



Company: XTO Energy
 Site: Hughes
 Well: 5H
 Project: Marion County, West Virginia (NAD 27)
 Rig: Nomac 78



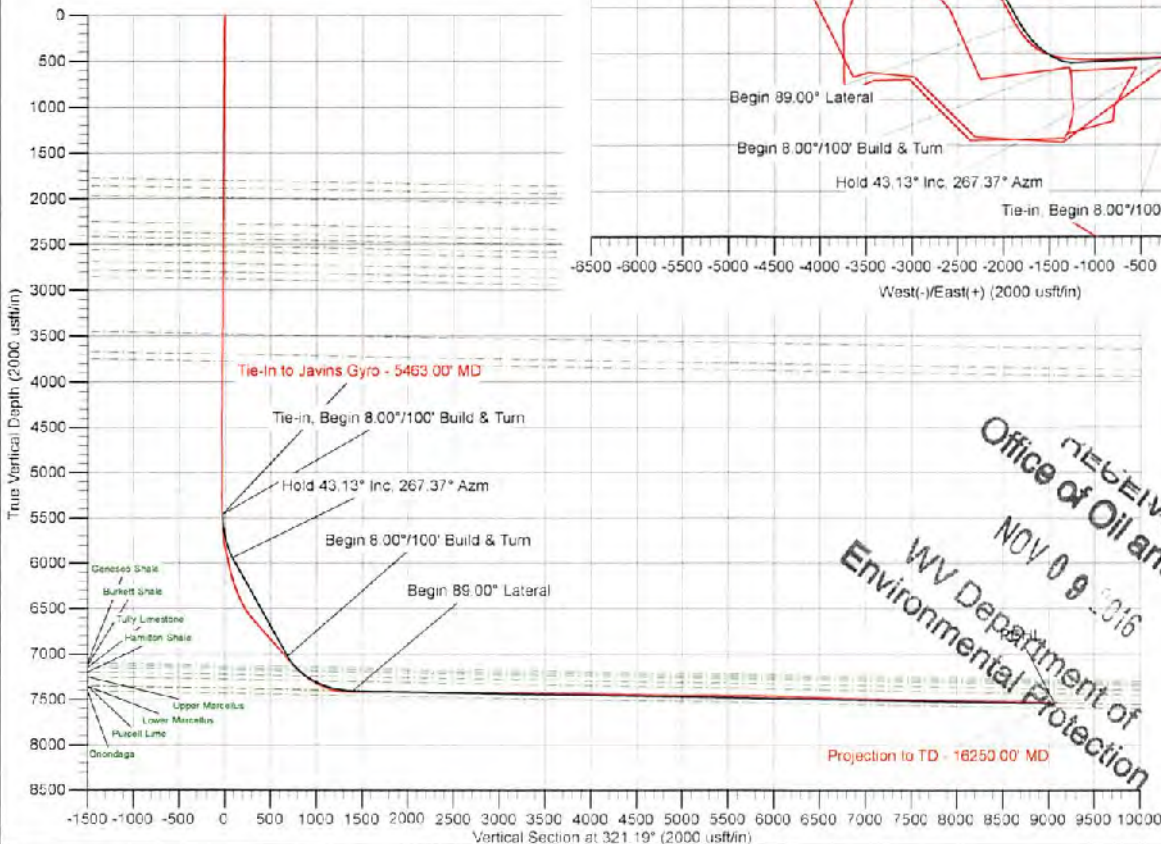
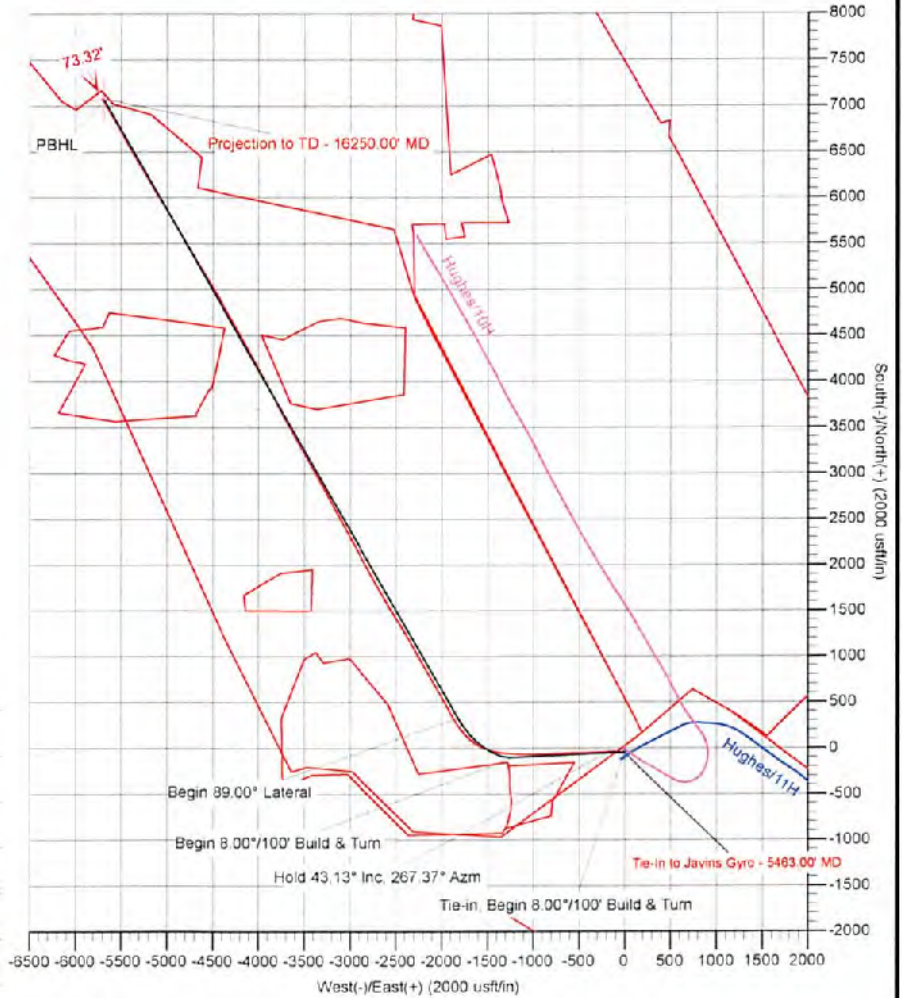
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 Azimuths to True North
 Magnetic North: -8.65°
 Magnetic Field
 Strength: 52114.0snT
 Dip Angle: 66.76°
 Date: 03/07/2016
 Model: BGGM2015

ANNOTATIONS

MD	Inc	Az	TVD	+N/-S	+E/-W	V Sect	Departure	Annotation
5463.00	0.79	266.56	5462.51	-44.92	-11.77	-27.53	0.00	Tie-in, Begin 8.00'/100' Build & Turn
5992.25	43.13	267.37	5942.27	-53.85	-205.01	86.53	193.45	Hold 43.13° Inc, 267.37° Azm
7477.18	43.13	267.37	7025.97	-100.45	-1219.12	585.82	1209.63	Begin 8.00'/100' Build & Turn
8355.11	89.00	330.19	7408.00	327.01	-1822.29	1396.93	1982.47	Begin 89.00° Lateral
15130.11	89.00	330.19	7544.10	7063.70	-5881.52	9065.07	9746.28	PBHL

US State Plane 1927 (Exact solution)
 West Virginia North 4701

Created By: CJH
 Date: 13:49, March 14 2016
 Plan: Design #2



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 Environmental Protection
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XTO Energy

Marion County, West Virginia (NAD 27)

Hughes

5H

Wellbore #1

Survey: Javins Gyro

Standard Survey Report

14 March, 2016



09/15/2017



MS Energy Services
Survey Report



Company:	XTO Energy	Local Co-ordinate Reference:	Well 5H
Project:	Marion County, West Virginia (NAD 27)	TVD Reference:	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	MD Reference:	WELL @ 1312.00usft (Nomac 78)
Well:	5H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Project	Marion County, West Virginia (NAD 27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	West Virginia North 4701		

Well	5H					
Well Position	+N/-S	0.00 usft	Northing:	348,558.04 usft	Latitude:	39° 27' 13.410 N
	+E/-W	0.00 usft	Easting:	1,754,094.02 usft	Longitude:	80° 22' 15.110 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	1,286.00 usft

Wellbore	Wellbore #1
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2015	03/07/16	-8.85	66.76	52,114

Design	Surveys
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Audit Notes:	
Version:	1.0
Phase:	ACTUAL
Tie On Depth:	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	321.19

Survey Program	Date	03/14/16
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From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
13.00	5,463.00	Javins Gyro (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro
5,499.00	16,250.00	MS MWD (Wellbore #1)	MWD	OWSG MWD - Standard

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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
13.00	0.00	0.00	13.00	0.00	0.00	0.00	0.00	0.00	0.00	
Added to adjust for KB-13.00' MD										
113.00	0.46	207.68	113.00	-0.36	-0.19	-0.16	0.46	0.46	0.00	
213.00	0.17	194.28	213.00	-0.85	-0.41	-0.41	0.30	-0.29	-13.40	
313.00	0.40	77.88	313.00	-0.93	-0.10	-0.66	0.50	0.23	-116.40	
413.00	0.61	105.98	412.99	-1.00	0.75	-1.25	0.32	0.21	28.10	
513.00	0.63	124.18	512.99	-1.45	1.71	-2.21	0.20	0.02	18.20	
613.00	0.64	161.18	612.98	-2.29	2.35	-3.26	0.40	0.01	37.00	
713.00	0.70	159.18	712.97	-3.39	2.75	-4.36	0.06	0.06	-2.00	
813.00	0.55	160.98	812.97	-4.42	3.12	-5.40	0.15	-0.15	1.80	
913.00	0.79	165.18	912.96	-5.54	3.45	-6.48	0.24	0.24	4.20	
1,013.00	0.84	142.38	1,012.95	-6.78	4.08	-7.84	0.33	0.05	-22.80	
1,113.00	0.36	103.58	1,112.95	-7.44	4.83	-8.82	0.60	-0.48	-38.80	
1,213.00	0.41	108.18	1,212.94	-7.62	5.47	-9.37	0.06	0.05	4.60	



MS Energy Services
Survey Report



Company:	XTO Energy	Local Co-ordinate Reference:	Well 5H
Project:	Marion County, West Virginia (NAD 27)	TVD Reference:	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	MD Reference:	WELL @ 1312.00usft (Nomac 78)
Well:	5H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

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)
1,313.00	0.33	91.58	1,312.94	-7.74	6.10	-9.86	0.13	-0.08	-16.60
1,413.00	0.49	122.18	1,412.94	-7.98	6.75	-10.45	0.27	0.16	30.60
1,513.00	0.37	105.38	1,512.94	-8.29	7.43	-11.12	0.17	-0.12	-16.80
1,613.00	0.36	100.78	1,612.93	-8.44	8.05	-11.62	0.03	-0.01	-4.60
1,713.00	0.34	91.58	1,712.93	-8.50	8.65	-12.05	0.06	-0.02	-9.20
1,813.00	0.33	85.28	1,812.93	-8.49	9.23	-12.40	0.04	-0.01	-6.30
1,913.00	0.21	353.78	1,912.93	-8.28	9.50	-12.41	0.40	-0.12	-91.50
2,013.00	0.42	224.38	2,012.93	-8.36	9.23	-12.30	0.58	0.21	-129.40
2,113.00	0.54	206.88	2,112.93	-9.04	8.76	-12.53	0.19	0.12	-17.50
2,213.00	0.64	189.48	2,212.92	-10.02	8.45	-13.10	0.20	0.10	-17.40
2,313.00	0.63	151.68	2,312.92	-11.05	8.62	-14.01	0.41	-0.01	-37.80
2,413.00	0.67	119.48	2,412.91	-11.82	9.39	-15.10	0.36	0.04	-32.20
2,513.00	0.34	117.88	2,512.90	-12.25	10.16	-15.91	0.33	-0.33	-1.60
2,613.00	0.44	178.18	2,612.90	-12.77	10.43	-16.49	0.40	0.10	60.30
2,713.00	0.76	182.28	2,712.90	-13.82	10.42	-17.30	0.32	0.32	4.10
2,813.00	0.82	176.68	2,812.89	-15.19	10.44	-18.38	0.10	0.06	-5.60
2,913.00	0.67	161.78	2,912.88	-16.46	10.66	-19.51	0.24	-0.15	-14.90
3,013.00	0.39	160.68	3,012.88	-17.34	10.95	-20.38	0.28	-0.28	-1.10
3,113.00	0.47	219.08	3,112.87	-17.98	10.81	-20.78	0.43	0.08	58.40
3,213.00	0.27	223.88	3,212.87	-18.47	10.39	-20.90	0.20	-0.20	4.80
3,313.00	0.48	211.38	3,312.87	-19.00	10.01	-21.07	0.22	0.21	-12.50
3,413.00	0.68	161.28	3,412.86	-19.92	9.98	-21.77	0.52	0.20	-50.10
3,513.00	0.68	193.68	3,512.86	-21.05	10.03	-22.69	0.38	0.00	32.40
3,613.00	0.74	188.28	3,612.85	-22.27	9.79	-23.49	0.09	0.06	-5.40
3,713.00	0.65	195.88	3,712.84	-23.45	9.55	-24.26	0.13	-0.09	7.60
3,813.00	0.76	157.78	3,812.84	-24.61	9.64	-25.22	0.47	0.11	-38.10
3,913.00	0.65	191.08	3,912.83	-25.78	9.78	-26.22	0.42	-0.11	33.30
4,013.00	0.68	157.88	4,012.82	-26.89	9.90	-27.16	0.38	0.03	-33.20
4,113.00	1.01	211.28	4,112.81	-28.19	9.66	-28.03	0.81	0.33	53.40
4,213.00	1.09	223.58	4,212.80	-29.64	8.55	-28.45	0.24	0.08	12.30
4,313.00	1.11	204.58	4,312.78	-31.21	7.49	-29.01	0.36	0.02	-19.00
4,413.00	1.49	220.28	4,412.75	-33.08	6.25	-29.69	0.52	0.38	15.70
4,513.00	1.52	227.78	4,512.72	-34.96	4.42	-30.02	0.20	0.03	7.50
4,613.00	1.45	265.78	4,612.69	-35.95	2.18	-29.38	0.97	-0.07	38.00
4,713.00	1.05	239.88	4,712.66	-36.50	0.13	-28.52	0.68	-0.40	-25.90
4,813.00	0.83	235.08	4,812.65	-37.37	-1.26	-28.33	0.23	-0.22	-4.80
4,913.00	1.07	258.78	4,912.64	-37.97	-2.77	-27.85	0.46	0.24	23.70
5,013.00	1.19	222.88	5,012.62	-38.91	-4.39	-27.57	0.71	0.12	-35.90
5,113.00	1.34	222.38	5,112.59	-40.54	-5.89	-27.90	0.15	0.15	-0.50
5,213.00	1.30	224.18	5,212.57	-42.21	-7.47	-28.21	0.06	-0.04	1.80
5,313.00	1.46	225.88	5,312.54	-43.91	-9.17	-28.47	0.17	0.16	1.70
5,413.00	1.03	265.58	5,412.52	-44.87	-10.98	-28.08	0.94	-0.43	39.70
5,463.00	0.79	266.58	5,462.51	-44.92	-11.77	-27.63	0.48	-0.48	2.00



Company:	XTO Energy	Local Co-ordinate Reference:	Well 5H
Project:	Marion County, West Virginia (NAD 27)	TVD Reference:	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	MD Reference:	WELL @ 1312.00usft (Nomac 78)
Well:	5H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe 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)
Final Javins Gyro-5463.00' MD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
13.00	13.00	0.00	0.00	Added to adjust for KB-13.00' MD
5,463.00	5,462.51	-44.92	-11.77	Final Javins Gyro-5463.00' MD



XTO Energy

Marion County, West Virginia (NAD 27)

Hughes

5H

Wellbore #1

Survey: MS MWD

Standard Survey Report

14 March, 2016



09/15/2017



MS Energy Services
Survey Report



Company:	XTO Energy	Local Co-ordinate Reference:	Well 5H
Project:	Marion County, West Virginia (NAD 27)	TVD Reference:	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	MD Reference:	WELL @ 1312.00usft (Nomac 78)
Well:	5H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Project	Marion County, West Virginia (NAD 27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	West Virginia North 4701		

Well	5H					
Well Position	+N-S	0.00 usft	Northing:	348,558.04 usft	Latitude:	39° 27' 13.410 N
	+E-W	0.00 usft	Easting:	1,754,094.02 usft	Longitude:	80° 22' 15.110 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	1,286.00 usft

Wellbore	Wellbore #1
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2015	03/07/16	-8.85	66.76	52,114

Design	Surveys
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Audit Notes:	
Version:	1.0
Phase:	ACTUAL
Tie On Depth:	0.00

Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)
	0.00	0.00	0.00	321.19

Survey Program	Date	03/14/16
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From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
13.00	5,463.00	Javins Gyro (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro
5,499.00	16,250.00	MS MWD (Wellbore #1)	MWD	OWSG MWD - Standard

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)	
5,463.00	0.79	266.58	5,462.51	-44.92	-11.77	-27.63	0.00	0.00	0.00	
Tie-in to Javins Gyro - 5463.00' MD										
5,499.00	0.70	262.80	5,498.51	-44.97	-12.24	-27.37	0.28	-0.25	-10.51	
5,595.00	3.40	264.10	5,594.44	-45.33	-15.65	-25.51	2.81	2.81	1.35	
5,690.00	9.10	278.40	5,688.84	-44.52	-25.90	-18.46	6.17	6.00	15.05	
5,785.00	14.70	277.10	5,781.76	-41.93	-45.31	-4.28	5.90	5.89	-1.37	
5,880.00	19.30	275.20	5,872.58	-39.02	-72.92	15.29	4.88	4.84	-2.00	
5,976.00	20.80	271.10	5,962.77	-37.26	-105.76	37.26	2.14	1.56	-4.27	
6,071.00	23.00	268.70	6,050.91	-37.35	-141.19	59.38	2.50	2.32	-2.53	
6,166.00	26.30	262.00	6,137.26	-40.70	-180.60	81.47	4.55	3.47	-7.05	
6,262.00	28.60	267.20	6,222.45	-44.79	-224.62	105.88	3.46	2.40	5.42	
6,358.00	32.20	271.00	6,305.25	-45.46	-273.17	135.78	4.25	3.75	3.96	
6,453.00	35.70	268.40	6,384.05	-45.80	-326.20	168.76	3.99	3.68	-2.74	
6,549.00	40.90	267.20	6,459.36	-48.11	-385.63	204.20	5.47	5.42	-1.25	
6,644.00	47.00	268.10	6,527.72	-50.79	-451.48	243.38	6.45	6.42	0.95	



MS Energy Services
Survey Report



Company:	XTO Energy	Local Co-ordinate Reference:	Well 5H
Project:	Marion County, West Virginia (NAD 27)	TVD Reference:	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	MD Reference:	WELL @ 1312.00usft (Nomac 78)
Well:	5H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

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)
6,739.00	53.70	268.20	6,588.31	-53.15	-524.55	287.34	7.05	7.05	0.11
6,834.00	55.20	268.40	6,643.54	-55.44	-601.80	333.98	1.59	1.58	0.21
6,929.00	55.30	268.60	6,697.69	-57.48	-679.83	381.29	0.20	0.11	0.21
7,024.00	55.10	268.60	6,751.91	-59.39	-757.82	428.68	0.21	-0.21	0.00
7,119.00	55.30	268.60	6,806.13	-61.29	-835.80	476.07	0.21	0.21	0.00
7,215.00	55.10	269.10	6,860.92	-62.87	-914.62	524.23	0.48	-0.21	0.52
7,310.00	54.80	269.10	6,915.47	-64.10	-992.38	572.02	0.32	-0.32	0.00
7,406.00	53.80	269.60	6,971.49	-64.98	-1,070.33	620.18	1.12	-1.04	0.52
7,500.00	53.30	269.90	7,027.34	-65.31	-1,145.94	667.31	0.59	-0.53	0.32
7,596.00	52.60	274.00	7,085.20	-62.72	-1,222.49	717.31	3.49	-0.73	4.27
7,691.00	53.80	276.20	7,142.11	-55.95	-1,298.25	770.07	2.24	1.26	2.32
7,787.00	54.20	281.10	7,198.56	-44.26	-1,374.99	827.27	4.15	0.42	5.10
7,882.00	57.50	283.70	7,251.88	-27.35	-1,451.75	888.55	4.15	3.47	2.74
7,978.00	63.20	291.10	7,299.41	-2.29	-1,531.20	957.87	8.95	5.94	7.71
8,073.00	66.00	301.90	7,340.25	36.00	-1,607.79	1,035.72	10.68	2.95	11.37
8,168.00	69.90	310.70	7,375.97	88.13	-1,678.60	1,120.71	9.51	4.11	9.26
8,263.00	78.40	317.30	7,401.92	151.59	-1,744.16	1,211.26	11.16	8.95	6.95
8,359.00	86.30	324.00	7,414.70	225.10	-1,804.36	1,306.27	10.75	8.23	6.98
8,454.00	87.90	329.70	7,419.51	304.50	-1,856.22	1,400.64	6.22	1.68	6.00
8,488.00	87.90	330.10	7,420.76	333.90	-1,873.26	1,434.23	1.18	0.00	1.18
8,584.00	91.90	331.70	7,420.92	417.76	-1,919.93	1,528.83	4.49	4.17	1.67
8,679.00	90.30	331.50	7,419.10	501.31	-1,965.11	1,622.24	1.70	-1.68	-0.21
8,774.00	89.10	330.10	7,419.60	584.23	-2,011.45	1,715.91	1.94	-1.26	-1.47
8,869.00	89.30	329.50	7,420.92	666.33	-2,059.23	1,809.83	0.67	0.21	-0.63
8,965.00	89.50	330.00	7,421.93	749.25	-2,107.59	1,904.75	0.56	0.21	0.52
9,060.00	89.50	330.80	7,422.76	831.85	-2,154.52	1,998.52	0.84	0.00	0.84
9,155.00	89.50	331.00	7,423.59	914.85	-2,200.72	2,092.16	0.21	0.00	0.21
9,250.00	89.50	330.80	7,424.42	997.86	-2,246.92	2,185.79	0.21	0.00	-0.21
9,345.00	88.70	329.90	7,425.91	1,080.41	-2,293.91	2,279.57	1.27	-0.84	-0.95
9,441.00	89.70	330.80	7,427.25	1,163.83	-2,341.39	2,374.33	1.40	1.04	0.94
9,536.00	88.80	329.70	7,428.49	1,246.30	-2,388.53	2,468.14	1.50	-0.95	-1.16
9,632.00	90.00	329.00	7,429.50	1,328.88	-2,437.46	2,563.16	1.45	1.25	-0.73
9,727.00	88.90	327.70	7,430.41	1,409.74	-2,487.31	2,657.41	1.79	-1.16	-1.37
9,822.00	88.40	327.90	7,432.65	1,490.11	-2,537.92	2,751.75	0.57	-0.53	0.21
9,918.00	90.20	329.40	7,433.82	1,572.08	-2,587.86	2,846.92	2.44	1.88	1.56
10,013.00	90.20	330.20	7,433.49	1,654.19	-2,635.64	2,940.85	0.84	0.00	0.84
10,109.00	91.40	330.80	7,432.15	1,737.73	-2,682.91	3,035.58	1.40	1.25	0.63
10,204.00	91.50	332.90	7,429.74	1,821.46	-2,727.71	3,128.90	2.21	0.11	2.21
10,299.00	90.40	331.60	7,428.17	1,905.52	-2,771.94	3,222.12	1.79	-1.16	-1.37
10,395.00	89.80	330.80	7,428.00	1,989.65	-2,818.18	3,316.66	1.04	-0.63	-0.83
10,490.00	89.80	330.80	7,428.33	2,072.57	-2,864.53	3,410.32	0.00	0.00	0.00
10,585.00	88.80	330.80	7,429.49	2,155.49	-2,910.87	3,503.98	1.05	-1.05	0.00
10,680.00	89.10	330.70	7,431.24	2,238.37	-2,957.29	3,597.65	0.33	0.32	-0.11



MS Energy Services
Survey Report



Company:	XTO Energy	Local Co-ordinate Reference:	Well 5H
Project:	Marion County, West Virginia (NAD 27)	TVD Reference:	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	MD Reference:	WELL @ 1312.00usft (Nomac 78)
Well:	5H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe 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)
10,776.00	88.90	330.60	7,432.91	2,322.03	-3,004.33	3,692.33	0.23	-0.21	-0.10
10,872.00	89.80	332.00	7,434.00	2,406.23	-3,050.43	3,786.83	1.73	0.94	1.46
10,968.00	90.20	332.00	7,434.00	2,490.99	-3,095.50	3,881.12	0.42	0.42	0.00
11,063.00	89.00	332.30	7,434.66	2,574.98	-3,139.88	3,974.39	1.30	-1.26	0.32
11,158.00	88.90	331.90	7,436.40	2,658.93	-3,184.32	4,067.65	0.43	-0.11	-0.42
11,252.00	88.40	331.70	7,438.62	2,741.75	-3,228.73	4,160.02	0.57	-0.53	-0.21
11,347.00	88.00	331.10	7,441.60	2,825.11	-3,274.18	4,253.47	0.76	-0.42	-0.63
11,442.00	89.70	330.90	7,443.51	2,908.18	-3,320.23	4,347.06	1.80	1.79	-0.21
11,537.00	88.90	330.70	7,444.67	2,991.10	-3,366.57	4,440.72	0.87	-0.84	-0.21
11,633.00	88.80	330.40	7,446.60	3,074.68	-3,413.76	4,535.42	0.33	-0.10	-0.31
11,729.00	88.50	330.60	7,448.86	3,158.21	-3,461.02	4,630.13	0.38	-0.31	0.21
11,824.00	88.50	331.20	7,451.34	3,241.19	-3,507.21	4,723.74	0.63	0.00	0.63
11,920.00	88.80	331.80	7,453.61	3,325.54	-3,553.00	4,818.16	0.70	0.31	0.63
12,014.00	89.10	330.30	7,455.33	3,407.77	-3,598.49	4,910.75	1.63	0.32	-1.60
12,110.00	90.40	330.10	7,455.75	3,491.08	-3,646.20	5,005.56	1.37	1.35	-0.21
12,206.00	91.20	330.50	7,454.41	3,574.46	-3,693.76	5,100.34	0.93	0.83	0.42
12,301.00	90.50	332.30	7,453.00	3,657.85	-3,739.23	5,193.82	2.03	-0.74	1.89
12,397.00	89.30	332.70	7,453.17	3,743.00	-3,783.55	5,287.96	1.32	-1.25	0.42
12,492.00	88.80	332.30	7,454.74	3,827.26	-3,827.41	5,381.10	0.67	-0.53	-0.42
12,587.00	88.80	332.00	7,456.73	3,911.23	-3,871.78	5,474.35	0.32	0.00	-0.32
12,682.00	88.70	331.90	7,458.80	3,995.06	-3,916.45	5,567.65	0.15	-0.11	-0.11
12,777.00	89.00	332.50	7,460.71	4,079.07	-3,960.74	5,660.89	0.71	0.32	0.63
12,873.00	89.90	331.90	7,461.63	4,163.99	-4,005.51	5,755.11	1.13	0.94	-0.63
12,969.00	90.10	332.40	7,461.63	4,248.87	-4,050.36	5,849.36	0.56	0.21	0.52
13,063.00	88.80	330.90	7,462.53	4,331.59	-4,094.99	5,941.79	2.11	-1.38	-1.60
13,159.00	88.30	330.20	7,464.96	4,415.15	-4,142.18	6,036.48	0.90	-0.52	-0.73
13,253.00	88.00	330.00	7,468.00	4,496.60	-4,189.01	6,129.30	0.38	-0.32	-0.21
13,348.00	88.00	330.20	7,471.31	4,578.90	-4,236.34	6,223.10	0.21	0.00	0.21
13,443.00	87.70	329.90	7,474.88	4,661.16	-4,283.73	6,316.90	0.45	-0.32	-0.32
13,538.00	87.80	329.90	7,478.61	4,743.29	-4,331.34	6,410.73	0.11	0.11	0.00
13,633.00	87.80	331.00	7,482.25	4,825.87	-4,378.16	6,504.42	1.16	0.00	1.16
13,728.00	89.10	329.30	7,484.82	4,908.44	-4,425.06	6,598.16	1.86	1.37	-1.26
13,823.00	88.60	330.00	7,486.73	4,990.61	-4,472.70	6,692.04	0.57	-0.53	0.21
13,919.00	88.30	328.80	7,489.33	5,073.21	-4,521.55	6,787.02	1.29	-0.31	-1.25
14,015.00	87.90	328.40	7,492.51	5,155.10	-4,571.53	6,882.17	0.59	-0.42	-0.42
14,111.00	89.10	328.10	7,495.02	5,236.71	-4,622.03	6,977.40	1.29	1.25	-0.31
14,206.00	88.90	328.80	7,496.68	5,317.65	-4,671.73	7,071.63	0.77	-0.21	0.74
14,302.00	88.80	330.00	7,498.61	5,400.26	-4,720.59	7,166.62	1.25	-0.10	1.25
14,397.00	89.40	330.40	7,500.10	5,482.69	-4,767.80	7,260.44	0.76	0.63	0.42
14,491.00	89.10	328.90	7,501.33	5,563.80	-4,815.29	7,353.40	1.63	-0.32	-1.60
14,587.00	89.40	329.00	7,502.59	5,646.04	-4,864.80	7,448.52	0.33	0.31	0.10
14,681.00	88.60	329.40	7,504.23	5,726.77	-4,912.92	7,541.59	0.95	-0.85	0.43
14,776.00	88.20	328.80	7,506.88	5,808.25	-4,961.69	7,635.64	0.76	-0.42	-0.63



MS Energy Services
Survey Report



Company:	XTO Energy	Local Co-ordinate Reference:	Well 5H
Project:	Marion County, West Virginia (NAD 27)	TVD Reference:	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	MD Reference:	WELL @ 1312.00usft (Nomac 78)
Well:	5H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe 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)
14,872.00	88.00	327.90	7,510.06	5,889.93	-5,012.04	7,730.84	0.96	-0.21	-0.94
14,967.00	88.60	329.10	7,512.88	5,970.89	-5,061.65	7,825.03	1.41	0.63	1.26
15,063.00	89.30	329.90	7,514.64	6,053.59	-5,110.36	7,920.00	1.11	0.73	0.83
15,158.00	89.30	329.50	7,515.80	6,135.61	-5,158.29	8,013.95	0.42	0.00	-0.42
15,253.00	89.20	329.00	7,517.04	6,217.24	-5,206.86	8,108.00	0.54	-0.11	-0.53
15,348.00	89.00	328.60	7,518.54	6,298.49	-5,256.07	8,202.15	0.47	-0.21	-0.42
15,443.00	89.60	330.60	7,519.70	6,380.42	-5,304.13	8,296.12	2.20	0.63	2.11
15,538.00	89.60	330.80	7,520.37	6,464.14	-5,351.11	8,390.80	0.21	0.00	0.21
15,634.00	89.60	331.10	7,521.03	6,547.19	-5,397.24	8,484.42	0.32	0.00	0.32
15,729.00	89.00	330.90	7,522.19	6,630.27	-5,443.29	8,578.02	0.67	-0.63	-0.21
15,825.00	88.50	330.00	7,524.29	6,713.76	-5,490.63	8,672.75	1.07	-0.52	-0.94
15,920.00	88.40	330.10	7,526.86	6,796.04	-5,538.04	8,766.58	0.15	-0.11	0.11
16,016.00	88.70	330.40	7,529.28	6,879.36	-5,585.66	8,861.35	0.44	0.31	0.31
16,111.00	88.70	330.80	7,531.44	6,962.11	-5,632.28	8,955.05	0.42	0.00	0.42
16,183.00	88.30	330.10	7,533.32	7,024.72	-5,667.78	9,028.09	1.12	-0.56	-0.97
16,250.00	88.30	330.10	7,535.31	7,082.78	-5,701.16	9,092.25	0.00	0.00	0.00
Projection to TD - 16250.00' MD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,463.00	5,462.51	-44.92	-11.77	Tie-In to Javins Gyro - 5463.00' MD
16,250.00	7,535.31	7,082.78	-5,701.16	Projection to TD - 16250.00' MD