



**Provide Signature Page for
Directional Survey**

XTO ENERGY, INC.

Eddy County, NM

Sec 31, T26S, R30E (True North)

Ross Draw 3031 Federal 1H

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NOV 16 2018

DISTRICT II-ARTESIA O.C.D.

Wellbore #1

30-015-44446

Design: Wellbore #1

QES Survey Report

19 December, 2017





Survey Report



Company: XTO ENERGY, INC.
Project: Eddy County, NM
Site: Sec 31, T26S, R30E (True North)
Well: Ross Draw 3031 Federal 1H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Ross Draw 3031 Federal 1H
TVD Reference: RKB @ 2904.0usft (Frontier #27)
MD Reference: RKB @ 2904.0usft (Frontier #27)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project	Eddy County, NM		
System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sec 31, T26S, R30E (True North)			
Site Position:		Northing:	364,129.80 usft	Latitude: 32° 0' 1.646 N
From:	Map	Easting:	625,809.10 usft	Longitude: 103° 55' 38.964 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence: 0.22 °

Well	Ross Draw 3031 Federal 1H			
Well Position	+N/-S	0.0 usft	Northing:	364,129.79 usft
	+E/-W	0.0 usft	Easting:	625,809.10 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level: 2,877.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	12/1/2017	7.05	59.79	47,724.31469961

Design	Wellbore #1			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	359.96

Survey Program	Date 12/19/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
92.0	9,592.0	Wellbender MWD (Wellbore #1)	MWD	OWSG MWD - Standard
9,672.0	17,264.0	QES MWD Surveys (Wellbore #1)	MWD	OWSG MWD - Standard

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
92.0	0.32	101.37	92.0	-0.1	0.3	-0.1	0.35	0.35	0.00
181.0	0.31	255.31	181.0	-0.2	0.3	-0.2	0.69	-0.01	172.97
272.0	0.88	54.65	272.0	0.2	0.6	0.2	1.29	0.63	175.10
365.0	1.32	58.34	365.0	1.2	2.1	1.2	0.48	0.47	3.97
453.0	1.32	61.24	453.0	2.2	3.8	2.2	0.08	0.00	3.30
540.0	1.41	59.13	539.9	3.2	5.6	3.2	0.12	0.10	-2.43
631.0	1.32	60.98	630.9	4.3	7.5	4.3	0.11	-0.10	2.03
721.0	1.41	64.90	720.9	5.3	9.4	5.3	0.14	0.10	4.36
816.0	0.48	226.74	815.9	5.5	10.2	5.5	1.97	-0.98	170.36

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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)
911.0	2.68	255.48	910.8	4.7	7.8	4.7	2.39	2.32	30.25
1,007.0	3.12	252.67	1,006.7	3.3	3.1	3.3	0.48	0.46	-2.93
1,102.0	3.21	251.88	1,101.6	1.7	-1.9	1.7	0.11	0.09	-0.83
1,198.0	2.51	257.50	1,197.4	0.4	-6.5	0.4	0.78	-0.73	5.85
1,293.0	2.59	265.50	1,292.3	-0.2	-10.7	-0.2	0.38	0.08	8.42
1,338.0	2.81	265.85	1,337.3	-0.4	-12.8	-0.3	0.49	0.49	0.78
1,484.0	2.02	269.72	1,483.2	-0.6	-18.9	-0.6	0.55	-0.54	2.65
1,579.0	2.02	266.12	1,578.1	-0.7	-22.3	-0.7	0.13	0.00	-3.79
1,675.0	2.11	270.42	1,674.0	-0.8	-25.7	-0.8	0.19	0.09	4.48
1,771.0	2.29	268.93	1,770.0	-0.9	-29.4	-0.8	0.20	0.19	-1.55
1,865.0	2.51	270.16	1,863.9	-0.9	-33.4	-0.9	0.24	0.23	1.31
1,960.0	2.90	268.40	1,958.8	-1.0	-37.8	-0.9	0.42	0.41	-1.85
2,055.0	2.90	269.72	2,053.7	-1.0	-42.7	-1.0	0.07	0.00	1.39
2,150.0	3.12	268.84	2,148.5	-1.1	-47.6	-1.1	0.24	0.23	-0.93
2,246.0	2.20	265.06	2,244.4	-1.3	-52.1	-1.3	0.98	-0.96	-3.94
2,341.0	0.79	255.22	2,339.4	-1.6	-54.5	-1.6	1.50	-1.48	-10.36
2,436.0	0.70	236.06	2,434.4	-2.1	-55.7	-2.1	0.28	-0.09	-20.17
2,529.0	2.68	265.85	2,527.3	-2.6	-58.3	-2.6	2.26	2.13	32.03
2,532.0	0.88	159.15	2,530.3	-2.6	-58.4	-2.6	101.72	-60.00	-3,556.67
2,627.0	0.88	144.04	2,625.3	-3.9	-57.7	-3.9	0.24	0.00	-15.91
2,723.0	1.49	144.56	2,721.3	-5.5	-56.5	-5.5	0.64	0.64	0.54
2,818.0	2.81	140.70	2,816.2	-8.3	-54.3	-8.3	1.40	1.39	-4.06
2,914.0	2.11	164.60	2,912.2	-11.8	-52.4	-11.8	1.28	-0.73	24.90
3,010.0	1.19	227.27	3,008.1	-14.2	-52.6	-14.2	1.97	-0.96	65.28
3,106.0	1.19	240.28	3,104.1	-15.4	-54.2	-15.4	0.28	0.00	13.55
3,235.0	1.49	248.28	3,233.1	-16.7	-56.9	-16.6	0.27	0.23	6.20
3,331.0	1.58	353.74	3,329.0	-15.8	-58.2	-15.8	2.55	0.09	109.85
3,427.0	1.49	253.11	3,425.0	-14.9	-59.6	-14.8	2.46	-0.09	-104.82
3,523.0	1.58	253.81	3,521.0	-15.6	-62.0	-15.6	0.10	0.09	0.73
3,618.0	1.58	250.12	3,616.0	-16.4	-64.5	-16.4	0.11	0.00	-3.88
3,714.0	1.71	243.62	3,711.9	-17.5	-67.1	-17.5	0.24	0.14	-6.77
3,809.0	1.71	246.34	3,806.9	-18.7	-69.6	-18.7	0.09	0.00	2.86
3,904.0	1.41	242.04	3,901.8	-19.8	-72.0	-19.8	0.34	-0.32	-4.53
3,999.0	1.19	240.54	3,996.8	-20.9	-73.9	-20.8	0.23	-0.23	-1.58
4,094.0	1.10	239.13	4,091.8	-21.8	-75.5	-21.7	0.10	-0.09	-1.48
4,190.0	1.19	242.74	4,187.8	-22.7	-77.2	-22.7	0.12	0.09	3.76
4,286.0	1.32	231.93	4,283.8	-23.9	-78.9	-23.8	0.28	0.14	-11.26
4,379.0	1.32	244.41	4,376.7	-25.0	-80.7	-24.9	0.31	0.00	13.42
4,475.0	1.19	250.74	4,472.7	-25.8	-82.7	-25.7	0.20	-0.14	6.59
4,571.0	1.01	252.32	4,568.7	-26.4	-84.4	-26.3	0.19	-0.19	1.65
4,667.0	1.10	250.12	4,664.7	-27.0	-86.1	-26.9	0.10	0.09	-2.29
4,762.0	1.10	236.15	4,759.7	-27.8	-87.7	-27.7	0.28	0.00	-14.71
4,858.0	1.19	240.88	4,855.6	-28.8	-89.4	-28.7	0.14	0.09	4.93



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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)
5,048.0	1.71	238.23	5,045.6	-31.2	-93.5	-31.2	0.28	0.27	-1
5,144.0	1.80	231.40	5,141.5	-32.9	-95.9	-32.9	0.24	0.09	-7.11
5,240.0	1.89	237.03	5,237.5	-34.7	-98.4	-34.7	0.21	0.09	5.86
5,336.0	2.02	231.22	5,333.4	-36.6	-101.0	-36.6	0.25	0.14	-6.05
5,432.0	2.02	231.14	5,429.4	-38.8	-103.7	-38.7	0.00	0.00	-0.08
5,527.0	2.11	229.64	5,524.3	-41.0	-106.3	-40.9	0.11	0.09	-1.58
5,623.0	2.42	230.96	5,620.2	-43.4	-109.2	-43.3	0.33	0.32	1.38
5,718.0	2.29	227.80	5,715.1	-45.9	-112.2	-45.8	0.19	-0.14	-3.33
5,813.0	2.29	224.90	5,810.1	-48.5	-114.9	-48.4	0.12	0.00	-3.05
5,908.0	2.42	222.26	5,905.0	-51.4	-117.6	-51.3	0.18	0.14	-2.78
6,003.0	1.41	236.85	5,999.9	-53.5	-120.0	-53.4	1.17	-1.06	15.36
6,098.0	1.10	245.46	6,094.9	-54.5	-121.8	-54.4	0.38	-0.33	9.06
6,193.0	1.19	231.66	6,189.9	-55.5	-123.4	-55.4	0.30	0.09	-14.53
6,289.0	1.10	221.73	6,285.9	-56.8	-124.8	-56.7	0.23	-0.09	-10.34
6,384.0	1.19	225.60	6,380.9	-58.2	-126.1	-58.1	0.12	0.09	4.07
6,479.0	1.01	221.73	6,475.8	-59.5	-127.3	-59.4	0.20	-0.19	-4.07
6,575.0	1.19	214.61	6,571.8	-60.9	-128.5	-60.8	0.24	0.19	-7.42
6,671.0	1.32	225.07	6,667.8	-62.5	-129.8	-62.4	0.27	0.14	10.90
6,766.0	1.19	218.92	6,762.8	-64.1	-131.2	-64.0	0.20	-0.14	-6.47
6,862.0	0.88	242.83	6,858.8	-65.2	-132.5	-65.1	0.55	-0.32	24.91
6,958.0	1.19	270.34	6,954.7	-65.5	-134.1	-65.4	0.60	0.32	28.66
7,053.0	2.02	288.35	7,049.7	-65.0	-136.7	-64.9	1.01	0.87	18.96
7,148.0	2.51	292.40	7,144.6	-63.7	-140.2	-63.6	0.54	0.52	4.26
7,244.0	2.68	282.73	7,240.5	-62.4	-144.4	-62.3	0.49	0.18	-10.07
7,339.0	2.59	271.48	7,335.4	-61.8	-148.7	-61.7	0.55	-0.09	-11.84
7,434.0	2.68	268.14	7,430.3	-61.8	-153.0	-61.7	0.19	0.09	-3.52
7,622.0	2.90	272.45	7,618.1	-61.8	-162.2	-61.7	0.16	0.12	2.29
7,813.0	3.38	274.55	7,808.8	-61.1	-172.6	-61.0	0.26	0.25	1.10
7,908.0	2.51	268.28	7,903.7	-61.0	-177.5	-60.8	0.98	-0.92	-6.60
8,004.0	2.11	261.90	7,999.6	-61.3	-181.3	-61.1	0.49	-0.42	-6.65
8,099.0	2.02	260.93	8,094.6	-61.8	-184.7	-61.6	0.10	-0.09	-1.02
8,195.0	1.71	277.63	8,190.5	-61.9	-187.8	-61.7	0.65	-0.32	17.40
8,291.0	1.80	277.10	8,286.5	-61.5	-190.7	-61.3	0.10	0.09	-0.55
8,385.0	2.02	273.41	8,380.4	-61.2	-193.9	-61.1	0.27	0.23	-3.93
8,481.0	2.29	278.77	8,476.3	-60.8	-197.4	-60.7	0.35	0.28	5.58
8,576.0	2.11	276.22	8,571.3	-60.3	-201.1	-60.2	0.22	-0.19	-2.68
8,671.0	1.58	254.52	8,666.2	-60.5	-204.1	-60.3	0.91	-0.56	-22.84
8,766.0	1.71	248.28	8,761.2	-61.4	-206.6	-61.2	0.23	0.14	-6.57
8,863.0	1.41	234.21	8,858.1	-62.6	-208.9	-62.4	0.50	-0.31	-14.51
8,958.0	1.49	231.14	8,953.1	-64.1	-210.9	-63.9	0.12	0.08	-3.23
9,054.0	2.02	227.18	9,049.1	-66.0	-213.1	-65.8	0.57	0.55	-4.13
9,150.0	2.02	217.34	9,145.0	-68.5	-215.3	-68.3	0.36	0.00	-10.25
9,242.0	2.02	215.32	9,237.0	-71.1	-217.3	-70.9	0.08	0.00	-2.20

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9,338.0	2.02	221.38	9,332.9	-73.8	-219.4	-73.6	0.22	0.00	6.31
9,433.0	2.02	219.01	9,427.8	-76.3	-221.5	-76.1	0.09	0.00	-2.49
9,529.0	1.89	222.26	9,523.8	-78.8	-223.6	-78.6	0.18	-0.14	3.39
Wellbender Tie-In @ 9592.0' MD / 9586.7' TVD									
9,592.0	1.80	222.70	9,586.7	-80.3	-225.0	-80.1	0.14	-0.14	0.70
9,673.0	2.70	94.20	9,667.7	-81.4	-224.0	-81.2	5.03	1.11	-158.64
9,720.0	8.40	76.00	9,714.5	-80.6	-219.5	-80.4	12.54	12.13	-38.72
9,769.0	13.30	65.20	9,762.6	-77.4	-210.9	-77.2	10.78	10.00	-22.04
9,816.0	16.70	60.20	9,808.0	-71.8	-200.2	-71.6	7.73	7.23	-10.64
9,865.0	19.40	50.60	9,854.6	-63.1	-187.8	-62.9	8.18	5.51	-19.59
9,912.0	22.90	48.10	9,898.4	-52.0	-174.9	-51.9	7.69	7.45	-5.32
9,960.0	27.60	44.80	9,941.8	-37.9	-160.1	-37.8	10.22	9.79	-6.88
10,007.0	31.60	39.70	9,982.7	-20.7	-144.6	-20.6	10.05	8.51	-10.85
10,056.0	35.30	37.10	10,023.6	0.5	-127.8	0.6	8.10	7.55	-5.31
10,103.0	38.30	31.00	10,061.2	23.8	-112.1	23.9	10.05	6.38	-12.98
10,151.0	41.80	26.50	10,097.9	50.9	-97.3	51.0	9.46	7.29	-9.38
10,198.0	45.60	23.10	10,131.9	80.4	-83.7	80.4	9.50	8.09	-7.23
10,247.0	48.70	19.30	10,165.3	113.9	-70.8	113.9	8.50	6.33	-7.76
10,294.0	51.00	15.00	10,195.6	148.2	-60.2	148.2	8.53	4.89	-9.15
10,343.0	53.40	10.90	10,225.6	185.9	-51.6	185.9	8.23	4.90	-8.37
10,390.0	55.60	8.50	10,252.9	223.6	-45.1	223.6	6.26	4.68	-5.11
10,438.0	58.30	7.80	10,279.1	263.4	-39.4	263.5	5.76	5.63	-1.46
10,503.0	60.90	8.70	10,312.0	318.9	-31.4	318.9	4.17	4.00	1.38
10,551.0	68.20	5.50	10,332.6	361.9	-26.1	361.9	16.35	15.21	-6.67
10,599.0	74.50	1.90	10,347.9	407.2	-23.2	407.3	14.92	13.13	-7.50
10,647.0	74.80	1.20	10,360.6	453.5	-21.9	453.5	1.54	0.63	-1.46
10,694.0	74.60	0.70	10,373.0	498.8	-21.2	498.9	1.11	-0.43	-1.06
10,742.0	74.20	0.10	10,385.9	545.1	-20.8	545.1	1.46	-0.83	-1.25
10,789.0	78.50	0.10	10,397.0	590.7	-20.8	590.8	9.15	9.15	0.00
10,837.0	81.50	1.20	10,405.4	638.0	-20.2	638.0	6.64	6.25	2.29
10,885.0	84.80	1.60	10,411.1	685.6	-19.1	685.6	6.92	6.88	0.83
10,933.0	89.10	1.20	10,413.6	733.5	-17.9	733.6	9.00	8.96	-0.83
10,980.0	89.70	1.20	10,414.1	780.5	-16.9	780.5	1.28	1.28	0.00
11,075.0	89.90	1.20	10,414.5	875.5	-14.9	875.5	0.21	0.21	0.00
11,170.0	89.10	1.20	10,415.3	970.5	-12.9	970.5	0.84	-0.84	0.00
11,265.0	90.90	1.60	10,415.3	1,065.4	-10.6	1,065.5	1.94	1.89	0.42
11,360.0	90.50	1.70	10,414.1	1,160.4	-7.9	1,160.4	0.43	-0.42	0.11
11,455.0	90.50	1.70	10,413.3	1,255.4	-5.0	1,255.4	0.00	0.00	0.00
11,550.0	91.30	1.70	10,411.8	1,350.3	-2.2	1,350.3	0.84	0.84	0.00
11,645.0	89.50	1.10	10,411.2	1,445.3	0.1	1,445.3	2.00	-1.89	-0.63
11,740.0	89.30	0.70	10,412.1	1,540.3	1.6	1,540.2	0.47	-0.21	-0.42
11,835.0	88.60	359.80	10,413.9	1,635.2	2.0	1,635.2	1.20	-0.74	-0.95
11,930.0	88.20	359.10	10,416.5	1,730.2	1.1	1,730.2	0.85	-0.42	-0.74
12,025.0	88.10	359.20	10,419.6	1,825.1	-0.3	1,825.1	0.15	-0.11	0.11



Survey Report



Company: XTO ENERGY, INC.
Project: Eddy County, NM
Site: Sec 31, T26S, R30E (True North)
Well: Ross Draw 3031 Federal 1H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Ross Draw 3031 Federal 1H
TVD Reference: RKB @ 2904.0usft (Frontier #27)
MD Reference: RKB @ 2904.0usft (Frontier #27)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

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)
12,120.0	88.50	358.50	10,422.4	1,920.1	-2.2	1,920.1	0.85	0.42	-0.74
12,216.0	89.50	0.10	10,424.1	2,016.0	-3.4	2,016.0	1.97	1.04	1.67
12,310.0	89.50	1.10	10,424.9	2,110.0	-2.4	2,110.0	1.06	0.00	1.06
12,406.0	88.60	3.00	10,426.5	2,206.0	1.0	2,206.0	2.19	-0.94	1.98
12,501.0	89.30	2.80	10,428.3	2,300.8	5.8	2,300.8	0.77	0.74	-0.21
12,596.0	91.00	1.20	10,428.0	2,395.7	9.1	2,395.7	2.46	1.79	-1.68
12,690.0	89.50	359.30	10,427.6	2,489.7	9.5	2,489.7	2.58	-1.60	-2.02
12,785.0	88.80	359.60	10,429.0	2,584.7	8.6	2,584.7	0.80	-0.74	0.32
12,880.0	88.40	359.10	10,431.3	2,679.7	7.6	2,679.7	0.67	-0.42	-0.53
12,974.0	90.50	0.10	10,432.2	2,773.7	6.9	2,773.7	2.47	2.23	1.06
13,070.0	91.50	358.90	10,430.6	2,869.7	6.1	2,869.6	1.63	1.04	-1.25
13,165.0	93.00	359.40	10,426.8	2,964.6	4.7	2,964.6	1.66	1.58	0.53
13,260.0	92.10	358.00	10,422.6	3,059.4	2.5	3,059.4	1.75	-0.95	-1.47
13,282.0	92.50	357.90	10,421.7	3,081.4	1.7	3,081.4	1.87	1.82	-0.45
13,377.0	88.50	356.90	10,420.9	3,176.3	-2.6	3,176.3	4.34	-4.21	-1.05
13,472.0	89.40	358.00	10,422.6	3,271.2	-6.8	3,271.2	1.50	0.95	1.16
13,567.0	92.00	357.70	10,421.5	3,366.1	-10.4	3,366.1	2.75	2.74	-0.32
13,662.0	91.20	357.80	10,418.8	3,461.0	-14.1	3,461.0	0.85	-0.84	0.11
13,757.0	88.30	358.70	10,419.2	3,555.9	-17.0	3,555.9	3.20	-3.05	0.95
13,852.0	87.50	359.30	10,422.7	3,650.9	-18.7	3,650.9	1.05	-0.84	0.63
13,947.0	88.40	0.00	10,426.1	3,745.8	-19.2	3,745.8	1.20	0.95	0.74
14,041.0	89.10	1.90	10,428.2	3,839.7	-17.7	3,839.8	2.15	0.74	2.02
14,131.0	91.00	2.70	10,428.1	3,929.7	-14.1	3,929.7	2.29	2.11	0.89
14,231.0	88.50	2.40	10,428.5	4,029.6	-9.6	4,029.6	2.52	-2.50	-0.30
14,326.0	90.50	2.80	10,429.3	4,124.5	-5.3	4,124.5	2.15	2.11	0.42
14,422.0	91.80	3.10	10,427.4	4,220.3	-0.4	4,220.3	1.39	1.35	0.31
14,517.0	91.40	2.30	10,424.8	4,315.2	4.1	4,315.2	0.94	-0.42	-0.84
14,612.0	87.30	1.00	10,425.8	4,410.1	6.8	4,410.1	4.53	-4.32	-1.37
14,707.0	86.20	0.30	10,431.2	4,504.9	7.9	4,504.9	1.37	-1.16	-0.74
14,803.0	86.40	359.80	10,437.4	4,600.7	8.0	4,600.7	0.56	0.21	-0.52
14,898.0	88.90	359.10	10,441.3	4,695.6	7.1	4,695.6	2.73	2.63	-0.74
14,993.0	88.40	358.70	10,443.6	4,790.6	5.3	4,790.6	0.67	-0.53	-0.42
15,090.0	91.00	1.80	10,444.1	4,887.6	5.7	4,887.6	4.17	2.68	3.20
15,186.0	86.50	1.80	10,446.2	4,983.5	8.7	4,983.5	4.69	-4.69	0.00
15,281.0	92.50	1.90	10,447.0	5,078.4	11.8	5,078.4	6.32	6.32	0.11
15,376.0	91.90	1.20	10,443.3	5,173.3	14.3	5,173.3	0.97	-0.63	-0.74
15,471.0	91.10	0.20	10,440.9	5,268.2	15.5	5,268.2	1.35	-0.84	-1.05
15,565.0	92.20	0.30	10,438.1	5,362.2	15.9	5,362.2	1.18	1.17	0.11
15,661.0	89.80	357.90	10,436.5	5,458.2	14.4	5,458.1	3.54	-2.50	-2.50
15,755.0	87.00	355.20	10,439.1	5,551.9	8.7	5,551.9	4.14	-2.98	-2.87
15,850.0	88.90	357.10	10,442.5	5,646.6	2.4	5,646.6	2.83	2.00	2.00
15,945.0	90.90	358.00	10,442.7	5,741.6	-1.7	5,741.6	2.31	2.11	0.95
16,040.0	90.10	357.90	10,441.8	5,836.5	-5.1	5,836.5	0.85	-0.84	-0.11

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North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

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)
16,135.0	90.00	357.30	10,441.7	5,931.4	-9.1	5,931.4	0.64	-0.11	-0.63
16,230.0	91.70	0.10	10,440.3	6,026.4	-11.2	6,026.4	3.45	1.79	2.95
16,325.0	88.40	0.70	10,440.3	6,121.3	-10.6	6,121.3	3.53	-3.47	0.63
16,420.0	92.30	2.20	10,439.7	6,216.3	-8.2	6,216.3	4.40	4.11	1.58
16,515.0	91.20	0.70	10,436.8	6,311.2	-5.8	6,311.2	1.96	-1.16	-1.58
16,609.0	90.20	0.30	10,435.6	6,405.2	-4.9	6,405.2	1.15	-1.06	-0.43
16,704.0	87.60	359.10	10,437.4	6,500.2	-5.4	6,500.2	3.01	-2.74	-1.26
16,799.0	87.90	359.70	10,441.2	6,595.1	-6.4	6,595.1	0.71	0.32	0.63
16,894.0	88.20	0.00	10,444.4	6,690.0	-6.7	6,690.0	0.45	0.32	0.32
16,988.0	90.00	0.40	10,445.9	6,784.0	-6.4	6,784.0	1.96	1.91	0.43
17,083.0	89.60	359.50	10,446.2	6,879.0	-6.4	6,879.0	1.04	-0.42	-0.95
17,178.0	91.00	0.20	10,445.7	6,974.0	-6.7	6,974.0	1.65	1.47	0.74
17,214.0	91.00	0.20	10,445.1	7,010.0	-6.6	7,010.0	0.00	0.00	0.00
TD @ 17264.0' MD / 10444.2' TVD									
17,264.0	91.00	0.20	10,444.2	7,060.0	-6.4	7,060.0	0.00	0.00	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,592.0	9,586.7	-80.3	-225.0	Wellbender Tie-In @ 9592.0' MD / 9586.7' TVD
17,264.0	10,444.2	7,060.0	-6.4	TD @ 17264.0' MD / 10444.2' TVD