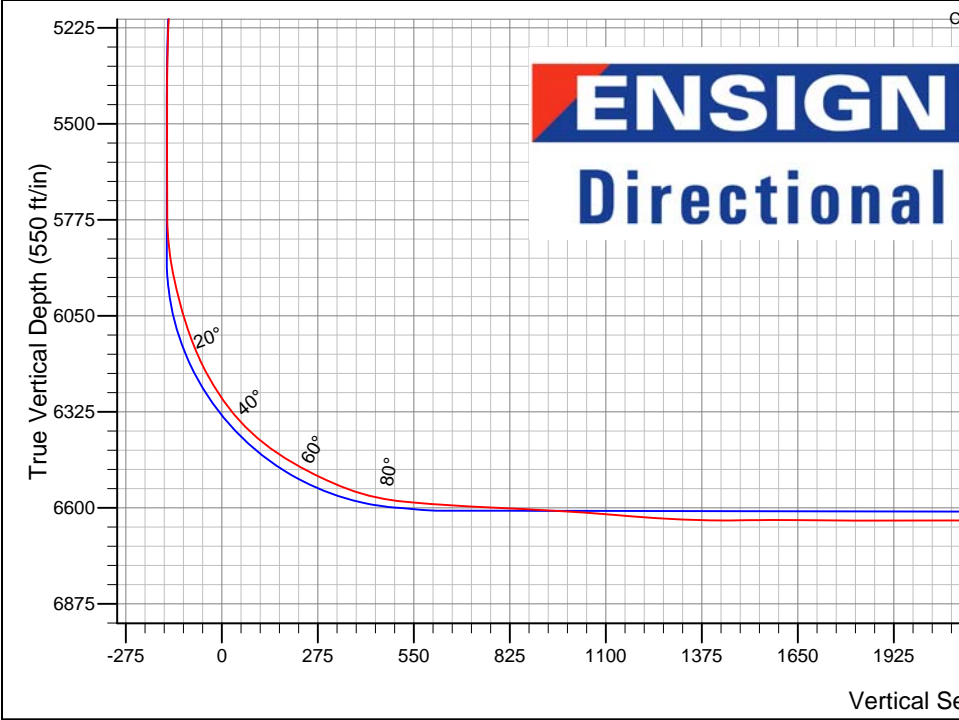
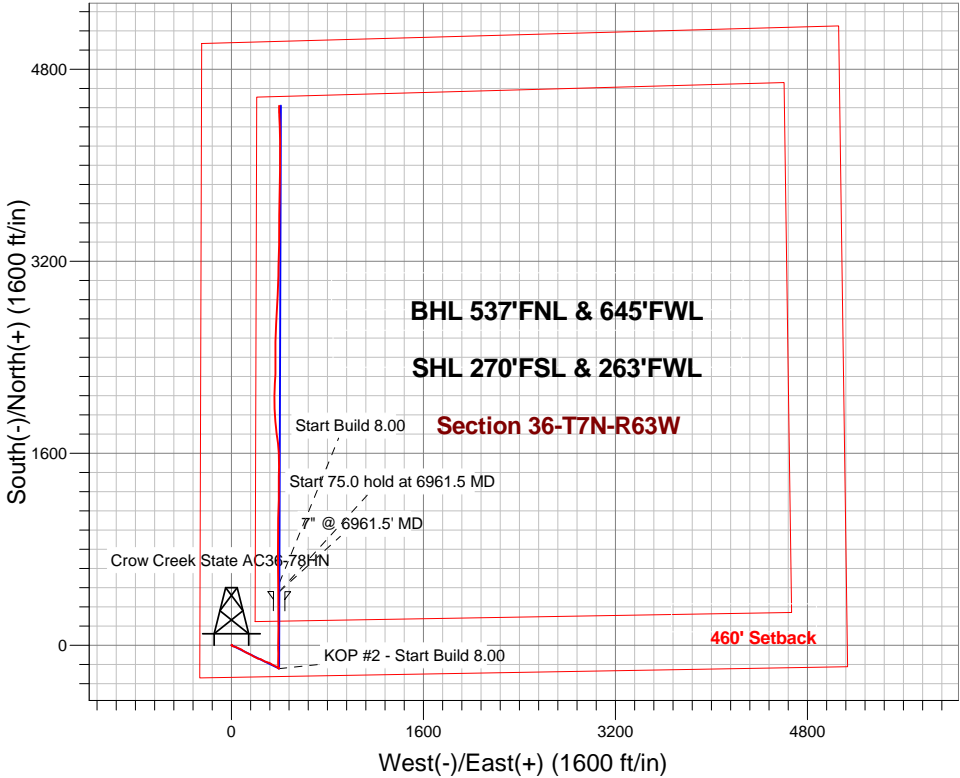


Noble Energy Inc.- Weld County, CO (Grid North)

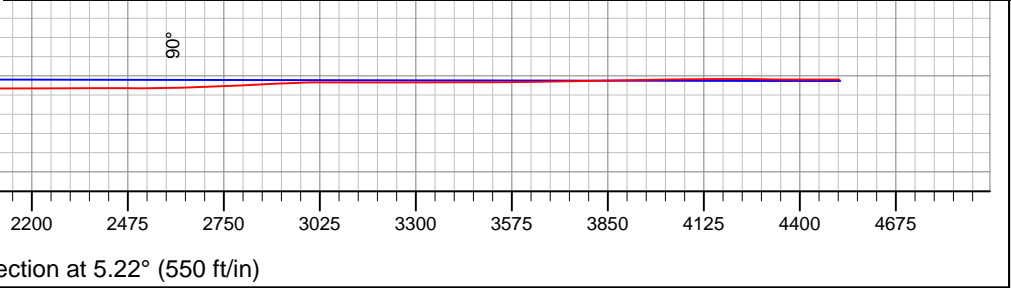
Well Name: **Crow Creek State AC36-78HN**
Surface Location: Crow Creek State AC36-78-1HN Pad Sec.36-T7N-R63W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4774.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1435493.42 3307657.64 40.523560 -104.393300
Precision 828 RKB - 16' WELL @ 4790.0ft (Precision 828 RKB - 16')

FINAL SURVEY

Projected Bottom Hole Location
10974' MD 6611' TVD 4496' N & 396' E of SHL
89.6 degree Incl @ 358.7 degree AZM



Crow Creek State AC36-78-1HN Pad Sec.36-T7N-R63 Crow Creek State AC36-78HN Wellbore #1 7:55, January 02 2014	ANNOTATIONS
	No annotation data is available.
LEGEND	
Crow Creek State AC36-78HN, Wellbore #1, Plan A - Rev 1 (Updated 10-3-13) V0	
Wellbore #1	





Noble Energy Inc.- Weld County, CO (Grid North)

Sec.36-T7N-R63W

Crow Creek State AC36-78-1HN Pad Sec.36-T7N-R63W

Crow Creek State AC36-78HN

Wellbore #1

Design: Wellbore #1

Standard Survey Report

02 January, 2014

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Crow Creek State AC36-78HN
Project:	Sec.36-T7N-R63W	TVD Reference:	WELL @ 4790.0ft (Precision 828 RKB - 16')
Site:	Crow Creek State AC36-78-1HN Pad Sec.36-T7N-R63W	MD Reference:	WELL @ 4790.0ft (Precision 828 RKB - 16')
Well:	Crow Creek State AC36-78HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	Sec.36-T7N-R63W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site		Crow Creek State AC36-78-1HN Pad Sec.36-T7N-R63W			
Site Position:		Northing:	1,435,493.88 ft	Latitude:	40.523560
From:	Lat/Long	Easting:	3,307,693.78 ft	Longitude:	-104.393170
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.72 °

Well	Crow Creek State AC36-78HN					
Well Position	+N-S	0.0 ft	Northing:	1,435,493.42 ft	Latitude:	40.523560
	+E-W	0.0 ft	Easting:	3,307,657.64 ft	Longitude:	-104.393300
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,774.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/12/2013	8.37	67.13	52,998

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	5.22	

Survey Program		Date	1/2/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
321.0	605.0	Surface (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
613.0	6,956.0	Intermediate (Wellbore #1)	MWD	MWD - Standard	
7,028.0	10,974.0	Lateral (Wellbore #1)	MWD	MWD - Standard	

Survey	Wellbore Data									
	Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
Survey A	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
	321.0	0.60	13.10	321.0	1.6	0.4	1.7	0.19	0.19	0.00
	605.0	0.60	92.40	605.0	3.0	2.2	3.2	0.27	0.00	27.92
	613.0	0.50	142.70	613.0	3.0	2.3	3.2	5.95	-1.25	628.75
	703.0	0.60	172.20	703.0	2.2	2.6	2.4	0.33	0.11	32.78
	793.0	0.60	147.90	793.0	1.3	2.9	1.6	0.28	0.00	-27.00
	883.0	0.60	174.70	883.0	0.5	3.2	0.8	0.31	0.00	29.78
	972.0	0.90	165.50	972.0	-0.7	3.4	-0.3	0.36	0.34	-10.34
	1,062.0	0.70	150.40	1,062.0	-1.8	3.8	-1.5	0.32	-0.22	-16.78
	1,152.0	0.60	135.10	1,152.0	0.5	3.2	0.8	0.31	0.00	29.78

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Crow Creek State AC36-78HN
Project:	Sec.36-T7N-R63W	TVD Reference:	WELL @ 4790.0ft (Precision 828 RKB - 16')
Site:	Crow Creek State AC36-78-1HN Pad	MD Reference:	WELL @ 4790.0ft (Precision 828 RKB - 16')
Well:	Sec.36-T7N-R63W	North Reference:	Grid
Wellbore:	Crow Creek State AC36-78HN	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark
Design:	Wellbore #1		

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,157.0	0.40	128.90	1,156.9	-2.5	4.4	-2.1	0.38	-0.32	-22.63
1,252.0	0.50	131.60	1,251.9	-3.0	5.0	-2.6	0.11	0.11	2.84
1,347.0	0.60	163.40	1,346.9	-3.8	5.4	-3.3	0.33	0.11	33.47
1,442.0	1.80	142.10	1,441.9	-5.4	6.5	-4.8	1.33	1.26	-22.42
1,537.0	3.30	115.20	1,536.8	-7.8	9.9	-6.8	1.98	1.58	-28.32
1,632.0	5.20	107.70	1,631.6	-10.2	16.4	-8.7	2.08	2.00	-7.89
1,727.0	6.20	102.20	1,726.1	-12.6	25.5	-10.3	1.20	1.05	-5.79
1,822.0	6.70	105.40	1,820.5	-15.2	35.9	-11.9	0.65	0.53	3.37
1,916.0	5.90	122.30	1,913.9	-19.2	45.3	-15.0	2.14	-0.85	17.98
2,014.0	7.50	118.40	2,011.3	-25.0	55.2	-19.8	1.70	1.63	-3.98
2,104.0	7.90	108.70	2,100.4	-29.7	66.2	-23.6	1.51	0.44	-10.78
2,194.0	8.00	114.50	2,189.6	-34.3	77.7	-27.1	0.90	0.11	6.44
2,284.0	7.10	124.60	2,278.8	-40.1	88.0	-31.9	1.78	-1.00	11.22
2,374.0	7.60	127.00	2,368.1	-46.8	97.4	-37.8	0.65	0.56	2.67
2,464.0	7.80	117.70	2,457.3	-53.2	107.5	-43.2	1.40	0.22	-10.33
2,553.0	7.50	118.10	2,545.5	-58.8	118.0	-47.8	0.34	-0.34	0.45
2,643.0	7.50	117.90	2,634.7	-64.3	128.4	-52.3	0.03	0.00	-0.22
2,733.0	6.90	114.90	2,724.0	-69.3	138.5	-56.4	0.79	-0.67	-3.33
2,823.0	6.60	112.60	2,813.4	-73.6	148.1	-59.8	0.45	-0.33	-2.56
2,913.0	7.70	119.60	2,902.7	-78.5	158.2	-63.8	1.56	1.22	7.78
3,003.0	7.70	119.30	2,991.9	-84.5	168.7	-68.8	0.04	0.00	-0.33
3,093.0	7.40	118.90	3,081.1	-90.2	179.0	-73.6	0.34	-0.33	-0.44
3,183.0	6.90	118.90	3,170.4	-95.6	188.8	-78.1	0.56	-0.56	0.00
3,273.0	6.30	116.80	3,259.8	-100.5	197.9	-82.1	0.72	-0.67	-2.33
3,363.0	5.40	114.90	3,349.3	-104.5	206.2	-85.3	1.02	-1.00	-2.11
3,453.0	5.70	117.70	3,438.9	-108.4	214.0	-88.4	0.45	0.33	3.11
3,543.0	5.70	106.30	3,528.4	-111.7	222.2	-91.0	1.26	0.00	-12.67
3,632.0	5.90	101.20	3,617.0	-113.8	231.0	-92.3	0.62	0.22	-5.73
3,722.0	5.90	108.20	3,706.5	-116.2	239.9	-93.9	0.80	0.00	7.78
3,812.0	6.30	118.40	3,796.0	-119.9	248.6	-96.8	1.28	0.44	11.33
3,902.0	6.50	117.00	3,885.4	-124.6	257.5	-100.7	0.28	0.22	-1.56
3,992.0	6.70	117.70	3,974.8	-129.4	266.7	-104.6	0.24	0.22	0.78
4,081.0	6.40	116.60	4,063.3	-134.0	275.7	-108.4	0.37	-0.34	-1.24
4,171.0	6.90	110.10	4,152.7	-138.1	285.3	-111.6	1.00	0.56	-7.22
4,261.0	6.10	102.20	4,242.1	-141.0	295.0	-113.5	1.33	-0.89	-8.78
4,351.0	6.80	110.70	4,331.5	-143.9	304.7	-115.5	1.31	0.78	9.44
4,441.0	7.60	113.30	4,420.8	-148.1	315.1	-118.8	0.96	0.89	2.89
4,531.0	8.00	118.80	4,510.0	-153.5	326.1	-123.2	0.94	0.44	6.11
4,621.0	6.70	125.40	4,599.2	-159.5	335.9	-128.3	1.72	-1.44	7.33
4,710.0	7.30	118.90	4,687.6	-165.3	345.1	-133.2	1.12	0.67	-7.30
4,800.0	7.00	118.20	4,776.9	-170.6	354.9	-137.6	0.35	-0.33	-0.78
4,890.0	5.90	111.20	4,866.3	-174.9	364.0	-141.0	1.50	-1.22	-7.78
4,980.0	6.40	111.50	4,955.8	-178.4	373.0	-143.7	0.56	0.56	0.33
5,070.0	6.20	123.00	5,045.2	-182.9	381.8	-147.4	1.42	-0.22	12.78
5,160.0	3.80	121.40	5,134.9	-187.1	388.4	-151.0	2.67	-2.67	-1.78
5,250.0	2.90	122.10	5,224.7	-189.9	392.9	-153.3	1.00	-1.00	0.78
5,340.0	2.00	143.70	5,314.7	-192.3	395.7	-155.5	1.42	-1.00	24.00
5,430.0	0.50	270.60	5,404.6	-193.6	396.3	-156.7	2.59	-1.67	141.00
5,520.0	0.90	278.50	5,494.6	-193.5	395.2	-156.7	0.46	0.44	8.78
5,609.0	0.70	271.00	5,583.6	-193.4	393.9	-156.7	0.25	-0.22	-8.43
5,699.0	0.90	277.80	5,673.6	-193.3	392.7	-156.7	0.25	0.22	7.56
5,744.0	0.70	282.10	5,718.6	-193.2	392.1	-156.7	0.46	-0.44	9.56

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Crow Creek State AC36-78HN
Project:	Sec.36-T7N-R63W	TVD Reference:	WELL @ 4790.0ft (Precision 828 RKB - 16')
Site:	Crow Creek State AC36-78-1HN Pad Sec.36-T7N-R63W	MD Reference:	WELL @ 4790.0ft (Precision 828 RKB - 16')
Well:	Crow Creek State AC36-78HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,789.0	1.10	302.40	5,763.6	-192.9	391.4	-156.5	1.12	0.89	45.11
5,834.0	3.40	348.00	5,808.6	-191.3	390.8	-155.0	6.10	5.11	101.33
5,879.0	6.50	352.50	5,853.4	-187.5	390.2	-151.2	6.94	6.89	10.00
5,924.0	9.30	356.40	5,898.0	-181.3	389.6	-145.1	6.33	6.22	8.67
5,968.0	11.90	356.10	5,941.2	-173.3	389.1	-137.2	5.91	5.91	-0.68
6,013.0	13.90	357.10	5,985.1	-163.2	388.5	-127.2	4.47	4.44	2.22
6,058.0	15.70	359.00	6,028.6	-151.8	388.1	-115.8	4.14	4.00	4.22
6,103.0	17.60	2.70	6,071.7	-138.9	388.3	-103.0	4.83	4.22	8.22
6,148.0	20.50	4.30	6,114.2	-124.2	389.2	-88.3	6.55	6.44	3.56
6,193.0	23.30	1.50	6,156.0	-107.5	390.1	-71.5	6.64	6.22	-6.22
6,238.0	26.60	358.00	6,196.8	-88.5	389.9	-52.6	8.03	7.33	-7.78
6,283.0	30.10	359.20	6,236.4	-67.1	389.4	-31.4	7.88	7.78	2.67
6,328.0	33.50	0.10	6,274.6	-43.4	389.3	-7.8	7.63	7.56	2.00
6,373.0	37.60	359.40	6,311.2	-17.3	389.2	18.2	9.16	9.11	-1.56
6,417.0	41.60	359.00	6,345.1	10.8	388.8	46.1	9.11	9.09	-0.91
6,462.0	46.00	359.70	6,377.6	41.9	388.4	77.1	9.84	9.78	1.56
6,507.0	51.00	0.60	6,407.4	75.6	388.5	110.6	11.21	11.11	2.00
6,552.0	55.20	1.20	6,434.4	111.6	389.1	146.5	9.39	9.33	1.33
6,597.0	58.30	1.20	6,459.1	149.2	389.9	184.1	6.89	6.89	0.00
6,642.0	61.00	0.50	6,481.8	188.0	390.5	222.8	6.15	6.00	-1.56
6,687.0	63.30	0.30	6,502.8	227.8	390.7	262.4	5.13	5.11	-0.44
6,732.0	65.90	0.50	6,522.1	268.5	391.0	302.9	5.79	5.78	0.44
6,777.0	68.10	0.10	6,539.7	309.9	391.2	344.2	4.96	4.89	-0.89
6,822.0	72.00	0.10	6,555.1	352.2	391.3	386.3	8.67	8.67	0.00
6,867.0	76.90	359.00	6,567.1	395.5	391.0	429.4	11.14	10.89	-2.44
6,912.0	80.90	358.90	6,575.8	439.6	390.2	473.3	8.89	8.89	-0.22
6,956.0	83.70	358.90	6,581.7	483.2	389.3	516.6	6.36	6.36	0.00
7,028.0	86.10	359.70	6,588.1	554.9	388.4	588.0	3.51	3.33	1.11
7,118.0	86.70	358.90	6,593.7	644.8	387.4	677.3	1.11	0.67	-0.89
7,207.0	86.80	359.90	6,598.8	733.6	386.4	765.7	1.13	0.11	1.12
7,297.0	87.10	359.60	6,603.6	823.5	386.0	855.2	0.47	0.33	-0.33
7,387.0	87.40	1.20	6,607.9	913.4	386.7	944.8	1.81	0.33	1.78
7,477.0	85.80	1.20	6,613.2	1,003.2	388.5	1,034.4	1.78	-1.78	0.00
7,567.0	85.40	1.30	6,620.1	1,092.9	390.5	1,123.9	0.46	-0.44	0.11
7,580.6	85.42	1.30	6,621.2	1,106.5	390.8	1,137.5	0.11	0.11	0.00
Crow Creek State AC36-78HN Landing Pt.									
7,657.0	85.50	1.30	6,627.3	1,182.6	392.5	1,213.4	0.11	0.11	0.00
7,746.0	87.80	0.30	6,632.5	1,271.4	393.8	1,302.0	2.82	2.58	-1.12
7,836.0	88.30	359.70	6,635.5	1,361.4	393.8	1,391.5	0.87	0.56	-0.67
7,926.0	91.20	1.50	6,635.9	1,451.4	394.7	1,481.2	3.79	3.22	2.00
8,016.0	90.10	359.70	6,634.9	1,541.3	395.7	1,570.9	2.34	-1.22	-2.00
8,106.0	89.50	355.50	6,635.2	1,631.2	391.9	1,660.1	4.71	-0.67	-4.67
8,196.0	89.40	352.20	6,636.1	1,720.7	382.2	1,748.3	3.67	-0.11	-3.67
8,286.0	90.00	353.90	6,636.6	1,810.0	371.4	1,836.3	2.00	0.67	1.89
8,375.0	89.70	355.70	6,636.8	1,898.7	363.3	1,923.8	2.05	-0.34	2.02
8,465.0	90.20	358.30	6,636.9	1,988.5	358.6	2,012.9	2.94	0.56	2.89
8,555.0	90.30	0.10	6,636.5	2,078.5	357.3	2,102.4	2.00	0.11	2.00
8,645.0	90.30	4.70	6,636.0	2,168.4	361.1	2,192.3	5.11	0.00	5.11
8,735.0	90.20	0.80	6,635.6	2,258.3	365.4	2,282.2	4.33	-0.11	-4.33
8,825.0	90.10	359.90	6,635.4	2,348.3	366.0	2,371.8	1.01	-0.11	-1.00
8,914.0	90.00	359.70	6,635.3	2,437.3	365.6	2,460.4	0.25	-0.11	-0.22
9,004.0	90.20	0.60	6,635.1	2,527.3	365.9	2,550.1	1.02	0.22	1.00

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Crow Creek State AC36-78HN
Project:	Sec.36-T7N-R63W	TVD Reference:	WELL @ 4790.0ft (Precision 828 RKB - 16')
Site:	Crow Creek State AC36-78-1HN Pad Sec.36-T7N-R63W	MD Reference:	WELL @ 4790.0ft (Precision 828 RKB - 16')
Well:	Crow Creek State AC36-78HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,094.0	91.70	3.10	6,633.6	2,617.2	368.8	2,639.9	3.24	1.67	2.78
9,184.0	92.50	3.40	6,630.3	2,707.0	373.9	2,729.8	0.95	0.89	0.33
9,274.0	92.40	3.30	6,626.5	2,796.8	379.1	2,819.7	0.16	-0.11	-0.11
9,364.0	93.10	1.50	6,622.2	2,886.6	382.9	2,909.5	2.14	0.78	-2.00
9,454.0	91.00	3.40	6,619.0	2,976.4	386.8	2,999.3	3.15	-2.33	2.11
9,543.0	89.30	0.80	6,618.7	3,065.4	390.0	3,088.1	3.49	-1.91	-2.92
9,632.0	89.90	1.00	6,619.3	3,154.4	391.4	3,176.9	0.71	0.67	0.22
9,722.0	90.60	1.70	6,619.0	3,244.3	393.5	3,266.7	1.10	0.78	0.78
9,812.0	90.40	2.00	6,618.2	3,334.3	396.4	3,356.5	0.40	-0.22	0.33
9,902.0	89.60	359.60	6,618.2	3,424.3	397.7	3,446.2	2.81	-0.89	-2.67
9,992.0	90.20	0.30	6,618.3	3,514.3	397.6	3,535.9	1.02	0.67	0.78
10,082.0	90.90	0.60	6,617.5	3,604.3	398.3	3,625.5	0.85	0.78	0.33
10,172.0	91.10	0.60	6,615.9	3,694.2	399.3	3,715.2	0.22	0.22	0.00
10,262.0	91.10	1.00	6,614.2	3,784.2	400.5	3,805.0	0.44	0.00	0.44
10,351.0	90.80	2.00	6,612.7	3,873.2	402.8	3,893.8	1.17	-0.34	1.12
10,441.0	91.20	0.60	6,611.1	3,963.1	404.9	3,983.5	1.62	0.44	-1.56
10,531.0	90.00	0.10	6,610.2	4,053.1	405.4	4,073.2	1.44	-1.33	-0.56
10,621.0	90.70	359.40	6,609.6	4,143.1	405.0	4,162.8	1.10	0.78	-0.78
10,711.0	89.30	358.90	6,609.6	4,233.1	403.7	4,252.3	1.65	-1.56	-0.56
10,801.0	89.70	358.20	6,610.4	4,323.1	401.4	4,341.7	0.90	0.44	-0.78
10,891.0	90.50	357.60	6,610.3	4,413.0	398.1	4,430.9	1.11	0.89	-0.67
10,917.0	89.60	358.70	6,610.2	4,439.0	397.3	4,456.7	5.47	-3.46	4.23
10,974.0	89.60	358.70	6,610.6	4,496.0	396.0	4,513.4	0.00	0.00	0.00
Crow Creek State AC36-78HN BHL 535'FNL & 660'FWL									

Checked By: _____	Approved By: _____	Date: _____
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