



**CHISHOLM
ENERGY**

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 29 2017

RECEIVED

Chisholm Energy Holdings, LLC

Eddy County, NM (NAD83)

Sec 28, T 26 S, R 26 E

Cottonwood 28-33 Federal 2H

Wellbore #1

30-015-43692

Design: Wellbore #1

Standard Survey Report

17 July, 2017





Integrity Directional Services, LLC
Survey Report



Company: Chisholm Energy Holdings, LLC
Project: Eddy County, NM (NAD83)
Site: Sec 28, T 26 S, R 26 E
Well: Cottonwood 28-33 Federal 2H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Cottonwood 28-33 Federal 2H
TVD Reference: KB=22' @ 3422.00ft (Nabors M55)
MD Reference: KB=22' @ 3422.00ft (Nabors M55)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Project	Eddy County, NM (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Sec 28, T 26 S, R 26 E		
Site Position:		Northing:	371,047.5000 usft
From:	Map	Easting:	551,006.1000 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32.0200858
		Longitude:	-104.3021363
		Grid Convergence:	0.02 °

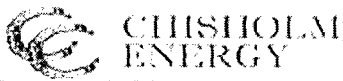
Well	Cottonwood 28-33 Federal 2H, ACTIVE		
Well Position	+N/-S	0.00 ft	Northing: 371,047.5000 usft
	+E/-W	0.00 ft	Easting: 551,006.1000 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	32.0200858
		Longitude:	-104.3021363
		Ground Level:	3,400.00 ft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	6/26/2017	7.48
		Dip Angle (°)	59.65
		Field Strength (nT)	47,916

Design	Wellbore #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)
	0.00	0.00	0.00
		Direction (°)	180.00

Survey Program	Date 7/17/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name
100.00	14,180.00	IDS MWD Surveys (Wellbore #1)	MWD
			Description
			MWD - Standard

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.70	27.40	100.00	0.54	0.28	-0.54	0.70	0.70	0.00
First MWD Survey @ 100'MD									
191.00	0.90	59.10	190.99	1.40	1.15	-1.40	0.52	0.22	34.84
279.00	0.60	67.80	278.98	1.93	2.17	-1.93	0.36	-0.34	9.89
351.00	1.00	88.00	350.97	2.10	3.15	-2.10	0.67	0.56	28.06
431.00	0.40	109.30	430.97	2.03	4.11	-2.03	0.80	-0.75	26.63
461.00	0.90	136.80	460.97	1.82	4.37	-1.82	1.92	1.67	91.67
551.00	1.10	99.20	550.95	1.17	5.70	-1.17	0.75	0.22	-41.78
673.00	1.10	105.80	672.93	0.66	7.99	-0.66	0.10	0.00	5.41
736.00	0.70	109.30	735.92	0.37	8.93	-0.37	0.64	-0.63	5.56



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Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)
831.00	1.30	100.50	830.91	-0.02	10.54	0.02	0.65	0.63	-9.26
926.00	1.10	85.40	925.89	-0.14	12.51	0.14	0.39	-0.21	-15.89
1,021.00	1.20	71.50	1,020.87	0.25	14.36	-0.25	0.31	0.11	-14.63
1,116.00	1.60	80.50	1,115.84	0.78	16.61	-0.78	0.48	0.42	9.47
1,211.00	1.20	36.20	1,210.81	1.80	18.51	-1.80	1.18	-0.42	-46.63
1,307.00	2.40	55.80	1,306.77	3.75	20.76	-3.75	1.39	1.25	20.42
1,402.00	3.30	64.10	1,401.65	6.06	24.87	-6.06	1.04	0.95	8.74
1,497.00	2.30	54.00	1,496.53	8.37	28.87	-8.37	1.17	-1.05	-10.63
1,560.00	2.20	59.10	1,559.49	9.74	30.93	-9.74	0.36	-0.16	8.10
1,649.00	1.60	71.00	1,648.44	11.02	33.57	-11.02	0.80	-0.67	13.37
1,744.00	1.50	340.10	1,743.41	12.62	34.40	-12.62	2.33	-0.11	-95.68
1,839.00	1.00	237.00	1,838.40	13.34	33.28	-13.34	2.09	-0.53	-108.53
1,934.00	1.00	265.10	1,933.39	12.81	31.76	-12.81	0.51	0.00	29.58
2,029.00	0.50	232.90	2,028.38	12.49	30.61	-12.49	0.67	-0.53	-33.89
2,124.00	0.90	276.30	2,123.37	12.33	29.53	-12.33	0.67	0.42	45.68
2,220.00	1.00	249.70	2,219.36	12.12	28.00	-12.12	0.47	0.10	-27.71
2,315.00	1.10	262.50	2,314.34	11.71	26.32	-11.71	0.27	0.11	13.47
2,410.00	0.80	284.80	2,409.33	11.76	24.77	-11.76	0.50	-0.32	23.47
2,505.00	0.50	284.60	2,504.32	12.04	23.73	-12.04	0.32	-0.32	-0.21
2,600.00	0.40	237.90	2,599.32	11.96	23.05	-11.96	0.39	-0.11	-49.16
2,695.00	0.90	267.80	2,694.31	11.76	22.02	-11.76	0.62	0.53	31.47
2,790.00	1.00	241.30	2,789.30	11.33	20.55	-11.33	0.47	0.11	-27.89
2,885.00	1.00	234.70	2,884.29	10.46	19.15	-10.46	0.12	0.00	-6.95
2,980.00	0.60	231.40	2,979.28	9.67	18.08	-9.67	0.42	-0.42	-3.47
3,075.00	0.40	240.80	3,074.27	9.19	17.40	-9.19	0.23	-0.21	9.89
3,171.00	0.50	260.20	3,170.27	8.96	16.70	-8.96	0.19	0.10	20.21
3,266.00	0.70	228.40	3,265.27	8.50	15.85	-8.50	0.40	0.21	-33.47
3,361.00	1.10	243.30	3,360.25	7.71	14.61	-7.71	0.48	0.42	15.68
3,456.00	1.00	229.40	3,455.24	6.76	13.16	-6.76	0.29	-0.11	-14.63
3,551.00	1.20	239.10	3,550.22	5.71	11.68	-5.71	0.29	0.21	10.21
3,646.00	1.10	256.00	3,645.20	4.98	9.94	-4.98	0.37	-0.11	17.79
3,742.00	1.20	252.20	3,741.18	4.45	8.09	-4.45	0.13	0.10	-3.96
3,837.00	1.50	249.40	3,836.16	3.71	5.98	-3.71	0.32	0.32	-2.95
3,932.00	1.30	248.20	3,931.13	2.87	3.81	-2.87	0.21	-0.21	-1.26
4,027.00	1.10	231.00	4,026.11	1.89	2.10	-1.89	0.43	-0.21	-18.11
4,122.00	1.40	222.90	4,121.08	0.47	0.61	-0.47	0.37	0.32	-8.53
4,217.00	1.50	225.60	4,216.05	-1.25	-1.07	1.25	0.13	0.11	2.84
4,312.00	1.40	247.20	4,311.02	-2.57	-3.03	2.57	0.58	-0.11	22.74
4,407.00	1.60	221.60	4,405.99	-4.01	-4.98	4.01	0.73	0.21	-26.95
4,502.00	0.70	4.70	4,500.98	-4.43	-5.81	4.43	2.32	-0.95	150.63
4,597.00	1.80	26.80	4,595.96	-2.52	-5.09	2.52	1.24	1.16	23.26
4,693.00	2.10	30.30	4,691.90	0.35	-3.53	-0.35	0.34	0.31	3.65
4,787.00	2.00	76.60	4,785.85	2.22	-1.06	-2.22	1.72	-0.11	49.26



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4,883.00	1.80	121.30	4,881.80	1.82	1.86	-1.82	1.52	-0.21	46.56
4,978.00	2.10	144.10	4,976.75	-0.36	4.15	0.36	0.87	0.32	24.00
5,073.00	1.90	142.60	5,071.69	-3.02	6.13	3.02	0.22	-0.21	-1.58
5,168.00	1.80	150.50	5,166.64	-5.57	7.82	5.57	0.29	-0.11	8.32
5,263.00	1.40	167.60	5,261.60	-8.01	8.80	8.01	0.65	-0.42	18.00
5,360.00	1.50	163.80	5,358.57	-10.38	9.41	10.38	0.14	0.10	-3.92
5,455.00	1.50	167.30	5,453.54	-12.79	10.03	12.79	0.10	0.00	3.68
5,550.00	1.90	163.70	5,548.50	-15.51	10.75	15.51	0.44	0.42	-3.79
5,645.00	0.70	63.00	5,643.48	-16.76	11.71	16.76	2.26	-1.26	-106.00
5,740.00	0.50	41.20	5,738.47	-16.19	12.50	16.19	0.32	-0.21	-22.95
5,836.00	0.50	266.60	5,834.47	-15.90	12.35	15.90	0.96	0.00	-140.21
5,931.00	1.70	218.30	5,929.46	-17.03	11.07	17.03	1.49	1.26	-50.84
6,026.00	1.80	208.50	6,024.41	-19.44	9.48	19.44	0.33	0.11	-10.32
6,119.00	2.30	206.60	6,117.35	-22.40	7.95	22.40	0.54	0.54	-2.04
6,215.00	0.80	197.10	6,213.31	-24.76	6.89	24.76	1.58	-1.56	-9.90
6,310.00	0.70	234.10	6,308.31	-25.73	6.22	25.73	0.51	-0.11	38.95
6,325.00	1.00	215.10	6,323.30	-25.89	6.08	25.89	2.72	2.00	-126.67
6,350.00	0.80	213.30	6,348.30	-26.22	5.85	26.22	0.81	-0.80	-7.20
6,382.00	1.00	138.60	6,380.30	-26.62	5.92	26.62	3.45	0.63	-233.44
6,414.00	4.70	104.90	6,412.25	-27.16	7.37	27.16	12.21	11.56	-105.31
6,445.00	8.90	98.30	6,443.03	-27.84	10.97	27.84	13.76	13.55	-21.29
6,477.00	13.00	94.40	6,474.44	-28.47	17.01	28.47	13.01	12.81	-12.19
6,509.00	16.90	93.60	6,505.35	-29.04	25.24	29.04	12.20	12.19	-2.50
6,541.00	21.20	93.00	6,535.59	-29.63	35.67	29.63	13.45	13.44	-1.88
6,573.00	24.70	90.60	6,565.06	-30.01	48.14	30.01	11.32	10.94	-7.50
6,604.00	28.20	95.00	6,592.81	-30.71	61.92	30.71	12.93	11.29	14.19
6,636.00	31.50	95.90	6,620.56	-32.23	77.77	32.23	10.41	10.31	2.81
6,668.00	34.90	97.10	6,647.33	-34.22	95.17	34.22	10.82	10.63	3.75
6,699.00	37.50	99.90	6,672.35	-36.94	113.27	36.94	9.94	8.39	9.03
6,731.00	40.20	101.70	6,697.27	-40.71	132.99	40.71	9.14	8.44	5.63
6,763.00	42.80	101.70	6,721.23	-45.01	153.75	45.01	8.13	8.13	0.00
6,795.00	44.30	101.70	6,744.42	-49.48	175.34	49.48	4.69	4.69	0.00
6,827.00	45.60	102.10	6,767.07	-54.14	197.46	54.14	4.16	4.06	1.25
6,858.00	47.40	102.70	6,788.41	-58.97	219.42	58.97	5.97	5.81	1.94
6,890.00	49.00	103.10	6,809.74	-64.30	242.67	64.30	5.09	5.00	1.25
6,922.00	50.50	103.50	6,830.41	-69.92	266.44	69.92	4.78	4.69	1.25
6,953.00	53.80	104.20	6,849.43	-75.78	290.20	75.78	10.79	10.65	2.26
6,985.00	57.90	106.10	6,867.39	-82.71	315.75	82.71	13.72	12.81	5.94
7,016.00	59.90	110.00	6,883.41	-90.94	340.98	90.94	12.56	6.45	12.58
7,048.00	60.40	115.00	6,899.34	-101.56	366.61	101.56	13.64	1.56	15.63
7,080.00	61.10	119.50	6,914.99	-114.34	391.42	114.34	12.46	2.19	14.06
7,111.00	61.70	122.90	6,929.83	-128.44	414.69	128.44	9.82	1.94	10.97
7,143.00	62.50	127.20	6,944.81	-144.68	437.83	144.68	12.14	2.50	13.44



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7,175.00	63.80	130.80	6,959.26	-162.65	460.01	162.65	10.83	4.06	11.25
7,204.64	64.95	133.96	6,972.09	-180.66	479.75	180.66	10.35	3.87	10.65
North 330 Hardline Crossing @ 7204.64'MD									
7,206.00	65.00	134.10	6,972.66	-181.52	480.63	181.52	10.35	3.98	10.54
7,237.00	66.70	138.30	6,985.35	-201.93	500.20	201.93	13.52	5.48	13.55
7,269.00	68.10	141.50	6,997.65	-224.53	519.22	224.53	10.22	4.38	10.00
7,300.00	69.20	145.10	7,008.94	-247.67	536.47	247.67	11.38	3.55	11.61
7,332.00	70.40	148.40	7,019.99	-272.78	552.93	272.78	10.38	3.75	10.31
7,363.00	70.80	151.70	7,030.29	-298.12	567.52	298.12	10.12	1.29	10.65
7,395.00	71.70	155.00	7,040.58	-325.19	581.11	325.19	10.16	2.81	10.31
7,427.00	72.80	157.60	7,050.34	-353.10	593.36	353.10	8.47	3.44	8.13
7,458.00	73.60	159.70	7,059.30	-380.74	604.16	380.74	6.98	2.58	6.77
7,490.00	74.80	161.40	7,068.01	-409.77	614.41	409.77	6.34	3.75	5.31
7,522.00	76.90	162.50	7,075.83	-439.27	624.02	439.27	7.36	6.56	3.44
7,553.00	78.80	164.30	7,082.36	-468.31	632.68	468.31	8.35	6.13	5.81
7,585.00	80.00	166.60	7,088.24	-498.75	640.58	498.75	8.00	3.75	7.19
7,617.00	80.70	169.30	7,093.61	-529.60	647.16	529.60	8.60	2.19	8.44
7,648.00	81.40	171.50	7,098.43	-559.79	652.27	559.79	7.37	2.26	7.10
7,680.00	82.50	173.10	7,102.91	-591.19	656.51	591.19	6.03	3.44	5.00
7,711.00	83.80	174.80	7,106.61	-621.80	659.76	621.80	6.87	4.19	5.48
7,743.00	85.40	176.70	7,109.62	-653.56	662.12	653.56	7.74	5.00	5.94
7,775.00	87.10	178.40	7,111.72	-685.46	663.48	685.46	7.50	5.31	5.31
7,869.00	91.10	180.80	7,113.19	-779.42	664.14	779.42	4.96	4.26	2.55
7,961.00	93.50	182.00	7,109.50	-871.32	661.89	871.32	2.92	2.61	1.30
8,051.00	92.90	180.50	7,104.48	-961.15	659.93	961.15	1.79	-0.67	-1.67
8,141.00	91.80	179.30	7,100.79	-1,051.07	660.09	1,051.07	1.81	-1.22	-1.33
8,231.00	91.40	179.00	7,098.27	-1,141.03	661.42	1,141.03	0.56	-0.44	-0.33
8,323.00	93.10	178.80	7,094.66	-1,232.93	663.19	1,232.93	1.86	1.85	-0.22
8,413.00	93.00	178.70	7,089.87	-1,322.79	665.15	1,322.79	0.16	-0.11	-0.11
8,508.00	93.90	179.10	7,084.16	-1,417.60	666.97	1,417.60	1.04	0.95	0.42
8,603.00	93.80	179.10	7,077.78	-1,512.37	668.46	1,512.37	0.11	-0.11	0.00
8,698.00	93.00	179.10	7,072.14	-1,607.19	669.95	1,607.19	0.84	-0.84	0.00
8,793.00	92.40	179.30	7,067.67	-1,702.07	671.27	1,702.07	0.67	-0.63	0.21
8,888.00	91.40	179.80	7,064.52	-1,797.02	672.02	1,797.02	1.18	-1.05	0.53
8,984.00	91.90	180.10	7,061.75	-1,892.98	672.10	1,892.98	0.61	0.52	0.31
9,079.00	92.70	180.60	7,057.94	-1,987.90	671.52	1,987.90	0.99	0.84	0.53
9,174.00	92.50	181.00	7,053.63	-2,082.79	670.20	2,082.79	0.47	-0.21	0.42
9,270.00	92.60	181.20	7,049.36	-2,178.68	668.36	2,178.68	0.23	0.10	0.21
9,365.00	93.50	181.50	7,044.31	-2,273.52	666.12	2,273.52	1.00	0.95	0.32
9,460.00	94.30	181.10	7,037.84	-2,368.27	663.97	2,368.27	0.94	0.84	-0.42
9,555.00	94.20	180.00	7,030.80	-2,463.00	663.06	2,463.00	1.16	-0.11	-1.16
9,650.00	93.40	180.20	7,024.51	-2,557.79	662.90	2,557.79	0.87	-0.84	0.21
9,746.00	92.10	180.30	7,019.90	-2,653.68	662.48	2,653.68	1.36	-1.35	0.10
9,841.00	91.10	180.40	7,017.25	-2,748.64	661.90	2,748.64	1.06	-1.05	0.11



Integrity Directional Services, LLC Survey Report



Company: Chisholm Energy Holdings, LLC
Project: Eddy County, NM (NAD83)
Site: Sec 28, T 26 S. R 26 E
Well: Cottonwood 28-33 Federal 2H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Cottonwood 28-33 Federal 2H
TVD Reference: KB=22' @ 3422.00ft (Nabors M55)
MD Reference: KB=22' @ 3422.00ft (Nabors M55)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,936.00	91.90	180.70	7,014.76	-2,843.60	660.99	2,843.60	0.90	0.84	0.32
10,031.00	93.30	181.50	7,010.45	-2,938.48	659.16	2,938.48	1.70	1.47	0.84
10,127.00	94.70	182.10	7,003.76	-3,034.20	656.16	3,034.20	1.59	1.46	0.63
10,222.00	92.60	182.20	6,997.71	-3,128.94	652.60	3,128.94	2.21	-2.21	0.11
10,317.00	92.60	182.80	6,993.40	-3,223.75	648.46	3,223.75	0.63	0.00	0.63
10,412.00	92.00	182.50	6,989.59	-3,318.57	644.07	3,318.57	0.71	-0.63	-0.32
10,507.00	91.70	182.30	6,986.52	-3,413.44	640.10	3,413.44	0.38	-0.32	-0.21
10,603.00	90.40	180.70	6,984.76	-3,509.38	637.58	3,509.38	2.15	-1.35	-1.67
10,698.00	90.50	179.10	6,984.01	-3,604.37	637.75	3,604.37	1.69	0.11	-1.68
10,793.00	90.40	178.20	6,983.27	-3,699.34	639.99	3,699.34	0.95	-0.11	-0.95
10,891.00	89.30	176.80	6,983.53	-3,797.25	644.26	3,797.25	1.82	-1.12	-1.43
10,986.00	90.80	177.30	6,983.44	-3,892.12	649.15	3,892.12	1.66	1.58	0.53
11,081.00	91.90	178.20	6,981.20	-3,987.02	652.88	3,987.02	1.50	1.16	0.95
11,176.00	91.90	178.80	6,978.05	-4,081.93	655.37	4,081.93	0.63	0.00	0.63
11,271.00	93.30	180.30	6,973.74	-4,176.82	656.11	4,176.82	2.16	1.47	1.58
11,365.00	93.80	180.60	6,967.92	-4,270.64	655.37	4,270.64	0.62	0.53	0.32
11,459.00	93.80	180.40	6,961.69	-4,364.43	654.56	4,364.43	0.21	0.00	-0.21
11,554.00	93.00	179.10	6,956.06	-4,459.26	654.97	4,459.26	1.60	-0.84	-1.37
11,649.00	92.50	177.70	6,951.50	-4,554.11	657.62	4,554.11	1.56	-0.53	-1.47
11,744.00	92.60	177.70	6,947.28	-4,648.94	661.43	4,648.94	0.11	0.11	0.00
11,838.00	92.10	178.80	6,943.42	-4,742.82	664.30	4,742.82	1.28	-0.53	1.17
11,933.00	89.20	178.80	6,942.34	-4,837.78	666.29	4,837.78	3.05	-3.05	0.00
12,027.00	89.30	178.90	6,943.57	-4,931.75	668.17	4,931.75	0.15	0.11	0.11
12,121.00	89.40	179.10	6,944.64	-5,025.73	669.81	5,025.73	0.24	0.11	0.21
12,215.00	89.10	179.30	6,945.87	-5,119.71	671.13	5,119.71	0.38	-0.32	0.21
12,266.49	88.61	179.19	6,946.90	-5,171.19	671.80	5,171.19	0.97	-0.95	-0.21
Sec 28 / 33 Line Crossing @ 12266.49'MD									
12,310.00	88.20	179.10	6,948.11	-5,214.68	672.45	5,214.68	0.97	-0.95	-0.21
12,405.00	88.50	179.40	6,950.84	-5,309.63	673.69	5,309.63	0.45	0.32	0.32
12,497.00	88.80	179.50	6,953.01	-5,401.60	674.58	5,401.60	0.34	0.33	0.11
12,591.00	89.30	179.70	6,954.57	-5,495.58	675.23	5,495.58	0.57	0.53	0.21
12,685.00	89.90	180.40	6,955.23	-5,589.58	675.15	5,589.58	0.98	0.64	0.74
12,780.00	90.30	180.40	6,955.06	-5,684.58	674.49	5,684.58	0.42	0.42	0.00
12,875.00	90.40	180.90	6,954.48	-5,779.57	673.41	5,779.57	0.54	0.11	0.53
12,970.00	89.30	181.00	6,954.73	-5,874.56	671.84	5,874.56	1.16	-1.16	0.11
13,065.00	88.20	181.30	6,956.80	-5,969.51	669.93	5,969.51	1.20	-1.16	0.32
13,161.00	88.60	181.70	6,959.48	-6,065.44	667.42	6,065.44	0.59	0.42	0.42
13,256.00	89.30	182.00	6,961.22	-6,160.37	664.35	6,160.37	0.80	0.74	0.32
13,351.00	89.50	182.30	6,962.22	-6,255.30	660.79	6,255.30	0.38	0.21	0.32
13,447.00	88.40	182.20	6,963.98	-6,351.21	657.02	6,351.21	1.15	-1.15	-0.10
13,542.00	88.40	182.80	6,966.63	-6,446.08	652.88	6,446.08	0.63	0.00	0.63
13,637.00	87.80	181.90	6,969.78	-6,540.95	648.98	6,540.95	1.14	-0.63	-0.95
13,732.00	88.10	181.80	6,973.18	-6,635.84	645.92	6,635.84	0.33	0.32	-0.11



Integrity Directional Services, LLC
Survey Report



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Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,828.00	88.70	180.60	6,975.86	-6,731.78	643.91	6,731.78	1.40	0.63	-1.25
13,923.00	89.40	178.20	6,977.43	-6,826.75	644.90	6,826.75	2.63	0.74	-2.53
14,018.00	90.50	177.20	6,977.52	-6,921.67	648.72	6,921.67	1.56	1.16	-1.05
14,039.25	90.56	177.26	6,977.32	-6,942.90	649.74	6,942.90	0.39	0.28	0.28
South 330 Hardline Crossing @ 14039.25'MD									
14,041.17	90.56	177.26	6,977.30	-6,944.82	649.83	6,944.82	0.39	0.28	0.28
28-33 FED 2H BHL									
14,090.00	90.70	177.40	6,976.76	-6,993.59	652.11	6,993.59	0.39	0.28	0.28
Final MWD Survey @ 14090'MD									
14,180.00	90.70	177.40	6,975.66	-7,083.49	656.19	7,083.49	0.00	0.00	0.00
Projection to TD @ 14180'MD									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
100.00	100.00	0.54	0.28	First MWD Survey @ 100'MD
7,204.64	6,972.09	-180.66	479.75	North 330 Hardline Crossing @ 7204.64'MD
12,266.49	6,946.90	-5,171.19	671.80	Sec 28 / 33 Line Crossing @ 12266.49'MD
14,039.25	6,977.32	-6,942.90	649.74	South 330 Hardline Crossing @ 14039.25'MD
14,090.00	6,976.76	-6,993.59	652.11	Final MWD Survey @ 14090'MD
14,180.00	6,975.66	-7,083.49	656.19	Projection to TD @ 14180'MD

Checked By: _____ Approved By: _____ Date: _____