

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

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

ALVIN 2C-29HZ

Plan A

Plan: Permit Rev-2

Sperry Drilling Services Proposal Report

23 April, 2015

Well Coordinates: 14,564,416.18 N, 1,730,003.62 E (40° 06' 10.94" N, 104° 40' 46.64" W)

Ground Level: 4,908.00 usft

Local Coordinate Origin:

Centered on Well ALVIN 2C-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 2C-29HZ

Wellbore: Plan A

Design: Permit Rev-2

US ROCKIES WATTENBERG PLANNING

HALLIBURTON

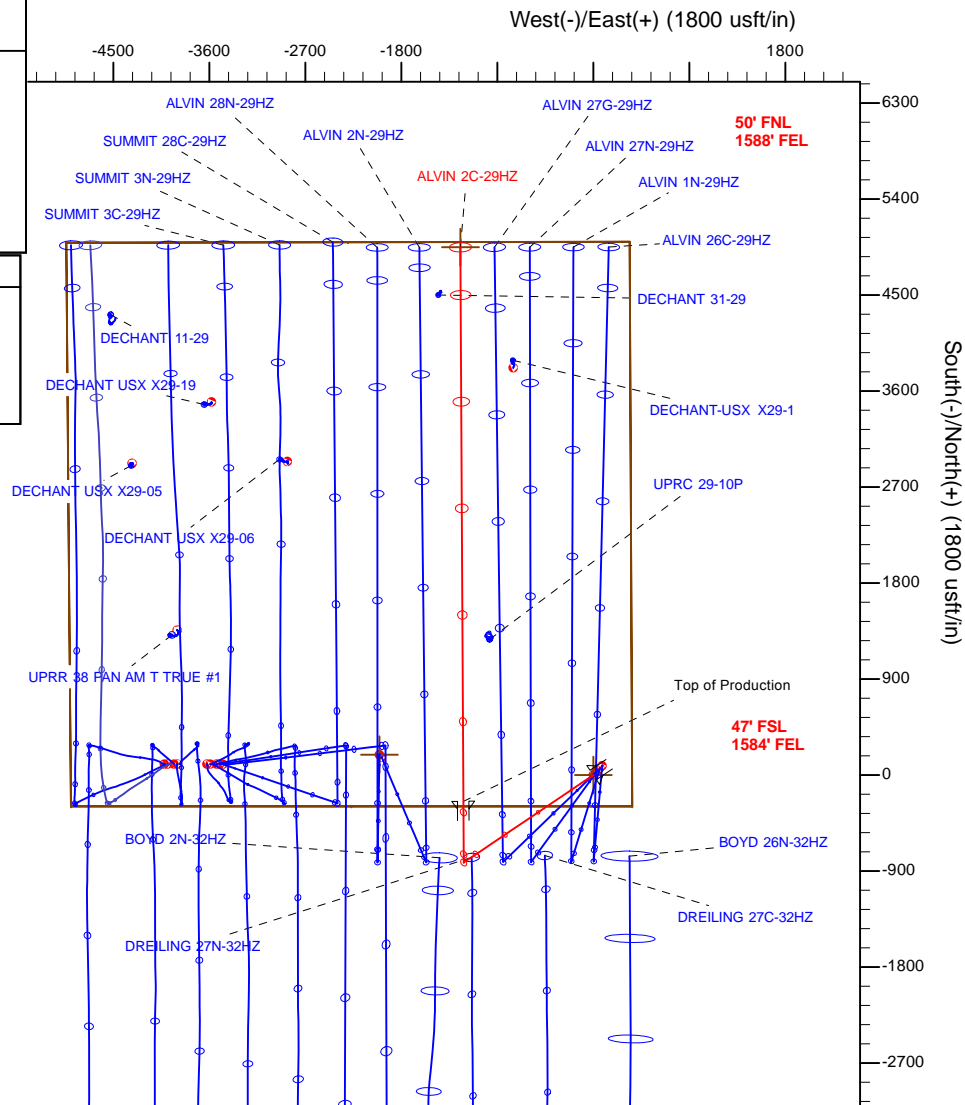
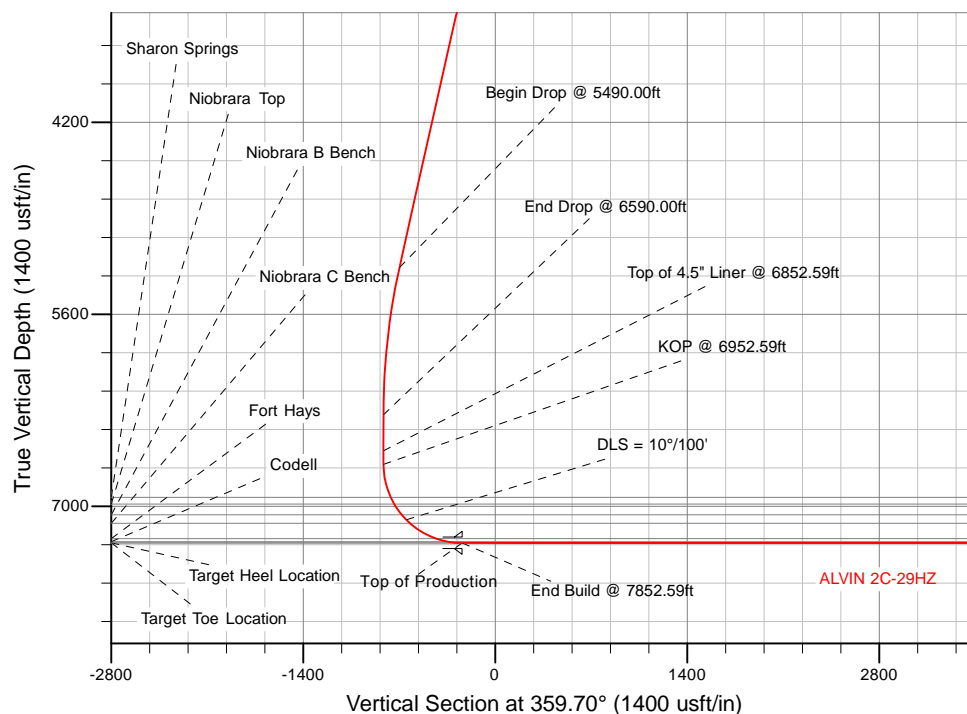
Sperry Drilling

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	1590.00	0.00	0.00	1590.00	0.00	0.00	0.00	0.00	0.00	
3	2690.00	22.00	236.00	2663.17	-116.65	-172.94	2.00	236.00	-115.74	
4	5490.00	22.00	236.00	5259.28	-703.19	-1042.52	0.00	0.00	-697.72	
5	6590.00	0.00	0.00	6332.45	-819.84	-1215.46	2.00	180.00	-813.46	
6	6952.59	0.00	0.00	6695.04	-819.84	-1215.46	0.00	0.00	-813.46	
7	7852.59	90.00	359.70	7268.00	-246.89	-1218.47	10.00	359.70	-240.50	
8	13047.29	90.00	359.70	7268.00	4947.75	-1245.79	0.00	0.00	4954.20	ALVIN 2C-29HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
ALVIN 2C-29HZ_SHL	0.00	0.00	0.00	40.103040	-104.679623
ALVIN 2C-29HZ_BHL	7268.00	4947.75	-1245.79	40.116627	-104.684079



WELL DETAILS: ALVIN 2C-29HZ

Ground Level: 4908.00

RKB = 17' @ 4925.00usft (D Rig)

Plan: Permit Rev-2 (ALVIN 2C-29HZ/Plan A)

Created By: Clint Eshelman

Date: 1/30/2015

Reviewed:

Date:

TVD MD

6595.04 6852.59 Top of 4.5" Liner @ 6852.59ft

6695.04 6952.59 KOP @ 6952.59ft

Plan Report for ALVIN 2C-29HZ - Permit Rev-2

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
2N-R65W-Sec. 29_Section Lines - ALVIN 2C-29HZ_SHL										
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
9 5/8"										
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,590.00	0.00	0.00	1,590.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1590.00ft										
1,600.00	0.20	236.00	1,600.00	-0.01	-0.01	-0.01	2.00	2.00	0.00	236.00
1,700.00	2.20	236.00	1,699.97	-1.18	-1.75	-1.17	2.00	2.00	0.00	0.00
1,800.00	4.20	236.00	1,799.81	-4.30	-6.38	-4.27	2.00	2.00	0.00	0.00
1,900.00	6.20	236.00	1,899.40	-9.37	-13.89	-9.30	2.00	2.00	0.00	0.00
2,000.00	8.20	236.00	1,998.60	-16.38	-24.28	-16.25	2.00	2.00	0.00	0.00
2,100.00	10.20	236.00	2,097.31	-25.32	-37.54	-25.12	2.00	2.00	0.00	0.00
2,200.00	12.20	236.00	2,195.40	-36.18	-53.64	-35.90	2.00	2.00	0.00	0.00
2,300.00	14.20	236.00	2,292.75	-48.95	-72.57	-48.57	2.00	2.00	0.00	0.00
2,400.00	16.20	236.00	2,389.25	-63.61	-94.30	-63.11	2.00	2.00	0.00	0.00
2,500.00	18.20	236.00	2,484.77	-80.14	-118.82	-79.52	2.00	2.00	0.00	0.00
2,600.00	20.20	236.00	2,579.21	-98.53	-146.08	-97.77	2.00	2.00	0.00	0.00
2,690.00	22.00	236.00	2,663.17	-116.65	-172.94	-115.74	2.00	2.00	0.00	0.00
End Nudge @ 2690.00ft										
2,700.00	22.00	236.00	2,672.44	-118.74	-176.05	-117.82	0.00	0.00	0.00	0.00
2,800.00	22.00	236.00	2,765.16	-139.69	-207.10	-138.61	0.00	0.00	0.00	0.00
2,900.00	22.00	236.00	2,857.88	-160.64	-238.16	-159.39	0.00	0.00	0.00	0.00
3,000.00	22.00	236.00	2,950.60	-181.59	-269.21	-180.18	0.00	0.00	0.00	0.00
3,100.00	22.00	236.00	3,043.31	-202.53	-300.27	-200.96	0.00	0.00	0.00	0.00
3,200.00	22.00	236.00	3,136.03	-223.48	-331.33	-221.74	0.00	0.00	0.00	0.00
3,300.00	22.00	236.00	3,228.75	-244.43	-362.38	-242.53	0.00	0.00	0.00	0.00
3,400.00	22.00	236.00	3,321.47	-265.38	-393.44	-263.31	0.00	0.00	0.00	0.00
3,500.00	22.00	236.00	3,414.19	-286.33	-424.50	-284.10	0.00	0.00	0.00	0.00
3,600.00	22.00	236.00	3,506.91	-307.27	-455.55	-304.88	0.00	0.00	0.00	0.00
3,700.00	22.00	236.00	3,599.62	-328.22	-486.61	-325.67	0.00	0.00	0.00	0.00
3,800.00	22.00	236.00	3,692.34	-349.17	-517.66	-346.45	0.00	0.00	0.00	0.00
3,900.00	22.00	236.00	3,785.06	-370.12	-548.72	-367.24	0.00	0.00	0.00	0.00
4,000.00	22.00	236.00	3,877.78	-391.06	-579.78	-388.02	0.00	0.00	0.00	0.00
4,100.00	22.00	236.00	3,970.50	-412.01	-610.83	-408.81	0.00	0.00	0.00	0.00
4,200.00	22.00	236.00	4,063.22	-432.96	-641.89	-429.59	0.00	0.00	0.00	0.00
4,300.00	22.00	236.00	4,155.93	-453.91	-672.95	-450.38	0.00	0.00	0.00	0.00
4,400.00	22.00	236.00	4,248.65	-474.86	-704.00	-471.16	0.00	0.00	0.00	0.00
4,500.00	22.00	236.00	4,341.37	-495.80	-735.06	-491.95	0.00	0.00	0.00	0.00
4,600.00	22.00	236.00	4,434.09	-516.75	-766.11	-512.73	0.00	0.00	0.00	0.00
4,700.00	22.00	236.00	4,526.81	-537.70	-797.17	-533.52	0.00	0.00	0.00	0.00
4,800.00	22.00	236.00	4,619.53	-558.65	-828.23	-554.30	0.00	0.00	0.00	0.00
4,900.00	22.00	236.00	4,712.25	-579.59	-859.28	-575.09	0.00	0.00	0.00	0.00
5,000.00	22.00	236.00	4,804.96	-600.54	-890.34	-595.87	0.00	0.00	0.00	0.00

Plan Report for ALVIN 2C-29HZ - Permit Rev-2

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	22.00	236.00	4,897.68	-621.49	-921.40	-616.66	0.00	0.00	0.00	0.00
5,200.00	22.00	236.00	4,990.40	-642.44	-952.45	-637.44	0.00	0.00	0.00	0.00
5,300.00	22.00	236.00	5,083.12	-663.39	-983.51	-658.23	0.00	0.00	0.00	0.00
5,400.00	22.00	236.00	5,175.84	-684.33	-1,014.57	-679.01	0.00	0.00	0.00	0.00
5,490.00	22.00	236.00	5,259.28	-703.19	-1,042.52	-697.72	0.00	0.00	0.00	0.00
Begin Drop @ 5490.00ft										
5,500.00	21.80	236.00	5,268.56	-705.27	-1,045.61	-699.79	2.00	-2.00	0.00	180.00
5,600.00	19.80	236.00	5,362.04	-725.13	-1,075.05	-719.49	2.00	-2.00	0.00	180.00
5,700.00	17.80	236.00	5,456.70	-743.15	-1,101.76	-737.37	2.00	-2.00	0.00	180.00
5,800.00	15.80	236.00	5,552.43	-759.31	-1,125.72	-753.40	2.00	-2.00	0.00	180.00
5,900.00	13.80	236.00	5,649.10	-773.59	-1,146.90	-767.58	2.00	-2.00	0.00	180.00
6,000.00	11.80	236.00	5,746.61	-785.98	-1,165.27	-779.87	2.00	-2.00	0.00	180.00
6,100.00	9.80	236.00	5,844.84	-796.46	-1,180.80	-790.27	2.00	-2.00	0.00	180.00
6,200.00	7.80	236.00	5,943.66	-805.01	-1,193.48	-798.75	2.00	-2.00	0.00	180.00
6,300.00	5.80	236.00	6,042.95	-811.63	-1,203.30	-805.32	2.00	-2.00	0.00	180.00
6,400.00	3.80	236.00	6,142.59	-816.31	-1,210.23	-809.97	2.00	-2.00	0.00	180.00
6,500.00	1.80	236.00	6,242.47	-819.04	-1,214.28	-812.68	2.00	-2.00	0.00	180.00
6,590.00	0.00	0.00	6,332.45	-819.84	-1,215.46	-813.46	2.00	-2.00	137.78	180.00
End Drop @ 6590.00ft										
6,600.00	0.00	0.00	6,342.45	-819.84	-1,215.46	-813.46	0.00	0.00	0.00	180.00
6,700.00	0.00	0.00	6,442.45	-819.84	-1,215.46	-813.46	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,542.45	-819.84	-1,215.46	-813.46	0.00	0.00	0.00	0.00
6,852.59	0.00	0.00	6,595.04	-819.84	-1,215.46	-813.46	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 6852.59ft										
6,900.00	0.00	0.00	6,642.45	-819.84	-1,215.46	-813.46	0.00	0.00	0.00	0.00
6,952.59	0.00	0.00	6,695.04	-819.84	-1,215.46	-813.46	0.00	0.00	0.00	0.00
KOP @ 6952.59ft										
7,000.00	4.74	359.70	6,742.40	-817.87	-1,215.47	-811.50	10.00	10.00	0.00	359.70
7,100.00	14.74	359.70	6,840.83	-800.98	-1,215.55	-794.60	10.00	10.00	0.00	0.00
7,199.08	24.65	359.70	6,934.00	-767.63	-1,215.73	-761.25	10.00	10.00	0.00	0.00
Sharon Springs										
7,200.00	24.74	359.70	6,934.84	-767.24	-1,215.73	-760.87	10.00	10.00	0.00	0.00
7,254.30	30.17	359.70	6,983.00	-742.22	-1,215.86	-735.84	10.00	10.00	0.00	0.00
Niobrara Top										
7,300.00	34.74	359.70	7,021.55	-717.70	-1,215.99	-711.32	10.00	10.00	0.00	0.00
7,349.55	39.70	359.70	7,061.00	-687.74	-1,216.15	-681.36	10.00	10.00	0.00	0.00
Niobrara B Bench										
7,400.00	44.74	359.70	7,098.35	-653.85	-1,216.33	-647.47	10.00	10.00	0.00	0.00
DLS = 10°/100'										
7,435.84	48.32	359.70	7,123.00	-627.84	-1,216.47	-621.47	10.00	10.00	0.00	0.00
Niobrara C Bench										
7,500.00	54.74	359.70	7,162.89	-577.63	-1,216.73	-571.26	10.00	10.00	0.00	0.00
7,600.00	64.74	359.70	7,213.22	-491.37	-1,217.18	-484.99	10.00	10.00	0.00	0.00
7,657.18	70.46	359.70	7,235.00	-438.52	-1,217.46	-432.14	10.00	10.00	0.00	0.00
Fort Hays										
7,700.00	74.74	359.70	7,247.80	-397.68	-1,217.68	-391.29	10.00	10.00	0.00	0.00
7,745.38	79.28	359.70	7,258.00	-353.46	-1,217.91	-347.08	10.00	10.00	0.00	0.00
Codell										
7,800.00	84.74	359.70	7,265.59	-299.40	-1,218.19	-293.02	10.00	10.00	0.00	0.00
7,852.59	90.00	359.70	7,268.00	-246.89	-1,218.47	-240.50	10.00	10.00	0.00	0.00
End Build @ 7852.59ft - Target Heel Location - Top of Production										
7,900.00	90.00	359.70	7,268.00	-199.48	-1,218.72	-193.09	0.00	0.00	0.00	0.00
8,000.00	90.00	359.70	7,268.00	-99.48	-1,219.24	-93.09	0.00	0.00	0.00	0.00
8,100.00	90.00	359.70	7,268.00	0.52	-1,219.77	6.91	0.00	0.00	0.00	0.00
8,200.00	90.00	359.70	7,268.00	100.52	-1,220.30	106.91	0.00	0.00	0.00	0.00
8,300.00	90.00	359.70	7,268.00	200.52	-1,220.82	206.91	0.00	0.00	0.00	0.00
8,400.00	90.00	359.70	7,268.00	300.52	-1,221.35	306.91	0.00	0.00	0.00	0.00
8,500.00	90.00	359.70	7,268.00	400.52	-1,221.87	406.91	0.00	0.00	0.00	0.00

Plan Report for ALVIN 2C-29HZ - Permit Rev-2

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 (°)
8,600.00	90.00	359.70	7,268.00	500.51	-1,222.40	506.91	0.00	0.00	0.00	0.00
8,700.00	90.00	359.70	7,268.00	600.51	-1,222.93	606.91	0.00	0.00	0.00	0.00
8,800.00	90.00	359.70	7,268.00	700.51	-1,223.45	706.91	0.00	0.00	0.00	0.00
8,900.00	90.00	359.70	7,268.00	800.51	-1,223.98	806.91	0.00	0.00	0.00	0.00
9,000.00	90.00	359.70	7,268.00	900.51	-1,224.50	906.91	0.00	0.00	0.00	0.00
9,100.00	90.00	359.70	7,268.00	1,000.51	-1,225.03	1,006.91	0.00	0.00	0.00	0.00
9,200.00	90.00	359.70	7,268.00	1,100.51	-1,225.56	1,106.91	0.00	0.00	0.00	0.00
9,300.00	90.00	359.70	7,268.00	1,200.50	-1,226.08	1,206.91	0.00	0.00	0.00	0.00
9,400.00	90.00	359.70	7,268.00	1,300.50	-1,226.61	1,306.91	0.00	0.00	0.00	0.00
9,500.00	90.00	359.70	7,268.00	1,400.50	-1,227.13	1,406.91	0.00	0.00	0.00	0.00
9,600.00	90.00	359.70	7,268.00	1,500.50	-1,227.66	1,506.91	0.00	0.00	0.00	0.00
9,700.00	90.00	359.70	7,268.00	1,600.50	-1,228.19	1,606.91	0.00	0.00	0.00	0.00
9,800.00	90.00	359.70	7,268.00	1,700.50	-1,228.71	1,706.91	0.00	0.00	0.00	0.00
9,900.00	90.00	359.70	7,268.00	1,800.50	-1,229.24	1,806.91	0.00	0.00	0.00	0.00
10,000.00	90.00	359.70	7,268.00	1,900.50	-1,229.76	1,906.91	0.00	0.00	0.00	0.00
10,100.00	90.00	359.70	7,268.00	2,000.49	-1,230.29	2,006.91	0.00	0.00	0.00	0.00
10,200.00	90.00	359.70	7,268.00	2,100.49	-1,230.82	2,106.91	0.00	0.00	0.00	0.00
10,300.00	90.00	359.70	7,268.00	2,200.49	-1,231.34	2,206.91	0.00	0.00	0.00	0.00
10,400.00	90.00	359.70	7,268.00	2,300.49	-1,231.87	2,306.91	0.00	0.00	0.00	0.00
10,500.00	90.00	359.70	7,268.00	2,400.49	-1,232.40	2,406.91	0.00	0.00	0.00	0.00
10,600.00	90.00	359.70	7,268.00	2,500.49	-1,232.92	2,506.91	0.00	0.00	0.00	0.00
10,700.00	90.00	359.70	7,268.00	2,600.49	-1,233.45	2,606.91	0.00	0.00	0.00	0.00
10,800.00	90.00	359.70	7,268.00	2,700.48	-1,233.97	2,706.91	0.00	0.00	0.00	0.00
10,900.00	90.00	359.70	7,268.00	2,800.48	-1,234.50	2,806.91	0.00	0.00	0.00	0.00
11,000.00	90.00	359.70	7,268.00	2,900.48	-1,235.03	2,906.91	0.00	0.00	0.00	0.00
11,100.00	90.00	359.70	7,268.00	3,000.48	-1,235.55	3,006.91	0.00	0.00	0.00	0.00
11,200.00	90.00	359.70	7,268.00	3,100.48	-1,236.08	3,106.91	0.00	0.00	0.00	0.00
11,300.00	90.00	359.70	7,268.00	3,200.48	-1,236.60	3,206.91	0.00	0.00	0.00	0.00
11,400.00	90.00	359.70	7,268.00	3,300.48	-1,237.13	3,306.91	0.00	0.00	0.00	0.00
11,500.00	90.00	359.70	7,268.00	3,400.47	-1,237.66	3,406.91	0.00	0.00	0.00	0.00
11,600.00	90.00	359.70	7,268.00	3,500.47	-1,238.18	3,506.91	0.00	0.00	0.00	0.00
11,700.00	90.00	359.70	7,268.00	3,600.47	-1,238.71	3,606.91	0.00	0.00	0.00	0.00
11,800.00	90.00	359.70	7,268.00	3,700.47	-1,239.23	3,706.91	0.00	0.00	0.00	0.00
11,900.00	90.00	359.70	7,268.00	3,800.47	-1,239.76	3,806.91	0.00	0.00	0.00	0.00
12,000.00	90.00	359.70	7,268.00	3,900.47	-1,240.29	3,906.91	0.00	0.00	0.00	0.00
12,100.00	90.00	359.70	7,268.00	4,000.47	-1,240.81	4,006.91	0.00	0.00	0.00	0.00
12,200.00	90.00	359.70	7,268.00	4,100.46	-1,241.34	4,106.91	0.00	0.00	0.00	0.00
12,300.00	90.00	359.70	7,268.00	4,200.46	-1,241.86	4,206.91	0.00	0.00	0.00	0.00
12,400.00	90.00	359.70	7,268.00	4,300.46	-1,242.39	4,306.91	0.00	0.00	0.00	0.00
12,500.00	90.00	359.70	7,268.00	4,400.46	-1,242.92	4,406.91	0.00	0.00	0.00	0.00
12,600.00	90.00	359.70	7,268.00	4,500.46	-1,243.44	4,506.91	0.00	0.00	0.00	0.00
12,700.00	90.00	359.70	7,268.00	4,600.46	-1,243.97	4,606.91	0.00	0.00	0.00	0.00
12,800.00	90.00	359.70	7,268.00	4,700.46	-1,244.49	4,706.91	0.00	0.00	0.00	0.00
12,900.00	90.00	359.70	7,268.00	4,800.45	-1,245.02	4,806.91	0.00	0.00	0.00	0.00
13,000.00	90.00	359.70	7,268.00	4,900.45	-1,245.55	4,906.91	0.00	0.00	0.00	0.00
13,047.29	90.00	359.70	7,268.00	4,947.74	-1,245.79	4,954.20	0.00	0.00	0.00	0.00

TD Well @ 13047.29ft - Target Toe Location - ALVIN 2C-29HZ_BHL

Plan Report for ALVIN 2C-29HZ - Permit Rev-2

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,590.00	1,590.00	0.00	0.00	Begin Nudge @ 1590.00ft
2,690.00	2,663.17	-116.65	-172.94	End Nudge @ 2690.00ft
5,490.00	5,259.28	-703.19	-1,042.52	Begin Drop @ 5490.00ft
6,590.00	6,332.45	-819.84	-1,215.46	End Drop @ 6590.00ft
6,852.59	6,595.04	-819.84	-1,215.46	Top of 4.5" Liner @ 6852.59ft
6,952.59	6,695.04	-819.84	-1,215.46	KOP @ 6952.59ft
7,400.00	7,098.35	-653.85	-1,216.33	DLS = 10°/100'
7,852.59	7,268.00	-246.89	-1,218.47	End Build @ 7852.59ft
13,047.29	7,268.00	4,947.74	-1,245.79	TD Well @ 13047.29ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
User	No Target (Freehand)	359.70	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,852.59	Permit Rev-2	APC_ISCWSA REV 2 MWD+IFR1
7,852.59	13,047.29	Permit Rev-2	APC_ISCWSA REV 2 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
7,852.59	7,268.00	Top of Production	5-1/2	7-7/8

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,199.08	6,934.00	Sharon Springs		0.00	
7,254.30	6,983.00	Niobrara Top		0.00	
7,349.55	7,061.00	Niobrara B Bench		0.00	
7,435.84	7,123.00	Niobrara C Bench		0.00	
7,657.18	7,235.00	Fort Hays		0.00	
7,745.38	7,258.00	Codell		0.00	
7,852.59	7,268.00	Target Heel Location		0.00	
13,047.29	7,268.00	Target Toe Location		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
2N-R65W-Sec. 29_Section Lines	-18.00	191.26	-2,004.95	Polygon
ALVIN 2C-29HZ_SHL	0.00	0.00	0.00	Point
ALVIN 2C-29HZ_BHL	7,268.00	4,947.75	-1,245.79	Point

North Reference Sheet for 2N-65W-29 Alvin 16-29HZ Pad - ALVIN 2C-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 2C-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: 14,564,416.18 usft N, 1,730,003.62 usft E

Geographical Coordinates of Well: 40° 06' 10.94" N, 104° 40' 46.64" W

Grid Convergence at Surface is: 0.21°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,047.29usft the Bottom Hole Displacement is 5,102.17usft in the Direction of 345.87° (True).

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

