1R - 173

REPORTS

DATE:

10/31/1996

Safety & Environmental Solutions, Inc.

Koch Oil Company

Vertical Extent Investigation Report

Crouch Station

Lea County, New Mexico

Safety & Environmental Solutions, Inc.
703 E. Clinton Suite 103
Hobbs, New Mexico 88240
(505) 397-0510

Table of Contents

I. Physical Description

Safety & Environmental Solutions, Inc. (SES) was engaged with by Koch Oil Company to supply the labor and equipment to perform a vertical extent investigation at the Crouch Station facility located in Section 18 Township 18S, Range 36E, Lea County, New Mexico. (Exhibit A)

The location may be further described as being 2 miles North of state highway 62-180 and 2 ½ miles west of county road. The elevation is approximately 3590 feet above sea level.

II. Background

Crouch Station has two (2) 15,000 barrels storage tanks inside a diked area. Crude oil was released from a hole in a 12" line just south of the west storage tank. (Exhibit B) The vertical extent of the crude oil migration was the subject of this investigation. The **"Guidelines for Remediation of Leaks, Spills and Releases"** *New Mexico Oil Conservation Division* - August 13, 1993 was used to determined the level of TPH and BTEX that would be acceptable for this investigation. The TPH level used in this investigation was 100 ppm and the BTEX level was ≥50 ppm. The ground water depth in this area is approximately 55'. (Exhibit C)The following individuals were present during the investigation.

Wayne Price	New Mexico Oil Conservation Division.
Porter Biffle	Koch Oil Company
Clay Lambert	Koch Oil Company
Dee Whatley	SES
Bob Allen	SES
Gayle Potter	Cardinal Laboratories
Donny Reyza	Harrison Drilling
Noe Garcia	Harrison Drilling
Jesse Partlon	Gandy Corporation

III. Vertical Extent Investigation

On October 25, 1996 SES drilled one bore hole (#1) to a total depth of 40'. Samples were taken every 5' and placed on ice for preservation and transported to Cardinal Laboratories in Hobbs, New Mexico under a chain of custody for TPH, BTEX and Chloride analysis. Field TPH screenings were performed along with PID readings to determine when acceptable TPH and BTEX levels were reach in this bore hole.

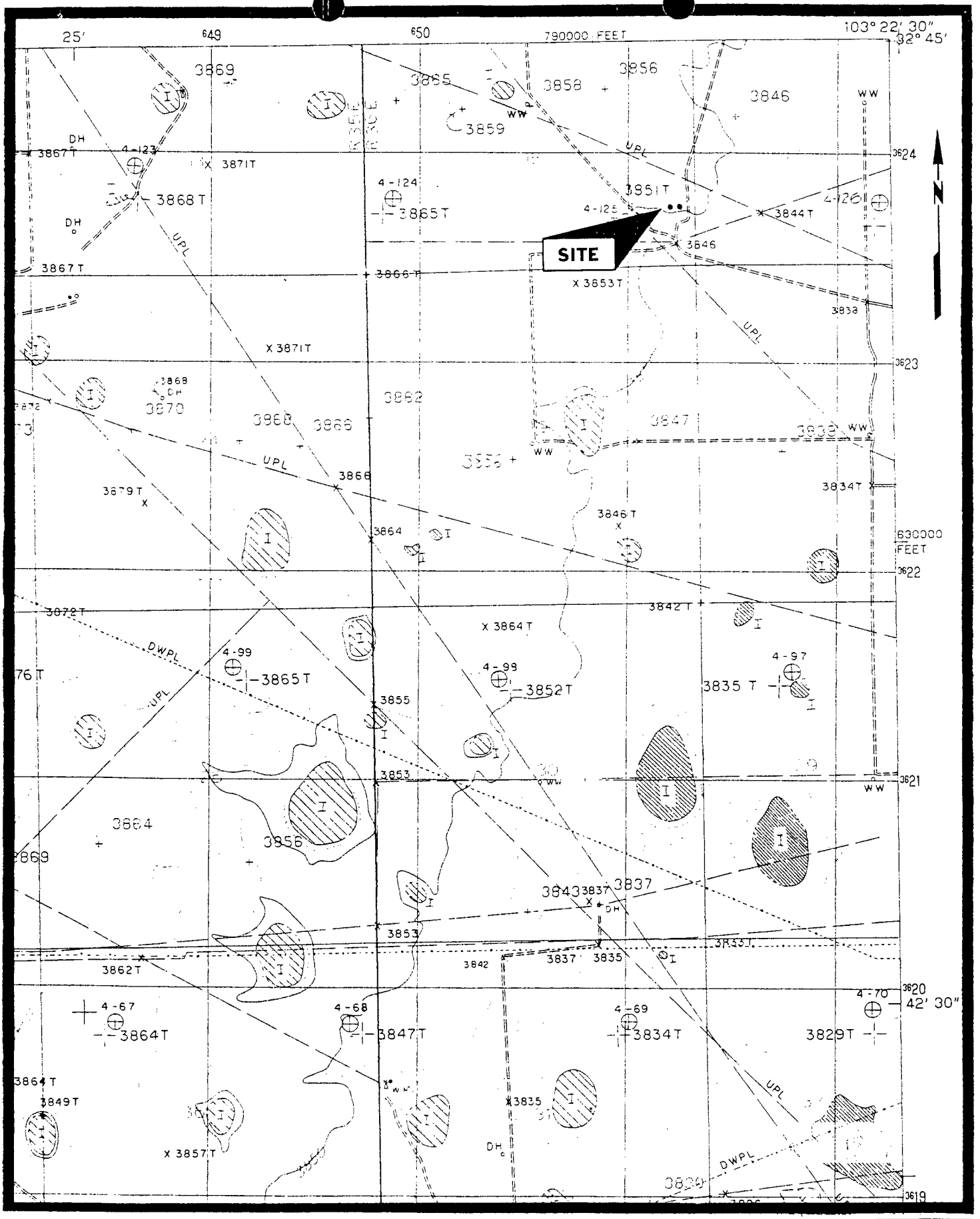
In addition, four bore holes (#2, #3, #4, & #5) were drilled in the southwest, northwest, northeast, and southeast inside corners of the containment dike respectively. The total depth of these holes was 10'. Samples were taken at the 10' level and placed on ice for preservation and transported under the above referenced chain of custody to Cardinal Laboratories for TPH, BTEX and Chloride analysis. (Exhibit D) A background sample of surface soils was obtained approximately 250' north of the fence surrounding Crouch Station. This sample was included in the chain of custody to Cardinal Laboratories.

The analytical results from Cardinal Laboratories determined that the TPH level at a depth of 25' was 76 ppm and no samples below that depth contained TPH levels above 170 ppm. Chloride results showed 160 ppm at 16' and 120 ppm at 35 ' while the remaining samples were < 100 ppm. BTEX results were < 2 ppb at 25' and below. (Exhibit E) Background sample results were 49 ppm TPH and 90 ppm chlorides.

IV. Maps and Figures

Exhibit A	7.5 Minute Quadrangle Maps
Exhibit B	Site Plan
Exhibit C	USGS Water Well Data
Exhibit D	Bore Hole Site Plan Monitor Well Cross-section
Exhibit E	Cardinal Laboratories Analytical Results

Exhibit A



Koch Oil Company	7.5 Minute Quadrangle Map	Safety & Environmental Solutions, Inc. Hobbs, New Mexico

Koch Oil Company	Vicinity Map	Safety & Environmental Solutions, Inc. Hobbs, New Mexico

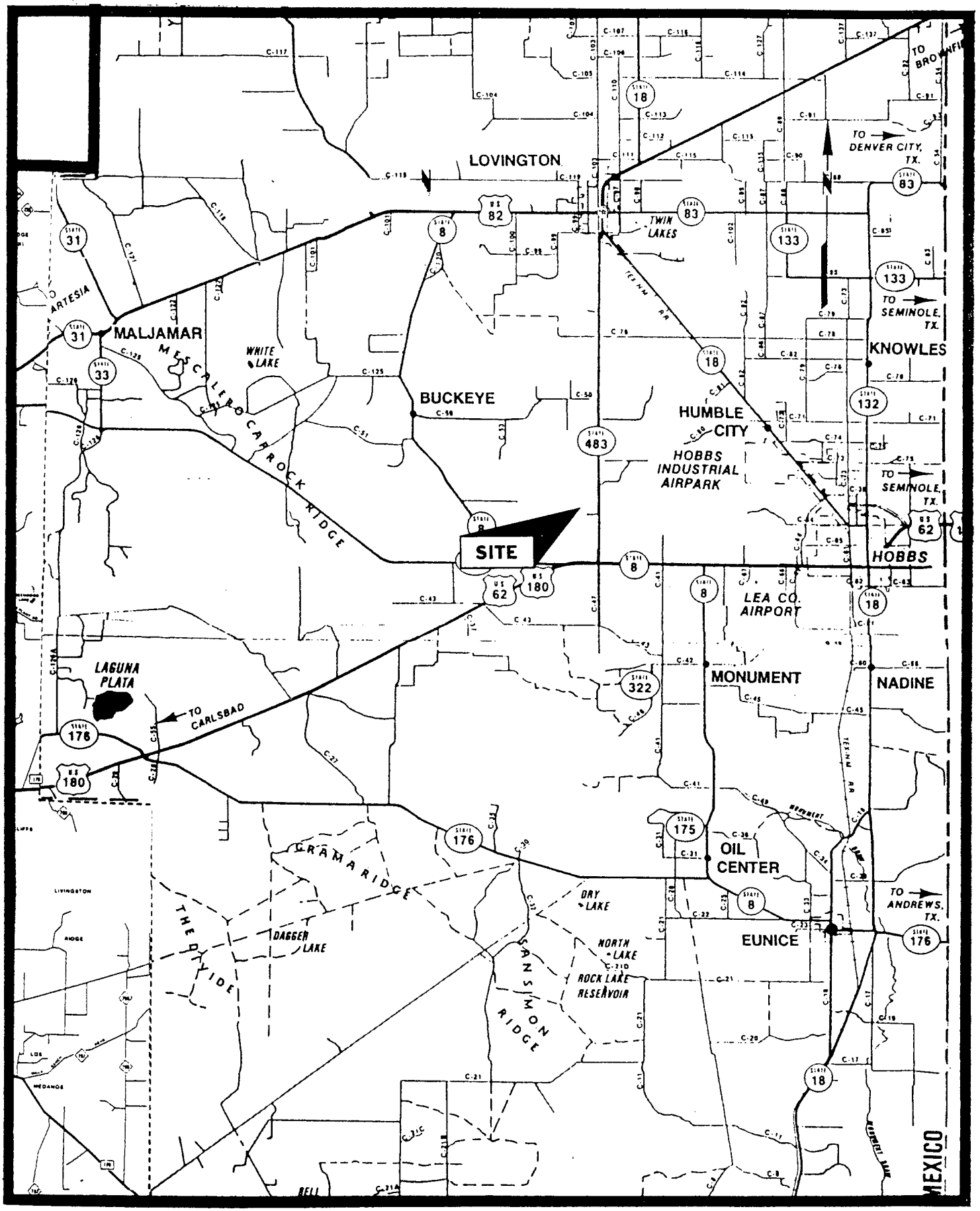
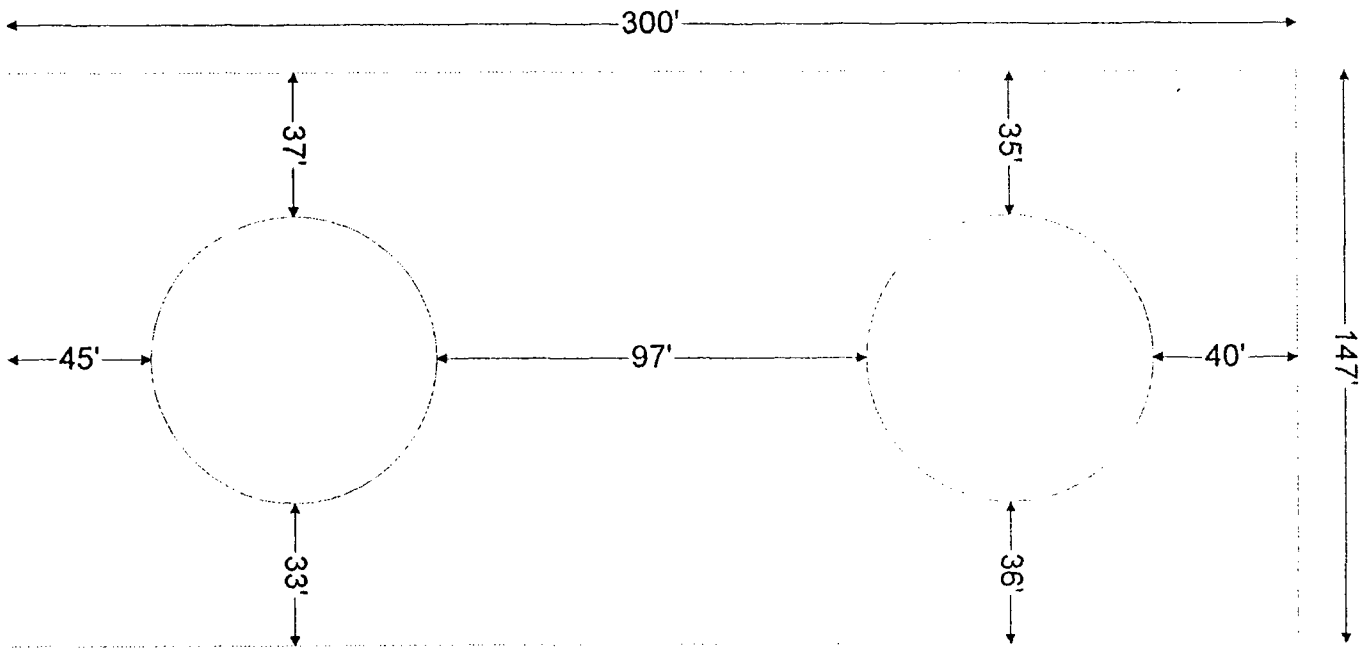


Exhibit B



Koch Oil Company
Crouch Station Site Plan
Safety & Environmental Solutions, Inc. Hobbs, New Mexico

Exhibit C

United States Geological Survey
Water Level Database Search Results

The information included in this report was compiled from a computerized database supplied by the United States Geological Survey in Albuquerque, New Mexico. This report contains the recorded water wells and the latest water level readings on file with the USGS and the New Mexico State Engineer's office.

CODES FOR WATER-LEVEL STATUS

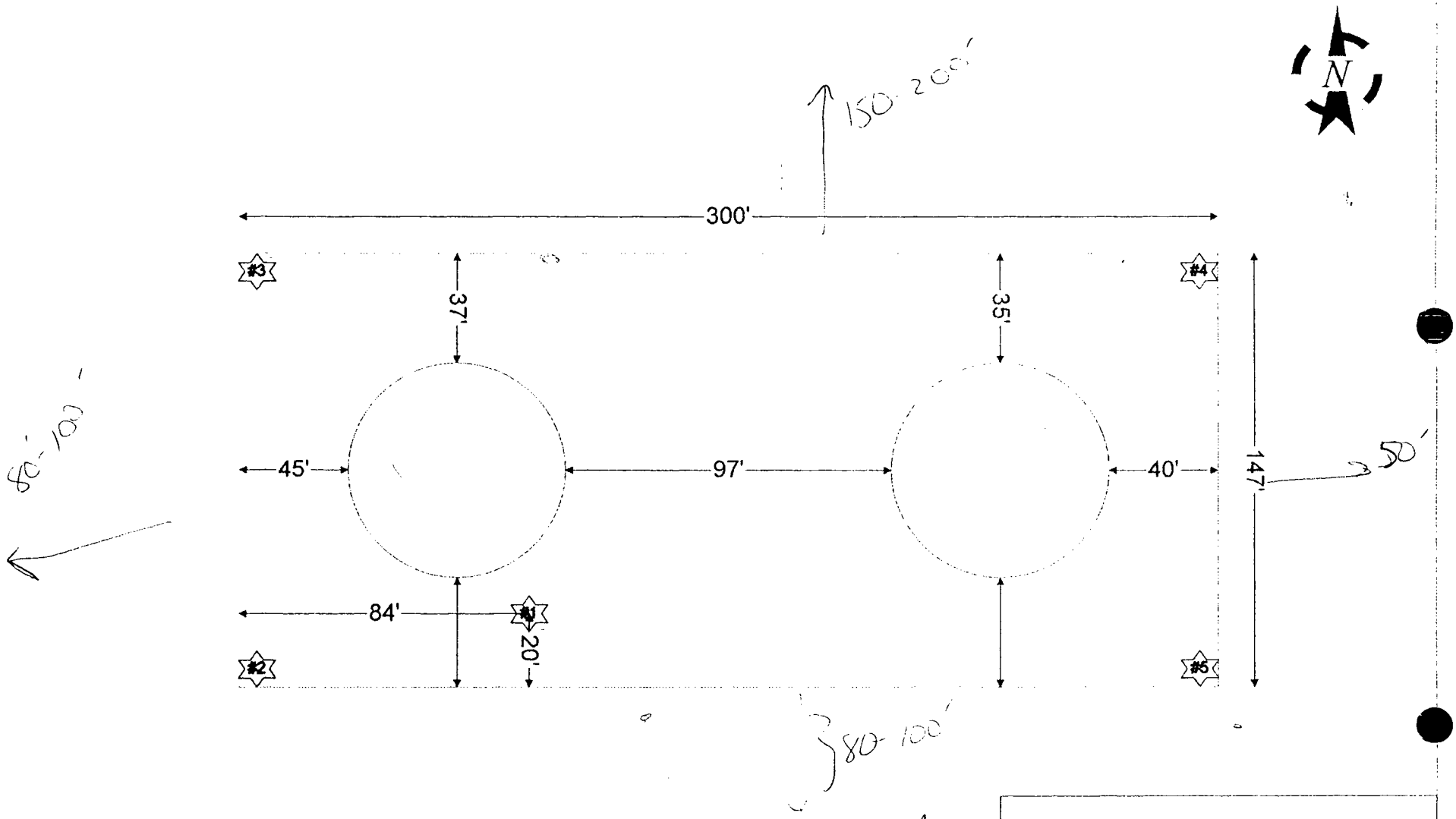
D - The site was dry (no water level is recorded).
E - The site was flowing recently.
F - The site was flowing, but the head could not be measured (no water level is recorded).
G - A nearby site that taps the same aquifer was flowing.
H - A nearby site that taps the same aquifer had been flowing recently.
I - Injector site (recharge water being injected into the aquifer).
J - Injector site monitor (a nearby site that taps the same aquifer is injecting recharge water).
N - The measurements at this site were discontinued.
O - An obstruction was encountered in the well above the water surface (no water level is recorded).
P - The site was being pumped.
R - The site had been pumped recently.
S - A nearby site that taps the same aquifer was being pumped.
T - A nearby site that taps the same aquifer had been pumped recently.
V - A foreign substance was present on the surface of the water.
W - The well was destroyed.
X - The water level was affected by stage in nearby surface water site.
Z - Other conditions that would affect the measured water level (explain in remarks).

If no site status is indicated, the inventoried water-level measurement represents a static level.

Koch Oil Company
Crouch Station
Section 18 T18S R 36E

Location	Date	Water Level/Code	Lat	Long
18S.36E.07.32222	1996-02-07	63.46		
18S.36E.17.32222	1986-01-16	51.20		
18S.36E.18.14444	**1991-03-13**	**57.17**		
18S.36E.19.32242	1986-01-16	54.39		
18S.36E.20.41111	1991-03-13	55.16		
18S.35E.13.14441	1991-04-12	46.00P		
18S.35E.24.111412	1991-03-12	47.12		

Exhibit D



Koch Oil Company
Crouch Station Bore Hole Sampling Site Plan
Safety & Environmental Solutions, Inc. Hobbs, New Mexico

Exhibit E

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS
ATTN: DEE WHATLEY
703 E. CLINTON
HOBBS, NM 88240
FAX TO:

Receiving Date: 10/25/96
Reporting Date: 10/28/96
Project Number: NOT GIVEN
Project Name: CROUCH STATION 4
Project Location: KOCH OIL CROUCH STATION 490

Sampling Date: 10/25/96
Sample Type: SOILS
Sample Condition: COOL & INTACT
Sample Received By: WL
Analyzed By: GP

LAB NUMBER	SAMPLE ID	TPH (ppm)	Cl (ppm)	BENZENE (ppb)	TOLUENE (ppb)	ETHYL BENZENE (ppb)	TOTAL XYLENES (ppb)
ANALYSIS DATE:		10/25/96	10/27/96	10/25/96	10/25/96	10/25/96	10/25/96
H2693-1	1-1 5 FT	65605	120	20700	53900	24800	28100
H2693-2	1-2 10 FT	37958	50	50600	102000	29800	33300
H2693-3	1-3 15 FT	4297	160	1350	11700	9400	121100
H2693-4	1-4 20 FT	327	100	856	1760	986	1060
H2693-5	1-5 25 FT	76	80	<2	<2	<2	11
H2693-6	1-6 30 FT	170	90	<2	<2	<2	<2
H2693-7	1-7 35 FT	113	120	<2	<2	<2	<2
H2693-8	1-8 40 FT	99	80	<2	<2	<2	<2
H2693-9	2-1 10 FT	615	70	<2	217	719	1088
H2693-10	3-1 10 FT	91	70	<2	<2	<2	<2
H2693-11	4-1 10 FT	51	60	<2	<2	<2	<2
H2693-12	5-1 10 FT	139	50	<2	<2	<2	<2
H2693-13	BACKGROUND	49	90	<2	<2	<2	<2
Quality Control		401	105	82.0	79.0	75.7	236
True Value QC		400	100	88.2	85.8	83.2	254
% Accuracy		100	105	92.9	92.0	91.0	92.9
Relative Percent Difference		1.2	1.9	4.9	0.4	0.5	0.8

METHODS: TRPHC - EPA 600/7-79-020, 418.1; BTEX-EPA SW-846-8020
Cl-EPA 600/7-79-020, 325.3

Gayle A. Potter, Chemist

10/28/96
Date

Safety & Environmental Solutions, Inc.

703 E. Clinton, Suite 103, Hobbs, New Mexico 88240
(505)397-0510

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: SESI

Phone #:

FAX #:

Company Name & Address:

Project #:

Project Name: Crouch Station 490

Project Location: Koch Oil Crouch Station 490

Sampler Signature: D. Whitley

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	MATRIX: SOIL	MATRIX: AIR	MATRIX: SLUDGE	MATRIX: OTHER	PRESERVATIVE METHOD: HCL	PRESERVATIVE METHOD: HNO3	PRESERVATIVE METHOD: ICE	PRESERVATIVE METHOD: NONE	PRESERVATIVE METHOD: OTHER	SAMPLING: DATE	SAMPLING: TIME	BTEX 8020/5030	TPH 418.1	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI	Chlorides
W2698-12	12-S-1-10Ft	1			X						X			10-25-96	4:00pm	X	X							X
-13	13-Background	1			X						X			" "	" "	X	X							X

Relinquished by:	Date:	Time:	Received by:
D. Whitley	10/25/96	4:00 P	
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DYKE BROWNING
703 E. CLINTON
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/01/96
Reporting Date: 11/04/96
Project Number: NOT GIVEN
Project Name: CROUCH STATION (KOCH)
Project Location: SOUTH OF LOVINGTON, NM

Sampling Date: 11/01/96
Sample Type: SOIL
Sample Condition: COOL, INTACT
Sample Received By: BC
Analyzed By: GP

LAB NUMBER	SAMPLE ID	REACTIVITY Sulfide (ppm)	REACTIVITY Cyanide (ppm)	CORROSIVITY (pH)	IGNITABILITY
ANALYSIS DATE:		10/5/96	10/5/96	10/4/96	10/4/96
H2695-15	RANDOM COMP. SPOILS PILE	<5	<5	7.40	Nonflammable
Quality Control		NR	NR	7.02	NR
True Value QC		NR	NR	7.00	NR
% Accuracy		NR	NR	100	NR
Relative Percent Difference		NR	NR	0.6	NR

METHOD: EPA SW 846-7.3, 7.2, 1010

Chemist

11/04/96
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
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ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DYKE BROWNING
703 EAST CLINTON
HOBBS, NEW MEXICO 88240
FAX TO: 505-393-4388

Receiving Date: 11/01.96
Reporting Date: 11/11/96
Project Number: NOT GIVEN
Project Name: CROUCH STATION (KOCH)
Project Location: SOUTH OF LOVINGTON, NM

Sampling Date: 11/01/96
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: LW & AK

TCLP METALS

LAB NUMBEF SAMPLE ID	As ppm	Ag ppm	Ba ppm	Cd ppm	Cr ppm	Pb ppm	Hg ppm	Se ppm
ANALYSIS DATE:	11/6/96	11/6/96	11/6/96	11/6/96	11/6/96	11/6/96	11/6/96	11/6/96
EPA LIMITS:	5	5	100	1	5	5	0.2	1
H2693-15 COMP. SPOILS	<0.05	<0.05	0.70	<0.01	<0.05	0.16	<0.002	<0.05
PILE								
Quality Control	2.450	4.750	4.750	4.650	4.440	2.500	0.0089	0.435
True Value QC	2.500	5.000	5.000	5.000	5.000	2.500	0.0100	0.500
% Accuracy	98	95	95	93	88	100	89	87
Relative Percent Difference	1	1	2	1	1	1	6	1
METHODS: EPA 1311, 600/4-91/	200.7	200.7	200.7	200.7	200.7	200.7	245.1	200.7

GAYLE A. POTTER
Chemist

11/11/96
Date

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ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DYKE BROWNING
703 E. CLINTON
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/01/96
Reporting Date: 11/06/96
Project Number: NOT GIVEN
Project Name: CROUCH STATION (KOCH)
Project Location: SOUTH OF LOVINGTON, NM
Sample ID: RANDOM COMPOSITE OF SPOILS PILE
Lab Number: H2693-15

Analysis Date: 11/05/96
Sampling Date: 11/01/96
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

TCLP VOLATILES (ppm)	EPA LIMIT	Sample Result H2693-15	Method Blank	QC	%IA	True Value QC
Vinyl Chloride	0.20	<0.005	<0.005	0.085	85	0.100
1,1-Dichloroethylene	0.7	<0.005	<0.005	0.115	115	0.100
Methyl Ethyl Ketone	200	<0.005	<0.005	0.082	82	0.100
Chloroform	6.0	<0.005	<0.005	0.093	93	0.100
1,2-Dichloroethane	0.5	<0.005	<0.005	0.083	83	0.100
Benzene	0.5	<0.005	<0.005	0.082	82	0.100
Carbon Tetrachloride	0.5	<0.005	<0.005	0.082	82	0.100
Trichloroethylene	0.5	<0.005	<0.005	0.088	88	0.100
Tetrachloroethylene	0.7	<0.005	<0.005	0.105	105	0.100
Chlorobenzene	100	<0.005	<0.005	0.091	91	0.100
1,4-Dichlorobenzene	7.5	<0.005	<0.005	0.090	90	0.100

	% RECOVERY
Dibromofluoromethane	104
Toluene-d8	98
Bromofluorobenzene	98

METHODS: EPA SW 846-8260

Burgess J. A. Cooke, Ph. D.

11/6/96
Date

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ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DYKE BROWNING
703 E. CLINTON
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/01/96
Reporting Date: 11/04/96
Project Number: NOT GIVEN
Project Name: CROUCH STATION (KOCH)
Project Location: SOUTH OF LOVINGTON, NM
Sample ID: RANDOM COMPOSITE OF SPOILS PILE
Lab Number: H2693-15

Analysis Date: 11/02/96
Sampling Date: 11/01/96
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

TCLP SEMIVOLATILES (ppm)	EPA LIMIT	Sample Result H2693-15	Method Blank	QC	%IA	True Value QC
Pyridine	5.00	<0.008	<0.002	0.049	98	0.050
1,4-Dichlorobenzene	7.50	<0.008	<0.002	0.049	98	0.050
o-Cresol	200	<0.008	<0.002	0.052	104	0.050
m, p-Cresol	200	<0.008	<0.002	0.053	106	0.050
Hexachloroethane	3.00	<0.008	<0.002	0.050	100	0.050
Nitrobenzene	2.00	<0.008	<0.002	0.049	98	0.050
Hexachloro-1,3-butadiene	0.500	<0.008	<0.002	0.048	96	0.050
2,4,6-Trichlorophenol	2.00	<0.008	<0.002	0.049	98	0.050
2,4,5-Trichlorophenol	400	<0.008	<0.002	0.050	100	0.050
2,4-Dinitrotoluene	0.130	<0.008	<0.002	0.051	102	0.050
Hexachlorobenzene	0.130	<0.008	<0.002	0.050	100	0.050
Pentachlorophenol	100	<0.008	<0.002	0.048	96	0.050

	% RECOVERY
Fluorophenol	72
Phenol-d5	69
Nitrobenzene-d5	89
2-Fluorobiphenyl	95
2,4,6-Tribromophenol	87
Terphenyl-d14	103

METHODS: EPA SW 846-8270

Burgess J. A. Cooke, Ph. D.

11/04/96
Date

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ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DYKE BROWNING
703 E. CLINTON
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/01/96
Reporting Date: 11/04/96
Project Number: NOT GIVEN
Project Name: CROUCH STATION (KOCH)
Project Location: SOUTH OF LOVINGTON, NM

Analysis Date: 11/01/96
Sampling Date: 11/01/96
Sample Type: SOIL
Sample Condition: COOL, INTACT
Sample Received By: BC
Analyzed By: GP

LAB NUMBER	SAMPLE ID	TPH (ppm)
H2693-14	RANDOM COMP., BERM	17400
Quality Control		406
True Value QC		400
% Accuracy		102
Relative Percent Difference		1.8

METHOD: EPA 418.1, 3510, 3540, or 3550; Infrared Spectroscopy

Chemist

11/4/96
Date

H2693-14 XLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
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PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DYKE BROWNING
703 E. CLINTON
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/01/96
Reporting Date: 11/01/96
Project Number: NOT GIVEN
Project Name: CROUCH STATION (KOCH)
Project Location: SOUTH OF LOVINGTON, NM
Sample ID: RANDOM COMPOSITE INSIDE BERM
Lab Number: H2693-14

Analysis Date: 11/01/96
Sampling Date: 11/01/96
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

EPA 8015M - (ppm)	Sample Result H2693-14	Method Blank	QC	%IA	True Value QC
C-8 n-Octane	<0.5	<0.5	86.6	87	100
C-9 n-Nonane	4.6	<0.5	86.6	87	100
C-10 n-Decane	17.5	<0.5	87.0	87	100
C-11 n-Undecane	37.6	<0.5	81.2	81	100
C-12 n-Dodecane	47.0	<0.5	81.5	82	100
C-13 n-Tridecane	69.8	<0.5	83.2	83	100
C-14 n-Tetradecane	90.2	<0.5	84.9	85	100
C-15 n-Pentadecane	76.5	<0.5	88.9	89	100
C-16 n-Hexadecane	69.0	<0.5	85.5	86	100
C-17 n-Heptadecane	77.9	<0.5	88.6	89	100
C-18 n-Octadecane	71.0	<0.5	84.6	85	100
C-19 n-Nonadecane	95.0	<0.5	83.3	83	100
C-20 n-Eicosane	102	<0.5	82.4	82	100
C-21 n-Heneicosane	61.0	<0.5	80.9	81	100
C-22 n-Docosane	100	<0.5	82.3	82	100
C-23 n-Tricosane	82.6	<0.5	84.5	84	100
C-24 n-Tetracosane	65.8	<0.5	83.8	84	100
C-25 n-Pentacosane	66.7	<0.5	82.5	83	100
C-26 n-Hexacosane	53.4	<0.5	83.2	83	100
C-27 n-Heptacosane	41.4	<0.5	83.7	84	100
C-28 n-Octacosane	37.8	<0.5	84.2	84	100

METHOD: EPA SW 846-8015 M (by GC/MS)

Burgess J. A. Cooke, Ph. D.

11/1/96
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
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PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 E. CLINTON
HOBBS, NM 88240
FAX TO:

Receiving Date: 10/25/96
Reporting Date: 11/01/96
Project Number: NOT GIVEN
Project Name: CROUCH STATION 490
Project Location: KOCH OIL CROUCH STATION 490
Sample ID: 2-1, 10 FT
Lab Number: H2693-9

Analysis Date: 10/31/96
Sampling Date: 10/25/96
Sample Type: SOIL
Sample Condition: COOL & INTAC
Sample Received By: WL
Analyzed By: BC

EPA 8015M - (ppm)	Sample Result H2693-9	Method Blank	QC	%IA	True Value QC
C-8 n-Octane	<0.5	<0.5	86.6	87	100
C-9 n-Nonane	<0.5	<0.5	86.6	87	100
C-10 n-Decane	4.15	<0.5	87.0	87	100
C-11 n-Undecane	6.15	<0.5	81.2	81	100
C-12 n-Dodecane	6.00	<0.5	81.5	82	100
C-13 n-Tridecane	7.00	<0.5	83.2	83	100
C-14 n-Tetradecane	8.00	<0.5	84.9	85	100
C-15 n-Pentadecane	7.05	<0.5	88.9	89	100
C-16 n-Hexadecane	5.50	<0.5	85.5	86	100
C-17 n-Heptadecane	5.80	<0.5	88.6	89	100
C-18 n-Octadecane	5.20	<0.5	84.6	85	100
C-19 n-Nonadecane	5.15	<0.5	83.3	83	100
C-20 n-Eicosane	4.90	<0.5	82.4	82	100
C-21 n-Heneicosane	3.85	<0.5	80.9	81	100
C-22 n-Docosane	3.70	<0.5	82.3	82	100
C-23 n-Tricosane	3.15	<0.5	84.5	84	100
C-24 n-Tetracosane	4.35	<0.5	83.8	84	100
C-25 n-Pentacosane	4.00	<0.5	82.5	83	100
C-26 n-Hexacosane	3.10	<0.5	83.2	83	100
C-27 n-Heptacosane	3.00	<0.5	83.7	84	100
C-28 n-Octacosane	3.60	<0.5	84.2	84	100

METHOD: EPA SW 846-8015 M (by GC/MS)

Burgess J. A. Cooke, Ph. D.

11/1/96
Date

Safety & Environmental Solutions, Inc.

703 E. Clinton, Suite 103, Hobbs, New Mexico 88240
(505)397-0510

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Dyke Browning
Phone #: 397-0510
FAX #: 393-4388

Company Name & Address: Koch

Project #: ~~H2699-1,2~~ H2693-14,15
Project Name: Crouch Station

Project Location: South of Lovington NM
Sampler Signature: Dyke Browning

ANALYSIS REQUEST

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME	BTEX 8021/5030	TPH 418.1	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI
(14)	Random Composite inside berm 11/1/96 DAD	1	12oz		X						X			11/1/96	9:23		X						
(15)2	Random Composite of spoils Pile	1	12oz		X						X			11/1/96	10:00	[redacted]	[redacted]	X	[redacted]	X	X		X

Relinquished by:	Date:	Time:	Received by:
Dyke Browning	11/1/96	10:23am	Burgess Cook
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS: Sampling witnessed by Kenneth Burns

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 E. CLINTON
HOBBS, NM 88240
FAX TO:

Receiving Date: 10/25/96
Reporting Date: 11/01/96
Project Number: NOT GIVEN
Project Name: CROUCH STATION 490
Project Location: KOCH OIL CROUCH STATION 490

Analysis Date: 10/31/96
Sampling Date: 10/25/96
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: WL
Analyzed By: BC

LAB NUMBER	SAMPLE ID*	TPH (ppm)
H2693-4	1-4 20 FT	<10
H2693-5	1-5 25 FT	<10
H2693-6	1-6 30 FT	<10
H2693-7	1-7 35 FT	<10
H2693-8	1-8 40 FT	<10
H2693-10	3-1 10 FT	<10
H2693-11	4-1 10 FT	<10
H2693-12	1-4 10 FT	<10
H2693-13	BACKGROUND	<10

METHOD: EPA SW 846-8015 M (by GC/MS)

*Samples negative for n-alkanes only. Positive samples and QC reported elsewhere.

Burgess J. A. Cooke, Ph. D.

11/1/96
Date

CARDINAL LABORATORIES

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PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 E. CLINTON
HOBBS, NM 88240
FAX TO:

Receiving Date: 10/25/96
Reporting Date: 11/01/96
Project Number: NOT GIVEN
Project Name: CROUCH STATION 490
Project Location: KOCH OIL CROUCH STATION 490
Sample ID: 1-1, 5 FT
Lab Number: H2693-1

Analysis Date: 10/31/96
Sampling Date: 10/25/96
Sample Type: SOIL
Sample Condition: COOL & INTAC
Sample Received By: WL
Analyzed By: BC

EPA 8015M - (ppm)	Sample Result H2693-1	Method Blank	QC	%IA	True Value QC
C-8 n-Octane	89.0	<0.5	86.6	87	100
C-9 n-Nonane	113	<0.5	86.6	87	100
C-10 n-Decane	147	<0.5	87.0	87	100
C-11 n-Undecane	178	<0.5	81.2	81	100
C-12 n-Dodecane	144	<0.5	81.5	82	100
C-13 n-Tridecane	156	<0.5	83.2	83	100
C-14 n-Tetradecane	181	<0.5	84.9	85	100
C-15 n-Pentadecane	164	<0.5	88.9	89	100
C-16 n-Hexadecane	168	<0.5	85.5	86	100
C-17 n-Heptadecane	140	<0.5	88.6	89	100
C-18 n-Octadecane	186	<0.5	84.6	85	100
C-19 n-Nonadecane	130	<0.5	83.3	83	100
C-20 n-Eicosane	91.5	<0.5	82.4	82	100
C-21 n-Heneicosane	69.0	<0.5	80.9	81	100
C-22 n-Docosane	71.8	<0.5	82.3	82	100
C-23 n-Tricosane	57.5	<0.5	84.5	84	100
C-24 n-Tetracosane	56.0	<0.5	83.8	84	100
C-25 n-Pentacosane	57.0	<0.5	82.5	83	100
C-26 n-Hexacosane	46.2	<0.5	83.2	83	100
C-27 n-Heptacosane	40.6	<0.5	83.7	84	100
C-28 n-Octacosane	34.0	<0.5	84.2	84	100

METHOD: EPA SW 846-8015 M (by GC/MS)

Burgess J. A. Cooke, Ph. D.

11/1/96
Date

H2693-1 XLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
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PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 E. CLINTON
HOBBS, NM 88240
FAX TO:

Receiving Date: 10/25/96
Reporting Date: 11/01/96
Project Number: NOT GIVEN
Project Name: CROUCH STATION 490
Project Location: KOCH OIL CROUCH STATION 490
Sample ID: 1-2,10 FT
Lab Number: H2693-2

Analysis Date: 10/31/96
Sampling Date: 10/25/96
Sample Type: SOIL
Sample Condition: COOL & INTAC
Sample Received By: WL
Analyzed By: BC

EPA 8015M - (ppm)	Sample Result H2693-2	Method Blank	QC	%IA	True Value QC
C-8 n-Octane	331	<0.5	86.6	87	100
C-9 n-Nonane	276	<0.5	86.6	87	100
C-10 n-Decane	336	<0.5	87.0	87	100
C-11 n-Undecane	372	<0.5	81.2	81	100
C-12 n-Dodecane	308	<0.5	81.5	82	100
C-13 n-Tridecane	354	<0.5	83.2	83	100
C-14 n-Tetradecane	353	<0.5	84.9	85	100
C-15 n-Pentadecane	315	<0.5	88.9	89	100
C-16 n-Hexadecane	279	<0.5	85.5	86	100
C-17 n-Heptadecane	268	<0.5	88.6	89	100
C-18 n-Octadecane	261	<0.5	84.6	85	100
C-19 n-Nonadecane	264	<0.5	83.3	83	100
C-20 n-Eicosane	221	<0.5	82.4	82	100
C-21 n-Heneicosane	181	<0.5	80.9	81	100
C-22 n-Docosane	155	<0.5	82.3	82	100
C-23 n-Tricosane	142	<0.5	84.5	84	100
C-24 n-Tetracosane	121	<0.5	83.8	84	100
C-25 n-Pentacosane	122	<0.5	82.5	83	100
C-26 n-Hexacosane	94.5	<0.5	83.2	83	100
C-27 n-Heptacosane	76.5	<0.5	83.7	84	100
C-28 n-Octacosane	63.8	<0.5	84.2	84	100

METHOD: EPA SW 846-8015 M (by GC/MS)

Burgess J. A. Cooke, Ph. D.

11/1/96
Date

CARDINAL LABORATORIES

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PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 E. CLINTON
HOBBS, NM 88240
FAX TO:

Receiving Date: 10/25/96
Reporting Date: 11/01/96
Project Number: NOT GIVEN
Project Name: CROUCH STATION 490
Project Location: KOCH OIL CROUCH STATION 490
Sample ID: 1-3,15 FT
Lab Number: H2693-3

Analysis Date: 10/31/96
Sampling Date: 10/25/96
Sample Type: SOIL
Sample Condition: COOL & INTAC
Sample Received By: WL
Analyzed By: BC

EPA 8015M - (ppm)	Sample Result H2693-3	Method Blank	QC	%IA	True Value QC
C-8 n-Octane	5.3	<0.5	86.6	87	100
C-9 n-Nonane	9.6	<0.5	86.6	87	100
C-10 n-Decane	16.9	<0.5	87.0	87	100
C-11 n-Undecane	27.2	<0.5	81.2	81	100
C-12 n-Dodecane	24.0	<0.5	81.5	82	100
C-13 n-Tridecane	32.8	<0.5	83.2	83	100
C-14 n-Tetradecane	32.4	<0.5	84.9	85	100
C-15 n-Pentadecane	33.4	<0.5	88.9	89	100
C-16 n-Hexadecane	26.3	<0.5	85.5	86	100
C-17 n-Heptadecane	25.6	<0.5	88.6	89	100
C-18 n-Octadecane	25.1	<0.5	84.6	85	100
C-19 n-Nonadecane	28.8	<0.5	83.3	83	100
C-20 n-Eicosane	27.2	<0.5	82.4	82	100
C-21 n-Heneicosane	17.5	<0.5	80.9	81	100
C-22 n-Docosane	17.5	<0.5	82.3	82	100
C-23 n-Tricosane	13.5	<0.5	84.5	84	100
C-24 n-Tetracosane	17.1	<0.5	83.8	84	100
C-25 n-Pentacosane	15.7	<0.5	82.5	83	100
C-26 n-Hexacosane	14.0	<0.5	83.2	83	100
C-27 n-Heptacosane	11.4	<0.5	83.7	84	100
C-28 n-Octacosane	12.3	<0.5	84.2	84	100

METHOD: EPA SW 846-8015 M (by GC/MS)

Burgess J. A. Cooke, Ph. D.

11/1/96
Date

FAXED 6/17/97

KOCH

KOCH OPERATIONS GROUP

ENVIRONMENTAL SERVICES

June 17, 1997

Mr. Satya Neelakantan
New Mexico Environment Department
Air Quality Bureau
P.O. Box 26110
Santa Fe, NM 87501

RE: Pilot Test Results for Crouch Station
Koch Pipeline Co., L.P. (Koch)

Dear Mr. Neelakantan:

On behalf of Koch, Western Technologies obtained permission in May, to perform a soil vapor extraction (SVE) pilot study at the above reference facility. The system was started with the Ambient Air Inlet Valve completely closed, and allowed to run for approximately 2.5 hours before collecting the air sample. The volumetric flow rate of the system was 260 cubic feet per minute (cfm). If the system operated for one year at the current concentrations, the VOC emissions would be approximately 19.94 lb/hr or 87.3 tons/yr. Please note that this is a conservative calculation because typically a spike of high concentrations are encountered toward initial start up of the system then, after a period of time, the concentrations naturally decrease.

However, if the Ambient Air Inlet Valve is opened slightly, the volume of air which is pulled from the well decreases and is replaced by the same volume of ambient air. The total volume of air being exhausted remains constant, however, the exhaust emissions will decrease due to the decrease in mass of VOC's being pulled from the well.

I have included two diagrams and a table for your convenience. Figure 1 depicts the system with no ambient air introduced, as was the scenario when the air sample was collected, and represents Scenario 1 in the table. Figure 2 depicts the system as ambient air is introduced and would represent Scenarios 2-5 in the table.

P.O. Box 2256 ▪ Wichita, Kansas 67201 ▪ 316/828-8584 ▪ FAX 316/828-8000

At this time Koch would propose to actually conduct scenario's 2-6 and collect the field data which correlates, since these are not the actual field numbers. The air samples would be lab analyzed to determine the concentrations (emissions) which correlate to the valve settings. After it is determined which valve setting is appropriate, the valve will be set and locked. This would prevent any tampering of the system.

It should be noted that the system's location is in an oil field production area with only 1 residence approximately ½ mile away. The station itself has a fence surrounding the facility and a gate which remains locked when Koch personnel are not on site.

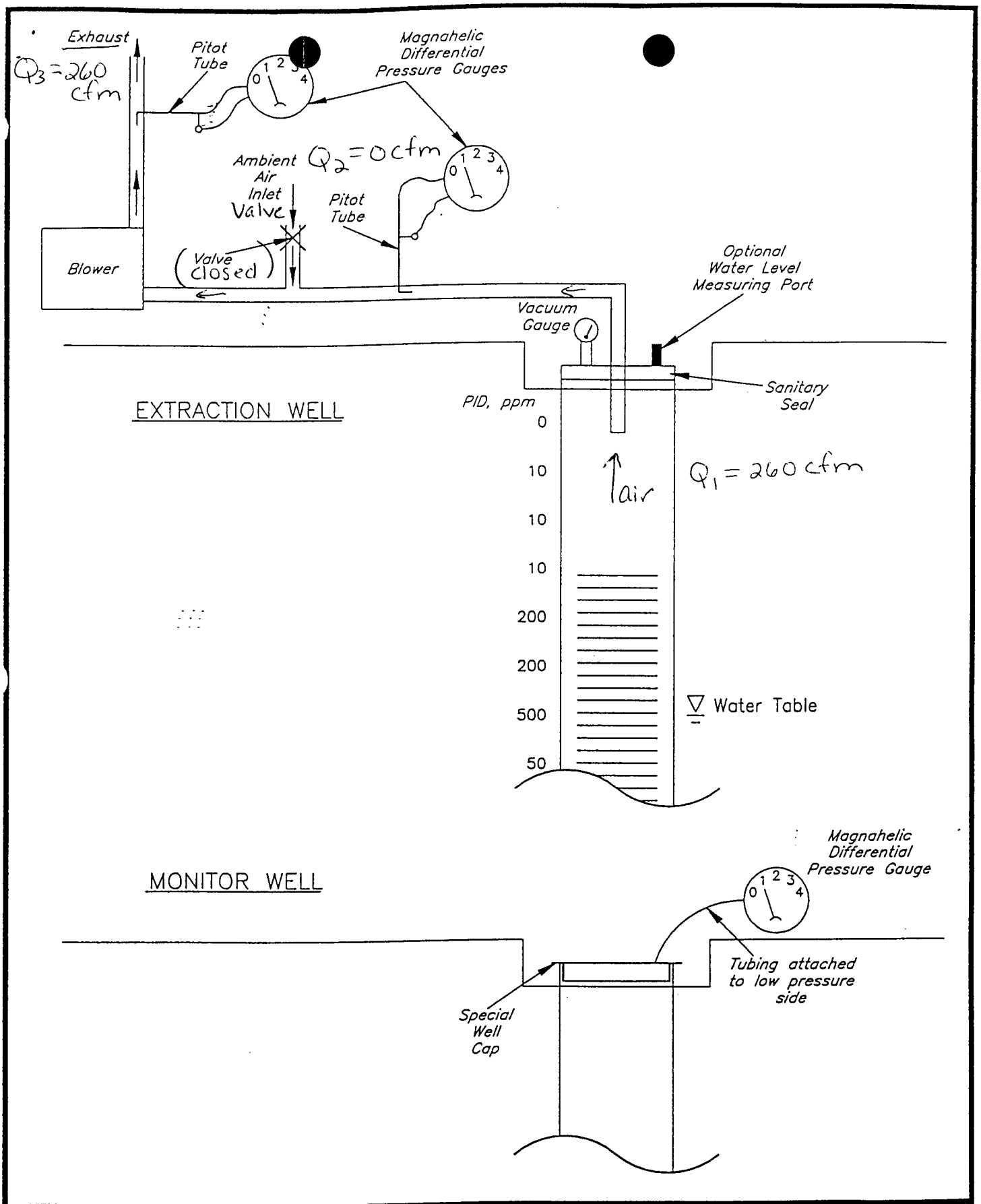
The remediation project is under the jurisdiction of the New Mexico Oil Conservation Division (NMOCD). Roger Anderson (Environmental Bureau Chief) along with Wayne Price, are overseeing the project. Time is of the essence due to the potential groundwater impact which could result if the system is non-operational and the remediation process not initiated.

Please call me at (316) 828-6960 to discuss this further after you have had a chance to review the material or if you have any questions.

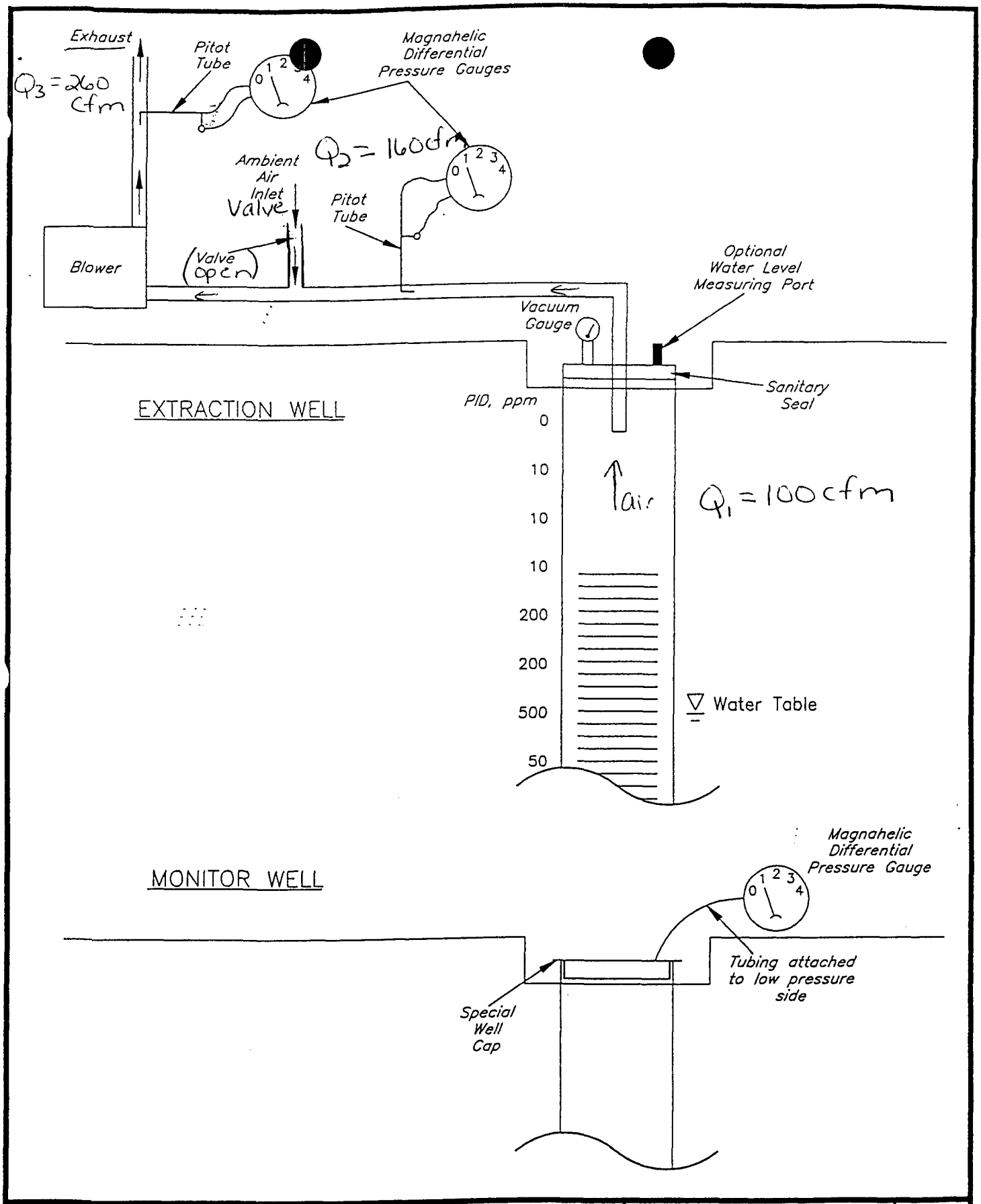
Respectfully,

Dana Kuchenbecker
Environmental Engineer
KOG Environmental Services

cc: Paul Holland, Koch Pipeline Co., L.P.



Koch Pipeline Co., L.P. Crouch Station	**Figure 1** No Ambient Air	VES Pilot Test Equipment Schematic



Koch Pipeline Co., L.P.	**Figure** 2	VES Pilot Test Equipment Schematic
Crouch Station	Ambient Air Intro.	

Scenario 3 on Table

Scenario	# of Valve Turns	Well Airflow	Ambient Airflow	Exhaust Airflow	Exhaust Emissions
		(cfm)	(cfm)	(cfm)	VOC (lb/hr)
1	Valve full closed	260	0	260	19.94
2	2	200	60	260	12
3	4	100	160	260	7
4	6	60	200	260	3
5	Valve full open	0	260	260	0

Vacuum Extraction

basis: U.S. Environmental Protection Agency
Office of Underground Storage Tanks
June 1989
"Estimating Air Emissions from Petroleum UST Cleanups"

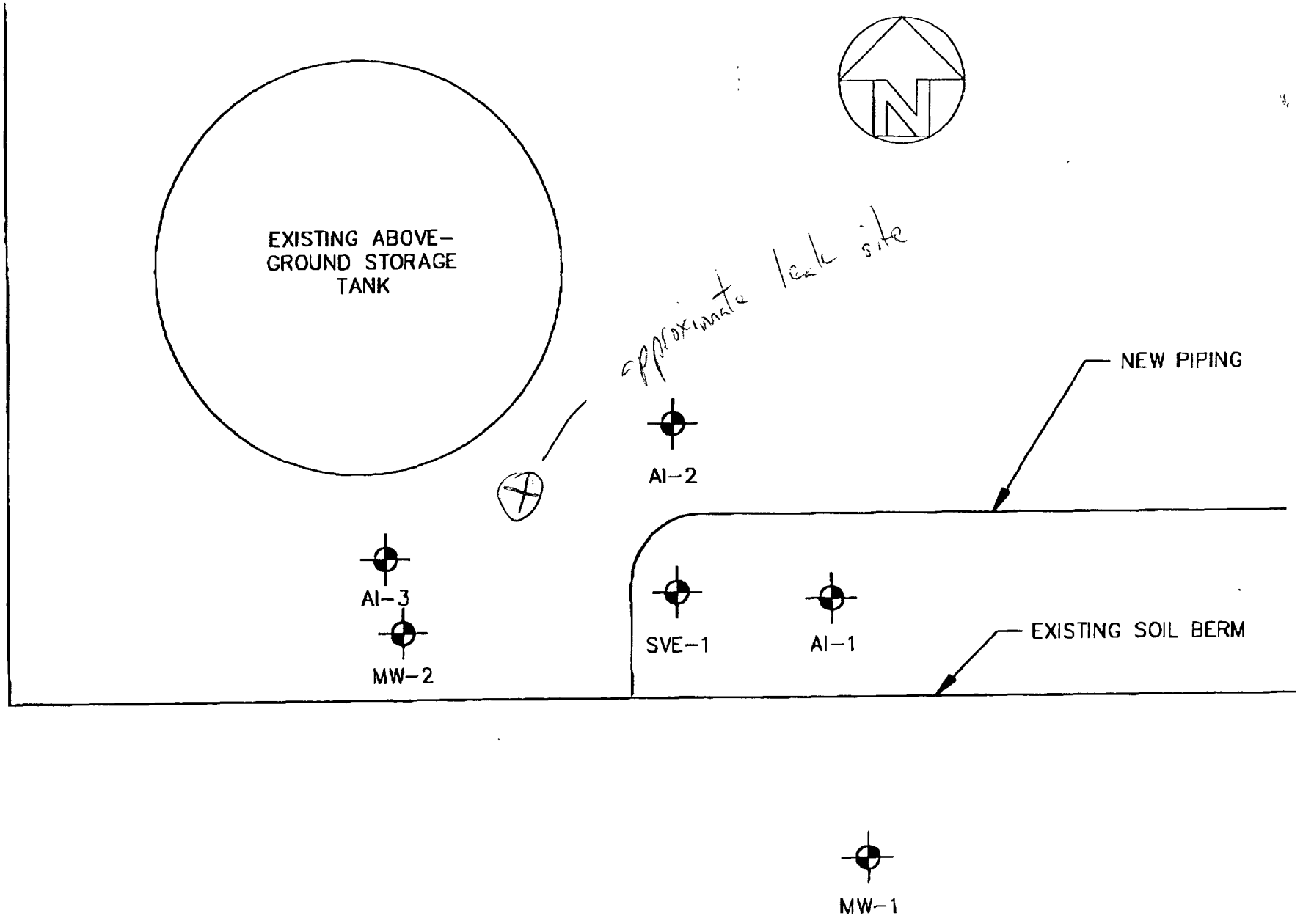
$ER = (Q \times C_{soil\ gas} \times MW \times 1.581 \times 10^{-7})$

ER = emission rate (lb/hr)
Q = pumping rate (cfm)
C = soil gas concentration (ppm-v)
MW = molecular weight of contaminant (lb/lb-mole)

State limit: **10.00 lb/hr**

			source
Q =	260	ft^3/min	test
C =	9700	ppm-v	lab sample
MW =	50	lb/lb-mole	AP-42; Table7.2-1 (1996) for Crude Oil
ER =	**19.94**	**lb/hr**	

Crouch Station



Westech of Texas, Inc.
The Quality People
Since 1955

[redacted] Ripley Drive, Suite A
El Paso, Texas 79922-1028
(915) 585-3443 • fax 585-4944

ANALYTICAL REPORT

CLIENT WESTERN TECHNOLOGIES, INC.
8305 WASHINGTON PLACE N.E.
ALBUQUERQUE, NM 87113

SAMPLE NO. : 7701373
INVOICE NO.: 3287W0059
REPORT DATE: 05-05-97
REVIEWED BY:

CLIENT SAMPLE ID : 7JX124-1
SAMPLE TYPE .....: Water
SAMPLED BY .....: R. Weaver
SUBMITTED BY ....: R. Weaver
SAMPLE SOURCE ...: MW-1
ANALYST .....: K. Costa

AUTHORIZED BY : B. Bockish
CLIENT P.O. : --
SAMPLE DATE ...: 04-23-97
SUBMITTAL DATE : 04-24-97
EXTRACTION DATE: --
ANALYSIS DATE .: 04-30-97

Petroleum Contaminants by 8020A

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
Benzene	710.	ug/L	10.
Toluene	<1.0	ug/L	1.0
Ethylbenzene	<1.0	ug/L	1.0
Total Xylenes	<1.0	ug/L	1.0

(1) Copy to Client

MANAGING DIRECTOR

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ANALYTICAL REPORT

CLIENT WESTERN TECHNOLOGIES, INC.
8305 WASHINGTON PLACE N.E.
ALBUQUERQUE, NM 87113

SAMPLE NO. : 7701373
INVOICE NO.: 3287W0059
REPORT DATE: 05-05-97
REVIEWED BY:

D A T A T A B L E (Cont.)

Surrogate Information -	Percent Recovery	Range
aaa Trifluorotoluene ..... :	96.5	77-120

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ANALYTICAL REPORT

CLIENT WESTERN TECHNOLOGIES, INC.
8305 WASHINGTON PLACE N.E.
ALBUQUERQUE, NM 87113

SAMPLE NO. : 7701373
INVOICE NO.: 3287W0059
REPORT DATE: 05-05-97
REVIEWED BY:

CLIENT SAMPLE ID : 7JX124-1
SAMPLE TYPE .....: Water
SAMPLED BY .....: R. Weaver
SUBMITTED BY ....: R. Weaver
SAMPLE SOURCE ...: MW-1
ANALYST .....: K. Costa

AUTHORIZED BY : B. Bockish
CLIENT P.O. : --
SAMPLE DATE ...: 04-23-97
SUBMITTAL DATE : 04-24-97
EXTRACTION DATE: --
ANALYSIS DATE .: 04-29-97

TPH Gas by Mod 8015

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
TPH Gas ..... :	2.2	mg/L	1.0

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ANALYTICAL REPORT

CLIENT WESTERN TECHNOLOGIES, INC.
8305 WASHINGTON PLACE N.E.
ALBUQUERQUE, NM 87113

SAMPLE NO. : 7701373
INVOICE NO.: 3287W0059
REPORT DATE: 05-05-97
REVIEWED BY: [signature]

D A T A T A B L E (Cont.)

Surrogate Information -	Percent Recovery	Range
4-Bromofluorobenzene ..... :	96.5	80-120

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El Paso, Texas 79922-1028
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ANALYTICAL REPORT

CLIENT WESTERN TECHNOLOGIES, INC.
8305 WASHINGTON PLACE N.E.
ALBUQUERQUE, NM 87113

SAMPLE NO. : 7701373
INVOICE NO.: 3287W0059
REPORT DATE: 05-05-97
REVIEWED BY:

CLIENT SAMPLE ID : 7JX124-1
SAMPLE TYPE .....: Water
SAMPLED BY .....: R. Weaver
SUBMITTED BY ....: R. Weaver
SAMPLE SOURCE ...: MW-1
ANALYST .....: K. Costa

AUTHORIZED BY : B. Bockish
CLIENT P.O. : --
SAMPLE DATE ...: 04-23-97
SUBMITTAL DATE : 04-24-97
EXTRACTION DATE: 05-02-97
ANALYSIS DATE .: 05-02-97

Method 8015 - Petroleum Contaminants

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
TPH Diesel by Mod 8015 .....:	<2.0	mg/L	2.0

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MANAGING DIRECTOR

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El Paso, Texas 79922-1028
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ANALYTICAL REPORT

CLIENT WESTERN TECHNOLOGIES, INC.
8305 WASHINGTON PLACE N.E.
ALBUQUERQUE, NM 87113

SAMPLE NO. : 7701373
INVOICE NO.: 3287W0059
REPORT DATE: 05-05-97
REVIEWED BY: JHH

D A T A T A B L E (Cont.)

Surrogate Information -	Percent Recovery	Range
Hexacosane ..... :	91.2	80-120

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El Paso, Texas 79922-1028
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QUALITY CONTROL REPORT

QC IDENTIFIER .....: 33-050297-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : GC-FID
ANALYZED BY : K. Costa
ANALYZED ON : 05-02-97

TEST DESCRIPTION ..: Method 8015 - Petroleum Contaminants

SAMPLES IN THIS RUN: 7701373

CALIBRATION CHECK -

PARAMETER	UNIT	TRUE VALUE	FOUND VALUE	%RECOVERY
TPH Diesel by Mod 8015	ug/ml	100.	102.	102.0
TPH Diesel by Mod 8015	ug/ml	100.	87.0	87.0
TPH Diesel by Mod 8015	ug/ml	100.	102.	102.0

SPIKES -

SAMPLE NUMBER	PARAMETER	UNIT	SAMPLE RESULT	SPIKE CONC.	SAMPLE+SPIKE DUP1/DUP2	%REC	RPD%
7701373	Total Petroleum Fuel Hydroca	mg/L	<2.0	100.	1) 106.	106.0	
					2) 117.	117.0	9.9

BLANK SPIKES

PARAMETER	UNIT	SAMPLE RESULT	SPIKE CONC.	[- SAMPLE AND SPIKE -] RESULT 1	RESULT 2	% REC1	% REC2	RPD%
Total Petroleum Fuel Hy	mg/L	<2.0	10.	11.6		116.0		

METHOD BLANKS -

PARAMETER	UNIT	RESULT
TPH Diesel by Mod 8015	mg/L	<2.0

Westech of Texas, Inc.
The Quality People
Since 1955

4725 Ripley Drive, Suite A
El Paso, Texas 79922-1028
(915) 585-3443 • fax 585-4944

QUALITY CONTROL REPORT

QC IDENTIFIER .....: 33-050297-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : GC-FID
ANALYZED BY : K. Costa
ANALYZED ON : 05-02-97

NOTE -

1) NC: Not Calculable because result is < 5 times the MDL

2) NP: Not Practical because sample result is 4 times or more greater than spike added.

3) Percent Recovery is:

$$\frac{\text{Sample+Spike Result - Sample Result}}{\text{Spike Amount}} \times 100$$

4) Relative Percent Difference (RPD) is:

$$\frac{\text{Sample Result - Replicate Result}}{(\text{Sample Result + Replicate Result})/2} \times 100$$

WESTECH OF TEXAS
QUALITY ASSURANCE OFFICER

K. C

DATE 05-06-97

Westech of Texas, Inc.
The Quality People
Since 1955

4725 Ripley Drive, Suite A
El Paso, Texas 79922-1028
(915) 585-3443 • fax 585-4944

QUALITY CONTROL REPORT

QC IDENTIFIER .....: 31-042997-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : K. Costa
ANALYZED ON : 04-29-97

TEST DESCRIPTION ..: TPH Gas by Mod 8015

SAMPLES IN THIS RUN: 7701373

CALIBRATION CHECK -

PARAMETER	UNIT	TRUE VALUE	FOUND VALUE	%RECOVERY
Total Petroleum Fuel Hydrocarbons	mg/L	1.0	1.09	109.0
Total Petroleum Fuel Hydrocarbons	mg/L	1.0	.91	91.0
Total Petroleum Fuel Hydrocarbons	mg/L	1.0	1.11	111.0

SPIKES -

SAMPLE NUMBER	PARAMETER	UNIT	SAMPLE RESULT	SPIKE CONC.	SAMPLE+SPIKE DUP1/DUP2	%REC	RPD%
7701373	Total Petroleum Fuel Hydroca	mg/L	2.2	50.	1) 56.1	107.8	
					2) 57.3	110.2	2.2

BLANK SPIKES

PARAMETER	UNIT	SAMPLE RESULT	SPIKE CONC.	[- SAMPLE AND SPIKE -] RESULT 1	RESULT 2	% REC1	% REC2	RPD%
Total Petroleum Fuel Hy	mg/L	<1.0	1.00	1.09		109.0		

METHOD BLANKS -

PARAMETER	UNIT	RESULT
TPH Gas	mg/L	<1.0

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QUALITY CONTROL REPORT

QC IDENTIFIER .....: 31-042997-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : K. Costa
ANALYZED ON : 04-29-97

NOTE -

1) NC: Not Calculable because result is < 5 times the MDL

2) NP: Not Practical because sample result is 4 times or more greater than spike added.

3) Percent Recovery is:

$$\frac{\text{Sample+Spike Result - Sample Result}}{\text{Spike Amount}} \times 100$$

4) Relative Percent Difference (RPD) is:

$$\frac{\text{Sample Result - Replicate Result}}{(\text{Sample Result + Replicate Result})/2} \times 100$$

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DATE 05-06-97

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QUALITY CONTROL REPORT

QC IDENTIFIER .....: 31-043097-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : K. Costa
ANALYZED ON : 04-30-97

TEST DESCRIPTION ..: Petroleum Contaminants by 8020A

SAMPLES IN THIS RUN: 7701373

CALIBRATION CHECK -

PARAMETER	UNIT	TRUE VALUE	FOUND VALUE	%RECOVERY
Benzene	ug/L	10	9.88	98.8
Toluene	ug/L	10	9.16	91.6
Ethylbenzene	ug/L	10	9.16	91.6
Total Xylenes	ug/L	30	29.5	98.3
Benzene	ug/L	10	10.4	104.0
Toluene	ug/L	10	9.50	95.0
Ethylbenzene	ug/L	10	9.42	94.2
Total Xylenes	ug/L	30	30.8	102.7
Benzene	ug/L	10	11.1	111.0
Toluene	ug/L	10	10.2	102.0
Ethylbenzene	ug/L	10	10.0	100.0
Total Xylenes	ug/L	30	31.5	105.0
Benzene	ug/L	10	10.5	105.0
Toluene	ug/L	10	9.68	96.8
Ethylbenzene	ug/L	10	9.62	96.2
Total Xylenes	ug/L	30	31.7	105.7
Benzene	ug/L	10	9.52	95.2
Toluene	ug/L	10	9.04	90.4
Ethylbenzene	ug/L	10	8.73	87.3
Total Xylenes	ug/L	30	28.6	95.3
Benzene	ug/L	10	11.1	111.0
Toluene	ug/L	10	10.2	102.0
Ethylbenzene	ug/L	10	9.88	98.8
Total Xylenes	ug/L	30	31.9	106.3

SPIKES -

SAMPLE NUMBER	PARAMETER	UNIT	SAMPLE RESULT	SPIKE CONC.	SAMPLE+SPIKE DUP1/DUP2	%REC	RPD%
7701373	Ethylbenzene	ug/L	<1.0	500.	1) 497.	99.4	
					2) 503.	100.6	1.2
7701373	Toluene	ug/L	<1.0	500.	1) 517.	103.4	
					2) 511.	102.2	1.2
7701373	Total Xylenes	ug/L	<1.0	1500.	1) 1600.	106.7	
					2) 1630.	108.7	1.9
7701373	Benzene	ug/L	710.	500.	1) 1300.	118.0	
					2) 1300.	118.0	0.0

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QUALITY CONTROL REPORT

QC IDENTIFIER .....: 31-043097-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : K. Costa
ANALYZED ON : 04-30-97

BLANK SPIKES

PARAMETER	UNIT	SAMPLE RESULT	SPIKE CONC.	[- SAMPLE AND SPIKE -] RESULT 1	RESULT 2	% REC1	% REC2	RPD%
Benzene	ug/L	<1.0	10.	10.0		100.0		
Toluene	ug/L	<1.0	10.	9.25		92.5		
Ethylbenzene	ug/L	<1.0	10.	9.18		91.8		
Total Xylenes	ug/L	<1.0	30.	29.7		99.0		

METHOD BLANKS -

PARAMETER	UNIT	RESULT
Benzene	ug/L	<1.0
Toluene	ug/L	<1.0
Ethylbenzene	ug/L	<1.0
Total Xylenes	ug/L	<1.0

NOTE -

1) NC: Not Calculable because result is < 5 times the MDL

2) NP: Not Practical because sample result is 4 times or more greater than spike added.

3) Percent Recovery is:

$$\frac{\text{Sample+Spike Result - Sample Result}}{\text{Spike Amount}} \times 100$$

4) Relative Percent Difference (RPD) is:

$$\frac{\text{Sample Result - Replicate Result}}{(\text{Sample Result + Replicate Result})/2} \times 100$$

WESTECH OF TEXAS
QUALITY ASSURANCE OFFICER
DATE 05-06-97

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QUALITY CONTROL REPORT

QC IDENTIFIER .....: 33-050197-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : GC-FID
ANALYZED BY : K. Costa
ANALYZED ON : 05-01-97

TEST DESCRIPTION ..: Method 8015 - Petroleum Contaminants

SAMPLES IN THIS RUN: 7701372

CALIBRATION CHECK -

PARAMETER	UNIT	TRUE VALUE	FOUND VALUE	%RECOVERY
JP4	mg/L	100.	91.8	91.8
JP4	mg/L	100.	93.9	93.9

SPIKES -

SAMPLE NUMBER	PARAMETER	UNIT	SAMPLE RESULT	SPIKE CONC.	SAMPLE+SPIKE DUP1/DUP2	%REC	RPD%
7701372	TPH Diesel by Mod 8015	mg/Kg	<20.	100.	1) 99.2	99.2	
					2) 93.2	93.2	6.2

BLANK SPIKES

PARAMETER	UNIT	SAMPLE RESULT	SPIKE CONC.	[- SAMPLE AND SPIKE -] RESULT 1	RESULT 2	% REC1	% REC2	RPD%
TPH Diesel by Mod 8015	mg/Kg	<20.	100.	88.2		88.2		

METHOD BLANKS -

PARAMETER	UNIT	RESULT
JP4 by Mod 8015	mg/Kg	<20.

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QUALITY CONTROL REPORT

QC IDENTIFIER .....: 33-050197-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : GC-FID
ANALYZED BY : K. Costa
ANALYZED ON : 05-01-97

NOTE -

1) NC: Not Calculable because result is < 5 times the MDL

2) NP: Not Practical because sample result is 4 times or more greater than spike added.

3) Percent Recovery is:

$$\frac{\text{Sample+Spike Result - Sample Result}}{\text{Spike Amount}} \times 100$$

4) Relative Percent Difference (RPD) is:

$$\frac{\text{Sample Result - Replicate Result}}{(\text{Sample Result + Replicate Result})/2} \times 100$$

WESTECH OF TEXAS
QUALITY ASSURANCE OFFICE
DATE 05-06-97

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis Number: 97-05-C88

Approved for Release by:

Siok Hong Chen, Project Manager

Date: 6/4/97

Greg Grandits
Laboratory Director

Idelis Williams
Quality Assurance Officer

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9705C88-01

Koch Pipeline L.P.
4111 E. 37th Street N.
Wichita, KS 67220
ATTN: Dana Kuchenbecker

P.O.# Crouch station
DATE: 06/04/97

PROJECT: Crouch Station
SITE:
SAMPLED BY: Koch
SAMPLE ID: TSX 124-5123197

PROJECT NO:
MATRIX: AIR
DATE SAMPLED: 05/23/97 10:20:00
DATE RECEIVED: 05/24/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	110	5.0 P	ppm
TOLUENE	84	5.0 P	ppm
ETHYLBENZENE	46	5.0 P	ppm
TOTAL XYLENE	29	5.0 P	ppm
TOTAL VOLATILE AROMATIC HYDROCARBONS	269		ppm
Method Modified 5030/8020A***			
Analyzed by: FAB			
Date: 05/24/97			
Total Petroleum Hydrocarbons	9700	25	ppm
Method Modified 8015A Air ***			
Analyzed by: fab			
Date: 05/24/97 03:32:00			

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

QUALITY CONTROL

DOCUMENTATION

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL BATCH QUALITY CONTROL REPORT ** PAGE
METHOD 5030/8020 (Modified)

Matrix: Air
Units: ppm

Batch Id: HP_P970522122000

BLANK SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(**) (Advisory) RPD Max.	QC Limits(**) (Advisory) Recovery Range
BENZENE	ND	20	18	91.0	19	96.0	5.35	30	37 - 117
TOLUENE	ND	20	17	83.5	18	88.5	5.81	30	25 - 113
ETHYLBENZENE	ND	20	16	80.0	17	85.0	6.06	30	25 - 106
O XYLENE	ND	20	17	85.0	18	90.0	5.71	30	15 - 109
M & P XYLENE	ND	20	17	85.5	18	90.5	5.68	30	12 - 114

Analyst: WK
Sequence Date: 05/22/97
Method Blank File ID:
Sample File ID:
Blank Spike File ID: P_E7328.TX0
Matrix Spike File ID:
Matrix Spike Duplicate File ID:

* = Values Outside QC Range. « = Data outside Method Specification limits.
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100
(**) = Source: Tempo. Limits & SPL-Houston Hist. Data(1st Qtr'97)

SAMPLES IN BATCH(SPL ID): 9705C23-01A 9705C25-01A 9705C88-01A 9705A80-02A 9705B74-08A

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL BATCH QUALITY CONTROL REPORT ** PAGE

METHOD 8015 (Modified)

Matrix: Air

Batch Id: HP_P970522081800

Units: ppm

B L A N K S P I K E S

S P I K E C O M P O U N D S	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(**) (Advisory) RPD Max.	QC Limits(**) (Advisory) Recovery Range
TPHAIR	ND	200	300	150	300	150	0	30	20 - 150

Analyst: WK

Sequence Date: 05/23/97

Method Blank File ID:

Sample File ID:

Blank Spike File ID: PPE7328.TX0

Matrix Spike File ID:

Matrix Spike Duplicate File ID:

* = Values Outside QC Range. « = Data outside Method Specification limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100

(**) = Source: Temporary limits

SAMPLES IN BATCH(SPL ID): 9705C23-01A 9705C25-01A 9705C88-01A 9705A80-02A 9705B63-01A 9705B74-08A