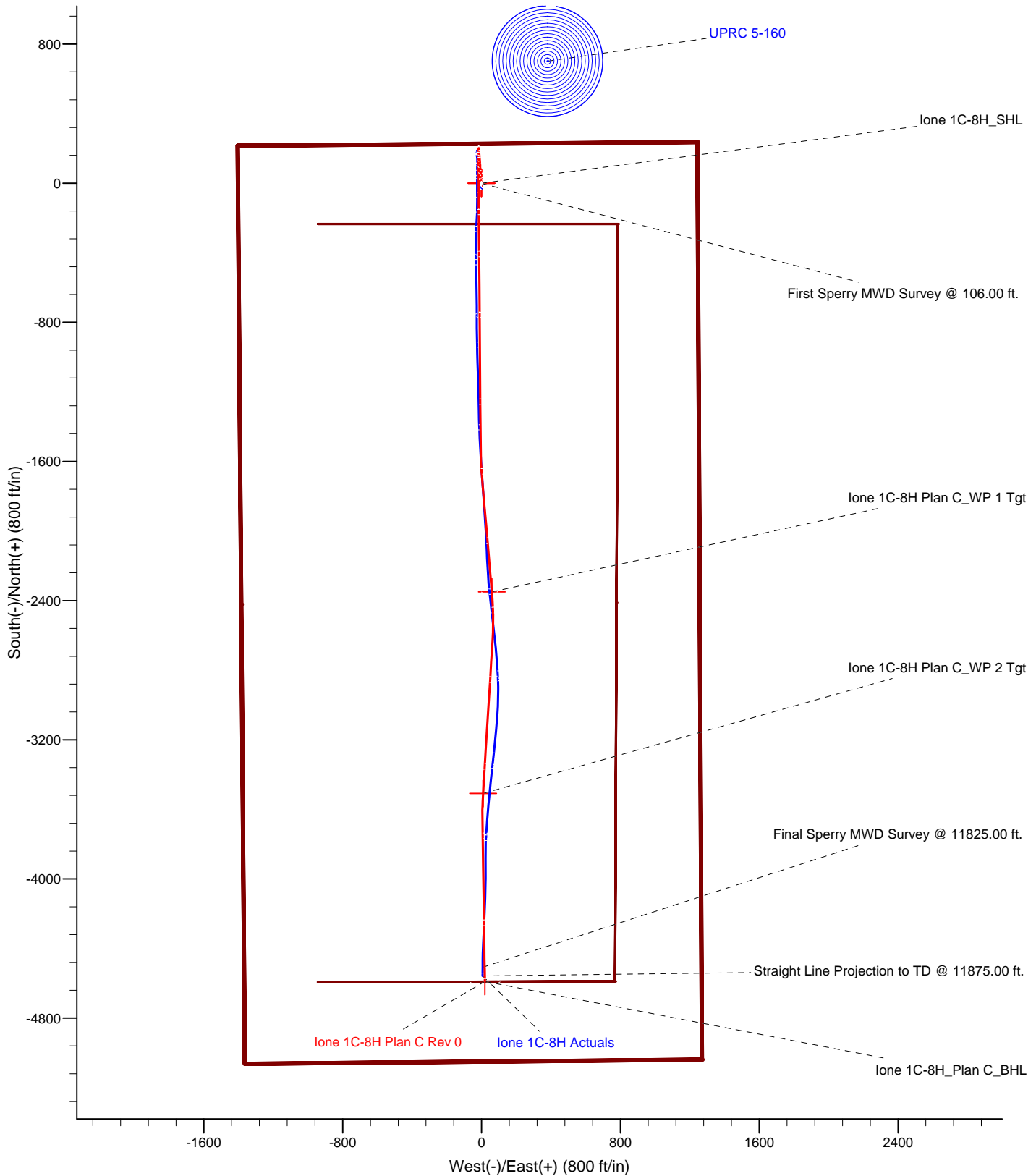
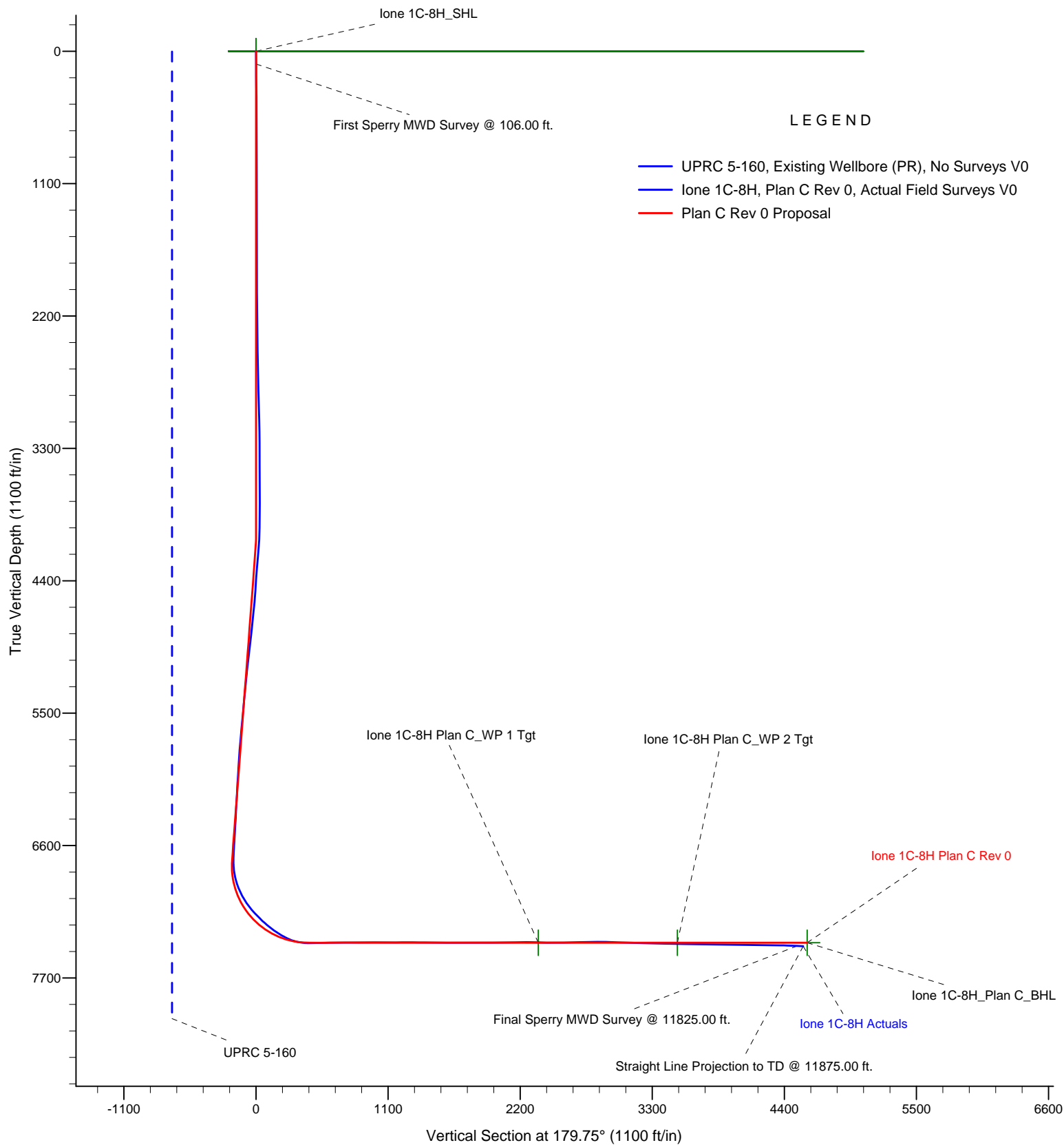


## LEGEND

- UPRC 5-160, Existing Wellbore (PR), No Surveys V0
- lone 1C-8H, Plan C Rev 0, Actual Field Surveys V0
- Plan C Rev 0 Proposal





# EnCana Oil & Gas (USA) Inc.

Weld County, CO

Sec. 8-T2N-R66W

lone 1C-8H

Plan C Rev 0

Survey: Sperry MWD Surveys

## Sperry Drilling Services Standard Report

05 November, 2012

Well Coordinates: 1,301,627.83 N, 3,196,732.05 E (40° 09' 33.19" N, 104° 47' 46.03" W)

Ground Level: 4,904.00 ft

Local Coordinate Origin:

Centered on Well lone 1C-8H

Viewing Datum:

RKB (13') @ 4917.00ft (Ensign 135)

TVDs to System:

N

North Reference:

Grid

Unit System:

API - US Survey Feet - Custom

Version: 2003.16 Build: 43I

**HALLIBURTON**

**Survey Report for Ione 1C-8H - Sperry MWD Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
106.00	0.66	149.90	106.00	-0.53	0.31	0.53	0.62
<b>First Sperry MWD Survey @ 106.00 ft.</b>							
198.00	0.65	136.76	197.99	-1.37	0.93	1.37	0.16
290.00	0.46	167.29	289.99	-2.11	1.37	2.11	0.37
382.00	0.48	149.65	381.98	-2.80	1.64	2.81	0.16
474.00	0.40	169.64	473.98	-3.45	1.90	3.46	0.19
566.00	0.57	171.76	565.98	-4.22	2.02	4.23	0.19
658.00	0.37	99.86	657.98	-4.72	2.38	4.73	0.63
750.00	0.18	183.07	749.98	-4.92	2.66	4.93	0.43
811.00	0.69	117.45	810.97	-5.18	2.98	5.19	1.04
917.00	0.09	74.22	916.97	-5.45	3.63	5.47	0.59
1,009.00	0.28	41.99	1,008.97	-5.27	3.85	5.28	0.23
1,101.00	0.11	69.45	1,100.97	-5.07	4.08	5.09	0.21
1,192.00	0.13	332.38	1,191.97	-4.95	4.12	4.96	0.20
1,285.00	0.29	235.14	1,284.97	-4.99	3.88	5.00	0.36
1,376.00	0.38	236.04	1,375.97	-5.29	3.44	5.30	0.10
1,468.00	0.36	228.01	1,467.97	-5.65	2.97	5.66	0.06
1,560.00	0.32	240.46	1,559.96	-5.97	2.53	5.98	0.09
1,652.00	0.45	242.52	1,651.96	-6.26	1.99	6.27	0.14
1,744.00	0.27	261.19	1,743.96	-6.46	1.45	6.47	0.23
1,836.00	0.34	254.90	1,835.96	-6.57	0.97	6.57	0.08
1,928.00	0.46	257.59	1,927.96	-6.72	0.35	6.72	0.13
2,023.00	0.53	224.55	2,022.95	-7.11	-0.33	7.11	0.30
2,117.00	0.85	217.66	2,116.95	-7.98	-1.06	7.97	0.35
2,212.00	0.79	226.44	2,211.94	-8.98	-1.97	8.98	0.15
2,307.00	1.47	237.98	2,306.92	-10.08	-3.48	10.07	0.75
2,401.00	1.67	236.81	2,400.88	-11.47	-5.64	11.45	0.22
2,496.00	1.46	210.09	2,495.85	-13.28	-7.41	13.24	0.79
2,591.00	0.83	198.12	2,590.83	-14.98	-8.23	14.94	0.71
2,685.00	1.58	161.42	2,684.81	-16.85	-8.03	16.82	1.11
2,780.00	1.81	151.52	2,779.77	-19.41	-6.90	19.38	0.39
2,875.00	1.90	142.70	2,874.72	-21.98	-5.23	21.96	0.31
2,970.00	1.68	142.10	2,969.67	-24.34	-3.42	24.32	0.23
3,064.00	1.57	142.98	3,063.63	-26.45	-1.79	26.44	0.12
3,159.00	1.38	138.33	3,158.60	-28.35	-0.25	28.34	0.24
3,254.00	0.87	126.72	3,253.58	-29.63	1.09	29.64	0.59
3,349.00	0.25	135.66	3,348.58	-30.21	1.81	30.22	0.66
3,443.00	0.44	246.53	3,442.58	-30.50	1.62	30.51	0.62
3,538.00	0.31	246.16	3,537.58	-30.75	1.05	30.75	0.14
3,633.00	0.64	276.67	3,632.57	-30.79	0.29	30.79	0.43
3,728.00	0.86	246.90	3,727.56	-31.01	-0.89	31.01	0.46
3,823.00	0.82	284.15	3,822.55	-31.12	-2.21	31.11	0.57
3,917.00	1.83	281.06	3,916.53	-30.67	-4.33	30.65	1.08
4,012.00	2.84	332.18	4,011.46	-28.30	-6.92	28.27	2.33
4,107.00	4.28	349.52	4,106.27	-22.73	-8.66	22.69	1.88
4,202.00	4.82	354.21	4,200.97	-15.27	-9.71	15.23	0.69
4,296.00	4.73	355.32	4,294.65	-7.48	-10.42	7.44	0.14
4,391.00	3.86	351.80	4,389.38	-0.41	-11.20	0.37	0.96
4,486.00	3.85	350.09	4,484.17	5.89	-12.20	-5.95	0.12



## Survey Report for lone 1C-8H - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,581.00	5.49	358.95	4,578.85	13.58	-12.84	-13.63	1.88
4,676.00	5.81	358.40	4,673.39	22.93	-13.05	-22.98	0.34
4,770.00	5.78	356.41	4,766.91	32.41	-13.48	-32.47	0.22
4,865.00	6.02	350.42	4,861.40	42.10	-14.61	-42.16	0.70
4,960.00	6.59	3.11	4,955.83	52.45	-15.15	-52.52	1.58
5,055.00	6.97	6.49	5,050.17	63.62	-14.20	-63.68	0.58
5,150.00	6.20	356.05	5,144.55	74.47	-13.90	-74.53	1.50
5,245.00	5.73	351.96	5,239.03	84.28	-14.92	-84.34	0.67
5,339.00	5.59	352.49	5,332.57	93.47	-16.17	-93.54	0.16
5,434.00	5.57	354.90	5,427.12	102.65	-17.19	-102.72	0.25
5,529.00	5.40	355.62	5,521.69	111.70	-17.94	-111.77	0.19
5,624.00	4.92	353.18	5,616.30	120.20	-18.76	-120.28	0.56
5,719.00	4.84	352.69	5,710.96	128.22	-19.76	-128.30	0.09
5,813.00	4.68	351.08	5,804.63	135.94	-20.86	-136.03	0.22
5,908.00	3.98	345.39	5,899.36	142.96	-22.29	-143.05	0.86
6,003.00	3.72	341.06	5,994.15	149.06	-24.12	-149.17	0.41
6,098.00	3.47	340.72	6,088.96	154.69	-26.07	-154.80	0.26
6,193.00	3.01	339.94	6,183.81	159.75	-27.87	-159.87	0.49
6,288.00	3.31	9.46	6,278.67	164.80	-28.28	-164.92	1.72
6,382.00	2.80	8.32	6,372.54	169.75	-27.50	-169.86	0.55
6,477.00	3.69	10.40	6,467.38	175.05	-26.61	-175.16	0.94
6,572.00	3.33	13.83	6,562.21	180.74	-25.40	-180.84	0.44
6,667.00	2.74	14.92	6,657.07	185.61	-24.16	-185.71	0.62
6,715.00	2.29	13.56	6,705.03	187.65	-23.64	-187.75	0.95
6,760.00	2.01	205.62	6,750.02	187.81	-23.77	-187.91	9.50
6,807.00	6.01	189.15	6,796.89	184.64	-24.52	-184.74	8.77
6,855.00	10.84	180.17	6,844.36	177.64	-24.93	-177.74	10.40
6,902.00	15.36	178.41	6,890.13	166.99	-24.77	-167.10	9.65
6,950.00	20.26	177.68	6,935.81	152.32	-24.26	-152.43	10.22
6,997.00	24.86	179.84	6,979.21	134.30	-23.90	-134.40	9.94
7,045.00	28.48	180.89	7,022.09	112.76	-24.05	-112.87	7.61
7,092.00	32.54	181.06	7,062.58	88.91	-24.46	-89.01	8.64
7,139.00	37.05	180.36	7,101.16	62.10	-24.78	-62.21	9.63
7,186.00	41.20	179.94	7,137.62	32.45	-24.85	-32.56	8.85
7,234.00	44.00	180.35	7,172.94	-0.04	-24.94	-0.07	5.86
7,281.00	45.44	179.27	7,206.34	-33.11	-24.82	33.00	3.46
7,329.00	47.89	179.51	7,239.28	-68.01	-24.45	67.91	5.12
7,376.00	50.44	180.59	7,270.01	-103.57	-24.49	103.47	5.70
7,424.00	54.23	180.63	7,299.33	-141.56	-24.90	141.45	7.90
7,471.00	57.57	182.32	7,325.68	-180.46	-25.91	180.34	7.70
7,518.00	59.78	183.60	7,350.12	-220.55	-27.99	220.43	5.25
7,566.00	64.69	182.22	7,372.47	-262.95	-30.13	262.82	10.54
7,581.00	67.46	182.25	7,378.55	-276.65	-30.67	276.52	18.47
7,605.00	71.26	181.28	7,387.01	-299.10	-31.36	298.96	16.28
7,682.00	81.57	179.54	7,405.07	-373.84	-31.87	373.70	13.57
7,700.00	83.87	179.21	7,407.35	-391.69	-31.67	391.55	12.91
7,763.00	90.43	178.88	7,410.49	-454.57	-30.62	454.43	10.43
7,858.00	91.79	178.99	7,408.65	-549.53	-28.86	549.40	1.44
7,953.00	90.99	179.66	7,406.34	-644.50	-27.74	644.37	1.10
8,048.00	90.74	179.74	7,404.91	-739.48	-27.24	739.36	0.28
8,142.00	89.75	179.34	7,404.50	-833.48	-26.49	833.36	1.14

**Survey Report for Ione 1C-8H - Sperry MWD Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,237.00	90.37	179.14	7,404.41	-928.47	-25.23	928.35	0.69
8,332.00	89.94	177.79	7,404.15	-1,023.43	-22.68	1,023.33	1.49
8,427.00	89.38	178.29	7,404.71	-1,118.37	-19.43	1,118.28	0.79
8,522.00	91.23	179.00	7,404.21	-1,213.34	-17.19	1,213.26	2.09
8,617.00	88.58	178.27	7,404.36	-1,308.31	-14.92	1,308.23	2.89
8,712.00	90.37	178.47	7,405.23	-1,403.26	-12.22	1,403.19	1.90
8,806.00	88.64	176.84	7,406.05	-1,497.17	-8.38	1,497.12	2.53
8,901.00	90.12	176.38	7,407.07	-1,592.00	-2.76	1,591.97	1.63
8,996.00	90.00	176.80	7,406.97	-1,686.83	2.89	1,686.82	0.46
9,091.00	89.44	175.24	7,407.44	-1,781.59	9.49	1,781.62	1.74
9,185.00	90.93	175.41	7,407.14	-1,875.28	17.15	1,875.33	1.60
9,280.00	90.80	176.79	7,405.70	-1,970.04	23.61	1,970.13	1.46
9,375.00	90.62	177.74	7,404.52	-2,064.93	28.14	2,065.03	1.02
9,470.00	90.62	176.97	7,403.50	-2,159.82	32.52	2,159.94	0.81
9,565.00	89.81	176.26	7,403.14	-2,254.65	38.13	2,254.80	1.13
9,659.00	89.57	174.38	7,403.65	-2,348.33	45.80	2,348.51	2.02
9,753.00	89.20	173.46	7,404.66	-2,441.80	55.76	2,442.01	1.05
9,848.00	89.32	172.81	7,405.88	-2,536.11	67.11	2,536.37	0.70
9,943.00	91.98	173.83	7,404.81	-2,630.45	78.16	2,630.76	3.00
10,037.00	91.17	176.14	7,402.22	-2,724.05	86.37	2,724.39	2.60
10,132.00	91.17	175.99	7,400.28	-2,818.80	92.89	2,819.17	0.16
10,227.00	88.46	180.08	7,400.59	-2,913.72	96.15	2,914.10	5.16
10,322.00	87.53	182.62	7,403.91	-3,008.62	93.91	3,009.00	2.85
10,417.00	88.70	184.67	7,407.04	-3,103.37	87.88	3,103.72	2.48
10,512.00	89.07	185.81	7,408.89	-3,197.96	79.20	3,198.27	1.26
10,606.00	87.77	186.32	7,411.48	-3,291.39	69.27	3,291.66	1.49
10,701.00	88.39	185.91	7,414.66	-3,385.80	59.16	3,386.02	0.78
10,796.00	89.75	186.01	7,416.20	-3,480.27	49.30	3,480.45	1.44
10,891.00	88.08	184.57	7,418.00	-3,574.84	40.54	3,574.98	2.32
10,986.00	90.00	184.95	7,419.59	-3,669.50	32.66	3,669.60	2.06
11,080.00	88.89	183.25	7,420.51	-3,763.25	25.94	3,763.32	2.16
11,175.00	88.70	179.73	7,422.50	-3,858.18	23.47	3,858.24	3.71
11,270.00	90.56	179.99	7,423.12	-3,953.17	23.70	3,953.24	1.98
11,365.00	87.78	181.47	7,424.49	-4,048.14	22.49	4,048.20	3.32
11,460.00	89.44	181.89	7,426.80	-4,143.07	19.71	4,143.12	1.80
11,555.00	88.76	182.55	7,428.29	-4,237.99	16.03	4,238.02	1.00
11,649.00	90.25	182.81	7,429.10	-4,331.88	11.63	4,331.89	1.61
11,744.00	88.02	181.64	7,430.54	-4,426.79	7.95	4,426.78	2.65
11,825.00	87.41	180.26	7,433.77	-4,507.71	6.60	4,507.70	1.86
<b>Final Sperry MWD Survey @ 11825.00 ft.</b>							
11,875.00	87.41	180.26	7,436.03	-4,557.66	6.38	4,557.64	0.00
<b>Straight Line Projection to TD @ 11875.00 ft.</b>							

**Survey Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
106.00	106.00	-0.53	0.31	First Sperry MWD Survey @ 106.00 ft.
11,825.00	7,433.77	-4,507.71	6.60	Final Sperry MWD Survey @ 11825.00 ft.
11,875.00	7,436.03	-4,557.66	6.38	Straight Line Projection to TD @ 11875.00 ft.

**Survey Report for lone 1C-8H - Sperry MWD Surveys****Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	lone 1C-8H_Plan C_BHL	179.75	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
106.00	11,875.00	Sperry MWD Surveys	MWD

**Targets**

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
lone 1C-8H_SHL - survey hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,301,627.83	3,196,732.05	40° 9' 33.192 N	104° 47' 46.032 W
East 1/2 Sec 8-T2N- - survey hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,301,627.83	3,196,732.05	40° 9' 33.192 N	104° 47' 46.032 W
lone 1C-8H Plan C_ - survey misses target center by 14.36ft at 9662.20ft MD (7403.67 TVD, -2351.51 N, 46.12 E) - Point	0.00	0.00	7,407.00	-2,350.00	60.00	1,299,277.83	3,196,792.05	40° 9' 9.964 N	104° 47' 45.500 W
lone 1C-8H Plan C_ - survey misses target center by 38.40ft at 10828.15ft MD (7416.50 TVD, -3512.25 N, 46.07 E) - Point	0.00	0.00	7,407.00	-3,509.00	9.00	1,298,118.83	3,196,741.05	40° 8' 58.514 N	104° 47' 46.275 W
East 1/2 Sec 8-T2N- - survey hits target center - Polygon	0.00	359.55	0.00	0.03	0.00	1,301,627.85	3,196,732.05	40° 9' 33.192 N	104° 47' 46.032 W
lone 1C-8H_Plan C_ - survey misses target center by 45.37ft at 11875.00ft MD (7436.03 TVD, -4557.66 N, 6.38 E) - Point	0.00	0.00	7,407.00	-4,589.90	19.66	1,297,037.93	3,196,751.71	40° 8' 47.832 N	104° 47' 46.248 W

**North Reference Sheet for Sec. 8-T2N-R66W - Ione 1C-8H - Plan C Rev 0**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to RKB (13') @ 4917.00ft (Ensign 135). Northing and Easting are relative to Ione 1C-8H

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° 30' 0.000 W°, Longitude Origin: 0° 0' 0.000 E°, Latitude Origin: 40° 47' 0.000 N°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99995812

Grid Coordinates of Well: 1,301,627.83 ft N, 3,196,732.05 ft E

Geographical Coordinates of Well: 40° 09' 33.19" N, 104° 47' 46.03" W

Grid Convergence at Surface is: 0.45°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,875.00ft  
the Bottom Hole Displacement is 4,557.66ft in the Direction of 179.92° (Grid).

Magnetic Convergence at surface is: -8.27° (20 October 2012, , BGGM2012)

