AP - 012

STAGE 1 & 2 WORKPLANS

DATE:
July 12, 1999

EOTT ENERGY Pipeline Limited Partnership

P.O. BOX 1660
5805 E. BUSINESS 20
MIDLAND, TEXAS 79702
(915) 687-2040

BY CERTIFIED MAIL
RETURN RECEIPT NO. ~~Z 425 534 612~~ EE251898194US

July 12, 1999

State of New Mexico
Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505
Attn: William Olson

RE: TNM-98-05A GROUNDWATER ABATEMENT PLAN (AP-12)

Dear Mr. Olson:

Attached please find EOTT Energy Pipeline Limited Partnership's (EOTT) proposed Groundwater Abatement Plan for TNM-98-05A.

A public notice will be published in the Hobbs News Sun and the Albuquerque Journal this week. A copy of the affidavit of publication will be forwarded to you as soon as I receive them from the newspapers. I have sent written notice to landowners within a one-mile radius of the leaksite and to "those persons, as identified by the Director, who have requested notification". An Affidavit of Mailing is attached.

I hope all meets with your approval but if you have any questions, please don't hesitate to call me at 915/684-3467.

Sincerely,

Lennah Frost

Lennah Frost
Sr. Environmental Engineer

cc: Al Hugh - Environmental File
NMOCD Hobbs District Office

EOTT ENERGY PIPELINE LIMITED PARTNERSHIP

PROPOSED STAGE 1 GROUND WATER ABATEMENT PLAN (AP-12)
TNM-98-05A
LEA COUNTY, NEW MEXICO

INTRODUCTION

EOTT Energy Pipeline Limited Partnership has recently acquired assets from Texas-New Mexico Pipe Line Company (TNMPL). Along with this acquisition EOTT has also accepted responsibility for cleanup on numerous TNMPL crude oil release sites. On February 5, 1998 TNMPL discovered a crude oil release had occurred on its pipeline located in Unit E, Section 26, T-21-S, R-37-E, Lea County, New Mexico. The spill was reported immediately to the New Mexico Oil Conservation Division (NMOCD) in Hobbs, New Mexico. The property is owned by Del Rose Scott. This property can best be described as open range. The location is referred to as TNM 98-05A.

TNMPL personnel determined that approximately 49 barrels of crude oil was released and 7 barrels were recovered. The release occured as a result of corrosion. TNMPL contracted with KEI Environmental to conduct a Subsurface Investigation at the site. From February, 1998 until March, 1999, KEI installed several monitor wells at the site and completed their subsurface investigation which was submitted to the NMOCD in March, 1999.

SITE HISTORY

A release of approximately 49 barrels of light crude oil occurred on February 5, 1998. Of the 49 barrels released approximately 3 barrels were recovered. Prior to the start of the subsurface investigation, minor excavation of impacted soils along the pipeline had taken place to facilitate pipeline repairs at the leak site. The site consisted of an open excavation 45 feet long, 10 feet wide, 4 feet deep. Approximately 87 cubic yards of soil were stockpiled along side the pipeline.

During the subsurface investigation, 4 monitoring wells (designated MW-1 through MW-4) were installed utilizing air rotary drilling. Soil samples were collected at selected intervals from the ground surface to the bottom of each boring. The soils were classified in the field, soil samples were field screened, and selected samples were prepared ans shipped to the laboratory for analysis. The results of the laboratory analysis are presented in TABLE I and TABLE II, attached. Details of the soil investigation are included in the Subsurface Investigation Report on file with the NMOCD in both the Hobbs District Office and the Santa Fe Office. Please refer to that report for detailed information about soils.

The monitoring well locations were surveyed by a Professional Land Surveyor registered in the State of New Mexico. The locations of the monitoring wells are presented in Fig. 2, attached.

The depth to groundwater measured in the monitoring wells on January 7, 1999, ranged from 44.16 to 46.94 feet bgs. Groundwater elevations indicate an approximate gradient of 0.0026 ft/ft to the south. Ground water contours are presented in Fig. 7, attached.

Phase-separate hydrocarbons (PSH) were observed on groundwater in MW-1 and MW-2 and are shown in TABLE III. MW-3 and MW-4 were sampled in November, 1998. Results of sampling are found in TABLE IV.

GEOLOGY AND HYDROGEOLOGY

The geology of the Southern High Plains of Texas and Eastern New Mexico consists of the Tertiary Ogallala Formation which is overlain by Quaternary eolian, fluvial, and lacustrine sediments. The Quaternary deposits, ranging in age from 1.4 millions years ago until recent, extends to a maximum depth of 80 feet bgs in the region. The Tertiary Ogallala Formation contains coarse fluvial conglomerates, sandstone, and fine-grain eolian siltstone and clay. The depositional environment of the Ogallala Formation and overlying Quaternary deposits produce overlapping, humid type alluvial fans. Exposed along dry riverbeds in the region, the Quaternary alluvium deposits consist of sands, silts, and gravels. Locally, a resistant calcitic layer known as the caprock overlies the Oglalla formation. The caprock is exposed along the northwestern portion of Lea County.

The Ogallala aquifer isthe primary drinking water/irrigation source for the Southern High Plains of Texas and Eastern New Mexico. The Ogallala aquifer occurs within the Tertiary Ogallala Formation which is composed of terrigenous sediments such as sands, gravels, and finer sediments. The aquifer is covered by Quaternary deposits and unconformably overlies Cretaceous, Triassic, and Permian rocks. Water table elevations approximately parallel regional land surface (dips to the south/southeast). Generally, the hydraulic conductivity (K) for the aquifer is < or = to 200 gal/day/ft2 with a porosity of 43% and a specific yield of 23% for fine-grain sands.

Water Well Inventory

A water well search for the site yielded 17 water wells located within a one-mile radius of the property (see attachment - Water Well Search.) One well (14) is located down gradient and within a 1 mile radius of the leaksite. Groundwater depths to these wells (as of 1976) was approximately 64 to 69 feet bgs.

Surface Water and Streams

No surface water bodies or streams are located within a 1-mile radius of the release site.

STAGE 1 ABATEMENT WORKPLAN

The following Stage 1 Abatement Workplan is based on the results of the assessment activities performed to date. This plan is actually a workplan for bioremediation of the leaksite. EOTT has contracted Environmental Technology Group, Inc. (ETGI) in Midland, Texas to remediate the site. Attached is their Workplan for Bioremediation of Site 98-05A Location along with detailed procedures to be utilized during this project.

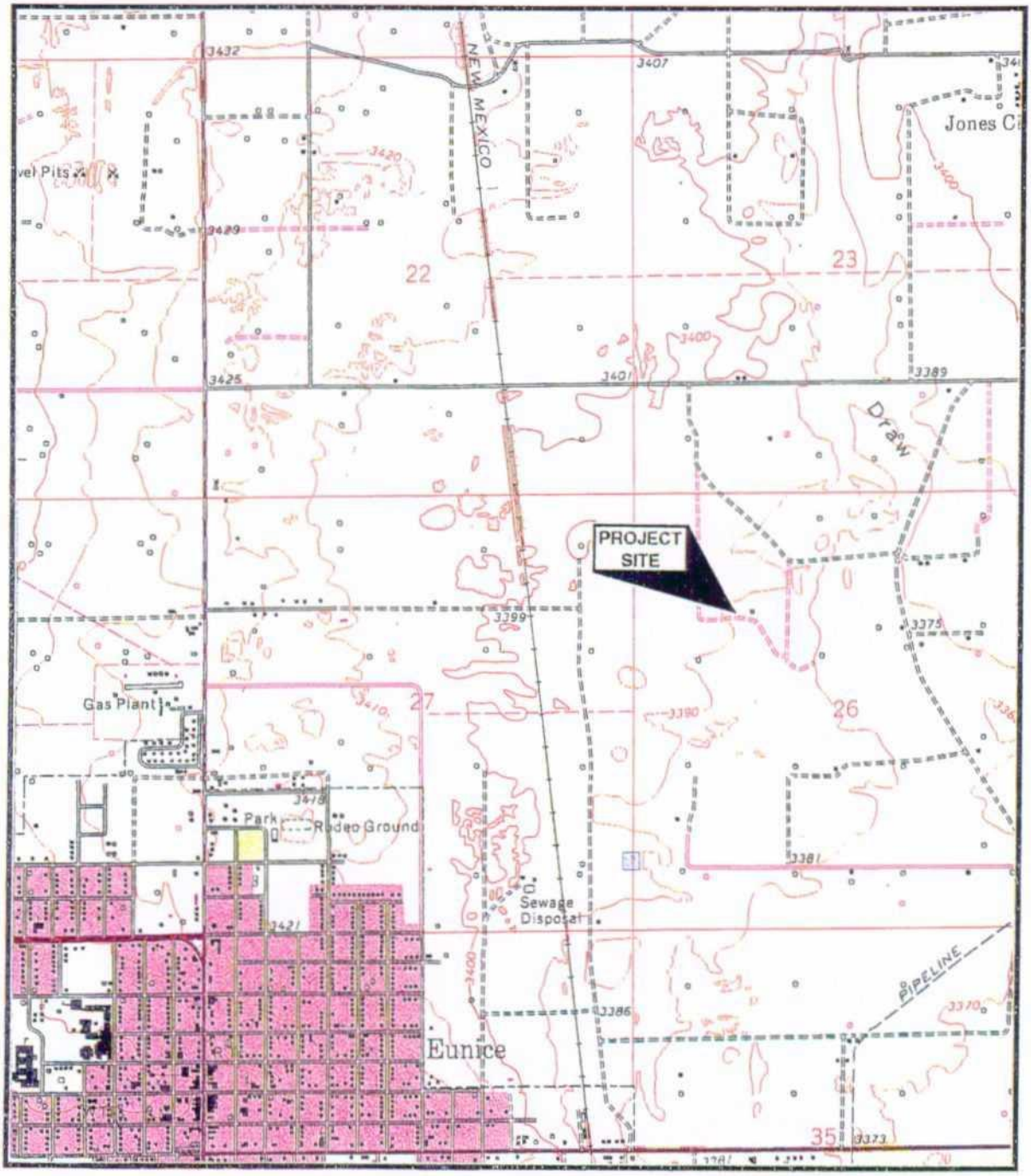
SCHEDULE

Field activities will be scheduled following written approval of the Stage 1 Abatement Workplan by the NMOCD. Field activities will be initiated immediately. The attached plan details the proposed schedule and completion time for the project.

EUNICE QUADRANGLE

NEW MEXICO - LEA CO.

7.5 MINUTE SERIES (TOPOGRAPHIC)



SCALE 1:24000

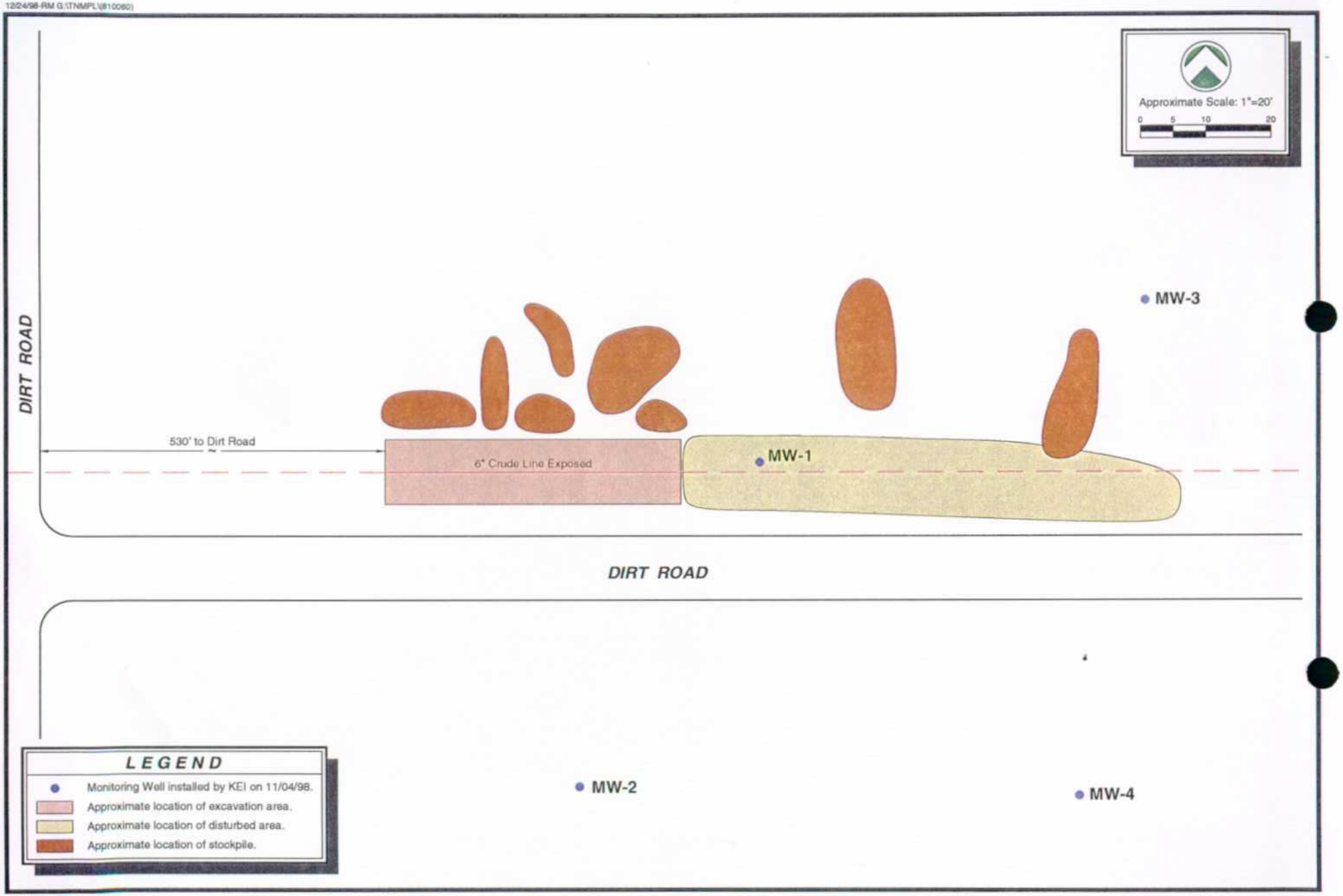
1 0 1/2 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

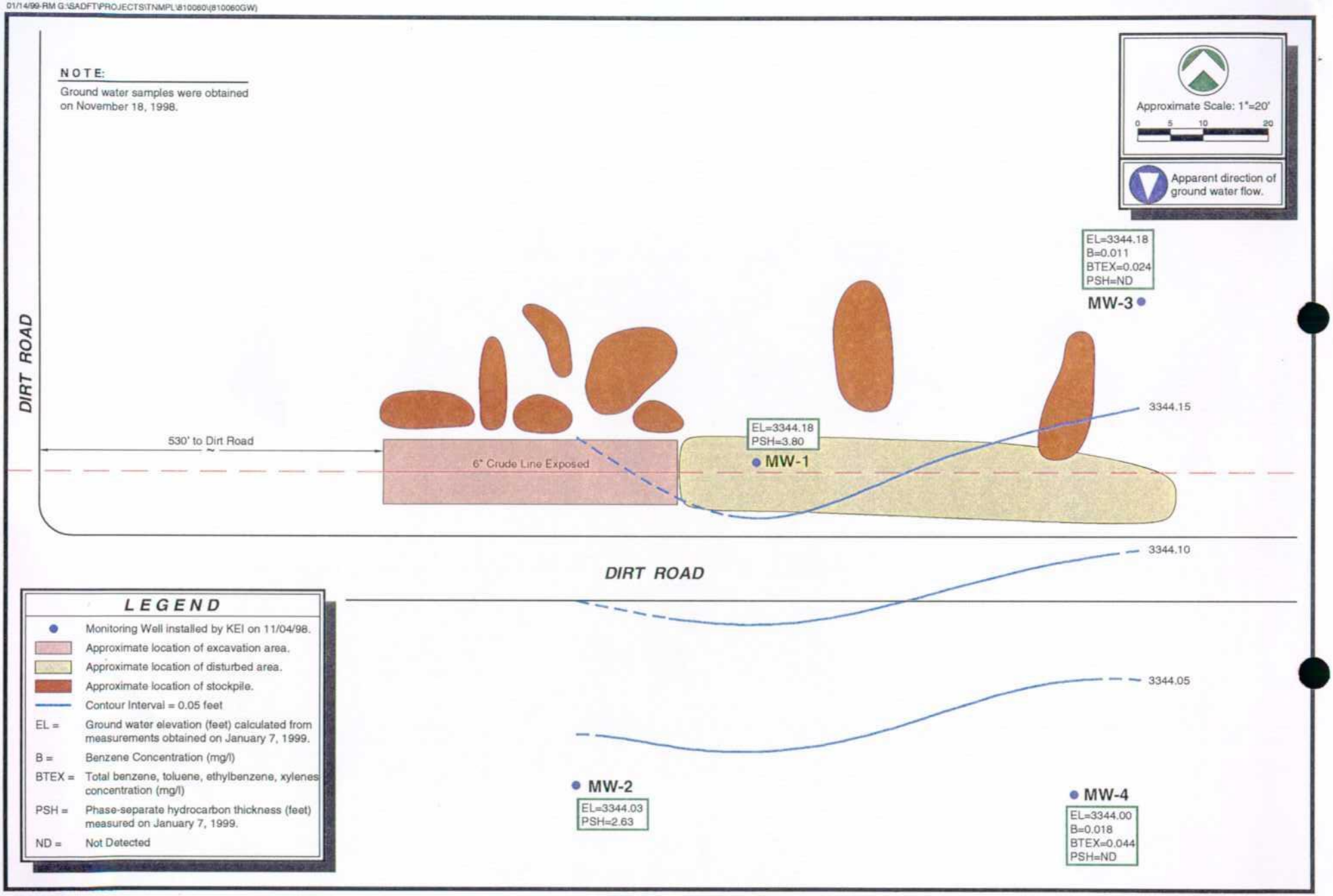
CONTOUR INTERVAL 5 FEET

k·e·i	*SITE LOCATION MAP*	810060-1-0
	TEXAS - NEW MEXICO PIPE LINE CO. TNM-98-05A LEA COUNTY, NEW MEXICO	FIG 1



k·e·i

SITE PLAN	810060-1-0
TEXAS-NEW MEXICO PIPE LINE CO. TNM-98-05A LEA COUNTY, NEW MEXICO	FIG 2



k·e·i

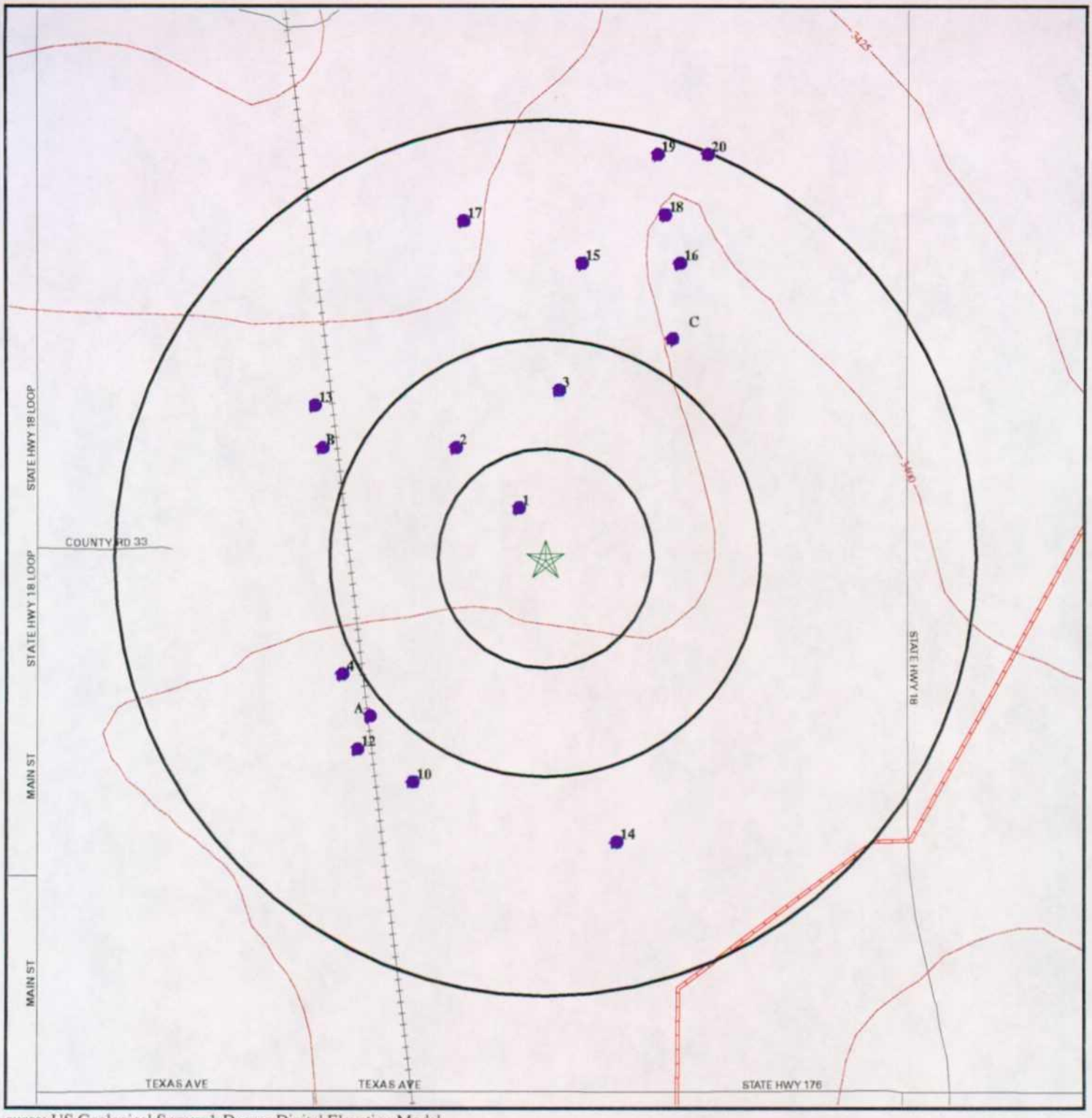
GROUND WATER CONTOURS / CONCENTRATION MAP

TEXAS-NEW MEXICO PIPE LINE CO. TNM-98-05A LEA COUNTY, NEW MEXICO

810060-1-0

FIG 7

TOPOGRAPHIC MAP -383540.3s -'EOTT Energy Corp'



ource: US Geological Survey 1-Degree Digital Elevation Model
Compiled 09/15/92

0 1/4 1/2 1

scale in miles

-Major Roads

-Contour lines (25 foot interval unless otherwise shown)

-Waterways

-Wells within search distance to Target Property

-Earthquake Epicenters (Richter 5 or greater)

-Power lines

-Pipe lines

-Fault lines

-Water

N

TARGET PROPERTY:	TNM-98-05+TNM-98-05A	CUSTOMER:	EOTT Energy Corp
ADDRESS:	TNM-98-05+TNM-98-05A	CONTACT:	Ms. Lennah Frost
CITY/STATE/ZIP:	Eunice NM 88231	INQUIRY #:	383540.3s
LAT/LONG:	32.4530 / 103.1387	DATE:	June 23, 1999

TABLE I

SUMMARY OF SOIL RESULTS - BTEX AND TPH
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-05A
LEA COUNTY, NEW MEXICO

SAMPLE LOCATION	SAMPLE DATE	DEPTH (feet)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL-BENZENE (mg/kg)	XYLENES (mg/kg)	TOTAL BTEX (mg/kg)	TPH (mg/kg)
MW-1	11/4/98	0 - 2	3.72	45.80	64.40	95.10	209.020	4,040
	11/4/98	2 - 4	4.68	32.70	27.40	38.90	103.680	11,800
	11/4/98	35 - 37	ND	ND	ND	ND	ND	33.8
MW-2	11/4/98	0 - 2	ND	ND	ND	ND	ND	14.6
	11/4/98	15 - 17	ND	ND	ND	ND	ND	ND
	11/4/98	40 - 42	0.096	0.318	0.442	0.919	1.775	14.0
MW-3	11/4/98	0 - 2	ND	ND	ND	ND	ND	ND
	11/4/98	25 - 27	ND	ND	ND	ND	ND	ND
	11/4/98	40 - 42	ND	ND	ND	ND	ND	ND
MW-4	11/4/98	0 - 2	ND	ND	ND	ND	ND	ND
	11/4/98	8 - 10	ND	ND	ND	ND	ND	25.4
	11/4/98	40 - 42	ND	ND	ND	ND	ND	14.5

TABLE II

SUMMARY OF SOIL RESULTS - SPLP
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-05A
LEA COUNTY, NEW MEXICO

PARAMETER	CONCENTRATION (mg/l)
SVOC	
Dibenzofuran	0.005
2-Methylnaphthalene	0.045
Naphthalene	0.071
VOC	
Benzene	0.034
n-Butylbenzene	0.017
sec-Butylbenzene	0.014
1,2-Dichloroethane	0.021
Ethylbenzene	1.388
Isopropylbenzene (Cumene)	0.075
p-Isopropyltoluene (p-Cymene)	0.009
Naphthalene	0.117
n-Propylbenzene	0.102
Toluene	2.082
1,2,4-Trimethylbenzene	0.338
1,3,5-Trimethylbenzene	0.068
o-Xylene	0.658
TPH	8.8 ppm

NOTES:

1. Sample was collected from monitoring well MW-1 from 2 to 4 feet on 11/04/98.
2. Those constituents not listed above were ND.

TABLE III

SUMMARY OF GROUND WATER MEASUREMENTS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-05A
LEA COUNTY, NEW MEXICO

MONITORING MONITOR WELL ID	DATE MEASURED	GROUND SURFACE ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
				Actual	Corrected	
MW-1	11/18/98	3,387.94	44.17	3,343.77	3,344.28	0.61
	12/03/98	3,387.94	45.88	3,342.06	3,344.23	2.60
	01/07/99	3,387.94	46.94	3,341.00	3,344.18	3.80
MW-2	11/18/98	3,388.65	46.85	3341.80	3,344.13	2.79
	12/03/98	3,388.65	46.91	3341.74	3,344.07	2.79
	01/07/99	3,388.65	46.82	3341.83	3,344.03	2.63
MW-3	11/18/98	3,388.45	44.13	3344.32	---	---
	12/03/98	3,388.45	44.21	3344.24	---	---
	01/07/99	3,388.45	44.27	3344.18	---	---
MW-4	11/18/98	3,388.16	44.06	3344.10	---	---
	12/03/98	3,388.16	44.15	3344.01	---	---
	01/07/99	3,388.16	44.16	3344.00	---	---

NOTES:

1. Depth to water is referenced from the ground surface.
2. The ground water elevation in wells containing PSH has been corrected using a specific gravity for PSH of 0.84.

TABLE IV

SUMMARY OF GROUND WATER RESULTS - BTEX
TEXAS-NEW MEXICO PIPE LINE COMPANY
TNM-98-05A
LEA COUNTY, NEW MEXICO

MONITORING WELL	DATE SAMPLED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL-BENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)
MW-3	11/18/98	0.011	0.006	0.004	0.003	0.024
MW-4	11/18/98	0.018	0.011	0.006	0.009	0.044

TABLE V

SUMMARY OF GROUND WATER RESULTS - MISCELLANEOUS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-05A
LEA COUNTY, NEW MEXICO

SAMPLE LOCATION	MW-3	MW-4
SAMPLE DATE	11/18/98	11/18/98
CONSTITUENT	CONCENTRATION (mg/l)	
PAH		
All Constituents	ND	ND
Metals		
Aluminum	2.26	ND
Barium	0.212	0.163
Boron	0.25	0.23
Calcium	666	631
Iron	0.94	ND
Magnesium	52.4	53.5
Manganese	0.133	0.095
Potassium	8.28	8.61
Silicon	39.8	34.6
Sodium	132	143
Strontium	3.44	2.97
Vanadium	0.066	0.109
Zinc	0.056	ND
Cations/Anions		
Bicarbonate	135	134
Chloride	238	315
Sulfate	216	274
TDS	892	865

NOTE:
Those constituents not listed above were ND.

The EDR-GeoCheck® Report

TNM-98-05+TNM-98-05A
TNM-98-05+TNM-98-05A
Eunice, NM 88231

Inquiry Number: 383540.3s

June 23, 1999

Environmental Data Resources, Inc.
an edr company

The Source For Environmental Risk Management Data

3530 Post Road
Southport, Connecticut 06490

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

THE EDR GEOCHECK™ REPORT

The EDR GeoCheck™ Report is a screening tool designed to assist in the hydrogeological assessment of a particular geographic area based upon publicly available information.

The EDR GeoCheck™ Report consists of the following information within a customer specified radius of the target property.

- topography (25 foot intervals unless otherwise shown)
- major roads
- surface water bodies
- railroad tracks
- flood plains (available in selected counties)
- wetlands (available in selected counties)
- wells including depth to water table and water level variability (in federal and selected state databases)
- public water supply wells (including violations information)
- geologic data
- radon data.

The EDR GeoCheck™ Report is a general area study. It may or may not be accurate at any specific location.

WELL SEARCH SUMMARY

GEOLOGIC AGE IDENTIFICATION†

Geologic Code:	Tpc
Era:	Cenozoic
System:	Tertiary
Series:	Pliocene

ROCK STRATIGRAPHIC UNIT†

Category:	Continental Deposits

SEARCH DISTANCE RADIUS INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal Database	1.000
State Database	1.000
PWS Database	1.000

FEDERAL DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	322717103082301	1/8 - 1/4 Mile NNW
2	322724103083201	1/4 - 1/2 Mile NW
3	322731103081701	1/4 - 1/2 Mile North
4	322657103084801	1/2 - 1 Mile WSW
A8	322652103084701	1/2 - 1 Mile SW
A5	322652103084401	1/2 - 1 Mile SW
B6	322724103085101	1/2 - 1 Mile WNW
B7	322724103085102	1/2 - 1 Mile WNW
C11	322738103075901	1/2 - 1 Mile NNE
C9	322737103080101	1/2 - 1 Mile NNE
10	322644103083801	1/2 - 1 Mile SSW
12	322648103084601	1/2 - 1 Mile SW
13	322729103085201	1/2 - 1 Mile WNW
14	322637103080901	1/2 - 1 Mile SSE
15	322746103081401	1/2 - 1 Mile North
16	322746103080001	1/2 - 1 Mile NNE
17	322751103083101	1/2 - 1 Mile NNW
18	322752103080201	1/2 - 1 Mile NNE
19	322759103080301	1/2 - 1 Mile NNE
20	322759103075601	1/2 - 1 Mile NNE

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
NO WELLS FOUND		

PUBLIC WATER SUPPLY SYSTEM INFORMATION

NO WELLS FOUND

AREA RADON INFORMATION

† Source: P.G Schruben, R.E. Arndt and W.J. Bawiec. Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994)

WELL SEARCH SUMMARY

AREA RADON INFORMATION

Zip Code: 88231

Number of sites tested: 2

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.250 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

WELL SEARCH FINDINGS

Map ID
Direction
Distance

1
NNW
1/8 - 1/4 Mile

Site ID:	322717103082301	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3395.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	65.25 ft.	Water Level:	61.69 ft.	Water Level:	60.39 ft.
Date Measured:	11/03/65	Date Measured:	12/17/70	Date Measured:	01/27/76

2
NW
1/4 - 1/2 Mile

Site ID:	322724103083201	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3401.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	70.42 ft.	Water Level:	68.56 ft.	Water Level:	66.06 ft.	Water Level:	64.84 ft.
Date Measured:	12/02/65	Date Measured:	03/12/68	Date Measured:	12/17/70	Date Measured:	01/27/76

3
North
1/4 - 1/2 Mile

Site ID:	322731103081701	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3400.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	65.15 ft.	Water Level:	62.99 ft.
Date Measured:	11/16/65	Date Measured:	12/17/70

WELL SEARCH FINDINGS

Map ID
Direction
Distance

4
WSW
1/2 - 1 Mile

Site ID:	322657103084801	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3397.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	74.82 ft.	Water Level:	73.43 ft.	Water Level:	68.07 ft.	Water Level:	60.29 ft.
Date Measured:	11/16/65	Date Measured:	03/04/66	Date Measured:	12/14/70	Date Measured:	01/20/76

A8
SW
1/2 - 1 Mile

Site ID:	322652103084701	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3398.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	75.87 ft.	Water Level:	75.14 ft.	Water Level:	66.49 ft.	Water Level:	61.49 ft.
Date Measured:	11/16/65	Date Measured:	03/04/66	Date Measured:	12/14/70	Date Measured:	01/20/76

A5
SW
1/2 - 1 Mile

Site ID:	322652103084401	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3397.10 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	75.88 ft.	Water Level:	74.46 ft.	Water Level:	69.57 ft.	Water Level:	67.06 ft.
Date Measured:	11/16/65	Date Measured:	05/17/66	Date Measured:	03/13/68	Date Measured:	12/14/70
Water Level:	60.87 ft.						
Date Measured:	01/20/76						

WELL SEARCH FINDINGS

Map ID
Direction
Distance

B6
WNW
1/2 - 1 Mile

Site ID:	322724103085101	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3408.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	77.23 ft.	Water Level:	70.09 ft.
Date Measured:	12/02/65	Date Measured:	12/17/70

B7
WNW
1/2 - 1 Mile

Site ID:	322724103085102	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3403.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	77.58 ft.	Water Level:	75.42 ft.	Water Level:	69.69 ft.	Water Level:	66.73 ft.
Date Measured:	11/15/65	Date Measured:	03/05/66	Date Measured:	12/17/70	Date Measured:	01/27/76

C11
NNE
1/2 - 1 Mile

Site ID:	322738103075901	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3388.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	50.42 ft.	Water Level:	50.48 ft.	Water Level:	50.52 ft.	Water Level:	50.26 ft.
Date Measured:	11/04/65	Date Measured:	03/05/66	Date Measured:	12/17/70	Date Measured:	01/27/76

WELL SEARCH FINDINGS

Map ID
Direction
Distance

C9
NNE
1/2 - 1 Mile

Site ID:	322737103080101	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3387.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	52.44 ft.	Water Level:	47.52 ft.	Water Level:	47.45 ft.
Date Measured:	11/02/65	Date Measured:	03/12/68	Date Measured:	12/17/70

10
SSW
1/2 - 1 Mile

Site ID:	322644103083801	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3393.40 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	57.21 ft.
Date Measured:	01/20/76

12
SW
1/2 - 1 Mile

Site ID:	322648103084601	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3397.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	75.49 ft.	Water Level:	74.57 ft.	Water Level:	60.63 ft.
Date Measured:	05/19/65	Date Measured:	03/04/66	Date Measured:	01/20/76

WELL SEARCH FINDINGS

Map ID
Direction
Distance

13
WNW
1/2 - 1 Mile

Site ID:	322729103085201	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3406.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	76.82 ft.	Water Level:	76.47 ft.	Water Level:	71.30 ft.	Water Level:	68.83 ft.
Date Measured:	11/16/65	Date Measured:	03/05/66	Date Measured:	12/17/70	Date Measured:	01/27/76

14
SSE
1/2 - 1 Mile

Site ID:	322637103080901	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3384.30 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	52.19 ft.
Date Measured:	01/27/76

15
North
1/2 - 1 Mile

Site ID:	322746103081401	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3400.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	60.00 ft.	Water Level:	62.10 ft.
Date Measured:	10/05/72	Date Measured:	01/27/76

WELL SEARCH FINDINGS

Map ID
Direction
Distance

16
NNE
1/2 - 1 Mile

Site ID:	322746103080001	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3391.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	51.16 ft.	Water Level:	50.83 ft.
Date Measured:	05/19/65	Date Measured:	03/05/66

17
NNW
1/2 - 1 Mile

Site ID:	322751103083101	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3401.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	63.38 ft.
Date Measured:	10/05/72

18
NNE
1/2 - 1 Mile

Site ID:	322752103080201	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3390.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	50.60 ft.	Water Level:	50.02 ft.
Date Measured:	11/04/65	Date Measured:	03/05/66

WELL SEARCH FINDINGS

Map ID
Direction
Distance

19
NNE
1/2 - 1 Mile

Site ID:	322759103080301	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3391.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	50.81 ft.	Water Level:	49.89 ft.	Water Level:	47.96 ft.
Date Measured:	11/04/65	Date Measured:	03/05/66	Date Measured:	12/17/70

20
NNE
1/2 - 1 Mile

Site ID:	322759103075601	Info. Source:	USGS
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	Lea
Altitude:	3404.00 ft.	State:	New Mexico
Well Depth:	Not Reported	Topographic Setting:	Not Reported
Depth to Water Table:	Not Reported	Prim. Use of Site:	Not Reported
Date Measured:	Not Reported	Prim. Use of Water:	Not Reported

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	60.00 ft.	Water Level:	60.17 ft.	Water Level:	58.27 ft.
Date Measured:	11/04/65	Date Measured:	03/05/66	Date Measured:	12/17/70

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-260-2805
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-260-2805
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SWDIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

Area Radon Information: The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones: Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

USGS Water Wells: In November 1971 the United States Geological Survey (USGS) implemented a national water resource information tracking system. This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on more than 900,000 wells, springs, and other sources of groundwater.

Water Dams: National Inventory of Dams
Source: Federal Emergency Management Agency
Telephone: 202-646-2801
National computer database of more than 74,000 dams maintained by the Federal Emergency Management Agency.

WORK PLAN FOR BIOREMEDIATION OF EOTT'S 9805-A LOCATION

ETGI PROJECT NO. EOT.1006R

PREPARED BY:

ENVIRONMENTAL TECHNOLOGY GROUP, INC.
MIDLAND, TEXAS

JULY 1, 1999

Midland, TX ■ P. O. Box 4845, 79704 ■ Office 915-522-1139 ■ Fax 915-520-4310
The Woodlands, TX ■ P. O. Box 131150, 77393 ■ Office (281) 362-8571 ■ Fax 281-362-8932

Work Plan for Bioremediation of EOTT's Eunice, New Mexico

Prepared For:

EOTT Energy Corporation
P.O. Box 1660
Midland, Texas 79702

ETGI Project No. EOT.1006R

Ronnie W. Nickell

July 1, 1999

TABLE OF CONTENTS

APPENDIX

1.0 INTRODUCTION

Environmental Technology Group, Inc. (ETGI) is pleased to present to EOTT Energy Corp. this Work Plan for in-situ bioremediation of petroleum contaminated soils located at their Eunice, New Mexico location.

The remediation process selected for this site involves treating the contaminated soils with bioremediation treatment technologies. Water augmented with microbes, nutrients, bioenhancers, and oxygen is injected into the contaminated soil through the Deep Remediation Injection System (DRIS).

ETGI's project objective is the remediation of petroleum contaminated soils in the areas defined by visual inspection on June 30, 1999. Execution of this Work Plan, utilizing bioremediation with the DRIS for a period of 6 months, should remediate these areas down to a depth of 25 feet.

The Project's goal is to achieve cleanup of contaminants detected in the treatment areas that meet and/or exceed the Oil Conservation Division (OCD) action level of soil to 5,000 ppm and ground water to 100 ppm. Total petroleum hydrocarbons (TPH). TPH is to be analyzed by EPA Method 8015.

In the event EOTT chooses to accept the cleanup goal required to meet OCD standards for TPH, ETGI, upon demonstrating the remediation of contaminants to this standard, will cease with the treatment activities and demobilize upon EOTT's written request.

2.0 TREATMENT AREAS

The areas that require treatment measure approximately 82' X 40' X 25' deep. Based on a preliminary site visit, the estimated volumes of contamination are approximately 3037 cubic yards.

3.0 FIELD WORK

3.1 Establishing Baseline Conditions

ETGI will establish baseline conditions in the impacted area by collecting soil samples and submitting these samples for analysis. Exact soil sample locations will be determined from the sampling grid for each of the treatment areas. This grid will allow duplication of sampling events to demonstrate achieved cleanup levels.

3.2 Monthly field Activities

The DRIS will be used once a month to introduce microbes, nutrients, and surfactant into

the contaminated soil. Monthly sampling of treated soils will be performed to fine tune the system and achieve optimal bioremedial activity and efficiency.

4.0 SAMPLING PROTOCOL

Each boring will be completed with a Geo Probe. Soil samples will be trimmed from the sampler using a decontaminated tool. A sample of soil will be placed into a glass container. The container will be placed into an ice chest with ice. The samples collected for TPH analysis for each boring location will be placed into laboratory supplied glass containers and immediately placed into a cooler with sufficient ice to maintain a temperature less than 4 degrees C. Relevant sampling data will be recorded into a field notebook. At the conclusion of all baseline sampling, the on-site Project Manager will complete and sign a Chain-of-Custody form and submit the samples for transportation to the designated analytical laboratory.

5.0 LABORATORY ANALYSIS PARAMETERS

5.1 Baseline Analytical Parameters

The analytical parameters that will be used to determine baseline conditions for the composite soil samples are as follows:

1. Total Petroleum Hydrocarbons (TPH) - EPA Method 8015
2. BETX - EPA Method SW 846-8021B

5.2 Monthly Operational Analytical Parameters

The analytical parameters that will be used to determine the degradation activity and progress of the treatment system are:

1. TPH
2. BETX

6.0 DECONTAMINATION

To prevent possible cross contamination of samples, all sampling equipment will be decontaminated prior to each use. Decontamination will be completed by cleaning the sampling equipment in a non-phosphate detergent in water, followed by triple rinsing in distilled water.

7.0 PROJECT ASSUMPTION

In order for ETGI to complete this project specified in the Work Plan, the following assumptions/limitations have been made:

* Written permission from EOTT to complete subsurface boring and injections using the DRIS unit. This will require all utilities to be located and marked by EOTT and the appropriate utility companies.

* Based on initial observations, contaminated soils exist down to a maximum depth of 25 feet.

* Baseline sampling and analysis will demonstrate that the only contaminant of concern is TPH and that conditions do not exist that will inhibit microbes which are used for treating TPH contaminated soils. Baseline sampling will also confirm that contaminated soils exist to a maximum depth of 25 feet and groundwater investigation and/or treatment will not be necessary.

* Borings will be completed in soil and not in hard rock. ETGI follow the OCD guidelines for remediation activities. Regulatory reports, requests, and communications are not included in this project. Any regulatory communication will be completed by EOTT. All copies of the quarterly reports and the final report will be submitted by ETGI in sufficient quantity for EOTT to forward copies to the appropriate regulatory authorities. Any enforcement actions made by the regulatory agencies are beyond the scope of this project. All work will be completed using Level D safety equipment consisting of steel-toe shoes, hard hats, safety glasses, and safety gloves.

8.0 PROJECT MANAGEMENT

ETGI will be the prime consultant responsible for conducting the enhanced biotreatment of the contaminated soils at EOTT's facility. All data collected will adhere to the specific requirements to control the quality of data and results obtained from the information collected.

8.1 Project Management, Organization, and Key Technical Personnel

ETGI will be the prime consultant responsible for conducting the remedial project at the EOTT site. Firms that have been incorporated as subcontractors for this project include: Environmental Lab of Texas, Inc. for chemical analytical services.

Monthly progress reports will be prepared and submitted to EOTT with a monthly invoice.

Progress reports will provide details by task, compliance with the project schedule, accomplishments, and projected changes in the project scope.

9.0 PROJECT SCHEDULE

Field activities will be started two weeks after written approval from EOTT to proceed with remediation, by collecting samples to determine baseline conditions. Monthly soil samples will be collected and submitted for analysis. The analytical results obtained will be used to calibrate the bioremediation systems. Upon completion of all field activities and reducing the contamination to meet OCD's standard selected by EOTT, a draft report will be prepared within 15 working days, and submitted to EOTT for review. The anticipated time frames for completion of this project to meet OCD's standard is six months.

ETGI's goal are to complete this project meeting the objectives specified in Section 1.0 in a safe and incident-free manner, within budget, and on schedule. ETGI has an excellent health and safety-record with zero reportable accidents to OSHA.