



XTO ENERGY, INC.

Eddy County, NM

Sec 21, T22S, R30E

James Ranch Unit DI 1 #161H

Wellbore #1

30-015 43607

RECEIVED

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DISTRICT II-ARTESIA O.C.D.

Design: Wellbore #1

QES Survey Certification Report

10 October, 2017



Quintana Energy Services

11390 FM 830
Willis, TX 77318
Phone: (936) 856-4332
Fax: (936) 856-8678



Survey Certification Sheet

Company	Job Number	Date
XTO Energy, Inc.	WT-170975	10/16/2017

Lease	Well Name	County & State
SEC 21, T-22S, R30E	James Ranch Unit DI 1#161H	Eddy County, NM

API No.	Survey Depth Range	Survey Type
30-015-43607	122 feet to 18476 feet MD	MWD

Sidetrack Information	Directional Supervisor/Surveyor
Click here to enter text.	Richard Tibbitts

Certification Statement

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by Quintana Energy Services (QES). This report represents a true and correct directional survey of this well based on the original data obtained at the well site. Wellbore coordinates are calculated using minimum curvature.

**Christopher
Hughes**

Digitally signed by Christopher Hughes
DN: cn=Christopher Hughes, o=QES,
ou=compliance, email=chrish@qeslp.com,
c=US
Date: 2017.10.25 13:15:47 -05'00'

Christopher Hughes
MWD Compliance Manager
Quintana Energy Services



QES Survey Certification Report



Company: XTO ENERGY, INC.
Project: Eddy County, NM
Site: Sec 21, T22S, R30E
Well: James Ranch Unit DI 1 #161H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well James Ranch Unit DI 1 #161H
TVD Reference: RKB @ 3189.0usft (Noram #25)
MD Reference: RKB @ 3189.0usft (Noram #25)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project	Eddy County, NM		
Map 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 21, T22S, R30E		
Site Position:		Northing:	502,495.20 usft
From:	Map	Easting:	639,272.00 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"
		Latitude:	32° 22' 50.401 N
		Longitude:	103° 52' 55.882 W
		Grid Convergence:	0.24 °

Well	James Ranch Unit DI 1 #161H		
Well Position	+N/-S	0.0 usft	Northing: 502,575.30 usft
	+E/-W	0.0 usft	Easting: 639,381.00 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 22' 51.189 N
		Longitude:	103° 52' 54.607 W
		Ground Level:	3,165.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	9/6/2017	7.09
			Dip Angle (°)
			60.15
			Field Strength (nT)
			47,977.35097907

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)
	0.0	0.0	0.0
		Direction (°)	77.14

Survey Program	Date 10/10/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
122.0	18,476.0	QES MWD Surveys (Wellbore #1)	MWD
			Description
			OWSG MWD - Standard

Survey								
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	
122.0	0.30	318.00	122.0	0.2	-0.2	0.3	318.00	
First MWD Survey @ 122.0' MD / 122.0' TVD								
152.0	0.40	327.00	152.0	0.4	-0.3	0.5	319.87	
182.0	0.27	321.00	182.0	0.5	-0.4	0.7	321.09	
213.0	0.46	314.00	213.0	0.7	-0.6	0.9	320.07	
246.0	0.63	284.00	246.0	0.8	-0.8	1.2	314.08	
275.0	0.34	287.40	275.0	0.9	-1.1	1.4	309.15	
305.0	0.30	355.03	305.0	1.0	-1.2	1.5	310.03	
335.0	0.28	255.29	335.0	1.0	-1.2	1.6	309.88	
365.0	0.16	92.07	365.0	1.0	-1.3	1.6	308.68	
395.0	0.09	47.88	395.0	1.0	-1.2	1.6	310.42	



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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)
424.0	0.16	220.46	424.0	1.0	-1.2	1.6	309.77
453.0	0.37	354.00	453.0	1.1	-1.3	1.7	310.63
486.0	0.62	346.00	486.0	1.4	-1.3	1.9	316.01
506.0	0.27	317.61	506.0	1.5	-1.4	2.0	317.58
568.0	0.38	312.43	568.0	1.7	-1.6	2.4	317.14
637.0	0.32	265.29	637.0	1.9	-2.0	2.7	313.56
700.0	0.42	199.54	700.0	1.6	-2.2	2.8	306.46
753.0	0.64	195.23	753.0	1.2	-2.4	2.6	296.42
816.0	0.72	188.86	816.0	0.4	-2.5	2.6	280.06
880.0	0.66	183.99	880.0	-0.3	-2.6	2.6	263.08
940.0	0.70	200.60	940.0	-1.0	-2.8	2.9	250.03
1,034.0	2.00	267.30	1,033.9	-1.6	-4.6	4.9	250.63
1,129.0	2.50	250.70	1,128.9	-2.4	-8.2	8.6	253.83
1,224.0	2.50	249.10	1,223.8	-3.8	-12.1	12.7	252.55
1,318.0	2.10	249.10	1,317.7	-5.2	-15.6	16.5	251.76
1,412.0	2.10	246.30	1,411.6	-6.5	-18.8	19.9	251.06
1,507.0	2.20	249.20	1,506.6	-7.8	-22.1	23.5	250.56
1,601.0	2.30	253.40	1,600.5	-9.0	-25.6	27.1	250.67
1,695.0	2.20	254.90	1,694.4	-10.0	-29.2	30.8	251.08
1,789.0	1.90	223.60	1,788.4	-11.6	-32.0	34.0	250.07
1,883.0	2.30	241.20	1,882.3	-13.6	-34.7	37.3	248.56
1,977.0	2.10	248.40	1,976.2	-15.2	-38.0	40.9	248.21
2,072.0	1.70	237.80	2,071.2	-16.6	-40.8	44.0	247.89
2,166.0	1.80	239.50	2,165.2	-18.1	-43.2	46.8	247.33
2,260.0	1.90	263.70	2,259.1	-19.0	-46.0	49.8	247.60
2,355.0	1.70	284.10	2,354.1	-18.8	-49.0	52.5	248.99
2,449.0	1.40	267.00	2,448.0	-18.5	-51.5	54.7	250.20
2,543.0	1.30	289.50	2,542.0	-18.2	-53.6	56.6	251.22
2,637.0	1.10	270.80	2,636.0	-17.9	-55.5	58.3	252.17
2,731.0	0.70	207.40	2,730.0	-18.4	-56.7	59.6	252.06
2,826.0	1.10	163.20	2,825.0	-19.7	-56.7	60.0	250.80
2,920.0	0.50	202.00	2,918.9	-21.0	-56.6	60.4	249.65
3,015.0	2.20	311.60	3,013.9	-20.2	-58.1	61.5	250.86
3,109.0	5.30	327.50	3,107.7	-15.3	-61.8	63.7	256.09
3,203.0	6.50	332.10	3,201.2	-6.9	-66.6	67.0	264.05
3,297.0	6.70	346.00	3,294.6	3.1	-70.4	70.5	272.51
3,392.0	9.30	358.50	3,388.7	16.1	-72.0	73.8	282.64
3,486.0	14.70	5.70	3,480.6	35.6	-71.0	79.4	296.64
3,589.0	16.00	5.00	3,579.9	62.8	-68.5	92.9	312.51
3,684.0	17.20	5.70	3,671.0	89.8	-65.9	111.4	323.71
3,778.0	18.70	3.70	3,760.4	118.6	-63.6	134.6	331.82
3,872.0	20.00	4.20	3,849.1	149.7	-61.4	161.8	337.70
3,967.0	20.00	5.40	3,938.3	182.1	-58.7	191.3	342.13
4,061.0	19.60	7.00	4,026.8	213.7	-55.3	220.8	345.50



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4,156.0	20.20	3.30	4,116.1	245.9	-52.4	251.5	347.98
4,250.0	20.20	3.70	4,204.3	278.3	-50.4	282.9	349.74
4,345.0	20.00	4.40	4,293.5	310.9	-48.1	314.6	351.21
4,439.0	18.80	4.20	4,382.2	342.0	-45.8	345.1	352.38
4,534.0	19.50	0.50	4,471.9	373.2	-44.5	375.8	353.20
4,628.0	19.40	1.30	4,560.6	404.5	-44.0	406.8	353.79
4,722.0	19.50	2.00	4,649.2	435.7	-43.1	437.9	354.35
4,817.0	19.90	1.50	4,738.7	467.8	-42.1	469.6	354.85
4,912.0	20.10	2.40	4,827.9	500.2	-41.0	501.9	355.31
5,006.0	19.90	2.90	4,916.3	532.3	-39.5	533.8	355.75
5,101.0	19.80	2.70	5,005.6	564.6	-38.0	565.8	356.15
5,196.0	19.30	4.00	5,095.1	596.3	-36.1	597.4	356.54
5,291.0	19.90	5.00	5,184.6	628.1	-33.6	629.0	356.94
5,385.0	19.60	5.20	5,273.1	659.7	-30.8	660.4	357.33
5,479.0	19.60	5.60	5,361.7	691.1	-27.8	691.7	357.70
5,573.0	20.80	5.40	5,449.9	723.4	-24.7	723.8	358.04
5,667.0	21.00	5.00	5,537.7	756.8	-21.7	757.1	358.36
5,760.0	20.90	4.70	5,624.5	789.9	-18.8	790.2	358.63
5,853.0	20.80	3.70	5,711.5	822.9	-16.4	823.1	358.86
5,948.0	19.90	3.10	5,800.5	855.9	-14.5	856.0	359.03
6,043.0	18.10	3.90	5,890.3	886.8	-12.6	886.9	359.19
6,138.0	18.50	4.30	5,980.5	916.5	-10.4	916.6	359.35
6,232.0	19.40	6.80	6,069.4	946.9	-7.5	946.9	359.55
6,327.0	21.00	6.90	6,158.6	979.5	-3.6	979.5	359.79
6,421.0	21.10	7.00	6,246.3	1,013.0	0.5	1,013.0	0.03
6,516.0	20.70	2.60	6,335.1	1,046.7	3.4	1,046.7	0.18
6,610.0	20.10	2.70	6,423.2	1,079.5	4.9	1,079.5	0.26
6,704.0	19.20	3.20	6,511.7	1,111.0	6.5	1,111.1	0.34
6,799.0	20.60	3.90	6,601.0	1,143.3	8.5	1,143.3	0.43
6,893.0	20.40	4.00	6,689.1	1,176.2	10.8	1,176.2	0.53
6,988.0	19.80	4.50	6,778.3	1,208.7	13.2	1,208.8	0.63
7,083.0	18.70	4.50	6,868.0	1,239.9	15.7	1,240.0	0.72
7,176.0	18.40	3.80	6,956.2	1,269.4	17.8	1,269.6	0.80
7,271.0	20.00	3.90	7,045.9	1,300.6	19.9	1,300.8	0.88
7,365.0	19.20	3.10	7,134.4	1,332.1	21.8	1,332.3	0.94
7,460.0	18.20	3.10	7,224.4	1,362.5	23.5	1,362.7	0.99
7,555.0	18.50	3.50	7,314.6	1,392.4	25.2	1,392.6	1.04
7,650.0	19.20	4.80	7,404.5	1,423.0	27.4	1,423.2	1.10
7,744.0	17.20	7.50	7,493.8	1,452.2	30.5	1,452.5	1.20
7,839.0	16.60	5.00	7,584.7	1,479.6	33.5	1,480.0	1.30
7,934.0	17.80	4.10	7,675.4	1,507.6	35.8	1,508.0	1.36
8,028.0	18.10	6.50	7,764.8	1,536.4	38.4	1,536.9	1.43
8,122.0	19.60	5.30	7,853.8	1,566.7	41.6	1,567.2	1.52
8,215.0	21.80	3.90	7,940.8	1,599.4	44.2	1,600.0	1.58
8,307.0	19.90	4.50	8,026.8	1,632.1	46.6	1,632.7	1.63



QES Survey Certification Report



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Design: Wellbore #1

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Well James Ranch Unit DI 1 #161H
RKB @ 3189.0usft (Noram #25)
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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)
8,401.0	18.90	4.40	8,115.4	1,663.2	49.0	1,663.9	1.69
8,494.0	20.60	4.80	8,203.0	1,694.5	51.5	1,695.3	1.74
8,588.0	21.80	7.50	8,290.6	1,728.3	55.2	1,729.2	1.83
8,682.0	19.80	9.20	8,378.5	1,761.3	60.0	1,762.4	1.95
8,752.0	20.00	10.40	8,444.3	1,784.8	64.1	1,786.0	2.06
8,784.0	21.30	13.90	8,474.2	1,795.8	66.4	1,797.1	2.12
8,814.0	22.40	21.30	8,502.1	1,806.5	69.8	1,807.8	2.21
8,846.0	23.90	26.40	8,531.5	1,817.9	74.9	1,819.5	2.36
8,878.0	24.40	31.40	8,560.7	1,829.4	81.2	1,831.2	2.54
8,909.0	24.00	32.30	8,589.0	1,840.2	88.0	1,842.3	2.74
8,940.0	25.10	34.60	8,617.2	1,850.9	95.1	1,853.4	2.94
8,972.0	27.20	38.30	8,645.9	1,862.3	103.4	1,865.1	3.18
9,003.0	28.00	42.00	8,673.4	1,873.2	112.7	1,876.6	3.44
9,034.0	29.10	46.00	8,700.6	1,883.9	123.0	1,887.9	3.74
9,065.0	29.80	51.50	8,727.6	1,893.9	134.5	1,898.7	4.06
9,096.0	31.20	56.10	8,754.3	1,903.2	147.1	1,908.9	4.42
9,128.0	34.00	60.10	8,781.3	1,912.3	161.8	1,919.1	4.84
9,159.0	36.60	63.40	8,806.6	1,920.7	177.6	1,928.9	5.28
9,191.0	38.20	66.80	8,832.0	1,928.9	195.2	1,938.7	5.78
9,222.0	40.00	69.60	8,856.1	1,936.1	213.3	1,947.9	6.29
9,254.0	41.90	71.40	8,880.2	1,943.1	233.1	1,957.1	6.84
9,285.0	43.40	72.60	8,903.0	1,949.6	253.1	1,966.0	7.40
9,316.0	45.00	74.00	8,925.3	1,955.8	273.8	1,974.9	7.97
9,348.0	46.30	74.00	8,947.6	1,962.1	295.8	1,984.3	8.57
9,379.0	47.70	74.70	8,968.8	1,968.3	317.6	1,993.7	9.17
9,410.0	48.40	75.60	8,989.5	1,974.2	339.9	2,003.2	9.77
9,441.0	49.30	76.80	9,009.9	1,979.7	362.6	2,012.7	10.38
9,473.0	50.60	76.60	9,030.5	1,985.4	386.4	2,022.6	11.01
9,504.0	51.60	77.20	9,049.9	1,990.8	409.9	2,032.6	11.63
9,536.0	54.20	76.80	9,069.2	1,996.6	434.8	2,043.4	12.28
9,567.0	57.10	76.40	9,086.7	2,002.5	459.7	2,054.6	12.93
9,599.0	60.30	76.80	9,103.4	2,008.8	486.3	2,066.9	13.61
9,631.0	61.70	77.00	9,118.9	2,015.2	513.5	2,079.6	14.30
9,662.0	62.40	78.00	9,133.4	2,021.1	540.3	2,092.1	14.97
9,694.0	63.10	79.60	9,148.1	2,026.6	568.2	2,104.8	15.66
9,726.0	64.30	81.20	9,162.2	2,031.4	596.4	2,117.2	16.36
9,757.0	66.50	84.00	9,175.1	2,035.0	624.4	2,128.7	17.06
9,789.0	68.00	85.20	9,187.5	2,037.8	653.8	2,140.1	17.79
9,820.0	71.00	87.00	9,198.4	2,039.8	682.7	2,151.0	18.51
9,852.0	74.00	87.30	9,208.0	2,041.3	713.2	2,162.3	19.26
9,883.0	76.70	87.70	9,215.8	2,042.6	743.2	2,173.6	19.99
9,915.0	82.00	87.90	9,221.7	2,043.8	774.6	2,185.7	20.76
9,947.0	86.40	88.20	9,225.0	2,044.9	806.4	2,198.2	21.52
9,978.0	91.20	87.90	9,225.6	2,046.0	837.4	2,210.7	22.26



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10,094.0	92.00	85.20	9,222.4	2,052.9	953.1	2,263.4	24.90
10,189.0	90.40	84.20	9,220.4	2,061.7	1,047.7	2,312.6	26.94
10,284.0	90.90	83.60	9,219.3	2,071.8	1,142.1	2,365.8	28.87
10,379.0	89.90	84.40	9,218.7	2,081.7	1,236.6	2,421.3	30.71
10,473.0	88.90	86.50	9,219.6	2,089.2	1,330.3	2,476.8	32.49
10,567.0	89.10	89.90	9,221.3	2,092.1	1,424.2	2,530.9	34.25
10,660.0	90.20	90.50	9,221.8	2,091.8	1,517.2	2,584.1	35.95
10,755.0	90.50	90.40	9,221.3	2,091.1	1,612.2	2,640.4	37.63
10,850.0	90.30	89.10	9,220.6	2,091.5	1,707.2	2,699.8	39.22
10,945.0	88.90	88.50	9,221.3	2,093.5	1,802.2	2,762.3	40.72
11,040.0	89.60	89.40	9,222.5	2,095.2	1,897.1	2,826.5	42.16
11,135.0	88.50	88.80	9,224.1	2,096.7	1,992.1	2,892.2	43.53
11,228.0	89.10	88.60	9,226.0	2,098.8	2,085.1	2,958.5	44.81
11,324.0	88.10	87.50	9,228.4	2,102.1	2,181.0	3,029.1	46.06
11,418.0	88.50	87.10	9,231.2	2,106.5	2,274.8	3,100.4	47.20
11,513.0	87.90	88.10	9,234.2	2,110.5	2,369.7	3,173.3	48.31
11,608.0	88.70	88.10	9,237.0	2,113.6	2,464.6	3,246.8	49.38
11,702.0	88.80	89.40	9,239.0	2,115.7	2,558.6	3,320.0	50.41
11,796.0	89.30	89.40	9,240.6	2,116.7	2,652.6	3,393.6	51.41
11,890.0	90.50	89.30	9,240.7	2,117.7	2,746.5	3,468.2	52.37
11,985.0	90.40	89.90	9,240.0	2,118.4	2,841.5	3,544.3	53.30
12,079.0	91.80	90.90	9,238.2	2,117.7	2,935.5	3,619.7	54.19
12,173.0	90.50	90.60	9,236.3	2,116.5	3,029.5	3,695.6	55.06
12,267.0	89.10	89.30	9,236.6	2,116.6	3,123.5	3,773.1	55.88
12,362.0	88.50	88.40	9,238.6	2,118.5	3,218.4	3,853.1	56.65
12,457.0	90.20	91.40	9,239.7	2,118.7	3,313.4	3,932.9	57.40
12,551.0	91.50	90.90	9,238.3	2,116.8	3,407.4	4,011.4	58.15
12,645.0	89.40	90.60	9,237.6	2,115.5	3,501.4	4,090.9	58.86
12,739.0	89.30	91.00	9,238.6	2,114.2	3,595.4	4,170.9	59.54
12,832.0	91.10	90.20	9,238.3	2,113.3	3,688.3	4,250.9	60.19
12,925.0	91.20	89.90	9,236.4	2,113.2	3,781.3	4,331.7	60.80
13,020.0	90.50	90.20	9,235.0	2,113.1	3,876.3	4,414.9	61.40
13,115.0	88.60	91.50	9,235.8	2,111.7	3,971.3	4,497.8	62.00
13,200.0	87.50	91.70	9,238.7	2,109.3	4,056.2	4,571.9	62.52
13,294.0	88.20	92.60	9,242.2	2,105.8	4,150.1	4,653.8	63.10
13,389.0	89.70	92.80	9,243.9	2,101.3	4,245.0	4,736.6	63.66
13,483.0	90.20	91.50	9,244.0	2,097.8	4,338.9	4,819.4	64.20
13,578.0	87.50	88.40	9,245.9	2,097.9	4,433.8	4,905.1	64.68
13,671.0	86.30	88.10	9,251.0	2,100.7	4,526.7	4,990.4	65.11
13,765.0	90.40	88.50	9,253.7	2,103.5	4,620.6	5,076.8	65.52
13,860.0	89.80	89.50	9,253.5	2,105.1	4,715.5	5,164.1	65.94
13,955.0	90.50	90.40	9,253.3	2,105.2	4,810.5	5,251.0	66.36
14,049.0	88.70	91.50	9,253.9	2,103.7	4,904.5	5,336.6	66.78
14,144.0	86.70	92.30	9,257.7	2,100.5	4,999.4	5,422.7	67.21



QES Survey Certification Report



Company: XTO ENERGY, INC.
Project: Eddy County, NM
Site: Sec 21, T22S, R30E
Well: James Ranch Unit DI 1 #161H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well James Ranch Unit DI 1 #161H
TVD Reference: RKB @ 3189.0usft (Noram #25)
MD Reference: RKB @ 3189.0usft (Noram #25)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)
14,238.0	88.20	92.30	9,261.9	2,096.8	5,093.2	5,507.9	67.62
14,332.0	89.50	91.30	9,263.8	2,093.8	5,187.2	5,593.8	68.02
14,427.0	89.50	90.30	9,264.6	2,092.5	5,282.1	5,681.5	68.39
14,522.0	90.30	89.30	9,264.8	2,092.8	5,377.1	5,770.0	68.73
14,616.0	91.80	88.20	9,263.1	2,094.9	5,471.1	5,858.4	69.05
14,711.0	91.20	88.10	9,260.6	2,097.9	5,566.0	5,948.3	69.35
14,806.0	89.00	90.60	9,260.4	2,099.0	5,661.0	6,037.6	69.66
14,900.0	87.80	90.40	9,263.0	2,098.2	5,754.9	6,125.5	69.97
14,995.0	88.80	89.60	9,265.9	2,098.2	5,849.9	6,214.8	70.27
15,090.0	87.70	90.50	9,268.8	2,098.1	5,944.9	6,304.2	70.56
15,184.0	87.30	90.40	9,272.9	2,097.4	6,038.8	6,392.6	70.85
15,280.0	86.70	90.10	9,277.9	2,096.9	6,134.6	6,483.1	71.13
15,375.0	86.90	89.50	9,283.2	2,097.3	6,229.5	6,573.1	71.39
15,470.0	89.80	88.30	9,285.9	2,099.1	6,324.4	6,663.7	71.64
15,564.0	91.20	86.60	9,285.1	2,103.3	6,418.3	6,754.1	71.86
15,659.0	90.10	86.80	9,284.0	2,108.7	6,513.1	6,846.0	72.06
15,753.0	90.00	86.80	9,283.9	2,114.0	6,607.0	6,937.0	72.26
15,848.0	90.80	86.30	9,283.3	2,119.7	6,701.8	7,029.1	72.45
15,943.0	92.10	87.30	9,280.9	2,125.0	6,796.6	7,121.1	72.64
16,038.0	92.90	87.80	9,276.7	2,129.1	6,891.5	7,212.9	72.83
16,133.0	89.90	88.70	9,274.4	2,132.0	6,986.4	7,304.4	73.03
16,226.0	90.60	88.70	9,274.0	2,134.1	7,079.4	7,394.0	73.22
16,328.0	91.20	90.60	9,272.4	2,134.7	7,181.3	7,491.9	73.45
16,423.0	90.40	92.40	9,271.1	2,132.2	7,276.3	7,582.3	73.67
16,519.0	90.40	92.90	9,270.4	2,127.8	7,372.2	7,673.1	73.90
16,613.0	88.40	91.70	9,271.4	2,124.0	7,466.1	7,762.3	74.12
16,707.0	89.20	91.90	9,273.4	2,121.1	7,560.0	7,851.9	74.33
16,801.0	88.10	91.70	9,275.6	2,118.1	7,654.0	7,941.6	74.53
16,896.0	89.30	91.70	9,277.7	2,115.3	7,748.9	8,032.4	74.73
16,991.0	88.60	91.70	9,279.5	2,112.5	7,843.8	8,123.3	74.93
17,084.0	89.50	90.90	9,281.0	2,110.4	7,936.8	8,212.6	75.11
17,179.0	87.40	90.20	9,283.6	2,109.4	8,031.7	8,304.1	75.28
17,274.0	88.00	89.30	9,287.4	2,109.9	8,126.7	8,396.1	75.45
17,368.0	89.00	88.60	9,289.8	2,111.6	8,220.6	8,487.5	75.59
17,463.0	89.00	90.50	9,291.5	2,112.3	8,315.6	8,579.7	75.75
17,558.0	90.30	90.40	9,292.1	2,111.6	8,410.6	8,671.6	75.91
17,652.0	89.40	90.90	9,292.3	2,110.5	8,504.6	8,762.5	76.06
17,747.0	90.80	90.20	9,292.2	2,109.6	8,599.6	8,854.6	76.22
17,841.0	88.40	90.20	9,292.8	2,109.3	8,693.6	8,945.8	76.36
17,936.0	88.70	89.90	9,295.2	2,109.2	8,788.5	9,038.1	76.50
18,031.0	90.50	90.10	9,295.9	2,109.2	8,883.5	9,130.5	76.64
18,126.0	91.40	89.20	9,294.3	2,109.8	8,978.5	9,223.1	76.78
18,220.0	92.70	88.30	9,291.0	2,111.8	9,072.4	9,315.0	76.90
18,315.0	94.40	87.10	9,285.1	2,115.6	9,167.2	9,408.1	77.00



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Design: Wellbore #1

Local Co-ordinate Reference: Well James Ranch Unit DI 1 #161H
TVD Reference: RKB @ 3189.0usft (Noram #25)
MD Reference: RKB @ 3189.0usft (Noram #25)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)
18,406.0	95.80	87.10	9,277.0	2,120.2	9,257.7	9,497.4	77.10
18,476.0	95.80	87.10	9,269.9	2,123.7	9,327.2	9,566.0	77.17

TD @ 18476.0' MD / 9269.9' TVD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
122.0	122.0	0.2	-0.2	First MWD Survey @ 122.0' MD / 122.0' TVD
18,476.0	9,269.9	2,123.7	9,327.2	TD @ 18476.0' MD / 9269.9' TVD