

**HALLIBURTON**

**Sperry Drilling**

# **Statoil**

**Wetzel County WV (NAD 83 UTM 17N)**

**Joe Jolliffe Unit**

**Joe Jolliffe Unit 5H**

**Wellbore #1**

**Design: Surveys**

# **Standard Survey Report**

**07 November, 2014**

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**Office of Oil and Gas**

**MAY 06 2015**

**WV Department of**  
**Environmental Protection**

**06/05/2015**

**Survey Report**

**Company:** Statoil  
**Project:** Wetzel County WV (NAD 83 UTM 17N)  
**Site:** Joe Jolliffe Unit  
**Well:** Joe Jolliffe Unit 5H  
**Wellbore:** Wellbore #1  
**Design:** Surveys

**Local Co-ordinate Reference:** Well Joe Jolliffe Unit 5H  
**TVD Reference:** GL 1358' + KB 22' @ 1380.00usft (Orion Polaris)  
**MD Reference:** GL 1358' + KB 22' @ 1380.00usft (Orion Polaris)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Single User Db

<b>Project</b>	Wetzel County WV (NAD 83 UTM 17N)		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	Joe Jolliffe Unit				
<b>Site Position:</b>		<b>Northing:</b>	4,388,679.10 m	<b>Latitude:</b>	39.647054
<b>From:</b>	Map	<b>Eastings:</b>	538,102.00 m	<b>Longitude:</b>	-80.555909
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b>	0.28 °

<b>Well</b>	Joe Jolliffe Unit 5H					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	4,388,675.00 m	<b>Latitude:</b>	39.647017
	<b>+E/-W</b>	0.00 usft	<b>Eastings:</b>	538,100.00 m	<b>Longitude:</b>	-80.555933
<b>Position Uncertainty</b>	0.00 usft		<b>Wellhead Elevation:</b>	1,380.00 usft	<b>Ground Level:</b>	1,358.00 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	BGGM2014	2/24/2014	-8.69	67.14	52,446

<b>Design</b>	Surveys				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	132.57	

<b>Survey Program</b>	Date 11/3/2014				
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
100.00	660.00	MS Gyro (Wellbore #1)	SR-Gyro-MS	Fixed:v2:surface readout gyro multishot	
716.00	13,670.00	Sperry MWD (Wellbore #1)	MWD	Fixed:v2:standard declination	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.88	311.78	100.00	0.51	-0.57	-0.77	0.88	0.88	0.00
200.00	1.50	304.31	199.97	1.76	-2.23	-2.83	0.68	0.68	-7.47
300.00	2.19	299.94	299.92	3.45	-4.96	-5.99	0.70	0.69	0.37
400.00	3.07	298.73	399.82	5.69	-8.97	-10.46	0.68	0.88	-1.21
500.00	3.66	299.36	499.64	8.55	-14.10	-16.16	0.59	0.59	0.63
600.00	3.28	300.46	599.46	11.56	-19.34	-22.07	0.39	-0.38	1.10
660.00	3.47	298.82	659.35	13.31	-22.42	-25.51	0.36	0.32	2.73

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716.00	3.49	298.26	715.25	14.93	-25.40	-28.81	0.07	0.04	-1.00
809.00	3.74	295.31	808.07	17.57	-30.64	-34.45	0.33	0.27	-3.17
901.00	4.24	272.71	899.85	19.01	-36.75	-39.92	1.78	0.54	-24.57
993.00	4.52	267.96	991.58	19.04	-43.77	-45.11	0.50	0.30	-5.16
1,084.00	5.86	247.28	1,082.21	17.12	-51.64	-49.61	2.51	1.47	-22.73
1,176.00	6.14	245.05	1,173.71	13.23	-60.43	-53.45	0.40	0.30	-2.42
1,267.00	6.09	242.38	1,264.19	8.94	-69.12	-56.95	0.32	-0.05	-2.93
1,362.00	6.18	237.55	1,358.65	3.86	-77.90	-59.98	0.55	0.09	-5.08
1,456.00	6.24	237.91	1,452.10	-1.57	-86.50	-62.64	0.08	0.06	0.38
1,551.00	6.15	238.09	1,546.54	-7.00	-95.19	-65.37	0.10	-0.09	0.19
1,646.00	6.36	238.95	1,640.98	-12.41	-104.02	-68.21	0.24	0.22	0.91
1,742.00	6.29	231.56	1,736.39	-18.42	-112.69	-70.53	0.85	-0.07	-7.70
1,837.00	6.25	230.12	1,830.83	-24.97	-120.74	-72.03	0.17	-0.04	-1.52
1,933.00	6.20	225.49	1,926.26	-31.95	-128.44	-72.98	0.53	-0.05	-4.82
2,029.00	5.40	227.87	2,021.77	-38.62	-135.49	-73.66	0.87	-0.83	2.48
2,123.00	4.44	227.17	2,115.42	-44.06	-141.44	-74.36	1.02	-1.02	-0.74
2,219.00	4.63	227.96	2,211.12	-49.18	-147.04	-75.02	0.21	0.20	0.82
2,315.00	5.49	232.10	2,306.75	-54.59	-153.54	-76.15	0.97	0.90	4.31
2,410.00	5.49	232.92	2,401.31	-60.13	-160.76	-77.71	0.08	0.00	0.86
2,506.00	4.98	236.21	2,496.91	-65.21	-167.88	-79.52	0.62	-0.53	3.43
2,601.00	3.87	231.07	2,591.62	-69.52	-173.80	-80.97	1.24	-1.17	-5.41
2,681.00	3.25	231.46	2,671.47	-72.63	-177.68	-81.72	0.78	-0.77	0.49
2,776.00	2.99	233.12	2,766.33	-75.79	-181.77	-82.59	0.29	-0.27	1.75
2,871.00	2.75	235.05	2,861.21	-78.59	-185.62	-83.53	0.27	-0.25	2.03
2,964.00	3.26	283.28	2,954.10	-79.26	-190.02	-86.32	2.69	0.55	51.86
3,060.00	3.15	285.92	3,049.95	-77.91	-195.21	-91.06	0.19	-0.11	2.75
3,155.00	2.80	284.36	3,144.82	-76.62	-199.97	-95.44	0.38	-0.37	-1.64
3,251.00	2.77	286.10	3,240.70	-75.39	-204.47	-99.58	0.09	-0.03	1.81
3,346.00	0.81	285.21	3,335.65	-74.58	-207.32	-102.23	2.06	-2.06	-0.94
3,442.00	0.94	271.52	3,431.64	-74.38	-208.77	-103.43	0.26	0.14	-14.26
3,537.00	0.84	269.09	3,526.63	-74.37	-210.24	-104.52	0.11	-0.11	-2.56
3,633.00	1.07	274.68	3,622.62	-74.31	-211.84	-105.74	0.26	0.24	5.82
3,728.00	0.84	279.72	3,717.60	-74.12	-213.41	-107.02	0.26	-0.24	5.31
3,823.00	0.75	289.78	3,812.59	-73.79	-214.68	-108.18	0.17	-0.09	10.59
3,919.00	0.62	300.67	3,908.59	-73.31	-215.72	-109.27	0.19	-0.14	11.34
4,015.00	0.88	350.17	4,004.58	-72.32	-216.29	-110.36	0.70	0.27	51.56
4,111.00	0.89	351.48	4,100.57	-70.86	-216.53	-111.53	0.11	0.11	1.36
4,204.00	0.81	345.54	4,193.56	-69.51	-216.80	-112.64	0.11	-0.09	-6.39
4,299.00	0.81	344.39	4,288.55	-68.21	-217.15	-113.77	0.02	0.00	-1.21
4,395.00	0.82	335.58	4,384.54	-66.93	-217.61	-114.98	0.15	0.12	-9.18
4,490.00	0.93	329.39	4,479.53	-65.65	-218.29	-116.35	0.15	0.12	-6.52
4,584.00	0.79	334.05	4,573.52	-64.41	-218.96	-117.68	0.17	-0.15	4.96

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4,679.00	0.44	323.48	4,668.51	-63.53	-219.46	-118.65	0.39	-0.37	-11.13
4,774.00	0.51	316.07	4,763.51	-62.93	-219.97	-119.43	0.10	0.07	-7.80
4,869.00	0.36	294.52	4,858.51	-62.50	-220.54	-120.13	0.23	-0.16	-22.68
4,965.00	0.30	315.49	4,954.50	-62.20	-220.99	-120.67	0.14	-0.06	21.84
5,061.00	0.18	346.34	5,050.50	-61.87	-221.20	-121.05	0.18	-0.12	32.14
5,156.00	0.15	335.13	5,145.50	-61.61	-221.29	-121.29	0.05	-0.03	-11.80
5,251.00	0.12	18.91	5,240.50	-61.41	-221.31	-121.44	0.11	-0.03	46.08
5,346.00	0.24	16.19	5,335.50	-61.12	-221.22	-121.57	0.13	0.13	-2.86
5,441.00	0.08	124.89	5,430.50	-60.97	-221.11	-121.59	0.29	-0.17	114.42
5,535.00	0.10	255.24	5,524.50	-61.03	-221.13	-121.57	0.17	0.02	138.67
5,632.00	0.17	278.70	5,621.50	-61.03	-221.36	-121.74	0.09	0.07	24.19
5,727.00	0.34	296.23	5,716.50	-60.88	-221.75	-122.12	0.19	0.18	18.45
5,823.00	0.14	262.93	5,812.50	-60.77	-222.12	-122.47	0.25	-0.21	-34.69
5,918.00	0.31	248.80	5,907.50	-60.88	-222.48	-122.66	0.19	0.18	-14.87
6,012.00	0.34	270.34	6,001.50	-60.97	-222.99	-122.98	0.13	0.03	22.91
6,108.00	0.27	239.00	6,097.50	-61.08	-223.47	-123.26	0.19	-0.07	-32.65
6,203.00	0.21	213.04	6,192.50	-61.34	-223.76	-123.29	0.13	-0.06	-27.33
6,298.00	0.18	182.48	6,287.50	-61.64	-223.86	-123.17	0.11	-0.03	-32.17
6,392.00	0.29	181.79	6,381.49	-62.02	-223.87	-122.92	0.12	0.12	-0.73
6,487.00	0.44	218.65	6,476.49	-62.55	-224.11	-122.73	0.29	0.16	38.80
6,580.00	0.38	160.08	6,569.49	-63.12	-224.23	-122.44	0.43	-0.06	-62.98
6,672.00	0.48	153.15	6,661.49	-63.75	-223.95	-121.80	0.12	0.11	-7.53
6,764.00	1.71	179.24	6,753.47	-65.46	-223.76	-120.50	1.41	1.34	28.36
6,795.00	3.91	183.09	6,784.43	-66.98	-223.81	-119.51	7.12	7.10	12.42
6,826.00	6.41	182.58	6,815.30	-69.77	-223.94	-117.73	8.07	8.06	-1.65
6,857.00	8.76	181.33	6,846.03	-73.86	-224.08	-115.06	7.60	7.58	-4.03
6,888.00	10.68	179.80	6,876.58	-79.09	-224.12	-111.55	6.25	6.19	-4.94
6,918.00	12.52	178.73	6,905.97	-85.12	-224.04	-107.41	6.17	6.13	-3.57
6,948.00	14.47	177.50	6,935.14	-92.12	-223.80	-102.51	6.57	6.50	-4.10
6,980.00	16.51	177.65	6,965.98	-100.65	-223.44	-96.46	6.38	6.37	0.47
7,012.00	18.12	177.55	6,996.52	-110.17	-223.04	-89.73	5.03	5.03	-0.31
7,042.00	20.23	179.00	7,024.86	-120.02	-222.75	-82.86	7.21	7.03	4.83
7,073.00	22.72	180.70	7,053.70	-131.36	-222.73	-75.17	8.28	8.03	5.48
7,103.00	25.07	180.27	7,081.13	-143.51	-222.83	-67.02	7.85	7.83	-1.43
7,134.00	27.80	180.75	7,108.89	-157.31	-222.96	-57.78	8.99	8.81	1.55
7,164.00	30.74	180.51	7,135.05	-171.98	-223.12	-47.97	9.80	9.80	-0.80
7,195.00	33.60	181.26	7,161.29	-188.48	-223.38	-37.00	9.32	9.23	2.42
7,226.00	36.63	183.50	7,186.65	-206.29	-224.13	-25.51	10.62	9.77	7.23
7,257.00	39.68	183.76	7,211.02	-225.40	-225.35	-13.47	9.85	9.84	0.84
7,287.00	42.92	184.35	7,233.56	-245.15	-226.75	-1.15	10.88	10.80	1.97
7,318.00	46.62	184.87	7,255.56	-266.91	-228.51	12.20	11.99	11.94	1.68
7,349.00	50.86	186.11	7,276.00	-290.10	-230.74	26.32	13.88	13.88	4.00

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7,380.00	55.28	186.73	7,294.62	-314.71	-233.52	40.93	14.35	14.26	2.00
7,410.00	58.37	186.72	7,311.04	-339.65	-236.46	55.63	10.30	10.30	-0.03
7,440.00	61.38	188.75	7,326.09	-365.35	-239.96	70.44	11.61	10.03	6.77
7,471.00	64.06	189.63	7,340.30	-392.55	-244.36	85.60	9.01	8.65	2.84
7,501.00	67.06	190.13	7,352.71	-419.45	-249.05	100.35	10.11	10.00	1.67
7,532.00	70.09	191.52	7,364.03	-447.79	-254.47	115.52	10.63	9.77	4.48
7,563.00	73.34	191.15	7,373.76	-476.65	-260.25	130.79	10.54	10.48	-1.19
7,593.00	75.69	189.80	7,381.77	-505.08	-265.51	146.15	8.95	7.83	-4.50
7,623.00	78.12	189.68	7,388.56	-533.87	-270.45	161.99	8.11	8.10	-0.40
7,654.00	79.86	187.37	7,394.49	-563.96	-274.96	179.02	9.22	5.61	-7.45
7,685.00	80.64	183.93	7,399.74	-594.36	-277.96	197.37	11.22	2.52	-11.10
7,717.00	81.18	181.01	7,404.79	-625.93	-279.32	217.72	9.17	1.69	-9.12
7,748.00	81.13	178.33	7,409.56	-656.55	-279.15	238.57	8.54	-0.16	-8.65
7,780.00	79.74	175.27	7,414.88	-688.06	-277.39	261.18	10.38	-4.34	-9.56
7,811.00	78.81	172.21	7,420.65	-718.33	-274.07	284.10	10.15	-3.00	-9.87
7,843.00	78.99	169.48	7,426.81	-749.33	-269.07	308.75	8.39	0.56	-8.53
7,874.00	79.49	166.47	7,432.60	-779.11	-262.73	333.57	9.67	1.61	-9.71
7,906.00	80.92	164.11	7,438.04	-809.61	-254.72	360.10	8.53	4.47	-7.37
7,938.00	81.70	161.81	7,442.88	-839.85	-245.45	387.39	7.51	2.44	-7.19
7,970.00	82.03	158.89	7,447.41	-869.68	-234.80	415.41	9.09	1.03	-9.12
8,002.00	81.70	155.82	7,451.94	-898.91	-222.60	444.17	9.55	-1.03	-9.59
8,034.00	81.32	152.78	7,456.66	-927.42	-208.88	473.56	9.47	-1.19	-9.50
8,066.00	81.47	149.51	7,461.45	-955.13	-193.61	503.55	10.11	0.47	-10.22
8,098.00	82.66	146.29	7,465.87	-981.98	-176.77	534.11	10.64	3.72	-10.06
8,130.00	84.65	142.68	7,469.41	-1,007.86	-158.30	565.22	12.82	6.22	-11.28
8,162.00	87.38	138.62	7,471.63	-1,032.53	-138.07	596.82	15.26	8.53	-12.69
8,194.00	89.19	135.43	7,472.59	-1,055.93	-116.26	628.70	11.46	5.66	-9.97
8,225.00	89.76	133.60	7,472.88	-1,077.66	-94.16	659.68	6.18	1.84	-5.90
8,257.00	89.77	134.54	7,473.01	-1,099.92	-71.17	691.67	2.94	0.03	2.94
8,353.00	90.50	134.46	7,472.78	-1,167.21	-2.70	787.62	0.76	0.76	-0.08
8,448.00	89.97	133.70	7,472.39	-1,233.29	65.54	882.58	0.98	-0.56	-0.80
8,540.00	89.93	131.97	7,472.47	-1,295.84	133.01	974.58	1.88	-0.04	-1.88
8,636.00	90.44	132.33	7,472.16	-1,360.26	204.18	1,070.57	0.65	0.53	0.37
8,732.00	90.47	130.59	7,471.40	-1,423.82	276.12	1,166.55	1.81	0.03	-1.81
8,827.00	89.60	130.79	7,471.34	-1,485.76	348.15	1,261.50	0.94	-0.92	0.21
8,922.00	89.13	131.69	7,472.39	-1,548.38	419.58	1,356.46	0.83	0.49	0.95
9,016.00	89.40	131.13	7,473.60	-1,610.55	490.08	1,450.44	0.80	0.29	-0.60
9,112.00	90.10	130.74	7,474.02	-1,673.45	562.60	1,546.40	0.83	0.73	-0.41
9,207.00	88.45	131.43	7,475.22	-1,735.87	634.19	1,641.35	1.88	-1.74	0.73
9,301.00	88.12	129.86	7,478.03	-1,797.07	705.48	1,735.25	1.71	-0.35	-1.67
9,396.00	88.89	131.30	7,480.51	-1,858.84	777.61	1,830.16	1.73	0.81	1.52
9,492.00	89.56	131.21	7,481.81	-1,922.14	849.77	1,926.13	0.70	0.70	-0.09

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**Survey Report**

**Company:** Statoil  
**Project:** Wetzel County WV (NAD 83 UTM 17N)  
**Site:** Joe Jolliffe Unit  
**Well:** Joe Jolliffe Unit 5H  
**Wellbore:** Wellbore #1  
**Design:** Surveys

**Local Co-ordinate Reference:** Well Joe Jolliffe Unit 5H  
**TVD Reference:** GL 1358' + KB 22' @ 1380.00usft (Orion Polaris)  
**MD Reference:** GL 1358' + KB 22' @ 1380.00usft (Orion Polaris)  
**North Reference:** Grid  
**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 (°/100ft)	Bulld Rate (°/100ft)	Turn Rate (°/100ft)
9,588.00	90.64	134.47	7,481.64	-1,987.41	920.15	2,022.11	3.58	1.12	3.40
9,684.00	90.67	133.21	7,480.55	-2,053.90	989.39	2,118.08	1.31	0.03	-1.31
9,779.00	90.81	132.12	7,479.32	-2,118.27	1,059.24	2,213.07	1.16	0.15	-1.15
9,875.00	90.84	134.13	7,477.94	-2,183.89	1,129.30	2,309.05	2.09	0.03	2.09
9,970.00	87.58	135.47	7,479.25	-2,250.81	1,196.69	2,403.95	3.71	-3.43	1.41
10,065.00	88.35	135.41	7,482.62	-2,318.46	1,263.30	2,498.77	0.81	0.81	-0.06
10,161.00	88.49	134.33	7,485.27	-2,386.16	1,331.31	2,594.66	1.13	0.15	-1.12
10,257.00	87.74	133.43	7,488.42	-2,452.66	1,400.47	2,690.58	1.22	-0.78	-0.94
10,353.00	88.19	134.43	7,491.83	-2,519.22	1,469.56	2,786.49	1.14	0.47	1.04
10,447.00	88.09	134.00	7,494.88	-2,584.74	1,536.90	2,880.40	0.47	-0.11	-0.46
10,543.00	88.48	132.96	7,497.76	-2,650.77	1,606.53	2,976.35	1.16	0.41	-1.08
10,637.00	90.97	133.62	7,498.21	-2,715.21	1,674.94	3,070.33	2.74	2.65	0.70
10,732.00	91.65	132.67	7,496.04	-2,780.16	1,744.24	3,165.30	1.23	0.72	-1.00
10,827.00	92.15	132.84	7,492.89	-2,844.62	1,813.95	3,260.25	0.56	0.53	0.18
10,923.00	88.01	130.81	7,492.75	-2,908.62	1,885.47	3,356.21	4.80	-4.31	-2.11
11,018.00	88.86	131.84	7,495.35	-2,971.33	1,956.79	3,451.15	1.41	0.89	1.08
11,114.00	89.63	132.11	7,496.61	-3,035.52	2,028.15	3,547.14	0.85	0.80	0.28
11,209.00	90.10	131.60	7,496.84	-3,098.91	2,098.91	3,642.13	0.73	0.49	-0.54
11,303.00	90.03	131.37	7,496.73	-3,161.18	2,169.33	3,736.11	0.26	-0.07	-0.24
11,399.00	91.01	132.11	7,495.86	-3,225.09	2,240.96	3,832.10	1.28	1.02	0.77
11,494.00	88.35	132.05	7,496.39	-3,288.75	2,311.46	3,927.08	2.80	-2.80	-0.06
11,589.00	89.26	132.93	7,498.37	-3,352.90	2,381.49	4,022.06	1.33	0.96	0.93
11,683.00	89.77	133.09	7,499.17	-3,417.02	2,450.23	4,116.05	0.57	0.54	0.17
11,778.00	90.47	133.19	7,498.97	-3,481.98	2,519.55	4,211.05	0.74	0.74	0.11
11,873.00	90.81	133.24	7,497.91	-3,547.02	2,588.78	4,306.04	0.36	0.36	0.05
11,969.00	91.88	133.99	7,495.65	-3,613.23	2,658.26	4,401.99	1.36	1.11	0.78
12,065.00	88.72	133.23	7,495.15	-3,679.43	2,727.76	4,497.96	3.39	-3.29	-0.79
12,161.00	89.53	133.23	7,496.62	-3,745.18	2,797.70	4,593.94	0.84	0.84	0.00
12,256.00	89.43	134.31	7,497.48	-3,810.89	2,866.29	4,688.92	1.14	-0.11	1.14
12,351.00	87.01	133.72	7,500.43	-3,876.86	2,934.58	4,783.83	2.62	-2.55	-0.62
12,446.00	86.27	133.45	7,506.00	-3,942.25	3,003.27	4,878.65	0.83	-0.78	-0.28
12,540.00	88.05	132.13	7,510.65	-4,006.02	3,072.16	4,972.53	2.36	1.89	-1.40
12,636.00	88.96	133.53	7,513.16	-4,071.26	3,142.54	5,068.50	1.74	0.95	1.46
12,731.00	91.88	133.38	7,512.46	-4,136.59	3,211.49	5,163.47	3.08	3.07	-0.16
12,826.00	91.68	131.83	7,509.51	-4,200.87	3,281.38	5,258.42	1.64	-0.21	-1.63
12,920.00	91.71	131.22	7,506.73	-4,263.15	3,351.72	5,352.37	1.65	0.88	-0.65
13,016.00	91.55	131.14	7,504.00	-4,326.34	3,423.95	5,448.30	0.19	-0.17	-0.08
13,111.00	89.40	131.82	7,503.21	-4,389.26	3,495.11	5,542.27	2.37	2.26	0.72
13,206.00	89.30	132.77	7,504.29	-4,453.18	3,565.38	5,638.26	0.52	-0.11	1.00
13,302.00	88.83	132.60	7,505.86	-4,518.26	3,635.94	5,734.25	0.52	-0.49	-0.18
13,398.00	88.22	132.07	7,508.33	-4,582.89	3,706.88	5,830.22	0.84	0.84	-0.55
13,494.00	87.45	131.37	7,511.96	-4,646.73	3,778.48	5,926.14	1.08	0.80	-0.73

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**Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
13,588.00	87.17	131.09	7,516.37	-4,708.61	3,849.10	6,020.01	0.42	-0.30	-0.30
13,619.00	86.98	132.26	7,517.95	-4,729.20	3,872.22	6,050.96	3.82	-0.61	3.77
<b>Last MWD Survey at 13619' MD</b>									
13,670.00	86.67	132.26	7,520.77	-4,763.44	3,909.91	6,101.88	0.61	-0.61	0.00
<b>Projection to TD at 13670' MD</b>									

**Design Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
13,619.00	7,517.95	-4,729.20	3,872.22	Last MWD Survey at 13619' MD
13,670.00	7,520.77	-4,763.44	3,909.91	Projection to TD at 13670' MD

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