



Project: COLORADO NORTHERN ZONE - 83
Site: WARDELL 2G-19HZ
Well: WARDELL 2G-19HZ
Wellbore: OH
Design: PLAN #1 PRELIMINARY



WELL DETAILS: WARDELL 2G-19HZ

GL 4951 & KB 17 @ 4976.00ft (HP 311)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1322813.69	3222790.02	40.2167700	-104.7022110

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1450.00	0.00	0.00	1450.00	0.00	0.00	0.00	0.00	0.00	
2071.81	12.44	299.17	2066.94	32.76	-58.70	2.00	299.17	-21.06	
5878.24	12.44	299.17	5784.06	432.24	-774.49	0.00	0.00	-277.89	
6500.06	0.00	0.00	6401.00	465.00	-833.19	2.00	180.00	-298.95	
6988.17	0.00	0.00	6889.11	465.00	-833.19	0.00	0.00	-298.95	
7896.75	90.86	180.00	7462.00	-116.54	-833.19	10.00	180.00	272.09	
12103.62	90.86	180.00	7399.00	-4322.94	-833.19	0.00	0.00	4402.50	PBHL_WARDELL 2G-19HZ(460 FSL 2347 FEL)

DESIGN TARGET DETAILS

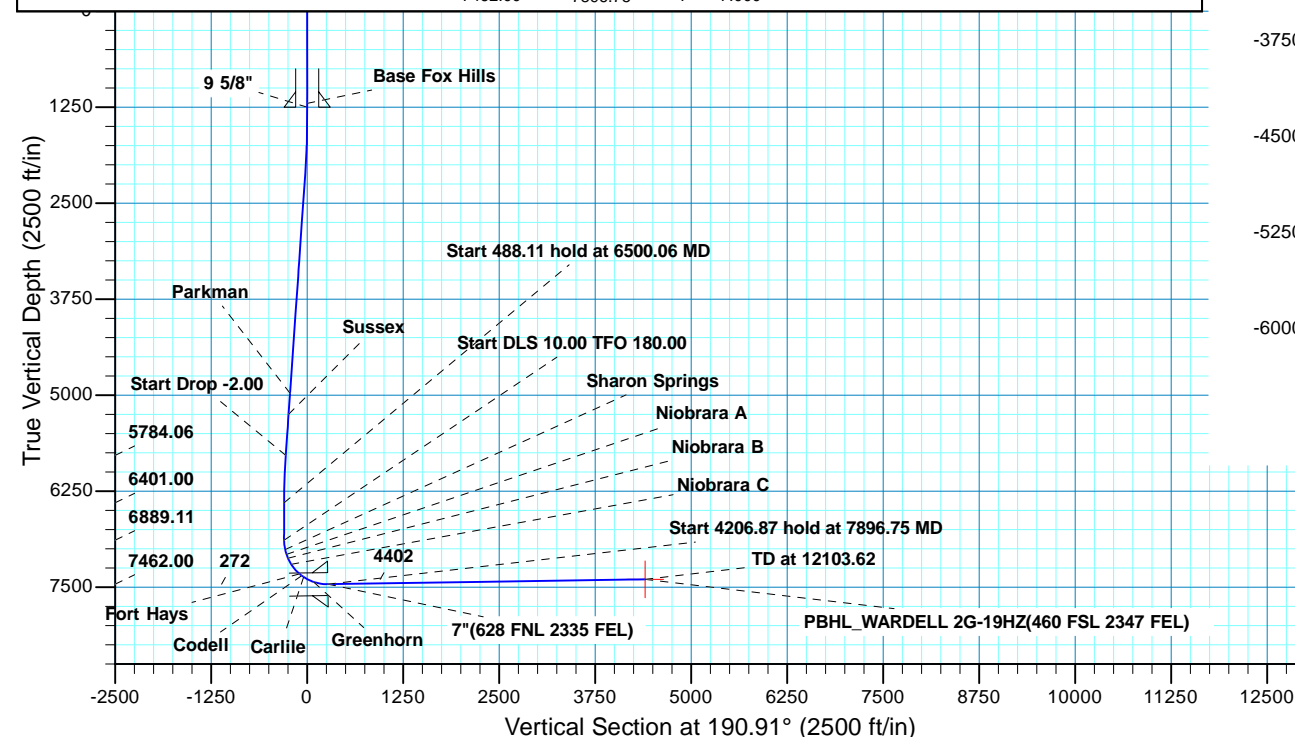
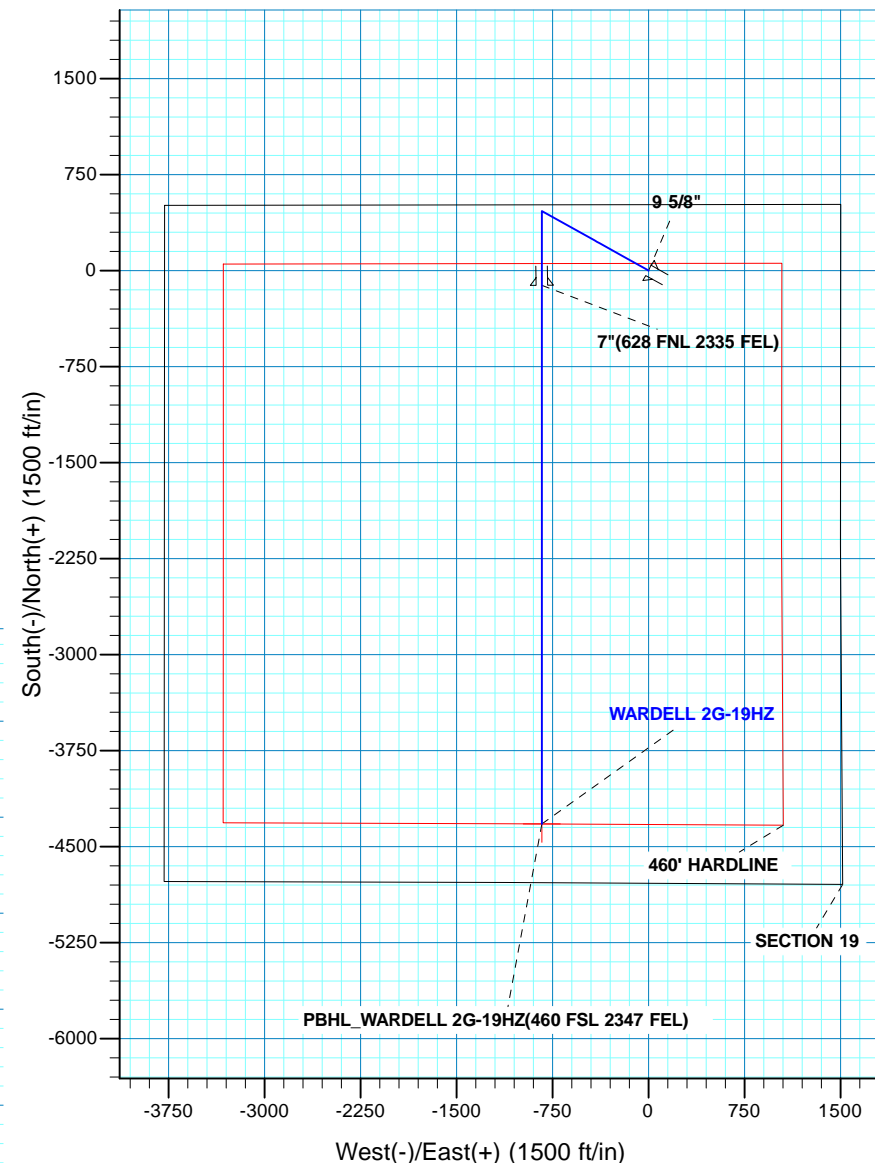
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL	7399.00	-4322.94	-833.19	1318483.44	3221995.76	40.2049030	-104.7051940	Point
- plan hits target center								

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	Inc
1200.00	1200.00	Base Fox Hills	0.00
4976.00	5050.77	Parkman	12.44
5249.00	5330.33	Sussex	12.44
7010.00	7109.97	Sharon Springs	12.18
7073.00	7175.37	Niobrara A	18.72
7123.00	7229.09	Niobrara B	24.09
7203.00	7320.36	Niobrara C	33.22
7328.00	7488.13	Fort Hays	50.00
7352.00	7527.07	Codell	53.89
7369.00	7557.01	Carlile	56.88
7433.00	7704.88	Greenhorn	71.67

CASING DETAILS

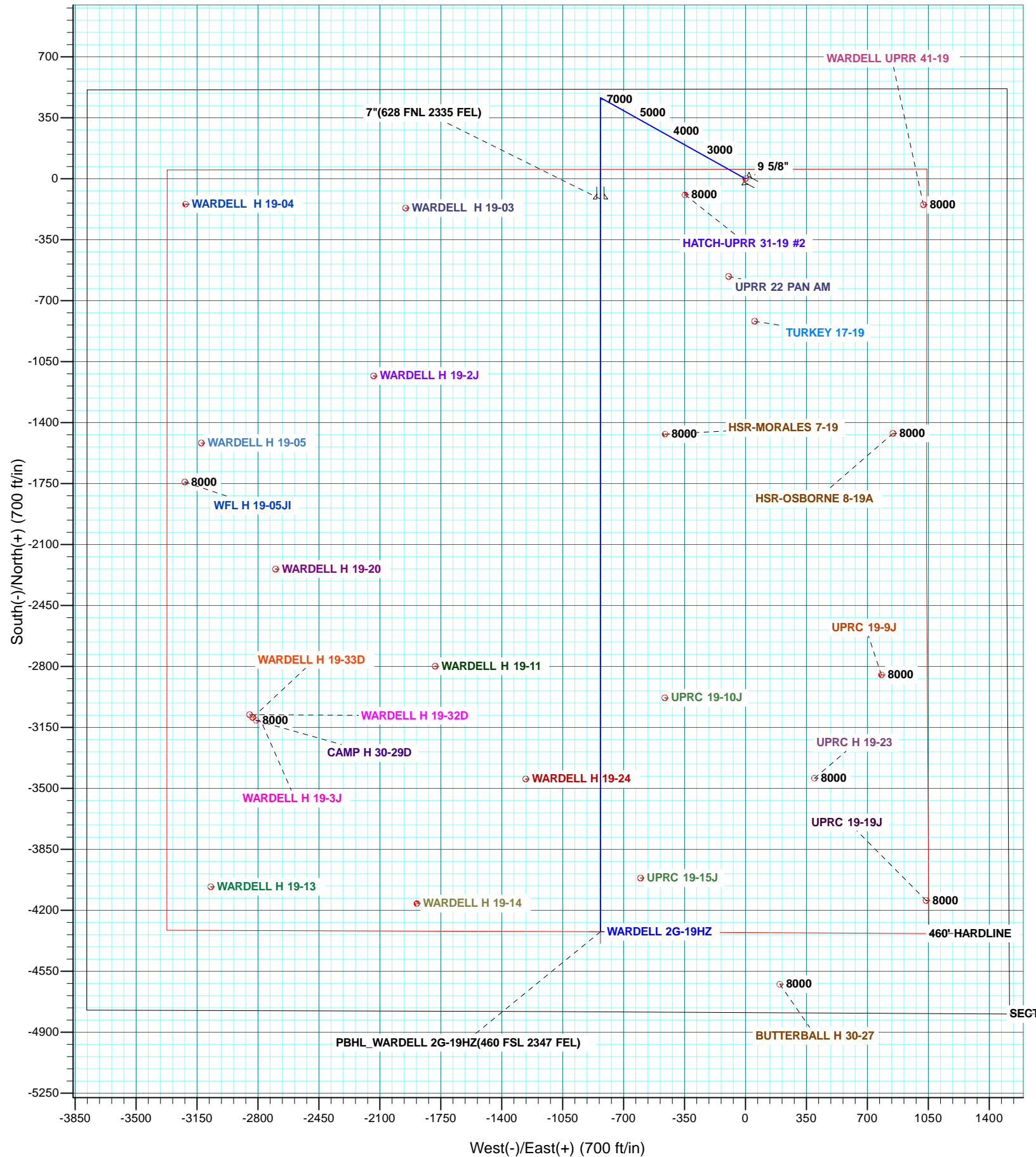
TVD	MD	Name	Size
1250.00	1250.00	9 5/8"	9.625
7462.00	7896.75	7"	7.000



Plan: PLAN #1 PRELIMINARY (WARDELL 2G-19HZ/OH)

Created By: RobertScott Date: 11:21, July 07 2014

PLAN #1 PRELIMINARY





Scientific Drilling

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WARDELL 2G-19HZ

WARDELL 2G-19HZ

OH

Plan: PLAN #1 PRELIMINARY

Standard Planning Report

07 July, 2014

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well WARDELL 2G-19HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 4951 & KB 17 @ 4976.00ft (HP 311)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 4951 & KB 17 @ 4976.00ft (HP 311)
Site:	WARDELL 2G-19HZ	North Reference:	True
Well:	WARDELL 2G-19HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

Project	COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	WARDELL 2G-19HZ, SECTION 19 T3N R65W			
Site Position:		Northing:	1,322,813.70 usft	Latitude: 40.2167700
From:	Lat/Long	Easting:	3,222,790.02 usft	Longitude: -104.7022110
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence: 0.52 °

Well	WARDELL 2G-19HZ, 515 FNL 1502 FEL			
Well Position	+N/-S	-0.01 ft	Northing:	1,322,813.69 usft
	+E/-W	0.00 ft	Easting:	3,222,790.02 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft
			Ground Level:	4,951.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	07/01/14	8.45	66.79	52,633

Design	PLAN #1 PRELIMINARY			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	190.91

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,450.00	0.00	0.00	1,450.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,071.81	12.44	299.17	2,066.94	32.76	-58.70	2.00	2.00	0.00	299.17	
5,878.24	12.44	299.17	5,784.06	432.24	-774.49	0.00	0.00	0.00	0.00	
6,500.06	0.00	0.00	6,401.00	465.00	-833.19	2.00	-2.00	0.00	180.00	
6,988.17	0.00	0.00	6,889.11	465.00	-833.19	0.00	0.00	0.00	0.00	
7,896.75	90.86	180.00	7,462.00	-116.54	-833.19	10.00	10.00	19.81	180.00	
12,103.62	90.86	180.00	7,399.00	-4,322.94	-833.19	0.00	0.00	0.00	0.00	PBHL_WARDELL 2G

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well WARDELL 2G-19HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 4951 & KB 17 @ 4976.00ft (HP 311)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 4951 & KB 17 @ 4976.00ft (HP 311)
Site:	WARDELL 2G-19HZ	North Reference:	True
Well:	WARDELL 2G-19HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

Planned 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)
0.00	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
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
Base Fox Hills									
1,250.00	0.00	0.00	1,250.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,450.00	0.00	0.00	1,450.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,500.00	1.00	299.17	1,500.00	0.21	-0.38	-0.14	2.00	2.00	0.00
1,600.00	3.00	299.17	1,599.93	1.91	-3.43	-1.23	2.00	2.00	0.00
1,700.00	5.00	299.17	1,699.68	5.31	-9.52	-3.42	2.00	2.00	0.00
1,800.00	7.00	299.17	1,799.13	10.41	-18.65	-6.69	2.00	2.00	0.00
1,900.00	9.00	299.17	1,898.15	17.19	-30.80	-11.05	2.00	2.00	0.00
2,000.00	11.00	299.17	1,996.63	25.65	-45.96	-16.49	2.00	2.00	0.00
2,071.81	12.44	299.17	2,066.94	32.76	-58.70	-21.06	2.00	2.00	0.00
Start 3806.43 hold at 2071.81 MD									
2,100.00	12.44	299.17	2,094.47	35.72	-64.00	-22.96	0.00	0.00	0.00
2,200.00	12.44	299.17	2,192.12	46.21	-82.80	-29.71	0.00	0.00	0.00
2,300.00	12.44	299.17	2,289.77	56.71	-101.61	-36.46	0.00	0.00	0.00
2,400.00	12.44	299.17	2,387.43	67.20	-120.41	-43.20	0.00	0.00	0.00
2,500.00	12.44	299.17	2,485.08	77.70	-139.22	-49.95	0.00	0.00	0.00
2,600.00	12.44	299.17	2,582.74	88.19	-158.02	-56.70	0.00	0.00	0.00
2,700.00	12.44	299.17	2,680.39	98.69	-176.83	-63.45	0.00	0.00	0.00
2,800.00	12.44	299.17	2,778.04	109.18	-195.63	-70.19	0.00	0.00	0.00
2,900.00	12.44	299.17	2,875.70	119.68	-214.44	-76.94	0.00	0.00	0.00
3,000.00	12.44	299.17	2,973.35	130.17	-233.24	-83.69	0.00	0.00	0.00
3,100.00	12.44	299.17	3,071.00	140.67	-252.05	-90.43	0.00	0.00	0.00
3,200.00	12.44	299.17	3,168.66	151.16	-270.85	-97.18	0.00	0.00	0.00
3,300.00	12.44	299.17	3,266.31	161.66	-289.66	-103.93	0.00	0.00	0.00
3,400.00	12.44	299.17	3,363.96	172.15	-308.46	-110.68	0.00	0.00	0.00
3,500.00	12.44	299.17	3,461.62	182.65	-327.27	-117.42	0.00	0.00	0.00
3,600.00	12.44	299.17	3,559.27	193.14	-346.07	-124.17	0.00	0.00	0.00
3,700.00	12.44	299.17	3,656.93	203.64	-364.88	-130.92	0.00	0.00	0.00
3,800.00	12.44	299.17	3,754.58	214.13	-383.68	-137.66	0.00	0.00	0.00
3,900.00	12.44	299.17	3,852.23	224.63	-402.49	-144.41	0.00	0.00	0.00
4,000.00	12.44	299.17	3,949.89	235.12	-421.29	-151.16	0.00	0.00	0.00
4,100.00	12.44	299.17	4,047.54	245.62	-440.10	-157.91	0.00	0.00	0.00
4,200.00	12.44	299.17	4,145.19	256.11	-458.90	-164.65	0.00	0.00	0.00
4,300.00	12.44	299.17	4,242.85	266.61	-477.71	-171.40	0.00	0.00	0.00
4,400.00	12.44	299.17	4,340.50	277.10	-496.51	-178.15	0.00	0.00	0.00
4,500.00	12.44	299.17	4,438.15	287.60	-515.32	-184.89	0.00	0.00	0.00
4,600.00	12.44	299.17	4,535.81	298.09	-534.12	-191.64	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well WARDELL 2G-19HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 4951 & KB 17 @ 4976.00ft (HP 311)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 4951 & KB 17 @ 4976.00ft (HP 311)
Site:	WARDELL 2G-19HZ	North Reference:	True
Well:	WARDELL 2G-19HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

Planned 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)
4,700.00	12.44	299.17	4,633.46	308.59	-552.92	-198.39	0.00	0.00	0.00
4,800.00	12.44	299.17	4,731.12	319.08	-571.73	-205.14	0.00	0.00	0.00
4,900.00	12.44	299.17	4,828.77	329.58	-590.53	-211.88	0.00	0.00	0.00
5,000.00	12.44	299.17	4,926.42	340.07	-609.34	-218.63	0.00	0.00	0.00
5,050.77	12.44	299.17	4,976.00	345.40	-618.89	-222.06	0.00	0.00	0.00
Parkman									
5,100.00	12.44	299.17	5,024.08	350.57	-628.14	-225.38	0.00	0.00	0.00
5,200.00	12.44	299.17	5,121.73	361.06	-646.95	-232.13	0.00	0.00	0.00
5,300.00	12.44	299.17	5,219.38	371.56	-665.75	-238.87	0.00	0.00	0.00
5,330.33	12.44	299.17	5,249.00	374.74	-671.46	-240.92	0.00	0.00	0.00
Sussex									
5,400.00	12.44	299.17	5,317.04	382.05	-684.56	-245.62	0.00	0.00	0.00
5,500.00	12.44	299.17	5,414.69	392.55	-703.36	-252.37	0.00	0.00	0.00
5,600.00	12.44	299.17	5,512.34	403.04	-722.17	-259.11	0.00	0.00	0.00
5,700.00	12.44	299.17	5,610.00	413.54	-740.97	-265.86	0.00	0.00	0.00
5,800.00	12.44	299.17	5,707.65	424.03	-759.78	-272.61	0.00	0.00	0.00
5,878.24	12.44	299.17	5,784.06	432.24	-774.49	-277.89	0.00	0.00	0.00
Start Drop -2.00									
5,900.00	12.00	299.17	5,805.32	434.49	-778.51	-279.33	2.00	-2.00	0.00
6,000.00	10.00	299.17	5,903.48	443.79	-795.18	-285.31	2.00	-2.00	0.00
6,100.00	8.00	299.17	6,002.24	451.41	-808.84	-290.21	2.00	-2.00	0.00
6,200.00	6.00	299.17	6,101.49	457.35	-819.48	-294.03	2.00	-2.00	0.00
6,300.00	4.00	299.17	6,201.11	461.60	-827.09	-296.76	2.00	-2.00	0.00
6,400.00	2.00	299.17	6,300.97	464.15	-831.66	-298.40	2.00	-2.00	0.00
6,500.00	0.00	299.17	6,400.94	465.00	-833.19	-298.95	2.00	-2.00	0.00
6,500.06	0.00	0.00	6,401.00	465.00	-833.19	-298.95	2.00	-2.00	0.00
Start 488.11 hold at 6500.06 MD									
6,600.00	0.00	0.00	6,500.94	465.00	-833.19	-298.95	0.00	0.00	0.00
6,700.00	0.00	0.00	6,600.94	465.00	-833.19	-298.95	0.00	0.00	0.00
6,800.00	0.00	0.00	6,700.94	465.00	-833.19	-298.95	0.00	0.00	0.00
6,900.00	0.00	0.00	6,800.94	465.00	-833.19	-298.95	0.00	0.00	0.00
6,988.17	0.00	0.00	6,889.11	465.00	-833.19	-298.95	0.00	0.00	0.00
Start DLS 10.00 TFO 180.00									
7,000.00	1.18	180.00	6,900.94	464.88	-833.19	-298.83	10.00	10.00	0.00
7,100.00	11.18	180.00	7,000.24	454.12	-833.19	-288.26	10.00	10.00	0.00
7,109.97	12.18	180.00	7,010.00	452.10	-833.19	-286.28	10.00	10.00	0.00
Sharon Springs									
7,175.37	18.72	180.00	7,073.00	434.69	-833.19	-269.18	10.00	10.00	0.00
Niobrara A									
7,200.00	21.18	180.00	7,096.15	426.28	-833.19	-260.93	10.00	10.00	0.00
7,229.09	24.09	180.00	7,123.00	415.09	-833.19	-249.94	10.00	10.00	0.00
Niobrara B									
7,300.00	31.18	180.00	7,185.78	382.22	-833.19	-217.66	10.00	10.00	0.00
7,320.36	33.22	180.00	7,203.00	371.37	-833.19	-207.01	10.00	10.00	0.00
Niobrara C									
7,400.00	41.18	180.00	7,266.39	323.25	-833.19	-159.76	10.00	10.00	0.00
7,488.13	50.00	180.00	7,328.00	260.36	-833.19	-98.00	10.00	10.00	0.00
Fort Hays									
7,500.00	51.18	180.00	7,335.53	251.19	-833.19	-89.00	10.00	10.00	0.00
7,527.07	53.89	180.00	7,352.00	229.70	-833.19	-67.90	10.00	10.00	0.00
Codell									
7,557.01	56.88	180.00	7,369.00	205.07	-833.19	-43.71	10.00	10.00	0.00

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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 4951 & KB 17 @ 4976.00ft (HP 311)
Site:	WARDELL 2G-19HZ	North Reference:	True
Well:	WARDELL 2G-19HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

Planned 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)
Carlile									
7,600.00	61.18	180.00	7,391.12	168.21	-833.19	-7.52	10.00	10.00	0.00
7,700.00	71.18	180.00	7,431.45	76.84	-833.19	82.20	10.00	10.00	0.00
7,704.88	71.67	180.00	7,433.00	72.22	-833.19	86.74	10.00	10.00	0.00
Greenhorn									
7,800.00	81.18	180.00	7,455.30	-20.14	-833.19	177.43	10.00	10.00	0.00
7,896.75	90.86	180.00	7,462.00	-116.54	-833.19	272.09	10.00	10.00	0.00
Start 4206.87 hold at 7896.75 MD - 7"(628 FNL 2335 FEL)									
7,900.00	90.86	180.00	7,461.95	-119.79	-833.19	275.28	0.00	0.00	0.00
8,000.00	90.86	180.00	7,460.46	-219.78	-833.19	373.46	0.00	0.00	0.00
8,100.00	90.86	180.00	7,458.96	-319.77	-833.19	471.65	0.00	0.00	0.00
8,200.00	90.86	180.00	7,457.46	-419.76	-833.19	569.83	0.00	0.00	0.00
8,300.00	90.86	180.00	7,455.96	-519.75	-833.19	668.01	0.00	0.00	0.00
8,400.00	90.86	180.00	7,454.47	-619.74	-833.19	766.19	0.00	0.00	0.00
8,500.00	90.86	180.00	7,452.97	-719.72	-833.19	864.38	0.00	0.00	0.00
8,600.00	90.86	180.00	7,451.47	-819.71	-833.19	962.56	0.00	0.00	0.00
8,700.00	90.86	180.00	7,449.97	-919.70	-833.19	1,060.74	0.00	0.00	0.00
8,800.00	90.86	180.00	7,448.48	-1,019.69	-833.19	1,158.92	0.00	0.00	0.00
8,900.00	90.86	180.00	7,446.98	-1,119.68	-833.19	1,257.11	0.00	0.00	0.00
9,000.00	90.86	180.00	7,445.48	-1,219.67	-833.19	1,355.29	0.00	0.00	0.00
9,100.00	90.86	180.00	7,443.98	-1,319.66	-833.19	1,453.47	0.00	0.00	0.00
9,200.00	90.86	180.00	7,442.49	-1,419.65	-833.19	1,551.65	0.00	0.00	0.00
9,300.00	90.86	180.00	7,440.99	-1,519.63	-833.19	1,649.84	0.00	0.00	0.00
9,400.00	90.86	180.00	7,439.49	-1,619.62	-833.19	1,748.02	0.00	0.00	0.00
9,500.00	90.86	180.00	7,437.99	-1,719.61	-833.19	1,846.20	0.00	0.00	0.00
9,600.00	90.86	180.00	7,436.50	-1,819.60	-833.19	1,944.38	0.00	0.00	0.00
9,700.00	90.86	180.00	7,435.00	-1,919.59	-833.19	2,042.57	0.00	0.00	0.00
9,800.00	90.86	180.00	7,433.50	-2,019.58	-833.19	2,140.75	0.00	0.00	0.00
9,900.00	90.86	180.00	7,432.00	-2,119.57	-833.19	2,238.93	0.00	0.00	0.00
10,000.00	90.86	180.00	7,430.50	-2,219.56	-833.19	2,337.11	0.00	0.00	0.00
10,100.00	90.86	180.00	7,429.01	-2,319.55	-833.19	2,435.30	0.00	0.00	0.00
10,200.00	90.86	180.00	7,427.51	-2,419.53	-833.19	2,533.48	0.00	0.00	0.00
10,300.00	90.86	180.00	7,426.01	-2,519.52	-833.19	2,631.66	0.00	0.00	0.00
10,400.00	90.86	180.00	7,424.51	-2,619.51	-833.19	2,729.84	0.00	0.00	0.00
10,500.00	90.86	180.00	7,423.02	-2,719.50	-833.19	2,828.03	0.00	0.00	0.00
10,600.00	90.86	180.00	7,421.52	-2,819.49	-833.19	2,926.21	0.00	0.00	0.00
10,700.00	90.86	180.00	7,420.02	-2,919.48	-833.19	3,024.39	0.00	0.00	0.00
10,800.00	90.86	180.00	7,418.52	-3,019.47	-833.19	3,122.57	0.00	0.00	0.00
10,900.00	90.86	180.00	7,417.03	-3,119.46	-833.19	3,220.76	0.00	0.00	0.00
11,000.00	90.86	180.00	7,415.53	-3,219.44	-833.19	3,318.94	0.00	0.00	0.00
11,100.00	90.86	180.00	7,414.03	-3,319.43	-833.19	3,417.12	0.00	0.00	0.00
11,200.00	90.86	180.00	7,412.53	-3,419.42	-833.19	3,515.30	0.00	0.00	0.00
11,300.00	90.86	180.00	7,411.04	-3,519.41	-833.19	3,613.49	0.00	0.00	0.00
11,400.00	90.86	180.00	7,409.54	-3,619.40	-833.19	3,711.67	0.00	0.00	0.00
11,500.00	90.86	180.00	7,408.04	-3,719.39	-833.19	3,809.85	0.00	0.00	0.00
11,600.00	90.86	180.00	7,406.54	-3,819.38	-833.19	3,908.03	0.00	0.00	0.00
11,700.00	90.86	180.00	7,405.04	-3,919.37	-833.19	4,006.22	0.00	0.00	0.00
11,800.00	90.86	180.00	7,403.55	-4,019.35	-833.19	4,104.40	0.00	0.00	0.00
11,900.00	90.86	180.00	7,402.05	-4,119.34	-833.19	4,202.58	0.00	0.00	0.00
12,000.00	90.86	180.00	7,400.55	-4,219.33	-833.19	4,300.76	0.00	0.00	0.00
12,100.00	90.86	180.00	7,399.05	-4,319.32	-833.19	4,398.95	0.00	0.00	0.00
12,103.62	90.86	180.00	7,399.00	-4,322.94	-833.19	4,402.50	0.00	0.00	0.00
TD at 12103.62 - PBHL_WARDELL 2G-19HZ(460 FSL 2347 FEL)									

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well WARDELL 2G-19HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 4951 & KB 17 @ 4976.00ft (HP 311)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 4951 & KB 17 @ 4976.00ft (HP 311)
Site:	WARDELL 2G-19HZ	North Reference:	True
Well:	WARDELL 2G-19HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
PBHL_WARDELL 2G-19HZ	0.00	0.00	7,399.00	-4,322.94	-833.19	1,318,483.44	3,221,995.76	40.2049030	-104.7051940
- plan hits target center									
- Point									

Casing Points					
Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter	
(ft)	(ft)		(in)	(in)	
1,250.00	1,250.00	9 5/8"	9.625	13.500	
7,896.75	7,462.00	7"(628 FNL 2335 FEL)	7.000	8.750	

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(ft)	(ft)			(°)	(°)	
1,200.00	1,200.00	Base Fox Hills		0.00		
5,050.77	4,976.00	Parkman				
5,330.33	5,249.00	Sussex				
7,109.97	7,010.00	Sharon Springs				
7,175.37	7,073.00	Niobrara A				
7,229.09	7,123.00	Niobrara B				
7,320.36	7,203.00	Niobrara C				
7,488.13	7,328.00	Fort Hays				
7,527.07	7,352.00	Codell				
7,557.01	7,369.00	Carlile				
7,704.88	7,433.00	Greenhorn				

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(ft)	(ft)	+N/-S	+E/-W		
(ft)	(ft)	(ft)	(ft)		
1,450.00	1,450.00	0.00	0.00	Start Build 2.00	
2,071.81	2,066.94	32.76	-58.70	Start 3806.43 hold at 2071.81 MD	
5,878.24	5,784.06	432.24	-774.49	Start Drop -2.00	
6,500.06	6,401.00	465.00	-833.19	Start 488.11 hold at 6500.06 MD	
6,988.17	6,889.11	465.00	-833.19	Start DLS 10.00 TFO 180.00	
7,896.75	7,462.00	-116.54	-833.19	Start 4206.87 hold at 7896.75 MD	
12,103.62	7,399.00	-4,322.94	-833.19	TD at 12103.62	