IRP-202
10.13.05

March 15, 2005

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

Re: XTO Energy Inc. Arrowhead Grayburg #168 Injection Header,
Final C-141 and Closure Documentation
ULs-K,L, N, & O of Section 1, T22S, R36E
Latitude: 32°25'13.22"N and Longitude: 103°13'31.73"W
Landowner: Niemeyer Properties (SW/4 of Sec 1) and BLM (SE/4 of Sec 1)
Driving Directions: From the intersection of NMSRs 8 and 207 in Eunice, New Mexico, go west on 8 for 2.2 miles, then left on LCR E22 (Coyote Hill Road) for 1.5 miles, then left on caliche road 1.6 miles then right 0.2 miles, then right along right-of-way 400 feet to the northwest point of release.

RECEIVED
OCD
Hobbs

Dear Mr. Johnson:

Environmental Plus, Inc. (EPI), on behalf of Guy Haykus, XTO Energy Inc., submits the attached New Mexico Oil Conservation Division (NMOCD) final form C-141 for the above referenced leak site located on land owned by the Niemeyer Properties (SW/4 of Sec 1) and US Department of the Interior Bureau of Land Management (SE/4 of Sec 1), approximately 3.5 miles southwest of Eunice, New Mexico. The attached site information and metrics form ranks the site in accordance with the "**NMOCD Guidelines for Remediation of Leaks, Spills and Releases (August 13, 1993).**"

NMOCD Site Rank and Remedial Goals

The New Mexico Office of the State Engineer information indicates an average depth to groundwater at the site of 137'bgs and identifies one domestic use water well (#763) approximately 800-feet northeast of the point of release. There are no agricultural or public use water wells located within a 1,000-foot radius of the site. There are no surface water bodies observed to be within a 1,000-foot radius of the site. These characteristics give the site a site ranking score of 20 that applies the following remedial goals for the constituents of concern (CoCs), i.e., chloride, total petroleum hydrocarbon using EPA

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method 8015m (TPH^{8015m}), benzene, and BTEX, i.e., the mass sum of benzene, toluene, ethylbenzene, and xylenes. The contaminated soil is exempted from RCRA 40 CFR Part 261:

CONSTITUENTS/CONTAMINANTS OF CONCERN	REMEDIAL GOAL
Benzene	10 mg/Kg
BTEX (mass sum of benzene, toluene, ethylbenzene, and xylenes	50 mg/Kg
Total Petroleum Hydrocarbon 8015m (TPH^{8015m})	1,000 mg/Kg
Chloride residuals must not be capable of impacting local water resources above the New Mexico Water Quality Control Commission (WQCC) water quality standard of 250 mg/Liter.	

Occurrence and Mitigation

A flange gasket failed in the 3" fiberglass water injection system header going to the XTO Arrowhead Grayburg #168 Well releasing approximately 400 barrels of saline injection water. No fluids were recovered. The average chloride concentration of the injection water, according XTO, is approximately 12,000 mg/Kg. The release flowed southeast along a dry shallow drainage for approximately 3,150-feet, impacting an estimated 42,176 square feet of surface area, i.e., 3,150' long x 1 to 13' wide. The system was shutdown immediately upon discovery and the NMOCD notified the following morning. The system was repaired and tested and placed back in service. To mitigate the release and minimize further impacts, the top 3 to 4-inches of soil, i.e., 532 cubic yards, in the flowpath was excavated and disposed of at an NMOCD approved facility.

Delineation

Nine trenches were excavated and sampled consistent with the delineation proposal included with the initial NMOCD C-141. The trenches were located approximately 500-feet apart along the flowpath and in the major pooling areas, i.e., up and down gradient of the two road culverts. The samples were collected, prepared, and submitted to Cardinal Laboratories in Hobbs, New Mexico for quantification of the CoCs. The laboratory reports are attached along with a analytical results summary.

TPH^{8015m} and Benzene and BTEX Delineation

Petroleum hydrocarbons are not typically contained in the injection fluid. Removal of the 3 to 4-inch thickness of soil during initial mitigation of the release removed all visible indications of petroleum hydrocarbon impact. TPH^{8015m}, benzene, and BTEX were not detected above the respective method detection limits in the surface sample from trench #1 (T1). TPH^{8015m}, benzene, and BTEX laboratory analyses were not performed on the other samples from trench T1 or samples from the other trenches.

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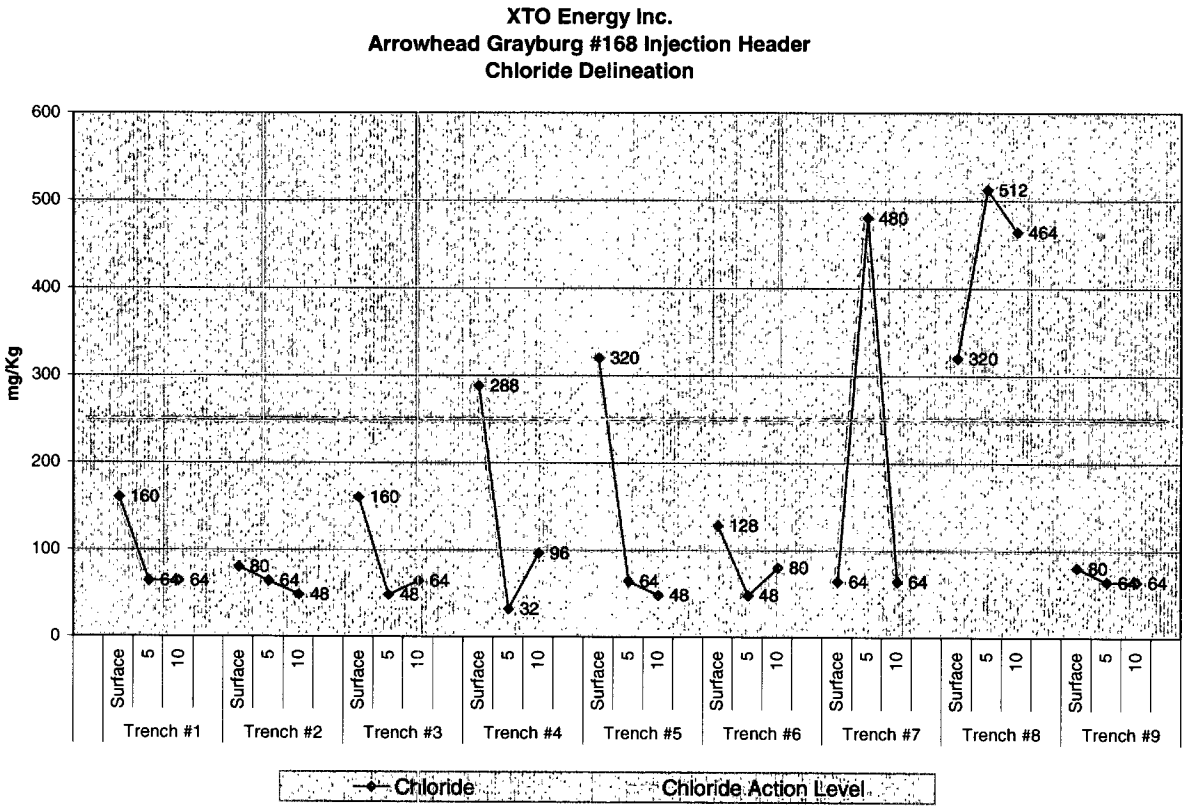
Chloride Delineation

All trench samples were tested in the laboratory for chloride. The analytical results are illustrated below.

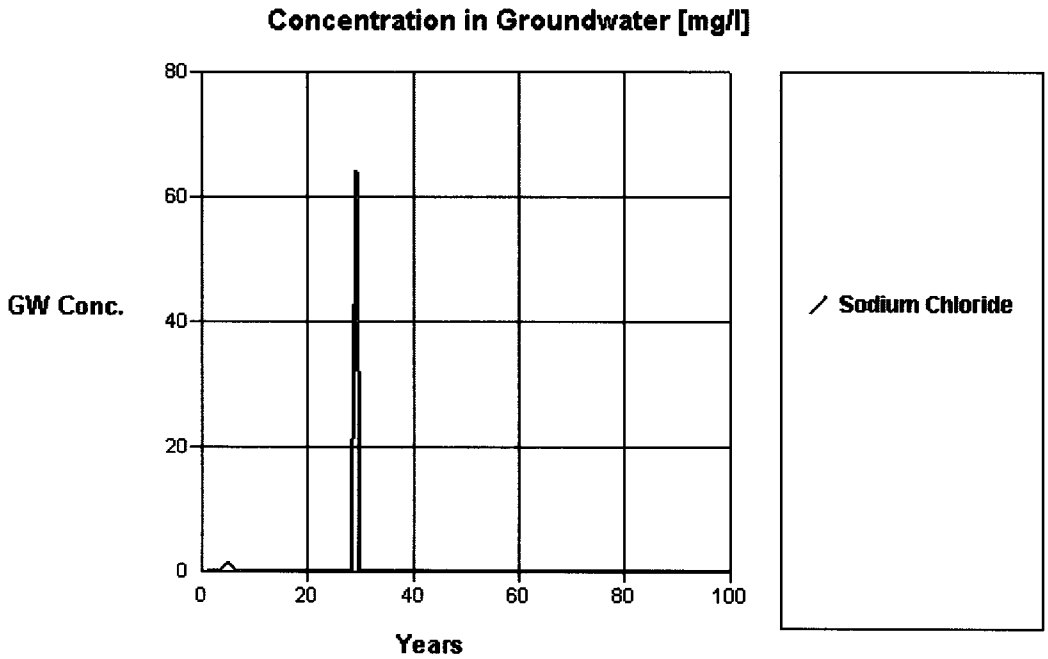


Given the narrow configuration of the flowpath, it reasonable to conclude that the horizontal extent of chloride impact is represented by the initial spill perimeter and be consistent with the surface sample chloride concentrations. The majority of the chloride source term was removed from the site during spill mitigation/remediation. The action level for residual soil chloride is determined by two characteristics:

1.) Will the residual chloride concentration be capable of impacting local groundwater in excess of the 250 mg/L WQCC groundwater chloride standard?
2.) Will the residual chloride concentration negatively impact surface vegetation?

The chloride concentrations at all intervals in trenches T1, T2, T3, T4, T5, T6, T7, T8, and T9 will not be capable of impacting groundwater above the WQCC standard nor will there be any negative effects

on surface vegetation. These conclusions are supported by a fate and transport simulation using the RISK4 computer model developed by BP Oil. The input variables are attached and the results are discussed and illustrated below. The residual chloride concentration used in the model was 512 mg/Kg (the highest site chloride concentration), the model receptor water well is located 1-meter down gradient of the site perimeter and screened from the top of the water table at 137'bgs to 140'bgs (approximately 1-meter). The infiltration rate is set at a conservative 20 centimeters/year. The simulation indicates a groundwater chloride impact of 65 mg/L in approximately 29 years, well below the 250 mg/L WQCC chloride standard.



Conclusion and Closure Request

The results of the post disposal investigation and the transport simulation indicate that the CoCs have been adequately remediated at the site and will not impact the environment in the future. EPI, on behalf of XTO Energy, requests that the NMOCD require "no further action" at this site. With approval, the site will be reseeded in the spring of 2005.

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If there are any questions or more information is needed, please call Mr. Cody Miller or myself at the office or at 505.631.8447 and 505.390.7864, respectively, or Mr. Guy Haykus at 505.394.2089. All official communication should be addressed to:

Mr. Guy Haykus
XTO Energy Inc.
P.O. Box 700
Eunice, New Mexico 88231
William_Haykus@XTOEnergy.com

Sincerely,

Pat McCasland
EPI Technical Services Manager
enviplus1@aol.com

cc: Jim Amos, BLM (james_amos@nm.blm.gov)
Guy Haykus, XTO Energy Inc. (William_Haykus@XTOEnergy.com)
Dudley McMinn, XTO Energy, Inc. (Dudley_McMinn@XTOEnergy.com)
file

Encl:

Site Information and Metrics Form
Final NMOCD form C-141
BLM Report of Undesirable Event
Archaeological Site Report - Boone Archaeological Services
Annotated Topographical Map
Annotated USGS 1996 Aerial Map
Site Map
New Mexico Office of the State Engineer Water Well Report
Photographs
Analytical Results Summary
Laboratory Reports
Fate and Transport Input Variables

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XTO ENERGY	Site Information and Metrics	Incident Date: **1-9-05@1:00AM**	NMOCD Notified: 1-9-05@8:00AM

SITE: Arrowhead Grayburg #168 Injection Header	Assigned Site Reference #:
Company: XTO Energy Inc.	
Street Address: PO Box 700	
Mailing Address:	
City, State, Zip: Eunice, New Mexico 88231	
Representative: Guy Haykus	
Representative Telephone: 505.394.2089 William_Haykus@XTOEnergy.com	
Telephone:	
Fluid volume released (bbls): 400 bbls	Recovered (bbls): 0 bbls
>25 bbls: Notify NMOCD verbally within 24 hrs and submit form C-141 within 15 days. (Also applies to unauthorized releases >500 mcf Natural Gas)	
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: Arrowhead Grayburg #168 Injection Header	
Source of contamination: 3" fiberglass pipeline flange	
Land Owner, i.e., BLM, ST, Fee, Other: Niemeyer Properties (SW/4 of Sec 1) and BLM (SE/4 of Sec 1)	
LSP Dimensions 3,150' x 1 to 13'	
LSP Area: 42,176 ft^2	
Location of Reference Point (RP)	
Location distance and direction from RP	
Latitude: 32°25'13.22"N	
Longitude: 103°13'31.73"W	
Elevation above mean sea level: 3,515 to 3,490 'amsl	
Feet from South Section Line	
Feet from West Section Line	
Location- Unit or ¼¼: NW¼ of the SW¼	Unit Letter: K,L, N, & O
Location- Section: 1	
Location- Township: T22S	
Location- Range: R36E	
Surface water body within 1000 ' radius of site: none	
Domestic water wells within 1000' radius of site: 1 - #763 800-feet NE	
Domestic water wells within 1000' radius of site:	
Agricultural water wells within 1000' radius of site: none	
Agricultural water wells within 1000' radius of site:	
Public water supply wells within 1000' radius of site: none	
Depth from land surface to ground water (DG) 137'bgs	
Depth of contamination (DC) – .33-feet	
Depth to ground water (DG – DC = DtGW) -	

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 = 0	*Wellhead Protection Area Score= 20*	*Surface Water Score= 0*

Site Rank (1+2+3) = 20

Total Site Ranking Score and Acceptable Concentrations

Parameter	>19	10-19	0-9
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

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
XTO Energy Inc.	**Guy Haykus**
Address	Telephone No.
PO Box 700 Eunice, New Mexico 88231	**505.394.2089 William_Haykus@XTOEnergy.com**
Facility Name	Facility Type
Arrowhead Grayburg #168 Injection Header	**3" fiberglass pipeline flange**

Surface Owner: **Niemeyer Properties (SW/4 of Sec 1) and BLM (SE/4 of Sec 1)**	Mineral Owner	Lease No.

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County: Lea
K,L, N, & O	**1**	**T22S**	**R36E**					

Latitude: **32°25'13.22"N** **Longitude:** **103°13'31.73"W**

NATURE OF RELEASE

Type of Release	Volume of Release	Volume Recovered
Produced Water	**400 bbls barrels**	**0 bbls barrels**
Source of Release	Date and Hour of Occurrence	Date and Hour of Discovery
3" fiberglass pipeline flange	**1-9-05@1:00AM**	**1-9-05@1:00AM**
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? **Gary Wink / Larry Johnson**	
By Whom? **Guy Haykus**	Date and Hour **1-9-05@8:00AM**	
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.* ***3" fiberglass pipeline flange*** **Flange gasket failed.**

Describe Area Affected and Cleanup Action Taken.*
The top 3 to 4-inches of soil in the flowpath was disposed of at an NMOCD approved facility. Sample trenches spaced every 500-feet and major pooling areas (road culverts) were sampled to delineate the vertical extent of impact. Remedial Goals: TPH 8015m = 5000 mg/Kg, Benzene = 10 mg/Kg, and BTEX, i.e., the mass sum of Benzene, Ethyl Benzene, Toluene, and Xylenes = 50 mg/Kg.

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: [signature]	**OIL CONSERVATION DIVISION**	
Printed Name: Guy Haykus (e-mail: William_Haykus@XTOEnergy.com)	Approved by District Supervisor:	
Title: Supervisor	Approval Date:	Expiration Date:
Date: ~~1/14/2005~~ 3-18-05 Phone: 505.394.2089	Conditions of Approval:	Attached ☐

Attach Additional Sheets If Necessary

Form NM 3162-1
(July 1991)

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Land Management
New Mexico State Office

REPORT OF UNDESIRABLE EVENT

DATE OF OCCURRENCE/DISCOVERY: 1-9-05@1:00AM TIME OF OCCURRENCE: **1-9-05@1:00AM**

DATE REPORTED TO BLM: **1-9-05@1:00AM** TIME REPORTED: **1-9-05@1:00AM**

BLM OFFICE REPORTED TO: (RESOURCE AREA/DISTRICT/OTHER): Carslbad, NM

LOCATION: ULs K, L, N, O SECTION 1 T.22S R.36E MERIDIAN32°25'13.22"N103°13'31.73"W

COUNTY: Lea STATE: New Mexico WELL NAME: Arrowhead Grayburg #168 Injection Header

OPERATOR: COMPANY NAME XTO Energy Inc. PHONE No. 505.394.2089
William_Haykus@XTOEnergy.com CONTACT PERSON'S NAME: Guy Haykus
SURFACE OWNER: Federal MINERAL OWNER: _____
(FEDERAL/INDIAN/FEE/STATE)

LEASE NO.: _____ RIGHT-OFWAY No.: _____

UNIT NAME / COMMUNITIZATION AGREEMENT No.: _____

TYPE OF EVENT, CIRCLE APPROPRIATE ITEM(S) :

BLOWOUT, FIRE, FATALITY, INJURY, PROPERTY DAMAGE, OIL SPILL, SALTWATER SPILL, OIL AND SALTWATER SPILL, TOXIC FLUID SPILL, HAZARDOUS MATERIAL SPILL, UNCONTROLLED FLOW OF WELLBORE FLUIDS, OTHER (SPECIFY) : Produced Water

CAUSE OF EVENT: 3" fiberglass pipeline flange

HazMat Notified: (for spills) NO

Law Enforcement Notified: (for thefts) _____

CAUSE AND EXTENT OF PERSONAL INJURIES/CAUSE OF DEATH(S): NONE

Safety Officer Notified: _____

EFFECTS OF EVENT: Soil impacted by saline produced water

ACTION TAKEN TO CONTROL EVENT: Leak repaired. Site to be delineated and remediated.

LENGTH OF TIME TO CONTROL BLOWOUT OR FIRE: _____

VOLUMES DISCHARGED: OIL NA WATER 400 bbls GAS NA

OTHER AGENCIES NOTIFIED: New Mexico Oil Conservation Division - Hobbs

TITLE PAGE/ABSTRACT/ NEGATIVE SITE REPORT CFO/RFO

1/03

1. BLM Report No.	2. Reviewer's Initials/Date_____ ACCEPTED ( ) REJECTED ( )	3. NMCRIS No.: 91509

4. Type of Report: Negative (X) Positive ( )

5. Title of Report:
Class III archaeological survey of a leak site from the Grayburg Unit No. 168 Injection Header.

Author(s): Ann Boone

6. Fieldwork Date(s): from 21 Jan., 2005 to

7. Report Date: 22 Jan., 2005

8. Consultant Name & Address:
Boone Archaeological Services
2030 North Canal, Carlsbad, NM 88220
Direct Charge: Danny Boone
Field Personnel Names: Danny Boone
Phone: (505) 885-1352

9. Cultural Resource Permit No.:
BLM: 190-2920-03-E
STATE: NM-05-157

10. Consultant Report No.
BAS 01-05-22

11. Customer Name: XTO Energy
Responsible Individual: Guy Haykus
Address: PO Box 700
Eunice, NM 88231
Phone: (505)394-2089

12. Customer Project No.:

13. Land Status:	BLM	STATE	PRIVATE	OTHER	TOTAL
a. Area Surveyed (acres)	1.03 (+/-)	0	7.0 (-/+)	0	8.03 (+/-)
b. Area of Effect (acres)	0.52 (-/+)	0	2.1 (+/-)	0	2.62 (-/+)

14. a. Linear: Length; 3,500' (+/-) Total [Private 3,050] [450' Fed.] Width; 100'
b. Block: N/A

15. Location: (Maps Attached if Negative Survey)
a. State: New Mexico
b. County: Lea
c. BLM Office: Carlsbad
d. Nearest City or Town: Eunice, NM
e. Legal Location: T 22S, R 36E, Sec. 1 [Private, NW SW, NE SW, SE SW], [Fed., SE SE].
f. Well Pad Footages: N/A
g. USGS 7.5 Map Name(s) and Code Number(s): EUNICE, NM, (1969, Photo Rev. 1979) 32103-D2

16. Project Data:

a. Records Search: Date(s) of BLM File Review: 20 Jan., 2005 Name of Reviewer (s): Danny Boone

Date(s) of ARMS Data Review: 20 Jan., 2005 Name of Reviewer (s): Ann Boone

Findings (see Field Office requirements to determine area to be reviewed during records search):

LA 89816 is within 500 feet, LA 49887 is within 0.25 mile.

b. Description of Undertaking:

Mr. Craig Johnson, Archaeologist with the Carlsbad BLM was consulted about this project. The project is a slightly incised southeast trending ephemeral drainage that liquid leaking from a pipline flowed through. At the time of this survey all of the surface spillage had been cleaned up by scraping it with a backhoe blade. No cultural resources were located but an unknown amount (appears to be small) of material had been transported from the location. This project crosses at least three access roads, seven buried pipelines, two overhead electric lines, three two-track roads and two surface pipelines. Survey acres were estimated on 3,500 feet in length by 100 feet in width. Impact acres were estimated on 3,050 feet in length by 30 feet in width for the Private portion and 450 feet in length by 50 feet in width for the Federal portion. No plats were available therefore location, footages and acres are estimations based on a hand held GPS Unit.

c. Environmental Setting (NRCS soil designation; vegetative community; etc.):

Topography: Southeast trending Ephemeral drainage.

Vegetation: Overall groundcover is approximately 25% and consists primarily of mesquite, creosote bush, yucca cactus, prickly pear cactus, various grasses and other flora.

NRCS: Berino-Cacique association: Nearly level and gently sloping, sandy soils that are deep and moderately deep to soft or indurated caliche.

d. Field Methods: (transect intervals; crew size; time in field, etc.):

Transects: One spaced up to 15 meters on each side of slightly incised drainage.

Crew Size: One

Time in Field: 2.0 hours

e. Artifacts Collected (?): None

17. Cultural Resource Findings:

a. Identification and description: None

b. Evaluation of significance of Each Resource: None

18. Management Summary (Recommendations):

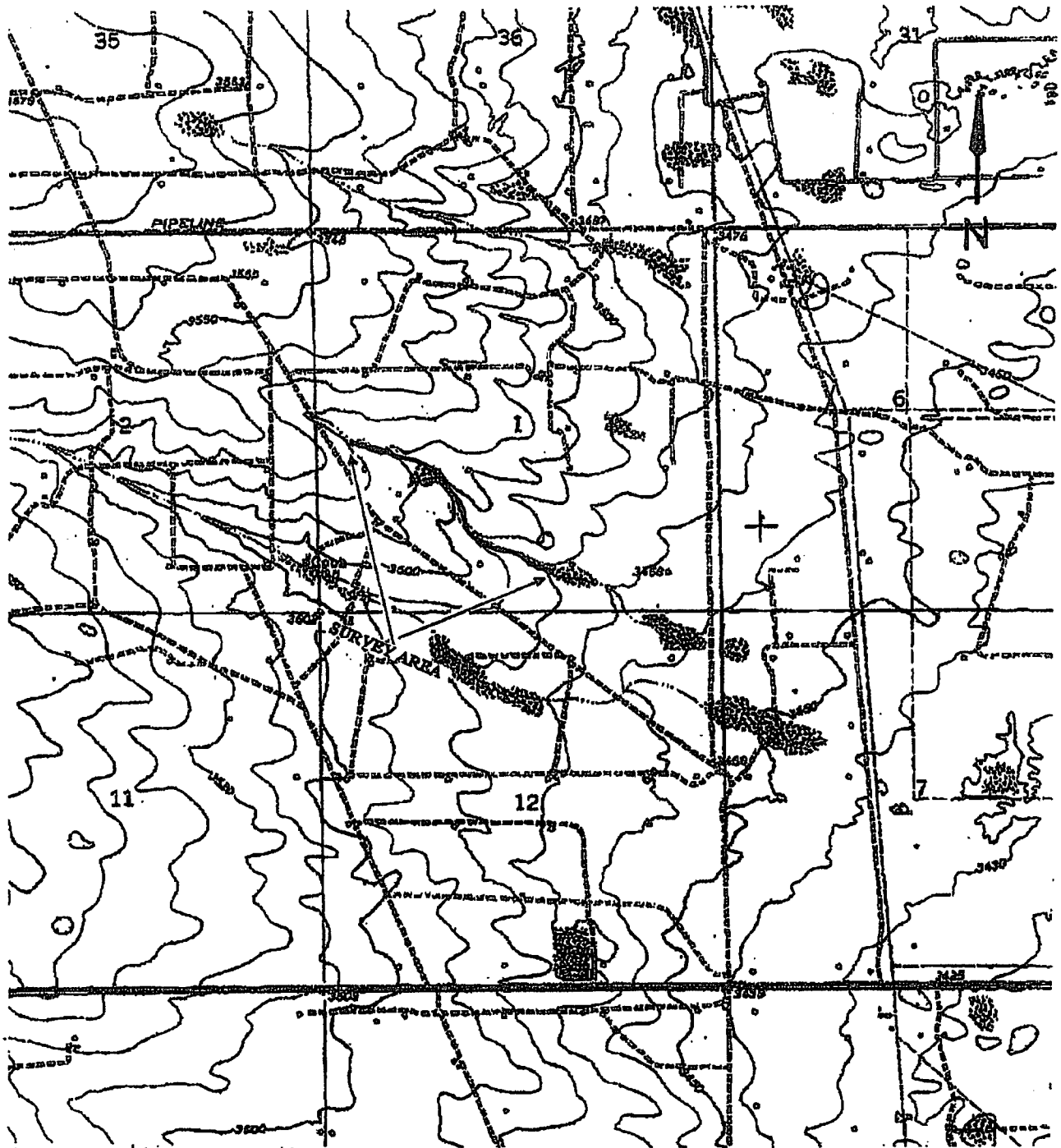
Archaeological clearance of a leak site from the Grayburg Unit No. 168 Injection Header for XTO Energy Inc. is recommended. If cultural resources are encountered at any time all activity should cease and the BLM Archaeologist notified immediately.

19.

I certify that the information provided above is correct and accurate and meets all appreciable BLM standards.

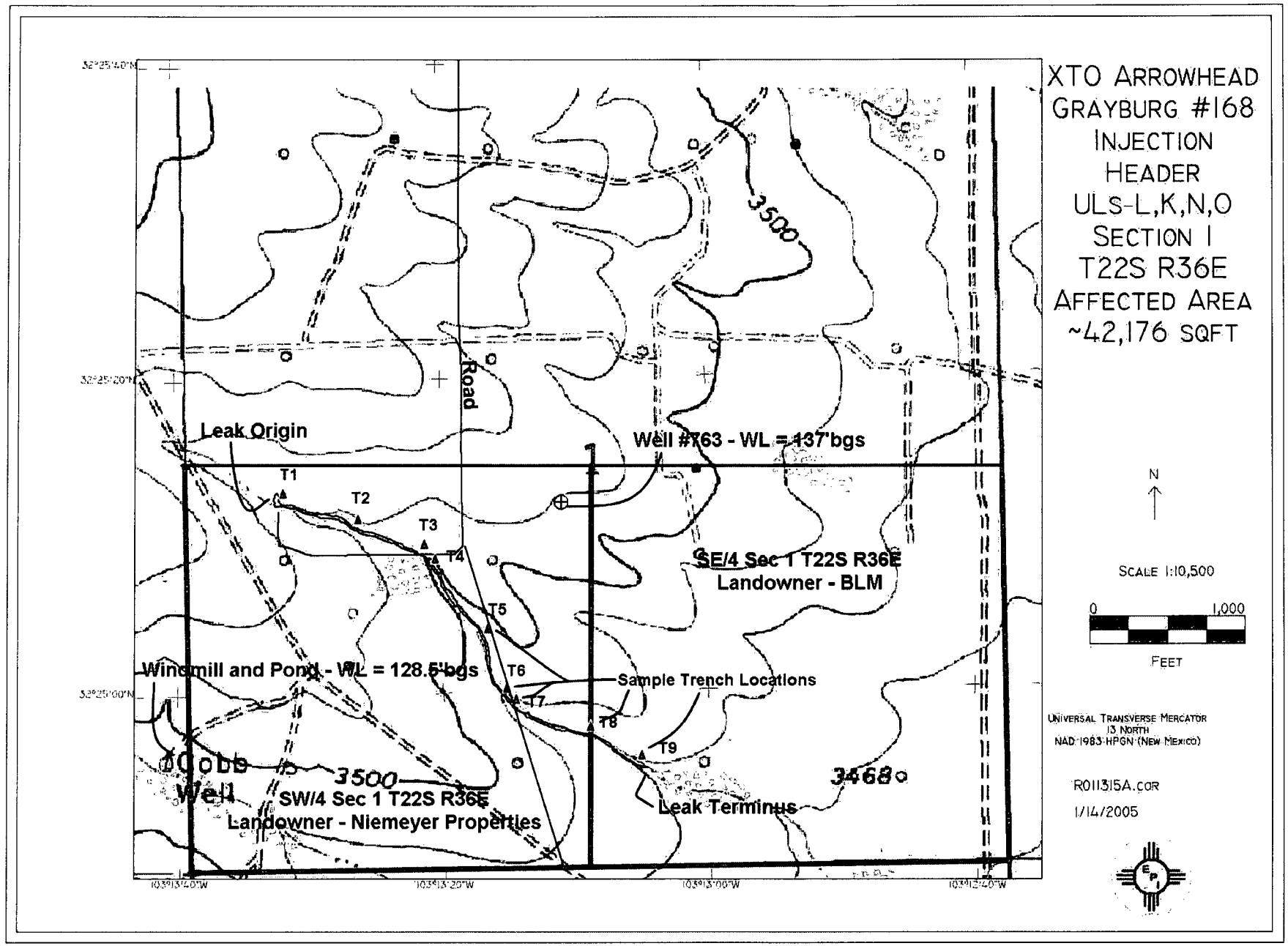
Responsible Archaeologist: Danny Boone 24 Jan. 2004

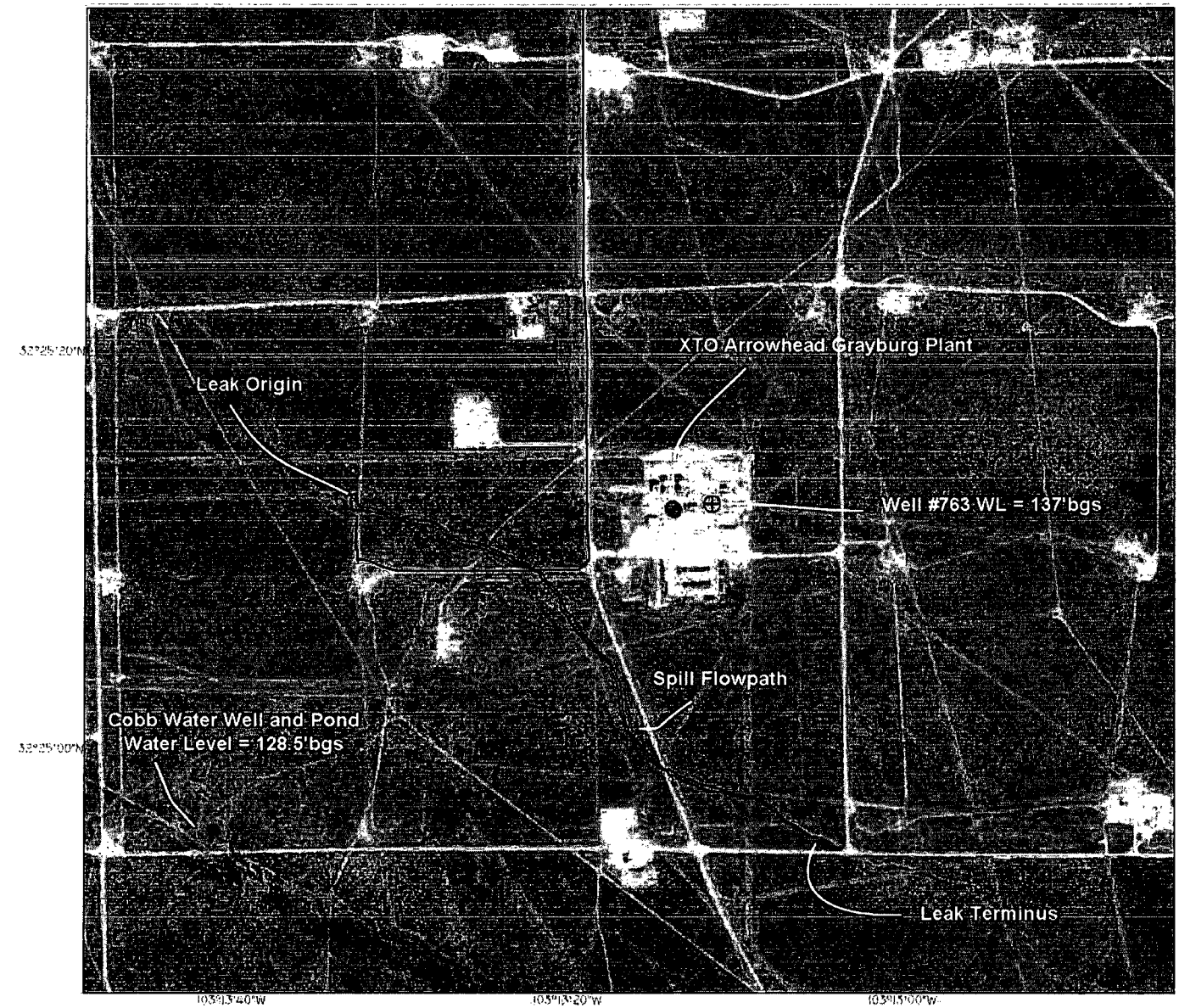
Signature Date



Location Map of a leak site from the Grayburg Unit No. 168 Injection Header for XTO Energy Inc. in Section 1, T22S, R36E, NMPM, LEA County, NM.
Map Reference, USGS 7.5' Series; EUNICE, NM, (1969, Photo Rev. 1979) 32103-D2

BAS


XTO ARROWHEAD
GRAYBURG #168
INJECTION
HEADER
ULS-L,K,N,O
SECTION 1
T22S R36E
AFFECTED AREA
~42,176 SQFT
Leak Origin
Well #763 - WL = 137'bgs
T1
T2
T3
T4
T5
T6
T7
T8
T9
SE/4 Sec 1 T22S R36E
Landowner - BLM
Windmill and Pond - WL = 128.5'bgs
Sample Trench Locations
Abd
Well
3500
SW/4 Sec 1 T22S R36E
Landowner - Niemeyer Properties
Leak Terminus
3468
Road
N
SCALE 1:10,500
0
1,000
FEET
UNIVERSAL TRANSVERSE MERCATOR
13 NORTH
NAD 1983 HPGN (NEW MEXICO)
R011315A.COR
1/14/2005



XTO ARROWHEAD GRAYBURG #168 INJECTION HEADER ULS-K,L,N,O SECTION 1 T22S R36E AFFECTED AREA ~42,176 SQFT

N

SCALE 1:10,000

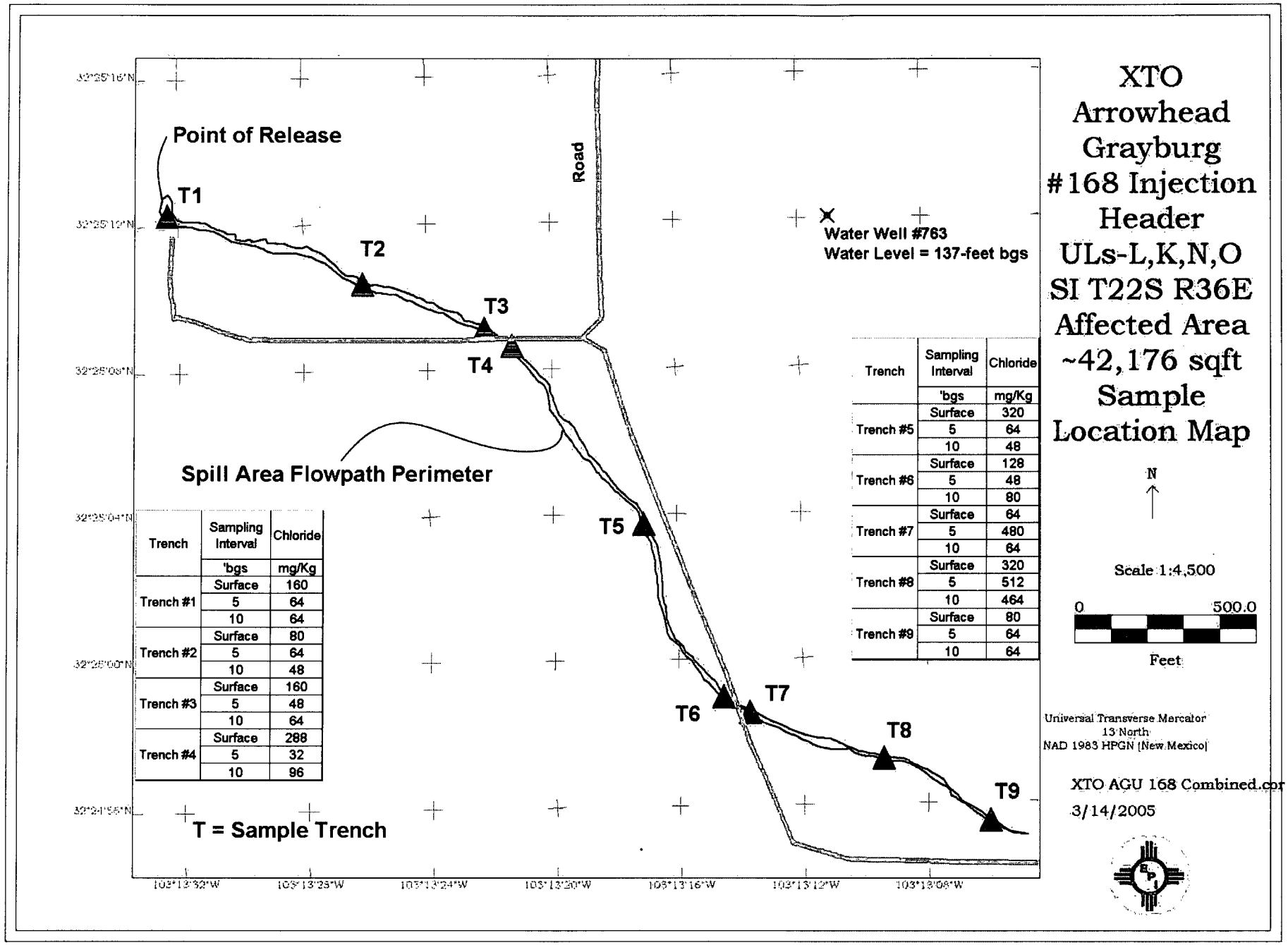
0 1,000

FEET

UNIVERSAL TRANSVERSE MERCATOR
13 NORTH
NAD 1983 HPGN (NEW MEXICO)

R011315A.COR

1/14/2005



Trench	Sampling Interval	Chloride
	'bgs	mg/Kg
Trench #1	Surface	160
	5	64
	10	64
Trench #2	Surface	80
	5	64
	10	48
Trench #3	Surface	160
	5	48
	10	64
Trench #4	Surface	288
	5	32
	10	96

Trench	Sampling Interval	Chloride
	'bgs	mg/Kg
Trench #5	Surface	320
	5	64
	10	48
Trench #6	Surface	128
	5	48
	10	80
Trench #7	Surface	64
	5	480
	10	64
Trench #8	Surface	320
	5	512
	10	464
Trench #9	Surface	80
	5	64
	10	64

New Mexico Office of the State Engineer
Well Reports and Downloads

Township: 22S Range: 36E Sections: 1,2,11,12

NAD27 X: Y: Zone: Search Radius:

County: Basin: Number: Suffix:

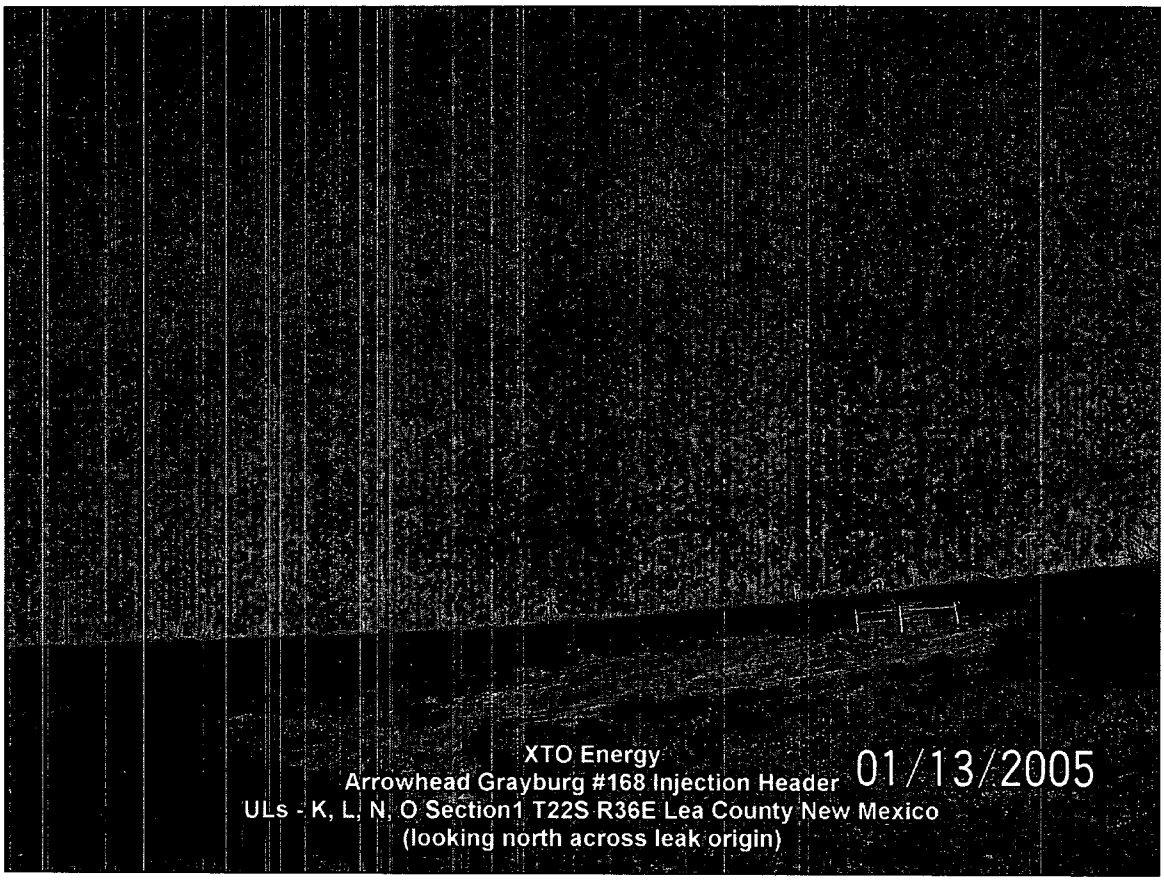
Owner Name: (First) (Last) ○ Non-Domestic ○ Domestic
◉ All

Well / Surface Data Report | Avg Depth to Water Report
Water Column Report
Clear Form | WATERS Menu | Help

AVERAGE DEPTH OF WATER REPORT 03/16/2005

								(Depth Water in Feet)		
Bsn	**Tws**	**Rng**	**Sec**	**Zone**	**X**	**Y**	**Wells**	**Min**	**Max**	**Avg**
CP	22S	36E	01				1	137	137	137

Record Count: 1


XTO Energy
Arrowhead Grayburg #168 Injection Header 01/13/2005
ULs - K, L, N, O Section1 T22S R36E Lea County New Mexico
(looking north across leak origin)


XTO Energy
Arrowhead Grayburg #168 Injection Header 01/13/2005
ULs - K, L, N, O Section1 T22S R36E Lea County New Mexico
(looking north across leak origin)

XTO Energy, Inc.
Arrowhead Grayburg Unit #168 Injection Header
Site Delineation Data

Sample Location	Sampling Interval (FT. BGS[1])	SAMPLE ID#	Date	Lithology	VOC Headspace ppm	GRO[3] mg/Kg	DRO[4] mg/Kg	TPH[5] mg/Kg	BTEX[9] mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethylbenzene mg/Kg	m/p/o Xylene mg/Kg	Chloride mg/Kg
Trench #1	Surface	TH#1 Surface	1/21/05	Sand	na	<10.0	<10.0	<10.0	ND	ND	ND	ND	ND	160
	5	TH#1 @5'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	64
	10	TH#1 @10'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	64
Trench #2	Surface	TH#2 Surface	1/21/05	Sand	na	na	na	na	na	na	na	na	na	80
	5	TH#2 @ 5'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	64
	10	TH#2 @ 10'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	48
Trench #3	Surface	TH#3Surface	1/21/05	Sand	na	na	na	na	na	na	na	na	na	160
	5	TH#3 @ 5'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	48
	10	TH#3 @ 10'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	64
Trench #4	Surface	TH#4 Surface	1/21/05	Sand	na	na	na	na	na	na	na	na	na	288
	5	TH#4 @ 5'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	32
	10	TH#4 @ 10'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	96
Trench #5	Surface	TH#5 Surface	1/21/05	Sand	na	na	na	na	na	na	na	na	na	320
	5	TH#5 @ 5'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	64
	10	TH#5 @ 10'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	48
Trench #6	Surface	TH#6 Surface	1/21/05	Sand	na	na	na	na	na	na	na	na	na	128
	5	TH#6 @ 5'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	48
	10	TH#6 @ 10'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	80
Trench #7	Surface	TH#7 Surface	1/21/05	Sand	na	na	na	na	na	na	na	na	na	64
	5	TH#7 @ 5'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	480
	10	TH#7 @ 10'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	64
Trench #8	Surface	TH#8 Surface	1/21/05	Sand	na	na	na	na	na	na	na	na	na	320
	5	TH#8 @ 5'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	512
	10	TH#8 @ 10'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	464
Trench #9	Surface	TH#9 Surface	1/21/05	Sand	na	na	na	na	na	na	na	na	na	80
	5	TH#9 @ 5'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	64
	10	TH#9 @ 10'	1/21/05	Sand	na	na	na	na	na	na	na	na	na	64
				Method Detection Limit		10	10			0.005	0.005	0.005	0.015	0.025
				New Mexico Oil Conservation Division Remedial Goals	100.0			5000	50.0000	10.0000				WQCC[7]

100 ppm Isobutylene calibration gas = 101 ppm

[1]bgs – below ground surface

[2]VOC–Volatile Organic Contaminants/Constituents

[3]GRO-Gasoline Range Organics C_6-C_{12}

[4]DRO-Diesel Range Organics C_{12}-C_{35}

[5]TPH-Total Petroleum Hydrocarbon = GRO+DRO.

na - not analyzed

[9]BTEX - Mass sum of benzene, toluene, ethylbenzene, and xylenes

ND - not detected above the method detection limit.

[7]WQCC - New Mexico Water Quality Control Commission

CARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ENVIRONMENTAL PLUS, INC.
ATTN: PAT McCASLAND
P.O. BOX 1558
EUNICE, NM 88231
FAX TO: (505) 394-2601

Receiving Date: 01/24/05
Reporting Date: 01/25/05
Project Owner: XTO
Project Name: AGU 168 INJECTION HEADER
Project Location: NOT GIVEN

Sampling Date: 01/21/05
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/Kg)	DRO (>C_{10}-C_{28}) (mg/Kg)	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)
ANALYSIS DATE:		01/24/05	01/24/05	01/24/05	01/24/05	01/24/05	01/24/05
H9496-1	TH#1 SURFACE	<10.0	<10.0	<0.005	<0.005	<0.005	<0.015
Quality Control		741	803	0.098	0.090	0.100	0.308
True Value QC		800	800	0.100	0.100	0.100	0.300
% Recovery		92.6	100	97.8	90.0	99.9	103
Relative Percent Difference		0.6	0.3	5.1	0.1	1.2	2.3

METHODS: TPH GRO & DRO - EPA SW-846 8015 M; BTEX - SW-846 8260.

Burgess J. A. Cooke, Ph. D.

1/25/05
Date

H9496A.XLS

CARDINAL LABORATORIES

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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ENVIRONMENTAL PLUS, INC.
ATTN: PAT McCASLAND
P.O.BOX 1558
EUNICE, NM 88231
FAX TO: (505) 394-2601

Receiving Date: 01/24/05
Reporting Date: 01/26/05
Project Owner: XTO
Project Name: AGU 168 INJECTION HEADER
Project Location: NOT GIVEN

Analysis Date: 01/26/05
Sampling Date: 01/21/05
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: AH

LAB NUMBER	SAMPLE ID	Cl^- (mg/Kg)
H9496-1	TH #1 SURFACE	160
H9496-2	TH #1 @ 5'	64
H9496-3	TH #1 @ 10'	64
H9496-4	TH #2 SURFACE	80
H9496-5	TH #2 @ 5'	64
H9496-6	TH #2 @ 10'	48
H9496-7	TH #3 SURFACE	160
H9496-8	TH #3 @ 5'	48
H9496-9	TH #3 @ 10'	64
Quality Control		930
True Value QC		1000
% Recovery		93.0
Relative Percent Difference		4.0

METHOD: Standard Methods	4500-ClB

Note: Analyses performed on 1:4 w:v aqueous extracts.

Amy Hill
Chemist

1/26/05
Date

Cardinal Laboratories Inc.

2111 Beechwood, Abilene, TX 79603 — 915-673-7001 Fax 915-673-7020

101 East Marland, Hobbs, NM 88240 — 505-393-2326 Fax 505-393-2476

Company Name	XTO
Project Manager	Pat McCasland
Address	
City, State, Zip	
Phone#/Fax#	
Project #/Owner	
Project Name	AGU 168 Injection Header
Project Location	
Sampler Name	Felix Hernandez

Bill To

ENVIRONMENTAL PLUS INC.

Analysis Request

LAB I.D.	SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUND WATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE	ICE/COOL	OTHER	SAMPLING: DATE	TIME	BTEX 8021B	TPH 8015Modified	Cl	SAR	EC	TDS	ANIONS	CATAIONS
H4961-1	TH#1 Surface	G	1			X					X		1/21	7:30	X	X	X					
-2	TH#1 @ 5'	G	1			X					X		1/21	7:40			X					
-3	TH#1 @ 10'	G	1			X					X		1/21	7:50			X					
-4	TH#2 Surface	G	1			X					X		1/21	8:00			X					
-5	TH#2 @ 5'	G	1			X					X		1/21	8:10			X					
-6	TH#2 @ 10'	G	1			X					X		1/21	8:20			X					
-7	TH#3 Surface	G	1			X					X		1/21	9:40			X					
-8	TH#3 @ 5'	G	1			X					X		1/21	9:50			X					
-9	TH#3 @ 10'	G	1			X					X		1/21	10:00			X					

Sampler Relinquished: Felix Hernandez	1-24 1:00	Received By: Tam Cleaver	Fax results to Pat McCasland 505-394-2601
Relinquished by: Tam Cleaver	Date 1/24/05 Time 1635	Received By: (lab staff) Burgess J. Cooley	Remarks
Delivered by Sampler	Sample Cool & Intact (Yes) No	Checked By:	

CARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ENVIRONMENTAL PLUS, INC.
ATTN: PAT McCASLAND
P.O.BOX 1558
EUNICE, NM 88231
FAX TO: (505) 394-2601

Receiving Date: 01/24/05
Reporting Date: 01/26/05
Project Owner: XTO
Project Name: AGU 168 INJECTION HEADER
Project Location: NOT GIVEN

Analysis Date: 01/26/05
Sampling Date: 01/21/05
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: AH

LAB NUMBER	SAMPLE ID	Cl^- (mg/Kg)
H9497-1	TH #4 SURFACE	288
H9497-2	TH #4 @ 5'	32
H9497-3	TH #4 @ 10'	96
H9497-4	TH #5 SURFACE	320
H9497-5	TH #5 @ 5'	64
H9497-6	TH #5 @ 10'	48
H9497-7	TH #6 SURFACE	128
H9497-8	TH #6 @ 5'	48
H9497-9	TH #6 @ 10'	80
Quality Control		930
True Value QC		1000
% Recovery		93.0
Relative Percent Difference		4.0

METHOD: Standard Methods	4500-ClB

Note: Analyses performed on 1:4 w:v aqueous extracts.

Amy Hill
Chemist

1/26/05
Date

Cardinal Laboratories Inc.

2111 Beechwood, Abilene, TX 79603
915-673-7001 Fax 915-673-7020

101 East Marland, Hobbs, NM 88240
505-393-2326 Fax 505-393-2476

Company Name	XTO
Project Manager	Pat McCasland
Address	
City, State, Zip	
Phone#/Fax#	
Project #/Owner	
Project Name	AGU 168 Injection Header
Project Location	
Sampler Name	Felix Hernandez

Bill To

ENVIRONMENTAL PLUS INC.

Analysis Request

LAB I.D.	SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUND WATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE	ICE/COOL	OTHER	SAMPLING: DATE	TIME	BTEX 8021B	TPH 8015Modified	Cl	SAR	EC	TDS	ANIONS	CATAIONS				
H9471	TH#4 Surface	G	1			X					X		1/21	10:42			X									
-2	TH#4 @ 5'	G	1			X					X		1/21	10:50			X									
-3	TH#4 @ 10'	G	1			X					X		1/21	11:00			X									
-4	TH#5 Surface	G	1			X					X		1/21	11:20			X									
-5	TH#5 @ 5'	G	1			X					X		1/21	11:27			X									
-6	TH#5 @ 10'	G	1			X					X		1/21	11:38			X									
-7	TH#6 Surface	G	1			X					X		1/21	12:40			X									
-8	TH#6 @ 5'	G	1			X					X		1/21	12:45			X									
-9	TH#6 @ 10'	G	1			X					X		1/21	12:55			X									

Sampler Relinquished: Felix Hernandez	1-24 1:00	Received By: Iain Owens	Fax results to Pat McCasland 505-394-2601
Relinquished by: Iain Owens	Date 1/24/05 Time 1835	Received By: (lab staff) Bernadette Cantu	Remarks
Delivered by Sampler	Sample Cool & Intact Yes No	Checked By:	

CARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ENVIRONMENTAL PLUS, INC.
ATTN: PAT McCASLAND
P.O.BOX 1558
EUNICE, NM 88231
FAX TO: (505) 394-2601

Receiving Date: 01/24/05
Reporting Date: 01/26/05
Project Owner: XTO
Project Name: AGU 168 INJECTION HEADER
Project Location: NOT GIVEN

Analysis Date: 01/26/05
Sampling Date: 01/21/05
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: AH

LAB NUMBER	SAMPLE ID	Cl^- (mg/Kg)
H9498-1*	TH #7 SURFACE	64
H9498-2	TH #7 @ 5'	480
H9498-3	TH #7 @ 10'	64
H9498-4	TH #8 SURFACE	320
H9498-5	TH #8 @ 5'	512
H9498-6	TH #8 @ 10'	464
H9498-7	TH #9 SURFACE	80
H9498-8	TH #9 @ 5'	64
H9498-9	TH #9 @ 10'	64
Quality Control		930
True Value QC		1000
% Recovery		93.0
Relative Percent Difference		4.0

METHOD: Standard Methods	4500-ClB

Note: Analyses performed on 1:4 w:v aqueous extracts.
*Matrix interference (color) observed.

Amy Hill
Chemist

1/26/05
Date

Cardinal Laboratories Inc.

2111 Beechwood, Abilene, TX 79603
915-673-7001 Fax 915-673-7020

101 East Marland, Hobbs, NM 88240
505-393-2326 Fax 505-393-2476

Company Name	XTO
Project Manager	Pat McCasland
Address	
City, State, Zip	
Phone#/Fax#	
Project #/Owner	
Project Name	AGU 168 Injection Header
Project Location	
Sampler Name	Felix Hernandez

Bill To

ENVIRONMENTAL PLUS INC.

Analysis Request

LAB I.D.	SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUND WATER	MATRIX: WASTEWATER	MATRIX: SOIL	MATRIX: CRUDE OIL	MATRIX: SLUDGE	MATRIX: OTHER:	PRESERV.: ACID/BASE	PRESERV.: ICE/COOL	PRESERV.: OTHER	SAMPLING: DATE	SAMPLING: TIME	BTEX 8021B	TPH 8015Modified	Cl	SAR	EC	TDS	ANIONS	CATAIONS				
H17498-1	TH#7 Surface	G	1			X					X		1/21	1:10			X									
-2	TH#7 @ 5'	G	1			X					X		1/21	1:20			X									
-3	TH#7 @ 10'	G	1			X					X		1/21	1:30			X									
-4	TH#8 Surface	G	1			X					X		1/21	1:50			X									
-5	TH#8 @ 5'	G	1			X					X		1/21	2:00			X									
-6	TH#8 @ 10'	G	1			X					X		1/21	2:10			X									
-7	TH#9 Surface	G	1			X					X		1/21	2:30			X									
-8	TH#9 @ 5'	G	1			X					X		1/21	2:40			X									
-9	TH#9 @ 10'	G	1			X					X		1/21	2:50			X									

Sampler Relinquished: Felix Hernandez	1-24-05 1:00	Received By: Tara Peters	Fax results to Pat McCasland 505-394-2601
Relinquished by: Tara Peters	Date 1/24/05 Time 1635	Received By: (lab staff) Burgess J. Cook	Remarks
Delivered by Sampler	Sample Cool & Intact Yes / No	Checked By:	

FATE AND TRANSPORT MODEL INPUT SUMMARY FILE

Model Description:
Unsaturated zone model linked with saturated zone model

Title:
XTO Arrowhead Grayburg #168 Injection Header

Simulation time (years). 100

Vadose Zone Source Parameters

Thickness of contamination (m)	2.0
Depth to top of contamination (m).	0.0
Length of source (m)	10.
Width of source (m).	10.

Unsaturated Zone Properties

Total Porosity in vadose zone (cm3/cm3)	0.25
Residual water content (cm3/cm3)	5.00E-02
Fraction organic carbon (g oc/g soil).	1.00E-02
Soil bulk density (g/cm3).	1.7
Infiltration Rate (cm/yr).	20.
Saturated conductivity (m/d)	7.1
Van Genuchten's N.	2.7
Thickness of vadose zone (m)	45.

Lens Parameters

Thickness of lens (m).	1.0
Total porosity in lens (cm3/cm3)	0.40
Residual water content--lens (cm3/cm3)	0.21
Saturated conductivity (m/d)	2.20E-02
Van Genuchten N in lens.	1.1

Aquifer Properties

Effective porosity (cm3/cm3)	0.25
Fraction organic carbon (g oc/g soil).	5.00E-03
Hydraulic conductivity (m/d)	7.1
Soil bulk density (g/cm3).	1.7
Hydraulic gradient (m/m)	0.27

***Longitudinal dispersivity (m). code calculated
***Transverse dispersivity (m). code calculated
***Vertical dispersivity (m). code calculated

Receptor Well Location

Distance downgradient (m).	1.0
Distance cross-gradient (m).	0.0
Depth to top of well screen (m).	0.0
Depth to bottom of well screen(m).	1.0
Number of points used to calc. conc.	2

TPH Data for Unsaturated Zone Source

Concentration of TPH in soil (mg/kg)	0.0
Molecular weight of TPH (g/mol).	0.0

CHEMICAL DATA FOR: Sodium Chloride

Diffusion coefficient in air (cm2/s)	0.0
Diffusion coefficient in water (cm2/s)	1.20E-06
Solubility (mg/l)	3.60E+05
Vapor pressure (mmHg)	0.0
KOC (L/kg).	0.0
Henry's Law coefficient (-).	0.0
Molecular weight (g/mol).	0.0
Degradation rate, saturated zone (1/d).	0.0
Degradation rate, vadose zone (1/d).	0.0

Source Concentrations:

Source conc. for unsaturated zone model (mg/kg). 5.12E+02