eott energy

RISK ASSESSMENT

AND

SITE CLOSURE PROPOSAL

MARATHON ROAD LEA TO LYNCH STATION
EOTT REF: #2002-10212

UL-M SW¼ OF THE SW¼ OF SECTION 12 T20S R34E

~24 MILES WEST-SOUTHWEST (BEARING 250°) OF

HOBBS, LEA COUNTY, NEW MEXICO

LATITUDE: 32°34'59.46"N LONGITUDE: 103°31'10.94"W

APRIL 4, 2003

PREPARED BY:

John Good
Environmental Consultant
ENVIRONMENTAL PLUS, INC.
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Plains - 34053
facility - fPAC0602637006
incident - nPAC0602637204
application - pPAC0602637413

April 4, 2003

Mr. Larry Johnson
New Mexico Oil Conservation Division
1625 North French
Hobbs, New Mexico 88240

Subject: EOTT Marathon 6" Lea to Lynch Station Gathering Site (2002-10212)
Risk Assessment and Site Closure Proposal

Dear Mr. Johnson:

Environmental Plus, Inc. (EPI), on behalf of Mr. Frank Hernandez, EOTT Energy Co., submits the attached "**Risk Assessment and Closure Proposal**" for the above referenced leak site located on land owned by Kenneth Smith, Inc. The site is located in the SW¼ of the SW¼ (Unit Letter M), Section 12, Township 20 South, and Range 34 East. The geographic location is 32°34'59.46"N and 103°31'10.94"W. The site is approximately 24 miles west-southwest (bearing 250°) of Hobbs, Lea County, New Mexico. According to information obtained from the New Mexico Office of the State Engineer (NMOSE) database, ground water level beneath this site is conservatively estimated to be 75-100-ft below ground surface (bgs). The site matrix ranking for this site is 10 based on depth to ground water from lowest contaminant level of 50-100-ft.

The remedial action proposal for this site is to install a 2-ft compacted clay barrier over an area of the current 20-ft bgs excavation that exhibits vadose zone contamination above the NMOCD remedial goals for hydrocarbon contamination at this site. A 1000-year VADSAT Risk Assessment was performed for this site incorporating conservative data parameters. The results of this VADSAT modeling indicate that the proposed placement of an impermeable layer above the zone of contamination will eliminate the risk of contaminant migration to the water table.

If there are any questions please call Mr. Ben Miller, or myself, at our office or at 505-390-0288 and 505-390-9804, respectively, or Mr. Frank Hernandez at 915-638-3799. All official written communications should be addressed to:

Mr. Frank Hernandez
EOTT Energy Co.
5805 E. Highway 80, Midland, Texas 79701
Midland, TX 79702

Sincerely,

John Good
EPI – Environmental Consultant

cc: Frank Hernandez, EOTT Energy Co. w/enclosure
William Von Drehle, EOTT Energy Co, w/enclosure
Ben Miller, EPI Vice President and General Manager
Sherry Miller, EPI President
file

Table of Contents

1.0 Introduction

This document addresses the initial site characterization, site excavation, vertical contaminant delineation and the proposal to close the site with the installation of an impermeable clay barrier the EOTT Energy "Marathon Road Lea to Lynch" (EOTT Reference 2002-10212) pipeline release site. Environmental Plus, Inc. (EPI), Eunice, New Mexico commenced the initial site characterization and delineation process at this site on August 6, 2002. To date, the following remediation activities have taken place:

- GPS demarcation of the release site and relevant surface features. *(See Plate 3, Attachments)*
- Excavation and disposal of > 4,000 yd^3 of contaminated soil. The 20-ft deep excavation has an approximate areal extent of 11,600-ft^2. *(See Plate 3, Attachments)*
- Drilling and sampling of 15 boreholes from the 20-ft bgs level down to 40-ft bgs within the extents of the excavation. *(See Plates 4-7, Attachments)*
- Stockpiling of clay and backfill materials.

2.0 Background

Environmental Plus, Inc. (EPI) was notified by EOTT Energy Company (EOTT) on August 6, 2002 regarding a remediation project located immediately south of EOTT's Lynch Station facility. The site is designated "Marathon Road Lea to Lynch", and has the EOTT reference number of 2002-10212. The release is located on land owned and operated by Kenneth Smith, Inc. The initial C-141 Form for this project was submitted to NMOCD on August 14, 2002, and is included in the Attachments of this document. The initial response consisted of flow-path containment, recovery of 140 bbl of pooled crude oil and the preliminary excavation/stockpiling of grossly contaminated soil on a plastic barrier. Due to the sandy nature of the soil, the lateral extents of hydrocarbon contamination were visibly discernable. The east end of the site was excavated to a depth of 20-ft and the west end was excavated to a depth of 15-ft. At this point in time it was obvious that the contamination in the east end of the excavation extended well beyond the 20-ft excavation bottom. The decision was made to delineate the vertical extent of contamination from the bottom levels of the excavation (20-ft and 15-ft). Soil analyses of 15 boreholes indicated that the contamination in the east end extended to 30-35-ft, and in the west end from 15-20-ft. The west end was excavated down to 20-ft to remove this portion from consideration and the project was temporarily halted to allow time to evaluate closure options for the deeply contaminated east end of the excavation.

3.0 Site Description

3.1 Site Location

The EOTT "Marathon Road Lea to Lynch" is located in UL-M of Section 12 T20S R34E. The site is approximately 770-ft from the west section line and 1000-ft from the south section line. The Latitude and Longitude coordinates are: 32°34'59.46"N; 103°31'10.94"W. The land is owned by Kenny Smith, d.b.a. Kenneth Smith Inc. 267 Smith Ranch, Hobbs, NM 88240. *(see Attachments, Plates 1, 2 and 3)*

3.2 Geohydrology

The United States Geological Survey (USGS) Ground-Water Report 6, "Geology and Ground-Water Conditions in Southern Lea County, New Mexico," A. Nicholson and A. Clebsch, 1961,

describes the near surface geology of southern Lea County as an intergrade of the Quaternary Alluvium (QA) sediments, i.e., fine to medium sand, with the mostly eroded Cenozoic Ogallala (CO) formation. Typically, the QA and CO formations in the area are capped by a thick interbed of caliche and generally overlain by sandy soil. The release site is located in the Laguna Valley physiographic subdivision, described by Nicholson & Clebsch as an area "covered almost entirely by dune sand which is stable or semi-stable over most of the area, but which locally drifts. The surface is very irregular and has no drainage features except at the edges of several playas. The sand is generally underlain by recent alluvium but in several places the sand forms topographic highs where it is underlain by a caliche surface. The thickness of the sand cover ranges from a few inches to a probable maximum of 20-feet."

The subsurface at the site is composed of a hard caliche base covered with 10-15 feet of reddish sand. The presence of ground water in this area of Lea County is best described as intermittent. Based on data obtained from the Office of the State Engineer, a conservative estimate of ground water depth at this site, if present, would be 75-100 feet bgs.

3.3 Ecology

The area is typical of the Upper Chihuahuan Desert Biome consisting primarily of hummocky sand hills covered with Harvard Shin Oak (Querqus harvardi) interspersed with Honey Mesquite (Prosopis glandulosa) along with typical desert grasses, flowering annuals and flowering perennials. Mammals represented, include Orrd's and Merriam's Kangaroo Rat, Deer Mouse, White Throated Wood Rat, Cottontail Rabbit, Black Tailed Jackrabbit, Mule Deer, Bobcat, Red Fox and Coyote. Reptiles, Amphibians, and Birds are numerous and typical of area. A survey of Listed, Threatened, or Endangered species was not conducted.

3.4 Area Water Wells and/or Surface Water Features

There are no water wells and/or surface water features within 1000-ft of the release site.

There are no surface water bodies within 1000-ft of the site.

4.0 NMOCD Site Ranking

Contaminant delineation and site characterization done at this site thus far indicate that the chemical parameters of the soil and ground water were characterized consistent with the characterization and remediation/abatement goals and objectives set forth in the New Mexico Oil Conservation Division (NMOCD) approved "***General Work Plan for Remediation of E.O.T.T. Pipeline Spills, Leaks and Releases in New Mexico, July 2000***" and the NMOCD guidelines published in the following documents:

- ***Guidelines for Remediation of Leaks, Spills and Releases (August 13, 1993)***
- ***Unlined Surface Impoundment Closure Guidelines (February 1993)***

Acceptable thresholds for **contaminants/constituents of concern** (CoCs), i.e., TPH^{8015m}, Benzene, and the mass sum of Benzene, Toluene, Ethyl Benzene, and total Xylene (BTEX), was determined based on the NMOCD Ranking Criteria as follows:

- Depth to Ground water, i.e., distance from the lower most acceptable concentration to the ground water.
- Wellhead Protection Area, i.e., distance from fresh water supply wells.
- Distance to Surface Water Body, i.e., horizontal distance to all down gradient surface water bodies.

Based on the proximity of the site to protectable area water wells, surface water bodies, and depth to ground water from the lower most contamination, the NMOCD ranking score for the site is 10 points with the soil remedial goals highlighted in the Site Ranking Matrix presented as Table 1 below.

Table 1 - Site Ranking Matrix

1. Ground Water	2. Wellhead Protection Area	3. Distance to Surface Water
Depth to GW <50 feet: *20 points*	**If <1000' from water source, or; <200' from private domestic water source: *20 points***	**<200 horizontal feet: *20 points***
Depth to GW 50 to 99 feet: *10 points*		**200-1000 horizontal feet: *10 points***
Depth to GW >100 feet: 0 points	**If >1000' from water source, or; >200' from private domestic water source: *0 points***	**>1000 horizontal feet: *0 points***
Ground Water Score = 20	Wellhead Protection Score = 0	Surface Water Score= 0
Site Rank (1+2+3) = 10 + 0 + 0 = 10 points (for soil 0-35'bgs)		

Total Site Ranking Score and Acceptable Remedial Goal Concentrations			
Parameter	20+	**10**	0
Benzene[1]	10 ppm	**10 ppm**	10 ppm
BTEX[1]	50 ppm	**50 ppm**	50 ppm
TPH	100 ppm	**1000 ppm**	5000 ppm

[1]100 ppm field VOC headspace measurement may be substituted for lab analysis

5.0 Subsurface Soil Investigation

The subsurface soil analyses were accomplished on September 18-20, 2002 with the drilling and sampling of 15 boreholes (designated BH1-BH15) down to 40-ft bgs. Analyses results indicated that the TPH and BTEX contamination in the west portion of the excavation was below remedial goals at the 20-ft level, and that the contamination extended to 30-35 feet bgs in the east portion of the excavation. *(Lab analyses results for this sampling event are included in the Attachments as Plates 5, 6 and 7).*

6.0 Ground Water Investigation

Ground water depth is projected to be 75-100-ft bgs at the site. The site was excavated to a maximum depth of 20-ft. All contaminated soil left within the excavation *(see Section 8.0 below)* will be covered with a 2-ft impermeable layer of compacted clay. The remaining volume of the excavation will be backfilled with clean caliche and topsoil. Based on the removal and/or containment of the Constituents of Concern and a remaining depth to ground water of > 50-ft, there will be no need for further ground water investigation at this site.

7.0 VADSAT Risk Assessment

A very conservative 1000-year Risk Assessment of vertical hydrocarbon migration for this site was generated utilizing the American Petroleum Institute's VADSAT 3.0 software. Although the sampling

protocol for this site does not show an inordinate presence of Benzene, it was the chemical species utilized to run the assessment because it is the lightest and fastest migrating of the chemical choices VADSAT offers. VADSAT calculates the Mean Infiltration Rate based on annual precipitation minus a runoff coefficient and the evaporation rate. This number must be positive, so VADSAT does not accommodate arid and semi-arid areas such as southeast NM where the evaporation rate exceeds the precipitation rate.

Although the water table is estimated to be 75-100 feet deep at this site, there is no empirical confirmation of this presumption. To allow for more conservancy in the VADSAT risk assessment modeling, the water table depth was set at 50-feet for both the assessment models presented with this site.

Two assessments were run for this site: one with no clay barrier present and one with a clay barrier present. Other than the presence of the clay barrier, the input parameters for each assessment are identical. The downstream receptors were set at 1-meter, 10-meters and 100-meters (X=1 X=10 X=100). The transverse offset (Y value) was set at 0-meters, and the depth into the aquifer (Z value) was set at 0.

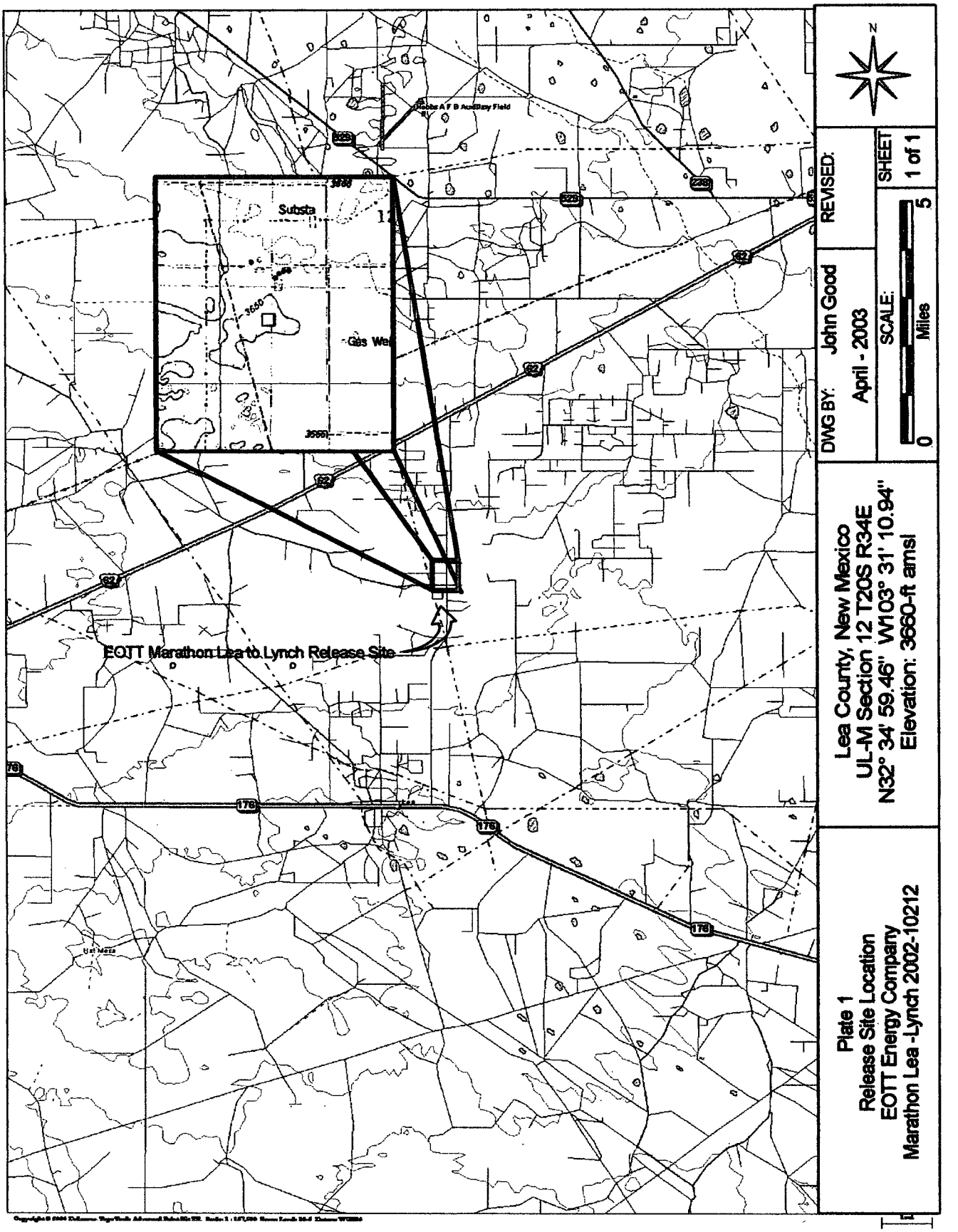
The results of the computer risk assessment modeling for the site without a clay barrier in place indicate that benzene present would reach the top of the aquifer directly under the site in approximately 100-years and reach its peak concentration of 0.07 mg/L 100-years later. The computer risk assessment modeling of the site with the clay barrier in place shows a flat-line of 0 values for the 1000-year period modeled, thus the contaminant migration would never reach the aquifer.

The raw data generated by the VADSAT program is included in the Attachments (pages 16-18). This data includes the parameters of the two models and the data points generated for the 1000-year span. Plate 8 is the graphical representation of both assessment models that were generated.

8.0 Closure Proposal

Based upon the VADSAT Risk Assessment model for this site which predicts no ground water impact with the placement of an impermeable layer, EOTT Energy proposes to contract with EPI for the placement of a 2-ft compacted clay barrier, with 5-ft overlap, over the contaminated soil remaining in the east portion of the excavation. The clay barrier will be placed in two stages, 1-ft thickness in each stage. After each 1-ft layer of clay is placed, it will be compacted and tested for compaction percentage by Pettigrew and Associates, Hobbs, NM. After the clay barrier is in place and certified, the remainder of the excavation will be backfilled with clean caliche and topsoil, smoothed and contoured.

Attachments:


Substa
Gas We
EOTT Marathon Lea to Lynch Release Site
Plate 1
Release Site Location
EOTT Energy Company
Marathon Lea -Lynch 2002-10212
Lea County, New Mexico
UL-M Section 12 T20S R34E
N32° 34' 59.46" W103° 31' 10.94"
Elevation: 3660-ft amsl
DWG BY: John Good
April - 2003
REVISED:
SCALE:
0
5
Miles
SHEET
1 of 1
N

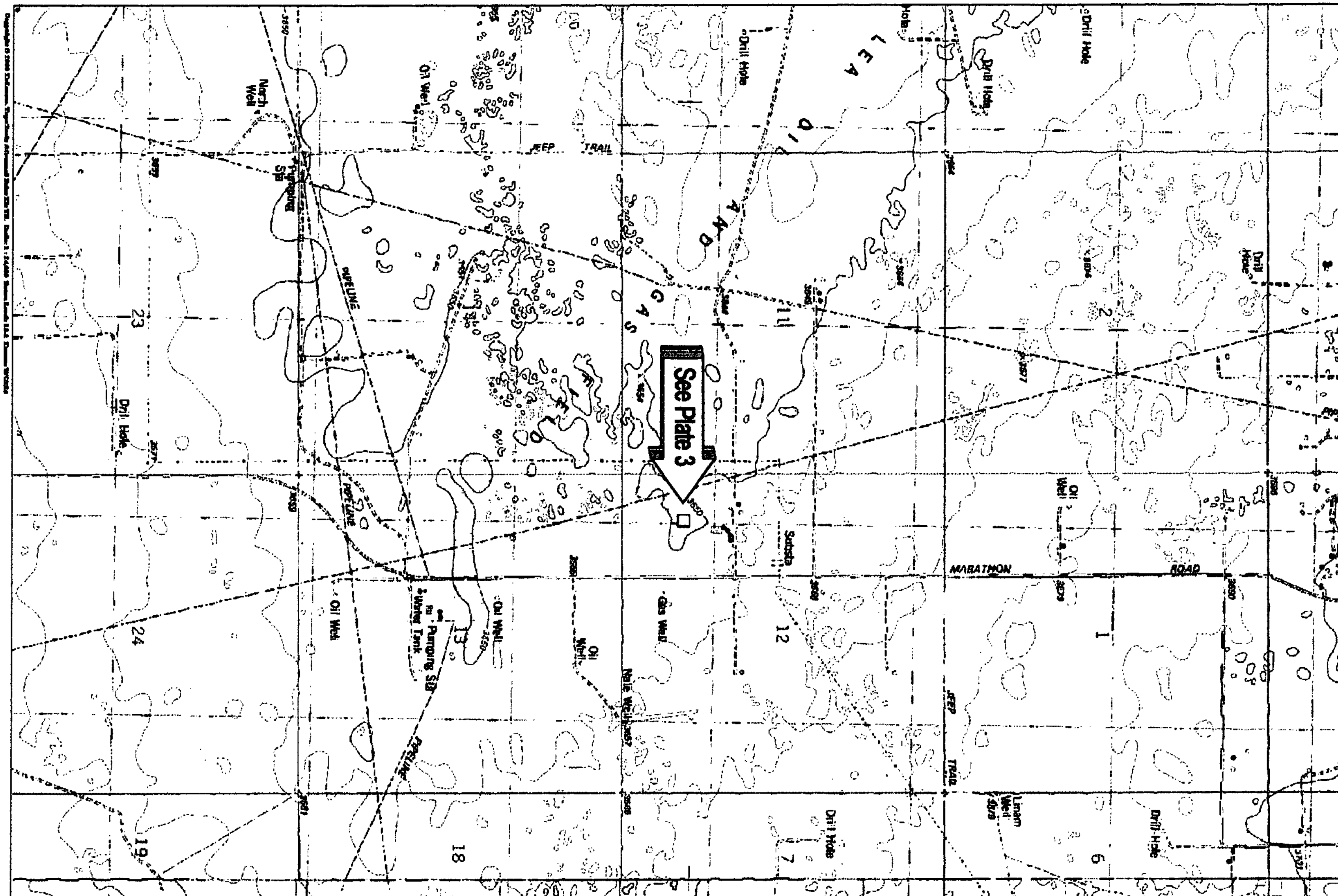
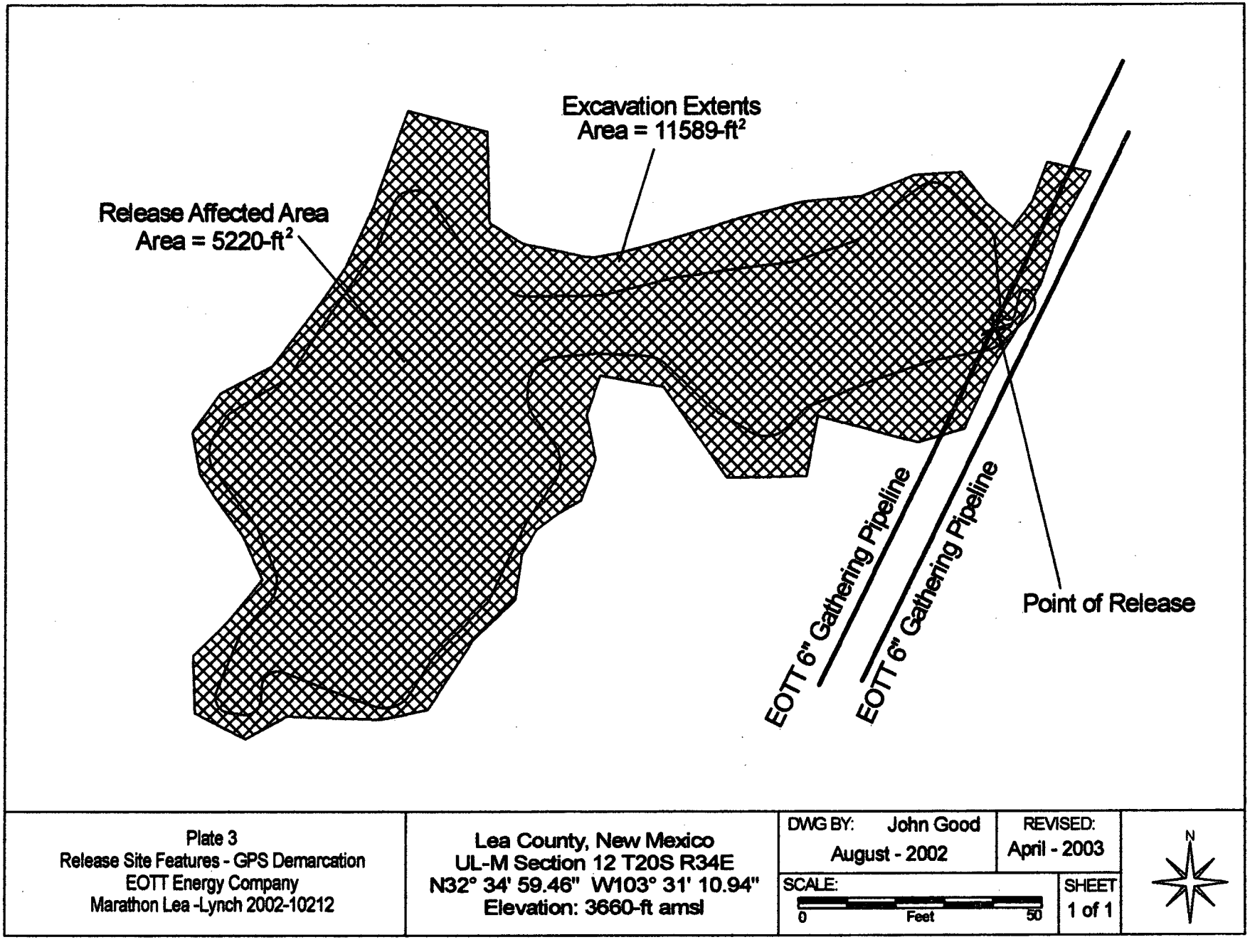
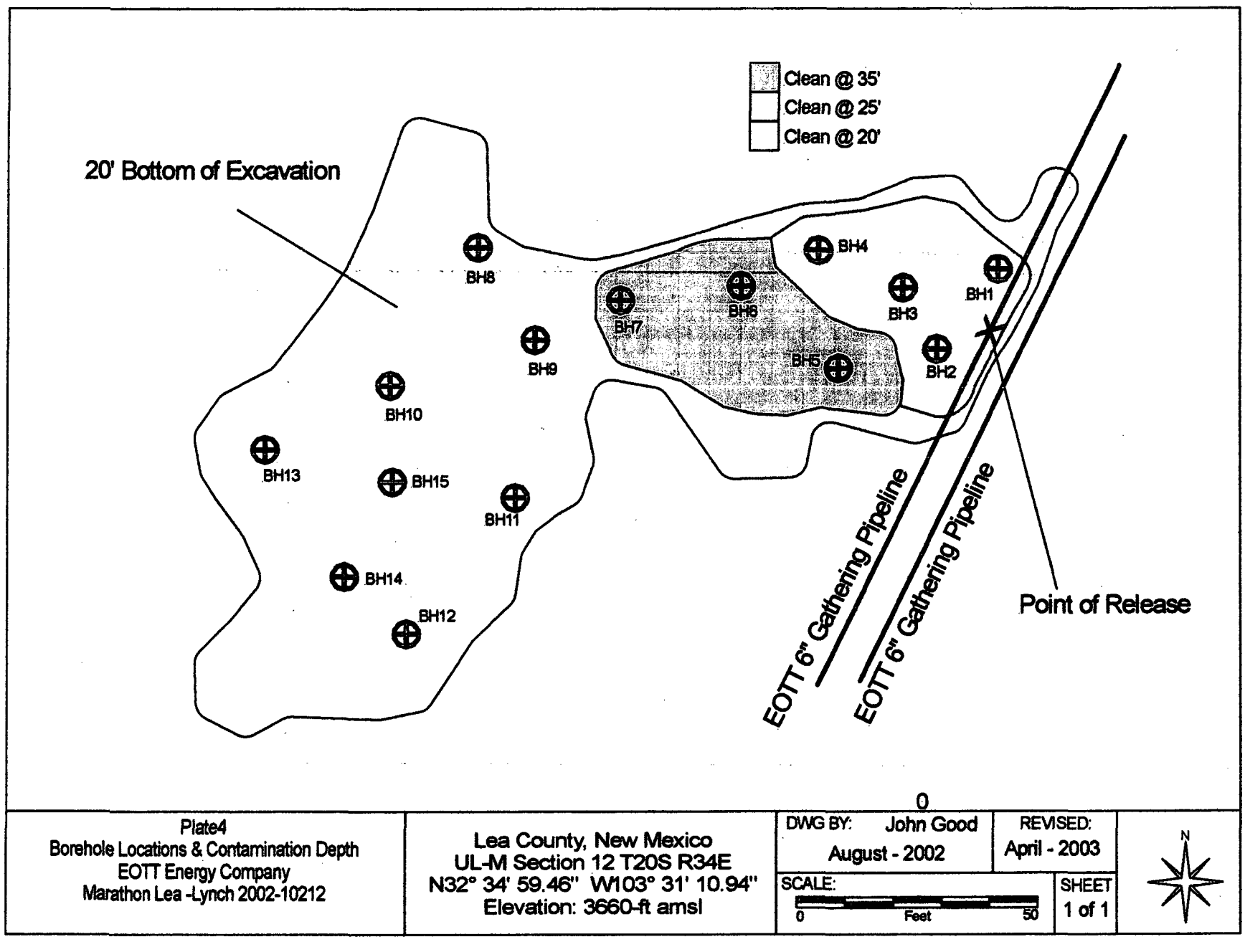


Plate 2 Release Site Topography EOTT Energy Company Marathon Lea -Lynch 2002-10212	Lea County, New Mexico UL-M Section 12 T20S R34E N32° 34' 59.46" W103° 31' 10.94" Elevation: 3660-ft amsl	DWG BY: John Good August - 2002	REVISED: April - 2003	N
		SCALE: 0 Feet 4000	SHEET 1 of 1	


Excavation Extents
Area = 11589-ft²
Release Affected Area
Area = 5220-ft²
EOTT 6" Gathering Pipeline
EOTT 6" Gathering Pipeline
Point of Release
Plate 3
Release Site Features - GPS Demarcation
EOTT Energy Company
Marathon Lea -Lynch 2002-10212
Lea County, New Mexico
UL-M Section 12 T20S R34E
N32° 34' 59.46" W103° 31' 10.94"
Elevation: 3660-ft amsl
DWG BY: John Good
August - 2002
REVISED:
April - 2003
SCALE:
0
Feet
50
SHEET
1 of 1
N


Clean @ 35'
Clean @ 25'
Clean @ 20'
20' Bottom of Excavation
BH8
BH4
BH1
BH6
BH3
BH7
BH9
BH5
BH2
BH10
BH13
BH15
BH11
BH14
BH12
EOTT 6" Gathering Pipeline
EOTT 6" Gathering Pipeline
Point of Release
0
Plate4
Borehole Locations & Contamination Depth
EOTT Energy Company
Marathon Lea -Lynch 2002-10212
Lea County, New Mexico
UL-M Section 12 T20S R34E
N32° 34' 59.46" W103° 31' 10.94"
Elevation: 3660-ft amsl
DWG BY: John Good
August - 2002
REVISED:
April - 2003
SCALE:
0 Feet 50
SHEET
1 of 1
N

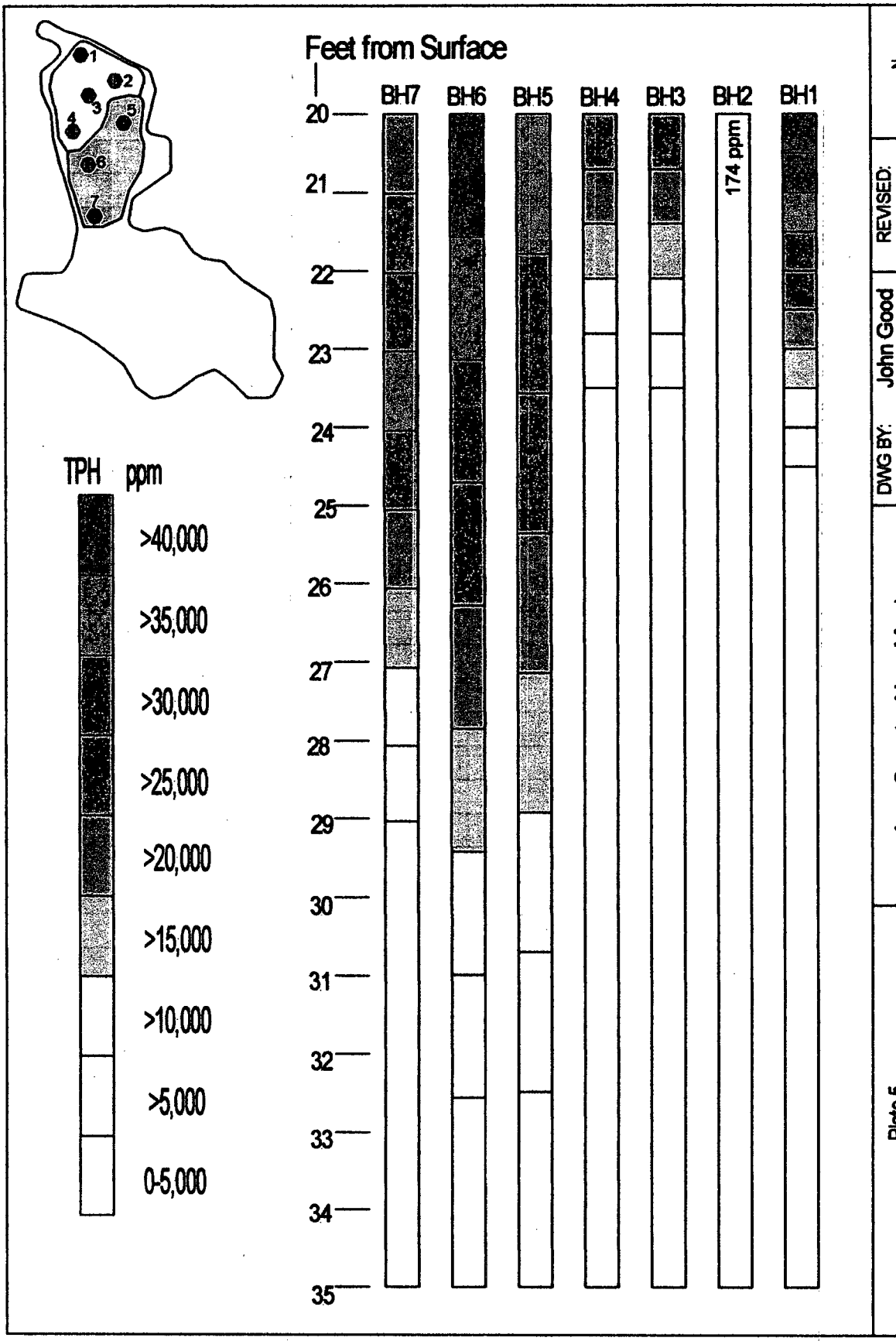

1
2
3
4
5
6
7
Feet from Surface
BH7
BH6
BH5
BH4
BH3
BH2
BH1
174 ppm
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
TPH ppm
>40,000
>35,000
>30,000
>25,000
>20,000
>15,000
>10,000
>5,000
0-5,000
N
DWG BY: John Good
April - 2003
REVISED:
SHEET
1 of 1
SCALE:
Lea County, New Mexico
UL-M Section 12 T20S R34E
N32° 34' 59.46" W103° 31' 10.94"
Elevation: 3660-ft amsl
Plate 5
Borehole 1-7 Contaminant Cross-Section
EOTT Energy Company
Marathon Lea -Lynch 2002-10212

Plate 6 - Soil Analysis Results (TPH & BTEX)

EOTT Energy Pipeline Marathon Lea to Lynch - #2002-10212 (Boreholes 1-8)													
	Bold cells indicate values in excess of the NMOCD remedial action guideline thresholds: TPH = 1000 mg/Kg; Benzene = 10 mg/Kg; BTEX = 50 mg/Kg												
Borehole	Sampling Interval (ft-bgs[1])	LITHOLOGY	SAMPLE ID#	HeadSpace VOC[2] ppm	GRO[3] mg/Kg	DRO[4] mg/Kg	TPH[5] mg/Kg	BTEX[6] mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl Benzene mg/Kg	m,p-Xylene mg/Kg	o-Xylene mg/Kg
1	15												
	20	Dark Oily Sand	SELL91802BH1-20	480.0	13200	28400	41600	222.660	0.360	13.800	71.300	85.800	51.300
	25	Light Brown Sand	SELL91802BH1-25	15.7				0.199		0.054	0.042	0.078	
	30	Brown Sand	SELL91802BH1-30	1.2									
	35												
	40												
2	15												
	20	Light Brown Sand	SELL91802BH2-20	21.8	15	159	174						
	25	Light Brown Sand	SELL91802BH2-25	16.4									
	30	Light Brown Sand	SELL91802BH2-30	2.4									
	35												
	40												
3	15												
	20	Dark Brown Sand	SELL91802BH3-20	418.0	5000	17900	22900	88.070	4.070	20.900	15.200	30.500	15.400
	25	Light Brown Sand	SELL91802BH3-25	9.6									
	30	Light Brown Sand	SELL91802BH3-30	2.8									
	35												
	40												
4	15												
	20	Dark Brown Sand	SELL91802BH4-20	757.0	8570	11800	20370	8.474	0.100	0.504	2.570	3.780	1.520
	25	Light Brown Sand	SELL91802BH4-25	9.5									
	30	Light Brown Sand	SELL91802BH4-30	3.4									
	35												
	40												
5	15												
	20	Dark Brown Sand	SELL91802BH5-20	688.0	10900	26600	37500	202.900	4.700	37.400	38.700	78.800	43.300
	25	Dark Oily Sand	SELL91802BH5-25	621.0	13400	14400	27800	484.500	44.900	160.000	80.800	140.000	68.800
	30	Brown Oily Sand	SELL91802BH5-30	88.0	3220	4440	7660	0.864	0.100	0.100	0.223	0.340	0.101
	35	Brown Sand	SELL91802BH5-35	10.2									
	40	Light Brown Sand	SELL91802BH5-40	1.4									
6	15												
	20	Dark Oily Sand	SELL91902BH6-20	360.0	11900	29100	41000	270.900	11.700	56.800	50.100	99.800	52.500
	25	Dark Oily Sand	SELL91902BH6-25	833.0	19300	19000	38300	641.000	56.800	199.000	101.000	195.000	89.200
	30	Brown Oily Sand	SELL91902BH6-30	1132.0	4960	6050	11010	233.400	15.400	67.500	39.200	78.000	33.300
	35	Light Brown Sand	SELL91902BH6-35	20.4		32	42						
	40	Light Brown Sand	SELL91902BH6-40	1.9									
7	15												
	20	Dark Oily Sand	SELL91902BH7-20	263.0	5760	15000	20760	101.060	4.260	21.400	18.400	37.300	19.700
	25	Dark Oily Sand	SELL91902BH7-25	733.0	18200	18700	36900	709.500	64.200	226.000	116.000	207.000	97.300
	30	Light Brown Sand	SELL91902BH7-30	291.0	206	505	711	3.109	0.047	0.319	0.610	1.530	0.603
	35	Light Brown Sand	SELL91902BH7-35	6.6									
	40	Brown Sand	SELL91902BH7-40	4.7									
8	15	Dark Brown Sand	SELL91902BH8-15	1.1		126	136						
	20	Light Brown Sand	SELL91902BH8-20	5.3									
	25	Light Brown Sand	SELL91902BH8-25	1.1									
	30												
	35												
	40				10.000	10.000							

EOTT Energy Pipeline Marathon Lea to Lynch - #2002-10212 (Boreholes 9-15)

Bold cells indicate values in excess of the NMOCD remedial action guideline thresholds: TPH = 1000 mg/Kg; Benzene = 10 mg/Kg; BTEX = 50 mg/Kg

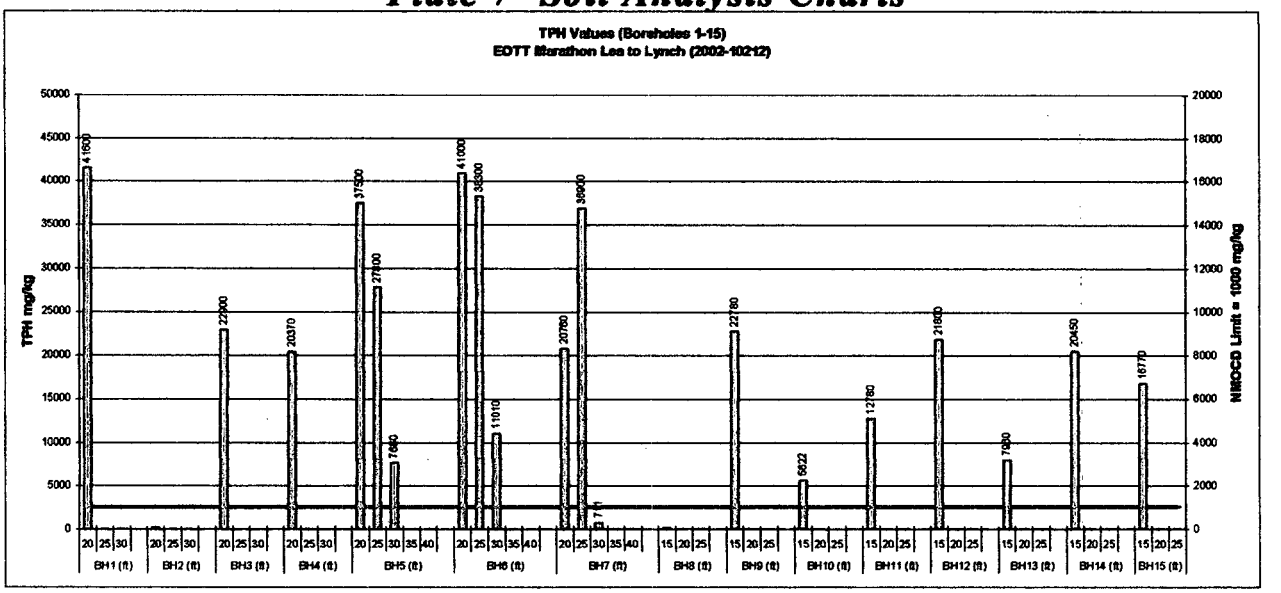
Borehole	Sampling Date	Sampling Interval (ft-bgs[1])	LITHOLOGY	SAMPLE ID#	HeadSpace VOC[2] ppm	GRO[3] mg/Kg	DRO[4] mg/Kg	TPH[5] mg/Kg	BTEX[6] mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl Benzene mg/Kg	m,p-Xylene mg/Kg	o-Xylene mg/Kg
9	9/19/02	15	Dark Brown Sand	SELL91902BH9-15	278.0	4780	18000	22780	63.136	0.836	10.400	11.900	26.400	13.600
	9/19/02	20	Light Brown Sand	SELL91902BH9-20	24.8	10	33	43	0.125	0.025	0.025	0.025	0.025	0.025
	9/19/02	25	Light Brown Sand	SELL91902BH9-25	3.1	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
		30												
		35												
		40												
10	9/19/02	15	Dark Brown Sand	SELL91902BH10-15	31.4	772	4850	6622	2.816	0.026	0.261	0.471	1.330	0.728
	9/19/02	20	Light Brown Sand	SELL91902BH10-20	10.3	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	9/19/02	25	Light Brown Sand	SELL91902BH10-25	6.6	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
		30												
		35												
		40												
11	9/20/02	15	Dark Brown Sand	SELL92002BH11-15	95.6	1380	11400	12780	19.164	0.364	2.590	3.530	8.480	4.200
	9/20/02	20	Light Brown Sand	SELL92002BH11-20	16.5	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	9/20/02	25	Brown Sand	SELL92002BH11-25	2.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
		30												
		35												
		40												
12	9/20/02	15	Dark Brown Sand	SELL92002BH12-15	400.0	8600	13200	21800	193.760	6.660	40.100	38.400	70.900	37.700
	9/20/02	20	Light Brown Sand	SELL92002BH12-20	72.1	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	9/20/02	25	Light Brown Sand	SELL92002BH12-25	4.9	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
		30												
		35												
		40												
13	9/20/02	15	Brown Sand & Rock	SELL92002BH13-15	200.0	2160	5800	7960	28.445	0.465	3.450	4.910	13.700	5.920
	9/20/02	20	Light Brown Sand	SELL92002BH13-20	44.2	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	9/20/02	25	Light Brown Sand	SELL92002BH13-25	3.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
		30												
		35												
		40												
14	9/20/02	15	Dark Brown Sand	SELL92002BH14-15	150.0	3570	13200	16770	402.000	6.800	81.300	63.700	179.000	71.200
	9/20/02	20	Light Brown Sand	SELL92002BH14-20	7.8	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	9/20/02	25	Light Brown Sand	SELL92002BH14-25	3.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
		30												
		35												
		40												
15	9/20/02	15	Dark Brown Sand	SELL92002BH15-15	150.0	3570	13200	16770	46.955	0.405	5.670	6.780	24.000	10.100
	9/20/02	20	Light Brown Sand	SELL92002BH15-20	7.8	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	9/20/02	25	Light Brown Sand	SELL92002BH15-25	3.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
		30												
		35												
		40												
1	4/2/03	20	Light Brown Sand	SEMLL040203NWBHC-20		19	399	418	0.135	0.025	0.025	0.025	0.035	0.025
2	4/2/03	20	Light Brown Sand	SEMLL040203SWBHC-20		10	76	86	0.125	0.025	0.025	0.025	0.025	0.025

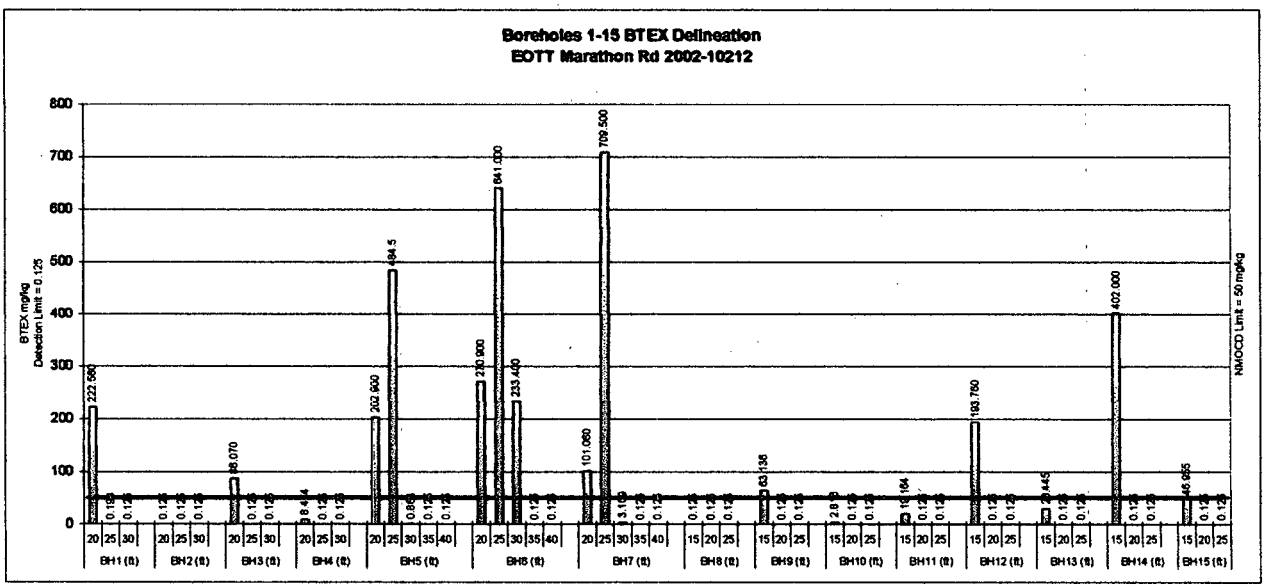
[1] bgs = below ground surface [2] VOC = Volatile Organic Constituents; (note: 100 ppm Isobutylene calibration gas = 101 ppm)

[3] GRO - Gasoline Range Organics (Detection Limit = 10 mg/Kg) [4] DRO - Diesel Range Organics (Detection Limit = 10 mg/Kg) [5] TPH - Total Petroleum Hydrocarbon (GRO+DRO)

[6] BTEX = Sum of CoC's (Detection Limit = 0.025 mg/Kg) Note: Reported detection limits are considered "de minimus" values and are not displayed but included in the TPH and BTEX summations.

Plate 7- Soil Analysis Charts





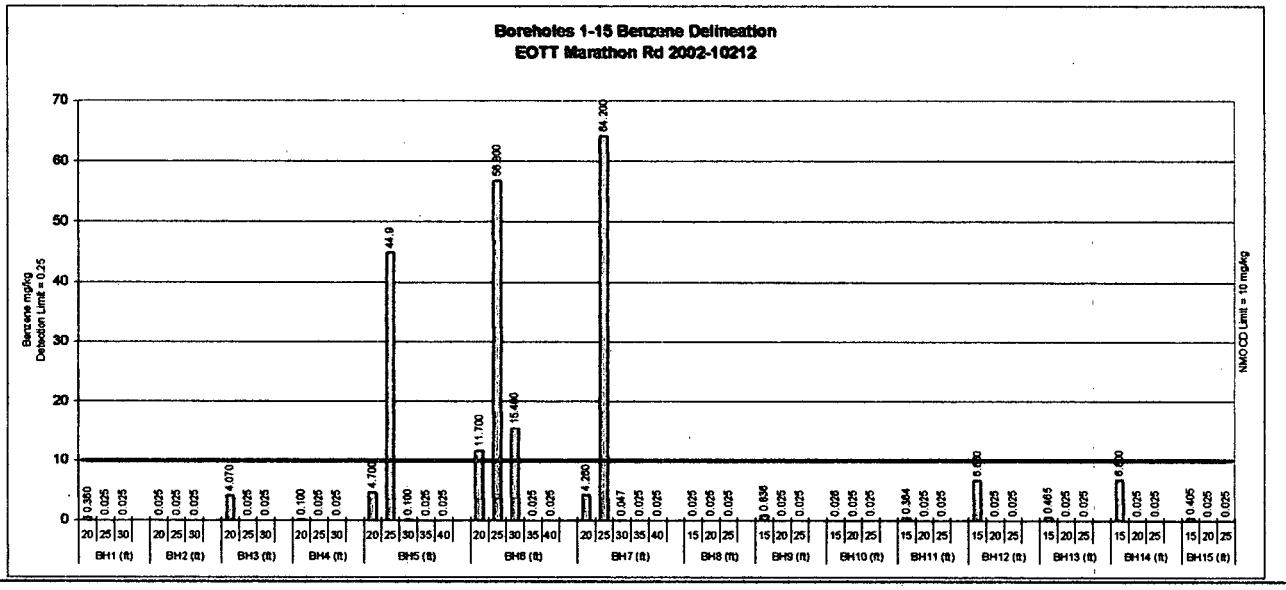
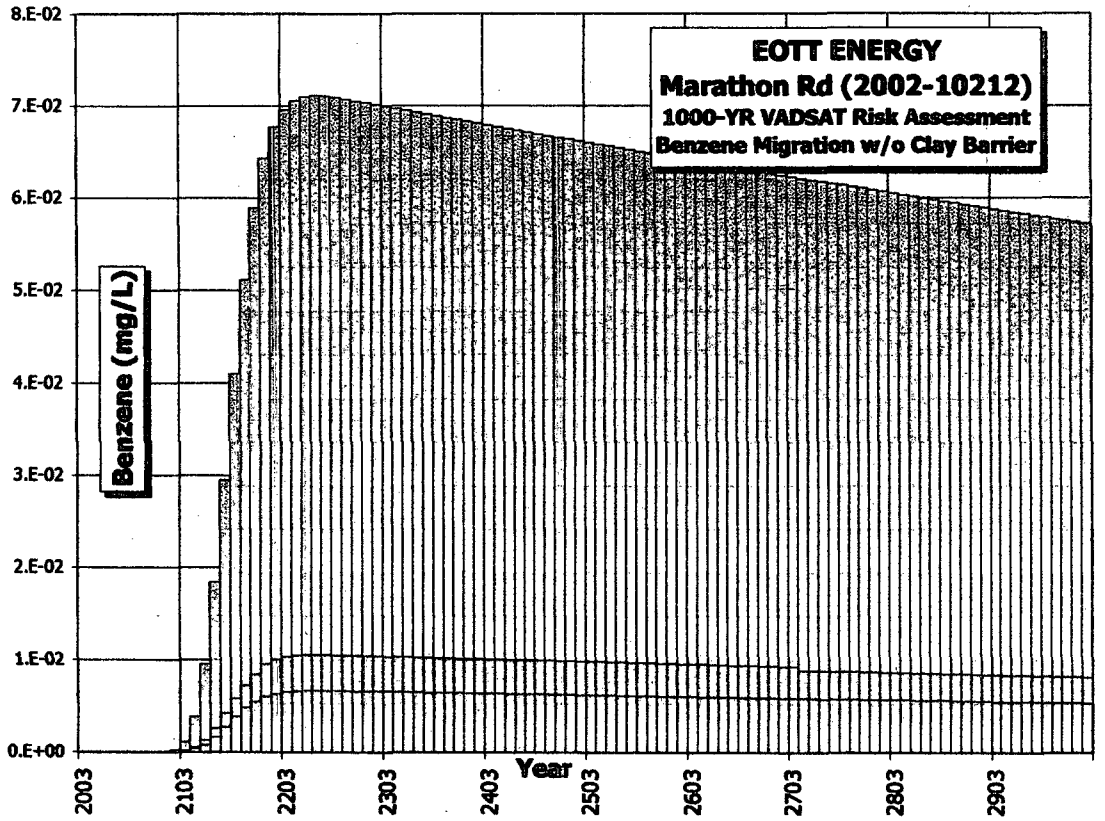
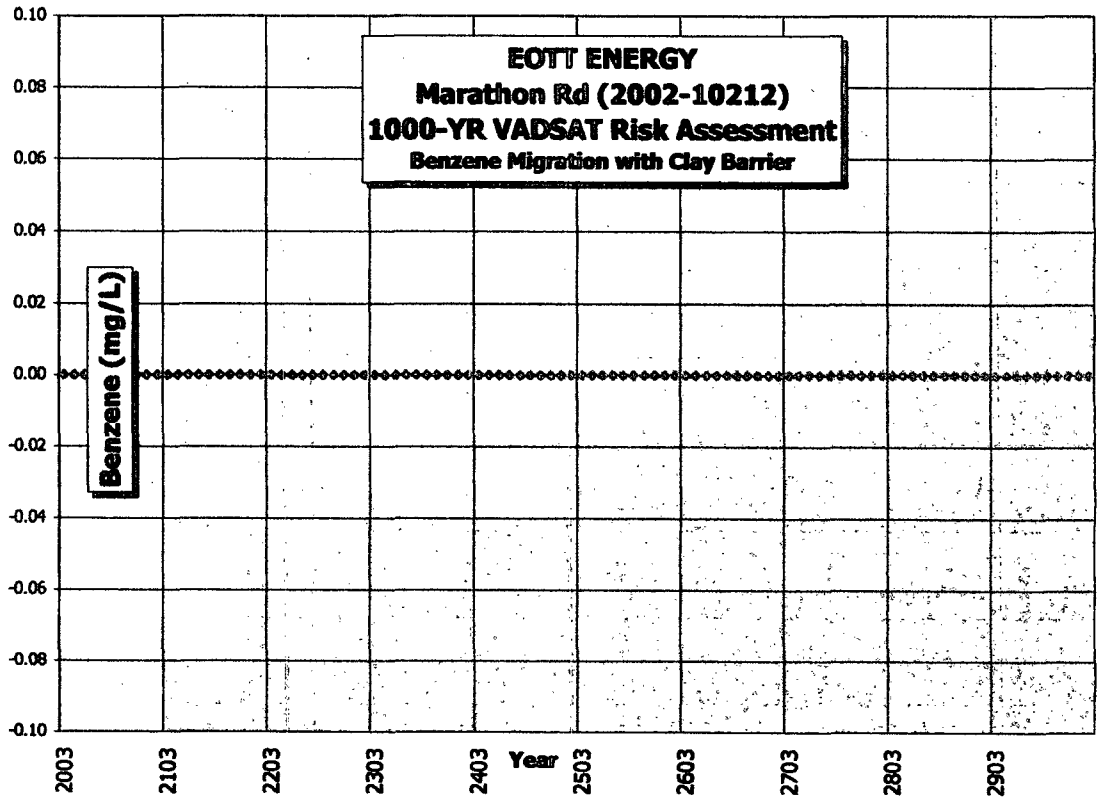


Plate 8- VADSAT Risk Assessment Charts





VADSAT Data (without a clay barrier)

Year	Water Table	1 Meter Down Gradient	10 Meter Down Gradient	100 Meter Down Gradient
2003	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2013	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2023	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2033	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2043	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2053	2.98E-11	3.82E-12	2.11E-12	2.79E-14
2063	1.29E-08	1.73E-09	9.97E-10	1.79E-11
2073	9.42E-07	1.30E-07	7.67E-08	1.71E-09
2083	2.10E-05	2.94E-06	1.77E-06	4.59E-08
2093	2.04E-04	2.79E-05	1.78E-05	5.14E-07
2103	1.10E-03	1.52E-04	9.74E-05	3.07E-06
2113	3.81E-03	5.31E-04	3.43E-04	1.15E-05
2123	9.50E-03	1.33E-03	8.65E-04	3.05E-05
2133	1.84E-02	2.59E-03	1.69E-03	6.20E-05
2143	2.95E-02	4.17E-03	2.73E-03	1.03E-04
2153	4.10E-02	5.81E-03	3.81E-03	1.47E-04
2163	5.11E-02	7.25E-03	4.76E-03	1.87E-04
2173	5.89E-02	8.37E-03	5.51E-03	2.19E-04
2183	6.43E-02	9.53E-03	6.02E-03	2.41E-04
2193	6.77E-02	1.00E-02	6.35E-03	2.55E-04
2203	6.96E-02	1.03E-02	6.53E-03	2.64E-04
2213	7.06E-02	1.05E-02	6.62E-03	2.68E-04
2223	7.10E-02	1.05E-02	6.66E-03	2.70E-04
2233	7.11E-02	1.06E-02	6.67E-03	2.71E-04
2243	7.10E-02	1.05E-02	6.67E-03	2.70E-04
2253	7.09E-02	1.05E-02	6.66E-03	2.70E-04
2263	7.07E-02	1.05E-02	6.64E-03	2.69E-04
2273	7.05E-02	1.05E-02	6.62E-03	2.69E-04
2283	7.03E-02	1.04E-02	6.60E-03	2.68E-04
2293	7.01E-02	1.04E-02	6.58E-03	2.67E-04
2303	6.99E-02	1.04E-02	6.57E-03	2.66E-04
2313	6.97E-02	1.04E-02	6.55E-03	2.66E-04
2323	6.95E-02	1.03E-02	6.53E-03	2.65E-04
2333	6.93E-02	1.03E-02	6.51E-03	2.64E-04
2343	6.91E-02	1.03E-02	6.49E-03	2.63E-04
2353	6.89E-02	1.02E-02	6.47E-03	2.62E-04
2363	6.87E-02	1.02E-02	6.45E-03	2.62E-04
2373	6.85E-02	1.02E-02	6.43E-03	2.61E-04
2383	6.83E-02	1.01E-02	6.42E-03	2.60E-04
2393	6.81E-02	1.01E-02	6.40E-03	2.59E-04
2403	6.79E-02	1.01E-02	6.38E-03	2.59E-04
2413	6.77E-02	1.01E-02	6.36E-03	2.58E-04
2423	6.75E-02	1.00E-02	6.34E-03	2.57E-04
2433	6.73E-02	1.00E-02	6.32E-03	2.56E-04
2443	6.71E-02	9.97E-03	6.30E-03	2.56E-04
2453	6.69E-02	9.94E-03	6.29E-03	2.55E-04
2463	6.68E-02	9.91E-03	6.27E-03	2.54E-04
2473	6.66E-02	9.88E-03	6.25E-03	2.54E-04
2483	6.64E-02	9.85E-03	6.23E-03	2.53E-04
2493	6.62E-02	9.82E-03	6.21E-03	2.52E-04

Year	Water Table	1 Meter Down Gradient	10 Meter Down Gradient	100 Meter Down Gradient
2503	6.60E-02	9.79E-03	6.20E-03	2.51E-04
2513	6.58E-02	9.77E-03	6.18E-03	2.51E-04
2523	6.56E-02	9.74E-03	6.16E-03	2.50E-04
2533	6.54E-02	9.71E-03	6.14E-03	2.49E-04
2543	6.52E-02	9.68E-03	6.12E-03	2.48E-04
2553	6.50E-02	9.65E-03	6.11E-03	2.48E-04
2563	6.48E-02	9.63E-03	6.09E-03	2.47E-04
2573	6.47E-02	9.60E-03	6.07E-03	2.46E-04
2583	6.45E-02	9.57E-03	6.05E-03	2.46E-04
2593	6.43E-02	9.54E-03	6.04E-03	2.45E-04
2603	6.41E-02	9.52E-03	6.02E-03	2.44E-04
2613	6.39E-02	9.49E-03	6.00E-03	2.43E-04
2623	6.37E-02	9.46E-03	5.98E-03	2.43E-04
2633	6.35E-02	9.43E-03	5.97E-03	2.42E-04
2643	6.34E-02	9.41E-03	5.95E-03	2.41E-04
2653	6.32E-02	9.38E-03	5.93E-03	2.41E-04
2663	6.30E-02	9.35E-03	5.92E-03	2.40E-04
2673	6.28E-02	9.32E-03	5.90E-03	2.39E-04
2683	6.26E-02	9.30E-03	5.88E-03	2.39E-04
2693	6.24E-02	9.27E-03	5.86E-03	2.38E-04
2703	6.23E-02	9.24E-03	5.85E-03	2.37E-04
2713	6.21E-02	8.85E-03	5.83E-03	2.36E-04
2723	6.19E-02	8.82E-03	5.81E-03	2.36E-04
2733	6.17E-02	8.80E-03	5.80E-03	2.35E-04
2743	6.16E-02	8.77E-03	5.78E-03	2.34E-04
2753	6.14E-02	8.75E-03	5.76E-03	2.34E-04
2763	6.12E-02	8.72E-03	5.75E-03	2.33E-04
2773	6.10E-02	8.70E-03	5.73E-03	2.32E-04
2783	6.08E-02	8.67E-03	5.71E-03	2.32E-04
2793	6.07E-02	8.64E-03	5.70E-03	2.31E-04
2803	6.05E-02	8.62E-03	5.68E-03	2.30E-04
2813	6.03E-02	8.59E-03	5.66E-03	2.30E-04
2823	6.01E-02	8.57E-03	5.65E-03	2.29E-04
2833	6.00E-02	8.55E-03	5.63E-03	2.28E-04
2843	5.98E-02	8.52E-03	5.61E-03	2.28E-04
2853	5.96E-02	8.50E-03	5.60E-03	2.27E-04
2863	5.94E-02	8.47E-03	5.58E-03	2.26E-04
2873	5.93E-02	8.45E-03	5.57E-03	2.26E-04
2883	5.91E-02	8.42E-03	5.55E-03	2.25E-04
2893	5.89E-02	8.40E-03	5.53E-03	2.24E-04
2903	5.88E-02	8.37E-03	5.52E-03	2.24E-04
2913	5.86E-02	8.35E-03	5.50E-03	2.23E-04
2923	5.84E-02	8.33E-03	5.49E-03	2.23E-04
2933	5.83E-02	8.30E-03	5.47E-03	2.22E-04
2943	5.81E-02	8.28E-03	5.45E-03	2.21E-04
2953	5.79E-02	8.25E-03	5.44E-03	2.21E-04
2963	5.77E-02	8.23E-03	5.42E-03	2.20E-04
2973	5.76E-02	8.21E-03	5.41E-03	2.19E-04
2983	5.74E-02	8.18E-03	5.39E-03	2.19E-04
2993	5.72E-02	8.16E-03	5.38E-03	2.18E-04

```
+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +
+                                                                       +
+                          VADSAT Version 3.0                           +
+                                                                       +
+   A Monte Carlo Model for Assessing the Effects of Soil               +
+            Contamination on Groundwater Quality                       +
+                                                                       +
+                                                                       +
+                          Developed by:                                +
+            Environmental Systems and Technologies Inc.                +
+                  Blacksburg, Virginia                                 +
+              Tel: 703-552-0685, Fax: 703-951-5307                     +
+                                                                       +
+                                                                       +
+                             For                                       +
+              The American Petroleum Institute                         +
+                             1995                                      +
+                                                                       +
+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +
```

PROJECT TITLE:EOTT MARATHON LEA TO LYNCH

SOURCE AND CHEMICAL DATA ****
DEPTHM, MEAN THICKNESS OF WASTE ZONE (m) = 4.57200

DEPSTD, STD.DEV. OF THICKNESS OF WASTE ZONE = 0.00000

AREAM, MEAN WASTE ZONE AREA (m^2) = 325.16000
STDA, STD.DEV. OF WASTE ZONE AREA = 0.00000

RLWM, MEAN L/W RATIO (-) = 1.40000
STDRLW, STD.DEV. OF L/W RATIO = 0.00000

CVRTHM, MEAN VALUE OF COVER THICKNESS (m) = 1.52400
CVRTHS, STD.DEV. OF COVER THICKNESS = 0.00000

KOCM, MEAN ORG. CARBON PARTITION COEF (cm^3/g)= 83.20000
STDKOC, STD.DEV. OF ORG.CARBON PARTITION COEF= 0.00000

FMOLM, MEAN INIT.VOL.FRAC. OF CONTAMINANT(-) = 0.01707
FMOLSTD, STD.DEV. OF VOL.FRAC. OF CONTAMINANT= 0.00000

CMFM, MASS OF CONTAMINANT PER MASS OF WASTE(mg/kg) = 700.00000
CMFSD, STD.DEV. OF MASS CONTAMINANT PER MASS WASTE = 0.00000

HCCONM, HYDCARBON MASS FRAC. IN WASTE (mg/kg)= 41000.00000
HCCONS, STD OF HYDCARBON MASS FRAC. IN WASTE = 0.00000

CHEMICAL SPECIES BENZENE

MOLW, MOLECULAR WT. OF CONTAMINANT (g/mole) = 78.10000

AVERMW, AVG. MOL. WT. OF OILY WASTE (g/mole) = 100.00000

RHO, DENSITY OF CONTAMINANT (g/cm^3) = 0.87600

RHOG, AVERAGE DENSITY OF HYDROCARBON (g/cm^3)= 0.90000

SOL, AQUEOUS SOLUB. OF CONTAMINANT (g/m^3) = 1790.00000

HENRYC, HENRY'S CONSTANT (-) = 0.23000

DIFFA, DIFFUSION COEF. IN FREE AIR (m^2/day) = 0.77000

HYDROGEOLOGICAL PROPERTIES

** UNSATURATED ZONE INPUT PARAMETERS **
GAMMAM, MEAN UNSAT ZONE DECAY COEF (1/day) = 0.00010
STDGAM, STD.DEV. OF UNSAT ZONE DECAY COEF = 0.00000

UNFOCM, MEAN UNSAT ZONE ORGANIC CARBON FRACTION (-) = 0.00000
UNFOCS, STD.DEV. OF UNSAT ZONE ORGANIC CARBON FRAC. = 0.00000

FKSW, MEAN SAT. CONDUCTIVITY (m/day) = 0.02900
STDFKS, STD.DEV. OF SAT. CONDUCTIVITY = 0.000

DISTM, MEAN DEPTH TO GROUNDWATER (m) = 30.48000
STDDST, STD.DEV. OF DEPTH TO GROUNDWATER = 0.00000

UNPORM, MEAN VADOSE ZONE POROSITY (-) = 0.38000
SUNPOR, STD.DEV. OF VADOSE ZONE POROSITY = 0.00000

PARNM, MEAN VALUE OF VG PARAMETER N (-) = 1.23000
SDPARN, STD.DEV. OF VG PARAMETER N = 0.00000

RESWCM, MEAN RESIDUAL WATER CONTENT (-) = 0.01110
RESWCS, STD.DEV. OF RESIDUAL WATER CONTENT = 0.00000

ALFINM = 0, UNSAT DISPERSIVITY CALCULATED INTERNALLY
** SATURATED ZONE INPUT PARAMETERS **

LAMBW, MEAN SAT. ZONE DECAY COEFF. (1/day) = 0.00010
SLAMB, STD.DEV. OF SAT. ZONE DECAY COEFF. = 0.00000

PORM, MEAN SAT. ZONE POROSITY (-) = 0.20000
STDPOR, STD.DEV. OF SAT. ZONE POROSITY = 0.00000

FOCM, MEAN SAT. ZONE ORG. CARBON FRAC. (-) = 0.00000
STDFOC, STD.DEV. SAT. ZONE ORG. CARBON FRAC.= 0.00000

ALRLTM, MEAN DISPERS, RATIO LONG/TRANSV. (-) = 3.00000
SALRLT, STD.DEV. OF DISP. RATIO LONG/TRANSV. = 0.00000

ALRTVM, MEAN DISPERS. RATIO TRANSV/VERT. (-) = 87.00000
SALRTV, STD.DEV. OF DISP. RATIO TRANSV/VERT. = 0.00000

CONDS, SAT. HYDRAULIC COND. (m/day) = 1.03000
SCONDS, STD.DEV. OF SAT HYDRAULIC COND. = 0.00000

GRADS, HYDRAULIC GRADIENT (m/m) = 0.02700
SGRADS, STD.DEV. OF HYDRAULIC GRADIENT = 0.00000

HMEAN, MEAN AQUIFER THICKNESS (m) = 23.40000
STDH, STD.DEV. OF AQUIFER THICKNESS = 0.00000

QINM, MEAN INFILTRATION RATE (m/day) = 0.00011
QINSTD, STD.DEV. OF INFILTRATION RATE = 0.00000

LOCATION OF RECEPTORS:

	X (M)	Y (M)	Z (M)
RECEPTOR(1)	1.0	0.0	0.0
RECEPTOR(2)	10.0	0.0	0.0
RECEPTOR(3)	100.0	0.0	0.0

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised March 17, 1999

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

☑ Initial Report ☐ Final Report

Name of Company	Contact
EOTT Energy Pipeline LP	**Frank Hernandez**
Address	Telephone No.
P.O. Box 1660 Midland, TX 79702	**(713) 253-7006**
Facility Name	Facility Type
Marathon 6" Lea to Lynch	**Crude Oil Gathering Line**

Surface Owner	Mineral Owner	Lease No.
Kenneth Smith Inc.	**NA**	**NA**

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from South Line	Feet from West Line	Longitude	Latitude	County:
M	**12**	**20S**	**34E**	**1000**	**770**	**103°31'10.94"W**	**32°34'59.46"N**	**Lea**

NATURE OF RELEASE

Type of Release	Volume of Release	Volume Recovered
Crude Oil Release and associated components	**165 bbl**	**140 bbl**
Source of Release	Date and Hour of Occurrence	Date and Hour of Discovery
6" Steel Crude Oil Pipeline	**8/6/2002**	**8/6/02**
Was Immediate Notice Given? ☑ Yes ☐ No ☐ Not Required	If YES, To Whom?	
	Larry Johnson - NMOCD (Hobbs)	
By Whom?	Date and Hour	
Frank Hernandez	**August 6, 2002**	
Was a Watercourse Reached? ☐ Yes ☑ No	If YES, Volume Impacting the Watercourse.	
	NA	

If a Watercourse was Impacted, Describe Fully.*
NA

Describe Cause of Problem and Remedial Action Taken.*
Internally Corroded pipeline, repaired with clamps.

Describe Area Affected and Cleanup Action Taken.*
Area = 5220-ft^2. Ground water occurs at 75-100-ft bgs. The Site Rank is 10. Contaminated soil above the site remedial goals will be excavated and disposed of by Environmental Plus, Inc., Eunice, NM. Remedial Goals: TPH = 1000 ppm; BTEX = 50 ppm; Benzene = 10 ppm.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: Frank Hernandez	OIL CONSERVATION DIVISION	
Printed Name: **Frank Hernandez**	Approved by District Supervisor:	
Title: **District Environmental Supv.**	Approval Date:	Expiration Date:
Date: **8/14/02** Phone: **(713) 253-7006**	Conditions of Approval:	☐ Attached

eott energy	Incident Date and NMOCD Notified? 8/6/02 8/6/02 12:00 AM

SITE: Marathon 6" Lea to Lynch		Assigned Site Reference 2002-10212	
Company:	EOTT Energy Pipeline LP		
Street Address:	5805 East Highway 80		
Mailing Address:	P.O. Box 1660		
City, State, Zip:	Midland, TX 79702		
Representative:	Frank Hernandez		
Representative Telephone:	(713) 253-7006		
Telephone:			
Fluid volume released (bbls):	165	Recovered (bbls):	140
>25 bbls: Notify NMOCD verbally within 24 hrs and submit form C-141 within 15 days.			
5-25 bbls: Submit form C-141 within 15 days (Also applies to unauthorized releases of 50-500 mcf Natural Gas)			
Leak, Spill, or Pit (LSP) Name:	2002-10212		
Source of contamination:	6" Steel Crude Oil Pipeline		
Land Owner, i.e., BLM, ST, Fee, Other:	Kenneth Smith Inc. 267 Smith Ranch, Hobbs, NM 88240		
LSP Dimensions:	Site diagrams attached		
LSP Area:	5,220 -ft^2		
Location of Reference Point (RP):			
Location distance and direction from RP:			
Latitude:	32°34'59.46"N		
Longitude:	103°31'10.94"W		
Elevation above mean sea level:	3600 -ft amsl		
Feet from South Section Line:	1000		
Feet from West Section Line:	770		
Location - Unit and 1/4 1/4:	UL- M	SW 1/4 of SW 1/4	
Location - Section:	12		
Location - Township:	20S		
Location - Range:	34E		
Surface water body within 1000' radius of Site:	0		
Surface water body within 1000' radius of Site:	0		
Domestic water wells within 1000' radius of Site:	0		
Domestic water wells within 1000' radius of Site:	0		
Agricultural water wells within 1000' radius of Site:	0		
Agricultural water wells within 1000' radius of Site:	0		
Public water supply wells within 1000' radius of Site:	0		
Public water supply wells within 1000' radius of Site:	0		
Depth (ft) from land surface to ground water (DG):	100		
Depth (ft) of contamination (DC):	10		
Depth (ft) to ground water (DG - DC = DtGW):	90		

1. Ground Water	2. Wellhead Protection Area	3. Distance to Surface Water Body
If Depth to GW <50 feet: *20 points*	If <1000' from water source, or, <200' from private domestic water source: *20 points*	<200 horizontal feet: 20 points
If Depth to GW 50 to 99 feet: *10 points*		200-100 horizontal feet: 10 points
If Depth to GW >100 feet: *0 points*	If >1000' from water source, or, >200' from private domestic water source: *0 points*	>1000 horizontal feet: 0 points
Ground water Score: 10	*Wellhead Protection Area Scor 0*	*Surface Water Score: 0*
Site Rank (1+2+3) = 10		

Total Site Ranking Score and Acceptable Concentrations

Parameter	20 or >	10	0
Benzene[1]	10 ppm	10 ppm	10 ppm
BTEX[1]	50 ppm	50 ppm	50 ppm
TPH	100 ppm	1000 ppm	5000 ppm

[1]100 ppm field VOC headspace measurement may be substituted for lab analysis

Site Photographs