1R - 293

REPORTS

DATE:

2003

Larson & Associates, Inc.
Environmental Consultants

May 14, 2003

RECEIVED
MAY 16 2003
ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

VIA FACSIMILE: (505) 393-0720

Mr. Paul R. Sheeley
New Mexico Oil Conservation Division
1625 N. French Drive
Hobbs, New Mexico 88240

Re: Soil and Groundwater Sample Results from Soil Boring BH-14, Former M^cKinley Lease Production Facility, UL A, Section 30, Township 18 South, Range 38 East, Lea County, New Mexico

Dear Mr. Sheeley:
ChevronTexaco Exploration and Production Company (ChevronTexaco), as successor to Texaco Exploration and Production Inc. (Texaco), has retained Larson and Associates, Inc. (LA) to supervise remediation of soil at a former oilfield production facility (Site) once operated by Texaco on the McKinley Lease in Unit Letter A (NE/4 NE/4), Section 30, Township 18 South, Range 38 East, Lea County, New Mexico. Figure 1 presents a location and topographic map.

Soil sample results from excavated areas and from soil boring BH-13 were submitted to the New Mexico Oil Conservation Division (NMOCD) on April 7, 2003. A verbal request was made by the NMOCD on April 28, 2003, to provide additional soil samples from the soil boring, as well as a groundwater sample.

Soil Boring
On April 30, 2003, soil boring BH-14 was drilled approximately five feet west of the BH-13 location. The boring was drilled by Scarborough Drilling, Inc. of Lamesa, Texas, utilizing an air rotary drilling rig. Figure 2 shows the location of excavations (Holes #1, 2 and 3) and soil borings BH-1 through BH-14. BH-12 is located north of the Site and is not shown on Figure 2. Appendix A provides a log of borehole BH-14.

Soil samples were collected at ground surface, and approximately every five (5) feet below ground surface (bgs), thereafter, using a split-spoon sampler. The split-spoon sampler was thoroughly washed between sample events. Drill cuttings were placed on the ground adjacent to the boring. The soil samples were placed in clean glass sample jars, labeled, chilled in an ice chest, and delivered under chain-of-custody control to Environmental Lab of Texas I, Ltd., located in Odessa, Texas. A portion of each sample was also placed in a clean glass sample jar for headspace analysis. The headspace jars were filled approximately ¾ full, and a layer of aluminum foil was placed over the

opening of the jar before replacing the cap. The headspace samples were allowed to reach ambient temperature before a RAE Instruments, Model 2000 photoionization detector (PID) was used to measure the concentration of organic vapors in the headspace of the sample jars. The PID probe was inserted into the headspace of the sample jars (through the aluminum foil), and the concentration of organic vapors was displayed by the instrument in parts per million (ppm). The PID was calibrated to 100.1 ppm isobutylene prior to obtaining headspace readings.

The NMOCD allows a PID measurement of less than 100 ppm to be used as a substitute for laboratory analysis of benzene and total benzene, toluene, ethylbenzene and xylenes (collectively referred to as BTEX). However, the PID measurement cannot be used as a substitute for total petroleum hydrocarbon (TPH) analysis by a laboratory. Samples from the surface and approximately every five (5) feet bgs were analyzed for chloride, and for TPH by EPA method SW-846-8015 for gasoline range organics (GRO) and diesel range organics (DRO).

Soil Boring Results

All samples collected from BH-14 exhibited a total TPH of less than ten (<10.0) milligrams per kilogram (mg/kg) except the sample from approximately 25-26 feet bgs, which resulted in a total TPH concentration of 1,053 mg/kg. All samples collected from BH-14 exhibited a chloride concentration less than the New Mexico Water Quality Control Comission (NMWQCC) standard of 250 mg/kg. Table 1 presents a summary of headspace, chloride and TPH analyses of soil samples from BH-14. Figure 2 shows the location of BH-14. Appendix B provides laboratory and chain-of-custody documentation. Appendix C presents copies of the field notes.

The borehole was advanced to a total depth of 61 feet bgs (approximately 13 feet into groundwater), covered, and allowed to remain open overnight to allow the groundwater to reach a static level. On May 1, 2003, the water level was measured at 52.5 feet below ground surface, using a Heron interface probe. By lowering a dedicated disposable polyethylene bailer into the open borehole, approximately four gallons of water was purged prior to obtaining a groundwater sample. The groundwater sample was carefully poured into laboratory-prepared containers, labeled, immediately chilled in an ice chest, and transferred under chain-of-custody control to Environmental Lab of Texas I, Ltd., in Odessa, Texas. A duplicate sample was collected by the NMOCD.

The groundwater sample was analyzed for chloride, and for BTEX by EPA method SW-8021B/5030. All BTEX constituents, except p/m xylene (0.002 milligrams per liter), were reported below detection limits. The NMWQCC human health standard for xylene is 0.62 mg/L. Chloride was reported at 155 mg/L. Table 2 provides a summary of

groundwater analytical results. Appendix B provides laboratory and chain-of-custody documentation.

The boring was filled with bentonite chips and hydrated with potable water upon completion of groundwater sampling activities.

Approximately 10,000 yd^3 of clean soil is stockpiled at the Site, awaiting backfilling of the excavations. ChevronTexaco requests the NMOCD allow it to fill the excavations. A final letter will be submitted to the NMOCD upon completion.

Per our conversation of May 9, 2003, it is noted that a bluish-gray tinted area of siltstone was encountered in the excavated area to the north of Hole #2, at a depth of approximately 19 to 29 feet bgs. The tinted siltstone is visible in Figure 4 of the April 7, 2003 report previously submitted to the NMOCD. All areas of tinted siltstone were sampled, and results were all below the recommended remediation action level of 100 ppm for this Site. Sample locations and analytical information can be found in the April 7, 2003 report.

Please call Mr. Scott Toner with ChevronTexaco at (915) 687-7318 or myself at (915) 687-0901 if you have questions.

Sincerely,
Larson and Associates, Inc.

Cindy K Crain
Geologist

Encl.

cc: Scott Toner, ChevronTexaco
William Olson, OCD Hydrologist

TABLES

Table 1: Summary of Headspace and Laboratory Analysis of Soil Samples
Texaco Exploration and Production Inc., McKinley Lease
NE/4, NE/4, Section 30, Township 18 South, Range 38 East
Lea County, New Mexico

Borehole Number	Sample Date	Sample Depth (feet BGS)	PID (ppm)	GRO C6-C12 mg/kg	DRO >C12-C35 mg/kg	TPH (C6-C35) mg/kg	Chloride mg/kg
RRAL						**100**	**250**
BH-13	**12/5/2002**	0-1	1	<10.0	<10.0	<10.0	—
		10-11	1	<10.0	<10.0	<10.0	—
		20-21	6.1	<10.0	**190.0**	**190.0**	—
		30-31	5.5	<10.0	<10.0	<10.0	—
		50-51	3.1	<10.0	<10.0	<10.0	—
BH-14	**4/30/2003**	0-1	0.1	<10.0	<10.0	<10.0	<20.0
		5-6	0.3	<10.0	<10.0	<10.0	<20.0
		10-11	0.1	<10.0	<10.0	<10.0	160.0
		15-16	0.1	<10.0	<10.0	<10.0	88.6
		20-21	0.3	<10.0	<10.0	<10.0	142.0
		25-26	58.7	**199.0**	**854.0**	**1053.0**	35.4
		30-31	7.6	<10.0	<10.0	<10.0	<20.0
		35-36	13.0	<10.0	<10.0	<10.0	<20.0
		40-41	4.8	<10.0	<10.0	<10.0	<20.0
		45-46	0.1	<10.0	<10.0	<10.0	29.5
		50-51	0.1	<10.0	<10.0	<10.0	29.5
		55-56	0.1	<10.0	<10.0	<10.0	35.4

Notes: All analyses performed by Environmental Lab of Texas, Inc., Midland, Texas
1. BGS: Depth in feet below ground surface
2. PID: Photoionization detector
3. ppm: Parts per million
4. GRO: Gasoline-range organics
5. DRO: Diesel-range organics
6. TPH: Total petroleum hydrocarbons (Sum of GRO + DRO)
7. mg/kg Milligrams per kilogram
8. —: No data available
9. <: Below method detection limit
10. RRAL: NMOCD Recommended Remediation

Table 2: Summary of BTEX and Chloride Analysis of Groundwater Samples
Texaco Exploration and Production Inc., McKinley Lease
NE/4, NE/4, Section 30, Township 18 South, Range 38 East
Lea County, New Mexico

Well Number	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethyl benzene (mg/L)	p/m Xylene (mg/L)	o-Xylene (mg/L)	Total BTEX (mg/L)	Chloride (mg/L)
BH-14	05/01/03	<0.001	<0.001	<0.001	0.002	<0.001	<0.006	155.0

Notes: Analyses performed by Environmental Lab of Texas I, Ltd., Odessa, Texas

1. mg/L: Concentration in milligrams per liter
2. <: Concentration below test method detection limit

FIGURES

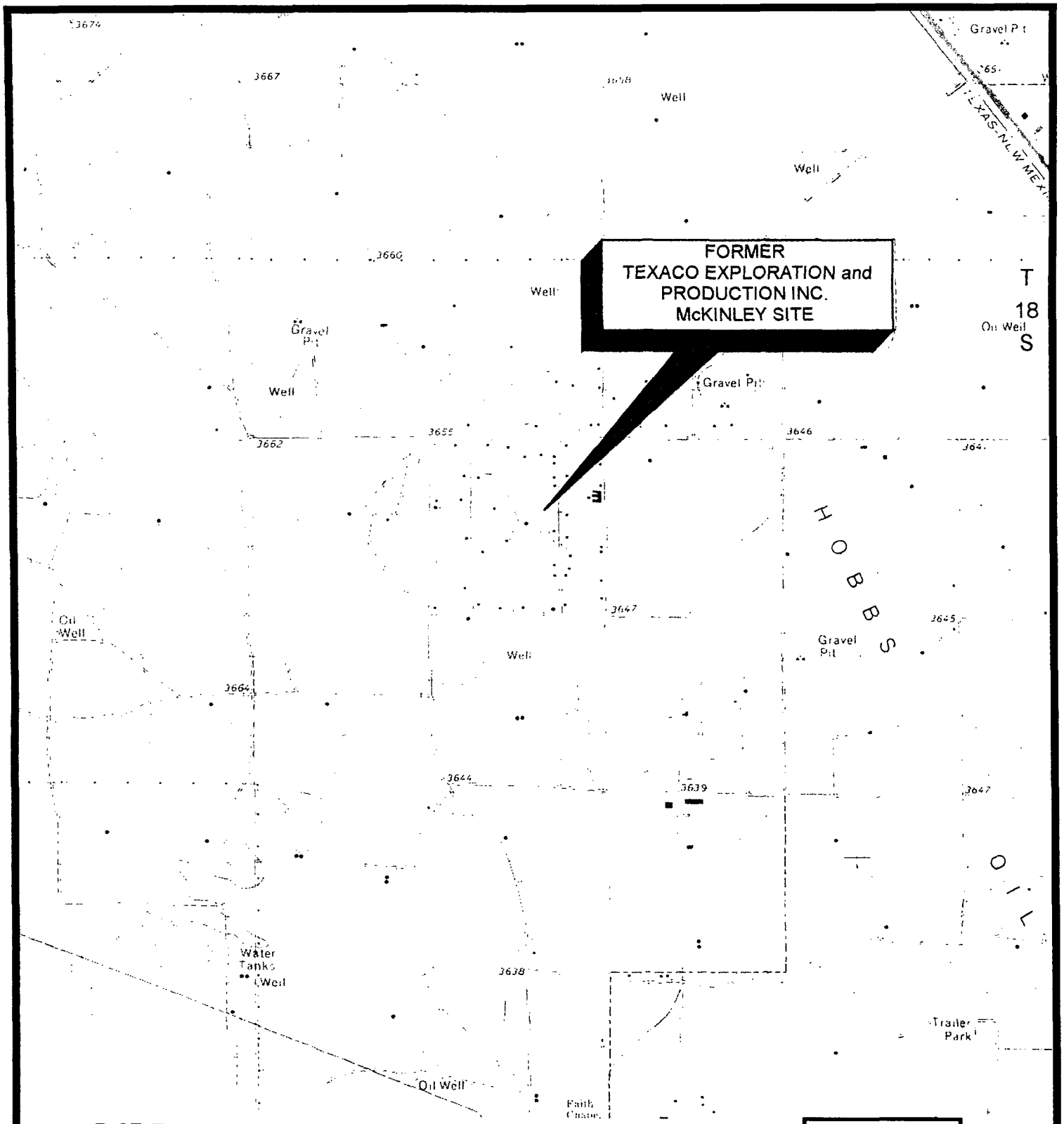


FIGURE #1

LEA COUNTY, NEW MEXICO

TEXACO EXPLORATION and PRODUCTION, INC.

McKINLEY LEASE

NW/4, SE/4, SECTION 30, T18S, R38E

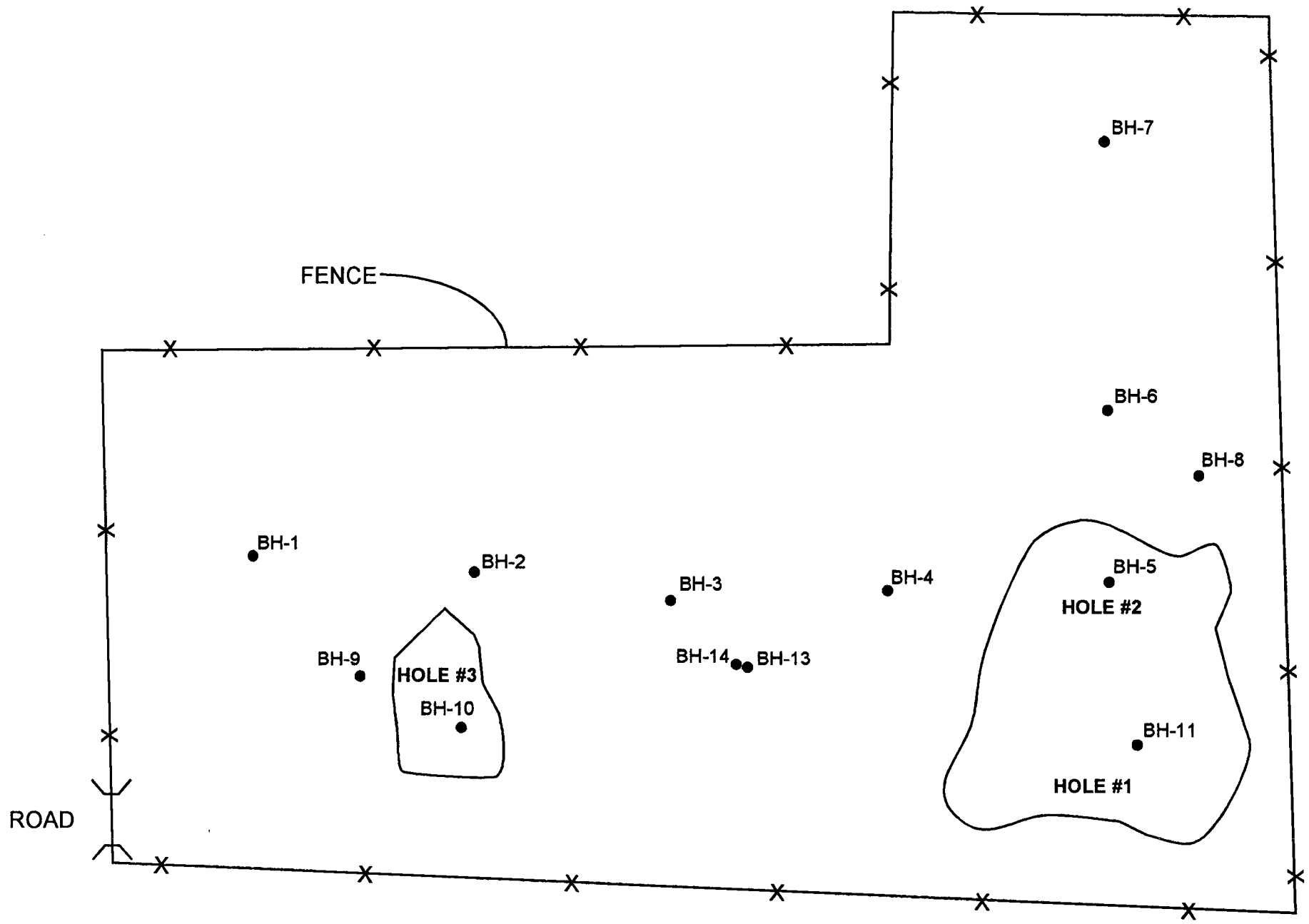
TOPOGRAPHIC MAP

TAKEN FROM U.S.G.S.
HOBBS WEST, N. MEX. 1979
7.5' QUADRANGLES

SCALE: 1"=2000'

DATE:	4/22/01
NAME:	
FILE:	2-001

Larson & Associates, Inc.
Environmental Consultants



NORTH

0 50 100

SCALE in FEET

LEGEND

BH-13
● SOIL BORING LOCATION

FIGURE #2

LEA COUNTY, NEW MEXICO

TEXACO EXPLORATION and PRODUCTION INC.

McKINLEY LEASE

NE/4, NE/4, SEC. 30, T18S, R38E

EXCAVATION DRAWING and BOREHOLE LOCATIONS

DATE: 04/01/03

NAME:

FILE:

Larson & Associates, Inc.
Environmental Consultants

APPPENDIX A

BORING LOG

Client: Texaco E&P

Project: Davis Property (McKinley Lease)

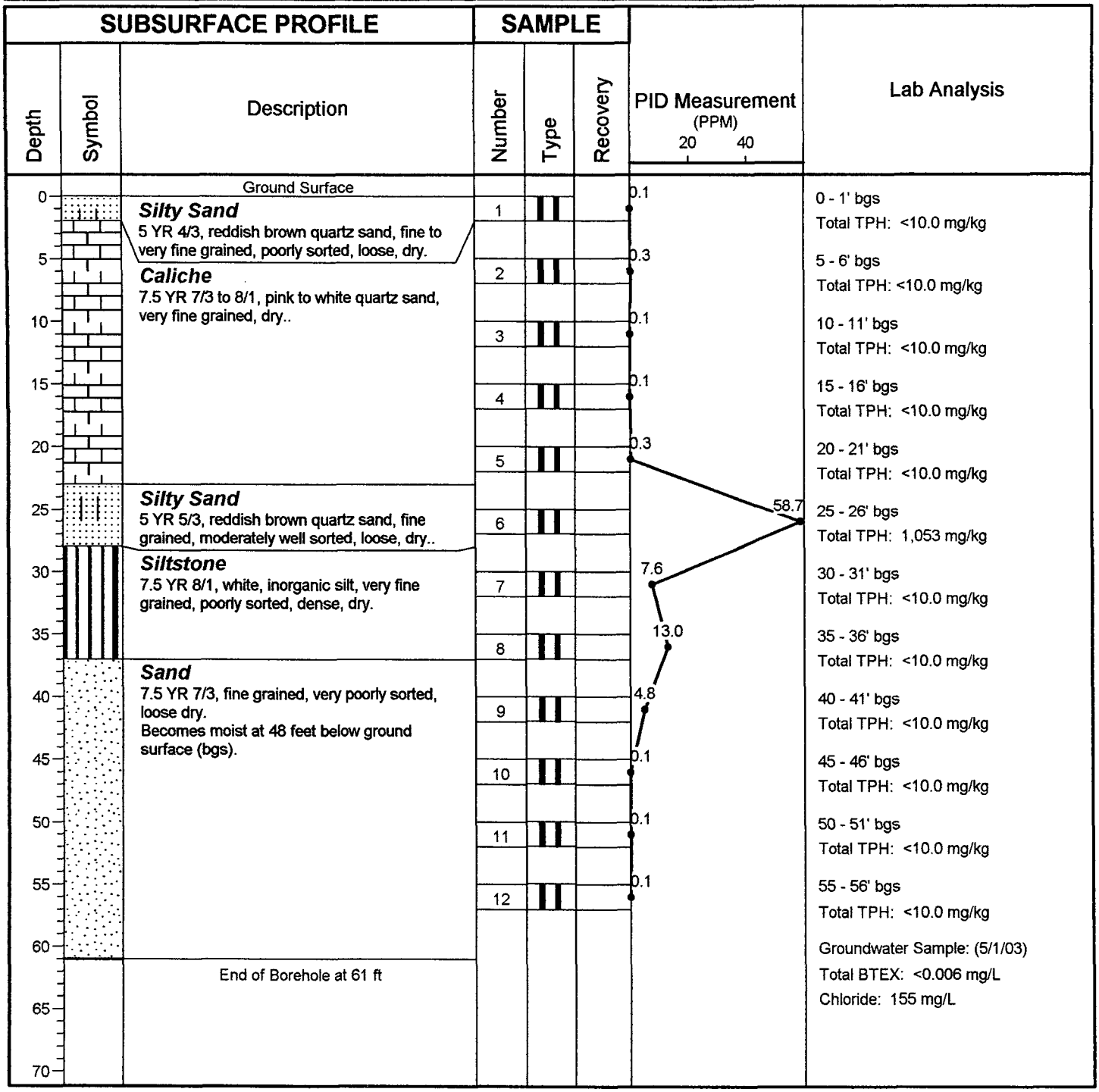
Project No: 2-0100

Location: SW/4, NE/4, Section 30, T18S, R38E, Lea Co., NM

Log of Borehole: BH-14

Geologist: Cindy K. Crain

Page: 1 of 1



Drilling Method: Air Rotary

Date Drilled: 4/30/03

Hole Size: 5 5/8"

Larson and Associates, Inc.
507 North Marienfeld St., Ste. 202
Midland, Texas 79701
(915) 687-0901

Checked by: CKC

Drilled by: Scarborough Drilling, Inc.

APPENDIX B

LABORATORY REPORT AND CHAIN-OF-CUSTODY DOCUMENTATION

ANALYTICAL REPORT

Prepared for:

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Project:	Texaco McKinley
PO#:	2-0100
Order#:	G0306388
Report Date:	05/02/2003

Certificates
US EPA Laboratory Code TX00158

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710
915-687-0456

Order#: G0306388
Project:
Project Name: Texaco McKinley
Location:

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
0306388-01	BH-14 (0-1')	SOIL	4/30/03 11:15	4/30/03 16:50	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 4 C		
0306388-02	BH-14 (5-6')	SOIL	4/30/03 11:20	4/30/03 16:50	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 4 C		
0306388-03	BH-14(10-11')	SOIL	4/30/03 11:29	4/30/03 16:50	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 4 C		
0306388-04	BH-14 (15-16')	SOIL	4/30/03 11:32	4/30/03 16:50	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 4 C		
0306388-05	BH-14 (20-21')	SOIL	4/30/03 11:49	4/30/03 16:50	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 4 C		
0306388-06	BH-14 (25-26')	SOIL	4/30/03 12:05	4/30/03 16:50	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 4 C		
0306388-07	BH-14 (30-31')	SOIL	4/30/03 12:10	4/30/03 16:50	4 oz Glass	Ice
	Lab Testing:	**Rejected:** No		**Temp:** 4 C		

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710
915-687-0456

Order#: G0306388
Project:
Project Name: Texaco McKinley
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The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
	8015M Chloride					
0306388-08	BH-14 (35-36')	SOIL	4/30/03 12:18	4/30/03 16:50	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 4 C		
0306388-09	BH-14 (40-41')	SOIL	4/30/03 12:28	4/30/03 16:50	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 4 C		
0306388-10	BH-14 (45-46')	SOIL	4/30/03 12:41	4/30/03 16:50	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 4 C		
0306388-11	BH-14 (50-51')	SOIL	4/30/03 12:54	4/30/03 16:50	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 4 C		
0306388-12	BH-14 (55-56')	SOIL	4/30/03 13:08	4/30/03 16:50	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 4 C		

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0306388
Project:
Project Name: Texaco McKinley
Location:

Lab ID: 0306388-01
Sample ID: BH-14 (0-1')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		5/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	99%	70	130
1-Chlorooctadecane	96%	70	130

Lab ID: 0306388-02
Sample ID: BH-14 (5-6')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		5/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	104%	70	130
1-Chlorooctadecane	102%	70	130

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0306388
Project:
Project Name: Texaco McKinley
Location:

Lab ID: 0306388-03
Sample ID: BH-14(10-11')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		5/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	83%	70	130
1-Chlorooctadecane	75%	70	130

Lab ID: 0306388-04
Sample ID: BH-14 (15-16')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		5/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	85%	70	130
1-Chlorooctadecane	79%	70	130

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0306388
Project:
Project Name: Texaco McKinley
Location:

Lab ID: 0306388-05
Sample ID: BH-14 (20-21')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		5/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	89%	70	130
1-Chlorooctadecane	81%	70	130

Lab ID: 0306388-06
Sample ID: BH-14 (25-26')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		5/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	199	10.0
DRO, >C12-C35	854	10.0
TOTAL, C6-C35	1,053	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	98%	70	130
1-Chlorooctadecane	85%	70	130

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0306388
Project:
Project Name: Texaco McKinley
Location:

Lab ID: 0306388-07
Sample ID: BH-14 (30-31')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		5/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	76%	70	130
1-Chlorooctadecane	71%	70	130

Lab ID: 0306388-08
Sample ID: BH-14 (35-36')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		5/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	86%	70	130
1-Chlorooctadecane	81%	70	130

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0306388
Project:
Project Name: Texaco McKinley
Location:

Lab ID: 0306388-09
Sample ID: BH-14 (40-41')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		5/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	88%	70	130
1-Chlorooctadecane	82%	70	130

Lab ID: 0306388-10
Sample ID: BH-14 (45-46')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		5/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	83%	70	130
1-Chlorooctadecane	77%	70	130

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0306388
Project:
Project Name: Texaco McKinley
Location:

Lab ID: 0306388-11
Sample ID: BH-14 (50-51')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		5/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	81%	70	130
1-Chlorooctadecane	74%	70	130

Lab ID: 0306388-12
Sample ID: BH-14 (55-56')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		5/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	81%	70	130
1-Chlorooctadecane	72%	70	130

Approval: Raland K Tuttle 5-02-03
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0306388
Project:
Project Name: Texaco McKinley
Location:

Lab ID: 0306388-01
Sample ID: BH-14 (0-1')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	<20.0	mg/kg	1	20	9253	5/1/03	CK

Lab ID: 0306388-02
Sample ID: BH-14 (5-6'0

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	<20.0	mg/kg	1	20	9253	5/1/03	CK

Lab ID: 0306388-03
Sample ID: BH-14(10-11')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	160	mg/kg	1	20	9253	5/1/03	CK

Lab ID: 0306388-04
Sample ID: BH-14 (15-16')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	88.6	mg/kg	1	20	9253	5/1/03	CK

Lab ID: 0306388-05
Sample ID: BH-14 (20-21')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	142	mg/kg	1	20	9253	5/1/03	CK

Lab ID: 0306388-06
Sample ID: BH-14 (25-26')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	5/1/03	CK

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0306388
Project:
Project Name: Texaco McKinley
Location:

Lab ID: 0306388-07
Sample ID: BH-14 (30-31')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	<20.0	mg/kg	1	20	9253	5/1/03	CK

Lab ID: 0306388-08
Sample ID: BH-14 (35-36')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	<20.0	mg/kg	1	20	9253	5/1/03	CK

Lab ID: 0306388-09
Sample ID: BH-14 (40-41')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	<20.0	mg/kg	1	20	9253	5/1/03	CK

Lab ID: 0306388-10
Sample ID: BH-14 (45-46')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	29.5	mg/kg	1	20	9253	5/1/03	CK

Lab ID: 0306388-11
Sample ID: BH-14 (50-51')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	29.5	mg/kg	1	20	9253	5/1/03	CK

Lab ID: 0306388-12
Sample ID: BH-14 (55-56')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	5/1/03	CK

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN	**Order#:** G0306388
LARSON AND ASSOCIATES, INC.	**Project:**
P.O. BOX 50685	**Project Name:** Texaco McKinley
MIDLAND, TX 79710	**Location:**

Approval: _____ 05/02/03
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8015M

Order#: G0306388

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0005404-02			<10.0		
MS SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
TOTAL, C6-C35-mg/kg	0306388-04	0	952	775	81.4%	
MSD SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
TOTAL, C6-C35-mg/kg	0306388-04	0	952	768	80.7%	0.9%
SRM SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
TOTAL, C6-C35-mg/kg	0005404-05		1,000	858	85.8%	

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

Test Parameters

Order#: G0306388

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg	0005391-01			<20.0		
MS SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/kg	0306371-01	88.6	500	638	109.9%	
MSD SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/kg	0306371-01	88.6	500	603	102.9%	5.6%
SRM SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/kg	0005391-04		5000	5050	101.%	

CHAIN—OF—CUSTODY RECORD

Larson & Associates, Inc.
Environmental Consultants
507 N. Marienfeld, Ste. 202 • Midland, TX 79701
Fax: 915-687-0456
915-687-0901

CLIENT NAME: Texaco

SITE MANAGER: Cindy Crain

PROJECT NO.: 2-0100

PROJECT NAME: McKinley

PAGE 1 OF 1

LAB. PO #

DATE	TIME	WATER	SOIL	OTHER	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	PARAMETERS/METHOD NUMBER: TPH 8015M	PARAMETERS/METHOD NUMBER: Chloride	LAB. I.D. NUMBER (LAB USE ONLY)	REMARKS (I.E., FILTERED, UNFILTERED, PRESERVED, UNPRESERVED, GRAB COMPOSITE)
4/30/03	1115		✓		BH-14 (0-1')	1	✓	✓	0306388-01	
"	1120		✓		" (5-6')	1	✓	✓	02	
"	1129		✓		" (10-11')	1	✓	✓	03	
"	1132		✓		" (15-16')	1	✓	✓	04	
"	1149		✓		" (20-21')	1	✓	✓	05	
"	1205		✓		" (25-26')	1	✓	✓	06	
"	1210		✓		" (30-31')	1	✓	✓	07	
"	1218		✓		" (35-36')	1	✓	✓	08	
"	1228		✓		" (40-41')	1	✓	✓	09	
"	1241		✓		" (45-46')	1	✓	✓	10	
"	1254		✓		" (50-51')	1	✓	✓	11	
"	1308		✓		" (55-56')	1	✓	✓	12	
"	1323		✓		"					

SAMPLED BY: (Signature) Cindy Crain
DATE: 4/30/03
TIME: 1330

RELINQUISHED BY: (Signature)
DATE:
TIME:

RECEIVED BY: (Signature)
DATE:
TIME:

RELINQUISHED BY: (Signature) Cindy Crain
DATE: 4/30/03
TIME: 1650

RECEIVED BY: (Signature)
DATE:
TIME:

SAMPLE SHIPPED BY: (Circle)
FEDEX BUS AIRBILL #:
HAND DELIVERED UPS OTHER:

COMMENTS:

TURNAROUND TIME NEEDED

WHITE – RECEIVING LAB
YELLOW – RECEIVING LAB (TO BE RETURNED TO LA AFTER RECEIPT)
PINK – PROJECT MANAGER
GOLD – QA/QC COORDINATOR

RECEIVING LABORATORY: Env. Lab of Texas
ADDRESS:
CITY: STATE: ZIP:
CONTACT: PHONE:

RECEIVED BY: (Signature)
DATE: 4/30/03 TIME: 16:50

SAMPLE CONDITION WHEN RECEIVED: 4.0 °C

LA CONTACT PERSON:

SAMPLE TYPE: Soil

ANALYTICAL REPORT

Prepared for:

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Project:	Texaco/ Mckinley
PO#:	
Order#:	G0306397
Report Date:	05/07/2003

Certificates
US EPA Laboratory Code TX00158

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710
915-687-0456

Order#: G0306397
Project: 2-0100
Project Name: Texaco/ Mckinley
Location: None Given

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
0306397-01	BH-14	WATER	5/1/03 13:05	5/1/03 17:05	See COC	See COC

Lab Testing:

Rejected: No

Temp: 4 C

8021B/5030 BTEX
Chloride

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0306397
Project: 2-0100
Project Name: Texaco/ Mckinley
Location: None Given

Lab ID: 0306397-01
Sample ID: BH-14

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0005454-02		5/6/03 12:30	1	1	CK	8021B

Parameter	Result mg/L	RL
Benzene	**<0.001**	0.001
Toluene	**<0.001**	0.001
Ethylbenzene	**<0.001**	0.001
p/m-Xylene	**0.002**	0.001
o-Xylene	**<0.001**	0.001

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	98%	80	120
Bromofluorobenzene	90%	80	120

Approval: Raland K Tuttle 5-08-03
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN		Order#:	G0306397
LARSON AND ASSOCIATES, INC.		Project:	2-0100
P.O. BOX 50685		Project Name:	Texaco/ Mckinley
MIDLAND, TX 79710		Location:	None Given

Lab ID: 0306397-01
Sample ID: BH-14

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	155	mg/L	1	5.00	9253	5/2/03	SB

Approval: Raland K Tuttle 5-08-03
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

RL = Reporting Limit **N/A = Not Applicable**

ENVIRONMENTAL LAB OF TEXAS I, LTD. **12600 West I-20 East, Odessa, TX 79765 Ph: 915-563-1800**

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8021B/5030 BTEX

Order#: G0306397

BLANK WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-mg/L	0005454-02			<0.001		
Toluene-mg/L	0005454-02			<0.001		
Ethylbenzene-mg/L	0005454-02			<0.001		
p/m-Xylene-mg/L	0005454-02			<0.001		
o-Xylene-mg/L	0005454-02			<0.001		
CONTROL WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Benzene-mg/L	0005454-03		0.1	0.105	105.%	
Toluene-mg/L	0005454-03		0.1	0.098	98.%	
Ethylbenzene-mg/L	0005454-03		0.1	0.097	97.%	
p/m-Xylene-mg/L	0005454-03		0.2	0.192	96.%	
o-Xylene-mg/L	0005454-03		0.1	0.093	93.%	
CONTROL DUP WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Benzene-mg/L	0005454-04		0.1	0.100	100.%	4.9%
Toluene-mg/L	0005454-04		0.1	0.098	98.%	0.%
Ethylbenzene-mg/L	0005454-04		0.1	0.096	96.%	1.%
p/m-Xylene-mg/L	0005454-04		0.2	0.199	99.5%	3.6%
o-Xylene-mg/L	0005454-04		0.1	0.096	96.%	3.2%
SRM WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Benzene-mg/L	0005454-05		0.1	0.103	103.%	
Toluene-mg/L	0005454-05		0.1	0.100	100.%	
Ethylbenzene-mg/L	0005454-05		0.1	0.095	95.%	
p/m-Xylene-mg/L	0005454-05		0.2	0.195	97.5%	
o-Xylene-mg/L	0005454-05		0.1	0.092	92.%	

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

Test Parameters

Order#: G0306397

BLANK WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/L	0005407-01			<5.00		
MS WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/L	0306381-01	301	500	798	99.4%	
MSD WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/L	0306381-01	301	500	789	97.6%	1.1%
SRM WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/L	0005407-04		5000	4960	99.2%	

CHAIN—OF—CUSTODY RECORD

Larson & Associates, Inc.
Environmental Consultants
Fax: 915-687-0456
915-687-0901
507 N. Marienfeld, Ste. 202 • Midland, TX 79701

CLIENT NAME: Texaco

SITE MANAGER: Cindy Crain

PROJECT NO.: 2-0100

PROJECT NAME: McKinley

PAGE 1 OF 1

LAB. PO #

DATE	TIME	WATER	SOIL	OTHER	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	BTEX 8021B	Chloride							LAB. I.D. NUMBER (LAB USE ONLY)	REMARKS (I.E., FILTERED, UNFILTERED, PRESERVED, UNPRESERVED, GRAB COMPOSITE)
5/1/03	1305	✓			BH-14	3	✓	✓							0306397-01	

40ml glass (2) 1 HDPE (1) w/HCl

SAMPLED BY: (Signature) Cindy Crain DATE: 5/1/03 TIME: 1305

RELINQUISHED BY: (Signature) DATE: TIME:

RECEIVED BY: (Signature) DATE: TIME:

RELINQUISHED BY: (Signature) Cindy Crain DATE: 5/1/03 TIME: 1705

RECEIVED BY: (Signature) DATE: TIME:

SAMPLE SHIPPED BY: (Circle) FEDEX BUS AIRBILL #: HAND DELIVERED (circled) UPS OTHER:

COMMENTS:

TURNAROUND TIME NEEDED

WHITE – RECEIVING LAB
YELLOW – RECEIVING LAB (TO BE RETURNED TO LA AFTER RECEIPT)
PINK – PROJECT MANAGER
GOLD – QA/QC COORDINATOR

RECEIVING LABORATORY: ELOT
ADDRESS: 12600 W I-20 E
CITY: Odessa STATE: TX ZIP: 7976
CONTACT: PHONE:

RECEIVED BY: (Signature) [signature] DATE: 5-01-03 TIME: 17:05

SAMPLE CONDITION WHEN RECEIVED: Ice 4°C

LA CONTACT PERSON:

SAMPLE TYPE: Water

APPENDIX C

FIELD NOTES

Wednesday, April 30, 2003

0930 On site to drill BH-14
Scarborough Drlg. arrived on-site
0940 - Jim Davis by site 1000 Paul Sheely & Larry Johnson by site till 11:35
1110 - Began drilling

1240 Calibrated PID to 100.1 ppm
Check Cal Gas = 100.0 ppm

1210 Paul Sheely & Jim Davis on site
1300 Hugh Davis on site

Drilled BH 14 to 60' bgs
Collected samples @ surface and every 5' to 55'.

1330 Covered boring to sit over night and allow groundwater to accumulate in borehole

Wednesday, May 1, 2003

1200 Arrived on site to sample groundwater @ BH-14

Have notified Paul Sheeley, Hugh Davis and Layne Scarborough to be on-site @ 12:30.

1230 Larry Johnson arrived on site

DTW: 52.5'

Bailed 4.0 gal

1305 Sampled - BTEX, Chlorides