



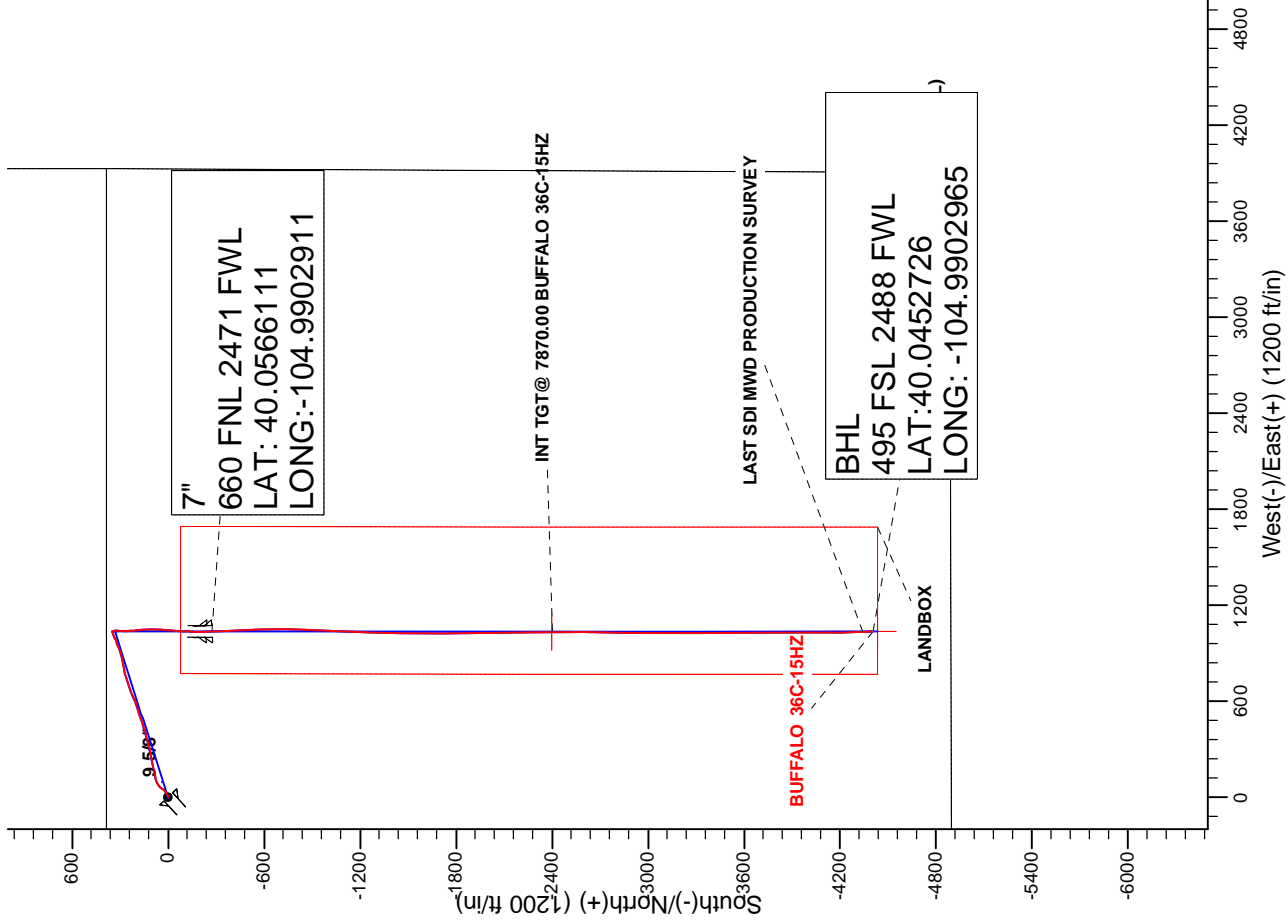
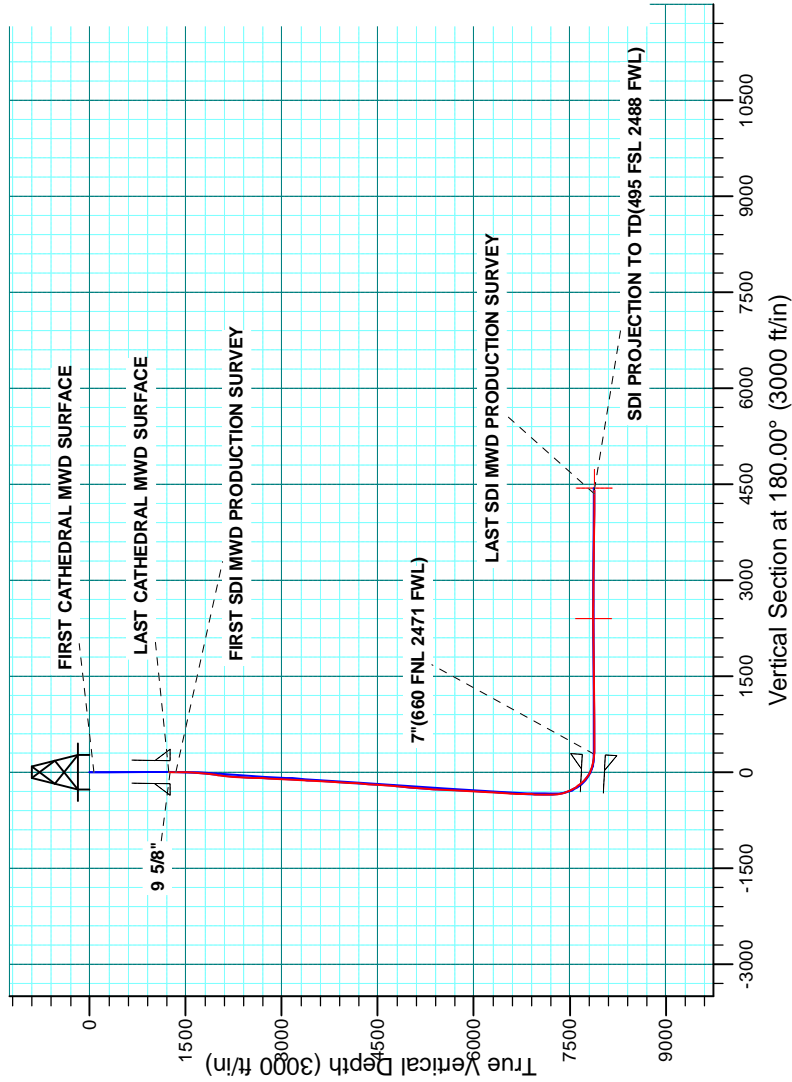
Project: COLORADO NORTHERN ZONE - 83  
Site: BUFFALO & BADGER 4-4 PAD  
Well: BUFFALO 36C-15HZ  
Wellbore: OH  
Design: OH



WELL DETAILS: BUFFALO 36C-15HZ				
GL 5125 & KB 25 @ 550.00ft (HP 290)				
+N/-S 0.00	+E/-W 0.00	Northing 1264147.56	Easting 3141640.79	Longitude -104.9939890

PROJECT DETAILS: COLORADO NORTHERN ZONE - 83	
Geodetic System: US State Plane 1983	
Datum: North American Datum 1983	
Ellipsoid: GRS 1980	
Zone: Colorado Northern Zone	
Location: NEW SECTION 15 T1N R68W	
System Datum: Mean Sea Level	

CASING DETAILS		
TVD	MD	Name
1256.94	1257.00	9 5/8" 9.625
7881.02	8347.00	7" 7.000





**Scientific Drilling**

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**BUFFALO & BADGER 4-4 PAD**

**BUFFALO 36C-15HZ**

**OH**

**Design: OH**

## **Standard Survey Report**

**12 January, 2015**

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well BUFFALO 36C-15HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 5125 & KB 25 @ 5150.00ft (HP 290)
<b>Site:</b>	BUFFALO & BADGER 4-4 PAD	<b>MD Reference:</b>	GL 5125 & KB 25 @ 5150.00ft (HP 290)
<b>Well:</b>	BUFFALO 36C-15HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Denver Sales

<b>Project</b>	COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site						BUFFALO & BADGER 4-4 PAD, NENW SECTION 15 T1N R68W											
Site Position:			Northing:			1,264,146.69 usft			Latitude:			40.0573630					
From:			Lat/Long			Easting:			3,141,610.56 usft			Longitude:			-104.9940970		
Position Uncertainty:			0.00 ft			Slot Radius:			13.200 in			Grid Convergence:			0.33 °		

Well	BUFFALO 36C-15HZ, 383 FNL 1439 FWL					
Well Position	+N/-S	0.00 ft	Northing:	1,264,147.56 usft	Latitude:	40.0573649
	+E/-W	0.00 ft	Easting:	3,141,640.79 usft	Longitude:	-104.9939890
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	5,125.00 ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	BGGM2014	6/3/2014	8.64	66.63	52,515

<b>Design</b>	OH				
<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) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	180.00	

<b>Survey Program</b>	<b>Date</b>	1/12/2015			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
19.00	1,240.00	Survey #1 CATHERDRAL MWD SURFAC	MWD SDI	MWD - Standard ver 1.0.1	
1,348.00	12,479.00	Survey #2 - SDI MWD PRODUCTION (OH)	SDI_MWD+CRUST_1.0	SDI MWD + Crustal anomaly, Version 1.0	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
19.00	0.00	0.00	19.00	0.00	0.00	0.00	0.00	0.00	0.00	
71.00	0.80	260.30	71.00	-0.06	-0.36	0.06	1.54	1.54	0.00	
<b>FIRST CATHEDRAL MWD SURFACE</b>										
161.00	0.80	282.00	160.99	-0.04	-1.59	0.04	0.33	0.00	24.11	
258.00	0.40	289.10	257.98	0.22	-2.57	-0.22	0.42	-0.41	7.32	
337.00	0.40	245.50	336.98	0.19	-3.09	-0.19	0.38	0.00	-55.19	
417.00	0.40	170.80	416.98	-0.20	-3.30	0.20	0.61	0.00	-93.38	
497.00	0.40	153.80	496.98	-0.73	-3.13	0.73	0.15	0.00	-21.25	
577.00	0.50	169.70	576.98	-1.32	-2.94	1.32	0.20	0.13	19.88	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well BUFFALO 36C-15HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 5125 & KB 25 @ 5150.00ft (HP 290)
<b>Site:</b>	BUFFALO & BADGER 4-4 PAD	<b>MD Reference:</b>	GL 5125 & KB 25 @ 5150.00ft (HP 290)
<b>Well:</b>	BUFFALO 36C-15HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Denver Sales

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)
657.00	0.40	150.60	656.97	-1.91	-2.74	1.91	0.22	-0.13	-23.88
737.00	0.40	157.30	736.97	-2.41	-2.50	2.41	0.06	0.00	8.38
817.00	0.60	115.10	816.97	-2.84	-2.01	2.84	0.51	0.25	-52.75
897.00	0.70	127.30	896.96	-3.32	-1.24	3.32	0.21	0.13	15.25
977.00	0.60	98.50	976.96	-3.68	-0.44	3.68	0.42	-0.13	-36.00
1,057.00	0.50	85.90	1,056.96	-3.71	0.32	3.71	0.20	-0.13	-15.75
1,137.00	0.90	48.30	1,136.95	-3.27	1.14	3.27	0.74	0.50	-47.00
1,240.00	0.60	47.60	1,239.94	-2.37	2.14	2.37	0.29	-0.29	-0.68
<b>LAST CATHEDRAL MWD SURFACE</b>									
1,257.00	0.65	46.36	1,256.94	-2.24	2.28	2.24	0.31	0.30	-7.29
<b>9 5/8"</b>									
1,348.00	0.93	42.08	1,347.93	-1.34	3.15	1.34	0.31	0.31	-4.70
<b>FIRST SDI MWD PRODUCTION SURVEY</b>									
1,438.00	2.91	72.69	1,437.88	-0.11	5.82	0.11	2.40	2.20	34.01
1,529.00	4.91	66.21	1,528.66	2.14	11.59	-2.14	2.25	2.20	-7.12
1,620.00	5.55	56.25	1,619.28	6.16	18.81	-6.16	1.22	0.70	-10.95
1,710.00	7.33	58.28	1,708.71	11.60	27.31	-11.60	1.99	1.98	2.26
1,800.00	8.79	47.92	1,797.83	19.23	37.30	-19.23	2.28	1.62	-11.51
1,890.00	9.71	31.63	1,886.67	30.30	46.39	-30.30	3.07	1.02	-18.10
1,981.00	10.05	37.77	1,976.32	43.11	55.28	-43.11	1.22	0.37	6.75
2,073.00	11.61	50.25	2,066.69	55.38	67.31	-55.38	3.05	1.70	13.57
2,163.00	11.56	63.21	2,154.88	65.23	82.33	-65.23	2.89	-0.06	14.40
2,254.00	12.98	72.43	2,243.80	72.43	100.21	-72.43	2.65	1.56	10.13
2,345.00	13.42	77.62	2,332.40	77.78	120.27	-77.78	1.39	0.48	5.70
2,439.00	13.28	76.53	2,423.86	82.63	141.43	-82.63	0.31	-0.15	-1.16
2,534.00	13.43	77.53	2,516.29	87.56	162.81	-87.56	0.29	0.16	1.05
2,628.00	11.66	79.45	2,608.05	91.65	182.81	-91.65	1.93	-1.88	2.04
2,723.00	12.28	74.81	2,700.98	96.06	202.00	-96.06	1.20	0.65	-4.88
2,817.00	12.12	79.98	2,792.86	100.39	221.36	-100.39	1.17	-0.17	5.50
2,911.00	12.98	80.46	2,884.62	103.86	241.49	-103.86	0.92	0.91	0.51
3,006.00	11.85	79.21	2,977.39	107.46	261.59	-107.46	1.22	-1.19	-1.32
3,100.00	12.91	78.79	3,069.21	111.30	281.37	-111.30	1.13	1.13	-0.45
3,195.00	11.29	76.12	3,162.09	115.60	300.81	-115.60	1.80	-1.71	-2.81
3,289.00	11.32	70.98	3,254.27	120.81	318.47	-120.81	1.07	0.03	-5.47
3,383.00	12.35	76.18	3,346.27	126.22	336.95	-126.22	1.58	1.10	5.53
3,478.00	10.97	76.27	3,439.31	130.79	355.60	-130.79	1.45	-1.45	0.09
3,572.00	11.90	78.25	3,531.44	134.89	373.78	-134.89	1.07	0.99	2.11
3,667.00	12.15	72.23	3,624.36	139.93	392.89	-139.93	1.35	0.26	-6.34
3,761.00	12.06	71.77	3,716.27	146.03	411.64	-146.03	0.14	-0.10	-0.49
3,856.00	11.83	74.17	3,809.22	151.79	430.43	-151.79	0.58	-0.24	2.53
3,950.00	12.60	77.36	3,901.09	156.66	449.71	-156.66	1.09	0.82	3.39
4,045.00	10.85	72.39	3,994.11	161.63	468.34	-161.63	2.13	-1.84	-5.23
4,139.00	11.18	67.56	4,086.38	167.79	485.20	-167.79	1.04	0.35	-5.14
4,234.00	12.52	69.43	4,179.35	174.92	503.35	-174.92	1.47	1.41	1.97

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<b>Well:</b>	BUFFALO 36C-15HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Denver Sales

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)
4,328.00	13.19	68.90	4,270.99	182.36	522.90	-182.36	0.72	0.71	-0.56
4,422.00	13.82	74.81	4,362.40	189.16	543.74	-189.16	1.61	0.67	6.29
4,517.00	12.73	76.13	4,454.86	194.65	564.85	-194.65	1.19	-1.15	1.39
4,611.00	10.27	76.23	4,546.96	199.13	583.05	-199.13	2.62	-2.62	0.11
4,706.00	9.61	66.57	4,640.54	204.29	598.55	-204.29	1.88	-0.69	-10.17
4,800.00	12.71	61.62	4,732.76	212.33	614.85	-212.33	3.45	3.30	-5.27
4,895.00	15.31	67.47	4,824.93	222.11	635.63	-222.11	3.11	2.74	6.16
4,989.00	15.24	69.35	4,915.61	231.22	658.66	-231.22	0.53	-0.07	2.00
5,083.00	13.91	69.76	5,006.58	239.48	680.82	-239.48	1.42	-1.41	0.44
5,178.00	13.78	69.81	5,098.82	247.34	702.15	-247.34	0.14	-0.14	0.05
5,272.00	15.05	74.21	5,189.86	254.53	724.41	-254.53	1.78	1.35	4.68
5,367.00	13.81	73.38	5,281.86	261.12	747.14	-261.12	1.32	-1.31	-0.87
5,461.00	14.14	77.34	5,373.08	266.85	769.09	-266.85	1.08	0.35	4.21
5,556.00	13.12	76.78	5,465.41	271.86	790.91	-271.86	1.08	-1.07	-0.59
5,650.00	11.19	75.29	5,557.30	276.62	810.12	-276.62	2.08	-2.05	-1.59
5,745.00	11.03	79.66	5,650.52	280.59	827.98	-280.59	0.90	-0.17	4.60
5,839.00	12.28	81.01	5,742.58	283.76	846.70	-283.76	1.36	1.33	1.44
5,933.00	12.56	76.88	5,834.38	287.65	866.53	-287.65	0.99	0.30	-4.39
6,028.00	10.94	75.51	5,927.39	292.25	885.32	-292.25	1.73	-1.71	-1.44
6,122.00	10.89	71.84	6,019.69	297.25	902.39	-297.25	0.74	-0.05	-3.90
6,217.00	11.79	69.54	6,112.83	303.44	920.01	-303.44	1.06	0.95	-2.42
6,311.00	9.77	69.82	6,205.17	309.54	936.49	-309.54	2.15	-2.15	0.30
6,406.00	9.72	70.51	6,298.80	315.00	951.62	-315.00	0.13	-0.05	0.73
6,500.00	8.74	70.15	6,391.58	320.07	965.82	-320.07	1.04	-1.04	-0.38
6,595.00	9.75	67.70	6,485.34	325.58	980.05	-325.58	1.14	1.06	-2.58
6,689.00	8.78	62.01	6,578.12	331.96	993.75	-331.96	1.42	-1.03	-6.05
6,784.00	6.64	59.80	6,672.25	338.13	1,004.90	-338.13	2.27	-2.25	-2.33
6,878.00	6.12	75.33	6,765.68	342.13	1,014.45	-342.13	1.91	-0.55	16.52
6,972.00	5.32	72.51	6,859.21	344.71	1,023.45	-344.71	0.90	-0.85	-3.00
7,067.00	3.64	70.79	6,953.92	347.03	1,030.50	-347.03	1.77	-1.77	-1.81
7,162.00	2.48	72.56	7,048.78	348.64	1,035.31	-348.64	1.22	-1.22	1.86
7,256.00	0.50	152.90	7,142.75	348.88	1,037.43	-348.88	2.60	-2.11	85.47
7,350.00	1.12	176.09	7,236.74	347.60	1,037.68	-347.60	0.73	0.66	24.67
7,397.00	1.18	192.07	7,283.73	346.67	1,037.61	-346.67	0.69	0.13	34.00
7,445.00	5.65	172.91	7,331.63	343.84	1,037.80	-343.84	9.48	9.31	-39.92
7,492.00	13.26	172.21	7,377.96	336.19	1,038.82	-336.19	16.19	16.19	-1.49
7,539.00	19.59	178.84	7,423.02	322.96	1,039.71	-322.96	14.03	13.47	14.11
7,586.00	23.31	181.05	7,466.76	305.78	1,039.70	-305.78	8.10	7.91	4.70
7,634.00	24.51	183.25	7,510.64	286.34	1,038.96	-286.34	3.11	2.50	4.58
7,681.00	27.70	178.21	7,552.85	265.68	1,038.75	-265.68	8.26	6.79	-10.72
7,728.00	32.48	174.26	7,593.51	242.19	1,040.35	-242.19	11.00	10.17	-8.40
7,775.00	36.56	175.17	7,632.22	215.67	1,042.80	-215.67	8.75	8.68	1.94
7,823.00	39.81	175.47	7,669.95	186.10	1,045.21	-186.10	6.78	6.77	0.63

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<b>Design:</b>	OH	<b>Database:</b>	Denver Sales

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)
7,870.00	43.62	177.84	7,705.03	154.89	1,047.01	-154.89	8.77	8.11	5.04
7,917.00	49.83	179.94	7,737.23	120.70	1,047.64	-120.70	13.61	13.21	4.47
7,964.00	52.94	180.71	7,766.56	83.98	1,047.43	-83.98	6.74	6.62	1.64
8,011.00	57.09	184.35	7,793.51	45.53	1,045.70	-45.53	10.87	8.83	7.74
8,058.00	63.85	184.52	7,816.66	4.78	1,042.54	-4.78	14.39	14.38	0.36
8,106.00	69.71	184.18	7,835.58	-39.19	1,039.20	39.19	12.23	12.21	-0.71
8,153.00	73.38	183.25	7,850.45	-83.67	1,036.31	83.67	8.03	7.81	-1.98
8,200.00	76.80	182.33	7,862.54	-129.02	1,034.11	129.02	7.52	7.28	-1.96
8,245.00	80.91	180.59	7,871.24	-173.15	1,032.99	173.15	9.89	9.13	-3.87
8,294.00	84.84	178.48	7,877.32	-221.76	1,033.38	221.76	9.09	8.02	-4.31
8,347.00	87.15	177.77	7,881.02	-274.59	1,035.12	274.59	4.56	4.36	-1.35
7"(660 FNL 2471 FWL)									
8,410.00	89.90	176.92	7,882.64	-337.50	1,038.04	337.50	4.56	4.36	-1.34
8,504.00	90.30	177.47	7,882.47	-431.39	1,042.64	431.39	0.72	0.43	0.59
8,598.00	88.52	177.89	7,883.44	-525.30	1,046.44	525.30	1.95	-1.89	0.45
8,693.00	89.06	178.86	7,885.45	-620.24	1,049.13	620.24	1.17	0.57	1.02
8,787.00	89.19	179.76	7,886.88	-714.22	1,050.27	714.22	0.97	0.14	0.96
8,881.00	90.13	181.93	7,887.44	-808.20	1,048.88	808.20	2.52	1.00	2.31
8,976.00	92.29	182.38	7,885.44	-903.11	1,045.31	903.11	2.32	2.27	0.47
9,070.00	91.14	182.80	7,882.62	-996.97	1,041.06	996.97	1.30	-1.22	0.45
9,164.00	90.77	182.97	7,881.06	-1,090.84	1,036.33	1,090.84	0.43	-0.39	0.18
9,259.00	90.91	181.73	7,879.66	-1,185.74	1,032.44	1,185.74	1.31	0.15	-1.31
9,353.00	90.44	182.24	7,878.56	-1,279.68	1,029.18	1,279.68	0.74	-0.50	0.54
9,448.00	90.97	180.89	7,877.39	-1,374.64	1,026.59	1,374.64	1.53	0.56	-1.42
9,542.00	90.54	181.10	7,876.15	-1,468.61	1,024.95	1,468.61	0.51	-0.46	0.22
9,637.00	90.30	180.33	7,875.45	-1,563.60	1,023.77	1,563.60	0.85	-0.25	-0.81
9,731.00	89.60	180.08	7,875.53	-1,657.60	1,023.43	1,657.60	0.79	-0.74	-0.27
9,826.00	90.60	179.60	7,875.37	-1,752.60	1,023.70	1,752.60	1.17	1.05	-0.51
9,920.00	89.50	179.77	7,875.29	-1,846.60	1,024.22	1,846.60	1.18	-1.17	0.18
10,015.00	90.40	179.08	7,875.37	-1,941.59	1,025.17	1,941.59	1.19	0.95	-0.73
10,109.00	91.34	179.79	7,873.94	-2,035.57	1,026.10	2,035.57	1.25	1.00	0.76
10,203.00	91.24	179.35	7,871.83	-2,129.55	1,026.80	2,129.55	0.48	-0.11	-0.47
10,298.00	91.21	179.26	7,869.79	-2,224.52	1,027.95	2,224.52	0.10	-0.03	-0.09
10,392.00	91.31	178.96	7,867.73	-2,318.48	1,029.41	2,318.48	0.34	0.11	-0.32
10,487.00	91.04	179.23	7,865.78	-2,413.45	1,030.91	2,413.45	0.40	-0.28	0.28
10,581.00	90.40	179.94	7,864.60	-2,507.44	1,031.59	2,507.44	1.02	-0.68	0.76
10,675.00	88.05	179.73	7,865.87	-2,601.42	1,031.86	2,601.42	2.51	-2.50	-0.22
10,770.00	89.16	181.30	7,868.18	-2,696.39	1,031.01	2,696.39	2.02	1.17	1.65
10,864.00	89.03	181.08	7,869.67	-2,790.36	1,029.06	2,790.36	0.27	-0.14	-0.23
10,958.00	89.60	180.55	7,870.79	-2,884.34	1,027.72	2,884.34	0.83	0.61	-0.56
11,053.00	89.53	180.38	7,871.51	-2,979.33	1,026.95	2,979.33	0.19	-0.07	-0.18
11,147.00	90.03	180.64	7,871.87	-3,073.33	1,026.11	3,073.33	0.60	0.53	0.28
11,242.00	89.43	179.62	7,872.32	-3,168.32	1,025.90	3,168.32	1.25	-0.63	-1.07

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well BUFFALO 36C-15HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 5125 & KB 25 @ 5150.00ft (HP 290)
<b>Site:</b>	BUFFALO & BADGER 4-4 PAD	<b>MD Reference:</b>	GL 5125 & KB 25 @ 5150.00ft (HP 290)
<b>Well:</b>	BUFFALO 36C-15HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Denver Sales

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)	
11,336.00	89.53	179.47	7,873.17	-3,262.32	1,026.64	3,262.32	0.19	0.11	-0.16	
11,430.00	90.40	179.97	7,873.23	-3,356.32	1,027.10	3,356.32	1.07	0.93	0.53	
11,525.00	88.86	179.64	7,873.84	-3,451.31	1,027.43	3,451.31	1.66	-1.62	-0.35	
11,619.00	88.86	179.62	7,875.71	-3,545.29	1,028.03	3,545.29	0.02	0.00	-0.02	
11,714.00	88.29	179.42	7,878.08	-3,640.26	1,028.83	3,640.26	0.64	-0.60	-0.21	
11,808.00	87.18	179.13	7,881.79	-3,734.17	1,030.02	3,734.17	1.22	-1.18	-0.31	
11,902.00	87.75	180.61	7,885.95	-3,828.08	1,030.23	3,828.08	1.69	0.61	1.57	
11,996.00	88.99	180.61	7,888.62	-3,922.03	1,029.23	3,922.03	1.32	1.32	0.00	
12,091.00	90.71	180.38	7,888.87	-4,017.03	1,028.41	4,017.03	1.83	1.81	-0.24	
12,186.00	90.03	180.22	7,888.26	-4,112.02	1,027.91	4,112.02	0.74	-0.72	-0.17	
12,280.00	90.64	178.66	7,887.71	-4,206.01	1,028.83	4,206.01	1.78	0.65	-1.66	
12,374.00	89.93	178.78	7,887.24	-4,299.99	1,030.93	4,299.99	0.77	-0.76	0.13	
12,417.00	89.30	178.37	7,887.53	-4,342.97	1,032.00	4,342.97	1.75	-1.47	-0.95	
<b>LAST SDI MWD PRODUCTION SURVEY</b>										
12,479.00	89.30	178.37	7,888.29	-4,404.94	1,033.76	4,404.94	0.00	0.00	0.00	
<b>SDI PROJECTION TO TD(495 FSL 2488 FWL)</b>										

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,257.00	1,256.94	9 5/8"	9.625	13.500	
8,347.00	7,881.02	7"(660 FNL 2471 FWL)	7.000	8.750	

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
71.00	71.00	-0.06	-0.36	FIRST CATHEDRAL MWD SURFACE	
1,240.00	1,239.94	-2.37	2.14	LAST CATHEDRAL MWD SURFACE	
1,348.00	1,347.93	-1.34	3.15	FIRST SDI MWD PRODUCTION SURVEY	
12,417.00	7,887.53	-4,342.97	1,032.00	LAST SDI MWD PRODUCTION SURVEY	
12,479.00	7,888.29	-4,404.94	1,033.76	SDI PROJECTION TO TD(495 FSL 2488 FWL)	

Checked By: _____	Approved By: _____	Date: _____
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