil Products Company  
Representing Shell Pipe Line Corporation

cc: Paul Newman  
EOTT Energy Corp.

Jerry Sexton  
OCD-Hobbs



STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING  
GOVERNOR

December 20, 1994

2040 S. PACHECO  
SANTA FE, NEW MEXICO 87505  
(505) 827-7131

**CERTIFIED MAIL**  
**RETURN RECEIPT NO. P-667-242-189**

Mr. Neal Stidham  
Shell Oil Company  
Two Shell Plaza  
P.O. Box 2099  
Houston, Texas 77252-2099

**RE: SITE ASSESSMENT AND REMEDIATION PLAN  
SHELL EUNICE CRUDE STATION  
LEA COUNTY, NEW MEXICO**

Dear Mr. Stidham:

The New Mexico Oil Conservation Division (OCD) has completed a review of the following documents submitted by the Shell Oil Company:

- a. October 19, 1994 "EUNICE STATION"
- b. November 11, 1993 "GENERAL LANDFARMING PROCEDURES FOR LOCATIONS REQUIRING ACTION".
- c. November 10, 1993 "SITE ASSESSMENT AND CLOSURE PLAN, EUNICE CRUDE OIL GATHERING AND PUMP STATION, LEA COUNTY, NEW MEXICO".
- d. October 25, 1993 "PHASE III SUBSURFACE INVESTIGATION, EUNICE STATION, LEA COUNTY NEW MEXICO, CURA PROJECT NO. 15-93673.3".
- e. September 10, 1993 "SITE ASSESSMENT, EUNICE CRUDE OIL GATHERING AND PUMP STATION, LEA COUNTY, NEW MEXICO".
- f. August 1993 "FINAL REPORT ENVIRONMENTAL DUE DILIGENCE ASSESSMENT, NEW MEXICO SWEET SYSTEM AND NEW MEXICO SOUR SYSTEM".
- g. March 9, 1993 "PHASE II ENVIRONMENTAL SITE ASSESSMENT, EUNICE STATION, LEA COUNTY, NEW MEXICO, CURA PROJECT NO.15-92567017.3".

These documents contain the results of Shell's investigations at the Eunice crude pump station and a proposal for remediation of contaminated soils at the site.

Mr. Neal Stidham  
December 20, 1994  
Page 2

The investigation and remedial actions, as contained in the above referenced documents, are approved with the following conditions:

1. Shell will document the final levels of benzene, toluene, ethylbenzene, xylene (BTEX) and total petroleum hydrocarbons (TPH) at the base of the excavations and in any landfarmed areas or insitu treatment areas.

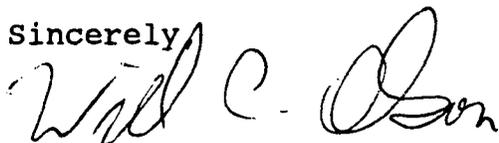
**NOTE:** Field headspace measurements of 100 parts per million of total organic vapor, if determined in accordance with OCD guidelines, may be substituted for a laboratory analysis of the concentrations of BTEX.

2. Shell will notify the OCD at least 48 hours in advance of all scheduled remediation activities such that the OCD may have the opportunity to witness the events and/or split samples.
3. A final report will be submitted to the OCD upon completion of the remedial actions and will include a description and the results of all remediation activities. The report will also include the composition, volume and application rates of any materials used in bioremediation and the final remediation levels achieved in the excavated and landfarmed or insitu treated areas.
4. All original documents will be submitted to the OCD Santa Fe Office with copies provided to the OCD Hobbs Office

Please be advised that OCD approval does not relieve Shell of liability should the remedial activities determine that contamination exists which is beyond the scope of the work plan or should the actions fail to adequately remediate contamination related to Shell's activities. In addition, OCD approval does not relieve Shell of responsibility for compliance with any other federal, state or local laws and/or regulations.

If you have any questions, please call me at (505) 827-7154.

Sincerely,



William C. Olson  
Hydrogeologist  
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor  
Wayne Price, OCD Hobbs Office

P 667 242 189

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P5 Form 3800, June 1990

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Shell Oil Company



Two Shell Plaza  
P. O. Box 2099  
Houston, Texas 77252-2099

October 19, 1994

Mr. William Olson  
State of New Mexico Oil Conservation Division  
Environmental Bureau  
P.O. Box 2088  
Santa Fe, New Mexico 87504-2088

**SUBJECT: EUNICE STATION**

Dear Mr. Olson,

The following is in response to the comments in your letter of December 2, 1993, to Shell Oil Company regarding Eunice Station.

Comment 1-the affected soil around B-6 will be tilled in-place where possible, based upon depth of contamination and equipment on-hand, or excavated and landfarmed or excavated and mixed with clean soil and backfilled. Which ever method is selected, the soils will be treated to achieve a TPH level of 5,000 ppm or less and a benzene/BTEX level not exceeding 10/50 ppm or a field headspace measurement of 100 ppm Total Organic Vapor.

Comment 2-the area identified as a "landfarm" in the Weston Report is neither "OCD permitted" nor a "landfarm". Neither is it on the station property nor part of this asset sale. The area in question is an old release that was disced. The Weston staff apparently considered, and reported, this as a potential "adjacent issue".

Enclosed is a photo of a soil shredder that we have successfully used for soil remediation. Excavated soils are passed through the machine which removes large rocks and breaks soil to a uniform size which allows volatilization and aeration of the soil. Soil can then be landfarmed if necessary or backfilled if contaminants are below the action threshold.

If you have any questions please call me at 713-241-2961.

Sincerely,

A handwritten signature in cursive script, appearing to read "Neal Stidham", written in black ink.

Neal Stidham





OIL CONSERVATION DIVISION  
RECEIVED **Shell Oil Company**



Two Shell Plaza  
P.O. Box 2099  
Houston, TX 77252

January 5, 1994

'94 JAN 11 AM 9 46

State of New Mexico  
Oil Conservation Division  
ATTN Mr. Roger C. Anderson  
P. O. Box 2088  
Land Office Building  
Santa Fe, NM 87504-2088

Gentlemen:

**SUBJECT: SITE ASSESSMENTS AND ACTION PLANS  
LEA COUNTY, NEW MEXICO**

Thank you for meeting with us on December 15, 1993. The meeting was informative and will help us in our remediation activities.

I have been assigned to another department and Mr. Neal Stidham will be handling the environmental matters for the New Mexico locations. His telephone number is (713) 241-2961.

It has been my pleasure to work with you and Mr. Olson to develop action plans on these locations. I appreciate the help and guidance you both have provided.

Please thank Mr. Olson for me.

Again, thank you for your help and I hope both of you have a great 1994.

I enjoyed my trip to Santa Fe. It was all you said it would be.

Sincerely,

A handwritten signature in cursive script that reads "John B. Hite".  
John B. Hite

cc: SHELL PIPE LINE CORPORATION  
G. H. Sherwin, Manager Environmental & Technical  
N. D. Stidham, Staff Engineer

DG400503.JBH



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION



BRUCE KING  
GOVERNOR

December 2, 1993

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SANTA FE, NEW MEXICO 87504  
(505) 827-5800

ANITA LOCKWOOD  
CABINET SECRETARY

**CERTIFIED MAIL**  
**RETURN RECEIPT NO. P-667-242-417**

Mr. John B. Hite  
Engineering Advisor  
General Engineering  
Shell Oil Company  
Two Shell Plaza  
P.O. Box 2099  
Houston, Texas 77252

**RE: SITE ASSESSMENT AND REMEDIATION PLAN  
SHELL EUNICE CRUDE STATION  
LEA COUNTY, NEW MEXICO**

Dear Mr. Hite:

The New Mexico Oil Conservation Division (OCD) is in the process of reviewing the following documents submitted by the Shell Oil Company on November 15, 1993:

- a. November 11, 1993 "GENERAL LANDFARMING PROCEDURES FOR LOCATIONS REQUIRING ACTION".
- b. November 10, 1993 "SITE ASSESSMENT AND CLOSURE PLAN, EUNICE CRUDE OIL GATHERING AND PUMP STATION, LEA COUNTY, NEW MEXICO".
- c. October 25, 1993 "PHASE III SUBSURFACE INVESTIGATION, EUNICE STATION, LEA COUNTY NEW MEXICO, CURA PROJECT NO. 15-93673.3".
- d. September 10, 1993 "SITE ASSESSMENT, EUNICE CRUDE OIL GATHERING AND PUMP STATION, LEA COUNTY, NEW MEXICO".
- e. August 1993 "FINAL REPORT ENVIRONMENTAL DUE DILIGENCE ASSESSMENT, NEW MEXICO SWEET SYSTEM AND NEW MEXICO SOUR SYSTEM".
- f. March 9, 1993 "PHASE II ENVIRONMENTAL SITE ASSESSMENT, EUNICE STATION, LEA COUNTY, NEW MEXICO, CURA PROJECT NO.15-92567017.3".

Mr. John B. Hite  
December 2, 1993  
Page 2

The OCD has the following comments, questions and requests for information regarding the above referenced documents:

1. The November 10, 1993 report proposes enhanced insitu bioremediation of contaminated soils in the vicinity of boreholes B-4 and B-6. However, the proposal does not contain a method for documenting the final contaminant level upon completion of the project. Please supply the OCD with a method for confirming that this remedial action will meet the OCD's recommended soil remediation levels or an approved alternate risk based remediation level.
2. The August 1993 report identified a landfarm area on the east side of the site. The subsequent reports do not address the landfarm. Please provide the OCD with information regarding the use of this landfarm area.

Receipt of the above information will allow the OCD to complete a review of the above referenced documents.

If you have any questions, please contact me at (505) 827-5885.

Sincerely,



William C. Olson  
Hydrogeologist  
Environmental Bureau

xc: OCD Hobbs District Office

PS Form 3800, June 1990

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Shell Oil Company



November 11, 1993

Two Shell Plaza  
P.O. Box 2099  
Houston, TX 77252

State of New Mexico  
Energy, Minerals and Natural Resource Dept.  
Oil Conservation Division  
ATTN Mr. William C. Olson  
Hydrogeologist - Environmental Bureau  
P. O. Box 2088  
Santa Fe, NM 87504

Gentlemen:

**SUBJECT: GENERAL LAND FARMING PROCEDURES FOR LOCATIONS  
REQUIRING ACTION**

The site assessments and proposed action plans have been sent to you on the following locations:

Denton  
Eunice  
Dublin  
Hugh  
Anderson Ranch  
Delaware

Land farming was a part of each of these locations remedial action plans. The areas to be land farmed are relatively small and all are inside the fenced station locations. We propose to till and/or disk the soil to 12 inches to 18 inches deep and add a high nitrogen content fertilizer at a rate of 200 to 250 pounds per acre and retill or disk the fertilizer into the soil. There are several areas that may require some spot excavation (primarily around the sumps). The excavated soils will be placed with the soils in the land farm areas. All of the sites will be land farmed in place. At the Delaware location, we propose to place some of the impacted soils on the tank dikes.

The soils in all cases are unsaturated contaminated soils. Our primary concern is with TPH levels. We will remediate until the soil TPH values are below 5000 ppm. At each of the facilities listed, the areas to be land farmed are located in places where any rainfall runoff will not be a concern.

Attached is a paper (No. WRC-49-89 Land Farming) that was prepared by Shell and we will use it as a guide.

Please advise if these procedures will be acceptable to the Oil Conservation Division (OCD) for Shell to use on the subject locations.

The Denton Station will require a system to remove the crude oil found on an abandoned water well. The site assessment and proposed action plan sent to the OCD address it.

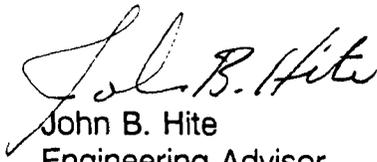
The Dublin Station has a hot spot that goes down to the groundwater at 103 feet. The groundwater was not impacted above your regulatory limit and our proposed plan sent to the OCD addresses it.

At the Lea Station, we are in the process of doing additional feasibility testing and you will receive a proposed action plan on it in the near future.

Shell would like to schedule a meeting with you after you have had a chance to review our proposed action plans. I will call you and see when it would be convenient for you to meet with us.

If you have any questions, please call me at (713) 241-1001. We look forward to working with the OCD to remediate the sites.

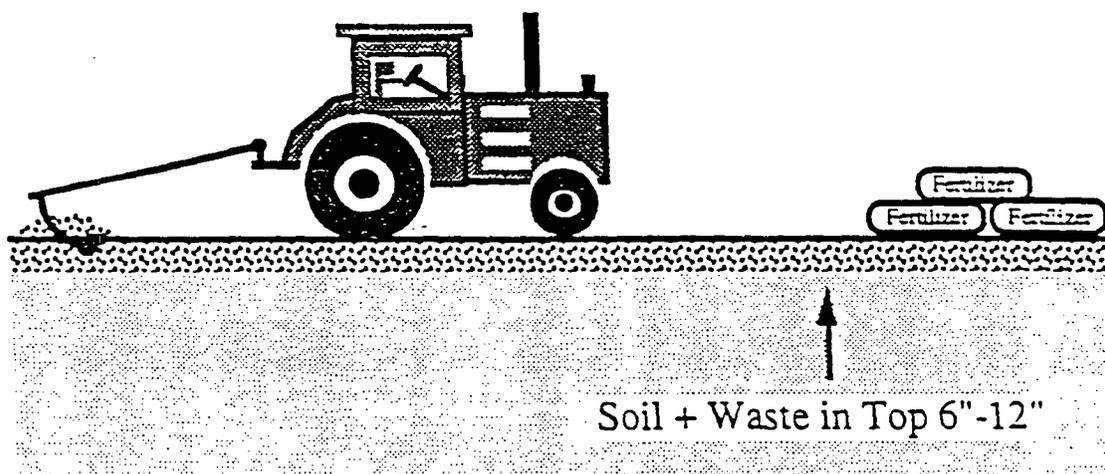
Sincerely,



John B. Hite  
Engineering Advisor  
General Engineering

Attachment

# Landfarming



## *Process Description*

"Landfarming" refers to the practice of spreading organic wastes over an area of land, then relying on natural microbial action to degrade the waste. It is a widely accepted and cost-effective practice for the treatment of petroleum hydrocarbons, chlorinated compounds, and pesticides. In this process soil-associated microorganisms (bacteria and fungi) degrade the organic compounds to  $\text{CO}_2$ , water, and biomass.

An efficient and effective land treatment process involves optimizing the bacterial degradative activity by controlling soil aeration (discing, rototilling), nutrient addition ( $\text{NH}_4^+$  or  $\text{NO}_3^-$  - nitrogen,  $\text{PO}_4^{3-}$  - phosphorous, Fe - iron, fertilizer), and pH and moisture control.

A petroleum industry review on the treatment of waste oily sludges at refineries indicated that substantial hydrocarbon removal efficiencies of 70% - 90% can be achieved at loading rates of 1% - 5% (w/v) in surface soils.

## *Applications*

Types of petroleum industry wastes that can be treated include refinery oily sludges, tank bottoms, crude oil, and gasoline. Landfarming has also been used to treat drilling mud pit sludges, and accidental releases of crude oil from pipelines.

### Limitations

Landfarming is generally limited to wastes containing smaller hydrocarbon molecules. Medium chain length alkanes and aromatic fractions are degraded nearly completely, while polynuclear aromatic hydrocarbons (PAH's) are degraded very slowly in soil (0-10% total). Examples of PAH's include: chrysene, pyrene, fluoranthene, benzo (a) anthracene, and perylene. The presence of salts and/or metals may inhibit microbial activity.

### Typical Operating Conditions

During landfarming, soil aeration (discing, rototilling), nutrient addition ( $\text{NH}_4^+$  or  $\text{NO}_3^-$  - nitrogen,  $\text{PO}_4^{3-}$  - phosphorous, Fe - iron, fertilizer), and pH and moisture are controlled to maximize the rate of biodegradation.

Soil pH:	6 to 8. If soil is too acidic ( $\text{pH} < 6$ ), it can be treated with lime.
Waste Level:	0.5% - 5% by weight as oil and grease (O&G), incorporated into top six inches of soil.
Fertilizer Addition:	Approximately 50 - 500 lbs Nitrogen (as $\text{NH}_4^+$ or $\text{NO}_3^-$ per acre, and 5 - 50 lbs Phosphorous (as $\text{PO}_4^{3-}$ ) per acre.
Other Amendments:	a) Mulch (bark, wood chips, straw, etc.) to facilitate mixing and soil aeration.  b) Microbes and organic nutrients (i.e. animal manure) to enhance degradation.
Tilling Frequency:	For aeration, once every two to four weeks during growing season.
Water Application:	Soil should be maintained in a moist state, but not flooded. Spray irrigation may be required in dry climates.
Revegetation:	Plant regrowth (seeding) can occur after 0.5 to 3 years. Weeds or local crops can be used.
Sampling:	Composite samples from several representative plot areas. For example, soil might be analyzed for oil and grease if petroleum hydrocarbons are being treated.
Performance Evaluation:	Waste degradation occurs more rapidly when soil temperatures are $\geq 50^\circ\text{F}$ . Decreases in the oil and grease content should decrease with a half-life ( $t_{1/2}$ ) of 50 - 60%/month during the growing season, and $t_{1/2} = 0 - 20\%$ /month during winter months.

### Process Economics

Depending upon the extent of contamination, waste type, and biodegradation rates, costs are \$5 - \$50 per  $\text{yd}^3$ .

## Waste Streams

Waste streams are not usually generated, and often the hydrocarbons do not migrate beyond the root zone (6 - 12 inches below surface) before they are degraded. If the waste contains highly volatile or soluble compounds, the possibility of vapor emissions or migration to groundwater must be considered.

## Permitting

Permits are not usually required for a one-time treatment, unless controlled substances are present in air emissions.

As with all ex-situ treatment processes, there will be permitting requirements for the vapors, odors, and dust associated with digging, storing, and feeding the soils.

## Associated Factors

Depending on the location, surface water run-on/run-off controls may be required. While landfarming is an attractive remediation technology because it does not require sophisticated machinery, and the operating costs are low, the costs associated with permitting may increase the total treatment cost significantly. Large areas must also be dedicated for landfarming.

## Contacts Within Shell

Joe P. Salanitro - Westhollow Research Center (Room EC-661) - SSN-433-7552  
 Curtis C. Stanley - Shell Oil Co. Head Office (Room TSP 2236) - SSN-241-6094

## Shell Applications

### Crude Oil Spill Release (Pipeline) Remediations:

- (1)
 

Location:	Milepole 526 Capline Karmak, Illinois (Massac County).
Date:	October 1988
Spill:	Unknown amount released. Landfarmed 0.8 - 3.6% by weight oil in soil.
Remediation:	Fertilizer - at 300 lbs/acre Nitrogen, bark mulch, lime, and manure added. Soil was tilled once a week for six weeks.
Results:	95% reduction in oil and grease content (degradation rate of 63% per month). Revegetation occurred with planted wheat and native grasses.
Contact:	R. Williams, Shell Pipeline Co., Mid-Continent Division, Wood River, Illinois.
  
- (2)
 

Location:	Everidge Cotton Farm, Upton County, West Texas
Date:	November 1986
Spill:	50 barrels crude oil in 0.2 acre of land. The contaminated area was landfarmed at 0.3 - 8.6% by weight oil and grease levels in soil.
Remediation:	Fertilizer - 150 lbs/acre. The area was spray irrigated and tilled about once a month.
Results:	Reduction rate for oil and grease content was about 4 - 10% per month during 15 months of treatment. Some vegetation (cotton) was observed at the edges of the treatment zone after one year.
Contact:	C. D. Simons, Shell Pipeline Co., Mid-Continent, West Texas Unit, Midland, Texas.

Shell Oil Company



November 10, 1993

Two Shell Plaza  
P.O. Box 2099  
Houston, TX 77252

State of New Mexico  
Energy Minerals and Natural Resources Department  
Oil Conservation Division  
ATTN Mr. William C. Olson  
Hydrogeologist - Environmental Bureau  
P. O. Box 2088  
Santa Fe, NM 87504

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NOV 15 1993

OIL CONSERVATION DIV.  
SANTA FE

Gentlemen:

SUBJECT: SITE ASSESSMENT AND CLOSURE PLAN  
EUNICE CRUDE OIL GATHERING AND PUMP STATION  
LEA COUNTY, NEW MEXICO

Please find attached a copy of Shell Pipe Line Corporation (Shell) environmental contractor's (CURA, Inc.) site assessment report and EOTT Energy Corp. environmental contractor's (Roy F. Weston, Inc.) due diligence assessment for the Eunice Station. This information is provided to the Oil Conservation Division for its information and review.

CURA advanced 8 soil borings in areas where crude oil impact to the environment was likely to occur. The work plan called for two samples per boring to be taken for analytical results on TPH and BTEX. Monitoring wells were to be installed if groundwater was encountered. No groundwater was encountered at Eunice Station.

Eunice Station is located approximately 5 miles west of the city of Eunice in Lea County, New Mexico. The station is surrounded by a barbed wire fence with a locked gate. The site is located in a rural area within the Monument-Jal oil field. No residences, public buildings, surface bodies of water, or water wells were observed within a 1,000 foot radius of the facility. The closest known water well is located approximately 1.5 miles west of the site based on the Oil Center, New Mexico USGS topographic map (1984).

Currently the groundwater in the site area is used primarily for stock and industrial use. The drinking water in Eunice, the nearest municipality, is supplied from a well located about 12 miles north-northeast of the site and produces from the Ogollahen formation at a depth of 80 to 120 feet. On September 24, 1993 CURA, Inc. drilled a

boring to 102 feet to establish the presence of water. No water was encountered and the cuttings showed no indication of moisture and minimal contamination at depth.

Two samples had TPH values greater than 1000 ppm. B-4 had 1800 ppm TPH at 5 - 7 feet and B-6 had 42,000 ppm TPH in the 1 - 3 feet level and 50 ppm TPH at 20 - 22 feet. The OVA readings in B-6 were less than one from 5 feet to 22 feet.

Based on the analytical results and field observations, the crude oil contamination was absorbed by the impacted soils and did not migrate downward to groundwater.

Shell proposes to remediate the area around boring B-6 by land farming the soil in place. Approximately an area of 120 feet by 90 feet (see drawing) will be tilled and disked. Fertilizer will be added at 200 lbs/acre.

Shell believes this is a low risk site (see attached Ranking Criteria Form) and that the proposed plan will treat the impacted soil, reduce the TPH values and prevent it from affecting the fresh water, public health and the environment.

Please advise if this proposed plan is acceptable to the New Mexico Oil Conservation Division. Upon receiving your approval we will implement the work.

If you have any questions, please contact me at (713) 241-1001.

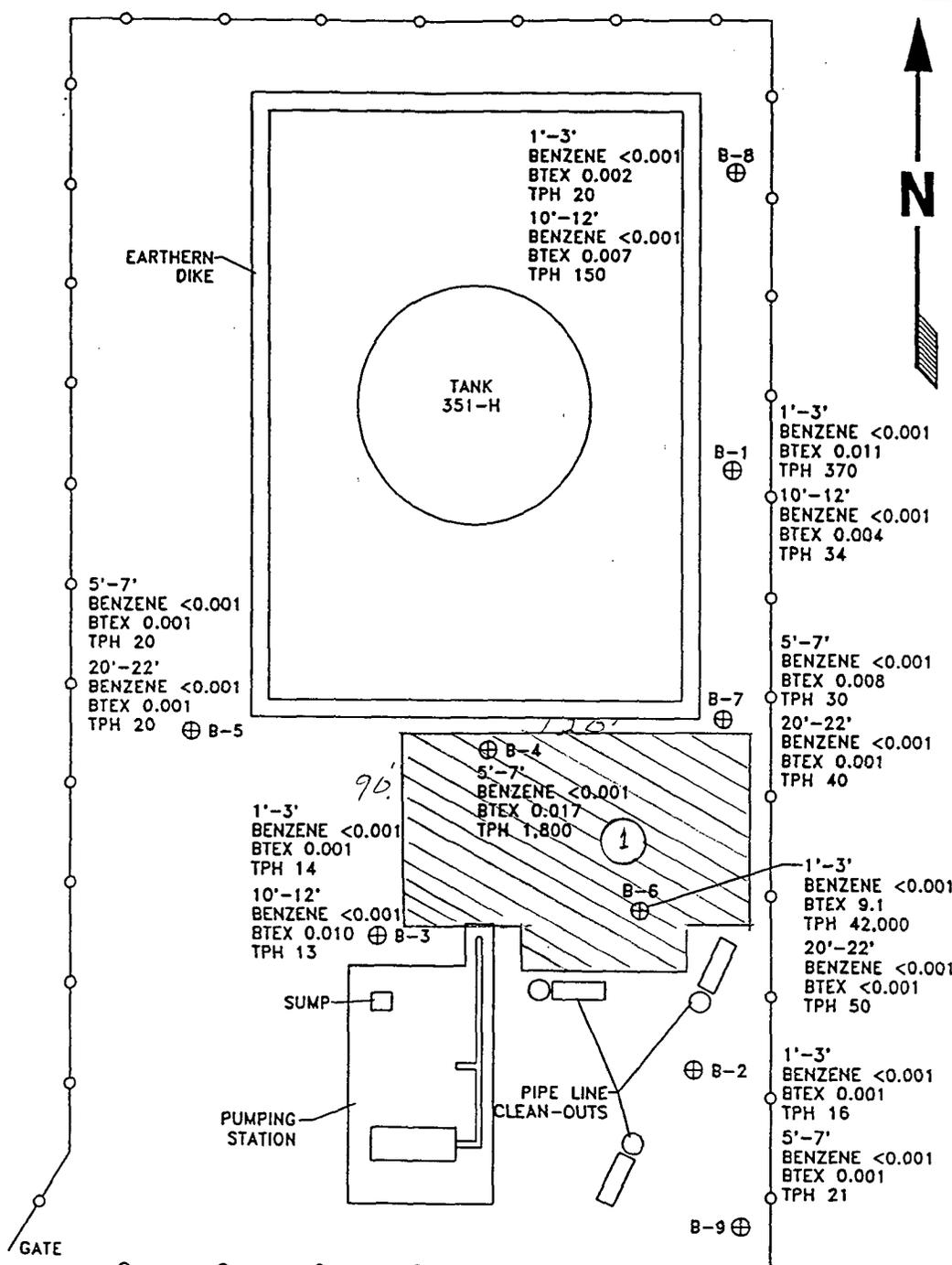
Sincerely,

  
John B. Hite  
Engineering Advisor  
General Engineering

Attachment

## EUNICE STATION RANKING CRITERIA

	<u>Ranking Score</u>	<u>Score</u>
<b>Depth to Groundwater</b>		
< 50 feet or unknown	20	_____
50 - 99	10	_____
100 - 200	5	<u>  0  </u>
> 200	0	_____
<b>Wellhead Protection Area</b>		
< 1000 feet from a water source or, < 200 feet from domestic water source		
Yes	20	_____
No	0	<u>  0  </u>
<b>Distance to Surface Water Body</b>		
< 500 horizontal feet	20	_____
500 - 1000 horizontal feet	10	_____
> 1000 horizontal feet	0	<u>  0  </u>
<b>Native Soil Type</b>		
Low permeability	0	<u>  0  </u>
Moderate permeability	5	_____
High permeability	10	_____
Total		<u>  5  </u>



① Disk area ≈ 90' x 120'  
Add 200#/Acres Fertilizer - Disk in

### SOIL HYDROCARBON CONCENTRATION MAP

BENZENE, TOTAL BTEX, AND TPH CONCENTRATIONS LISTED IN mg/kg (ppm)



**CURA INC.**  
2735 VILLA CREEK DRIVE - TWO METRO SQUARE  
BLDG. C - SUITE 250 - DALLAS, TX 75234  
620-7117 FAX - 620-8219

EUNICE STATION  
SHELL PIPE LINE CORPORATION  
LEA COUNTY, NEW MEXICO

DATE: OCT 1993	SCALE: SEE ABOVE
PROJECT NO. 15-93673	FIGURE NO. 1



State of New Mexico  
**ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT**  
 Santa Fe, New Mexico 87505

STATE OF  
 NEW MEXICO  
 OIL  
 CONSERVATION  
 DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

Telephone     Personal

Time 1100

Date 9/27/93

Originating Party

Other Parties

Bill Olson - Envir. Bureau

John Hite - Shell Pipeline

Subject

Pump Station Environmental Assessment

Discussion

Told him OCO needs TCLP analyses on any constituents with totals above TC limits  
 OCO will also need MHW construction details

Conclusions or Agreements

Shell is currently completing work referenced in the reports.  
 Final reports on sites and proposal completion will be submitted to OCO in approx. 30 days

Distribution

Signed

Bill Olson

September 10, 1993

OIL CONSERVATION DIVISION  
**Shell Oil Company**  
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P.O. Box 2099  
Houston, TX 77252

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State of New Mexico  
Energy Minerals and Natural Resources Department  
Oil Conservation Division  
ATTN Mr. William C. Olson  
Hydrogeologist - Environmental Bureau  
P. O. Box 2088  
Santa Fe, NM 87504

Gentlemen:

**SUBJECT: SITE ASSESSMENT  
EUNICE CRUDE OIL GATHERING AND PUMP STATION  
LEA COUNTY, NEW MEXICO**

Please find attached a copy of Shell Pipe Line Corporation (Shell) environmental contractor's (CURA, Inc.) site assessment report and EOTT Energy Corp. environmental contractor's (Roy F. Weston, Inc.) due diligence assessment for the Eunice Station. This information is provided to the Oil Conservation Division for its information and review.

CURA advanced 8 soil borings in areas where crude oil impact to the environment was likely to occur. The work plan called for two samples per boring to be taken for analytical results on TPH and BTEX. Monitoring wells were to be installed if groundwater was encountered. No groundwater was encountered at Eunice Station.

Eunice Station is located approximately 5 miles west of the city of Eunice in Lea County, New Mexico. The station is surrounded by a barbed wire fence with a locked gate. The site is located in a rural area within the Monument-Jal oil field. No residences, public buildings, surface bodies of water, or water wells were observed within a 1,000 foot radius of the facility. The closest known water well is located approximately 1.5 miles west of the site based on the Oil Center, New Mexico USGS topographic map (1984).

Currently the groundwater in the site area is used primarily for stock and industrial use. The drinking water in Eunice, the nearest municipality, is supplied from a well located about 12 miles north-northeast of the site and produces from the Ogollahen formation at a depth of 80 to 120 feet.

EuniceSt.jbh

Two samples had TPH values greater than 1000 ppm. B-4 had 1800 ppm TPH at 5 - 7 feet and B-6 had 42,000 ppm TPH in the 1 - 3 feet level and 50 ppm TPH at 20 - 22 feet. The OVA readings in B-6 were less than one from 5 feet to 22 feet.

Based on the analytical results and field observations, the crude oil contamination was absorbed by the impacted soils and did not migrate downward to groundwater.

Shell proposes to conduct a pilot test to determine the treatability of the impacted soils at the site. We will look at ex-situ enhanced bioremediation and in-situ enhanced bioremediation. We will install a monitoring well to approximately 100 feet to determine any groundwater impact. After we have conducted these tests and obtained results from the well, we will present the Oil Conservation Division with a proposed remedial action plan for your review. A complete copy of the site assessment will be included.

If you have any questions, please contact me at (713) 241-1001.

Sincerely,



John B. Hite  
Engineering Advisor  
General Engineering

Attachment

FINAL REPORT  
ENVIRONMENTAL DUE DILIGENCE ASSESSMENT  
NEW MEXICO SWEET SYSTEM AND  
NEW MEXICO SOUR SYSTEM

RECEIVED

NOV 15 1993

OIL CONSERVATION DIV.  
SANTA FE

Submitted by:

Roy F. Weston, Inc.  
5599 San Felipe, Suite 700  
Houston, Texas 77056  
(713) 621-1620

AUGUST 1993

## SECTION 8

### EUNICE STATION

#### 8.1 SITE LOCATION AND DESCRIPTION

The Eunice Station is located approximately 5 miles west of Eunice, Lea County, New Mexico. The site location is shown in Figure 8-1. Eunice Station is a crude oil pumping station and storage facility where sour oil from gathering lines is pumped into a trunk line.

The Eunice Station site layout is depicted in Figure 8-2. Above-ground facilities include a 15,000 BBL external floating roof crude oil storage tank (tank 351), pump, pump sump, three scraper traps, and three scraper trap sumps. Three unlabelled transformers are attached to a utility pole south of the tank. Ownership of the transformers is unknown. Hydrocarbon staining is visible in approximately 70% of the surface soils inside the tank dike. Large areas of hydrocarbon staining cover approximately 40% of the site east of the tank. The extent of hydrocarbon staining is depicted in Figure 8-2. SPLC personnel reported that the incoming pipeline running east-west north of the tank has had several leaks recently.

Hydrocarbon-contaminated soils located in a separate, fenced area east of the station fence are being landfarmed by SPLC to reduce the hydrocarbon concentrations.

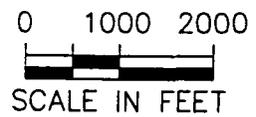
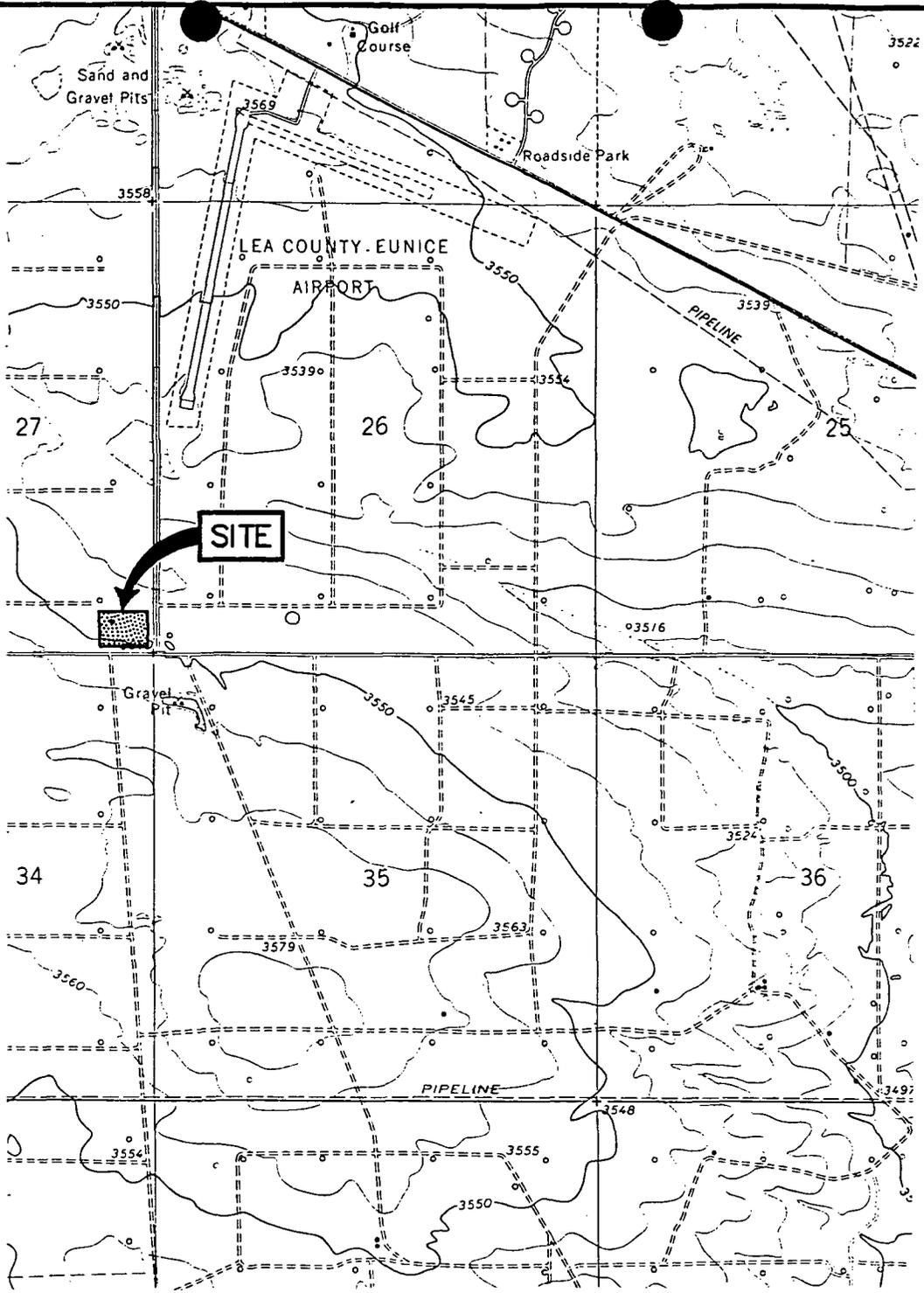
The site is located in an active oil field. SPLC is leasing the approximately 10-acre site. A producing oil well is located approximately 75 feet from the northeast site fence corner.

#### 8.2 PREVIOUS INVESTIGATION RESULTS AND CONCLUSIONS

CURA, Inc. performed a baseline assessment of soil and groundwater conditions at Eunice Station in December, 1992, and a Phase II investigation in February, 1993. CURA advanced a total of eight soil borings within the western portion of the site containing the tank and pump. No sampling was conducted by CURA in the landfarm area. The CURA soil boring locations are shown in Figure 8-2.

BTEX concentrations in soil samples collected from the borings ranged from <0.001 mg/kg to 9.1 mg/kg. Only one sample contained more than 0.02 mg/kg BTEX. TPH concentrations ranged from 13 mg/kg to 42,000 mg/kg. All but four of the 15 samples analyzed contained less than 50 mg/kg TPH. The highest hydrocarbon concentrations occurred northeast of the tank dike between the tank dike and the scraper traps, and were limited to the upper 7 feet of soils.

CURA concluded that the extent of hydrocarbon-impacted soils in the north of the tank dike is limited in size and contains relatively low (<200 mg/kg) concentrations of TPH. CURA also concluded that the extent of hydrocarbon-impacted soil northeast of the tank is limited to an area at least 120 wide and approximately 200 feet long. CURA reported that the crude oil contamination was absorbed by the impacted soils and did not migrate downward to groundwater.



  
 BASE MAP FROM:  
 U.S. DEPT. OF THE INTERIOR  
 GEOLOGICAL SURVEY  
 EUNICE QUADRANGLE  
 NEW MEXICO  
 7.5 MINUTE SERIES (TOPOGRAPHIC)  
 1969 SERIES (REV. 1979)  
 SCALE 1:24,000

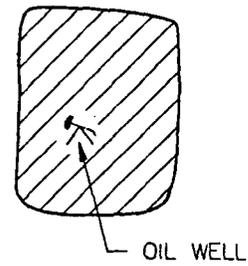
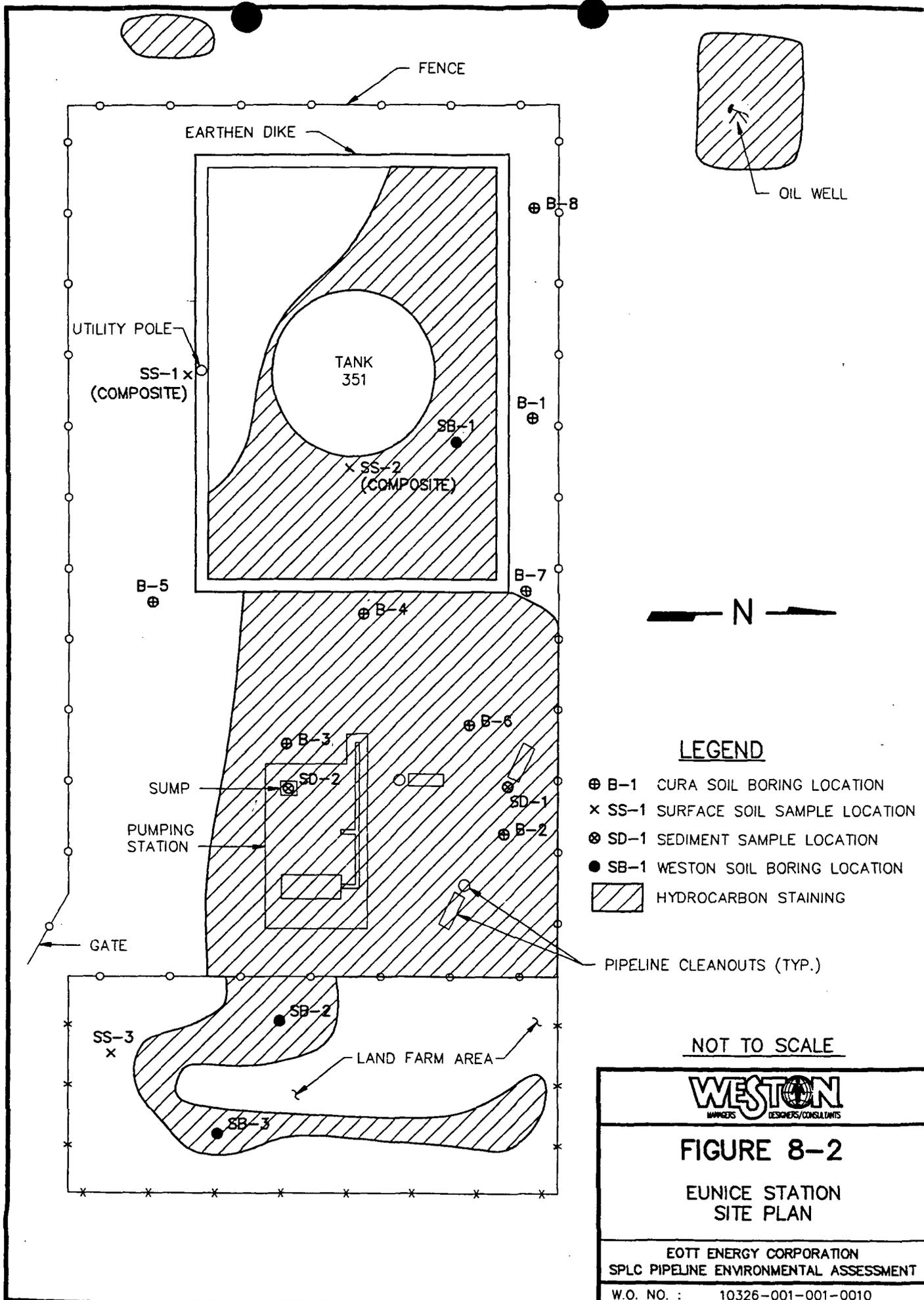
  
**FIGURE 8-1**  
**EUNICE STATION LOCATION**  
**LEA COUNTY, NEW MEXICO**

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**EOTT ENERGY CORPORATION**  
**SPLC PIPELINE ENVIRONMENTAL ASSESSMENT**

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W.O. NO. : 10326-001-001-0010



**LEGEND**

- ⊕ B-1 CURA SOIL BORING LOCATION
- × SS-1 SURFACE SOIL SAMPLE LOCATION
- ⊗ SD-1 SEDIMENT SAMPLE LOCATION
- SB-1 WESTON SOIL BORING LOCATION
- ▨ HYDROCARBON STAINING

PIPELINE CLEANOUTS (TYP.)

NOT TO SCALE



**FIGURE 8-2**

**EUNICE STATION  
SITE PLAN**

EOTT ENERGY CORPORATION  
SPLC PIPELINE ENVIRONMENTAL ASSESSMENT

W.O. NO. : 10326-001-001-0010

### 8.3 SITE SAMPLING

After the records review, site inspection and CURA report review, WESTON recommended sampling at Eunice Station to address the following environmental issues:

- potential lead contamination of soil surrounding tank,
- potential PCB contamination beneath electrical equipment,
- potential PCB contamination of sumps from PCB oils,
- soil staining inside tank dike, and
- soil staining in landfarm area east of the fenced site.

The sample locations are shown on Figure 8-2. Analytical results are provided in Table 8-1.

No PCBs were detected in SS-01 collected from beneath the transformers. No PCBs were detected in SD-01 or SD-02 collected from two of the sumps.

SS-02 collected from surface soils adjacent to the tank contained 11.1 mg/kg total lead. Background sample SS-03 collected from the southwest corner of the landfarm area at a location which appeared undisturbed by site activities contained 14.1 mg/kg lead. Based on these results, it appears that soil surrounding the tank has not been impacted from past tank coating activities.

Boring SB-01 was advanced into stained soils inside the tank dike. A description of the soils encountered in this boring is as follows:

0 in. - 3 in.	Rock and oil-stained sand
3 in. - 1.3 ft.	Dark reddish-brown sand, possibly stained
	Auger refusal at 1.3 ft.
	OVA = 0 ppm off cuttings at 0.8 - 3 ft.

Sample SB-01 was collected at a depth between 1.0 and 1.3 feet. SB-01 contained 0.0071 mg/kg BTEX and 563 mg/kg TPH.

Boring SB-02 was advanced into stained soils at the western side of the landfarm area. A description of the soils encountered in this boring is as follows:

0 ft. - 1.5 ft.	Reddish clayey sand, hydrocarbon staining
	Auger refusal at 1.5 ft.
	OVA = >500 ppm off cuttings at 1.0 ft.
	OVA = 400 ppm off cuttings at 1.5 ft.

Two samples were collected. Sample SB-02-01 was collected from 0 to 0.5 feet and sample SB-02-02 at a depth of 1.5 feet. SB-02-01 contained 0.031 mg/kg BTEX and 30,100 mg/kg TPH. SB-02-02 contained 4.68 mg/kg BTEX and 30,800 mg/kg TPH.

Boring SB-03 was advanced into stained soils at the western side of the landfarm area. A description of the soils encountered in this boring is as follows:

0 ft. - 1.5 ft.	Reddish-brown sand OVA = 50 ppm off cuttings at 1.0 ft. OVA = 50 ppm off cuttings at 1.5 ft.
1.5 ft. - 1.8 ft.	Reddish sand Auger refusal at 1.8 ft.

Samples SB-03-01 and SB-03-02 were collected from depths of 1.5 and 0.5 feet respectively. SB-03-01 contained 0.0047 mg/kg BTEX and 3,830 mg/kg TPH. SB-03-02 contained 0.0176 mg/kg BTEX and 23,600 mg/kg TPH.

#### 8.4 COMPLIANCE ISSUES

##### Air Issues for Tank 351

Based on the available information, an air permit is not required for this tank. If the tank is not operated at a constant crude oil level, then an air permit would probably be required if the tank throughput is greater than 60 million BBL per year. The tank appears to be in compliance with other New Mexico and federal regulations.

#### 8.5 LIABILITY ISSUES

##### Hydrocarbon Contaminated Soil

The CURA investigation identified two areas of hydrocarbon-contaminated soil; one along the north tank dike, and the other at the northeast corner of the site. Although most of the CURA boring results indicated that hydrocarbon impacts were limited to shallow depths, results from CURA borings B-5 and B-4 indicate that the impacts are not homogeneous. The sandy composition of the soils and the frequency of leaks in the pipeline north of the tank could have resulted in deeper soil impacts from hydrocarbons.

The WESTON soil borings and site inspection identified additional areas of hydrocarbon impacts inside the tank dike and in the landfarm area. The impacted areas identified by WESTON are shown in Figure 8-2. The WESTON soil borings indicate that hydrocarbon contamination is probably not much deeper than 1.5 feet inside the diked area. The relatively high concentration of hydrocarbons in the landfarm area suggests that hydrocarbon contamination may be deeper in this area. Additional work is needed to identify the horizontal and vertical extent of hydrocarbon-impacted soil, and determine whether or not groundwater is threatened.

Because of their TPH concentration, the soils in the landfarm area would have to be remediated, regardless of the depth or quality of groundwater, if the OCD were to apply the pit closure guidelines as cleanup standards. Landfarming is a suggested method of remediation by the OCD.

### Groundwater Contamination

The composition of the site soils and frequent leaks from the gathering line north of the tank make groundwater contamination possible. If the site groundwater contains constituents above the New Mexico water quality criteria concentrations, groundwater remediation to the criteria discussed in Section 2.1.4 will likely be necessary.

WESTON recommends that the depth to the uppermost water bearing zone be determined if possible. If groundwater is relatively shallow (less than 100 feet deep), WESTON recommends that a groundwater monitor well be installed at the site to determine if groundwater has been impacted from leaks and spills from the gathering line north of the tank. If contaminated groundwater is encountered, it may have to be remediated as discussed in Section 2.1.4.

### Regulatory Database Search

The regulatory database search did not confirm any environmental risk sites within the distances given in Section 2.2.1.

**TABLE 8-1  
EUNICE STATION ANALYTICAL RESULTS  
EOTT ENVIRONMENTAL ASSESSMENT OF THE  
SPLC ZONE III PIPELINE**

SAMPLE NUMBER: LOCATION: DATE COLLECTED:	SS-01 BENEATH TRANSFORMERS 6/23/93	SS-02 ADJACENT TO TANK 6/23/93	SS-03 BACKGROUND 6/23/93	SB-01 INSIDE TANK DIKE 6/23/93	SB-02-01 W SIDE OF LANDFARM 6/23/93	SB-02-02 W SIDE OF LANDFARM 6/23/93	SB-03-01 E SIDE OF LANDFARM 6/23/93	SB-03-02 E SIDE OF LANDFARM 6/23/93
<b>ORGANICS (mg/kg):<sup>1</sup></b>								
Benzene	NA	NA	NA	<0.0008	0.0023	<0.17	<0.00075	<0.00088
Toluene	NA	NA	NA	0.0018	0.0018	<0.17	0.0036	<0.00088
Ethylbenzene	NA	NA	NA	0.0011	0.012	0.98	<0.0075	0.0076
Total Xylenes	NA	NA	NA	0.0042	0.015	3.7	0.0011	0.01
TOTAL BTEX <sup>2</sup>	NA	NA	NA	0.0071	0.031	4.68	0.0047	0.0176
TPH <sup>3</sup>	NA	NA	NA	563	30,100	30,800	3,830	23,600
TOTAL PCBs <sup>4</sup>	<0.00081	NA	NA	NA	NA	NA	NA	NA
<b>METALS (mg/kg):</b>								
Silver	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	11.1	14.1	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA

1 "NA" = not analyzed.

2 "BTEX" = total benzene, toluene, ethylbenzene, and xylenes.

3 "TPH" = total petroleum hydrocarbons.

4 "PCBs" = polychlorinated biphenyls.

**TABLE 8-1 (Cont.)  
EUNICE STATION ANALYTICAL RESULTS  
EOTT ENVIRONMENTAL ASSESSMENT OF THE  
SPLC ZONE III PIPELINE**

SAMPLE NUMBER: LOCATION: DATE COLLECTED:	SD-01 SCRAPER SUMPS 6/23/93	SD-02 PUMP SUMP 6/23/93				
ORGANICS (mg/kg): <sup>1</sup>						
Benzene	NA	NA				
Toluene	NA	NA				
Ethylbenzene	NA	NA				
Total Xylenes	NA	NA				
TOTAL BTEX <sup>2</sup>	NA	NA				
TPH <sup>3</sup>	NA	NA				
TOTAL PCBs <sup>4</sup>	<5.7	<11				
METALS (mg/kg):						
Silver	NA	NA				
Arsenic	NA	NA				
Barium	NA	NA				
Cadmium	NA	NA				
Chromium	NA	NA				
Mercury	NA	NA				
Lead	NA	NA				
Selenium	NA	NA				

1 "NA" = not analyzed.  
 2 "BTEX" = total benzene, toluene, ethylbenzene, and xylenes.  
 3 "TPH" = total petroleum hydrocarbons.  
 4 "PCBs" = polychlorinated biphenyls.