



## Survey Certification

7327 West Barton Road  
Casper, WY 82604  
(307)-472-6621 Fax (307) 472-5439

<b>Operator</b>	EnCana Oil & Gas (USA) Inc
<b>Well Name &amp; No.</b>	Dale 4C-20H-O264
<b>County &amp; State</b>	Weld County, CO
<b>SDI Job No.</b>	410814HEFK186395
<b>Rig</b>	H&P 278
<b>Survey Date</b>	9-Nov-2014

I, Seth M. Burstad, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 0 feet to a measured depth of 11533 feet is true and correct as determined from all available records.

Seth Burstad  
Signature

10-Nov-2014  
Date

**Seth M. Burstad**  
Rockies Region Well Planner  
Scientific Drilling - Rocky Mountain District



## **EnCana Oil & Gas (USA) Inc**

**DJ Wattenberg**

**S20-T2N-R64W (Dale)**

**Dale 4C-20H-O264**

**HZ**

**Design: HZ**

## **Standard Survey Report**

**10 November, 2014**





<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Dale 4C-20H-O264
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 4988.00ft (Original Well Elev)
<b>Site:</b>	S20-T2N-R64W (Dale)	<b>MD Reference:</b>	WELL @ 4988.00ft (Original Well Elev)
<b>Well:</b>	Dale 4C-20H-O264	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	HZ	<b>Database:</b>	Casper District

<b>Project</b>	DJ Wattenberg, Weld County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

<b>Site</b>	S20-T2N-R64W (Dale)			
<b>Site Position:</b>		<b>Northing:</b>	1,287,026.80 usft	<b>Latitude:</b> 40.117609
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,257,591.72 usft	<b>Longitude:</b> -104.578929
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> 0.60 °

<b>Well</b>	Dale 4C-20H-O264			
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	1,287,059.11 usft
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	3,259,538.55 usft
<b>Position Uncertainty</b>	0.00 ft		<b>Wellhead Elevation:</b>	ft
			<b>Ground Level:</b>	4,958.00 ft

<b>Wellbore</b>	HZ				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	BGGM2014	10/31/2014	8.38	66.73	52,536

<b>Design</b>	HZ			
<b>Audit Notes:</b>				
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b> 0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	217.98

<b>Survey Program</b>	<b>Date</b>	11/10/2014		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
140.00	1,051.00	Survey #1 - Surface (HZ)	SDI MWD	SDI MWD - Standard ver 1.0.1
1,154.00	7,223.00	Survey #2 - Intermediate (HZ)	SDI MWD	SDI MWD - Standard ver 1.0.1
7,359.00	11,533.00	Survey #3 - Lateral (HZ)	SDI MWD	SDI MWD - Standard ver 1.0.1

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140.00	0.18	76.20	140.00	0.05	0.21	-0.17	0.13	0.13	0.00
<b>First SDI MWD Survey</b>									
232.00	0.35	68.03	232.00	0.19	0.61	-0.53	0.19	0.18	-8.88
323.00	1.14	245.92	322.99	-0.07	0.05	0.03	1.64	0.87	195.48
415.00	3.08	230.45	414.93	-2.02	-2.70	3.25	2.18	2.11	-16.82
507.00	3.96	225.44	506.75	-5.82	-6.87	8.82	1.01	0.96	-5.45
598.00	5.19	217.00	597.46	-11.32	-11.58	16.05	1.54	1.35	-9.27
690.00	5.01	216.39	689.10	-17.87	-16.47	24.22	0.20	-0.20	-0.66

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Dale 4C-20H-O264
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 4988.00ft (Original Well Elev)
<b>Site:</b>	S20-T2N-R64W (Dale)	<b>MD Reference:</b>	WELL @ 4988.00ft (Original Well Elev)
<b>Well:</b>	Dale 4C-20H-O264	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	HZ	<b>Database:</b>	Casper District

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
781.00	5.01	219.64	779.75	-24.13	-21.36	32.17	0.31	0.00	3.57
873.00	4.66	216.74	871.42	-30.22	-26.16	39.92	0.46	-0.38	-3.15
964.00	5.89	210.15	962.04	-37.22	-30.72	48.24	1.50	1.35	-7.24
1,051.00	5.63	208.56	1,048.60	-44.83	-35.00	56.87	0.35	-0.30	-1.83
Last SDI MWD Surface Survey									
1,154.00	5.48	205.34	1,151.11	-53.71	-39.52	66.66	0.34	-0.15	-3.13
First SDI MWD Intermediate Survey									
1,338.00	9.36	228.46	1,333.58	-71.58	-54.49	89.95	2.62	2.11	12.57
1,521.00	10.81	233.20	1,513.75	-91.73	-79.37	121.15	0.91	0.79	2.59
1,704.00	11.09	233.40	1,693.42	-112.51	-107.24	154.68	0.15	0.15	0.11
1,887.00	11.44	230.81	1,872.89	-134.47	-135.44	189.34	0.34	0.19	-1.42
2,070.00	10.68	226.81	2,052.49	-157.54	-161.87	223.79	0.59	-0.42	-2.19
2,252.00	9.81	228.26	2,231.59	-179.41	-185.73	255.71	0.50	-0.48	0.80
2,435.00	7.58	234.74	2,412.48	-196.76	-207.22	282.61	1.33	-1.22	3.54
2,618.00	8.79	230.49	2,593.61	-212.62	-227.87	307.82	0.74	0.66	-2.32
2,802.00	9.70	230.01	2,775.22	-231.53	-250.59	336.71	0.50	0.49	-0.26
2,992.00	10.13	231.26	2,962.38	-252.27	-275.89	368.62	0.25	0.23	0.66
3,181.00	10.12	231.75	3,148.44	-272.95	-301.89	400.93	0.05	-0.01	0.26
3,371.00	8.87	231.01	3,335.83	-292.50	-326.39	431.41	0.66	-0.66	-0.39
3,560.00	5.35	220.92	3,523.36	-308.34	-343.49	454.42	1.97	-1.86	-5.34
3,750.00	4.98	230.86	3,712.59	-320.23	-355.69	471.30	0.51	-0.19	5.23
3,939.00	4.19	231.47	3,900.98	-329.71	-367.45	486.01	0.42	-0.42	0.32
4,128.00	1.00	235.55	4,089.77	-334.95	-374.21	494.30	1.69	-1.69	2.16
4,317.00	0.60	123.11	4,278.76	-336.42	-374.75	495.79	0.71	-0.21	-59.49
4,507.00	1.19	26.88	4,468.74	-335.21	-373.02	493.77	0.73	0.31	-50.65
4,697.00	0.75	88.60	4,658.72	-333.42	-370.88	491.04	0.56	-0.23	32.48
4,888.00	0.76	77.57	4,849.70	-333.11	-368.40	489.28	0.08	0.01	-5.77
5,078.00	1.13	351.86	5,039.68	-330.99	-367.43	487.01	0.69	0.19	-45.11
5,268.00	0.70	354.31	5,229.66	-327.98	-367.81	484.87	0.23	-0.23	1.29
5,459.00	0.41	269.09	5,420.65	-326.83	-368.61	484.45	0.41	-0.15	-44.62
5,649.00	1.10	107.84	5,610.64	-327.40	-367.56	484.25	0.79	0.36	-84.87
5,839.00	0.47	256.15	5,800.63	-328.14	-366.58	484.24	0.80	-0.33	78.06
6,030.00	0.18	206.58	5,991.63	-328.60	-367.47	485.15	0.20	-0.15	-25.95
6,221.00	0.51	130.89	6,182.62	-329.42	-366.96	485.48	0.26	0.17	-39.63
6,316.00	0.47	70.15	6,277.62	-329.57	-366.28	485.17	0.52	-0.04	-63.94
6,411.00	3.91	356.36	6,372.54	-326.20	-366.12	482.42	4.01	3.62	-77.67
6,506.00	10.28	359.44	6,466.77	-314.48	-366.40	473.36	6.71	6.71	3.24
6,601.00	14.71	4.81	6,559.50	-293.97	-365.48	456.63	4.82	4.66	5.65
6,696.00	23.15	2.12	6,649.28	-263.24	-363.77	431.35	8.93	8.88	-2.83
6,792.00	30.09	359.98	6,735.05	-220.26	-363.08	397.05	7.30	7.23	-2.23
6,887.00	42.77	1.68	6,811.34	-163.97	-362.14	352.10	13.39	13.35	1.79
6,982.00	55.51	357.92	6,873.37	-92.30	-362.62	295.90	13.74	13.41	-3.96
7,077.00	68.70	0.26	6,917.72	-8.54	-363.84	230.63	14.05	13.88	2.46
7,173.00	81.91	357.86	6,942.03	84.10	-365.42	158.59	13.97	13.76	-2.50

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<b>Well:</b>	Dale 4C-20H-O264	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	HZ	<b>Database:</b>	Casper District

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,223.00	89.56	358.23	6,945.74	133.89	-367.12	120.38	15.32	15.30	0.74
<b>Last SDI MWD Intermediate Survey</b>									
7,359.00	92.28	359.10	6,943.56	269.82	-370.29	15.19	2.10	2.00	0.64
7,451.00	92.32	0.65	6,939.87	361.75	-370.49	-57.14	1.68	0.04	1.68
7,542.00	91.24	1.84	6,937.04	452.68	-368.51	-130.03	1.77	-1.19	1.31
7,633.00	90.00	2.97	6,936.05	543.59	-364.69	-204.04	1.84	-1.36	1.24
7,728.00	89.43	3.78	6,936.53	638.42	-359.10	-282.23	1.04	-0.60	0.85
7,823.00	89.63	3.71	6,937.31	733.21	-352.90	-360.77	0.22	0.21	-0.07
7,918.00	88.99	3.01	6,938.45	828.04	-347.33	-438.94	1.00	-0.67	-0.74
8,014.00	89.76	4.09	6,939.50	923.85	-341.38	-518.12	1.38	0.80	1.13
<b>First SDI MWD Lateral Survey</b>									
8,109.00	89.70	2.78	6,939.94	1,018.68	-335.69	-596.37	1.38	-0.06	-1.38
8,204.00	89.70	1.76	6,940.44	1,113.60	-331.93	-673.50	1.07	0.00	-1.07
8,299.00	89.23	0.07	6,941.33	1,208.58	-330.41	-749.30	1.85	-0.49	-1.78
8,394.00	89.83	359.17	6,942.11	1,303.57	-331.04	-823.79	1.14	0.63	-0.95
8,489.00	89.60	358.78	6,942.58	1,398.56	-332.74	-897.61	0.48	-0.24	-0.41
8,585.00	90.71	359.38	6,942.32	1,494.54	-334.28	-972.32	1.31	1.16	0.63
8,680.00	90.20	359.00	6,941.57	1,589.53	-335.63	-1,046.37	0.67	-0.54	-0.40
8,776.00	89.16	358.72	6,942.10	1,685.51	-337.54	-1,120.84	1.12	-1.08	-0.29
8,871.00	89.63	359.42	6,943.11	1,780.49	-339.08	-1,194.76	0.89	0.49	0.74
8,966.00	89.16	359.74	6,944.11	1,875.48	-339.77	-1,269.21	0.60	-0.49	0.34
9,061.00	89.90	359.35	6,944.89	1,970.47	-340.53	-1,343.62	0.88	0.78	-0.41
9,157.00	89.56	359.15	6,945.34	2,066.46	-341.79	-1,418.51	0.41	-0.35	-0.21
9,252.00	91.01	0.33	6,944.87	2,161.46	-342.22	-1,493.12	1.97	1.53	1.24
9,347.00	90.27	0.63	6,943.81	2,256.45	-341.42	-1,568.48	0.84	-0.78	0.32
9,442.00	89.23	0.57	6,944.22	2,351.44	-340.43	-1,643.97	1.10	-1.09	-0.06
9,537.00	89.46	0.12	6,945.31	2,446.43	-339.85	-1,719.19	0.53	0.24	-0.47
9,632.00	88.99	358.75	6,946.59	2,541.42	-340.79	-1,793.49	1.52	-0.49	-1.44
9,727.00	90.50	358.64	6,947.02	2,636.39	-342.95	-1,867.01	1.59	1.59	-0.12
9,823.00	90.81	0.17	6,945.92	2,732.37	-343.95	-1,942.06	1.63	0.32	1.59
9,918.00	89.76	1.11	6,945.45	2,827.36	-342.89	-2,017.59	1.48	-1.11	0.99
10,013.00	88.92	1.31	6,946.54	2,922.34	-340.88	-2,093.68	0.91	-0.88	0.21
10,108.00	87.55	0.12	6,949.47	3,017.28	-339.70	-2,169.25	1.91	-1.44	-1.25
10,203.00	88.15	0.65	6,953.03	3,112.21	-339.06	-2,244.46	0.84	0.63	0.56
10,298.00	87.24	359.46	6,956.85	3,207.13	-338.97	-2,319.34	1.58	-0.96	-1.25
10,393.00	86.91	359.98	6,961.70	3,302.00	-339.43	-2,393.84	0.65	-0.35	0.55
10,488.00	86.67	357.88	6,967.02	3,396.83	-341.20	-2,467.49	2.22	-0.25	-2.21
10,584.00	88.22	355.66	6,971.30	3,492.58	-346.61	-2,539.63	2.82	1.61	-2.31
10,679.00	88.82	356.06	6,973.75	3,587.30	-353.46	-2,610.08	0.76	0.63	0.42
10,774.00	90.57	356.01	6,974.26	3,682.06	-360.03	-2,680.73	1.84	1.84	-0.05
10,869.00	91.75	356.79	6,972.34	3,776.86	-366.00	-2,751.78	1.49	1.24	0.82
10,964.00	90.64	357.47	6,970.35	3,871.71	-370.75	-2,823.62	1.37	-1.17	0.72
11,059.00	91.98	357.97	6,968.18	3,966.61	-374.53	-2,896.10	1.51	1.41	0.53



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<b>Well:</b>	Dale 4C-20H-O264	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	HZ	<b>Database:</b>	Casper District

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,154.00	90.97	358.56	6,965.74	4,061.53	-377.41	-2,969.15	1.23	-1.06	0.62
11,250.00	91.98	359.12	6,963.27	4,157.48	-379.35	-3,043.58	1.20	1.05	0.58
11,345.00	91.14	0.30	6,960.68	4,252.44	-379.83	-3,118.14	1.52	-0.88	1.24
11,440.00	91.48	1.05	6,958.51	4,347.41	-378.71	-3,193.68	0.87	0.36	0.79
11,469.00	91.81	1.10	6,957.67	4,376.39	-378.17	-3,216.86	1.15	1.14	0.17
<b>Last SDI MWD Survey</b>									
11,533.00	91.81	1.10	6,955.65	4,440.35	-376.94	-3,268.03	0.00	0.00	0.00
<b>Projection to TD</b>									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
140.00	140.00	0.05	0.21	First SDI MWD Survey
1,051.00	1,048.60	-44.83	-35.00	Last SDI MWD Surface Survey
1,154.00	1,151.11	-53.71	-39.52	First SDI MWD Intermediate Survey
7,223.00	6,945.74	133.89	-367.12	Last SDI MWD Intermediate Survey
8,014.00	6,939.50	923.85	-341.38	First SDI MWD Lateral Survey
11,469.00	6,957.67	4,376.39	-378.17	Last SDI MWD Survey
11,533.00	6,955.65	4,440.35	-376.94	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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