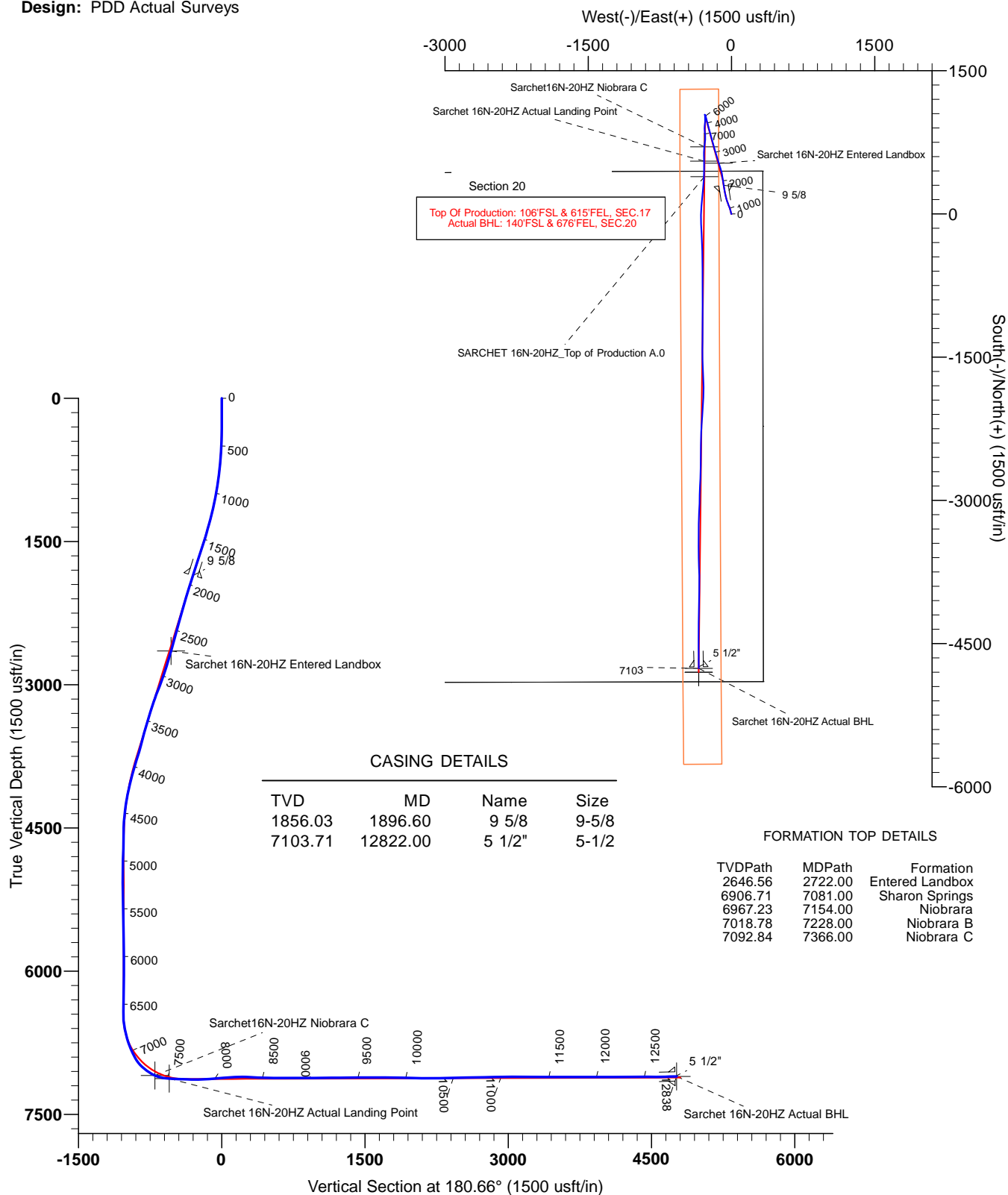


# US ROCKIES WATTENBERG PLANNING



Project: WELD-NAD83-UTMFT13N  
 Site: 2N-65W-20 Sarchet 1-20HZ Pad  
 Well: SARCHET 16N-20HZ  
 Wellbore: Plan A  
 Design: PDD Actual Surveys



## CASING DETAILS

TVD	MD	Name	Size
1856.03	1896.60	9 5/8	9-5/8
7103.71	12822.00	5 1/2"	5-1/2

## FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2646.56	2722.00	Entered Landbox
6906.71	7081.00	Sharon Springs
6967.23	7154.00	Niobrara
7018.78	7228.00	Niobrara B
7092.84	7366.00	Niobrara C

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Sarchet 16N-20HZ Entered Landbox	2646.56	532.27	-132.82	14574847.37	1729839.37	40.131687	-104.680076	Point
Sarchet16N-20HZ Niobrara C	7092.84	702.35	-283.70	14575016.90	1729687.87	40.132154	-104.680616	Point
Sarchet 16N-20HZ Actual BHL	7103.26	-4759.59	-340.97	14569554.80	1729650.29	40.117155	-104.680821	Point
Sarchet 16N-20HZ Actual Landing Point	7126.27	553.16	-286.10	14574867.71	1729686.02	40.131744	-104.680625	Point



# **US ROCKIES WATTENBERG PLANNING**

**WELD-NAD83-UTMFT13N**

**2N-65W-20 Sarchet 1-20HZ Pad**

**SARCHET 16N-20HZ**

**Plan A**

**Design: PDD Actual Surveys**

## **Standard Survey Report**

**06 October, 2015**

# PDD

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well SARCHET 16N-20HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	4897+25 @ 4922.00usft (hp307)
<b>Site:</b>	2N-65W-20 Sarchet 1-20HZ Pad	<b>MD Reference:</b>	4897+25 @ 4922.00usft (hp307)
<b>Well:</b>	SARCHET 16N-20HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PDD Actual Surveys	<b>Database:</b>	EDM 5000.1 Single User Db

<b>Project</b>	WELD-NAD83-UTMFT13N		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)		

Site	2N-65W-20 Sarchet 1-20HZ Pad, centered on 16-20				
Site Position:		Northing:	14,574,315.58 usft	Latitude:	40.130225
From:	Lat/Long	Easting:	1,729,974.11 usft	Longitude:	-104.679601
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.21 °

Well		SARCHET 16N-20HZ				
Well Position	+N/-S	0.00 usft	Northing:	14,574,315.58 usft	Latitude:	40.130225
	+E/-W	0.00 usft	Easting:	1,729,974.11 usft	Longitude:	-104.679601
Position Uncertainty		3.28 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,897.00 usft

<b>Wellbore</b>	Plan A				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	2/2/2015	8.31	66.72	52,615

<b>Design</b>	PDD Actual Surveys				
<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) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	180.66	

<b>Survey Program</b>	<b>Date</b>	10/6/2015			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
133.00	1,833.00	Cathedral MWD Surface (Plan A)	APC_ISCWSA REV 2 MWD	Fixed:v2:standard declination	
2,039.00	12,765.00	Precision MWD+IFR Surveys (Plan A)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
133.00	0.86	162.40	133.00	-0.95	0.30	0.95	0.65	0.65	0.00	
224.00	0.15	348.12	223.99	-1.49	0.48	1.48	1.11	-0.78	-191.52	
314.00	0.86	317.19	313.99	-0.88	0.00	0.87	0.82	0.79	-34.37	
392.00	1.48	318.64	391.97	0.31	-1.06	-0.30	0.80	0.79	1.86	
527.00	3.11	350.64	526.86	5.23	-2.81	-5.20	1.49	1.21	23.70	
662.00	5.00	346.64	661.52	14.57	-4.77	-14.51	1.41	1.40	-2.96	
752.00	6.38	348.33	751.07	23.28	-6.68	-23.21	1.54	1.53	1.88	
843.00	8.15	345.52	841.34	34.48	-9.32	-34.37	1.98	1.95	-3.09	
933.00	9.78	340.84	930.24	47.88	-13.42	-47.72	1.98	1.81	-5.20	

# PDD Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well SARCHET 16N-20HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	4897+25 @ 4922.00usft (hp307)
<b>Site:</b>	2N-65W-20 Sarchet 1-20HZ Pad	<b>MD Reference:</b>	4897+25 @ 4922.00usft (hp307)
<b>Well:</b>	SARCHET 16N-20HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PDD Actual Surveys	<b>Database:</b>	EDM 5000.1 Single User Db

Survey									
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)
1,022.00	11.26	340.27	1,017.74	63.20	-18.84	-62.98	1.67	1.66	-0.64
1,112.00	12.92	338.58	1,105.74	80.84	-25.48	-80.54	1.89	1.84	-1.88
1,292.00	15.51	341.08	1,280.22	122.35	-40.63	-121.87	1.48	1.44	1.39
1,383.00	16.58	341.45	1,367.67	146.17	-48.71	-145.60	1.18	1.18	0.41
1,563.00	19.09	348.10	1,539.02	199.33	-62.95	-198.59	1.79	1.39	3.69
1,653.00	17.94	348.20	1,624.36	227.30	-68.82	-226.49	1.28	-1.28	0.11
1,743.00	18.17	349.97	1,709.93	254.69	-74.10	-253.82	0.66	0.26	1.97
1,833.00	17.91	350.46	1,795.51	282.15	-78.84	-281.22	0.33	-0.29	0.54
2,039.00	17.80	352.30	1,991.59	344.59	-88.31	-343.55	0.28	-0.05	0.89
2,228.00	16.20	352.30	2,172.32	399.35	-95.71	-398.22	0.85	-0.85	0.00
2,417.00	15.60	344.60	2,354.11	449.98	-105.99	-448.73	1.16	-0.32	-4.07
2,606.00	17.00	340.20	2,535.52	500.48	-122.10	-499.04	0.99	0.74	-2.33
2,795.00	16.40	344.10	2,716.55	552.14	-138.77	-550.51	0.67	-0.32	2.06
2,984.00	19.80	343.50	2,896.17	608.51	-155.18	-606.68	1.80	1.80	-0.32
3,173.00	22.70	343.50	3,072.30	674.18	-174.63	-672.13	1.53	1.53	0.00
3,362.00	18.20	344.80	3,249.35	737.67	-192.74	-735.40	2.39	-2.38	0.69
3,551.00	17.10	343.70	3,429.45	792.82	-208.28	-790.37	0.61	-0.58	-0.58
3,739.00	14.90	343.70	3,610.16	842.56	-222.82	-839.93	1.17	-1.17	0.00
3,928.00	18.30	347.80	3,791.26	894.90	-235.91	-892.12	1.90	1.80	2.17
4,117.00	14.60	344.40	3,972.49	946.86	-248.59	-943.94	2.02	-1.96	-1.80
4,306.00	12.20	343.60	4,156.34	988.97	-260.64	-985.90	1.27	-1.27	-0.42
4,495.00	6.40	347.00	4,342.77	1,018.42	-268.66	-1,015.25	3.08	-3.07	1.80
4,684.00	1.30	317.20	4,531.30	1,030.26	-272.48	-1,027.05	2.81	-2.70	-15.77
4,873.00	1.10	326.00	4,720.25	1,033.34	-274.96	-1,030.10	0.14	-0.11	4.66
5,062.00	2.50	315.60	4,909.16	1,037.79	-278.85	-1,034.51	0.76	0.74	-5.50
5,251.00	0.90	119.30	5,098.11	1,040.01	-280.44	-1,036.71	1.78	-0.85	86.61
5,440.00	2.00	143.80	5,287.05	1,036.62	-277.20	-1,033.36	0.66	0.58	12.96
5,629.00	1.20	137.30	5,475.97	1,032.50	-273.91	-1,029.28	0.43	-0.42	-3.44
5,818.00	0.90	146.10	5,664.94	1,029.82	-271.74	-1,026.62	0.18	-0.16	4.66
6,007.00	1.30	189.50	5,853.91	1,026.47	-271.27	-1,023.28	0.47	0.21	22.96
6,196.00	1.50	332.80	6,042.89	1,026.56	-272.75	-1,023.35	1.41	0.11	75.82
6,385.00	1.20	337.90	6,231.83	1,030.59	-274.63	-1,027.36	0.17	-0.16	2.70
6,574.00	0.80	322.70	6,420.80	1,033.47	-276.17	-1,030.22	0.25	-0.21	-8.04
6,669.00	3.90	184.00	6,515.74	1,030.78	-276.80	-1,027.52	4.77	3.26	-146.00
6,763.00	11.30	178.10	6,608.85	1,018.37	-276.72	-1,015.11	7.91	7.87	-6.28
6,858.00	16.30	176.30	6,701.08	995.74	-275.55	-992.50	5.28	5.26	-1.89
6,889.00	18.20	178.50	6,730.68	986.56	-275.14	-983.33	6.48	6.13	7.10
6,921.00	19.80	181.70	6,760.94	976.15	-275.17	-972.91	5.96	5.00	10.00
6,952.00	21.10	183.20	6,789.99	965.33	-275.64	-962.09	4.52	4.19	4.84
6,984.00	23.60	184.50	6,819.58	953.19	-276.46	-949.94	7.96	7.81	4.06
7,015.00	25.80	185.00	6,847.74	940.28	-277.54	-937.02	7.13	7.10	1.61
7,047.00	26.30	185.20	6,876.49	926.28	-278.79	-923.01	1.59	1.56	0.63
7,079.00	28.10	185.20	6,904.95	911.72	-280.11	-908.43	5.63	5.63	0.00

# PDD Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well SARCHET 16N-20HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	4897+25 @ 4922.00usft (hp307)
<b>Site:</b>	2N-65W-20 Sarchet 1-20HZ Pad	<b>MD Reference:</b>	4897+25 @ 4922.00usft (hp307)
<b>Well:</b>	SARCHET 16N-20HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PDD Actual Surveys	<b>Database:</b>	EDM 5000.1 Single User Db

Survey									
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)
7,110.00	32.30	179.90	6,931.74	896.16	-280.76	-892.86	16.04	13.55	-17.10
7,142.00	37.90	177.40	6,957.91	877.77	-280.30	-874.49	18.06	17.50	-7.81
7,173.00	44.00	173.60	6,981.32	857.54	-278.66	-854.27	21.25	19.68	-12.26
7,205.00	47.70	173.20	7,003.61	834.73	-276.02	-831.50	11.60	11.56	-1.25
7,236.00	50.50	176.90	7,023.90	811.40	-274.02	-808.19	12.76	9.03	11.94
7,268.00	53.70	181.20	7,043.57	786.16	-273.62	-782.96	14.57	10.00	13.44
7,299.00	57.00	187.00	7,061.20	760.75	-275.47	-757.53	18.71	10.65	18.71
7,331.00	62.20	189.20	7,077.39	733.44	-279.37	-730.17	17.30	16.25	6.88
7,362.00	65.00	187.00	7,091.17	705.95	-283.27	-702.64	11.04	9.03	-7.10
7,394.00	70.10	184.00	7,103.39	676.53	-286.09	-673.19	18.14	15.94	-9.38
7,425.00	74.80	179.90	7,112.74	647.00	-287.08	-643.65	19.72	15.16	-13.23
7,457.00	80.50	179.90	7,119.58	615.76	-287.03	-612.41	17.81	17.81	0.00
7,520.00	87.30	178.40	7,126.27	553.16	-286.10	-549.83	11.05	10.79	-2.38
7,614.00	87.80	180.90	7,130.29	459.25	-285.52	-455.94	2.71	0.53	2.66
7,708.00	88.20	182.90	7,133.57	365.37	-288.64	-362.02	2.17	0.43	2.13
7,803.00	89.70	185.60	7,135.31	270.66	-295.68	-267.23	3.25	1.58	2.84
7,897.00	92.40	186.00	7,133.59	177.16	-305.17	-173.64	2.90	2.87	0.43
7,992.00	95.10	184.50	7,127.38	82.78	-313.85	-79.15	3.25	2.84	-1.58
8,087.00	96.10	181.10	7,118.10	-11.64	-318.47	15.31	3.71	1.05	-3.58
8,181.00	93.70	176.80	7,110.07	-105.25	-316.75	108.90	5.22	-2.55	-4.57
8,276.00	89.50	177.70	7,107.42	-200.09	-312.19	203.67	4.52	-4.42	0.95
8,370.00	86.30	178.10	7,110.86	-293.95	-308.75	297.48	3.43	-3.40	0.43
8,465.00	87.90	178.50	7,115.67	-388.78	-305.94	392.28	1.74	1.68	0.42
8,559.00	88.80	178.70	7,118.38	-482.71	-303.64	486.18	0.98	0.96	0.21
8,654.00	89.60	179.40	7,119.70	-577.69	-302.06	581.13	1.12	0.84	0.74
8,748.00	90.90	180.00	7,119.29	-671.68	-301.57	675.11	1.52	1.38	0.64
8,843.00	89.20	179.90	7,119.21	-766.68	-301.49	770.10	1.79	-1.79	-0.11
8,937.00	89.50	179.80	7,120.28	-860.67	-301.24	864.09	0.34	0.32	-0.11
9,032.00	90.50	180.20	7,120.28	-955.67	-301.24	959.08	1.13	1.05	0.42
9,126.00	91.50	180.30	7,118.63	-1,049.66	-301.65	1,053.06	1.07	1.06	0.11
9,221.00	90.10	180.20	7,117.31	-1,144.64	-302.07	1,148.05	1.48	-1.47	-0.11
9,316.00	90.60	180.20	7,116.73	-1,239.64	-302.40	1,243.04	0.53	0.53	0.00
9,410.00	91.60	180.40	7,114.92	-1,333.62	-302.89	1,337.02	1.08	1.06	0.21
9,505.00	89.90	179.80	7,113.68	-1,428.61	-303.06	1,432.00	1.90	-1.79	-0.63
9,599.00	89.80	178.60	7,113.93	-1,522.60	-301.75	1,525.97	1.28	-0.11	-1.28
9,694.00	90.20	178.30	7,113.93	-1,617.56	-299.18	1,620.90	0.53	0.42	-0.32
9,788.00	89.80	177.20	7,113.93	-1,711.49	-295.49	1,714.78	1.25	-0.43	-1.17
9,883.00	89.00	178.80	7,114.92	-1,806.42	-292.17	1,809.67	1.88	-0.84	1.68
9,977.00	88.00	182.50	7,117.38	-1,900.37	-293.24	1,903.62	4.08	-1.06	3.94
10,072.00	89.10	183.20	7,119.79	-1,995.22	-297.96	1,998.52	1.37	1.16	0.74
10,166.00	89.40	183.50	7,121.02	-2,089.05	-303.45	2,092.40	0.45	0.32	0.32
10,261.00	90.00	184.90	7,121.51	-2,183.79	-310.41	2,187.22	1.60	0.63	1.47
10,356.00	90.50	182.00	7,121.10	-2,278.60	-316.12	2,282.09	3.10	0.53	-3.05

**PDD**  
Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well SARCHET 16N-20HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	4897+25 @ 4922.00usft (hp307)
<b>Site:</b>	2N-65W-20 Sarchet 1-20HZ Pad	<b>MD Reference:</b>	4897+25 @ 4922.00usft (hp307)
<b>Well:</b>	SARCHET 16N-20HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PDD Actual Surveys	<b>Database:</b>	EDM 5000.1 Single User Db

Survey										
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)	
10,450.00	91.60	180.60	7,119.38	-2,372.56	-318.26	2,376.07	1.89	1.17	-1.49	
10,545.00	92.20	181.00	7,116.23	-2,467.50	-319.58	2,471.02	0.76	0.63	0.42	
10,640.00	90.70	180.20	7,113.82	-2,562.46	-320.58	2,565.98	1.79	-1.58	-0.84	
10,734.00	90.10	181.80	7,113.17	-2,656.44	-322.22	2,659.97	1.82	-0.64	1.70	
10,829.00	90.90	182.00	7,112.34	-2,751.38	-325.37	2,754.95	0.87	0.84	0.21	
10,923.00	92.10	181.90	7,109.88	-2,845.29	-328.56	2,848.89	1.28	1.28	-0.11	
11,018.00	91.30	181.80	7,107.06	-2,940.20	-331.63	2,943.83	0.85	-0.84	-0.11	
11,112.00	89.70	181.60	7,106.24	-3,034.15	-334.42	3,037.80	1.72	-1.70	-0.21	
11,207.00	90.70	183.30	7,105.91	-3,129.06	-338.48	3,132.75	2.08	1.05	1.79	
11,301.00	88.80	180.90	7,106.32	-3,222.99	-341.92	3,226.71	3.26	-2.02	-2.55	
11,396.00	88.40	180.50	7,108.64	-3,317.95	-343.08	3,321.68	0.60	-0.42	-0.42	
11,491.00	89.30	180.50	7,110.55	-3,412.93	-343.91	3,416.66	0.95	0.95	0.00	
11,585.00	89.70	180.20	7,111.37	-3,506.92	-344.49	3,510.66	0.53	0.43	-0.32	
11,679.00	90.50	178.30	7,111.20	-3,600.91	-343.25	3,604.62	2.19	0.85	-2.02	
11,774.00	91.10	177.60	7,109.88	-3,695.84	-339.86	3,699.51	0.97	0.63	-0.74	
11,868.00	90.20	179.30	7,108.81	-3,789.79	-337.31	3,793.43	2.05	-0.96	1.81	
11,963.00	90.70	180.60	7,108.06	-3,884.79	-337.23	3,888.41	1.47	0.53	1.37	
12,057.00	88.70	180.20	7,108.55	-3,978.78	-337.89	3,982.41	2.17	-2.13	-0.43	
12,152.00	89.40	180.70	7,110.13	-4,073.76	-338.63	4,077.39	0.91	0.74	0.53	
12,246.00	90.60	181.20	7,110.13	-4,167.75	-340.19	4,171.39	1.38	1.28	0.53	
12,341.00	91.60	181.60	7,108.31	-4,262.70	-342.51	4,266.36	1.13	1.05	0.42	
12,435.00	90.50	180.30	7,106.58	-4,356.67	-344.07	4,360.34	1.81	-1.17	-1.38	
12,530.00	89.30	180.10	7,106.75	-4,451.66	-344.40	4,455.34	1.28	-1.26	-0.21	
12,625.00	90.10	179.80	7,107.25	-4,546.66	-344.32	4,550.33	0.90	0.84	-0.32	
12,719.00	91.00	178.90	7,106.34	-4,640.65	-343.25	4,644.30	1.35	0.96	-0.96	
12,765.00	91.60	178.90	7,105.30	-4,686.63	-342.37	4,690.26	1.30	1.30	0.00	
12,838.00	91.60	178.90	7,103.26	-4,759.59	-340.97	4,763.20	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Sarchet 16N-20HZ Enter - hit/miss target - Shape - actual wellpath hits target center - Point	0.00	0.00	2,646.56	532.27	-132.82	14,574,847.37	1,729,839.37	40.131687	-104.680076	
Sarchet16N-20HZ Niobr - actual wellpath hits target center - Point	0.00	0.00	7,092.84	702.35	-283.70	14,575,016.90	1,729,687.87	40.132154	-104.680616	
Sarchet 16N-20HZ Actur - actual wellpath hits target center - Point	0.00	0.00	7,103.26	-4,759.59	-340.97	14,569,554.80	1,729,650.29	40.117155	-104.680821	
Sarchet 16N-20HZ Actur - actual wellpath hits target center - Point	0.00	0.00	7,126.27	553.16	-286.10	14,574,867.71	1,729,686.02	40.131744	-104.680625	

# PDD

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well SARCHET 16N-20HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	4897+25 @ 4922.00usft (hp307)
<b>Site:</b>	2N-65W-20 Sarchet 1-20HZ Pad	<b>MD Reference:</b>	4897+25 @ 4922.00usft (hp307)
<b>Well:</b>	SARCHET 16N-20HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PDD Actual Surveys	<b>Database:</b>	EDM 5000.1 Single User Db

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")
1,896.60	1,856.03	9 5/8		9-5/8	13-1/2
12,822.00	7,103.71	5 1/2"		5-1/2	8-1/2

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,722.00	2,646.56	Entered Landbox		0.00	
7,081.00	6,906.71	Sharon Springs		0.00	
7,154.00	6,967.23	Niobrara		0.00	
7,228.00	7,018.78	Niobrara B		0.00	
7,366.00	7,092.84	Niobrara C		0.00	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
12,838.00	7,103.26	-4,759.59	-340.97	Projection to Bit	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_