

Project: Weld County, CO (NAD 83)  
 Site: Sec. 18-T1N-R65W  
 Well: PETTINGER 27C-18HZ  
 Wellbore: Plan A0  
 Design: Plan A0 - PERMIT



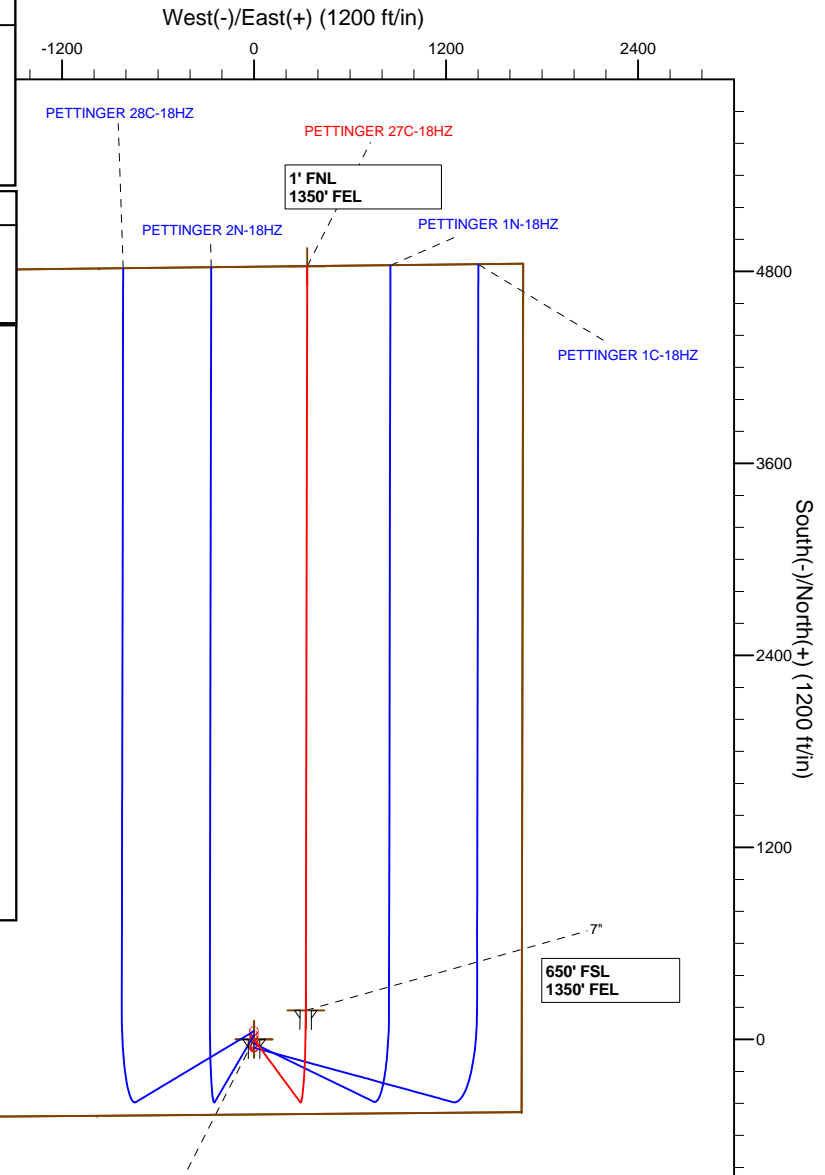
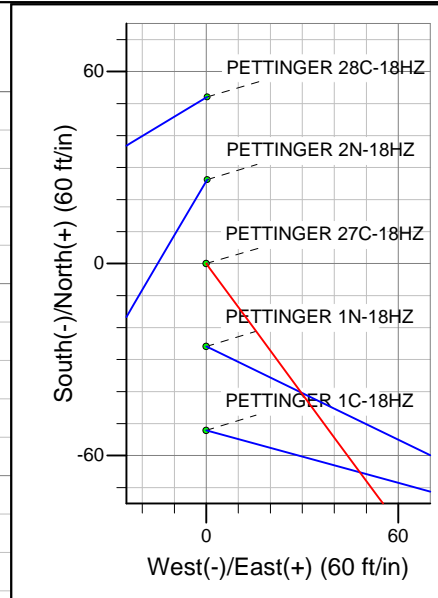
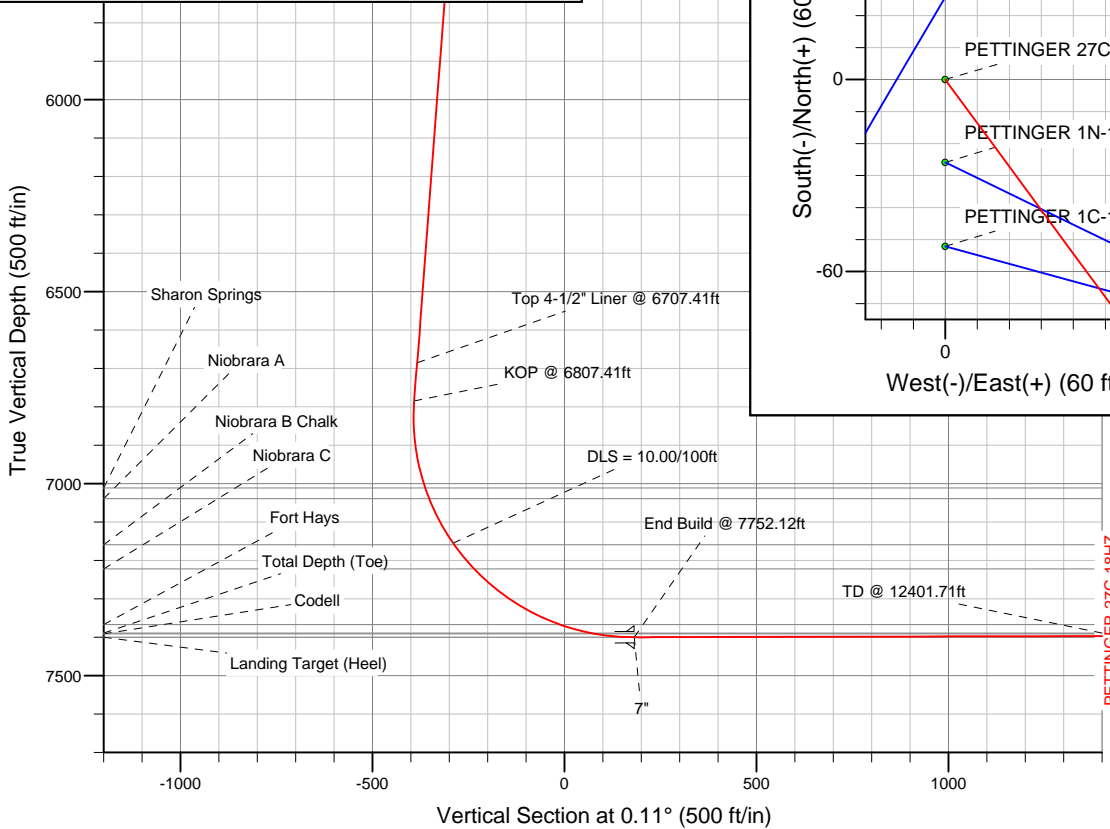
SECTION DETAILS

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	1769.73	5.39	143.64	1769.33	-10.22	7.52	2.00	143.64	-10.20	
4	6807.41	5.39	143.64	6784.70	-391.61	288.33	0.00	0.00	-391.05	
5	7752.12	90.14	0.11	7400.00	181.00	324.00	10.00	-143.40	181.62	PETTINGER 27C-18HZ_tgt
6	12402.71	90.14	0.11	7389.00	4831.57	332.55	0.00	0.00	4832.20	PETTINGER 27C-18HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
PETTINGER 27C-18HZ_Sec	0.00	0.00	0.00	40.045455	-104.703054	Polygon
PETTINGER 27C-18HZ_SHL	0.00	0.00	0.00	40.045455	-104.703054	Point
PETTINGER 27C-18HZ_BHL	7389.00	4831.57	332.55	40.058718	-104.701866	Point
PETTINGER 27C-18HZ_tgt	7400.00	181.00	324.00	40.045952	-104.701897	Point

MD	TVD	Notes
6707.41	6685.14	Top 4-1/2" Liner @ 6707.41ft
6807.41	6784.70	KOP @ 6807.41ft



WELL DETAILS: PETTINGER 27C-18HZ	
Ground Level:	4997.00
RKB = 17 @ 5014.00ft (Drilling Rig)	
Plan: Plan A0 - PERMIT (PETTINGER 27C-18HZ/Plan A0)	
Created By: Fred Hartmann Date: 07/22/2013	

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 18-T1N-R65W

PETTINGER 27C-18HZ

Plan A0

Plan: Plan A0 - PERMIT

## Sperry Drilling Services

# Proposal Report

22 July, 2013

Well Coordinates: 1,260,407.55 N, 3,223,115.47 E (40° 02' 43.64" N, 104° 42' 10.99" W)

Ground Level: 4,997.00 ft

Local Coordinate Origin: Centered on Well PETTINGER 27C-18HZ

Viewing Datum: RKB = 17 @ 5014.00ft (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 27C-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
1,170.00	0.00	0.00	1,170.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>9 5/8"</b>										
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
<b>Begin Nudge @ 1500.00ft</b>										
1,600.00	2.00	143.64	1,599.98	-1.41	1.03	-1.40	2.00	2.00	0.00	143.64
1,700.00	4.00	143.64	1,699.84	-5.62	4.14	-5.61	2.00	2.00	0.00	0.00
1,769.73	5.39	143.64	1,769.33	-10.22	7.52	-10.20	2.00	2.00	0.00	0.00
<b>End Nudge @ 1769.73ft</b>										
1,800.00	5.39	143.64	1,799.47	-12.51	9.21	-12.49	0.00	0.00	0.00	0.00
1,900.00	5.39	143.64	1,899.02	-20.08	14.78	-20.05	0.00	0.00	0.00	0.00
2,000.00	5.39	143.64	1,998.58	-27.65	20.36	-27.61	0.00	0.00	0.00	0.00
2,100.00	5.39	143.64	2,098.14	-35.22	25.93	-35.17	0.00	0.00	0.00	0.00
2,200.00	5.39	143.64	2,197.70	-42.79	31.51	-42.73	0.00	0.00	0.00	0.00
2,300.00	5.39	143.64	2,297.25	-50.36	37.08	-50.29	0.00	0.00	0.00	0.00
2,400.00	5.39	143.64	2,396.81	-57.93	42.66	-57.85	0.00	0.00	0.00	0.00
2,500.00	5.39	143.64	2,496.37	-65.50	48.23	-65.41	0.00	0.00	0.00	0.00
2,600.00	5.39	143.64	2,595.92	-73.08	53.80	-72.97	0.00	0.00	0.00	0.00
2,700.00	5.39	143.64	2,695.48	-80.65	59.38	-80.53	0.00	0.00	0.00	0.00
2,800.00	5.39	143.64	2,795.04	-88.22	64.95	-88.09	0.00	0.00	0.00	0.00
2,900.00	5.39	143.64	2,894.60	-95.79	70.53	-95.65	0.00	0.00	0.00	0.00
3,000.00	5.39	143.64	2,994.15	-103.36	76.10	-103.21	0.00	0.00	0.00	0.00
3,100.00	5.39	143.64	3,093.71	-110.93	81.67	-110.77	0.00	0.00	0.00	0.00
3,200.00	5.39	143.64	3,193.27	-118.50	87.25	-118.33	0.00	0.00	0.00	0.00
3,300.00	5.39	143.64	3,292.82	-126.07	92.82	-125.89	0.00	0.00	0.00	0.00
3,400.00	5.39	143.64	3,392.38	-133.64	98.40	-133.45	0.00	0.00	0.00	0.00
3,500.00	5.39	143.64	3,491.94	-141.21	103.97	-141.01	0.00	0.00	0.00	0.00
3,600.00	5.39	143.64	3,591.50	-148.78	109.54	-148.57	0.00	0.00	0.00	0.00
3,700.00	5.39	143.64	3,691.05	-156.35	115.12	-156.13	0.00	0.00	0.00	0.00
3,800.00	5.39	143.64	3,790.61	-163.92	120.69	-163.69	0.00	0.00	0.00	0.00
3,900.00	5.39	143.64	3,890.17	-171.49	126.27	-171.25	0.00	0.00	0.00	0.00
4,000.00	5.39	143.64	3,989.72	-179.07	131.84	-178.81	0.00	0.00	0.00	0.00
4,100.00	5.39	143.64	4,089.28	-186.64	137.42	-186.37	0.00	0.00	0.00	0.00
4,168.02	5.39	143.64	4,157.00	-191.79	141.21	-191.51	0.00	0.00	0.00	0.00
<b>Parkman</b>										
4,200.00	5.39	143.64	4,188.84	-194.21	142.99	-193.93	0.00	0.00	0.00	0.00
4,300.00	5.39	143.64	4,288.39	-201.78	148.56	-201.49	0.00	0.00	0.00	0.00
4,400.00	5.39	143.64	4,387.95	-209.35	154.14	-209.05	0.00	0.00	0.00	0.00
4,500.00	5.39	143.64	4,487.51	-216.92	159.71	-216.61	0.00	0.00	0.00	0.00
4,547.70	5.39	143.64	4,535.00	-220.53	162.37	-220.22	0.00	0.00	0.00	0.00
<b>Sussex</b>										
4,600.00	5.39	143.64	4,587.07	-224.49	165.29	-224.17	0.00	0.00	0.00	0.00
4,700.00	5.39	143.64	4,686.62	-232.06	170.86	-231.73	0.00	0.00	0.00	0.00
4,800.00	5.39	143.64	4,786.18	-239.63	176.43	-239.29	0.00	0.00	0.00	0.00

**Plan Report for PETTINGER 27C-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	5.39	143.64	4,885.74	-247.20	182.01	-246.85	0.00	0.00	0.00	0.00
5,000.00	5.39	143.64	4,985.29	-254.77	187.58	-254.41	0.00	0.00	0.00	0.00
5,100.00	5.39	143.64	5,084.85	-262.34	193.16	-261.97	0.00	0.00	0.00	0.00
5,200.00	5.39	143.64	5,184.41	-269.91	198.73	-269.53	0.00	0.00	0.00	0.00
5,300.00	5.39	143.64	5,283.97	-277.48	204.30	-277.09	0.00	0.00	0.00	0.00
5,400.00	5.39	143.64	5,383.52	-285.06	209.88	-284.65	0.00	0.00	0.00	0.00
5,500.00	5.39	143.64	5,483.08	-292.63	215.45	-292.21	0.00	0.00	0.00	0.00
5,600.00	5.39	143.64	5,582.64	-300.20	221.03	-299.77	0.00	0.00	0.00	0.00
5,700.00	5.39	143.64	5,682.19	-307.77	226.60	-307.33	0.00	0.00	0.00	0.00
5,800.00	5.39	143.64	5,781.75	-315.34	232.17	-314.89	0.00	0.00	0.00	0.00
5,900.00	5.39	143.64	5,881.31	-322.91	237.75	-322.45	0.00	0.00	0.00	0.00
6,000.00	5.39	143.64	5,980.87	-330.48	243.32	-330.01	0.00	0.00	0.00	0.00
6,100.00	5.39	143.64	6,080.42	-338.05	248.90	-337.57	0.00	0.00	0.00	0.00
6,200.00	5.39	143.64	6,179.98	-345.62	254.47	-345.13	0.00	0.00	0.00	0.00
6,300.00	5.39	143.64	6,279.54	-353.19	260.05	-352.69	0.00	0.00	0.00	0.00
6,400.00	5.39	143.64	6,379.09	-360.76	265.62	-360.25	0.00	0.00	0.00	0.00
6,500.00	5.39	143.64	6,478.65	-368.33	271.19	-367.81	0.00	0.00	0.00	0.00
6,600.00	5.39	143.64	6,578.21	-375.90	276.77	-375.37	0.00	0.00	0.00	0.00
6,700.00	5.39	143.64	6,677.76	-383.47	282.34	-382.93	0.00	0.00	0.00	0.00
6,707.41	5.39	143.64	6,685.14	-384.04	282.75	-383.49	0.00	0.00	0.00	0.00
<b>Top 4-1/2" Liner @ 6707.41ft</b>										
6,800.00	5.39	143.64	6,777.32	-391.05	287.92	-390.49	0.00	0.00	0.00	0.00
6,807.41	5.39	143.64	6,784.70	-391.61	288.33	-391.05	0.00	0.00	0.00	0.00
<b>KOP @ 6807.41ft</b>										
6,900.00	5.88	33.16	6,877.04	-391.14	293.51	-390.58	10.00	0.52	-119.31	-143.40
7,000.00	15.26	11.99	6,975.27	-373.94	299.06	-373.37	10.00	9.38	-21.17	-33.19
7,037.39	18.93	9.54	7,011.00	-363.14	301.09	-362.57	10.00	9.81	-6.56	-12.30
<b>Sharon Springs</b>										
7,067.27	21.88	8.15	7,039.00	-352.85	302.68	-352.27	10.00	9.87	-4.64	-9.95
<b>Niobrara A</b>										
7,100.00	25.12	6.99	7,069.01	-339.92	304.39	-339.33	10.00	9.90	-3.54	-8.65
7,200.00	35.05	4.70	7,155.44	-290.11	309.34	-289.51	10.00	9.94	-2.29	-7.59
<b>DLS = 10.00/100ft</b>										
7,204.36	35.49	4.63	7,159.00	-287.60	309.55	-287.00	10.00	9.95	-1.68	-5.60
<b>Niobrara B Chalk</b>										
7,286.15	43.63	3.49	7,222.00	-235.68	313.19	-235.08	10.00	9.96	-1.39	-5.54
<b>Niobrara C</b>										
7,300.00	45.01	3.33	7,231.91	-226.02	313.76	-225.42	10.00	9.97	-1.15	-4.66
7,400.00	54.99	2.37	7,296.11	-149.61	317.52	-149.00	10.00	9.97	-0.96	-4.55
7,500.00	64.97	1.62	7,346.08	-63.19	320.49	-62.57	10.00	9.98	-0.75	-3.92
7,555.20	70.48	1.25	7,367.00	-12.15	321.77	-11.53	10.00	9.98	-0.66	-3.55
<b>Fort Hays</b>										
7,600.00	74.95	0.98	7,380.31	30.61	322.60	31.23	10.00	9.98	-0.62	-3.41
7,648.99	79.84	0.69	7,391.00	78.40	323.29	79.02	10.00	9.98	-0.59	-3.33
<b>Codell</b>										
7,700.00	84.93	0.40	7,397.76	128.94	323.77	129.57	10.00	9.98	-0.57	-3.26
7,752.12	90.14	0.11	7,400.00	181.00	324.00	181.62	10.00	9.98	-0.56	-3.23
<b>End Build @ 7752.12ft - Landing Target (Heel) - 7" - PETTINGER 27C-18HZ_tgt</b>										
7,800.00	90.14	0.11	7,399.89	228.88	324.09	229.50	0.00	0.00	0.00	-3.21
7,900.00	90.14	0.11	7,399.65	328.88	324.27	329.50	0.00	0.00	0.00	0.00
8,000.00	90.14	0.11	7,399.41	428.88	324.46	429.50	0.00	0.00	0.00	0.00
8,100.00	90.14	0.11	7,399.18	528.88	324.64	529.50	0.00	0.00	0.00	0.00
8,200.00	90.14	0.11	7,398.94	628.88	324.82	629.50	0.00	0.00	0.00	0.00
8,300.00	90.14	0.11	7,398.70	728.88	325.01	729.50	0.00	0.00	0.00	0.00
8,400.00	90.14	0.11	7,398.47	828.87	325.19	829.50	0.00	0.00	0.00	0.00
8,500.00	90.14	0.11	7,398.23	928.87	325.37	929.50	0.00	0.00	0.00	0.00
8,600.00	90.14	0.11	7,397.99	1,028.87	325.56	1,029.50	0.00	0.00	0.00	0.00
8,700.00	90.14	0.11	7,397.76	1,128.87	325.74	1,129.50	0.00	0.00	0.00	0.00

**Plan Report for PETTINGER 27C-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 (°)
8,800.00	90.14	0.11	7,397.52	1,228.87	325.93	1,229.50	0.00	0.00	0.00	0.00
8,900.00	90.14	0.11	7,397.28	1,328.87	326.11	1,329.50	0.00	0.00	0.00	0.00
9,000.00	90.14	0.11	7,397.05	1,428.87	326.29	1,429.50	0.00	0.00	0.00	0.00
9,100.00	90.14	0.11	7,396.81	1,528.87	326.48	1,529.50	0.00	0.00	0.00	0.00
9,200.00	90.14	0.11	7,396.58	1,628.87	326.66	1,629.50	0.00	0.00	0.00	0.00
9,300.00	90.14	0.11	7,396.34	1,728.87	326.85	1,729.50	0.00	0.00	0.00	0.00
9,400.00	90.14	0.11	7,396.10	1,828.87	327.03	1,829.49	0.00	0.00	0.00	0.00
9,500.00	90.14	0.11	7,395.87	1,928.87	327.21	1,929.49	0.00	0.00	0.00	0.00
9,600.00	90.14	0.11	7,395.63	2,028.87	327.40	2,029.49	0.00	0.00	0.00	0.00
9,700.00	90.14	0.11	7,395.39	2,128.87	327.58	2,129.49	0.00	0.00	0.00	0.00
9,800.00	90.14	0.11	7,395.16	2,228.87	327.76	2,229.49	0.00	0.00	0.00	0.00
9,900.00	90.14	0.11	7,394.92	2,328.87	327.95	2,329.49	0.00	0.00	0.00	0.00
10,000.00	90.14	0.11	7,394.68	2,428.87	328.13	2,429.49	0.00	0.00	0.00	0.00
10,100.00	90.14	0.11	7,394.45	2,528.87	328.32	2,529.49	0.00	0.00	0.00	0.00
10,200.00	90.14	0.11	7,394.21	2,628.87	328.50	2,629.49	0.00	0.00	0.00	0.00
10,300.00	90.14	0.11	7,393.97	2,728.87	328.68	2,729.49	0.00	0.00	0.00	0.00
10,400.00	90.14	0.11	7,393.74	2,828.87	328.87	2,829.49	0.00	0.00	0.00	0.00
10,500.00	90.14	0.11	7,393.50	2,928.87	329.05	2,929.49	0.00	0.00	0.00	0.00
10,600.00	90.14	0.11	7,393.26	3,028.86	329.23	3,029.49	0.00	0.00	0.00	0.00
10,700.00	90.14	0.11	7,393.03	3,128.86	329.42	3,129.49	0.00	0.00	0.00	0.00
10,800.00	90.14	0.11	7,392.79	3,228.86	329.60	3,229.49	0.00	0.00	0.00	0.00
10,900.00	90.14	0.11	7,392.55	3,328.86	329.79	3,329.49	0.00	0.00	0.00	0.00
11,000.00	90.14	0.11	7,392.32	3,428.86	329.97	3,429.49	0.00	0.00	0.00	0.00
11,100.00	90.14	0.11	7,392.08	3,528.86	330.15	3,529.49	0.00	0.00	0.00	0.00
11,200.00	90.14	0.11	7,391.84	3,628.86	330.34	3,629.49	0.00	0.00	0.00	0.00
11,300.00	90.14	0.11	7,391.61	3,728.86	330.52	3,729.49	0.00	0.00	0.00	0.00
11,400.00	90.14	0.11	7,391.37	3,828.86	330.71	3,829.49	0.00	0.00	0.00	0.00
11,500.00	90.14	0.11	7,391.14	3,928.86	330.89	3,929.49	0.00	0.00	0.00	0.00
11,600.00	90.14	0.11	7,390.90	4,028.86	331.07	4,029.49	0.00	0.00	0.00	0.00
11,700.00	90.14	0.11	7,390.66	4,128.86	331.26	4,129.49	0.00	0.00	0.00	0.00
11,800.00	90.14	0.11	7,390.43	4,228.86	331.44	4,229.49	0.00	0.00	0.00	0.00
11,900.00	90.14	0.11	7,390.19	4,328.86	331.62	4,329.49	0.00	0.00	0.00	0.00
12,000.00	90.14	0.11	7,389.95	4,428.86	331.81	4,429.49	0.00	0.00	0.00	0.00
12,100.00	90.14	0.11	7,389.72	4,528.86	331.99	4,529.49	0.00	0.00	0.00	0.00
12,200.00	90.14	0.11	7,389.48	4,628.86	332.18	4,629.49	0.00	0.00	0.00	0.00
12,300.00	90.14	0.11	7,389.24	4,728.86	332.36	4,729.49	0.00	0.00	0.00	0.00
12,400.00	90.14	0.11	7,389.01	4,828.86	332.54	4,829.49	0.00	0.00	0.00	0.00
12,401.71	90.14	0.11	7,389.00	4,830.57	332.55	4,831.20	0.00	0.00	0.00	0.00
<b>TD @ 12401.71ft</b>										
12,402.71	90.14	0.11	7,389.00	4,831.57	332.55	4,832.20	0.00	0.00	0.00	0.00
<b>Total Depth (Toe) - PETTINGER 27C-18HZ_BHL</b>										

**Plan Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N-S (ft)	+E-W (ft)	
1,500.00	1,500.00	0.00	0.00	Begin Nudge @ 1500.00ft
1,769.73	1,769.33	-10.22	7.52	End Nudge @ 1769.73ft
6,707.41	6,685.14	-384.04	282.75	Top 4-1/2" Liner @ 6707.41ft
6,807.41	6,784.70	-391.61	288.33	KOP @ 6807.41ft
7,200.00	7,155.44	-290.11	309.34	DLS = 10.00/100ft
7,752.12	7,400.00	181.00	324.00	End Build @ 7752.12ft
12,401.71	7,389.00	4,830.57	332.55	TD @ 12401.71ft

**Plan Report for PETTINGER 27C-18HZ - Plan A0 - PERMIT****Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	0.11	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	12,402.71	Plan A0 - PERMIT	MWD

**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
1,170.00	1,170.00	9 5/8"	9-5/8	13-1/2
7,752.12	7,400.00	7"	7	8-3/4

**Formation Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,168.02	4,157.00	Parkman		0.00	
4,547.70	4,535.00	Sussex		0.00	
7,037.39	7,011.00	Sharon Springs		0.00	
7,067.27	7,039.00	Niobrara A		0.00	
7,204.36	7,159.00	Niobrara B Chalk		0.00	
7,286.15	7,222.00	Niobrara C		0.00	
7,555.20	7,367.00	Fort Hays		0.00	
7,648.99	7,391.00	Codell		0.00	
7,752.12	7,400.00	Landing Target (Heel)		0.00	
12,402.71	7,389.00	Total Depth (Toe)		0.00	

**Targets associated with this wellbore**

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
PETTINGER 27C-18HZ_BHL	7,389.00	4,831.57	332.55	Point
PETTINGER 27C-18HZ_tgt	7,400.00	181.00	324.00	Point
PETTINGER 27C-18HZ_Sec	0.00	0.00	0.00	Polygon
PETTINGER 27C-18HZ_SHL	0.00	0.00	0.00	Point

**North Reference Sheet for Sec. 18-T1N-R65W - PETTINGER 27C-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 @ 5014.00ft (Drilling Rig). Northing and Easting are relative to PETTINGER 27C-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: 0.99996323

Grid Coordinates of Well: 1,260,407.55 ft N, 3,223,115.47 ft E  
 Geographical Coordinates of Well: 40° 02' 43.64" N, 104° 42' 10.99" W  
 Grid Convergence at Surface is: 0.51°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,402.71ft  
 the Bottom Hole Displacement is 4,843.00ft in the Direction of 3.94° (True).

Magnetic Convergence at surface is: -8.03° (22 July 2013, , BGGM2013)

