

# US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N  
1N-66W-08 Gabel 2-8HZ Pad  
GABEL 15C-8HZ

Plan A

Plan: Permit Rev-1

## Sperry Drilling Services Proposal Report

17 June, 2015

Well Coordinates: 14,552,606.65 N, 1,696,800.04 E (40° 04' 15.16" N, 104° 47' 54.45" W)  
Ground Level: 4,938.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Centered on Well GABEL 15C-8HZ

RKB = 17' @ 4955.00usft (D Rig)

N

True

Dec-Deg - API - US Survey Feet - Custom

Version: 5000.1 Build: 73

**HALLIBURTON**

Project: WELD-NAD83-UTMFT13N  
Site: 1N-66W-08 Gabel 2-8HZ Pad  
Well: GABEL 15C-8HZ  
Wellbore: Plan A  
Design: Permit Rev-1



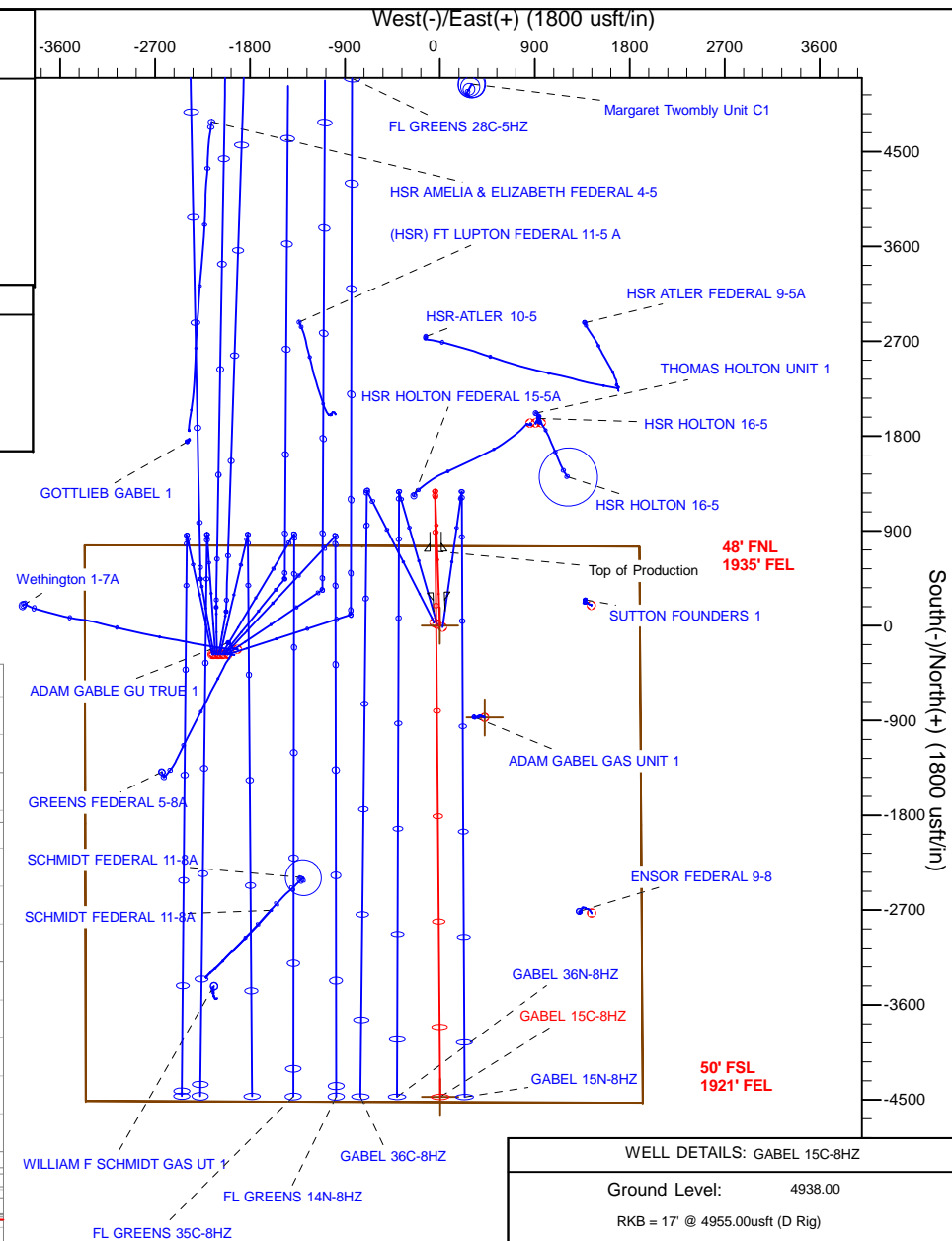
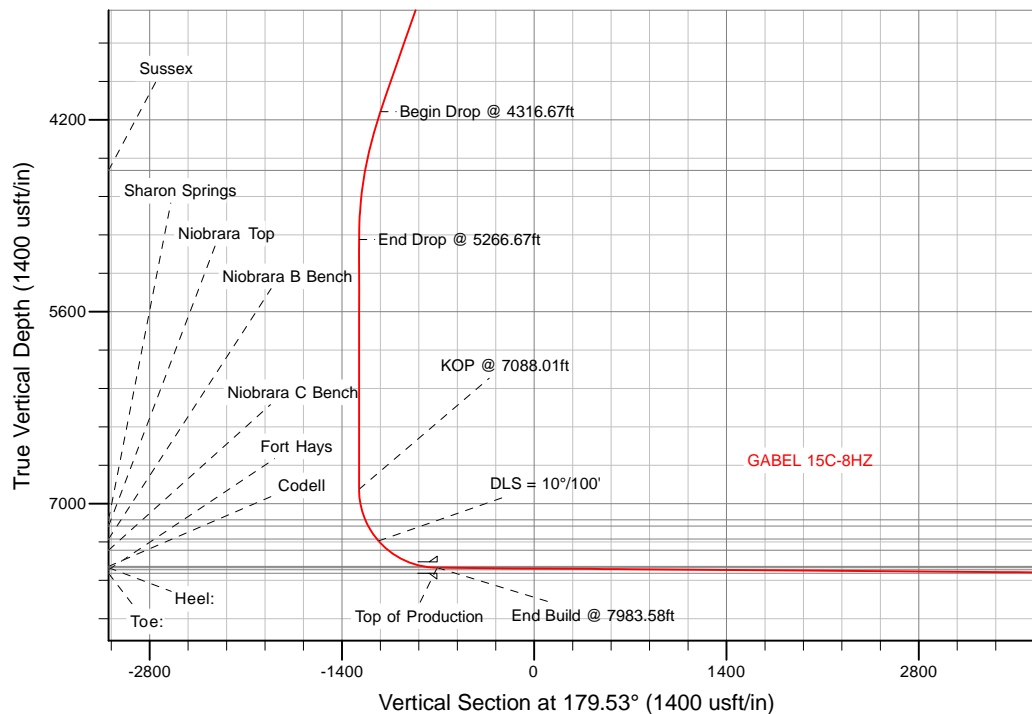
HALLIBURTON  
Sperry Drilling

#### 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	250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	
3	1516.67	19.00	358.00	1493.58	207.98	-7.26	1.50	358.00	-208.03	
4	4316.67	19.00	358.00	4141.03	1119.01	-39.08	0.00	0.00	-1119.30	
5	5266.67	0.00	0.00	5073.71	1275.00	-44.52	2.00	180.00	-1275.32	
6	7088.01	0.00	0.00	6895.05	1275.00	-44.52	0.00	0.00	-1275.32	
7	7983.58	89.56	179.53	7468.00	706.48	-39.82	10.00	179.53	-706.78	
8	13164.66	89.56	179.53	7508.00	-4474.26	3.08	0.00	0.00	4474.13	GABEL 15C-8HZ_Toe

#### WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
GABEL 15C-8HZ_SHL	0.00	0.00	0.00	40.070877	-104.798459	Point
GABEL 15C-8HZ_Toe	7508.00	-4474.26	3.08	40.058590	-104.798448	Point



#### WELL DETAILS: GABEL 15C-8HZ

Ground Level: 4938.00

RKB = 17' @ 4955.00usft (D Rig)

Plan: Permit Rev-1 (GABEL 15C-8HZ/Plan A)

Created By: Clint Eshelman Date: 6/17/2015  
Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_

## Plan Report for GABEL 15C-8HZ - Permit Rev-1

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>GABEL 15C-8HZ_SHL</b>										
8.00	0.00	0.00	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>1N-R66W-Sec. 8_Section Lines</b>										
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
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 250.00ft</b>										
300.00	0.75	358.00	300.00	0.33	-0.01	-0.33	1.50	1.50	0.00	358.00
400.00	2.25	358.00	399.96	2.94	-0.10	-2.94	1.50	1.50	0.00	0.00
500.00	3.75	358.00	499.82	8.17	-0.29	-8.18	1.50	1.50	0.00	0.00
600.00	5.25	358.00	599.51	16.01	-0.56	-16.02	1.50	1.50	0.00	0.00
700.00	6.75	358.00	698.96	26.46	-0.92	-26.47	1.50	1.50	0.00	0.00
800.00	8.25	358.00	798.10	39.50	-1.38	-39.51	1.50	1.50	0.00	0.00
900.00	9.75	358.00	896.87	55.14	-1.93	-55.15	1.50	1.50	0.00	0.00
1,000.00	11.25	358.00	995.19	73.35	-2.56	-73.37	1.50	1.50	0.00	0.00
1,100.00	12.75	358.00	1,093.00	94.13	-3.29	-94.15	1.50	1.50	0.00	0.00
1,200.00	14.25	358.00	1,190.24	117.46	-4.10	-117.49	1.50	1.50	0.00	0.00
1,300.00	15.75	358.00	1,286.83	143.32	-5.00	-143.36	1.50	1.50	0.00	0.00
1,400.00	17.25	358.00	1,382.71	171.71	-6.00	-171.75	1.50	1.50	0.00	0.00
1,414.98	17.47	358.00	1,397.00	176.17	-6.15	-176.22	1.50	1.50	0.00	0.00
<b>Fox Hills</b>										
1,500.00	18.75	358.00	1,477.81	202.59	-7.07	-202.64	1.50	1.50	0.00	0.00
1,516.67	19.00	358.00	1,493.58	207.98	-7.26	-208.03	1.50	1.50	0.00	0.00
<b>End Nudge @ 1516.67ft</b>										
1,600.00	19.00	358.00	1,572.37	235.09	-8.21	-235.15	0.00	0.00	0.00	0.00
1,700.00	19.00	358.00	1,666.92	267.63	-9.35	-267.70	0.00	0.00	0.00	0.00
1,800.00	19.00	358.00	1,761.48	300.17	-10.48	-300.24	0.00	0.00	0.00	0.00
1,840.74	19.00	358.00	1,800.00	313.42	-10.94	-313.50	0.00	0.00	0.00	0.00
<b>9 5/8"</b>										
1,900.00	19.00	358.00	1,856.03	332.70	-11.62	-332.79	0.00	0.00	0.00	0.00
2,000.00	19.00	358.00	1,950.58	365.24	-12.75	-365.33	0.00	0.00	0.00	0.00
2,100.00	19.00	358.00	2,045.13	397.78	-13.89	-397.88	0.00	0.00	0.00	0.00
2,200.00	19.00	358.00	2,139.68	430.31	-15.03	-430.42	0.00	0.00	0.00	0.00
2,300.00	19.00	358.00	2,234.23	462.85	-16.16	-462.97	0.00	0.00	0.00	0.00
2,400.00	19.00	358.00	2,328.79	495.39	-17.30	-495.51	0.00	0.00	0.00	0.00
2,500.00	19.00	358.00	2,423.34	527.92	-18.44	-528.06	0.00	0.00	0.00	0.00
2,600.00	19.00	358.00	2,517.89	560.46	-19.57	-560.60	0.00	0.00	0.00	0.00
2,700.00	19.00	358.00	2,612.44	593.00	-20.71	-593.15	0.00	0.00	0.00	0.00
2,800.00	19.00	358.00	2,706.99	625.53	-21.84	-625.69	0.00	0.00	0.00	0.00
2,900.00	19.00	358.00	2,801.55	658.07	-22.98	-658.24	0.00	0.00	0.00	0.00
3,000.00	19.00	358.00	2,896.10	690.61	-24.12	-690.78	0.00	0.00	0.00	0.00
3,100.00	19.00	358.00	2,990.65	723.15	-25.25	-723.33	0.00	0.00	0.00	0.00
3,200.00	19.00	358.00	3,085.20	755.68	-26.39	-755.87	0.00	0.00	0.00	0.00
3,300.00	19.00	358.00	3,179.75	788.22	-27.53	-788.42	0.00	0.00	0.00	0.00
3,400.00	19.00	358.00	3,274.31	820.76	-28.66	-820.96	0.00	0.00	0.00	0.00
3,500.00	19.00	358.00	3,368.86	853.29	-29.80	-853.51	0.00	0.00	0.00	0.00
3,600.00	19.00	358.00	3,463.41	885.83	-30.93	-886.05	0.00	0.00	0.00	0.00
3,700.00	19.00	358.00	3,557.96	918.37	-32.07	-918.60	0.00	0.00	0.00	0.00
3,800.00	19.00	358.00	3,652.51	950.90	-33.21	-951.15	0.00	0.00	0.00	0.00
3,900.00	19.00	358.00	3,747.06	983.44	-34.34	-983.69	0.00	0.00	0.00	0.00
4,000.00	19.00	358.00	3,841.62	1,015.98	-35.48	-1,016.24	0.00	0.00	0.00	0.00
4,100.00	19.00	358.00	3,936.17	1,048.52	-36.61	-1,048.78	0.00	0.00	0.00	0.00
4,200.00	19.00	358.00	4,030.72	1,081.05	-37.75	-1,081.33	0.00	0.00	0.00	0.00
4,300.00	19.00	358.00	4,125.27	1,113.59	-38.89	-1,113.87	0.00	0.00	0.00	0.00
4,316.67	19.00	358.00	4,141.03	1,119.01	-39.08	-1,119.30	0.00	0.00	0.00	0.00
<b>Begin Drop @ 4316.67ft</b>										

## Plan Report for GABEL 15C-8HZ - Permit Rev-1

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
4,400.00	17.33	358.00	4,220.21	1,144.98	-39.98	-1,145.27	2.00	-2.00	0.00	180.00
4,500.00	15.33	358.00	4,316.17	1,173.08	-40.96	-1,173.38	2.00	-2.00	0.00	180.00
4,600.00	13.33	358.00	4,413.05	1,197.82	-41.83	-1,198.12	2.00	-2.00	0.00	180.00
4,700.00	11.33	358.00	4,510.74	1,219.17	-42.57	-1,219.48	2.00	-2.00	0.00	180.00
4,760.32	10.13	358.00	4,570.00	1,230.39	-42.97	-1,230.70	2.00	-2.00	0.00	180.00
<b>Sussex</b>										
4,800.00	9.33	358.00	4,609.11	1,237.09	-43.20	-1,237.41	2.00	-2.00	0.00	180.00
4,900.00	7.33	358.00	4,708.05	1,251.58	-43.71	-1,251.89	2.00	-2.00	0.00	180.00
5,000.00	5.33	358.00	4,807.43	1,262.60	-44.09	-1,262.92	2.00	-2.00	0.00	180.00
5,100.00	3.33	358.00	4,907.14	1,270.15	-44.35	-1,270.47	2.00	-2.00	0.00	180.00
5,200.00	1.33	358.00	5,007.05	1,274.22	-44.50	-1,274.54	2.00	-2.00	0.00	180.00
5,266.67	0.00	0.00	5,073.72	1,275.00	-44.52	-1,275.32	2.00	-2.00	3.00	180.00
<b>End Drop @ 5266.67ft</b>										
5,300.00	0.00	0.00	5,107.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,207.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,307.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,407.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,507.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,607.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,707.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,807.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	5,907.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,007.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,107.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,207.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,307.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,407.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,507.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,607.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,707.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,807.05	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
7,088.01	0.00	0.00	6,895.06	1,275.00	-44.52	-1,275.32	0.00	0.00	0.00	0.00
<b>KOP @ 7088.01ft</b>										
7,100.00	1.20	179.53	6,907.05	1,274.87	-44.52	-1,275.19	10.00	10.00	1,497.29	179.53
7,200.00	11.20	179.53	7,006.34	1,264.08	-44.43	-1,264.41	10.00	10.00	0.00	0.00
7,300.00	21.20	179.53	7,102.24	1,236.22	-44.20	-1,236.54	10.00	10.00	0.00	0.00
7,318.31	23.03	179.53	7,119.20	1,229.33	-44.15	-1,229.65	10.00	10.00	0.00	0.00
<b>Sharon Springs</b>										
7,367.06	27.91	179.53	7,163.20	1,208.38	-43.97	-1,208.70	10.00	10.00	0.00	0.00
<b>Niobrara Top</b>										
7,400.00	31.20	179.53	7,191.86	1,192.13	-43.84	-1,192.45	10.00	10.00	0.00	0.00
7,483.37	39.54	179.53	7,259.78	1,143.92	-43.44	-1,144.24	10.00	10.00	0.00	0.00
<b>Niobrara B Bench</b>										
7,500.00	41.20	179.53	7,272.45	1,133.15	-43.35	-1,133.47	10.00	10.00	0.00	0.00
<b>DLS = 10°/100'</b>										
7,597.43	50.94	179.53	7,339.96	1,063.07	-42.77	-1,063.38	10.00	10.00	0.00	0.00
<b>Niobrara C Bench</b>										
7,600.00	51.20	179.53	7,341.58	1,061.07	-42.75	-1,061.38	10.00	10.00	0.00	0.00
7,700.00	61.20	179.53	7,397.14	978.08	-42.07	-978.39	10.00	10.00	0.00	0.00
7,800.00	71.20	179.53	7,437.44	886.70	-41.31	-887.01	10.00	10.00	0.00	0.00
7,876.70	78.87	179.53	7,457.23	812.66	-40.70	-812.97	10.00	10.00	0.00	0.00
<b>Codell</b>										
7,900.00	81.20	179.53	7,461.27	789.71	-40.51	-790.02	10.00	10.00	0.00	0.00
7,983.58	89.56	179.53	7,468.00	706.48	-39.82	-706.79	10.00	10.00	0.00	0.00
<b>End Build @ 7983.58ft - Heel: - Top of Production</b>										
8,000.00	89.56	179.53	7,468.12	690.06	-39.68	-690.37	0.00	0.00	0.00	0.00
8,100.00	89.56	179.53	7,468.89	590.07	-38.85	-590.37	0.00	0.00	0.00	0.00
8,134.83	89.56	179.53	7,469.16	555.24	-38.56	-555.54	0.00	0.00	0.00	0.00

## Plan Report for GABEL 15C-8HZ - Permit Rev-1

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
<b>GABEL 15C-8HZ_Heel</b>										
8,200.00	89.56	179.53	7,469.67	490.08	-38.03	-490.37	0.00	0.00	0.00	0.00
8,300.00	89.56	179.53	7,470.44	390.08	-37.20	-390.38	0.00	0.00	0.00	0.00
8,400.00	89.56	179.53	7,471.21	290.09	-36.37	-290.38	0.00	0.00	0.00	0.00
8,500.00	89.56	179.53	7,471.98	190.10	-35.54	-190.38	0.00	0.00	0.00	0.00
8,600.00	89.56	179.53	7,472.76	90.10	-34.71	-90.38	0.00	0.00	0.00	0.00
8,700.00	89.56	179.53	7,473.53	-9.89	-33.89	9.61	0.00	0.00	0.00	0.00
8,800.00	89.56	179.53	7,474.30	-109.88	-33.06	109.61	0.00	0.00	0.00	0.00
8,900.00	89.56	179.53	7,475.07	-209.88	-32.23	209.61	0.00	0.00	0.00	0.00
9,000.00	89.56	179.53	7,475.84	-309.87	-31.40	309.60	0.00	0.00	0.00	0.00
9,100.00	89.56	179.53	7,476.62	-409.86	-30.57	409.60	0.00	0.00	0.00	0.00
9,200.00	89.56	179.53	7,477.39	-509.86	-29.75	509.60	0.00	0.00	0.00	0.00
9,300.00	89.56	179.53	7,478.16	-609.85	-28.92	609.59	0.00	0.00	0.00	0.00
9,400.00	89.56	179.53	7,478.93	-709.85	-28.09	709.59	0.00	0.00	0.00	0.00
9,500.00	89.56	179.53	7,479.70	-809.84	-27.26	809.59	0.00	0.00	0.00	0.00
9,600.00	89.56	179.53	7,480.48	-909.83	-26.43	909.59	0.00	0.00	0.00	0.00
9,700.00	89.56	179.53	7,481.25	-1,009.83	-25.61	1,009.58	0.00	0.00	0.00	0.00
9,800.00	89.56	179.53	7,482.02	-1,109.82	-24.78	1,109.58	0.00	0.00	0.00	0.00
9,900.00	89.56	179.53	7,482.79	-1,209.81	-23.95	1,209.58	0.00	0.00	0.00	0.00
9,921.92	89.56	179.53	7,482.96	-1,231.73	-23.77	1,231.50	0.00	0.00	0.00	0.00
<b>Fort Hays</b>										
10,000.00	89.56	179.53	7,483.56	-1,309.81	-23.12	1,309.57	0.00	0.00	0.00	0.00
10,100.00	89.56	179.53	7,484.34	-1,409.80	-22.30	1,409.57	0.00	0.00	0.00	0.00
10,200.00	89.56	179.53	7,485.11	-1,509.79	-21.47	1,509.57	0.00	0.00	0.00	0.00
10,300.00	89.56	179.53	7,485.88	-1,609.79	-20.64	1,609.56	0.00	0.00	0.00	0.00
10,400.00	89.56	179.53	7,486.65	-1,709.78	-19.81	1,709.56	0.00	0.00	0.00	0.00
10,500.00	89.56	179.53	7,487.43	-1,809.78	-18.98	1,809.56	0.00	0.00	0.00	0.00
10,600.00	89.56	179.53	7,488.20	-1,909.77	-18.16	1,909.56	0.00	0.00	0.00	0.00
10,700.00	89.56	179.53	7,488.97	-2,009.76	-17.33	2,009.55	0.00	0.00	0.00	0.00
10,800.00	89.56	179.53	7,489.74	-2,109.76	-16.50	2,109.55	0.00	0.00	0.00	0.00
10,900.00	89.56	179.53	7,490.51	-2,209.75	-15.67	2,209.55	0.00	0.00	0.00	0.00
11,000.00	89.56	179.53	7,491.29	-2,309.74	-14.84	2,309.54	0.00	0.00	0.00	0.00
11,100.00	89.56	179.53	7,492.06	-2,409.74	-14.02	2,409.54	0.00	0.00	0.00	0.00
11,200.00	89.56	179.53	7,492.83	-2,509.73	-13.19	2,509.54	0.00	0.00	0.00	0.00
11,300.00	89.56	179.53	7,493.60	-2,609.72	-12.36	2,609.53	0.00	0.00	0.00	0.00
11,400.00	89.56	179.53	7,494.37	-2,709.72	-11.53	2,709.53	0.00	0.00	0.00	0.00
11,500.00	89.56	179.53	7,495.15	-2,809.71	-10.71	2,809.53	0.00	0.00	0.00	0.00
11,600.00	89.56	179.53	7,495.92	-2,909.70	-9.88	2,909.53	0.00	0.00	0.00	0.00
11,700.00	89.56	179.53	7,496.69	-3,009.70	-9.05	3,009.52	0.00	0.00	0.00	0.00
11,800.00	89.56	179.53	7,497.46	-3,109.69	-8.22	3,109.52	0.00	0.00	0.00	0.00
11,900.00	89.56	179.53	7,498.24	-3,209.69	-7.39	3,209.52	0.00	0.00	0.00	0.00
12,000.00	89.56	179.53	7,499.01	-3,309.68	-6.57	3,309.51	0.00	0.00	0.00	0.00
12,100.00	89.56	179.53	7,499.78	-3,409.67	-5.74	3,409.51	0.00	0.00	0.00	0.00
12,200.00	89.56	179.53	7,500.55	-3,509.67	-4.91	3,509.51	0.00	0.00	0.00	0.00
12,300.00	89.56	179.53	7,501.32	-3,609.66	-4.08	3,609.51	0.00	0.00	0.00	0.00
12,400.00	89.56	179.53	7,502.10	-3,709.65	-3.25	3,709.50	0.00	0.00	0.00	0.00
12,500.00	89.56	179.53	7,502.87	-3,809.65	-2.43	3,809.50	0.00	0.00	0.00	0.00
12,600.00	89.56	179.53	7,503.64	-3,909.64	-1.60	3,909.50	0.00	0.00	0.00	0.00
12,700.00	89.56	179.53	7,504.41	-4,009.63	-0.77	4,009.49	0.00	0.00	0.00	0.00
12,800.00	89.56	179.53	7,505.18	-4,109.63	0.06	4,109.49	0.00	0.00	0.00	0.00
12,900.00	89.56	179.53	7,505.96	-4,209.62	0.89	4,209.49	0.00	0.00	0.00	0.00
13,000.00	89.56	179.53	7,506.73	-4,309.62	1.71	4,309.48	0.00	0.00	0.00	0.00
13,100.00	89.56	179.53	7,507.50	-4,409.61	2.54	4,409.48	0.00	0.00	0.00	0.00
13,164.65	89.56	179.53	7,508.00	-4,474.25	3.08	4,474.13	0.00	0.00	0.00	0.00
<b>Toe:</b>										
13,164.66	89.56	179.53	7,508.00	-4,474.26	3.08	4,474.13	0.00	0.00	0.00	0.00
<b>TD Well @ 13164.66ft - GABEL 15C-8HZ_Toe</b>										

**Plan Report for GABEL 15C-8HZ - Permit Rev-1****Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
250.00	250.00	0.00	0.00	Begin Nudge @ 250.00ft
1,516.67	1,493.58	207.98	-7.26	End Nudge @ 1516.67ft
4,316.67	4,141.03	1,119.01	-39.08	Begin Drop @ 4316.67ft
5,266.67	5,073.72	1,275.00	-44.52	End Drop @ 5266.67ft
7,088.01	6,895.06	1,275.00	-44.52	KOP @ 7088.01ft
7,500.00	7,272.45	1,133.15	-43.35	DLS = 10°/100'
7,983.58	7,468.00	706.48	-39.82	End Build @ 7983.58ft
13,164.66	7,508.00	-4,474.26	3.08	TD Well @ 13164.66ft

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	179.53	Slot	0.00	0.00	0.00

**Survey tool program**

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,983.58	Permit Rev-1	APC_ISCWSA REV 2 MWD+IFR1
7,983.58	13,164.66	Permit Rev-1	APC_ISCWSA REV 2 MWD+IFR1

**Casing Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,840.74	1,800.00	9 5/8"	9-5/8	13-1/2
7,983.58	7,468.00	Top of Production	5-1/2	7-7/8

**Formation Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,414.98	1,397.00	Fox Hills		0.00	
4,760.32	4,570.00	Sussex		0.00	
7,318.31	7,119.20	Sharon Springs		0.00	
7,367.06	7,163.20	Niobrara Top		0.00	
7,483.37	7,259.78	Niobrara B Bench		0.00	
7,597.43	7,339.96	Niobrara C Bench		0.00	
7,876.70	7,457.23	Codell		0.00	
7,983.58	7,468.00	Heel:		0.00	
9,921.92	7,482.96	Fort Hays		0.00	
13,164.65	7,508.00	Toe:		0.00	

**Plan Report for GABEL 15C-8HZ - Permit Rev-1**

***Targets associated with this wellbore***

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
GABEL 15C-8HZ_SHL	0.00	0.00	0.00	Point
1N-R66W-Sec. 8_Section Lines	8.00	-872.13	425.81	Polygon
GABEL 15C-8HZ_Heel	7,468.00	555.32	-27.70	Point
GABEL 15C-8HZ_Toe	7,508.00	-4,474.26	3.08	Point

**Directional Difficulty Index**

Average Dogleg over Survey:	0.95 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 7,949.08 usft
Net Tortousity applicable to Plans:	0.95 °/100usft	Directional Difficulty Index:	6.305

**Audit Info**

**North Reference Sheet for 1N-66W-08 Gabel 2-8HZ Pad - GABEL 15C-8HZ - Plan A**

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' @ 4955.00usft (D Rig). Northing and Easting are relative to GABEL 15C-8HZ

Coordinate System is Universal Transverse Mercator (US Survey Feet), Zone 13N (108 W to 102 W) using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is -105.00°, Longitude Origin:0.000000°, Latitude Origin:0.000000°

False Easting: 1,640,416.67usft, False Northing: 0.00usft, Scale Reduction: 0.99960364

Grid Coordinates of Well: 14,552,606.65 usft N, 1,696,800.04 usft E

Geographical Coordinates of Well: 40° 04' 15.16" N, 104° 47' 54.45" W

Grid Convergence at Surface is: 0.13°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,164.66usft the Bottom Hole Displacement is 4,474.26usft in the Direction of 179.96° ( True).

Magnetic Convergence at surface is: -8.19° (17 June 2015, , IGRF2010)

