



Project: COLORADO NORTHERN ZONE - 83
Site: BUFFALO & BADGER 4W-15HZ PAD
Well: BUFFALO 13C-15HZ
Wellbore: OH
Design: PLAN #2 PRELIMINARY

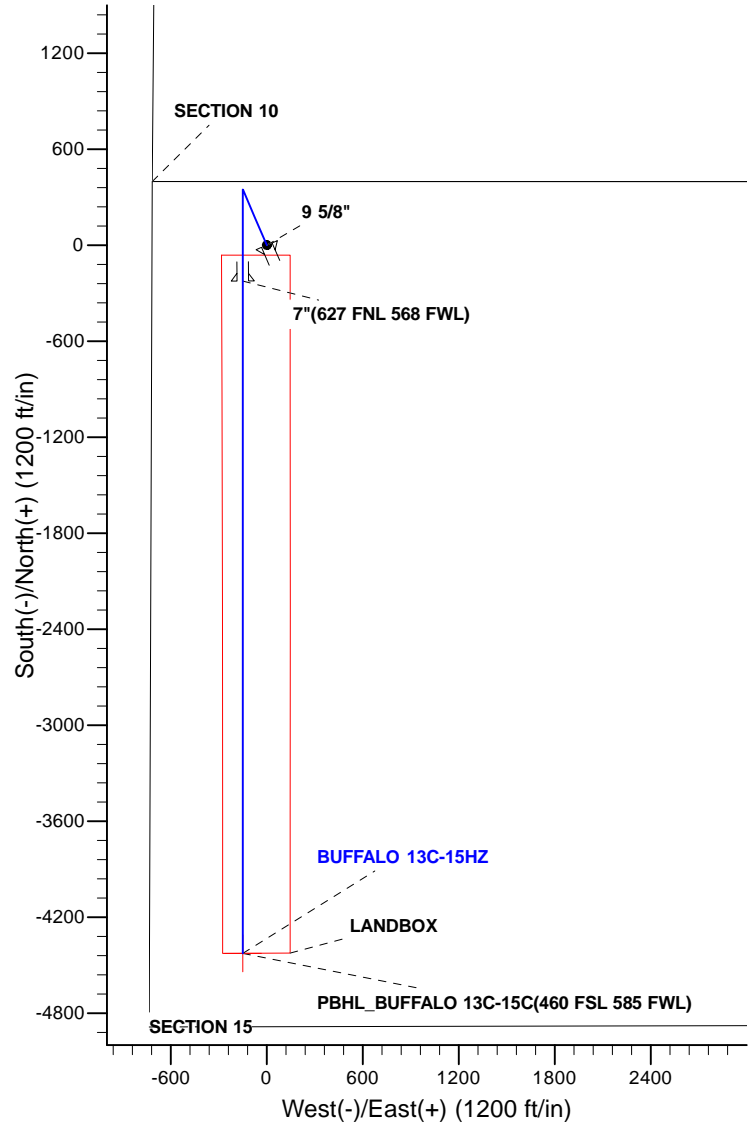
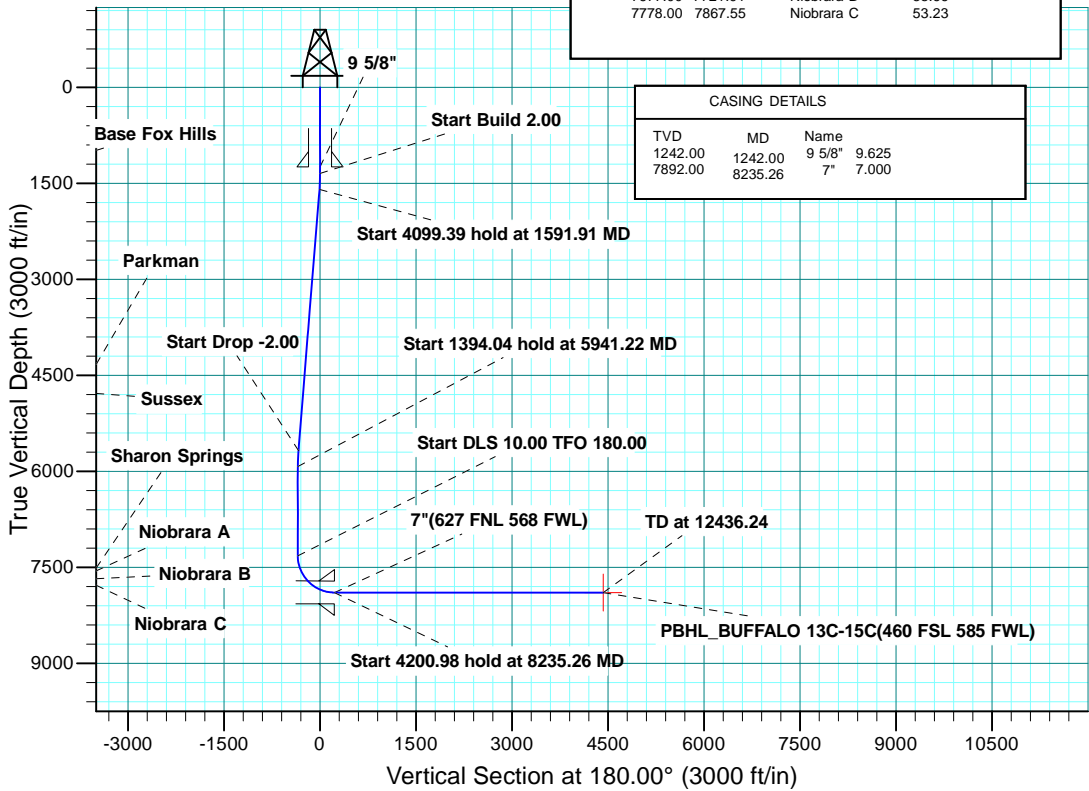


WELL DETAILS: BUFFALO 13C-15HZ									
GL 5141 & KB 21 @ 5161.00ft (UNIT 403)									
		+N/-S 0.00	+E/-W 0.00	Northing 1264129.99	Easting 3140920.93	Latitude 40.0573279		Longitude -104.9965610	
SECTION DETAILS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1342.00	0.00	0.00	1342.00	0.00	0.00	0.00	0.00	0.00	
1591.91	5.00	336.68	1591.60	10.00	-4.31	2.00	336.68	-10.00	
5691.31	5.00	336.68	5675.40	338.00	-145.69	0.00	0.00	-338.00	
5941.22	0.00	0.00	5925.00	348.00	-150.00	2.00	180.00	-348.00	
7335.26	0.00	0.00	7319.04	348.00	-150.00	0.00	0.00	-348.00	
8235.26	90.00	180.00	7892.00	-224.96	-150.00	10.00	180.00	224.96	
12436.24	90.00	180.00	7892.00	-4425.94	-150.00	0.00	0.00	4425.94	PBHL_BUFFALO 13C-15C(460 FSL 585 FWL)
DESIGN TARGET DETAILS									
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape	
PBHL	7892.00	-4425.94	-150.00	1259703.29	3140796.06	40.0451780	-104.9970968	Point	
- plan hits target center									

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: SECTION 15 T1N R68W	
System Datum: Mean Sea Level	

FORMATION TOP DETAILS			
TVDPath	MDPath	Formation	Inc
982.00	982.00	Base Fox Hills	0.00
4324.00	4334.75	Parkman	5.00
4782.00	4794.50	Sussex	5.00
7507.00	7526.77	Sharon Springs	19.15
7553.00	7576.27	Niobrara A	24.10
7677.00	7721.91	Niobrara B	38.66
7778.00	7867.55	Niobrara C	53.23

CASING DETAILS			
TVD	MD	Name	
1242.00	1242.00	9 5/8"	9.625
7892.00	8235.26	7"	7.000





Scientific Drilling

US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
BUFFALO & BADGER 4W-15HZ PAD
BUFFALO 13C-15HZ**

OH

Plan: PLAN #2 PRELIMINARY

Standard Planning Report

03 October, 2014

Database:	Denver Sales	Local Co-ordinate Reference:	Well BUFFALO 13C-15HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BUFFALO 13C-15HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

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

Site	BUFFALO & BADGER 4W-15HZ PAD, SECTION 15 T1N R68W			
Site Position:		Northing:	1,264,129.48 usft	Latitude: 40.0573270
From:	Lat/Long	Easting:	3,140,890.98 usft	Longitude: -104.9966680
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence: 0.33 °

Well	BUFFALO 13C-15HZ, 397 FNL 720 FWL			
Well Position	+N/-S	0.34 ft	Northing:	1,264,129.99 usft
	+E/-W	29.95 ft	Easting:	3,140,920.93 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft
			Ground Level:	5,141.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	6/10/2014	8.61	66.62	52,524

Design	PLAN #2 PRELIMINARY			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	180.00

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,342.00	0.00	0.00	1,342.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,591.91	5.00	336.68	1,591.60	10.00	-4.31	2.00	2.00	0.00	336.68	
5,691.31	5.00	336.68	5,675.40	338.00	-145.69	0.00	0.00	0.00	0.00	
5,941.22	0.00	0.00	5,925.00	348.00	-150.00	2.00	-2.00	0.00	180.00	
7,335.26	0.00	0.00	7,319.04	348.00	-150.00	0.00	0.00	0.00	0.00	
8,235.26	90.00	180.00	7,892.00	-224.96	-150.00	10.00	10.00	20.00	180.00	
12,436.24	90.00	180.00	7,892.00	-4,425.94	-150.00	0.00	0.00	0.00	0.00	PBHL_BUFFALO 13C

Database:	Denver Sales	Local Co-ordinate Reference:	Well BUFFALO 13C-15HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BUFFALO 13C-15HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

Planned 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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
982.00	0.00	0.00	982.00	0.00	0.00	0.00	0.00	0.00	0.00
Base Fox Hills									
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,242.00	0.00	0.00	1,242.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,342.00	0.00	0.00	1,342.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,400.00	1.16	336.68	1,400.00	0.54	-0.23	-0.54	2.00	2.00	0.00
1,500.00	3.16	336.68	1,499.92	4.00	-1.72	-4.00	2.00	2.00	0.00
1,591.91	5.00	336.68	1,591.60	10.00	-4.31	-10.00	2.00	2.00	0.00
Start 4099.39 hold at 1591.91 MD									
1,600.00	5.00	336.68	1,599.65	10.65	-4.59	-10.65	0.00	0.00	0.00
1,700.00	5.00	336.68	1,699.27	18.65	-8.04	-18.65	0.00	0.00	0.00
1,800.00	5.00	336.68	1,798.89	26.65	-11.49	-26.65	0.00	0.00	0.00
1,900.00	5.00	336.68	1,898.51	34.65	-14.94	-34.65	0.00	0.00	0.00
2,000.00	5.00	336.68	1,998.13	42.66	-18.39	-42.66	0.00	0.00	0.00
2,100.00	5.00	336.68	2,097.75	50.66	-21.83	-50.66	0.00	0.00	0.00
2,200.00	5.00	336.68	2,197.37	58.66	-25.28	-58.66	0.00	0.00	0.00
2,300.00	5.00	336.68	2,296.99	66.66	-28.73	-66.66	0.00	0.00	0.00
2,400.00	5.00	336.68	2,396.61	74.66	-32.18	-74.66	0.00	0.00	0.00
2,500.00	5.00	336.68	2,496.23	82.66	-35.63	-82.66	0.00	0.00	0.00
2,600.00	5.00	336.68	2,595.85	90.66	-39.08	-90.66	0.00	0.00	0.00
2,700.00	5.00	336.68	2,695.47	98.66	-42.53	-98.66	0.00	0.00	0.00
2,800.00	5.00	336.68	2,795.09	106.66	-45.98	-106.66	0.00	0.00	0.00
2,900.00	5.00	336.68	2,894.71	114.66	-49.42	-114.66	0.00	0.00	0.00
3,000.00	5.00	336.68	2,994.33	122.66	-52.87	-122.66	0.00	0.00	0.00
3,100.00	5.00	336.68	3,093.95	130.67	-56.32	-130.67	0.00	0.00	0.00
3,200.00	5.00	336.68	3,193.57	138.67	-59.77	-138.67	0.00	0.00	0.00
3,300.00	5.00	336.68	3,293.19	146.67	-63.22	-146.67	0.00	0.00	0.00
3,400.00	5.00	336.68	3,392.81	154.67	-66.67	-154.67	0.00	0.00	0.00
3,500.00	5.00	336.68	3,492.43	162.67	-70.12	-162.67	0.00	0.00	0.00
3,600.00	5.00	336.68	3,592.05	170.67	-73.56	-170.67	0.00	0.00	0.00
3,700.00	5.00	336.68	3,691.67	178.67	-77.01	-178.67	0.00	0.00	0.00
3,800.00	5.00	336.68	3,791.29	186.67	-80.46	-186.67	0.00	0.00	0.00
3,900.00	5.00	336.68	3,890.91	194.67	-83.91	-194.67	0.00	0.00	0.00
4,000.00	5.00	336.68	3,990.53	202.67	-87.36	-202.67	0.00	0.00	0.00
4,100.00	5.00	336.68	4,090.15	210.68	-90.81	-210.68	0.00	0.00	0.00
4,200.00	5.00	336.68	4,189.77	218.68	-94.26	-218.68	0.00	0.00	0.00
4,300.00	5.00	336.68	4,289.39	226.68	-97.71	-226.68	0.00	0.00	0.00
4,334.75	5.00	336.68	4,324.00	229.46	-98.90	-229.46	0.00	0.00	0.00
Parkman									

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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BUFFALO 13C-15HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

Planned 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)
4,400.00	5.00	336.68	4,389.00	234.68	-101.15	-234.68	0.00	0.00	0.00
4,500.00	5.00	336.68	4,488.62	242.68	-104.60	-242.68	0.00	0.00	0.00
4,600.00	5.00	336.68	4,588.24	250.68	-108.05	-250.68	0.00	0.00	0.00
4,700.00	5.00	336.68	4,687.86	258.68	-111.50	-258.68	0.00	0.00	0.00
4,794.50	5.00	336.68	4,782.00	266.24	-114.76	-266.24	0.00	0.00	0.00
Sussex									
4,800.00	5.00	336.68	4,787.48	266.68	-114.95	-266.68	0.00	0.00	0.00
4,900.00	5.00	336.68	4,887.10	274.68	-118.40	-274.68	0.00	0.00	0.00
5,000.00	5.00	336.68	4,986.72	282.68	-121.85	-282.68	0.00	0.00	0.00
5,100.00	5.00	336.68	5,086.34	290.69	-125.30	-290.69	0.00	0.00	0.00
5,200.00	5.00	336.68	5,185.96	298.69	-128.74	-298.69	0.00	0.00	0.00
5,300.00	5.00	336.68	5,285.58	306.69	-132.19	-306.69	0.00	0.00	0.00
5,400.00	5.00	336.68	5,385.20	314.69	-135.64	-314.69	0.00	0.00	0.00
5,500.00	5.00	336.68	5,484.82	322.69	-139.09	-322.69	0.00	0.00	0.00
5,600.00	5.00	336.68	5,584.44	330.69	-142.54	-330.69	0.00	0.00	0.00
5,691.31	5.00	336.68	5,675.40	338.00	-145.69	-338.00	0.00	0.00	0.00
Start Drop -2.00									
5,700.00	4.82	336.68	5,684.06	338.68	-145.98	-338.68	2.00	-2.00	0.00
5,800.00	2.82	336.68	5,783.83	344.80	-148.62	-344.80	2.00	-2.00	0.00
5,900.00	0.82	336.68	5,883.78	347.73	-149.88	-347.73	2.00	-2.00	0.00
5,941.22	0.00	0.00	5,925.00	348.00	-150.00	-348.00	2.00	-2.00	0.00
Start 1394.04 hold at 5941.22 MD									
6,000.00	0.00	0.00	5,983.78	348.00	-150.00	-348.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,083.78	348.00	-150.00	-348.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,183.78	348.00	-150.00	-348.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,283.78	348.00	-150.00	-348.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,383.78	348.00	-150.00	-348.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,483.78	348.00	-150.00	-348.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,583.78	348.00	-150.00	-348.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,683.78	348.00	-150.00	-348.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,783.78	348.00	-150.00	-348.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,883.78	348.00	-150.00	-348.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,983.78	348.00	-150.00	-348.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,083.78	348.00	-150.00	-348.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,183.78	348.00	-150.00	-348.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,283.78	348.00	-150.00	-348.00	0.00	0.00	0.00
7,335.26	0.00	0.00	7,319.04	348.00	-150.00	-348.00	0.00	0.00	0.00
Start DLS 10.00 TFO 180.00									
7,400.00	6.47	180.00	7,383.64	344.35	-150.00	-344.35	10.00	10.00	0.00
7,500.00	16.47	180.00	7,481.52	324.48	-150.00	-324.48	10.00	10.00	0.00
7,526.77	19.15	180.00	7,507.00	316.29	-150.00	-316.29	10.00	10.00	0.00
Sharon Springs									
7,576.27	24.10	180.00	7,553.00	298.06	-150.00	-298.06	10.00	10.00	0.00
Niobrara A									
7,600.00	26.47	180.00	7,574.46	287.92	-150.00	-287.92	10.00	10.00	0.00
7,700.00	36.47	180.00	7,659.64	235.77	-150.00	-235.77	10.00	10.00	0.00
7,721.91	38.66	180.00	7,677.00	222.42	-150.00	-222.42	10.00	10.00	0.00
Niobrara B									
7,800.00	46.47	180.00	7,734.47	169.63	-150.00	-169.63	10.00	10.00	0.00
7,867.55	53.23	180.00	7,778.00	118.02	-150.00	-118.02	10.00	10.00	0.00
Niobrara C									
7,900.00	56.47	180.00	7,796.68	91.50	-150.00	-91.50	10.00	10.00	0.00
8,000.00	66.47	180.00	7,844.37	3.75	-150.00	-3.75	10.00	10.00	0.00

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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BUFFALO 13C-15HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

Planned 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)	
8,100.00	76.47	180.00	7,876.11	-90.95	-150.00	90.95	10.00	10.00	0.00	
8,200.00	86.47	180.00	7,890.91	-189.72	-150.00	189.72	10.00	10.00	0.00	
8,235.26	90.00	180.00	7,892.00	-224.96	-150.00	224.96	10.00	10.00	0.00	
Start 4200.98 hold at 8235.26 MD - 7"(627 FNL 568 FWL)										
8,300.00	90.00	180.00	7,892.00	-289.70	-150.00	289.70	0.00	0.00	0.00	
8,400.00	90.00	180.00	7,892.00	-389.70	-150.00	389.70	0.00	0.00	0.00	
8,500.00	90.00	180.00	7,892.00	-489.70	-150.00	489.70	0.00	0.00	0.00	
8,600.00	90.00	180.00	7,892.00	-589.70	-150.00	589.70	0.00	0.00	0.00	
8,700.00	90.00	180.00	7,892.00	-689.70	-150.00	689.70	0.00	0.00	0.00	
8,800.00	90.00	180.00	7,892.00	-789.70	-150.00	789.70	0.00	0.00	0.00	
8,900.00	90.00	180.00	7,892.00	-889.70	-150.00	889.70	0.00	0.00	0.00	
9,000.00	90.00	180.00	7,892.00	-989.70	-150.00	989.70	0.00	0.00	0.00	
9,100.00	90.00	180.00	7,892.00	-1,089.70	-150.00	1,089.70	0.00	0.00	0.00	
9,200.00	90.00	180.00	7,892.00	-1,189.70	-150.00	1,189.70	0.00	0.00	0.00	
9,300.00	90.00	180.00	7,892.00	-1,289.70	-150.00	1,289.70	0.00	0.00	0.00	
9,400.00	90.00	180.00	7,892.00	-1,389.70	-150.00	1,389.70	0.00	0.00	0.00	
9,500.00	90.00	180.00	7,892.00	-1,489.70	-150.00	1,489.70	0.00	0.00	0.00	
9,600.00	90.00	180.00	7,892.00	-1,589.70	-150.00	1,589.70	0.00	0.00	0.00	
9,700.00	90.00	180.00	7,892.00	-1,689.70	-150.00	1,689.70	0.00	0.00	0.00	
9,800.00	90.00	180.00	7,892.00	-1,789.70	-150.00	1,789.70	0.00	0.00	0.00	
9,900.00	90.00	180.00	7,892.00	-1,889.70	-150.00	1,889.70	0.00	0.00	0.00	
10,000.00	90.00	180.00	7,892.00	-1,989.70	-150.00	1,989.70	0.00	0.00	0.00	
10,100.00	90.00	180.00	7,892.00	-2,089.70	-150.00	2,089.70	0.00	0.00	0.00	
10,200.00	90.00	180.00	7,892.00	-2,189.70	-150.00	2,189.70	0.00	0.00	0.00	
10,300.00	90.00	180.00	7,892.00	-2,289.70	-150.00	2,289.70	0.00	0.00	0.00	
10,400.00	90.00	180.00	7,892.00	-2,389.70	-150.00	2,389.70	0.00	0.00	0.00	
10,500.00	90.00	180.00	7,892.00	-2,489.70	-150.00	2,489.70	0.00	0.00	0.00	
10,600.00	90.00	180.00	7,892.00	-2,589.70	-150.00	2,589.70	0.00	0.00	0.00	
10,700.00	90.00	180.00	7,892.00	-2,689.70	-150.00	2,689.70	0.00	0.00	0.00	
10,800.00	90.00	180.00	7,892.00	-2,789.70	-150.00	2,789.70	0.00	0.00	0.00	
10,900.00	90.00	180.00	7,892.00	-2,889.70	-150.00	2,889.70	0.00	0.00	0.00	
11,000.00	90.00	180.00	7,892.00	-2,989.70	-150.00	2,989.70	0.00	0.00	0.00	
11,100.00	90.00	180.00	7,892.00	-3,089.70	-150.00	3,089.70	0.00	0.00	0.00	
11,200.00	90.00	180.00	7,892.00	-3,189.70	-150.00	3,189.70	0.00	0.00	0.00	
11,300.00	90.00	180.00	7,892.00	-3,289.70	-150.00	3,289.70	0.00	0.00	0.00	
11,400.00	90.00	180.00	7,892.00	-3,389.70	-150.00	3,389.70	0.00	0.00	0.00	
11,500.00	90.00	180.00	7,892.00	-3,489.70	-150.00	3,489.70	0.00	0.00	0.00	
11,600.00	90.00	180.00	7,892.00	-3,589.70	-150.00	3,589.70	0.00	0.00	0.00	
11,700.00	90.00	180.00	7,892.00	-3,689.70	-150.00	3,689.70	0.00	0.00	0.00	
11,800.00	90.00	180.00	7,892.00	-3,789.70	-150.00	3,789.70	0.00	0.00	0.00	
11,900.00	90.00	180.00	7,892.00	-3,889.70	-150.00	3,889.70	0.00	0.00	0.00	
12,000.00	90.00	180.00	7,892.00	-3,989.70	-150.00	3,989.70	0.00	0.00	0.00	
12,100.00	90.00	180.00	7,892.00	-4,089.70	-150.00	4,089.70	0.00	0.00	0.00	
12,200.00	90.00	180.00	7,892.00	-4,189.70	-150.00	4,189.70	0.00	0.00	0.00	
12,300.00	90.00	180.00	7,892.00	-4,289.70	-150.00	4,289.70	0.00	0.00	0.00	
12,400.00	90.00	180.00	7,892.00	-4,389.70	-150.00	4,389.70	0.00	0.00	0.00	
12,436.24	90.00	180.00	7,892.00	-4,425.94	-150.00	4,425.94	0.00	0.00	0.00	
TD at 12436.24 - PBHL_BUFFALO 13C-15C(460 FSL 585 FWL)										

Database:	Denver Sales	Local Co-ordinate Reference:	Well BUFFALO 13C-15HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BUFFALO 13C-15HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL_BUFFALO 13C-1	0.00	0.00	7,892.00	-4,425.94	-150.00	1,259,703.28	3,140,796.06	40.0451780	-104.9970967
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,242.00	1,242.00	9 5/8"	9.625	13.500	
8,235.26	7,892.00	7"(627 FNL 568 FWL)	7.000	8.750	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
982.00	982.00	Base Fox Hills				
4,334.75	4,324.00	Parkman				
4,794.50	4,782.00	Sussex				
7,526.77	7,507.00	Sharon Springs				
7,576.27	7,553.00	Niobrara A				
7,721.91	7,677.00	Niobrara B				
7,867.55	7,778.00	Niobrara C				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,342.00	1,342.00	0.00	0.00	Start Build 2.00	
1,591.91	1,591.60	10.00	-4.31	Start 4099.39 hold at 1591.91 MD	
5,691.31	5,675.40	338.00	-145.69	Start Drop -2.00	
5,941.22	5,925.00	348.00	-150.00	Start 1394.04 hold at 5941.22 MD	
7,335.26	7,319.04	348.00	-150.00	Start DLS 10.00 TFO 180.00	
8,235.26	7,892.00	-224.96	-150.00	Start 4200.98 hold at 8235.26 MD	
12,436.24	7,892.00	-4,425.94	-150.00	TD at 12436.24	