



Project: Niobrara CON'83
County: Weld
Site: Bringelson 20-9-58 Pad
Well: 17-20-9-58
Wellbore: 17-20-9-58 OH
Design: Plan #1

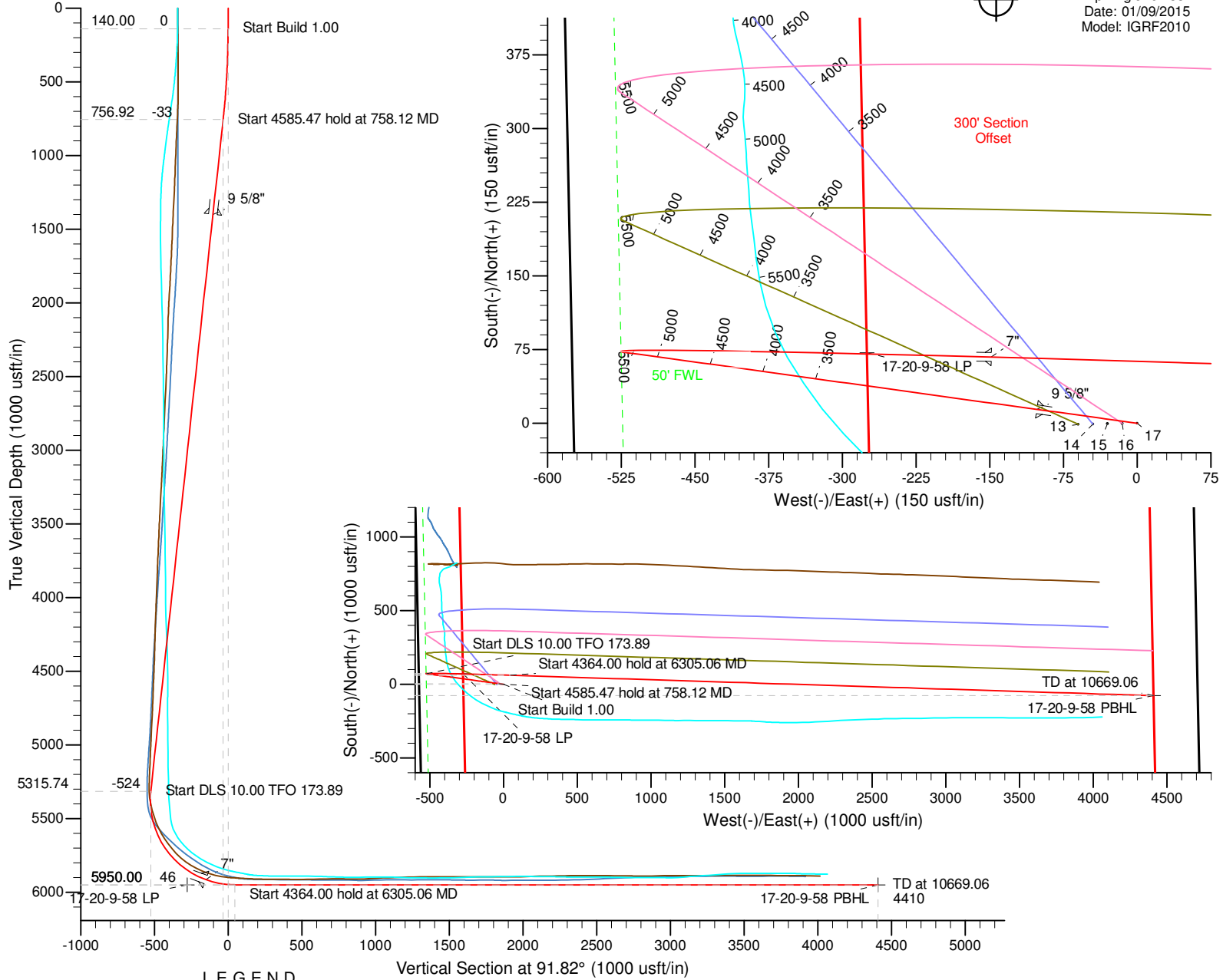


Azimuths to Grid North
True North: -1.04°
Magnetic North: 6.89°

Magnetic Field
Strength: 53017.7snT
Dip Angle: 67.33°
Date: 01/09/2015
Model: IGRF2010

CASING DETAILS

TVD	MD	Name	Size
1400.00	1404.96	9 5/8"	9-5/8
5915.44	6105.04	7"	7



LEGEND

- 1-20-11-9-58, 1-20-11-9-58 OH, 1-20-11-9-58 OH V0
- 3-20-11-9-58 OH, 3-20-11-9-58 OH, 3-20-11-9-58 OH V0
- 2-20-11-9-58, 2-20-11-9-58 OH, 2-20-11-9-58 OH V0
- 14-20-9-58, 14-20-9-58 OH, Plan #1 NS V0
- 13-20-9-58, 13-20-9-58 OH, Plan #1 NS V0
- 16-20-9-58, 16-20-9-58 OH, Plan #1 V0
- Plan #1

SLOTS

Slot Name	+N/-S	+E/-W	Northing	Easting
13	-1.05	-59.99	1515767.89	3444534.59
14	-0.79	-44.99	1515768.15	3444549.59
15	-0.52	-30.00	1515768.42	3444564.58
16	-0.26	-15.00	1515768.68	3444579.58
17	0.00	0.00	1515768.94	3444594.58

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
17-20-9-58 LP	5950.00	71.77	-274.91	1515840.71	3444319.67	40° 44' 18.040 N	103° 53' 47.641 W	Point
17-20-9-58 PBHL	5950.00	-76.75	4409.36	1515692.19	3449003.91	40° 44' 15.731 N	103° 52' 46.834 W	Point

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	140.00	0.00	0.00	140.00	0.00	0.00	0.00	0.00	0.00		Start Build 1.00
3	758.12	6.18	277.89	756.92	4.57	-32.99	1.00	277.89	-33.12		Start 4585.47 hold at 758.12 MD
4	5343.59	6.18	277.89	5315.74	72.33	-522.06	0.00	0.00	-524.09		Start DLS 10.00 TFO 173.89
5	6305.06	90.00	91.82	5950.00	61.54	47.55	10.00	173.89	45.57		Start 4364.00 hold at 6305.06 MD
6	10669.06	90.00	91.82	5950.00	-76.75	4409.36	0.00	0.00	4409.57	17-20-9-58 PBHL	TD at 10669.06

Titan Directional Drilling, LLC

Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well 17-20-9-58 - Slot 17
Company:	Carrizo Oil & Gas, Inc.	TVD Reference:	4872'GL+17'KB @ 4889.00usft (Xtreme 19)
Project:	Niobrara CON'83	MD Reference:	4872'GL+17'KB @ 4889.00usft (Xtreme 19)
Site:	Bringelson 20-9-58 Pad	North Reference:	Grid
Well:	17-20-9-58	Survey Calculation Method:	Minimum Curvature
Wellbore:	17-20-9-58 OH		
Design:	Plan #1		

Project	Niobrara CON'83,		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site		Bringelson 20-9-58 Pad, Centered on 17-20-9-58			
Site Position:		Northing:	1,515,768.94 usft	Latitude:	40° 44' 17.281 N
From:	Map	Easting:	3,444,594.58 usft	Longitude:	103° 53' 44.087 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.04 °

Well	17-20-9-58 - Slot 17					
Well Position	+N/-S	0.00 usft	Northing:	1,515,768.94 usft	Latitude:	40° 44' 17.281 N
	+E/-W	0.00 usft	Easting:	3,444,594.58 usft	Longitude:	103° 53' 44.087 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	4,889.00 usft	Ground Level:	4,872.00 usft

Wellbore	17-20-9-58 OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	01/09/15	7.93	67.33	53,018

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	91.82

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
140.00	0.00	0.00	140.00	0.00	0.00	0.00	0.00	0.00	0.00	
758.12	6.18	277.89	756.92	4.57	-32.99	1.00	1.00	0.00	277.89	
5,343.59	6.18	277.89	5,315.74	72.33	-522.06	0.00	0.00	0.00	0.00	
6,305.06	90.00	91.82	5,950.00	61.54	47.55	10.00	8.72	18.09	173.89	
10,669.06	90.00	91.82	5,950.00	-76.75	4,409.36	0.00	0.00	0.00	0.00	17-20-9-58 PBHL

Titan Directional Drilling, LLC

Planning Report

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Company:	Carrizo Oil & Gas, Inc.	TVD Reference:	4872'GL+17'KB @ 4889.00usft (Xtreme 19)
Project:	Niobrara CON'83	MD Reference:	4872'GL+17'KB @ 4889.00usft (Xtreme 19)
Site:	Bringelson 20-9-58 Pad	North Reference:	Grid
Well:	17-20-9-58	Survey Calculation Method:	Minimum Curvature
Wellbore:	17-20-9-58 OH		
Design:	Plan #1		

Planned 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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
140.00	0.00	0.00	140.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.60	277.89	200.00	0.04	-0.31	-0.31	1.00	1.00	0.00
300.00	1.60	277.89	299.98	0.31	-2.21	-2.22	1.00	1.00	0.00
400.00	2.60	277.89	399.91	0.81	-5.84	-5.87	1.00	1.00	0.00
500.00	3.60	277.89	499.76	1.55	-11.20	-11.24	1.00	1.00	0.00
600.00	4.60	277.89	599.51	2.53	-18.28	-18.35	1.00	1.00	0.00
700.00	5.60	277.89	699.11	3.75	-27.09	-27.19	1.00	1.00	0.00
758.12	6.18	277.89	756.92	4.57	-32.99	-33.12	1.00	1.00	0.00
800.00	6.18	277.89	798.56	5.19	-37.46	-37.61	0.00	0.00	0.00
900.00	6.18	277.89	897.98	6.67	-48.13	-48.31	0.00	0.00	0.00
1,000.00	6.18	277.89	997.40	8.15	-58.79	-59.02	0.00	0.00	0.00
1,100.00	6.18	277.89	1,096.81	9.62	-69.46	-69.73	0.00	0.00	0.00
1,200.00	6.18	277.89	1,196.23	11.10	-80.12	-80.44	0.00	0.00	0.00
1,300.00	6.18	277.89	1,295.65	12.58	-90.79	-91.14	0.00	0.00	0.00
1,400.00	6.18	277.89	1,395.07	14.06	-101.45	-101.85	0.00	0.00	0.00
1,404.96	6.18	277.89	1,400.00	14.13	-101.98	-102.38	0.00	0.00	0.00
9 5/8"									
1,500.00	6.18	277.89	1,494.49	15.53	-112.12	-112.56	0.00	0.00	0.00
1,600.00	6.18	277.89	1,593.91	17.01	-122.78	-123.26	0.00	0.00	0.00
1,700.00	6.18	277.89	1,693.33	18.49	-133.45	-133.97	0.00	0.00	0.00
1,800.00	6.18	277.89	1,792.74	19.97	-144.12	-144.68	0.00	0.00	0.00
1,900.00	6.18	277.89	1,892.16	21.45	-154.78	-155.38	0.00	0.00	0.00
2,000.00	6.18	277.89	1,991.58	22.92	-165.45	-166.09	0.00	0.00	0.00
2,100.00	6.18	277.89	2,091.00	24.40	-176.11	-176.80	0.00	0.00	0.00
2,200.00	6.18	277.89	2,190.42	25.88	-186.78	-187.51	0.00	0.00	0.00
2,300.00	6.18	277.89	2,289.84	27.36	-197.44	-198.21	0.00	0.00	0.00
2,400.00	6.18	277.89	2,389.26	28.83	-208.11	-208.92	0.00	0.00	0.00
2,500.00	6.18	277.89	2,488.68	30.31	-218.77	-219.63	0.00	0.00	0.00
2,600.00	6.18	277.89	2,588.09	31.79	-229.44	-230.33	0.00	0.00	0.00
2,700.00	6.18	277.89	2,687.51	33.27	-240.10	-241.04	0.00	0.00	0.00
2,800.00	6.18	277.89	2,786.93	34.75	-250.77	-251.75	0.00	0.00	0.00
2,900.00	6.18	277.89	2,886.35	36.22	-261.44	-262.45	0.00	0.00	0.00
3,000.00	6.18	277.89	2,985.77	37.70	-272.10	-273.16	0.00	0.00	0.00
3,100.00	6.18	277.89	3,085.19	39.18	-282.77	-283.87	0.00	0.00	0.00
3,200.00	6.18	277.89	3,184.61	40.66	-293.43	-294.58	0.00	0.00	0.00
3,300.00	6.18	277.89	3,284.02	42.13	-304.10	-305.28	0.00	0.00	0.00
3,400.00	6.18	277.89	3,383.44	43.61	-314.76	-315.99	0.00	0.00	0.00
3,500.00	6.18	277.89	3,482.86	45.09	-325.43	-326.70	0.00	0.00	0.00
3,600.00	6.18	277.89	3,582.28	46.57	-336.09	-337.40	0.00	0.00	0.00
3,700.00	6.18	277.89	3,681.70	48.05	-346.76	-348.11	0.00	0.00	0.00
3,800.00	6.18	277.89	3,781.12	49.52	-357.42	-358.82	0.00	0.00	0.00
3,900.00	6.18	277.89	3,880.54	51.00	-368.09	-369.52	0.00	0.00	0.00
4,000.00	6.18	277.89	3,979.95	52.48	-378.76	-380.23	0.00	0.00	0.00
4,100.00	6.18	277.89	4,079.37	53.96	-389.42	-390.94	0.00	0.00	0.00
4,200.00	6.18	277.89	4,178.79	55.43	-400.09	-401.64	0.00	0.00	0.00
4,300.00	6.18	277.89	4,278.21	56.91	-410.75	-412.35	0.00	0.00	0.00
4,400.00	6.18	277.89	4,377.63	58.39	-421.42	-423.06	0.00	0.00	0.00
4,500.00	6.18	277.89	4,477.05	59.87	-432.08	-433.77	0.00	0.00	0.00
4,600.00	6.18	277.89	4,576.47	61.35	-442.75	-444.47	0.00	0.00	0.00
4,700.00	6.18	277.89	4,675.89	62.82	-453.41	-455.18	0.00	0.00	0.00
4,800.00	6.18	277.89	4,775.30	64.30	-464.08	-465.89	0.00	0.00	0.00
4,900.00	6.18	277.89	4,874.72	65.78	-474.74	-476.59	0.00	0.00	0.00

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Planning Report

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Site:	Bringelson 20-9-58 Pad	North Reference:	Grid
Well:	17-20-9-58	Survey Calculation Method:	Minimum Curvature
Wellbore:	17-20-9-58 OH		
Design:	Plan #1		

Planned 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)
5,000.00	6.18	277.89	4,974.14	67.26	-485.41	-487.30	0.00	0.00	0.00
5,100.00	6.18	277.89	5,073.56	68.73	-496.08	-498.01	0.00	0.00	0.00
5,200.00	6.18	277.89	5,172.98	70.21	-506.74	-508.71	0.00	0.00	0.00
5,300.00	6.18	277.89	5,272.40	71.69	-517.41	-519.42	0.00	0.00	0.00
5,343.59	6.18	277.89	5,315.74	72.33	-522.06	-524.09	0.00	0.00	0.00
5,350.00	5.54	278.59	5,322.11	72.43	-522.70	-524.74	10.00	-9.94	11.01
5,400.00	0.83	324.20	5,372.02	73.08	-525.30	-527.36	10.00	-9.43	91.20
5,450.00	4.54	83.52	5,421.97	73.60	-523.55	-525.62	10.00	7.43	238.65
5,500.00	9.52	87.90	5,471.58	73.97	-517.45	-519.54	10.00	9.95	8.75
5,550.00	14.51	89.28	5,520.47	74.20	-507.05	-509.15	10.00	9.98	2.76
5,600.00	19.50	89.96	5,568.27	74.29	-492.43	-494.54	10.00	9.99	1.37
5,650.00	24.50	90.38	5,614.61	74.23	-473.70	-475.82	10.00	10.00	0.83
5,700.00	29.50	90.66	5,659.15	74.02	-451.01	-453.13	10.00	10.00	0.56
5,750.00	34.50	90.86	5,701.54	73.66	-424.52	-426.65	10.00	10.00	0.41
5,800.00	39.50	91.02	5,741.46	73.17	-394.45	-396.57	10.00	10.00	0.32
5,850.00	44.50	91.15	5,778.60	72.53	-361.01	-363.13	10.00	10.00	0.26
5,900.00	49.50	91.26	5,812.69	71.77	-324.46	-326.58	10.00	10.00	0.21
5,950.00	54.50	91.35	5,843.47	70.87	-285.08	-287.19	10.00	10.00	0.18
6,000.00	59.50	91.43	5,870.70	69.85	-243.18	-245.27	10.00	10.00	0.16
6,050.00	64.50	91.50	5,894.16	68.72	-199.06	-201.14	10.00	10.00	0.15
6,100.00	69.50	91.57	5,913.70	67.49	-153.07	-155.13	10.00	10.00	0.14
6,105.04	70.00	91.58	5,915.44	67.36	-148.34	-150.41	10.00	10.00	0.13
7"									
6,150.00	74.50	91.63	5,929.15	66.16	-105.55	-107.60	10.00	10.00	0.13
6,200.00	79.49	91.69	5,940.40	64.74	-56.87	-58.90	10.00	10.00	0.12
6,250.00	84.49	91.75	5,947.36	63.26	-7.39	-9.40	10.00	10.00	0.12
6,300.00	89.49	91.81	5,949.98	61.70	42.50	40.52	10.00	10.00	0.11
6,305.06	90.00	91.82	5,950.00	61.54	47.55	45.57	10.00	10.00	0.11
6,400.00	90.00	91.82	5,950.00	58.54	142.45	140.52	0.00	0.00	0.00
6,500.00	90.00	91.82	5,950.00	55.37	242.40	240.52	0.00	0.00	0.00
6,600.00	90.00	91.82	5,950.00	52.20	342.35	340.52	0.00	0.00	0.00
6,700.00	90.00	91.82	5,950.00	49.03	442.30	440.52	0.00	0.00	0.00
6,800.00	90.00	91.82	5,950.00	45.86	542.25	540.52	0.00	0.00	0.00
6,900.00	90.00	91.82	5,950.00	42.69	642.20	640.52	0.00	0.00	0.00
7,000.00	90.00	91.82	5,950.00	39.52	742.15	740.52	0.00	0.00	0.00
7,100.00	90.00	91.82	5,950.00	36.35	842.10	840.52	0.00	0.00	0.00
7,200.00	90.00	91.82	5,950.00	33.18	942.04	940.52	0.00	0.00	0.00
7,300.00	90.00	91.82	5,950.00	30.01	1,041.99	1,040.52	0.00	0.00	0.00
7,400.00	90.00	91.82	5,950.00	26.85	1,141.94	1,140.52	0.00	0.00	0.00
7,500.00	90.00	91.82	5,950.00	23.68	1,241.89	1,240.52	0.00	0.00	0.00
7,600.00	90.00	91.82	5,950.00	20.51	1,341.84	1,340.52	0.00	0.00	0.00
7,700.00	90.00	91.82	5,950.00	17.34	1,441.79	1,440.52	0.00	0.00	0.00
7,800.00	90.00	91.82	5,950.00	14.17	1,541.74	1,540.52	0.00	0.00	0.00
7,900.00	90.00	91.82	5,950.00	11.00	1,641.69	1,640.52	0.00	0.00	0.00
8,000.00	90.00	91.82	5,950.00	7.83	1,741.64	1,740.52	0.00	0.00	0.00
8,100.00	90.00	91.82	5,950.00	4.66	1,841.59	1,840.52	0.00	0.00	0.00
8,200.00	90.00	91.82	5,950.00	1.49	1,941.54	1,940.52	0.00	0.00	0.00
8,300.00	90.00	91.82	5,950.00	-1.68	2,041.49	2,040.52	0.00	0.00	0.00
8,400.00	90.00	91.82	5,950.00	-4.84	2,141.44	2,140.52	0.00	0.00	0.00
8,500.00	90.00	91.82	5,950.00	-8.01	2,241.39	2,240.52	0.00	0.00	0.00
8,600.00	90.00	91.82	5,950.00	-11.18	2,341.34	2,340.52	0.00	0.00	0.00
8,700.00	90.00	91.82	5,950.00	-14.35	2,441.29	2,440.52	0.00	0.00	0.00
8,800.00	90.00	91.82	5,950.00	-17.52	2,541.24	2,540.52	0.00	0.00	0.00

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Wellbore:	17-20-9-58 OH		
Design:	Plan #1		

Planned 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)	
8,900.00	90.00	91.82	5,950.00	-20.69	2,641.19	2,640.52	0.00	0.00	0.00	
9,000.00	90.00	91.82	5,950.00	-23.86	2,741.14	2,740.52	0.00	0.00	0.00	
9,100.00	90.00	91.82	5,950.00	-27.03	2,841.09	2,840.52	0.00	0.00	0.00	
9,200.00	90.00	91.82	5,950.00	-30.20	2,941.04	2,940.52	0.00	0.00	0.00	
9,300.00	90.00	91.82	5,950.00	-33.37	3,040.99	3,040.52	0.00	0.00	0.00	
9,400.00	90.00	91.82	5,950.00	-36.53	3,140.94	3,140.52	0.00	0.00	0.00	
9,500.00	90.00	91.82	5,950.00	-39.70	3,240.89	3,240.52	0.00	0.00	0.00	
9,600.00	90.00	91.82	5,950.00	-42.87	3,340.84	3,340.52	0.00	0.00	0.00	
9,700.00	90.00	91.82	5,950.00	-46.04	3,440.79	3,440.52	0.00	0.00	0.00	
9,800.00	90.00	91.82	5,950.00	-49.21	3,540.74	3,540.52	0.00	0.00	0.00	
9,900.00	90.00	91.82	5,950.00	-52.38	3,640.69	3,640.52	0.00	0.00	0.00	
10,000.00	90.00	91.82	5,950.00	-55.55	3,740.64	3,740.52	0.00	0.00	0.00	
10,100.00	90.00	91.82	5,950.00	-58.72	3,840.59	3,840.52	0.00	0.00	0.00	
10,200.00	90.00	91.82	5,950.00	-61.89	3,940.54	3,940.52	0.00	0.00	0.00	
10,300.00	90.00	91.82	5,950.00	-65.06	4,040.49	4,040.52	0.00	0.00	0.00	
10,400.00	90.00	91.82	5,950.00	-68.22	4,140.44	4,140.52	0.00	0.00	0.00	
10,500.00	90.00	91.82	5,950.00	-71.39	4,240.39	4,240.52	0.00	0.00	0.00	
10,600.00	90.00	91.82	5,950.00	-74.56	4,340.34	4,340.52	0.00	0.00	0.00	
10,669.06	90.00	91.82	5,950.00	-76.75	4,409.36	4,409.57	0.00	0.00	0.00	

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting		
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)	Latitude	Longitude
17-20-9-58 LP	0.00	0.00	5,950.00	71.77	-274.91	1,515,840.71	3,444,319.67	40° 44' 18.040 N	103° 53' 47.641 W
- plan misses target center by 84.62usft at 6009.19usft MD (5875.29 TVD, 69.65 N, -235.23 E)									
- Point									
17-20-9-58 PBHL	0.00	0.00	5,950.00	-76.75	4,409.36	1,515,692.19	3,449,003.91	40° 44' 15.731 N	103° 52' 46.834 W
- plan hits target center									
- Point									

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")	
1,404.96	1,400.00	9 5/8"		9-5/8	12-1/4	
6,105.04	5,915.44	7"		7	8-3/4	