

# US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

2N-65W-29 Alvin 16-29HZ Pad

ALVIN 27G-29HZ

Plan A

Plan: Permit Rev-1

## Sperry Drilling Services Proposal Report

29 January, 2015

Well Coordinates: 14,564,438.10 N, 1,730,024.24 E (40° 06' 11.16" N, 104° 40' 46.38" W)

Ground Level: 4,908.00 usft

Local Coordinate Origin:

Centered on Well ALVIN 27G-29HZ

Viewing Datum:

RKB = 17' @ 4925.00usft (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: 2N-65W-29 Alvin 16-29HZ Pad

Well: ALVIN 27G-29HZ

Wellbore: Plan A

Design: Permit Rev-1

# US ROCKIES WATTENBERG PLANNING

HALLIBURTON

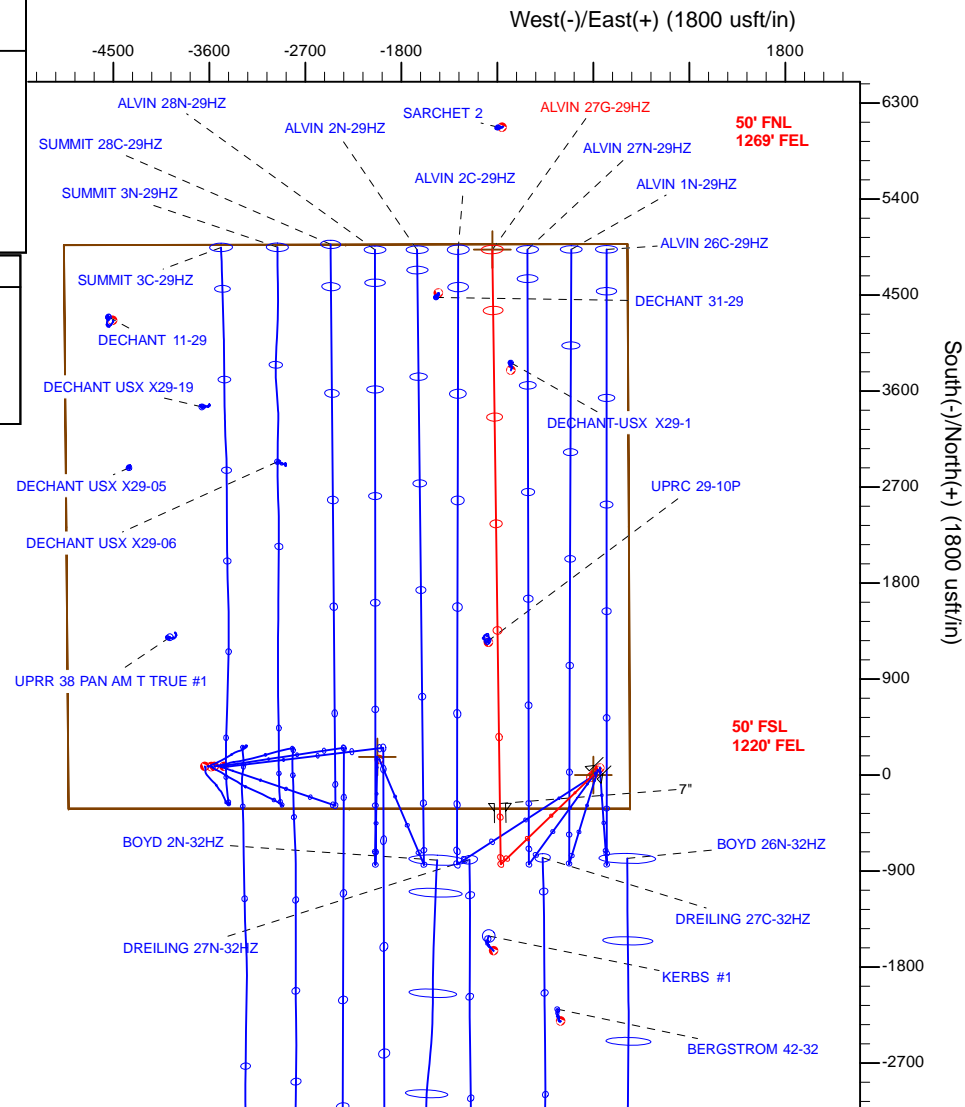
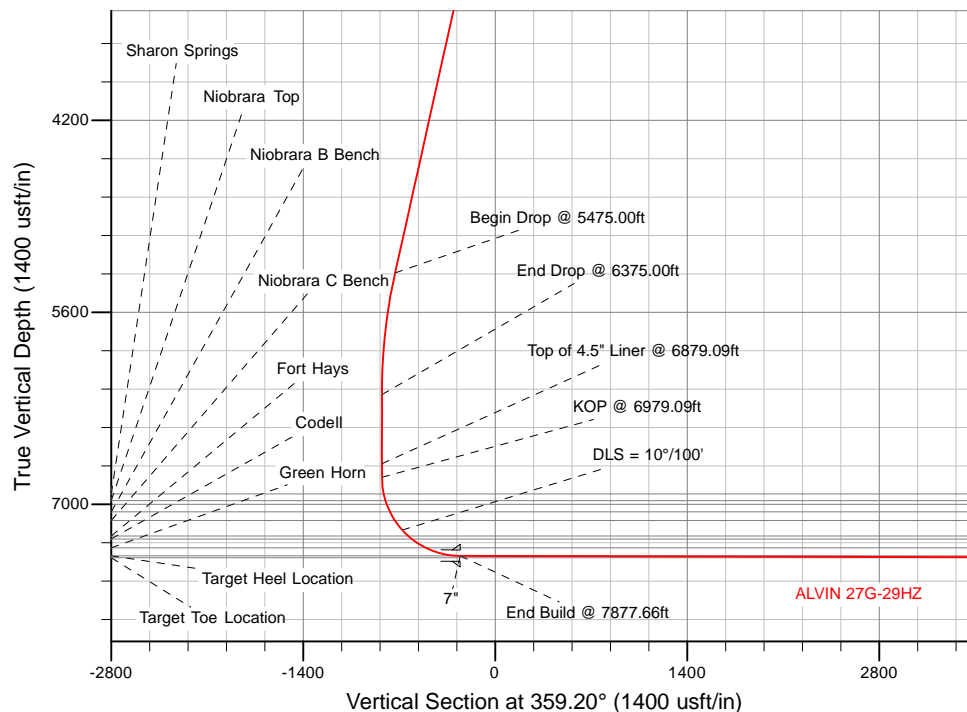
Sperry Drilling

## 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	1580.00	0.00	0.00	1580.00	0.00	0.00	0.00	0.00	0.00	
3	2480.00	18.00	226.00	2465.27	-97.40	-100.86	2.00	226.00	-95.98	
4	5475.00	18.00	226.00	5313.68	-740.31	-766.61	0.00	0.00	-729.53	
5	6375.00	0.00	0.00	6198.95	-837.71	-867.47	2.00	180.00	-825.52	
6	6979.09	0.00	0.00	6803.04	-837.71	-867.47	0.00	0.00	-825.52	
7	7877.66	89.86	359.20	7376.00	-266.24	-875.41	10.00	359.20	-253.99	
8	13071.39	89.86	359.20	7389.00	4926.97	-947.56	0.00	0.00	4939.72	ALVIN 27G-29HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
ALVIN 27G-29HZ_SHL	0.00	0.00	0.00	40.103100	-104.679549
ALVIN 27G-29HZ_BHL	7389.00	4926.97	-947.56	40.116630	-104.682938



WELL DETAILS: ALVIN 27G-29HZ

Ground Level: 4908.00

RKB = 17' @ 4925.00usft (D Rig)

Plan: Permit Rev-1 (ALVIN 27G-29HZ/Plan A)

Created By: Clint Eshelman

Date: 1/29/2015

Reviewed:

Date:

TVD	MD
6703.04	6879.09
6803.04	6979.09

Top of 4.5" Liner @ 6879.09ft

KOP @ 6979.09ft

## Plan Report for ALVIN 27G-29HZ - 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>2N-R65W-Sec. 29_Section Lines - ALVIN 27G-29HZ_SHL</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
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
1,200.00	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
1,440.00	0.00	0.00	1,440.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>9 5/8"</b>										
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,580.00	0.00	0.00	1,580.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 1580.00ft</b>										
1,600.00	0.40	226.00	1,600.00	-0.05	-0.05	-0.05	2.00	2.00	0.00	226.00
1,700.00	2.40	226.00	1,699.96	-1.75	-1.81	-1.72	2.00	2.00	0.00	0.00
1,800.00	4.40	226.00	1,799.78	-5.87	-6.07	-5.78	2.00	2.00	0.00	0.00
1,900.00	6.40	226.00	1,899.33	-12.40	-12.84	-12.22	2.00	2.00	0.00	0.00
2,000.00	8.40	226.00	1,998.50	-21.35	-22.11	-21.04	2.00	2.00	0.00	0.00
2,100.00	10.40	226.00	2,097.15	-32.69	-33.86	-32.22	2.00	2.00	0.00	0.00
2,200.00	12.40	226.00	2,195.17	-46.42	-48.07	-45.75	2.00	2.00	0.00	0.00
2,300.00	14.40	226.00	2,292.44	-62.52	-64.74	-61.61	2.00	2.00	0.00	0.00
2,400.00	16.40	226.00	2,388.85	-80.97	-83.84	-79.79	2.00	2.00	0.00	0.00
2,480.00	18.00	226.00	2,465.27	-97.40	-100.86	-95.98	2.00	2.00	0.00	0.00
<b>End Nudge @ 2480.00ft</b>										
2,500.00	18.00	226.00	2,484.29	-101.69	-105.31	-100.21	0.00	0.00	0.00	0.00
2,600.00	18.00	226.00	2,579.40	-123.16	-127.54	-121.37	0.00	0.00	0.00	0.00
2,700.00	18.00	226.00	2,674.50	-144.63	-149.76	-142.52	0.00	0.00	0.00	0.00
2,800.00	18.00	226.00	2,769.61	-166.09	-171.99	-163.67	0.00	0.00	0.00	0.00
2,900.00	18.00	226.00	2,864.71	-187.56	-194.22	-184.83	0.00	0.00	0.00	0.00
3,000.00	18.00	226.00	2,959.82	-209.02	-216.45	-205.98	0.00	0.00	0.00	0.00
3,100.00	18.00	226.00	3,054.92	-230.49	-238.68	-227.13	0.00	0.00	0.00	0.00
3,200.00	18.00	226.00	3,150.03	-251.96	-260.91	-248.29	0.00	0.00	0.00	0.00
3,300.00	18.00	226.00	3,245.13	-273.42	-283.14	-269.44	0.00	0.00	0.00	0.00
3,400.00	18.00	226.00	3,340.24	-294.89	-305.37	-290.60	0.00	0.00	0.00	0.00
3,500.00	18.00	226.00	3,435.35	-316.35	-327.59	-311.75	0.00	0.00	0.00	0.00
3,600.00	18.00	226.00	3,530.45	-337.82	-349.82	-332.90	0.00	0.00	0.00	0.00
3,700.00	18.00	226.00	3,625.56	-359.29	-372.05	-354.06	0.00	0.00	0.00	0.00
3,800.00	18.00	226.00	3,720.66	-380.75	-394.28	-375.21	0.00	0.00	0.00	0.00
3,900.00	18.00	226.00	3,815.77	-402.22	-416.51	-396.36	0.00	0.00	0.00	0.00
4,000.00	18.00	226.00	3,910.87	-423.69	-438.74	-417.52	0.00	0.00	0.00	0.00
4,100.00	18.00	226.00	4,005.98	-445.15	-460.97	-438.67	0.00	0.00	0.00	0.00
4,200.00	18.00	226.00	4,101.09	-466.62	-483.20	-459.83	0.00	0.00	0.00	0.00
4,300.00	18.00	226.00	4,196.19	-488.08	-505.43	-480.98	0.00	0.00	0.00	0.00
4,400.00	18.00	226.00	4,291.30	-509.55	-527.65	-502.13	0.00	0.00	0.00	0.00
4,500.00	18.00	226.00	4,386.40	-531.02	-549.88	-523.29	0.00	0.00	0.00	0.00
4,600.00	18.00	226.00	4,481.51	-552.48	-572.11	-544.44	0.00	0.00	0.00	0.00
4,700.00	18.00	226.00	4,576.61	-573.95	-594.34	-565.59	0.00	0.00	0.00	0.00
4,800.00	18.00	226.00	4,671.72	-595.41	-616.57	-586.75	0.00	0.00	0.00	0.00
4,900.00	18.00	226.00	4,766.83	-616.88	-638.80	-607.90	0.00	0.00	0.00	0.00
5,000.00	18.00	226.00	4,861.93	-638.35	-661.03	-629.05	0.00	0.00	0.00	0.00

## Plan Report for ALVIN 27G-29HZ - 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 (°)
5,100.00	18.00	226.00	4,957.04	-659.81	-683.26	-650.21	0.00	0.00	0.00	0.00
5,200.00	18.00	226.00	5,052.14	-681.28	-705.48	-671.36	0.00	0.00	0.00	0.00
5,300.00	18.00	226.00	5,147.25	-702.74	-727.71	-692.52	0.00	0.00	0.00	0.00
5,400.00	18.00	226.00	5,242.35	-724.21	-749.94	-713.67	0.00	0.00	0.00	0.00
5,475.00	18.00	226.00	5,313.68	-740.31	-766.61	-729.53	0.00	0.00	0.00	0.00
<b>Begin Drop @ 5475.00ft</b>										
5,500.00	17.50	226.00	5,337.49	-745.60	-772.10	-734.75	2.00	-2.00	0.00	180.00
5,600.00	15.50	226.00	5,433.37	-765.33	-792.53	-754.19	2.00	-2.00	0.00	180.00
5,700.00	13.50	226.00	5,530.18	-782.73	-810.54	-771.33	2.00	-2.00	0.00	180.00
5,800.00	11.50	226.00	5,627.80	-797.76	-826.10	-786.15	2.00	-2.00	0.00	180.00
5,900.00	9.50	226.00	5,726.12	-810.42	-839.21	-798.62	2.00	-2.00	0.00	180.00
6,000.00	7.50	226.00	5,825.02	-820.69	-849.84	-808.74	2.00	-2.00	0.00	180.00
6,100.00	5.50	226.00	5,924.37	-828.55	-857.99	-816.49	2.00	-2.00	0.00	180.00
6,200.00	3.50	226.00	6,024.06	-834.00	-863.63	-821.86	2.00	-2.00	0.00	180.00
6,300.00	1.50	226.00	6,123.96	-837.03	-866.77	-824.84	2.00	-2.00	0.00	180.00
6,375.00	0.00	0.00	6,198.95	-837.71	-867.47	-825.52	2.00	-2.00	178.67	180.00
<b>End Drop @ 6375.00ft</b>										
6,400.00	0.00	0.00	6,223.95	-837.71	-867.47	-825.52	0.00	0.00	0.00	180.00
6,500.00	0.00	0.00	6,323.95	-837.71	-867.47	-825.52	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,423.95	-837.71	-867.47	-825.52	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,523.95	-837.71	-867.47	-825.52	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,623.95	-837.71	-867.47	-825.52	0.00	0.00	0.00	0.00
6,879.09	0.00	0.00	6,703.04	-837.71	-867.47	-825.52	0.00	0.00	0.00	0.00
<b>Top of 4.5" Liner @ 6879.09ft</b>										
6,900.00	0.00	0.00	6,723.95	-837.71	-867.47	-825.52	0.00	0.00	0.00	0.00
6,979.09	0.00	0.00	6,803.04	-837.71	-867.47	-825.52	0.00	0.00	0.00	0.00
<b>KOP @ 6979.09ft</b>										
7,000.00	2.09	359.20	6,823.95	-837.33	-867.48	-825.14	10.00	10.00	-3.81	-0.80
7,100.00	12.09	359.20	6,923.06	-825.00	-867.65	-812.81	10.00	10.00	0.00	0.00
7,101.99	12.29	359.20	6,925.00	-824.58	-867.66	-812.39	10.00	10.00	0.00	0.00
<b>Sharon Springs</b>										
7,152.69	17.36	359.20	6,974.00	-811.61	-867.84	-799.42	10.00	10.00	0.00	0.00
<b>Niobrara Top</b>										
7,200.00	22.09	359.20	7,018.52	-795.65	-868.06	-783.45	10.00	10.00	0.00	0.00
7,239.97	26.09	359.20	7,055.00	-779.34	-868.29	-767.14	10.00	10.00	0.00	0.00
<b>Niobrara B Bench</b>										
7,300.00	32.09	359.20	7,107.43	-750.17	-868.69	-737.97	10.00	10.00	0.00	0.00
7,312.56	33.35	359.20	7,118.00	-743.39	-868.78	-731.18	10.00	10.00	0.00	0.00
<b>Niobrara C Bench</b>										
7,400.00	42.09	359.20	7,187.10	-689.95	-869.53	-677.74	10.00	10.00	0.00	0.00
<b>DLS = 10°/100'</b>										
7,462.34	48.33	359.20	7,231.00	-645.73	-870.14	-633.52	10.00	10.00	0.00	0.00
<b>Fort Hays</b>										
7,498.22	51.91	359.20	7,254.00	-618.21	-870.52	-605.99	10.00	10.00	0.00	0.00
<b>Codell</b>										
7,500.00	52.09	359.20	7,255.10	-616.80	-870.54	-604.59	10.00	10.00	0.00	0.00
7,600.00	62.09	359.20	7,309.36	-532.97	-871.71	-520.74	10.00	10.00	0.00	0.00
7,619.06	64.00	359.20	7,318.00	-515.98	-871.94	-503.75	10.00	10.00	0.00	0.00
<b>Green Horn</b>										
7,700.00	72.09	359.20	7,348.24	-440.98	-872.99	-428.75	10.00	10.00	0.00	0.00
7,800.00	82.09	359.20	7,370.55	-343.64	-874.34	-331.40	10.00	10.00	0.00	0.00
7,877.66	89.86	359.20	7,376.00	-266.24	-875.41	-253.99	10.00	10.00	0.00	0.00
<b>End Build @ 7877.66ft - Target Heel Location - 7"</b>										
7,900.00	89.86	359.20	7,376.05	-243.90	-875.72	-231.65	0.00	0.00	0.00	0.00
8,000.00	89.86	359.20	7,376.30	-143.91	-877.11	-131.65	0.00	0.00	0.00	0.00
8,100.00	89.86	359.20	7,376.55	-43.92	-878.50	-31.65	0.00	0.00	0.00	0.00
8,200.00	89.86	359.20	7,376.80	56.07	-879.89	68.35	0.00	0.00	0.00	0.00
8,300.00	89.86	359.20	7,377.05	156.06	-881.28	168.35	0.00	0.00	0.00	0.00

## Plan Report for ALVIN 27G-29HZ - 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	89.86	359.20	7,377.31	256.05	-882.67	268.35	0.00	0.00	0.00	0.00
8,500.00	89.86	359.20	7,377.56	356.04	-884.06	368.35	0.00	0.00	0.00	0.00
8,600.00	89.86	359.20	7,377.81	456.03	-885.45	468.35	0.00	0.00	0.00	0.00
8,700.00	89.86	359.20	7,378.06	556.02	-886.84	568.35	0.00	0.00	0.00	0.00
8,800.00	89.86	359.20	7,378.31	656.01	-888.23	668.35	0.00	0.00	0.00	0.00
8,900.00	89.86	359.20	7,378.56	756.00	-889.62	768.35	0.00	0.00	0.00	0.00
9,000.00	89.86	359.20	7,378.81	855.99	-891.00	868.35	0.00	0.00	0.00	0.00
9,100.00	89.86	359.20	7,379.06	955.98	-892.39	968.35	0.00	0.00	0.00	0.00
9,200.00	89.86	359.20	7,379.31	1,055.97	-893.78	1,068.35	0.00	0.00	0.00	0.00
9,300.00	89.86	359.20	7,379.56	1,155.96	-895.17	1,168.35	0.00	0.00	0.00	0.00
9,400.00	89.86	359.20	7,379.81	1,255.95	-896.56	1,268.35	0.00	0.00	0.00	0.00
9,500.00	89.86	359.20	7,380.06	1,355.94	-897.95	1,368.35	0.00	0.00	0.00	0.00
9,600.00	89.86	359.20	7,380.31	1,455.93	-899.34	1,468.35	0.00	0.00	0.00	0.00
9,700.00	89.86	359.20	7,380.56	1,555.92	-900.73	1,568.35	0.00	0.00	0.00	0.00
9,800.00	89.86	359.20	7,380.81	1,655.91	-902.12	1,668.34	0.00	0.00	0.00	0.00
9,900.00	89.86	359.20	7,381.06	1,755.90	-903.51	1,768.34	0.00	0.00	0.00	0.00
10,000.00	89.86	359.20	7,381.31	1,855.89	-904.90	1,868.34	0.00	0.00	0.00	0.00
10,100.00	89.86	359.20	7,381.56	1,955.88	-906.28	1,968.34	0.00	0.00	0.00	0.00
10,200.00	89.86	359.20	7,381.81	2,055.87	-907.67	2,068.34	0.00	0.00	0.00	0.00
10,300.00	89.86	359.20	7,382.06	2,155.86	-909.06	2,168.34	0.00	0.00	0.00	0.00
10,400.00	89.86	359.20	7,382.31	2,255.85	-910.45	2,268.34	0.00	0.00	0.00	0.00
10,500.00	89.86	359.20	7,382.56	2,355.84	-911.84	2,368.34	0.00	0.00	0.00	0.00
10,600.00	89.86	359.20	7,382.81	2,455.83	-913.23	2,468.34	0.00	0.00	0.00	0.00
10,700.00	89.86	359.20	7,383.06	2,555.82	-914.62	2,568.34	0.00	0.00	0.00	0.00
10,800.00	89.86	359.20	7,383.31	2,655.81	-916.01	2,668.34	0.00	0.00	0.00	0.00
10,900.00	89.86	359.20	7,383.56	2,755.80	-917.40	2,768.34	0.00	0.00	0.00	0.00
11,000.00	89.86	359.20	7,383.81	2,855.79	-918.79	2,868.34	0.00	0.00	0.00	0.00
11,100.00	89.86	359.20	7,384.06	2,955.78	-920.18	2,968.34	0.00	0.00	0.00	0.00
11,200.00	89.86	359.20	7,384.31	3,055.77	-921.56	3,068.34	0.00	0.00	0.00	0.00
11,300.00	89.86	359.20	7,384.57	3,155.76	-922.95	3,168.34	0.00	0.00	0.00	0.00
11,400.00	89.86	359.20	7,384.82	3,255.75	-924.34	3,268.34	0.00	0.00	0.00	0.00
11,500.00	89.86	359.20	7,385.07	3,355.74	-925.73	3,368.34	0.00	0.00	0.00	0.00
11,600.00	89.86	359.20	7,385.32	3,455.73	-927.12	3,468.34	0.00	0.00	0.00	0.00
11,700.00	89.86	359.20	7,385.57	3,555.72	-928.51	3,568.34	0.00	0.00	0.00	0.00
11,800.00	89.86	359.20	7,385.82	3,655.71	-929.90	3,668.34	0.00	0.00	0.00	0.00
11,900.00	89.86	359.20	7,386.07	3,755.70	-931.29	3,768.34	0.00	0.00	0.00	0.00
12,000.00	89.86	359.20	7,386.32	3,855.69	-932.68	3,868.34	0.00	0.00	0.00	0.00
12,100.00	89.86	359.20	7,386.57	3,955.68	-934.07	3,968.34	0.00	0.00	0.00	0.00
12,200.00	89.86	359.20	7,386.82	4,055.67	-935.46	4,068.34	0.00	0.00	0.00	0.00
12,300.00	89.86	359.20	7,387.07	4,155.66	-936.84	4,168.34	0.00	0.00	0.00	0.00
12,400.00	89.86	359.20	7,387.32	4,255.65	-938.23	4,268.34	0.00	0.00	0.00	0.00
12,500.00	89.86	359.20	7,387.57	4,355.64	-939.62	4,368.34	0.00	0.00	0.00	0.00
12,600.00	89.86	359.20	7,387.82	4,455.63	-941.01	4,468.34	0.00	0.00	0.00	0.00
12,700.00	89.86	359.20	7,388.07	4,555.62	-942.40	4,568.34	0.00	0.00	0.00	0.00
12,800.00	89.86	359.20	7,388.32	4,655.61	-943.79	4,668.34	0.00	0.00	0.00	0.00
12,900.00	89.86	359.20	7,388.57	4,755.60	-945.18	4,768.34	0.00	0.00	0.00	0.00
13,000.00	89.86	359.20	7,388.82	4,855.59	-946.57	4,868.33	0.00	0.00	0.00	0.00
13,071.38	89.86	359.20	7,389.00	4,926.96	-947.56	4,939.71	0.00	0.00	0.00	0.00
<b>Target Toe Location</b>										
13,071.39	89.86	359.20	7,389.00	4,926.97	-947.56	4,939.72	0.02	0.00	0.00	0.00
<b>TD Well @ 13071.39ft - ALVIN 27G-29HZ_BHL</b>										

## Plan Report for ALVIN 27G-29HZ - Permit Rev-1

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,580.00	1,580.00	0.00	0.00	Begin Nudge @ 1580.00ft
2,480.00	2,465.27	-97.40	-100.86	End Nudge @ 2480.00ft
5,475.00	5,313.68	-740.31	-766.61	Begin Drop @ 5475.00ft
6,375.00	6,198.95	-837.71	-867.47	End Drop @ 6375.00ft
6,879.09	6,703.04	-837.71	-867.47	Top of 4.5" Liner @ 6879.09ft
6,979.09	6,803.04	-837.71	-867.47	KOP @ 6979.09ft
7,400.00	7,187.10	-689.95	-869.53	DLS = 10°/100'
7,877.66	7,376.00	-266.24	-875.41	End Build @ 7877.66ft
13,071.39	7,389.00	4,926.97	-947.56	TD Well @ 13071.39ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	359.20	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,877.66	Permit Rev-1	MWD+IFR1
7,877.66	13,071.39	Permit Rev-1	MWD+IFR1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,440.00	1,440.00	9 5/8"	9-5/8	13-1/2
7,877.66	7,376.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,101.99	6,925.00	Sharon Springs		0.00	
7,152.69	6,974.00	Niobrara Top		0.00	
7,239.97	7,055.00	Niobrara B Bench		0.00	
7,312.56	7,118.00	Niobrara C Bench		0.00	
7,462.34	7,231.00	Fort Hays		0.00	
7,498.22	7,254.00	Codell		0.00	
7,619.06	7,318.00	Green Horn		0.00	
7,877.66	7,376.00	Target Heel Location		0.00	
13,071.38	7,389.00	Target Toe Location		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
ALVIN 27G-29HZ_BHL	7,389.00	4,926.97	-947.56	Point
2N-R65W-Sec. 29_Section Lines	-18.00	169.41	-2,025.64	Polygon
ALVIN 27G-29HZ_SHL	0.00	0.00	0.00	Point

**North Reference Sheet for 2N-65W-29 Alvin 16-29HZ Pad - ALVIN 27G-29HZ - 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' @ 4925.00usft (D Rig). Northing and Easting are relative to ALVIN 27G-29HZ

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: 0.99960918

Grid Coordinates of Well: 14,564,438.10 usft N, 1,730,024.24 usft E

Geographical Coordinates of Well: 40° 06' 11.16" N, 104° 40' 46.38" W

Grid Convergence at Surface is: 0.21°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,071.39usft  
the Bottom Hole Displacement is 5,017.26usft in the Direction of 349.11° (True).

Magnetic Convergence at surface is: -8.10° (28 January 2015, , IGRF2010)

