

Project: Weld County, CO (NAD 83)
 Site: Sec. 18-T1N-R65W
 Well: PETTINGER 30N-18HZ
 Wellbore: Plan A0
 Design: Plan A0 - PERMIT



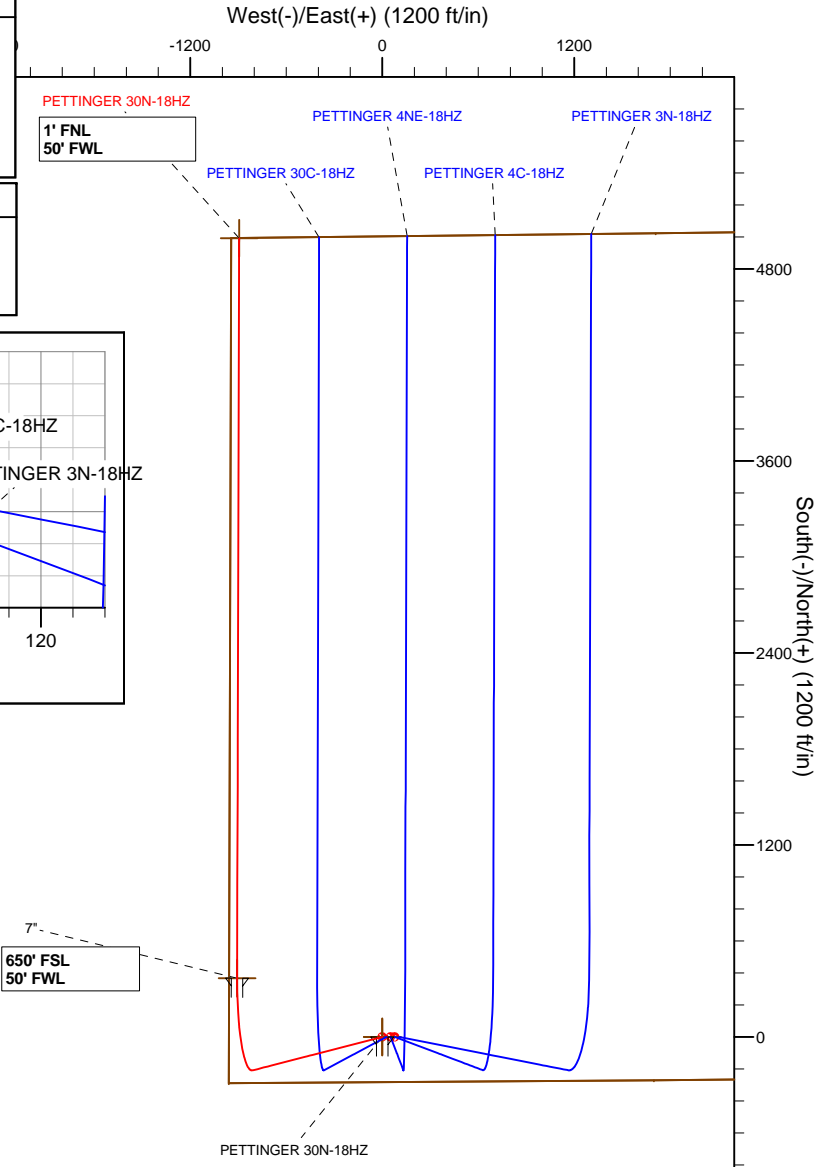
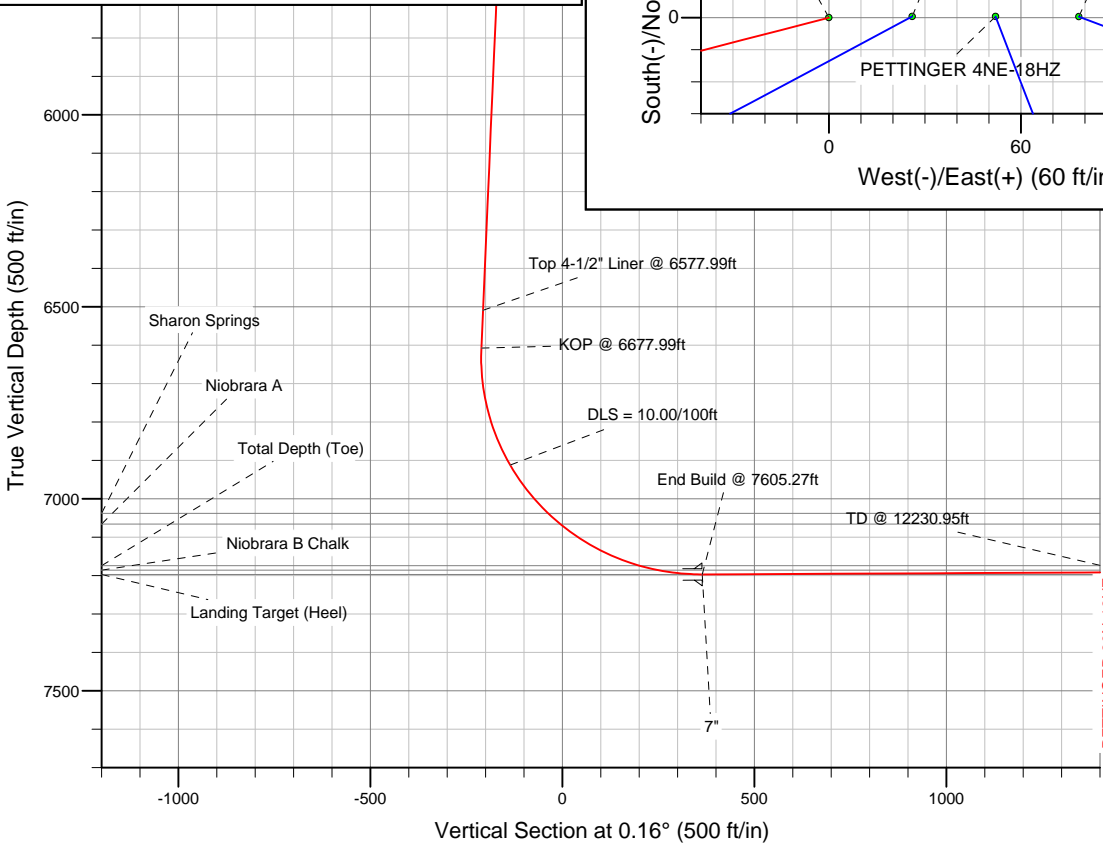
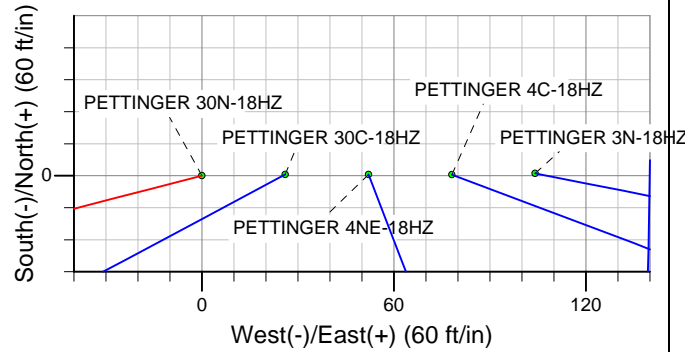
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00	0.00	
3	1987.93	9.76	255.56	1985.58	-10.33	-40.14	2.00	255.56	-10.45	
4	6677.99	9.76	255.56	6607.77	-208.51	-810.00	0.00	0.00	-210.77	
5	7605.27	90.28	0.16	7197.00	367.00	-907.00	10.00	104.34	364.47	PETTINGER 30N-18HZ_tgt
6	12230.95	90.28	0.16	7174.00	4992.60	-894.35	0.00	0.00	4990.08	PETTINGER 30N-18HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
PETTINGER 30N-18HZ_Sec	0.00	0.00	0.00	40.044889	-104.712620	Polygon
PETTINGER 30N-18HZ_SHL	0.00	0.00	0.00	40.044889	-104.712620	Point
PETTINGER 30N-18HZ_BHL	7174.00	4992.60	-894.35	40.058594	-104.715815	Point
PETTINGER 30N-18HZ_tgt	7197.00	367.00	-907.00	40.045896	-104.715860	Point

MD	TVD	
6577.99	6509.22	Top 4-1/2" Liner @ 6577.99ft
6677.99	6607.77	KOP @ 6677.99ft



WELL DETAILS: PETTINGER 30N-18HZ	
Ground Level:	5007.00
RKB = 17 @ 5024.00ft (Drilling Rig)	
Plan:	Plan A0 - PERMIT (PETTINGER 30N-18HZ/Plan A0)
Created By:	Fred Hartmann Date: 07/22/2013

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 18-T1N-R65W

PETTINGER 30N-18HZ

Plan A0

Plan: Plan A0 - PERMIT

Sperry Drilling Services

Proposal Report

22 July, 2013

Well Coordinates: 1,260,177.45 N, 3,220,439.24 E (40° 02' 41.60" N, 104° 42' 45.43" W)

Ground Level: 5,007.00 ft

Local Coordinate Origin: Centered on Well PETTINGER 30N-18HZ

Viewing Datum: RKB = 17 @ 5024.00ft (Drilling Rig)

TVDs to System: N

North Reference: True

Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Plan Report for PETTINGER 30N-18HZ - Plan A0 - PERMIT

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)	Toolface Azimuth (°)
0.00	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	0.00
200.00	0.00	0.00	200.00	0.00	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	0.00
400.00	0.00	0.00	400.00	0.00	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	0.00
600.00	0.00	0.00	600.00	0.00	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	0.00
800.00	0.00	0.00	800.00	0.00	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	0.00
1,000.00	0.00	0.00	1,000.00	0.00	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	0.00
1,180.00	0.00	0.00	1,180.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1500.00ft										
1,600.00	2.00	255.56	1,599.98	-0.44	-1.69	-0.44	2.00	2.00	0.00	255.56
1,700.00	4.00	255.56	1,699.84	-1.74	-6.76	-1.76	2.00	2.00	0.00	0.00
1,800.00	6.00	255.56	1,799.45	-3.91	-15.20	-3.95	2.00	2.00	0.00	0.00
1,900.00	8.00	255.56	1,898.70	-6.95	-27.00	-7.03	2.00	2.00	0.00	0.00
1,987.93	9.76	255.56	1,985.57	-10.33	-40.14	-10.45	2.00	2.00	0.00	0.00
End Nudge @ 1987.93ft										
2,000.00	9.76	255.56	1,997.47	-10.84	-42.12	-10.96	0.00	0.00	0.00	0.00
2,100.00	9.76	255.56	2,096.02	-15.07	-58.54	-15.23	0.00	0.00	0.00	0.00
2,200.00	9.76	255.56	2,194.58	-19.29	-74.95	-19.50	0.00	0.00	0.00	0.00
2,300.00	9.76	255.56	2,293.13	-23.52	-91.37	-23.78	0.00	0.00	0.00	0.00
2,400.00	9.76	255.56	2,391.68	-27.75	-107.78	-28.05	0.00	0.00	0.00	0.00
2,500.00	9.76	255.56	2,490.23	-31.97	-124.20	-32.32	0.00	0.00	0.00	0.00
2,600.00	9.76	255.56	2,588.79	-36.20	-140.61	-36.59	0.00	0.00	0.00	0.00
2,700.00	9.76	255.56	2,687.34	-40.42	-157.03	-40.86	0.00	0.00	0.00	0.00
2,800.00	9.76	255.56	2,785.89	-44.65	-173.44	-45.13	0.00	0.00	0.00	0.00
2,900.00	9.76	255.56	2,884.45	-48.87	-189.86	-49.40	0.00	0.00	0.00	0.00
3,000.00	9.76	255.56	2,983.00	-53.10	-206.27	-53.67	0.00	0.00	0.00	0.00
3,100.00	9.76	255.56	3,081.55	-57.32	-222.69	-57.95	0.00	0.00	0.00	0.00
3,200.00	9.76	255.56	3,180.11	-61.55	-239.10	-62.22	0.00	0.00	0.00	0.00
3,300.00	9.76	255.56	3,278.66	-65.78	-255.52	-66.49	0.00	0.00	0.00	0.00
3,400.00	9.76	255.56	3,377.21	-70.00	-271.93	-70.76	0.00	0.00	0.00	0.00
3,500.00	9.76	255.56	3,475.77	-74.23	-288.35	-75.03	0.00	0.00	0.00	0.00
3,600.00	9.76	255.56	3,574.32	-78.45	-304.76	-79.30	0.00	0.00	0.00	0.00
3,700.00	9.76	255.56	3,672.87	-82.68	-321.17	-83.57	0.00	0.00	0.00	0.00
3,800.00	9.76	255.56	3,771.42	-86.90	-337.59	-87.85	0.00	0.00	0.00	0.00
3,900.00	9.76	255.56	3,869.98	-91.13	-354.00	-92.12	0.00	0.00	0.00	0.00
4,000.00	9.76	255.56	3,968.53	-95.35	-370.42	-96.39	0.00	0.00	0.00	0.00
4,100.00	9.76	255.56	4,067.08	-99.58	-386.83	-100.66	0.00	0.00	0.00	0.00
4,200.00	9.76	255.56	4,165.64	-103.80	-403.25	-104.93	0.00	0.00	0.00	0.00
4,218.63	9.76	255.56	4,184.00	-104.59	-406.31	-105.73	0.00	0.00	0.00	0.00
Parkman										
4,300.00	9.76	255.56	4,264.19	-108.03	-419.66	-109.20	0.00	0.00	0.00	0.00
4,400.00	9.76	255.56	4,362.74	-112.26	-436.08	-113.47	0.00	0.00	0.00	0.00
4,500.00	9.76	255.56	4,461.30	-116.48	-452.49	-117.74	0.00	0.00	0.00	0.00
4,600.00	9.76	255.56	4,559.85	-120.71	-468.91	-122.02	0.00	0.00	0.00	0.00
4,602.18	9.76	255.56	4,562.00	-120.80	-469.27	-122.11	0.00	0.00	0.00	0.00
Sussex										
4,700.00	9.76	255.56	4,658.40	-124.93	-485.32	-126.29	0.00	0.00	0.00	0.00
4,800.00	9.76	255.56	4,756.95	-129.16	-501.74	-130.56	0.00	0.00	0.00	0.00

Plan Report for PETTINGER 30N-18HZ - Plan A0 - PERMIT

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)	Toolface Azimuth (°)
4,900.00	9.76	255.56	4,855.51	-133.38	-518.15	-134.83	0.00	0.00	0.00	0.00
5,000.00	9.76	255.56	4,954.06	-137.61	-534.57	-139.10	0.00	0.00	0.00	0.00
5,100.00	9.76	255.56	5,052.61	-141.83	-550.98	-143.37	0.00	0.00	0.00	0.00
5,200.00	9.76	255.56	5,151.17	-146.06	-567.40	-147.64	0.00	0.00	0.00	0.00
5,300.00	9.76	255.56	5,249.72	-150.29	-583.81	-151.92	0.00	0.00	0.00	0.00
5,400.00	9.76	255.56	5,348.27	-154.51	-600.23	-156.19	0.00	0.00	0.00	0.00
5,500.00	9.76	255.56	5,446.83	-158.74	-616.64	-160.46	0.00	0.00	0.00	0.00
5,600.00	9.76	255.56	5,545.38	-162.96	-633.06	-164.73	0.00	0.00	0.00	0.00
5,700.00	9.76	255.56	5,643.93	-167.19	-649.47	-169.00	0.00	0.00	0.00	0.00
5,800.00	9.76	255.56	5,742.49	-171.41	-665.88	-173.27	0.00	0.00	0.00	0.00
5,900.00	9.76	255.56	5,841.04	-175.64	-682.30	-177.54	0.00	0.00	0.00	0.00
6,000.00	9.76	255.56	5,939.59	-179.86	-698.71	-181.81	0.00	0.00	0.00	0.00
6,100.00	9.76	255.56	6,038.14	-184.09	-715.13	-186.09	0.00	0.00	0.00	0.00
6,200.00	9.76	255.56	6,136.70	-188.32	-731.54	-190.36	0.00	0.00	0.00	0.00
6,300.00	9.76	255.56	6,235.25	-192.54	-747.96	-194.63	0.00	0.00	0.00	0.00
6,400.00	9.76	255.56	6,333.80	-196.77	-764.37	-198.90	0.00	0.00	0.00	0.00
6,500.00	9.76	255.56	6,432.36	-200.99	-780.79	-203.17	0.00	0.00	0.00	0.00
6,577.99	9.76	255.56	6,509.22	-204.29	-793.59	-206.50	0.00	0.00	0.00	0.00
Top 4-1/2" Liner @ 6577.99ft										
6,600.00	9.76	255.56	6,530.91	-205.22	-797.20	-207.44	0.00	0.00	0.00	0.00
6,677.99	9.76	255.56	6,607.77	-208.51	-810.00	-210.77	0.00	0.00	0.00	0.00
KOP @ 6677.99ft										
6,700.00	9.45	268.66	6,629.47	-209.02	-813.62	-211.29	10.00	-1.38	59.49	104.34
6,800.00	13.56	316.44	6,727.65	-200.70	-829.95	-203.02	10.00	4.10	47.78	91.43
6,900.00	21.82	335.54	6,822.92	-175.22	-845.76	-177.58	10.00	8.27	19.10	44.48
7,000.00	31.09	344.09	6,912.38	-133.36	-860.57	-135.76	10.00	9.27	8.54	26.21
DLS = 10.00/100ft										
7,100.00	40.69	348.94	6,993.31	-76.39	-873.94	-78.83	10.00	9.59	4.86	18.54
7,161.83	46.69	351.08	7,038.00	-34.35	-881.30	-36.81	10.00	9.71	3.46	14.59
Sharon Springs										
7,200.00	50.42	352.20	7,063.26	-6.04	-885.45	-8.52	10.00	9.76	2.93	13.04
7,204.31	50.84	352.32	7,066.00	-2.74	-885.90	-5.21	10.00	9.77	2.75	12.30
Niobrara A										
7,300.00	60.21	354.64	7,120.11	75.55	-894.75	73.05	10.00	9.80	2.43	12.23
7,400.00	70.05	356.64	7,162.11	165.90	-901.58	163.38	10.00	9.83	2.00	10.91
7,489.12	78.83	358.23	7,186.00	251.58	-905.39	249.05	10.00	9.85	1.77	10.06
Niobrara B Chalk										
7,500.00	79.90	358.41	7,188.01	262.27	-905.70	259.74	10.00	9.86	1.70	9.64
7,600.00	89.76	0.07	7,197.00	361.73	-907.01	359.19	10.00	9.86	1.66	9.60
7,605.27	90.28	0.16	7,197.00	367.00	-907.00	364.47	9.99	9.86	1.64	9.45
End Build @ 7605.27ft - Landing Target (Heel) - 7" - PETTINGER 30N-18HZ_tgt										
7,700.00	90.28	0.16	7,196.53	461.73	-906.74	459.19	0.00	0.00	0.00	9.45
7,800.00	90.28	0.16	7,196.03	561.72	-906.47	559.19	0.00	0.00	0.00	0.00
7,900.00	90.28	0.16	7,195.53	661.72	-906.19	659.19	0.00	0.00	0.00	0.00
8,000.00	90.28	0.16	7,195.04	761.72	-905.92	759.19	0.00	0.00	0.00	0.00
8,100.00	90.28	0.16	7,194.54	861.72	-905.65	859.19	0.00	0.00	0.00	0.00
8,200.00	90.28	0.16	7,194.04	961.72	-905.37	959.19	0.00	0.00	0.00	0.00
8,300.00	90.28	0.16	7,193.55	1,061.72	-905.10	1,059.18	0.00	0.00	0.00	0.00
8,400.00	90.28	0.16	7,193.05	1,161.71	-904.83	1,159.18	0.00	0.00	0.00	0.00
8,500.00	90.28	0.16	7,192.55	1,261.71	-904.55	1,259.18	0.00	0.00	0.00	0.00
8,600.00	90.28	0.16	7,192.05	1,361.71	-904.28	1,359.18	0.00	0.00	0.00	0.00
8,700.00	90.28	0.16	7,191.56	1,461.71	-904.01	1,459.18	0.00	0.00	0.00	0.00
8,800.00	90.28	0.16	7,191.06	1,561.71	-903.73	1,559.18	0.00	0.00	0.00	0.00
8,900.00	90.28	0.16	7,190.56	1,661.71	-903.46	1,659.18	0.00	0.00	0.00	0.00
9,000.00	90.28	0.16	7,190.07	1,761.70	-903.19	1,759.18	0.00	0.00	0.00	0.00
9,100.00	90.28	0.16	7,189.57	1,861.70	-902.91	1,859.17	0.00	0.00	0.00	0.00
9,200.00	90.28	0.16	7,189.07	1,961.70	-902.64	1,959.17	0.00	0.00	0.00	0.00
9,300.00	90.28	0.16	7,188.57	2,061.70	-902.37	2,059.17	0.00	0.00	0.00	0.00
9,400.00	90.28	0.16	7,188.08	2,161.70	-902.09	2,159.17	0.00	0.00	0.00	0.00

Plan Report for PETTINGER 30N-18HZ - Plan A0 - PERMIT

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)	Toolface Azimuth (°)
9,500.00	90.28	0.16	7,187.58	2,261.70	-901.82	2,259.17	0.00	0.00	0.00	0.00
9,600.00	90.28	0.16	7,187.08	2,361.69	-901.55	2,359.17	0.00	0.00	0.00	0.00
9,700.00	90.28	0.16	7,186.58	2,461.69	-901.27	2,459.17	0.00	0.00	0.00	0.00
9,800.00	90.28	0.16	7,186.09	2,561.69	-901.00	2,559.17	0.00	0.00	0.00	0.00
9,900.00	90.28	0.16	7,185.59	2,661.69	-900.73	2,659.16	0.00	0.00	0.00	0.00
10,000.00	90.28	0.16	7,185.09	2,761.69	-900.45	2,759.16	0.00	0.00	0.00	0.00
10,100.00	90.28	0.16	7,184.60	2,861.69	-900.18	2,859.16	0.00	0.00	0.00	0.00
10,200.00	90.28	0.16	7,184.10	2,961.68	-899.91	2,959.16	0.00	0.00	0.00	0.00
10,300.00	90.28	0.16	7,183.60	3,061.68	-899.63	3,059.16	0.00	0.00	0.00	0.00
10,400.00	90.28	0.16	7,183.10	3,161.68	-899.36	3,159.16	0.00	0.00	0.00	0.00
10,500.00	90.28	0.16	7,182.61	3,261.68	-899.09	3,259.16	0.00	0.00	0.00	0.00
10,600.00	90.28	0.16	7,182.11	3,361.68	-898.81	3,359.16	0.00	0.00	0.00	0.00
10,700.00	90.28	0.16	7,181.61	3,461.68	-898.54	3,459.15	0.00	0.00	0.00	0.00
10,800.00	90.28	0.16	7,181.12	3,561.68	-898.27	3,559.15	0.00	0.00	0.00	0.00
10,900.00	90.28	0.16	7,180.62	3,661.67	-897.99	3,659.15	0.00	0.00	0.00	0.00
11,000.00	90.28	0.16	7,180.12	3,761.67	-897.72	3,759.15	0.00	0.00	0.00	0.00
11,100.00	90.28	0.16	7,179.62	3,861.67	-897.45	3,859.15	0.00	0.00	0.00	0.00
11,200.00	90.28	0.16	7,179.13	3,961.67	-897.17	3,959.15	0.00	0.00	0.00	0.00
11,300.00	90.28	0.16	7,178.63	4,061.67	-896.90	4,059.15	0.00	0.00	0.00	0.00
11,400.00	90.28	0.16	7,178.13	4,161.67	-896.63	4,159.15	0.00	0.00	0.00	0.00
11,500.00	90.28	0.16	7,177.63	4,261.66	-896.35	4,259.14	0.00	0.00	0.00	0.00
11,600.00	90.28	0.16	7,177.14	4,361.66	-896.08	4,359.14	0.00	0.00	0.00	0.00
11,700.00	90.28	0.16	7,176.64	4,461.66	-895.81	4,459.14	0.00	0.00	0.00	0.00
11,800.00	90.28	0.16	7,176.14	4,561.66	-895.53	4,559.14	0.00	0.00	0.00	0.00
11,900.00	90.28	0.16	7,175.65	4,661.66	-895.26	4,659.14	0.00	0.00	0.00	0.00
12,000.00	90.28	0.16	7,175.15	4,761.66	-894.99	4,759.14	0.00	0.00	0.00	0.00
12,100.00	90.28	0.16	7,174.65	4,861.65	-894.71	4,859.14	0.00	0.00	0.00	0.00
12,200.00	90.28	0.16	7,174.15	4,961.65	-894.44	4,959.14	0.00	0.00	0.00	0.00
12,230.94	90.28	0.16	7,174.00	4,992.59	-894.35	4,990.08	0.00	0.00	0.00	0.00
Total Depth (Toe)										
12,230.95	90.28	0.16	7,174.00	4,992.60	-894.35	4,990.08	0.00	0.00	0.00	0.00
PETTINGER 30N-18HZ_BHL										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
1,500.00	1,500.00	0.00	0.00	Begin Nudge @ 1500.00ft
1,987.93	1,985.57	-10.33	-40.14	End Nudge @ 1987.93ft
6,577.99	6,509.22	-204.29	-793.59	Top 4-1/2" Liner @ 6577.99ft
6,677.99	6,607.77	-208.51	-810.00	KOP @ 6677.99ft
7,000.00	6,912.38	-133.36	-860.57	DLS = 10.00/100ft
7,605.27	7,197.00	367.00	-907.00	End Build @ 7605.27ft
12,230.95	7,174.00	4,992.60	-894.35	TD @ 12230.95ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	+E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	0.16	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	12,230.95	Plan A0 - PERMIT	MWD

Plan Report for PETTINGER 30N-18HZ - Plan A0 - PERMIT**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
1,180.00	1,180.00	9 5/8"	9-5/8	13-1/2
7,605.27	7,197.00	7"	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,218.63	4,184.00	Parkman		0.00	
4,602.18	4,562.00	Sussex		0.00	
7,161.83	7,038.00	Sharon Springs		0.00	
7,204.31	7,066.00	Niobrara A		0.00	
7,489.12	7,186.00	Niobrara B Chalk		0.00	
7,605.27	7,197.00	Landing Target (Heel)		0.00	
12,230.94	7,174.00	Total Depth (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
PETTINGER 30N-18HZ_SHL	0.00	0.00	0.00	Point
PETTINGER 30N-18HZ_BHL	7,174.00	4,992.60	-894.35	Point
PETTINGER 30N-18HZ_tgt	7,197.00	367.00	-907.00	Point
PETTINGER 30N-18HZ_Sec	0.00	0.00	0.00	Polygon

North Reference Sheet for Sec. 18-T1N-R65W - PETTINGER 30N-18HZ - Plan A0

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.
 Vertical Depths are relative to RKB = 17 @ 5024.00ft (Drilling Rig). Northing and Easting are relative to PETTINGER 30N-18HZ
 Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)
 Central Meridian is -105.50°, Longitude Origin:0.000000°, Latitude Origin:40.783333°
 False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996327

Grid Coordinates of Well: 1,260,177.45 ft N, 3,220,439.24 ft E
 Geographical Coordinates of Well: 40° 02' 41.60" N, 104° 42' 45.43" W
 Grid Convergence at Surface is: 0.51°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,230.95ft
 the Bottom Hole Displacement is 5,072.07ft in the Direction of 349.84° (True).

Magnetic Convergence at surface is: -8.05° (22 July 2013, , BGGM2013)

Magnetic Model: BGGM 2013
 Date: 22-Jul-13
 Declination: 8.55°
 Inclination/Dip: 66.69°
 Field Strength: 52657

Grid North is 0.51° East of True North (Grid Convergence)
 Magnetic North is 8.55° East of True North (Magnetic Declination)
 Magnetic North is 8.05° East of Grid North (Magnetic Convergence)

To convert a True Direction to a Grid Direction, Subtract 0.51°
 To convert a Magnetic Direction to a True Direction, Add 8.55° East
 To convert a Magnetic Direction to a Grid Direction, Add 8.05°