

WELL DETAILS: Land Fed 13S-32HZ

GL 4897' & KB 20' @ 4917.00ft (Precision 461)  
+N/-S +E/-W Northing Easting Latitude Longitude  
0.00 0.00 14562852.94 1694787.13 40.0990270 -104.8055740

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00
1070.46	12.31	339.86	1064.16	82.41	-30.22	1.50	339.86	-82.41
3348.01	12.31	339.86	3289.38	538.19	-197.34	0.00	0.00	-538.19
3963.35	0.00	0.00	3900.00	600.00	-220.00	2.00	180.00	-600.00
4054.75	0.00	0.00	3991.40	600.00	-220.00	0.00	0.00	-600.00
5049.96	89.57	180.00	4628.00	-31.83	-220.00	9.00	180.00	31.83
9567.61	89.57	180.00	4662.00	-4549.35	-220.00	0.00	0.00	4549.35

PROJECT DETAILS: US Rockies Wattenberg Planning

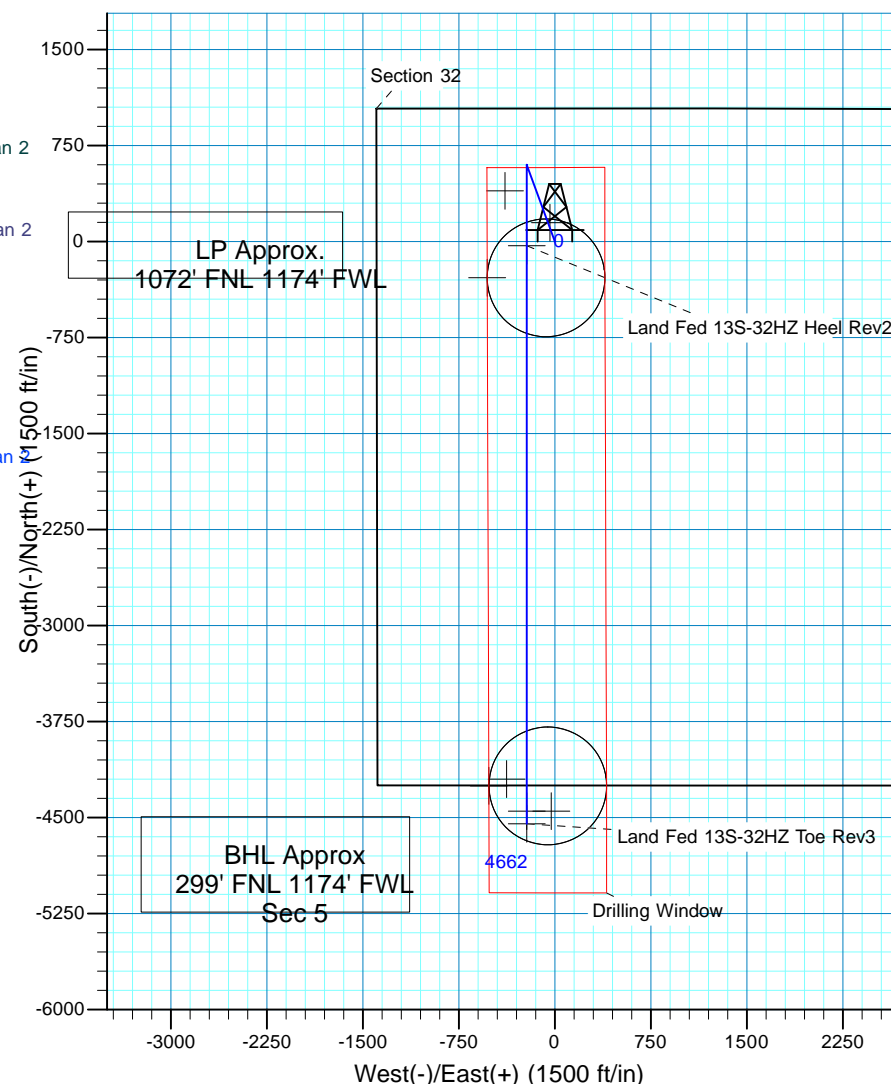
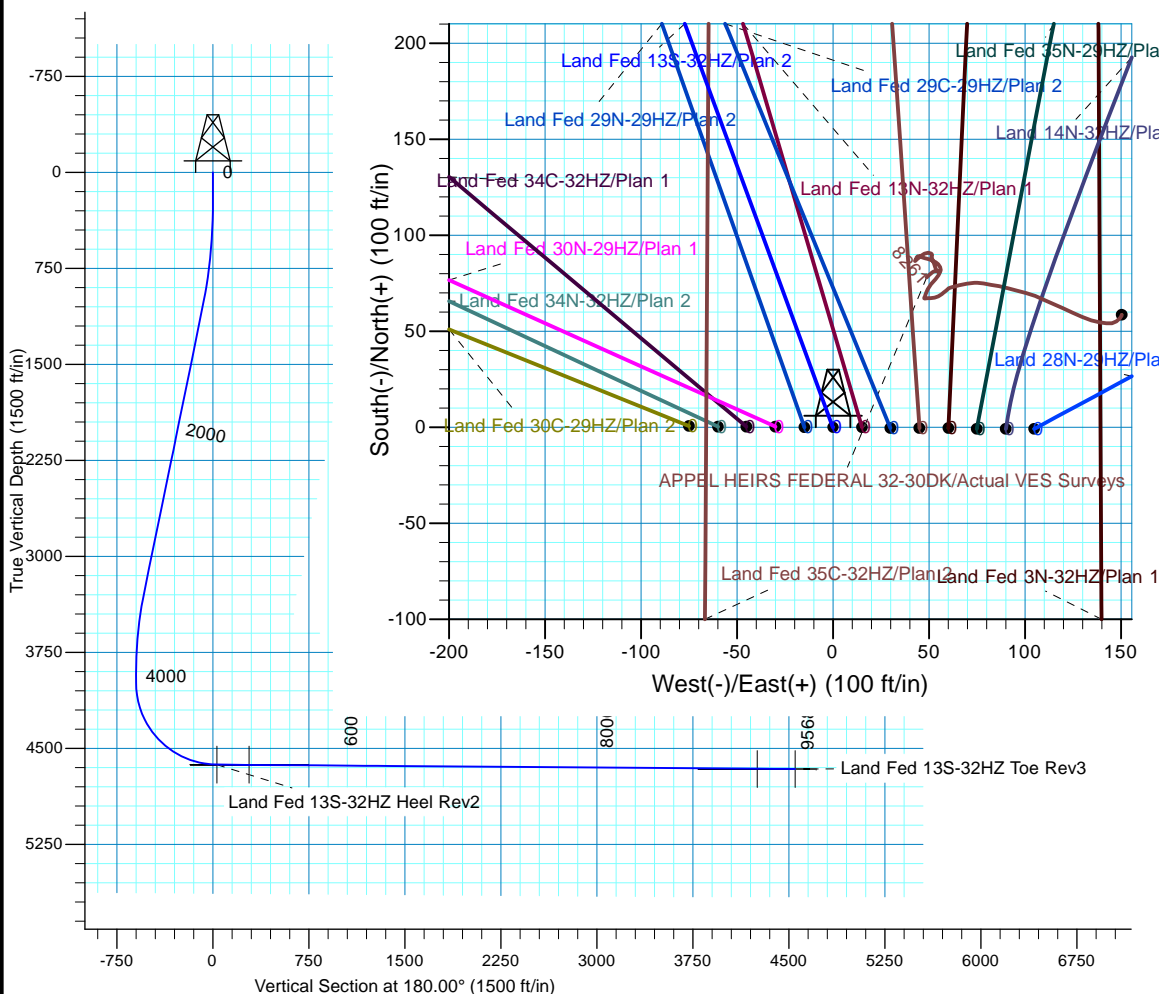
Geodetic System: Universal Transverse Mercator (US Survey Feet)  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Zone 13N (108 W to 102 W)  
System Datum: Mean Sea Level  
Local North: True



Azimuths to True North  
Magnetic North: 8.47°  
Magnetic Field  
Strength: 52368.8nT  
Dip Angle: 66.69°  
Date: 5/5/2016  
Model: BGGM2015

Plan: Plan 2 (Land Fed 13S-32HZ/OH)

Created By: Julie Cruse Date: 12 May 2016





# **US ROCKIES REGION PLANNING**

**US Rockies Wattenberg Planning**

**Land 18-32HZ Pad 2N-66W-32**

**Land Fed 13S-32HZ**

**OH**

**Plan: Plan 2**

## **Standard Planning Report**

**12 May, 2016**



<b>Database:</b>	Denver Sales Office	<b>Local Co-ordinate Reference:</b>	Well Land Fed 13S-32HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL 4897' & KB 20' @ 4917.00ft (Precision 461)
<b>Project:</b>	US Rockies Wattenberg Planning	<b>MD Reference:</b>	GL 4897' & KB 20' @ 4917.00ft (Precision 461)
<b>Site:</b>	Land 18-32HZ Pad 2N-66W-32	<b>North Reference:</b>	True
<b>Well:</b>	Land Fed 13S-32HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan 2		

<b>Project</b>	US Rockies Wattenberg Planning		
<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)		

<b>Site</b>	Land 18-32HZ Pad 2N-66W-32, Site Center: Land Fed 30C-29HZ		
<b>Site Position:</b>		<b>Northing:</b>	14,562,853.50 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,694,712.19 usft
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in
		<b>Latitude:</b>	40.0990290
		<b>Longitude:</b>	-104.8058420
		<b>Grid Convergence:</b>	0.13 °

<b>Well</b>	Land Fed 13S-32HZ, 1040' FNL 1394' FWL Sec 32 T2N R66W		
<b>Well Position</b>	<b>+N/-S</b>	-0.73 ft	<b>Northing:</b> 14,562,852.93 usft
	<b>+E/-W</b>	74.95 ft	<b>Easting:</b> 1,694,787.13 usft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	0.00 ft
		<b>Latitude:</b>	40.0990270
		<b>Longitude:</b>	-104.8055740
		<b>Ground Level:</b>	4,897.00 ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	BGGM2015	5/5/2016	8.48	66.69	52,369

<b>Design</b>	Plan 2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<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	180.00

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	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	
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,070.46	12.31	339.86	1,064.16	82.41	-30.22	1.50	1.50	0.00	339.86	
3,348.01	12.31	339.86	3,289.38	538.19	-197.34	0.00	0.00	0.00	0.00	
3,963.35	0.00	0.00	3,900.00	600.00	-220.00	2.00	-2.00	0.00	180.00	
4,054.75	0.00	0.00	3,991.40	600.00	-220.00	0.00	0.00	0.00	0.00	
5,049.96	89.57	180.00	4,628.00	-31.83	-220.00	9.00	9.00	18.09	180.00	
9,567.61	89.57	180.00	4,662.00	-4,549.35	-220.00	0.00	0.00	0.00	0.00	Land Fed 13S-32HZ 1

<b>Database:</b>	Denver Sales Office	<b>Local Co-ordinate Reference:</b>	Well Land Fed 13S-32HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL 4897' & KB 20' @ 4917.00ft (Precision 461)
<b>Project:</b>	US Rockies Wattenberg Planning	<b>MD Reference:</b>	GL 4897' & KB 20' @ 4917.00ft (Precision 461)
<b>Site:</b>	Land 18-32HZ Pad 2N-66W-32	<b>North Reference:</b>	True
<b>Well:</b>	Land Fed 13S-32HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan 2		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.75	339.86	300.00	0.31	-0.11	-0.31	1.50	1.50	0.00
400.00	2.25	339.86	399.96	2.76	-1.01	-2.76	1.50	1.50	0.00
500.00	3.75	339.86	499.82	7.68	-2.82	-7.68	1.50	1.50	0.00
600.00	5.25	339.86	599.51	15.04	-5.52	-15.04	1.50	1.50	0.00
700.00	6.75	339.86	698.96	24.86	-9.11	-24.86	1.50	1.50	0.00
800.00	8.25	339.86	798.10	37.11	-13.61	-37.11	1.50	1.50	0.00
900.00	9.75	339.86	896.87	51.80	-18.99	-51.80	1.50	1.50	0.00
1,000.00	11.25	339.86	995.19	68.91	-25.27	-68.91	1.50	1.50	0.00
1,070.46	12.31	339.86	1,064.16	82.41	-30.22	-82.41	1.50	1.50	0.00
1,100.00	12.31	339.86	1,093.03	88.32	-32.39	-88.32	0.00	0.00	0.00
1,200.00	12.31	339.86	1,190.73	108.34	-39.72	-108.34	0.00	0.00	0.00
1,300.00	12.31	339.86	1,288.43	128.35	-47.06	-128.35	0.00	0.00	0.00
1,400.00	12.31	339.86	1,386.13	148.36	-54.40	-148.36	0.00	0.00	0.00
1,500.00	12.31	339.86	1,483.83	168.37	-61.74	-168.37	0.00	0.00	0.00
1,600.00	12.31	339.86	1,581.54	188.38	-69.07	-188.38	0.00	0.00	0.00
1,700.00	12.31	339.86	1,679.24	208.39	-76.41	-208.39	0.00	0.00	0.00
1,800.00	12.31	339.86	1,776.94	228.41	-83.75	-228.41	0.00	0.00	0.00
1,900.00	12.31	339.86	1,874.64	248.42	-91.09	-248.42	0.00	0.00	0.00
2,000.00	12.31	339.86	1,972.35	268.43	-98.42	-268.43	0.00	0.00	0.00
2,100.00	12.31	339.86	2,070.05	288.44	-105.76	-288.44	0.00	0.00	0.00
2,200.00	12.31	339.86	2,167.75	308.45	-113.10	-308.45	0.00	0.00	0.00
2,300.00	12.31	339.86	2,265.45	328.47	-120.44	-328.47	0.00	0.00	0.00
2,400.00	12.31	339.86	2,363.15	348.48	-127.78	-348.48	0.00	0.00	0.00
2,500.00	12.31	339.86	2,460.86	368.49	-135.11	-368.49	0.00	0.00	0.00
2,600.00	12.31	339.86	2,558.56	388.50	-142.45	-388.50	0.00	0.00	0.00
2,700.00	12.31	339.86	2,656.26	408.51	-149.79	-408.51	0.00	0.00	0.00
2,800.00	12.31	339.86	2,753.96	428.52	-157.13	-428.52	0.00	0.00	0.00
2,900.00	12.31	339.86	2,851.66	448.54	-164.46	-448.54	0.00	0.00	0.00
3,000.00	12.31	339.86	2,949.37	468.55	-171.80	-468.55	0.00	0.00	0.00
3,100.00	12.31	339.86	3,047.07	488.56	-179.14	-488.56	0.00	0.00	0.00
3,200.00	12.31	339.86	3,144.77	508.57	-186.48	-508.57	0.00	0.00	0.00
3,300.00	12.31	339.86	3,242.47	528.58	-193.81	-528.58	0.00	0.00	0.00
3,348.01	12.31	339.86	3,289.38	538.19	-197.34	-538.19	0.00	0.00	0.00
3,400.00	11.27	339.86	3,340.27	548.16	-200.99	-548.16	2.00	-2.00	0.00
3,500.00	9.27	339.86	3,438.66	564.90	-207.13	-564.90	2.00	-2.00	0.00
3,600.00	7.27	339.86	3,537.62	578.39	-212.08	-578.39	2.00	-2.00	0.00
3,700.00	5.27	339.86	3,637.02	588.64	-215.84	-588.64	2.00	-2.00	0.00
3,800.00	3.27	339.86	3,736.74	595.63	-218.40	-595.63	2.00	-2.00	0.00
3,900.00	1.27	339.86	3,836.65	599.34	-219.76	-599.34	2.00	-2.00	0.00
3,963.35	0.00	0.00	3,900.00	600.00	-220.00	-600.00	2.00	-2.00	0.00
4,000.00	0.00	0.00	3,936.65	600.00	-220.00	-600.00	0.00	0.00	0.00
4,054.75	0.00	0.00	3,991.40	600.00	-220.00	-600.00	0.00	0.00	0.00
4,100.00	4.07	180.00	4,036.61	598.39	-220.00	-598.39	9.00	9.00	0.00
4,200.00	13.07	180.00	4,135.39	583.50	-220.00	-583.50	9.00	9.00	0.00
4,300.00	22.07	180.00	4,230.63	553.34	-220.00	-553.34	9.00	9.00	0.00
4,400.00	31.07	180.00	4,319.97	508.66	-220.00	-508.66	9.00	9.00	0.00
4,500.00	40.07	180.00	4,401.23	450.54	-220.00	-450.54	9.00	9.00	0.00
4,600.00	49.07	180.00	4,472.39	380.43	-220.00	-380.43	9.00	9.00	0.00

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<b>Site:</b>	Land 18-32HZ Pad 2N-66W-32	<b>North Reference:</b>	True
<b>Well:</b>	Land Fed 13S-32HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan 2		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,700.00	58.07	180.00	4,531.71	300.06	-220.00	-300.06	9.00	9.00	0.00
4,800.00	67.07	180.00	4,577.73	211.39	-220.00	-211.39	9.00	9.00	0.00
4,900.00	76.07	180.00	4,609.30	116.61	-220.00	-116.61	9.00	9.00	0.00
5,000.00	85.07	180.00	4,625.67	18.07	-220.00	-18.07	9.00	9.00	0.00
5,049.96	89.57	180.00	4,628.00	-31.83	-220.00	31.83	9.00	9.00	0.00
5,100.00	89.57	180.00	4,628.38	-81.86	-220.00	81.86	0.00	0.00	0.00
5,200.00	89.57	180.00	4,629.13	-181.86	-220.00	181.86	0.00	0.00	0.00
5,300.00	89.57	180.00	4,629.88	-281.86	-220.00	281.86	0.00	0.00	0.00
5,400.00	89.57	180.00	4,630.64	-381.86	-220.00	381.86	0.00	0.00	0.00
5,500.00	89.57	180.00	4,631.39	-481.85	-220.00	481.85	0.00	0.00	0.00
5,600.00	89.57	180.00	4,632.14	-581.85	-220.00	581.85	0.00	0.00	0.00
5,700.00	89.57	180.00	4,632.89	-681.85	-220.00	681.85	0.00	0.00	0.00
5,800.00	89.57	180.00	4,633.65	-781.85	-220.00	781.85	0.00	0.00	0.00
5,900.00	89.57	180.00	4,634.40	-881.84	-220.00	881.84	0.00	0.00	0.00
6,000.00	89.57	180.00	4,635.15	-981.84	-220.00	981.84	0.00	0.00	0.00
6,100.00	89.57	180.00	4,635.91	-1,081.84	-220.00	1,081.84	0.00	0.00	0.00
6,200.00	89.57	180.00	4,636.66	-1,181.83	-220.00	1,181.83	0.00	0.00	0.00
6,300.00	89.57	180.00	4,637.41	-1,281.83	-220.00	1,281.83	0.00	0.00	0.00
6,400.00	89.57	180.00	4,638.16	-1,381.83	-220.00	1,381.83	0.00	0.00	0.00
6,500.00	89.57	180.00	4,638.92	-1,481.83	-220.00	1,481.83	0.00	0.00	0.00
6,600.00	89.57	180.00	4,639.67	-1,581.82	-220.00	1,581.82	0.00	0.00	0.00
6,700.00	89.57	180.00	4,640.42	-1,681.82	-220.00	1,681.82	0.00	0.00	0.00
6,800.00	89.57	180.00	4,641.17	-1,781.82	-220.00	1,781.82	0.00	0.00	0.00
6,900.00	89.57	180.00	4,641.93	-1,881.81	-220.00	1,881.81	0.00	0.00	0.00
7,000.00	89.57	180.00	4,642.68	-1,981.81	-220.00	1,981.81	0.00	0.00	0.00
7,100.00	89.57	180.00	4,643.43	-2,081.81	-220.00	2,081.81	0.00	0.00	0.00
7,200.00	89.57	180.00	4,644.18	-2,181.81	-220.00	2,181.81	0.00	0.00	0.00
7,300.00	89.57	180.00	4,644.94	-2,281.80	-220.00	2,281.80	0.00	0.00	0.00
7,400.00	89.57	180.00	4,645.69	-2,381.80	-220.00	2,381.80	0.00	0.00	0.00
7,500.00	89.57	180.00	4,646.44	-2,481.80	-220.00	2,481.80	0.00	0.00	0.00
7,600.00	89.57	180.00	4,647.19	-2,581.79	-220.00	2,581.79	0.00	0.00	0.00
7,700.00	89.57	180.00	4,647.95	-2,681.79	-220.00	2,681.79	0.00	0.00	0.00
7,800.00	89.57	180.00	4,648.70	-2,781.79	-220.00	2,781.79	0.00	0.00	0.00
7,900.00	89.57	180.00	4,649.45	-2,881.79	-220.00	2,881.79	0.00	0.00	0.00
8,000.00	89.57	180.00	4,650.20	-2,981.78	-220.00	2,981.78	0.00	0.00	0.00
8,100.00	89.57	180.00	4,650.96	-3,081.78	-220.00	3,081.78	0.00	0.00	0.00
8,200.00	89.57	180.00	4,651.71	-3,181.78	-220.00	3,181.78	0.00	0.00	0.00
8,300.00	89.57	180.00	4,652.46	-3,281.77	-220.00	3,281.77	0.00	0.00	0.00
8,400.00	89.57	180.00	4,653.21	-3,381.77	-220.00	3,381.77	0.00	0.00	0.00
8,500.00	89.57	180.00	4,653.97	-3,481.77	-220.00	3,481.77	0.00	0.00	0.00
8,600.00	89.57	180.00	4,654.72	-3,581.77	-220.00	3,581.77	0.00	0.00	0.00
8,700.00	89.57	180.00	4,655.47	-3,681.76	-220.00	3,681.76	0.00	0.00	0.00
8,800.00	89.57	180.00	4,656.22	-3,781.76	-220.00	3,781.76	0.00	0.00	0.00
8,900.00	89.57	180.00	4,656.98	-3,881.76	-220.00	3,881.76	0.00	0.00	0.00
9,000.00	89.57	180.00	4,657.73	-3,981.75	-220.00	3,981.75	0.00	0.00	0.00
9,100.00	89.57	180.00	4,658.48	-4,081.75	-220.00	4,081.75	0.00	0.00	0.00
9,200.00	89.57	180.00	4,659.23	-4,181.75	-220.00	4,181.75	0.00	0.00	0.00
9,300.00	89.57	180.00	4,659.99	-4,281.75	-220.00	4,281.75	0.00	0.00	0.00
9,400.00	89.57	180.00	4,660.74	-4,381.74	-220.00	4,381.74	0.00	0.00	0.00
9,500.00	89.57	180.00	4,661.49	-4,481.74	-220.00	4,481.74	0.00	0.00	0.00
9,567.61	89.57	180.00	4,662.00	-4,549.35	-220.00	4,549.35	0.00	0.00	0.00

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<b>Site:</b>	Land 18-32HZ Pad 2N-66W-32	<b>North Reference:</b>	True
<b>Well:</b>	Land Fed 13S-32HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan 2		

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Land Fed 13S-32HZ 460 - plan misses target center by 309.55ft at 5301.32ft MD (4629.89 TVD, -283.17 N, -220.00 E) - Circle (radius 460.00)	0.00	0.00	4,628.00	-283.19	-529.55	14,562,568.59	1,694,258.21	40.0982493	-104.8074676
Land Fed 13S-32HZ Heel - plan hits target center - Point	0.00	0.00	4,628.00	-31.83	-220.00	14,562,820.62	1,694,567.20	40.0989396	-104.8063607
Land Fed 13S-32HZ 460 - plan misses target center by 295.53ft at 9270.55ft MD (4659.76 TVD, -4252.29 N, -220.00 E) - Circle (radius 460.00)	0.00	0.00	4,662.00	-4,252.28	-515.52	14,558,599.55	1,694,280.91	40.0873497	-104.8074171
Land Fed 13S-32HZ Toe - plan hits target center - Point	0.00	0.00	4,662.00	-4,549.35	-220.00	14,558,303.12	1,694,577.08	40.0865339	-104.8063605

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,591.83	4,467.00	Sussex		0.00		
5,049.58	4,628.00	Landing Target (Heel)		0.00		
9,567.61	4,662.00	BHL (Toe)		0.00		