

Noble Energy Inc.- Weld County, CO (Grid North)

Well Name: **Seneca E15-72-1HC**

Surface Location: Eagle E14-62-1HN Pad Sec.14-T6N-R65W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

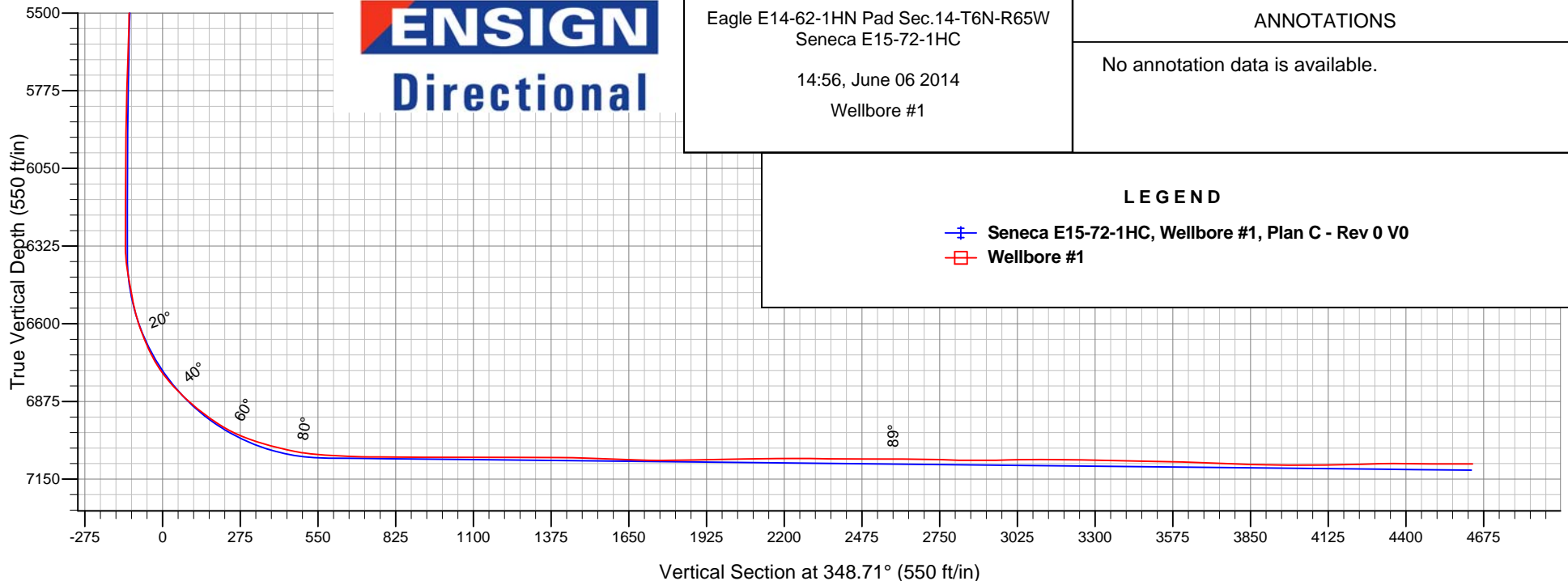
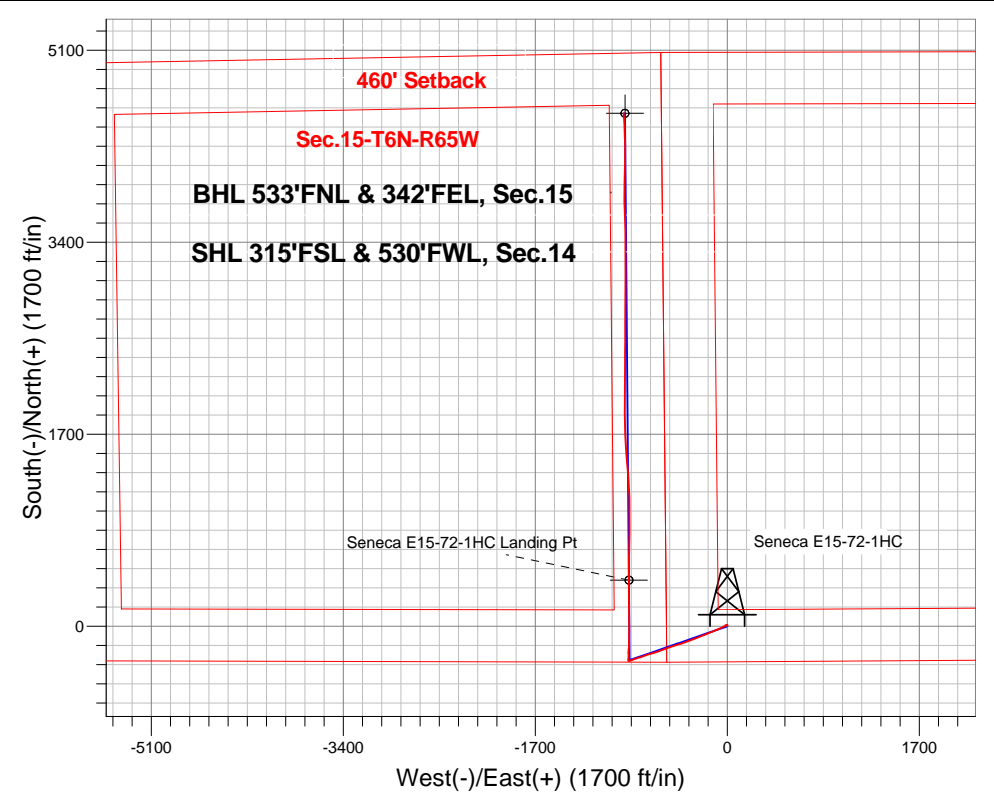
Ground Elevation: 4738.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1418749.24	3239745.51	40.479670	-104.638160	

Precision 829 RKB - 16' WELL @ 4754.0ft (Precision 829 RKB - 16')

FINAL SURVEY

Projected Bottom Hole Location
11710'MD 7096'TVD 4544'N & 918'W of SHL
90.2 degree Incl @ 355.7 degree AZM



Eagle E14-62-1HN Pad Sec.14-T6N-R65W
Seneca E15-72-1HC

14:56, June 06 2014
Wellbore #1

ANNOTATIONS

No annotation data is available.

LEGEND

- Seneca E15-72-1HC, Wellbore #1, Plan C - Rev 0 V0
- Wellbore #1



Noble Energy Inc.- Weld County, CO (Grid North)

Sec.14-T6N-R65W

Eagle E14-62-1HN Pad Sec.14-T6N-R65W

Seneca E15-72-1HC

Wellbore #1

Design: Wellbore #1

Standard Survey Report

06 June, 2014

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Seneca E15-72-1HC
Project:	Sec.14-T6N-R65W	TVD Reference:	WELL @ 4754.0ft (Precision 829 RKB - 16')
Site:	Eagle E14-62-1HN Pad Sec.14-T6N-R65W	MD Reference:	WELL @ 4754.0ft (Precision 829 RKB - 16')
Well:	Seneca E15-72-1HC	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	Sec.14-T6N-R65W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Eagle E14-62-1HN Pad Sec.14-T6N-R65W					
Site Position:		Northing:		Latitude:	
From:		1,418,814.82 ft		40.479850	
Lat/Long		Easting:		Longitude:	
		3,239,744.87 ft		-104.638160	
Position Uncertainty:		Slot Radius:		Grid Convergence:	
0.0 ft		"		0.56 °	

Well	Seneca E15-72-1HC					
Well Position	+N-S	0.0 ft	Northing:	1,418,749.24 ft	Latitude:	40.479670
	+E-W	0.0 ft	Easting:	3,239,745.51 ft	Longitude:	-104.638160
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,738.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/28/2014	8.41	67.03	52,876

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	348.71	

Survey Program		Date	6/6/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
352.0	665.0	Surface (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
708.0	7,528.0	Intermediate (Wellbore #1)	MWD	MWD - Standard	
7,617.0	11,710.0	Lateral (Wellbore #1)	MWD	MWD - Standard	

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
352.0	0.20	60.55	352.0	0.3	0.5	0.2	0.06	0.06	0.00
665.0	0.20	2.75	665.0	1.1	1.0	0.9	0.06	0.00	-18.47
708.0	0.80	15.60	708.0	1.5	1.1	1.2	1.41	1.40	29.88
797.0	0.80	13.50	797.0	2.7	1.4	2.4	0.03	0.00	-2.36
887.0	0.90	5.40	887.0	4.0	1.6	3.6	0.17	0.11	-9.00
977.0	0.80	14.40	977.0	5.3	1.9	4.8	0.19	-0.11	10.00
1,066.0	0.70	9.30	1,066.0	6.4	2.1	5.9	0.13	-0.11	-5.73
1,143.0	0.70	2.60	1,143.0	7.4	2.2	6.8	0.11	0.00	-8.70
1,238.0	0.70	304.20	1,237.9	8.3	1.8	7.8	0.72	0.00	-61.47

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Site:	Eagle E14-62-1HN Pad Sec.14-T6N-R65W	MD Reference:	WELL @ 4754.0ft (Precision 829 RKB - 16')
Well:	Seneca E15-72-1HC	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
1,335.0	0.50	342.70	1,334.9	9.0	1.1	8.6	0.45	-0.21	39.69
1,429.0	2.10	289.60	1,428.9	10.0	-0.6	9.9	1.96	1.70	-56.49
1,524.0	2.80	283.10	1,523.8	11.1	-4.5	11.8	0.79	0.74	-6.84
1,618.0	3.60	257.10	1,617.7	11.0	-9.6	12.6	1.74	0.85	-27.66
1,712.0	5.50	237.40	1,711.4	7.9	-16.3	10.9	2.59	2.02	-20.96
1,806.0	7.00	236.00	1,804.8	2.2	-24.8	7.1	1.60	1.60	-1.49
1,900.0	8.00	237.40	1,898.0	-4.5	-35.1	2.5	1.08	1.06	1.49
1,994.0	8.00	246.70	1,991.1	-10.6	-46.6	-1.3	1.38	0.00	9.89
2,086.0	9.20	245.30	2,082.1	-16.2	-59.2	-4.3	1.32	1.30	-1.52
2,178.0	11.30	247.30	2,172.6	-22.7	-74.2	-7.8	2.31	2.28	2.17
2,272.0	12.70	246.70	2,264.6	-30.4	-92.2	-11.8	1.50	1.49	-0.64
2,365.0	12.80	246.90	2,355.3	-38.5	-111.0	-16.0	0.12	0.11	0.22
2,458.0	12.80	246.20	2,445.9	-46.7	-129.9	-20.3	0.17	0.00	-0.75
2,551.0	14.20	249.50	2,536.4	-54.8	-150.0	-24.4	1.72	1.51	3.55
2,641.0	13.50	246.00	2,623.8	-63.0	-170.0	-28.5	1.21	-0.78	-3.89
2,730.0	12.30	243.00	2,710.5	-71.5	-187.9	-33.3	1.54	-1.35	-3.37
2,820.0	14.30	252.00	2,798.1	-79.3	-207.0	-37.2	3.19	2.22	10.00
2,910.0	14.30	251.70	2,885.3	-86.2	-228.2	-39.9	0.08	0.00	-0.33
2,999.0	13.10	248.50	2,971.8	-93.4	-248.0	-43.0	1.59	-1.35	-3.60
3,089.0	12.40	247.10	3,059.6	-100.9	-266.4	-46.8	0.85	-0.78	-1.56
3,179.0	13.30	248.70	3,147.3	-108.4	-284.9	-50.5	1.08	1.00	1.78
3,268.0	13.20	250.40	3,233.9	-115.5	-304.0	-53.8	0.45	-0.11	1.91
3,358.0	12.70	248.10	3,321.7	-122.6	-322.9	-57.1	0.80	-0.56	-2.56
3,447.0	11.80	250.30	3,408.6	-129.4	-340.5	-60.2	1.14	-1.01	2.47
3,537.0	11.00	250.30	3,496.8	-135.4	-357.3	-62.8	0.89	-0.89	0.00
3,627.0	11.30	251.10	3,585.1	-141.1	-373.7	-65.2	0.38	0.33	0.89
3,716.0	13.80	252.40	3,672.0	-147.1	-392.1	-67.6	2.83	2.81	1.46
3,806.0	15.20	251.00	3,759.1	-154.2	-413.5	-70.3	1.60	1.56	-1.56
3,896.0	16.30	251.70	3,845.8	-162.0	-436.6	-73.4	1.24	1.22	0.78
3,985.0	16.40	251.50	3,931.2	-169.9	-460.4	-76.6	0.13	0.11	-0.22
4,075.0	14.90	254.10	4,017.8	-177.1	-483.6	-79.1	1.84	-1.67	2.89
4,165.0	12.80	251.30	4,105.2	-183.5	-504.1	-81.3	2.45	-2.33	-3.11
4,254.0	11.50	250.10	4,192.2	-189.7	-521.8	-83.9	1.49	-1.46	-1.35
4,344.0	11.30	251.10	4,280.4	-195.6	-538.6	-86.4	0.31	-0.22	1.11
4,434.0	12.30	247.40	4,368.5	-202.1	-555.8	-89.5	1.39	1.11	-4.11
4,523.0	13.40	249.40	4,455.3	-209.4	-574.2	-93.0	1.33	1.24	2.25
4,613.0	14.20	252.40	4,542.7	-216.4	-594.5	-95.9	1.19	0.89	3.33
4,703.0	11.80	249.70	4,630.4	-223.0	-613.6	-98.5	2.75	-2.67	-3.00
4,793.0	12.00	249.70	4,718.5	-229.4	-631.0	-101.5	0.22	0.22	0.00
4,882.0	13.10	252.70	4,805.3	-235.6	-649.3	-104.0	1.44	1.24	3.37
4,971.0	13.50	253.10	4,891.9	-241.6	-668.9	-106.0	0.46	0.45	0.45
5,061.0	14.20	255.50	4,979.3	-247.4	-689.7	-107.7	1.01	0.78	2.67
5,150.0	14.50	253.90	5,065.6	-253.3	-710.9	-109.2	0.56	0.34	-1.80
5,240.0	12.00	247.80	5,153.2	-259.9	-730.4	-111.9	3.18	-2.78	-6.78
5,330.0	10.60	249.70	5,241.4	-266.3	-746.8	-115.0	1.61	-1.56	2.11
5,419.0	10.20	253.10	5,328.9	-271.5	-762.1	-117.1	0.82	-0.45	3.82
5,509.0	8.80	259.90	5,417.7	-275.0	-776.5	-117.7	1.99	-1.56	7.56
5,599.0	9.10	251.00	5,506.6	-278.5	-790.0	-118.5	1.57	0.33	-9.89
5,688.0	10.80	251.10	5,594.3	-283.5	-804.5	-120.6	1.91	1.91	0.11
5,778.0	11.10	247.10	5,682.6	-289.6	-820.5	-123.4	0.91	0.33	-4.44
5,867.0	9.90	247.60	5,770.2	-295.9	-835.4	-126.6	1.35	-1.35	0.56
5,957.0	8.40	258.70	5,859.0	-300.1	-849.0	-128.1	2.57	-1.67	12.33
6,047.0	6.20	243.90	5,948.3	-303.5	-859.9	-129.4	3.20	-2.44	-16.44
6,136.0	4.40	253.60	6,036.9	-306.6	-867.5	-130.9	2.25	-2.02	10.90

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Site:	Eagle E14-62-1HN Pad Sec.14-T6N-R65W	MD Reference:	WELL @ 4754.0ft (Precision 829 RKB - 16')
Well:	Seneca E15-72-1HC	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
6,225.0	2.80	265.50	6,125.7	-307.7	-872.9	-130.9	1.97	-1.80	13.37
6,315.0	0.40	146.90	6,215.7	-308.2	-874.9	-131.0	3.35	-2.67	-131.78
6,404.0	0.40	121.40	6,304.7	-308.6	-874.5	-131.5	0.20	0.00	-28.65
6,449.0	2.20	340.10	6,349.7	-307.9	-874.6	-130.7	5.61	4.00	-314.00
6,494.0	7.70	344.60	6,394.5	-304.1	-875.7	-126.9	12.24	12.22	10.00
6,539.0	10.60	356.60	6,438.9	-297.1	-876.8	-119.7	7.68	6.44	26.67
6,584.0	10.40	9.30	6,483.2	-289.0	-876.4	-111.8	5.15	-0.44	28.22
6,628.0	12.20	11.90	6,526.3	-280.5	-874.8	-103.9	4.25	4.09	5.91
6,673.0	15.40	1.30	6,570.0	-269.9	-873.7	-93.6	9.04	7.11	-23.56
6,718.0	19.60	356.40	6,612.9	-256.3	-874.0	-80.3	9.88	9.33	-10.89
6,763.0	22.60	358.70	6,654.9	-240.2	-874.7	-64.3	6.91	6.67	5.11
6,808.0	26.00	3.80	6,695.9	-221.7	-874.2	-46.3	8.87	7.56	11.33
6,853.0	31.10	4.30	6,735.4	-200.2	-872.7	-25.6	11.35	11.33	1.11
6,898.0	36.70	1.30	6,772.8	-175.2	-871.5	-1.2	12.98	12.44	-6.67
6,942.0	41.40	0.60	6,806.9	-147.5	-871.1	25.9	10.73	10.68	-1.59
6,987.0	45.10	0.30	6,839.7	-116.6	-870.8	56.1	8.23	8.22	-0.67
7,032.0	48.30	0.50	6,870.6	-83.9	-870.6	88.1	7.12	7.11	0.44
7,077.0	51.70	1.70	6,899.5	-49.4	-869.9	121.8	7.83	7.56	2.67
7,122.0	54.30	1.20	6,926.6	-13.5	-869.0	156.8	5.85	5.78	-1.11
7,166.0	57.30	359.60	6,951.3	22.9	-868.8	192.5	7.45	6.82	-3.64
7,211.0	60.90	358.90	6,974.4	61.5	-869.3	230.4	8.11	8.00	-1.56
7,256.0	67.40	358.90	6,994.0	102.0	-870.0	270.3	14.44	14.44	0.00
7,301.0	71.10	359.40	7,010.0	144.0	-870.7	311.6	8.29	8.22	1.11
7,346.0	73.30	359.90	7,023.7	186.9	-870.9	353.7	5.00	4.89	1.11
7,390.0	75.70	359.80	7,035.5	229.3	-871.0	395.3	5.46	5.45	-0.23
7,435.0	77.80	359.90	7,045.8	273.1	-871.2	438.3	4.67	4.67	0.22
7,480.0	79.90	0.30	7,054.5	317.2	-871.1	481.6	4.75	4.67	0.89
7,528.0	84.70	0.10	7,060.9	364.8	-870.9	528.2	10.01	10.00	-0.42
7,572.9	85.91	359.85	7,064.6	409.5	-870.9	572.0	2.75	2.70	-0.56
Seneca E15-72-1HC Landing Pt									
7,617.0	87.10	359.60	7,067.3	453.5	-871.1	615.2	2.75	2.70	-0.56
7,707.0	88.40	359.80	7,070.8	543.5	-871.6	703.5	1.46	1.44	0.22
7,796.0	90.20	1.50	7,071.9	632.4	-870.6	790.6	2.78	2.02	1.91
7,886.0	89.60	1.70	7,072.1	722.4	-868.1	878.3	0.70	-0.67	0.22
7,975.0	89.80	1.20	7,072.5	811.4	-865.8	965.1	0.61	0.22	-0.56
8,065.0	89.90	0.30	7,072.8	901.4	-864.7	1,053.2	1.01	0.11	-1.00
8,155.0	90.00	0.30	7,072.8	991.4	-864.2	1,141.3	0.11	0.11	0.00
8,245.0	89.70	358.70	7,073.1	1,081.3	-865.0	1,229.7	1.81	-0.33	-1.78
8,334.0	89.70	358.00	7,073.5	1,170.3	-867.5	1,317.5	0.79	0.00	-0.79
8,424.0	89.70	355.40	7,074.0	1,260.2	-872.7	1,406.6	2.89	0.00	-2.89
8,513.0	88.20	355.20	7,075.6	1,348.8	-880.0	1,495.0	1.70	-1.69	-0.22
8,603.0	87.60	355.20	7,078.9	1,438.5	-887.5	1,584.3	0.67	-0.67	0.00
8,693.0	88.50	356.10	7,082.0	1,528.1	-894.4	1,673.6	1.41	1.00	1.00
8,783.0	89.50	357.00	7,083.6	1,618.0	-899.8	1,762.8	1.49	1.11	1.00
8,872.0	91.40	358.40	7,082.9	1,706.9	-903.3	1,850.7	2.65	2.13	1.57
8,962.0	91.30	359.10	7,080.7	1,796.8	-905.3	1,939.3	0.79	-0.11	0.78
9,052.0	90.90	359.20	7,079.0	1,886.8	-906.6	2,027.8	0.46	-0.44	0.11
9,141.0	90.30	0.10	7,078.1	1,975.8	-907.2	2,115.1	1.22	-0.67	1.01
9,231.0	90.90	0.60	7,077.1	2,065.8	-906.6	2,203.3	0.87	0.67	0.56
9,320.0	88.90	0.10	7,077.3	2,154.8	-906.1	2,290.5	2.32	-2.25	-0.56
9,410.0	89.40	359.90	7,078.6	2,244.8	-906.1	2,378.7	0.60	0.56	-0.22
9,500.0	90.50	0.30	7,078.7	2,334.8	-905.9	2,466.9	1.30	1.22	0.44
9,590.0	90.00	0.50	7,078.3	2,424.8	-905.3	2,555.1	0.60	-0.56	0.22

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Design:	Wellbore #1	Database:	Landmark

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9,679.0	89.00	0.30	7,079.1	2,513.8	-904.7	2,642.2	1.15	-1.12	-0.22
9,769.0	88.40	0.50	7,081.1	2,603.7	-904.1	2,730.3	0.70	-0.67	0.22
9,858.0	89.30	0.30	7,082.9	2,692.7	-903.4	2,817.5	1.04	1.01	-0.22
9,948.0	90.10	359.80	7,083.4	2,782.7	-903.4	2,905.7	1.05	0.89	-0.56
10,038.0	91.60	0.80	7,082.1	2,872.7	-902.9	2,993.9	2.00	1.67	1.11
10,129.0	90.30	359.90	7,080.6	2,963.7	-902.3	3,083.0	1.74	-1.43	-0.99
10,217.0	89.60	0.10	7,080.6	3,051.7	-902.3	3,169.3	0.83	-0.80	0.23
10,307.0	88.70	0.50	7,082.0	3,141.7	-901.9	3,257.4	1.09	-1.00	0.44
10,397.0	88.40	0.50	7,084.2	3,231.6	-901.1	3,345.5	0.33	-0.33	0.00
10,486.0	89.30	0.50	7,086.0	3,320.6	-900.3	3,432.6	1.01	1.01	0.00
10,576.0	89.30	359.10	7,087.1	3,410.6	-900.6	3,520.9	1.56	0.00	-1.56
10,665.0	87.80	358.70	7,089.4	3,499.6	-902.3	3,608.5	1.74	-1.69	-0.45
10,755.0	87.90	358.00	7,092.8	3,589.5	-904.9	3,697.1	0.79	0.11	-0.78
10,844.0	87.80	358.40	7,096.1	3,678.4	-907.7	3,784.9	0.46	-0.11	0.45
10,934.0	88.90	359.10	7,098.7	3,768.3	-909.7	3,873.5	1.45	1.22	0.78
11,023.0	89.30	0.10	7,100.1	3,857.3	-910.3	3,960.8	1.21	0.45	1.12
11,113.0	90.00	1.00	7,100.6	3,947.3	-909.4	4,048.9	1.27	0.78	1.00
11,203.0	91.30	2.00	7,099.6	4,037.2	-907.1	4,136.7	1.82	1.44	1.11
11,292.0	91.70	0.60	7,097.3	4,126.2	-905.0	4,223.5	1.64	0.45	-1.57
11,382.0	90.90	359.80	7,095.2	4,216.2	-904.7	4,311.7	1.26	-0.89	-0.89
11,472.0	89.30	359.10	7,095.1	4,306.1	-905.6	4,400.1	1.94	-1.78	-0.78
11,561.0	89.30	357.30	7,096.2	4,395.1	-908.4	4,487.9	2.02	0.00	-2.02
11,658.0	90.20	355.70	7,096.6	4,491.9	-914.3	4,584.0	1.89	0.93	-1.65
11,707.0	90.20	355.70	7,096.4	4,540.8	-918.0	4,632.7	0.00	0.00	0.00
Seneca E15-72-1HC BHL 535'FNL & 330'FEL									
11,710.0	90.20	355.70	7,096.4	4,543.8	-918.2	4,635.6	0.00	0.00	0.00

Checked By: _____ Approved By: _____ Date: _____