

SURVEY DATA CERTIFICATION



PHOENIX HOBBS OCD
TECHNOLOGY SERVICES

AUG 29 2018

RECEIVED

Job #: 63046
Client: Kaiser Francis
County & State: Lea County, NM
Well: Bell Lake Unit South 430H
API No: 30-025-44619
Proposed Direction: 323.00 degrees

TIE-IN DATA

MD	TVD	INC	AZM	N/-S	E/-W	DATA SOURCE
1221.00 ft	1220.92 ft	0.40°	323.00°	13.06 N	1.38 W	Phoenix Surveys
Data Source Company:						Phoenix Tech

SURVEY DATA

First Survey Date	First Survey Depth	INC	AZM
5-Jul-18	1,428 ft	1.32°	310.33°

Last Survey Date	Last Survey Depth	INC	AZM
28-Jul-18	19,822 ft	89.36°	342.79°

Projected TD Survey Date	Projected TD Survey Depth	INC	AZM
28-Jul-18	19,877 ft	89.36°	342.79°

Survey Instrument Type

Phoenix MWD

CORRECTION INFORMATION

Magnetic Declination Used	6.69 degrees
Grid Convergence Used	0.43 degrees

Total Correction	6.26 degrees
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Corrected to True/Grid North

Grid North

Derek Tylka

Signature

7/28/2018

Date

TO THE BEST OF MY KNOWLEDGE, I CERTIFY THIS SURVEY DATA TO BE TRUE AND CORRECT.

HOBBS OCD

AUG 29 2018

RECEIVED

Kaiser-Francis Oil Company

Lea County, NM (NAD 83)

Bell Lake Unit South

430H

OH / Job 63046

Survey: Phoenix MWD Surveys

Standard Survey Report

30 July, 2018



Survey Report



Company:	Kaiser-Francis Oil Company	Local Co-ordinate Reference:	Well 430H
Project:	Lea County, NM (NAD 83)	TVD Reference:	RKB @ 3609.20usft
Site:	Bell Lake Unit South	MD Reference:	RKB @ 3609.20usft
Well:	430H	North Reference:	Grid
Wellbore:	OH / Job 63046	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Cactus 171)	Database:	USA Compass

Project	Lea County, NM (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site Bell Lake Unit South

Site Position:		Northing:	453,977.40 usft	Latitude:	32° 14' 43.88291 N
From:	Map	Easting:	788,854.22 usft	Longitude:	103° 31' 57.83548 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.43 °

Well 430H

Well Position	+N/-S	0.00 usft	Northing:	453,959.70 usft	Latitude:	32° 14' 43.00624 N
	+E/-W	0.00 usft	Easting:	798,187.25 usft	Longitude:	103° 30' 9.16989 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,601.20 usft

Wellbore OH / Job 63046

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	7/28/2018	6.69	59.93	47,961.98076334

Design Surveys (Cactus 171)

Audit Notes:

Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
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Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	358.63

Survey Program Date 7/30/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
277.00	1,221.00	Teledrift Surveys (OH / Job 63046)	MWD	MWD - Standard
1,428.00	19,877.00	Phoenix MWD Surveys (OH / Job 63046)	MWD+HDGM	OWSG Rev.2 MWD + HDGM

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,221.00	0.40	323.00	1,220.92	13.06	-1.38	13.09	0.00	0.00	0.00
Tie In									
1,428.00	1.32	310.33	1,427.89	15.18	-3.63	15.26	0.45	0.44	-6.12
First Phoenix MWD Survey									
1,520.00	0.60	301.25	1,519.88	16.11	-4.85	16.23	0.80	-0.78	-9.87
1,612.00	0.32	321.25	1,611.88	16.56	-5.42	16.69	0.35	-0.30	21.74
1,704.00	0.19	265.98	1,703.88	16.75	-5.74	16.89	0.29	-0.14	-60.08
1,799.00	0.59	263.51	1,798.87	16.69	-6.38	16.84	0.42	0.42	-2.60
1,893.00	0.66	263.59	1,892.87	16.57	-7.40	16.74	0.07	0.07	0.09

Survey Report



Company:	Kaiser-Francis Oil Company	Local Co-ordinate Reference:	Well 430H
Project:	Lea County, NM (NAD 83)	TVD Reference:	RKB @ 3609.20usft
Site:	Bell Lake Unit South	MD Reference:	RKB @ 3609.20usft
Well:	430H	North Reference:	Grid
Wellbore:	OH / Job 63046	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Cactus 171)	Database:	USA Compass

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,987.00	0.58	256.58	1,986.86	16.40	-8.40	16.60	0.12	-0.09	-7.46
2,082.00	0.62	272.95	2,081.86	16.32	-9.38	16.54	0.18	0.04	17.23
2,176.00	0.94	281.65	2,175.85	16.50	-10.64	16.75	0.36	0.34	9.26
2,270.00	0.21	179.08	2,269.85	16.48	-11.40	16.75	1.07	-0.78	-109.12
2,364.00	0.19	234.91	2,363.84	16.22	-11.52	16.49	0.20	-0.02	59.39
2,457.00	0.39	294.88	2,456.84	16.26	-11.94	16.55	0.36	0.22	64.48
2,552.00	0.92	131.54	2,551.84	15.89	-11.66	16.17	1.37	0.56	-171.94
2,647.00	0.79	139.03	2,646.83	14.89	-10.66	15.15	0.18	-0.14	7.88
2,741.00	0.56	126.10	2,740.82	14.13	-9.86	14.37	0.29	-0.24	-13.76
2,835.00	0.74	106.32	2,834.82	13.69	-8.91	13.90	0.30	0.19	-21.04
2,930.00	1.52	106.71	2,929.80	13.16	-7.11	13.33	0.82	0.82	0.41
3,024.00	1.94	110.47	3,023.76	12.24	-4.43	12.35	0.46	0.45	4.00
3,118.00	3.60	112.03	3,117.64	10.58	-0.20	10.58	1.77	1.77	1.66
3,213.00	4.79	113.56	3,212.39	7.88	6.20	7.73	1.26	1.25	1.61
3,308.00	6.51	107.78	3,306.92	4.65	14.96	4.29	1.90	1.81	-6.08
3,402.00	6.63	108.54	3,400.30	1.29	25.18	0.69	0.16	0.13	0.81
3,496.00	6.98	107.86	3,493.64	-2.18	35.77	-3.04	0.38	0.37	-0.72
3,590.00	6.96	106.45	3,586.95	-5.55	46.66	-6.66	0.18	-0.02	-1.50
3,684.00	6.77	105.46	3,680.27	-8.64	57.47	-10.01	0.24	-0.20	-1.05
3,779.00	6.44	102.14	3,774.64	-11.25	68.07	-12.88	0.53	-0.35	-3.49
3,873.00	6.21	100.06	3,868.07	-13.25	78.23	-15.11	0.35	-0.24	-2.21
3,968.00	5.91	101.62	3,962.54	-15.13	88.08	-17.23	0.36	-0.32	1.64
4,063.00	5.78	103.45	4,057.05	-17.23	97.52	-19.56	0.24	-0.14	1.93
4,158.00	6.00	101.15	4,151.54	-19.30	107.05	-21.86	0.34	0.23	-2.42
4,252.00	6.25	99.47	4,245.01	-21.09	116.92	-23.88	0.33	0.27	-1.79
4,347.00	7.46	104.40	4,339.33	-23.48	127.99	-26.53	1.42	1.27	5.19
4,442.00	7.98	108.45	4,433.47	-27.10	140.22	-30.44	0.79	0.55	4.26
4,536.00	5.69	108.61	4,526.79	-30.65	150.83	-34.25	2.44	-2.44	0.17
4,631.00	5.89	107.65	4,621.31	-33.63	159.93	-37.45	0.23	0.21	-1.01
4,725.00	5.87	107.27	4,714.81	-36.52	169.12	-40.55	0.05	-0.02	-0.40
4,819.00	5.11	112.10	4,808.38	-39.52	177.59	-43.76	0.95	-0.81	5.14
4,914.00	4.09	106.38	4,903.08	-42.07	184.76	-46.48	1.18	-1.07	-6.02
5,008.00	3.46	102.22	4,996.87	-43.62	190.75	-48.16	0.73	-0.67	-4.43
5,102.00	3.09	104.92	5,090.72	-44.87	195.97	-49.54	0.43	-0.39	2.87
5,197.00	2.96	100.98	5,185.59	-46.00	200.85	-50.78	0.26	-0.14	-4.15
5,292.00	1.82	107.48	5,280.50	-46.92	204.70	-51.80	1.23	-1.20	6.84
5,386.00	1.62	102.77	5,374.46	-47.66	207.42	-52.60	0.26	-0.21	-5.01
5,481.00	0.73	125.66	5,469.44	-48.31	209.22	-53.30	1.04	-0.94	24.09
5,576.00	0.59	162.87	5,564.43	-49.13	209.85	-54.13	0.46	-0.15	39.17
5,670.00	0.57	139.39	5,658.43	-49.94	210.30	-54.96	0.25	-0.02	-24.98
5,765.00	0.44	130.43	5,753.42	-50.54	210.89	-55.57	0.16	-0.14	-9.43
5,859.00	0.26	91.65	5,847.42	-50.78	211.37	-55.82	0.31	-0.19	-41.26
5,954.00	0.14	337.42	5,942.42	-50.68	211.55	-55.72	0.36	-0.13	-120.24

Survey Report



Company:	Kaiser-Francis Oil Company	Local Co-ordinate Reference:	Well 430H
Project:	Lea County, NM (NAD 83)	TVD Reference:	RKB @ 3609.20usft
Site:	Bell Lake Unit South	MD Reference:	RKB @ 3609.20usft
Well:	430H	North Reference:	Grid
Wellbore:	OH / Job 63046	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Cactus 171)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,048.00	0.16	350.04	6,036.42	-50.44	211.48	-55.49	0.04	0.02	13.43
6,143.00	0.40	340.47	6,131.42	-50.00	211.34	-55.04	0.26	0.25	-10.07
6,238.00	0.20	334.55	6,226.42	-49.54	211.16	-54.57	0.21	-0.21	-6.23
6,332.00	0.31	4.63	6,320.42	-49.14	211.11	-54.17	0.18	0.12	32.00
6,427.00	0.24	354.72	6,415.42	-48.68	211.11	-53.72	0.09	-0.07	-10.43
6,522.00	0.54	340.28	6,510.42	-48.06	210.95	-53.09	0.33	0.32	-15.20
6,617.00	0.63	326.35	6,605.41	-47.21	210.51	-52.23	0.18	0.09	-14.66
6,711.00	0.55	325.02	6,699.41	-46.41	209.96	-51.41	0.09	-0.09	-1.41
6,806.00	0.50	334.51	6,794.40	-45.66	209.52	-50.66	0.11	-0.05	9.99
6,900.00	0.68	307.46	6,888.40	-44.95	208.90	-49.93	0.35	0.19	-28.78
6,994.00	0.45	317.02	6,982.39	-44.34	208.21	-49.31	0.26	-0.24	10.17
7,088.00	0.70	303.56	7,076.39	-43.75	207.48	-48.70	0.30	0.27	-14.32
7,182.00	0.54	309.10	7,170.38	-43.16	206.65	-48.08	0.18	-0.17	5.89
7,276.00	0.63	285.99	7,264.38	-42.73	205.81	-47.64	0.27	0.10	-24.59
7,370.00	0.46	265.89	7,358.37	-42.62	204.94	-47.51	0.27	-0.18	-21.38
7,466.00	0.42	270.49	7,454.37	-42.64	204.20	-47.51	0.06	-0.04	4.79
7,560.00	0.76	261.37	7,548.36	-42.73	203.24	-47.58	0.37	0.36	-9.70
7,655.00	0.68	251.04	7,643.36	-43.01	202.09	-47.83	0.16	-0.08	-10.87
7,750.00	0.64	248.19	7,738.35	-43.39	201.06	-48.19	0.05	-0.04	-3.00
7,844.00	0.69	260.40	7,832.34	-43.68	200.02	-48.45	0.16	0.05	12.99
7,939.00	0.87	271.43	7,927.34	-43.76	198.73	-48.50	0.25	0.19	11.61
8,033.00	1.09	257.90	8,021.32	-43.93	197.14	-48.63	0.34	0.23	-14.39
8,128.00	0.32	270.11	8,116.31	-44.12	195.99	-48.79	0.82	-0.81	12.85
8,222.00	0.25	223.77	8,210.31	-44.27	195.59	-48.93	0.25	-0.07	-49.30
8,317.00	0.33	271.89	8,305.31	-44.41	195.17	-49.06	0.26	0.08	50.65
8,412.00	0.83	267.15	8,400.31	-44.43	194.21	-49.06	0.53	0.53	-4.99
8,506.00	1.07	216.30	8,494.30	-45.17	193.01	-49.77	0.90	0.26	-54.10
8,601.00	0.54	257.09	8,589.29	-45.99	192.05	-50.57	0.79	-0.56	42.94
8,696.00	0.11	75.25	8,684.29	-46.06	191.70	-50.63	0.68	-0.45	187.54
8,789.00	0.17	91.31	8,777.29	-46.04	191.93	-50.62	0.08	0.06	17.27
8,884.00	0.32	341.47	8,872.28	-45.80	191.98	-50.37	0.43	0.16	-115.62
8,978.00	0.29	219.18	8,966.28	-45.73	191.75	-50.30	0.57	-0.03	-130.10
9,073.00	0.63	229.71	9,061.28	-46.26	191.20	-50.81	0.37	0.36	11.08
9,168.00	0.63	243.22	9,156.28	-46.83	190.34	-51.37	0.16	0.00	14.22
9,262.00	0.63	250.10	9,250.27	-47.24	189.39	-51.75	0.08	0.00	7.32
9,358.00	0.47	192.64	9,346.27	-47.80	188.81	-52.30	0.57	-0.17	-59.85
9,452.00	1.65	77.91	9,440.25	-47.89	190.05	-52.42	2.02	1.26	-122.05
9,546.00	1.52	95.02	9,534.22	-47.72	192.61	-52.31	0.52	-0.14	18.20
9,641.00	0.84	119.29	9,629.20	-48.17	194.47	-52.81	0.87	-0.72	25.55
9,736.00	0.72	143.41	9,724.19	-48.99	195.44	-53.65	0.36	-0.13	25.39
9,831.00	0.81	96.38	9,819.18	-49.54	196.46	-54.23	0.65	0.09	-49.51
9,926.00	0.69	73.91	9,914.17	-49.46	197.68	-54.17	0.33	-0.13	-23.65
10,021.00	0.89	39.27	10,009.16	-48.73	198.69	-53.47	0.53	0.21	-36.46
10,116.00	1.10	20.63	10,104.15	-47.31	199.48	-52.06	0.40	0.22	-19.62

Survey Report



Company: Kaiser-Francis Oil Company
Project: Lea County, NM (NAD 83)
Site: Bell Lake Unit South
Well: 430H
Wellbore: OH / Job 63046
Design: Surveys (Cactus 171)

Local Co-ordinate Reference: Well 430H
TVD Reference: RKB @ 3609.20usft
MD Reference: RKB @ 3609.20usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Buid Rate (°/100usft)	Turn Rate (°/100usft)
10,211.00	0.58	335.31	10,199.14	-46.02	199.60	-50.78	0.85	-0.55	-47.71
10,306.00	0.38	20.78	10,294.14	-45.28	199.51	-50.04	0.44	-0.21	47.86
10,401.00	0.51	348.72	10,389.14	-44.58	199.54	-49.33	0.29	0.14	-33.75
10,496.00	0.62	335.32	10,484.13	-43.69	199.24	-48.45	0.18	0.12	-14.11
10,591.00	0.73	302.88	10,579.12	-42.90	198.52	-47.63	0.41	0.12	-34.15
10,685.00	0.53	313.43	10,673.12	-42.27	197.70	-46.99	0.25	-0.21	11.22
10,780.00	0.56	205.85	10,768.12	-42.39	197.18	-47.09	0.93	0.03	-113.24
10,876.00	0.89	257.33	10,864.11	-42.98	196.25	-47.66	0.73	0.34	53.63
10,971.00	1.49	294.04	10,959.09	-42.63	194.40	-47.27	0.99	0.63	38.64
11,065.00	1.69	279.36	11,053.05	-41.91	191.92	-46.49	0.48	0.21	-15.62
11,096.00	1.70	278.04	11,084.04	-41.77	191.01	-46.33	0.13	0.03	-4.26
11,139.00	2.04	273.82	11,127.02	-41.63	189.62	-46.15	0.85	0.79	-9.81
11,186.00	1.56	283.89	11,173.99	-41.42	188.16	-45.91	1.22	-1.02	21.43
11,233.00	3.26	332.60	11,220.96	-40.08	186.92	-44.54	5.36	3.62	103.64
11,280.00	9.78	350.21	11,267.63	-34.96	185.63	-39.38	14.35	13.87	37.47
11,328.00	17.01	357.92	11,314.30	-23.91	184.68	-28.32	15.48	15.06	16.06
11,375.00	23.06	1.19	11,358.43	-7.82	184.62	-12.23	13.09	12.87	6.96
11,423.00	28.30	4.56	11,401.68	12.94	185.72	8.49	11.33	10.92	7.02
11,470.00	33.00	7.72	11,442.10	36.74	188.33	32.23	10.57	10.00	6.72
11,517.00	36.30	7.03	11,480.76	63.24	191.75	58.64	7.07	7.02	-1.47
11,564.00	41.05	4.94	11,517.45	92.44	194.78	87.76	10.48	10.11	-4.45
11,612.00	44.01	1.48	11,552.82	124.82	196.57	120.09	7.86	6.17	-7.21
11,659.00	47.92	358.97	11,585.49	158.60	196.68	153.85	9.16	8.32	-5.34
11,707.00	49.69	359.33	11,617.10	194.71	196.15	189.97	3.73	3.69	0.75
11,754.00	53.73	357.67	11,646.22	231.58	195.17	226.85	9.03	8.60	-3.53
11,801.00	57.22	355.77	11,672.85	270.23	192.94	265.54	8.14	7.43	-4.04
11,848.00	60.97	355.18	11,696.99	310.42	189.75	305.80	8.05	7.98	-1.26
11,896.00	67.48	357.18	11,717.85	353.53	186.90	348.96	14.07	13.56	4.17
11,943.00	73.17	2.47	11,733.68	397.75	186.80	393.17	16.09	12.11	11.26
11,991.00	76.51	3.59	11,746.23	444.00	189.25	439.35	7.31	6.96	2.33
12,038.00	79.62	2.72	11,755.95	489.91	191.78	485.19	6.86	6.62	-1.85
12,086.00	87.16	0.62	11,761.47	537.53	193.16	532.76	16.30	15.71	-4.38
12,113.00	91.89	0.68	11,761.70	564.52	193.47	559.74	17.52	17.52	0.22
12,208.00	93.90	359.96	11,756.90	659.40	194.00	654.57	2.25	2.12	-0.76
12,303.00	89.67	358.64	11,753.94	754.32	192.84	749.49	4.66	-4.45	-1.39
12,398.00	90.79	357.74	11,753.56	849.27	189.84	844.49	1.51	1.18	-0.95
12,493.00	87.53	357.31	11,754.95	944.16	185.73	939.45	3.46	-3.43	-0.45
12,587.00	87.79	355.68	11,758.79	1,037.90	179.99	1,033.30	1.75	0.28	-1.73
12,682.00	90.56	355.77	11,760.16	1,132.62	172.91	1,128.16	2.92	2.92	0.09
12,777.00	90.13	356.40	11,759.58	1,227.39	166.43	1,223.06	0.80	-0.45	0.66
12,871.00	88.47	356.96	11,760.73	1,321.22	160.98	1,317.00	1.86	-1.77	0.60
12,966.00	85.64	358.41	11,765.61	1,416.01	157.15	1,411.85	3.35	-2.98	1.53
13,061.00	88.99	358.35	11,770.06	1,510.85	154.47	1,506.73	3.53	3.53	-0.06

Survey Report



Company: Kaiser-Francis Oil Company
Project: Lea County, NM (NAD 83)
Site: Bell Lake Unit South
Well: 430H
Wellbore: OH / Job 63046
Design: Surveys (Cactus 171)

Local Co-ordinate Reference: Well 430H
TVD Reference: RKB @ 3609.20usft
MD Reference: RKB @ 3609.20usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)
13,156.00	90.39	356.00	11,770.58	1,605.73	149.78	1,601.69	2.88	1.47	-2.47
13,251.00	91.99	356.94	11,768.60	1,700.52	143.94	1,696.59	1.95	1.68	0.99
13,346.00	90.93	358.32	11,766.18	1,795.41	140.01	1,791.55	1.83	-1.12	1.45
13,441.00	90.39	357.20	11,765.09	1,890.33	136.30	1,886.53	1.31	-0.57	-1.18
13,535.00	87.11	358.43	11,767.14	1,984.22	132.71	1,980.48	3.73	-3.49	1.31
13,630.00	90.02	0.30	11,769.52	2,079.17	131.66	2,075.43	3.64	3.06	1.97
13,725.00	89.72	356.53	11,769.73	2,174.12	129.04	2,170.41	3.98	-0.32	-3.97
13,820.00	89.56	355.09	11,770.33	2,268.86	122.09	2,265.29	1.53	-0.17	-1.52
13,914.00	85.64	359.91	11,774.27	2,362.64	117.99	2,359.14	6.61	-4.17	5.13
14,009.00	86.52	2.02	11,780.76	2,457.40	119.59	2,453.84	2.40	0.93	2.22
14,104.00	88.15	1.61	11,785.18	2,552.24	122.60	2,548.58	1.77	1.72	-0.43
14,198.00	87.51	0.87	11,788.74	2,646.15	124.63	2,642.42	1.04	-0.68	-0.79
14,293.00	87.46	2.34	11,792.91	2,741.02	127.29	2,737.20	1.55	-0.05	1.55
14,388.00	89.33	2.92	11,795.57	2,835.88	131.65	2,831.92	2.06	1.97	0.61
14,483.00	91.95	0.12	11,794.51	2,930.82	134.17	2,926.78	4.04	2.76	-2.95
14,577.00	91.69	359.71	11,791.52	3,024.78	134.03	3,020.71	0.52	-0.28	-0.44
14,672.00	90.62	358.31	11,789.61	3,119.74	132.38	3,115.68	1.85	-1.13	-1.47
14,767.00	87.11	356.83	11,791.49	3,214.62	128.36	3,210.63	4.01	-3.69	-1.56
14,862.00	91.74	0.79	11,792.44	3,309.55	126.39	3,305.58	6.41	4.87	4.17
14,957.00	89.24	358.59	11,791.63	3,404.53	125.87	3,400.55	3.51	-2.63	-2.32
15,051.00	88.59	357.53	11,793.41	3,498.46	122.69	3,494.52	1.32	-0.69	-1.13
15,146.00	92.51	359.15	11,792.50	3,593.39	119.94	3,589.50	4.46	4.13	1.71
15,241.00	93.05	359.13	11,787.89	3,688.27	118.52	3,684.38	0.57	0.57	-0.02
15,335.00	93.23	359.72	11,782.74	3,782.12	117.58	3,778.23	0.66	0.19	0.63
15,430.00	89.50	359.66	11,780.48	3,877.08	117.06	3,873.17	3.93	-3.93	-0.06
15,524.00	90.88	0.91	11,780.17	3,971.07	117.53	3,967.12	1.98	1.47	1.33
15,619.00	87.99	359.82	11,781.10	4,066.05	118.13	4,062.07	3.25	-3.04	-1.15
15,714.00	88.11	358.93	11,784.34	4,160.99	117.10	4,157.00	0.94	0.13	-0.94
15,808.00	87.27	356.40	11,788.13	4,254.83	113.27	4,250.90	2.83	-0.89	-2.69
15,903.00	94.51	359.80	11,786.65	4,349.69	110.12	4,345.81	8.42	7.62	3.58
15,998.00	90.21	359.47	11,782.74	4,444.58	109.52	4,440.69	4.54	-4.53	-0.35
16,093.00	86.97	358.84	11,785.08	4,539.53	108.12	4,535.65	3.47	-3.41	-0.66
16,187.00	87.50	358.62	11,789.61	4,633.40	106.04	4,629.54	0.61	0.56	-0.23
16,282.00	89.78	358.53	11,791.87	4,728.33	103.68	4,724.50	2.40	2.40	-0.09
16,377.00	88.99	357.68	11,792.89	4,823.28	100.53	4,819.49	1.22	-0.83	-0.89
16,472.00	89.84	357.99	11,793.86	4,918.20	96.95	4,914.48	0.95	0.89	0.33
16,567.00	88.13	359.23	11,795.54	5,013.15	94.64	5,009.46	2.22	-1.80	1.31
16,661.00	88.38	0.38	11,798.40	5,107.11	94.32	5,103.39	1.25	0.27	1.22
16,756.00	84.57	0.19	11,804.24	5,201.91	94.79	5,198.16	4.02	-4.01	-0.20
16,853.00	83.80	359.40	11,814.07	5,298.41	94.45	5,294.63	1.13	-0.79	-0.81
16,948.00	88.07	359.29	11,820.80	5,393.14	93.37	5,389.37	4.50	4.49	-0.12
17,043.00	90.91	0.72	11,821.65	5,488.12	93.37	5,484.32	3.35	2.99	1.51
17,137.00	89.27	358.30	11,821.50	5,582.11	92.57	5,578.30	3.11	-1.74	-2.57

Survey Report



Company:	Kaiser-Francis Oil Company	Local Co-ordinate Reference:	Well 430H
Project:	Lea County, NM (NAD 83)	TVD Reference:	RKB @ 3609.20usft
Site:	Bell Lake Unit South	MD Reference:	RKB @ 3609.20usft
Well:	430H	North Reference:	Grid
Wellbore:	OH / Job 63046	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Cactus 171)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)
17,232.00	85.87	357.65	11,825.53	5,676.95	89.22	5,673.20	3.64	-3.58	-0.68
17,327.00	86.68	356.42	11,831.70	5,771.62	84.31	5,767.96	1.55	0.85	-1.29
17,421.00	88.35	357.61	11,835.78	5,865.40	79.42	5,861.82	2.18	1.78	1.27
17,516.00	90.90	357.31	11,836.40	5,960.30	75.21	5,956.80	2.70	2.68	-0.32
17,611.00	90.08	358.38	11,835.58	6,055.22	71.64	6,051.78	1.42	-0.86	1.13
17,705.00	87.55	357.17	11,837.53	6,149.12	67.99	6,145.74	2.98	-2.69	-1.29
17,800.00	90.05	358.32	11,839.52	6,244.02	64.26	6,240.70	2.90	2.63	1.21
17,895.00	90.76	358.66	11,838.85	6,338.98	61.75	6,335.70	0.83	0.75	0.36
17,990.00	86.02	358.65	11,841.51	6,433.89	59.53	6,430.63	4.99	-4.99	-0.01
18,084.00	87.70	356.38	11,846.66	6,527.65	55.46	6,524.46	3.00	1.79	-2.41
18,179.00	91.35	355.15	11,847.45	6,622.37	48.44	6,619.32	4.05	3.84	-1.29
18,274.00	94.92	355.61	11,842.26	6,716.91	40.80	6,714.01	3.79	3.76	0.48
18,369.00	94.95	357.40	11,834.08	6,811.38	35.03	6,808.59	1.88	0.03	1.88
18,464.00	95.75	1.08	11,825.22	6,905.94	33.78	6,903.16	3.95	0.84	3.87
18,558.00	91.79	2.38	11,819.04	6,999.67	36.61	6,996.79	4.43	-4.21	1.38
18,653.00	87.18	3.48	11,819.90	7,094.51	41.46	7,091.50	4.99	-4.85	1.16
18,748.00	82.57	359.79	11,828.38	7,189.05	44.17	7,185.94	6.21	-4.85	-3.88
18,842.00	83.96	359.91	11,839.41	7,282.40	43.93	7,279.27	1.48	1.48	0.13
18,937.00	83.09	357.73	11,850.12	7,376.77	41.99	7,373.66	2.46	-0.92	-2.29
19,032.00	86.81	357.59	11,858.48	7,471.31	38.12	7,468.26	3.92	3.92	-0.15
19,127.00	89.18	356.11	11,861.81	7,566.09	32.91	7,563.15	2.94	2.49	-1.56
19,221.00	94.26	356.10	11,858.99	7,659.80	26.53	7,656.98	5.40	5.40	-0.01
19,316.00	92.51	354.39	11,853.38	7,754.31	18.66	7,751.64	2.57	-1.84	-1.80
19,411.00	92.16	354.60	11,849.51	7,848.79	9.56	7,846.32	0.43	-0.37	0.22
19,506.00	91.91	353.07	11,846.13	7,943.18	-0.64	7,940.92	1.63	-0.26	-1.61
19,600.00	95.94	351.50	11,839.70	8,036.09	-13.22	8,034.10	4.60	4.29	-1.67
19,695.00	92.02	349.23	11,833.11	8,129.49	-29.08	8,127.87	4.77	-4.13	-2.39
19,822.00	89.36	342.79	11,831.58	8,252.64	-59.77	8,251.71	5.49	-2.09	-5.07
Final Phoenix MWD Survey									
19,877.00	89.36	342.79	11,832.18	8,305.18	-76.04	8,304.62	0.00	0.00	0.00
Projection to TD									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,221.00	1,220.92	13.06	-1.38	Tie In
1,428.00	1,427.89	15.18	-3.63	First Phoenix MWD Survey
19,822.00	11,831.58	8,252.64	-59.77	Final Phoenix MWD Survey
19,877.00	11,832.19	8,305.18	-76.04	Projection to TD