

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

1N-66W-09 Highlands 1-9HZ Pad

HIGHLANDS 16C-9HZ

Plan A

Plan: Permit Rev-1

Sperry Drilling Services Proposal Report

18 May, 2015

Well Coordinates: 14,553,012.80 N, 1,702,953.53 E (40° 04' 19.03" N, 104° 46' 35.26" W)

Ground Level: 4,998.00 usft

Local Coordinate Origin:

Centered on Well HIGHLANDS 16C-9HZ

Viewing Datum:

RKB = 17' @ 5015.00usft (D Rig)

TVDs to System:

N

North Reference:

True

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Version: 5000.1 Build: 70

HALLIBURTON

Project: WELD-NAD83-UTMFT13N

Site: 1N-66W-09 Highlands 1-9HZ Pad

Well: HIGHLANDS 16C-9HZ

Wellbore: Plan A

Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

HALLIBURTON

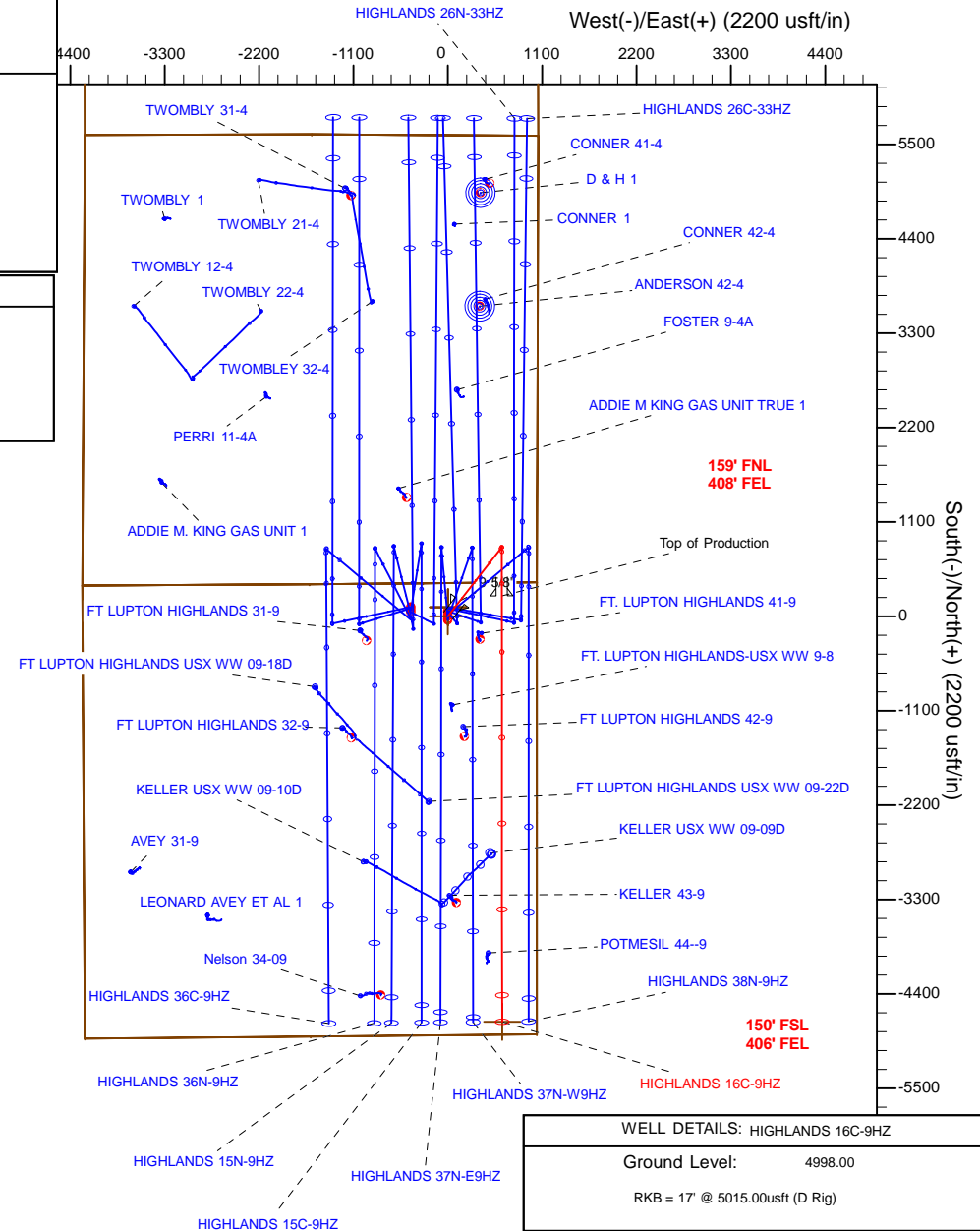
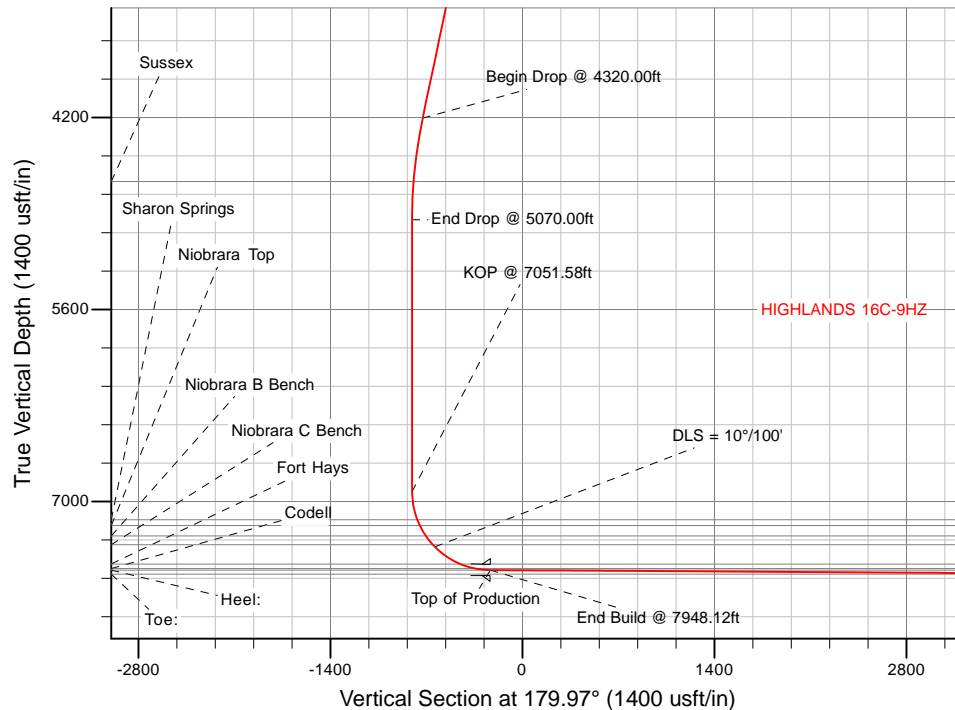
Sperry Drilling

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	1250.00	15.00	38.00	1238.62	102.56	80.13	1.50	38.00	-102.52	
4	4320.00	15.00	38.00	4204.01	728.70	569.32	0.00	0.00	-728.40	
5	5070.00	0.00	0.00	4945.47	805.62	629.42	2.00	180.00	-805.29	
6	7051.58	0.00	0.00	6927.05	805.62	629.42	0.00	0.00	-805.29	
7	7948.12	89.65	179.97	7500.00	236.12	629.69	10.00	179.97	-235.79	
8	12910.21	89.65	179.97	7530.00	-4725.88	632.09	0.00	0.00	4726.21	HIGHLANDS 16C-9HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HIGHLANDS 16C-9HZ_SHL	0.00	0.00	0.00	40.071952	-104.776460
HIGHLANDS 16C-9HZ_BHL	7530.00	-4725.88	632.09	40.058974	-104.774201



WELL DETAILS: HIGHLANDS 16C-9HZ

Ground Level: 4998.00

RKB = 17' @ 5015.00usft (D Rig)

Plan: Permit Rev-1 (HIGHLANDS 16C-9HZ/Plan A)

Created By: Clint Eshelman

Date: 5/19/2015

Reviewed:

Date:

Plan Report for HIGHLANDS 16C-9HZ - 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
1N-R66W-Sec. 9_Section Lines - HIGHLANDS 16C-9HZ_SHL - 2N-R66W-Sec. 33_Section Lines - 1N-R66W-Sec. 4_Section Lines										
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
Begin Nudge @ 250.00ft										
300.00	0.75	38.00	300.00	0.26	0.20	-0.26	1.50	1.50	0.00	38.00
400.00	2.25	38.00	399.96	2.32	1.81	-2.32	1.50	1.50	0.00	0.00
500.00	3.75	38.00	499.82	6.44	5.04	-6.44	1.50	1.50	0.00	0.00
600.00	5.25	38.00	599.51	12.63	9.87	-12.62	1.50	1.50	0.00	0.00
700.00	6.75	38.00	698.96	20.86	16.30	-20.86	1.50	1.50	0.00	0.00
800.00	8.25	38.00	798.10	31.15	24.34	-31.14	1.50	1.50	0.00	0.00
900.00	9.75	38.00	896.87	43.48	33.97	-43.46	1.50	1.50	0.00	0.00
1,000.00	11.25	38.00	995.19	57.84	45.19	-57.81	1.50	1.50	0.00	0.00
1,100.00	12.75	38.00	1,093.00	74.22	57.99	-74.19	1.50	1.50	0.00	0.00
1,200.00	14.25	38.00	1,190.24	92.61	72.36	-92.58	1.50	1.50	0.00	0.00
1,250.00	15.00	38.00	1,238.62	102.56	80.13	-102.52	1.50	1.50	0.00	0.00
End Nudge @ 1250.00ft										
1,300.00	15.00	38.00	1,286.91	112.76	88.10	-112.71	0.00	0.00	0.00	0.00
1,400.00	15.00	38.00	1,383.50	133.16	104.03	-133.10	0.00	0.00	0.00	0.00
1,488.51	15.00	38.00	1,469.00	151.21	118.14	-151.15	0.00	0.00	0.00	0.00
Fox Hills										
1,500.00	15.00	38.00	1,480.10	153.55	119.97	-153.49	0.00	0.00	0.00	0.00
1,600.00	15.00	38.00	1,576.69	173.95	135.90	-173.87	0.00	0.00	0.00	0.00
1,624.13	15.00	38.00	1,600.00	178.87	139.75	-178.79	0.00	0.00	0.00	0.00
9 5/8"										
1,700.00	15.00	38.00	1,673.28	194.34	151.84	-194.26	0.00	0.00	0.00	0.00
1,800.00	15.00	38.00	1,769.88	214.74	167.77	-214.65	0.00	0.00	0.00	0.00
1,900.00	15.00	38.00	1,866.47	235.13	183.70	-235.04	0.00	0.00	0.00	0.00
2,000.00	15.00	38.00	1,963.06	255.53	199.64	-255.42	0.00	0.00	0.00	0.00
2,100.00	15.00	38.00	2,059.65	275.92	215.57	-275.81	0.00	0.00	0.00	0.00
2,200.00	15.00	38.00	2,156.25	296.32	231.51	-296.20	0.00	0.00	0.00	0.00
2,300.00	15.00	38.00	2,252.84	316.71	247.44	-316.58	0.00	0.00	0.00	0.00
2,400.00	15.00	38.00	2,349.43	337.11	263.38	-336.97	0.00	0.00	0.00	0.00
2,500.00	15.00	38.00	2,446.02	357.50	279.31	-357.36	0.00	0.00	0.00	0.00
2,600.00	15.00	38.00	2,542.62	377.90	295.25	-377.74	0.00	0.00	0.00	0.00
2,700.00	15.00	38.00	2,639.21	398.29	311.18	-398.13	0.00	0.00	0.00	0.00
2,800.00	15.00	38.00	2,735.80	418.69	327.12	-418.52	0.00	0.00	0.00	0.00
2,900.00	15.00	38.00	2,832.39	439.08	343.05	-438.90	0.00	0.00	0.00	0.00
3,000.00	15.00	38.00	2,928.99	459.48	358.98	-459.29	0.00	0.00	0.00	0.00
3,100.00	15.00	38.00	3,025.58	479.87	374.92	-479.68	0.00	0.00	0.00	0.00
3,200.00	15.00	38.00	3,122.17	500.27	390.85	-500.06	0.00	0.00	0.00	0.00
3,300.00	15.00	38.00	3,218.76	520.66	406.79	-520.45	0.00	0.00	0.00	0.00
3,400.00	15.00	38.00	3,315.36	541.06	422.72	-540.84	0.00	0.00	0.00	0.00
3,500.00	15.00	38.00	3,411.95	561.45	438.66	-561.23	0.00	0.00	0.00	0.00
3,600.00	15.00	38.00	3,508.54	581.85	454.59	-581.61	0.00	0.00	0.00	0.00
3,700.00	15.00	38.00	3,605.13	602.25	470.53	-602.00	0.00	0.00	0.00	0.00
3,800.00	15.00	38.00	3,701.73	622.64	486.46	-622.39	0.00	0.00	0.00	0.00
3,900.00	15.00	38.00	3,798.32	643.04	502.39	-642.77	0.00	0.00	0.00	0.00
4,000.00	15.00	38.00	3,894.91	663.43	518.33	-663.16	0.00	0.00	0.00	0.00
4,100.00	15.00	38.00	3,991.50	683.83	534.26	-683.55	0.00	0.00	0.00	0.00
4,200.00	15.00	38.00	4,088.10	704.22	550.20	-703.93	0.00	0.00	0.00	0.00
4,300.00	15.00	38.00	4,184.69	724.62	566.13	-724.32	0.00	0.00	0.00	0.00
4,320.00	15.00	38.00	4,204.01	728.70	569.32	-728.40	0.00	0.00	0.00	0.00
Begin Drop @ 4320.00ft										
4,400.00	13.40	38.00	4,281.56	744.16	581.40	-743.86	2.00	-2.00	0.00	180.00
4,500.00	11.40	38.00	4,379.22	761.08	594.62	-760.77	2.00	-2.00	0.00	180.00
4,600.00	9.40	38.00	4,477.58	775.30	605.73	-774.99	2.00	-2.00	0.00	180.00

Plan Report for HIGHLANDS 16C-9HZ - 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 (°)
4,700.00	7.40	38.00	4,576.50	786.82	614.73	-786.49	2.00	-2.00	0.00	180.00
4,790.08	5.60	38.00	4,666.00	794.85	621.00	-794.52	2.00	-2.00	0.00	180.00
Sussex										
4,800.00	5.40	38.00	4,675.87	795.60	621.59	-795.27	2.00	-2.00	0.00	-180.00
4,900.00	3.40	38.00	4,775.57	801.64	626.31	-801.32	2.00	-2.00	0.00	180.00
5,000.00	1.40	38.00	4,875.48	804.94	628.89	-804.61	2.00	-2.00	0.00	180.00
5,070.00	0.00	0.00	4,945.47	805.62	629.42	-805.29	2.00	-2.00	0.00	-180.00
End Drop @ 5070.00ft										
5,100.00	0.00	0.00	4,975.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,075.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,175.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,275.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,375.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,475.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,575.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,675.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,775.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,875.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	5,975.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,075.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,175.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,275.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,375.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,475.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,575.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,675.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,775.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,875.47	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
7,051.58	0.00	0.00	6,927.05	805.62	629.42	-805.29	0.00	0.00	0.00	0.00
KOP @ 7051.58ft										
7,100.00	4.84	179.97	6,975.41	803.57	629.42	-803.24	10.00	10.00	0.00	179.97
7,200.00	14.84	179.97	7,073.82	786.50	629.43	-786.17	10.00	10.00	0.00	0.00
7,262.79	21.12	179.97	7,133.51	767.13	629.44	-766.80	10.00	10.00	0.00	0.00
Sharon Springs										
7,300.00	24.84	179.97	7,167.76	752.60	629.44	-752.27	10.00	10.00	0.00	0.00
7,307.46	25.59	179.97	7,174.51	749.42	629.44	-749.09	10.00	10.00	0.00	0.00
Niobrara Top										
7,395.84	34.43	179.97	7,250.96	705.27	629.47	-704.94	10.00	10.00	0.00	0.00
Niobrara B Bench										
7,400.00	34.84	179.97	7,254.39	702.90	629.47	-702.57	10.00	10.00	0.00	0.00
7,477.06	42.55	179.97	7,314.49	654.76	629.49	-654.43	10.00	10.00	0.00	0.00
Niobrara C Bench										
7,500.00	44.84	179.97	7,331.07	638.92	629.50	-638.59	10.00	10.00	0.00	0.00
DLS = 10°/100'										
7,600.00	54.84	179.97	7,395.48	562.59	629.53	-562.26	10.00	10.00	0.00	0.00
7,700.00	64.84	179.97	7,445.66	476.23	629.58	-475.90	10.00	10.00	0.00	0.00
7,726.84	67.53	179.97	7,456.49	451.69	629.59	-451.36	10.00	10.00	0.00	0.00
Fort Hays										
7,800.00	74.84	179.97	7,480.07	382.48	629.62	-382.15	10.00	10.00	0.00	0.00
7,839.33	78.78	179.97	7,489.05	344.19	629.64	-343.86	10.00	10.00	0.00	0.00
Codell										
7,900.00	84.84	179.97	7,497.69	284.17	629.67	-283.84	10.00	10.00	0.00	0.00
7,948.12	89.65	179.97	7,500.00	236.12	629.69	-235.79	10.00	10.00	0.00	0.00
End Build @ 7948.12ft - Heel: - Top of Production										
8,000.00	89.65	179.97	7,500.31	184.24	629.72	-183.91	0.00	0.00	0.00	0.00
8,100.00	89.65	179.97	7,500.92	84.24	629.77	-83.91	0.00	0.00	0.00	0.00
8,200.00	89.65	179.97	7,501.52	-15.76	629.81	16.09	0.00	0.00	0.00	0.00
8,300.00	89.65	179.97	7,502.13	-115.75	629.86	116.08	0.00	0.00	0.00	0.00

Plan Report for HIGHLANDS 16C-9HZ - 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 (°)
8,400.00	89.65	179.97	7,502.73	-215.75	629.91	216.08	0.00	0.00	0.00	0.00
8,500.00	89.65	179.97	7,503.33	-315.75	629.96	316.08	0.00	0.00	0.00	0.00
8,600.00	89.65	179.97	7,503.94	-415.75	630.01	416.08	0.00	0.00	0.00	0.00
8,700.00	89.65	179.97	7,504.54	-515.75	630.06	516.08	0.00	0.00	0.00	0.00
8,800.00	89.65	179.97	7,505.15	-615.74	630.10	616.07	0.00	0.00	0.00	0.00
8,900.00	89.65	179.97	7,505.75	-715.74	630.15	716.07	0.00	0.00	0.00	0.00
9,000.00	89.65	179.97	7,506.36	-815.74	630.20	816.07	0.00	0.00	0.00	0.00
9,100.00	89.65	179.97	7,506.96	-915.74	630.25	916.07	0.00	0.00	0.00	0.00
9,200.00	89.65	179.97	7,507.57	-1,015.74	630.30	1,016.07	0.00	0.00	0.00	0.00
9,300.00	89.65	179.97	7,508.17	-1,115.74	630.35	1,116.07	0.00	0.00	0.00	0.00
9,400.00	89.65	179.97	7,508.78	-1,215.73	630.39	1,216.06	0.00	0.00	0.00	0.00
9,500.00	89.65	179.97	7,509.38	-1,315.73	630.44	1,316.06	0.00	0.00	0.00	0.00
9,600.00	89.65	179.97	7,509.99	-1,415.73	630.49	1,416.06	0.00	0.00	0.00	0.00
9,700.00	89.65	179.97	7,510.59	-1,515.73	630.54	1,516.06	0.00	0.00	0.00	0.00
9,800.00	89.65	179.97	7,511.19	-1,615.73	630.59	1,616.06	0.00	0.00	0.00	0.00
9,900.00	89.65	179.97	7,511.80	-1,715.72	630.64	1,716.05	0.00	0.00	0.00	0.00
10,000.00	89.65	179.97	7,512.40	-1,815.72	630.68	1,816.05	0.00	0.00	0.00	0.00
10,100.00	89.65	179.97	7,513.01	-1,915.72	630.73	1,916.05	0.00	0.00	0.00	0.00
10,200.00	89.65	179.97	7,513.61	-2,015.72	630.78	2,016.05	0.00	0.00	0.00	0.00
10,300.00	89.65	179.97	7,514.22	-2,115.72	630.83	2,116.05	0.00	0.00	0.00	0.00
10,400.00	89.65	179.97	7,514.82	-2,215.71	630.88	2,216.04	0.00	0.00	0.00	0.00
10,500.00	89.65	179.97	7,515.43	-2,315.71	630.93	2,316.04	0.00	0.00	0.00	0.00
10,600.00	89.65	179.97	7,516.03	-2,415.71	630.97	2,416.04	0.00	0.00	0.00	0.00
10,700.00	89.65	179.97	7,516.64	-2,515.71	631.02	2,516.04	0.00	0.00	0.00	0.00
10,800.00	89.65	179.97	7,517.24	-2,615.71	631.07	2,616.04	0.00	0.00	0.00	0.00
10,900.00	89.65	179.97	7,517.85	-2,715.71	631.12	2,716.04	0.00	0.00	0.00	0.00
11,000.00	89.65	179.97	7,518.45	-2,815.70	631.17	2,816.03	0.00	0.00	0.00	0.00
11,100.00	89.65	179.97	7,519.05	-2,915.70	631.22	2,916.03	0.00	0.00	0.00	0.00
11,200.00	89.65	179.97	7,519.66	-3,015.70	631.26	3,016.03	0.00	0.00	0.00	0.00
11,300.00	89.65	179.97	7,520.26	-3,115.70	631.31	3,116.03	0.00	0.00	0.00	0.00
11,400.00	89.65	179.97	7,520.87	-3,215.70	631.36	3,216.03	0.00	0.00	0.00	0.00
11,500.00	89.65	179.97	7,521.47	-3,315.69	631.41	3,316.02	0.00	0.00	0.00	0.00
11,600.00	89.65	179.97	7,522.08	-3,415.69	631.46	3,416.02	0.00	0.00	0.00	0.00
11,700.00	89.65	179.97	7,522.68	-3,515.69	631.51	3,516.02	0.00	0.00	0.00	0.00
11,800.00	89.65	179.97	7,523.29	-3,615.69	631.55	3,616.02	0.00	0.00	0.00	0.00
11,900.00	89.65	179.97	7,523.89	-3,715.69	631.60	3,716.02	0.00	0.00	0.00	0.00
12,000.00	89.65	179.97	7,524.50	-3,815.69	631.65	3,816.02	0.00	0.00	0.00	0.00
12,100.00	89.65	179.97	7,525.10	-3,915.68	631.70	3,916.01	0.00	0.00	0.00	0.00
12,200.00	89.65	179.97	7,525.71	-4,015.68	631.75	4,016.01	0.00	0.00	0.00	0.00
12,300.00	89.65	179.97	7,526.31	-4,115.68	631.80	4,116.01	0.00	0.00	0.00	0.00
12,400.00	89.65	179.97	7,526.92	-4,215.68	631.84	4,216.01	0.00	0.00	0.00	0.00
12,500.00	89.65	179.97	7,527.52	-4,315.68	631.89	4,316.01	0.00	0.00	0.00	0.00
12,600.00	89.65	179.97	7,528.12	-4,415.67	631.94	4,416.00	0.00	0.00	0.00	0.00
12,700.00	89.65	179.97	7,528.73	-4,515.67	631.99	4,516.00	0.00	0.00	0.00	0.00
12,800.00	89.65	179.97	7,529.33	-4,615.67	632.04	4,616.00	0.00	0.00	0.00	0.00
12,900.00	89.65	179.97	7,529.94	-4,715.67	632.09	4,716.00	0.00	0.00	0.00	0.00
12,910.21	89.65	179.97	7,530.00	-4,725.88	632.09	4,726.21	0.00	0.00	0.00	0.00

TD Well @ 12910.21ft - Toe: - HIGHLANDS 16C-9HZ_BHL

Plan Report for HIGHLANDS 16C-9HZ - 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
1,250.00	1,238.62	102.56	80.13	End Nudge @ 1250.00ft
4,320.00	4,204.01	728.70	569.32	Begin Drop @ 4320.00ft
5,070.00	4,945.47	805.62	629.42	End Drop @ 5070.00ft
7,051.58	6,927.05	805.62	629.42	KOP @ 7051.58ft
7,500.00	7,331.07	638.92	629.50	DLS = 10°/100'
7,948.12	7,500.00	236.12	629.69	End Build @ 7948.12ft
12,910.21	7,530.00	-4,725.88	632.09	TD Well @ 12910.21ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
User	No Target (Freehand)	179.97	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,948.12	Permit Rev-1	APC_ISCWSA REV 2 MWD+IFR1
7,948.12	12,910.21	Permit Rev-1	APC_ISCWSA REV 2 MWD+IFR1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,624.13	1,600.00	9 5/8"	9-5/8	13-1/2
7,948.12	7,500.00	Top of Production	5-1/2	7-7/8

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,488.51	1,469.00	Fox Hills		0.00	
4,790.08	4,666.00	Sussex		0.00	
7,262.79	7,133.51	Sharon Springs		0.00	
7,307.46	7,174.51	Niobrara Top		0.00	
7,395.84	7,250.96	Niobrara B Bench		0.00	
7,477.06	7,314.49	Niobrara C Bench		0.00	
7,726.84	7,456.49	Fort Hays		0.00	
7,839.33	7,489.05	Codell		0.00	
7,948.12	7,500.00	Heel:		0.00	
12,910.21	7,530.00	Toe:		0.00	

Plan Report for HIGHLANDS 16C-9HZ - Permit Rev-1

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
1N-R66W-Sec. 9_Section Lines	0.00	105.24	0.84	Polygon
HIGHLANDS 16C-9HZ_BHL	7,530.00	-4,725.88	632.09	Point
HIGHLANDS 16C-9HZ_SHL	0.00	0.00	0.00	Point
2N-R66W-Sec. 33_Section Lines	0.00	105.24	0.84	Polygon
1N-R66W-Sec. 4_Section Lines	0.00	105.24	0.84	Polygon

North Reference Sheet for 1N-66W-09 Highlands 1-9HZ Pad - HIGHLANDS 16C-9HZ - 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' @ 5015.00usft (D Rig). Northing and Easting are relative to HIGHLANDS 16C-9HZ

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

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: 0.99960447

Grid Coordinates of Well: 14,553,012.80 usft N, 1,702,953.53 usft E

Geographical Coordinates of Well: 40° 04' 19.03" N, 104° 46' 35.26" W

Grid Convergence at Surface is: 0.14°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,910.21usft
the Bottom Hole Displacement is 4,767.96usft in the Direction of 172.38° (True).

Magnetic Convergence at surface is: -8.17° (12 May 2015, , IGRF2010)

