

# **US ROCKIES WATTENBERG PLANNING**

**WELD-NAD83-UTMFT13N  
2N-65W-13 Swartz 16-13HZ Pad  
SWARTZ 1N-12HZ**

**Plan B**

**Plan: Permit Rev-1**

## **Standard Planning Report**

**15 December, 2016**



Azimuths to True North  
Magnetic North: 8.20°

Magnetic Field  
Strength: 52572.2snT  
Dip Angle: 66.72°  
Date: 7/29/2015  
Model: IGRF2010

SITE: 2N-65W-13 Swartz 16-13HZ Pad

Well: SWARTZ 1N-12HZ  
Wellbore: Plan B  
Design: Permit Rev-1

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1372.00	1377.46	Fox Hills Mkr
4068.00	4081.13	Parkman
4449.00	4474.70	Sussex
6839.00	6834.73	Sharon Springs
6891.00	7023.50	Niobrara
6959.00	7187.93	Nio B

#### WELL DETAILS: SWARTZ 1N-12HZ

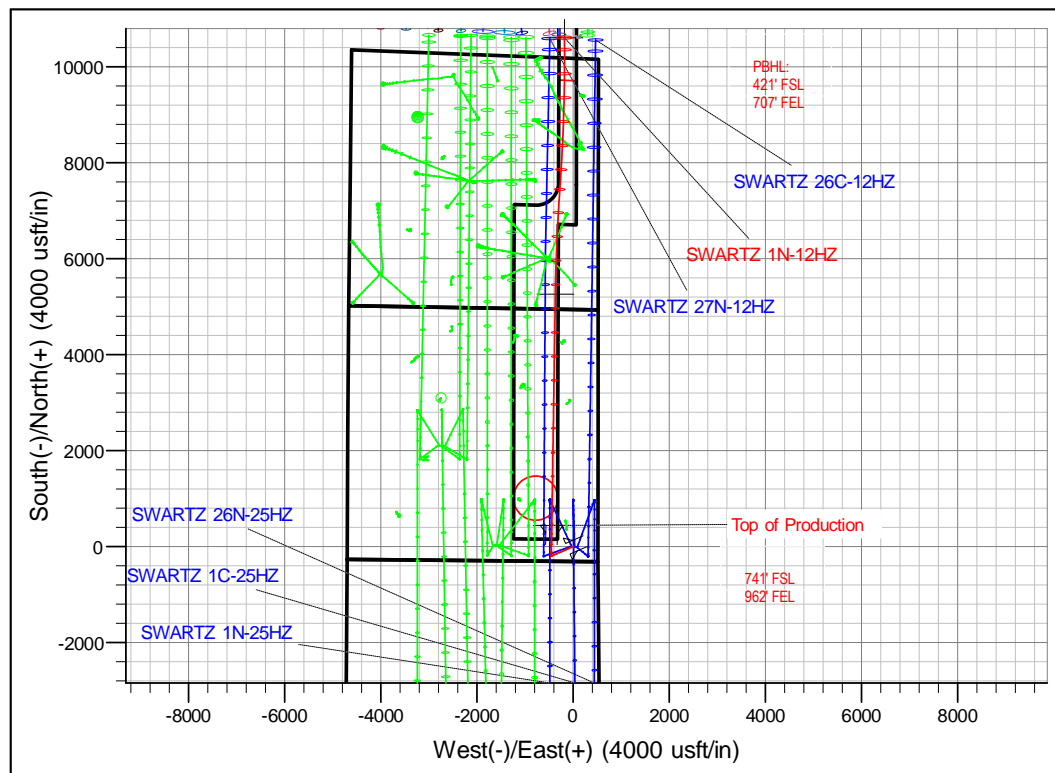
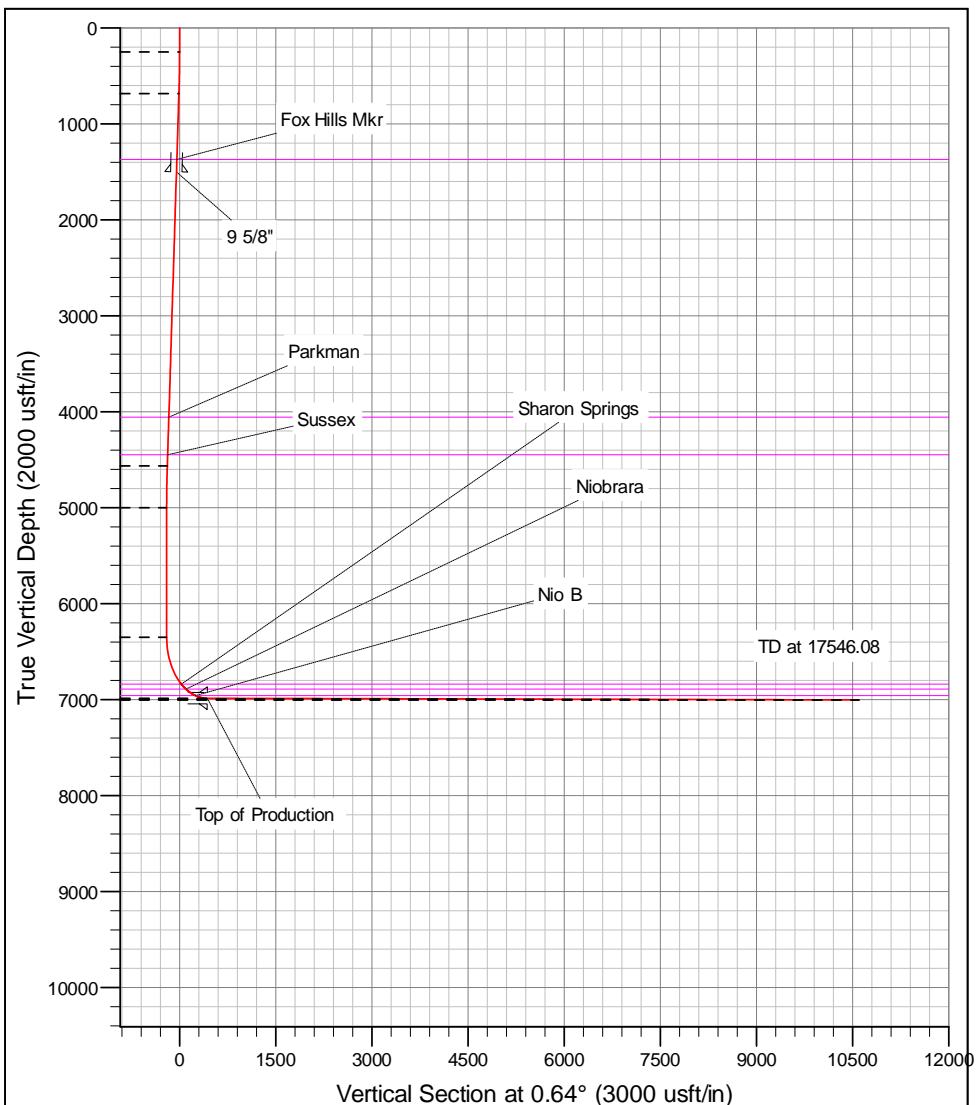
+N/-S	+E/-W	GL: 4956.00 Northing	RKB = 17' @ 4973.00usft (D Rig) Easting	Latitude	Longitude	Slot
0.00	0.00	14575037.74	1750880.98	40.131977	-104.604795	

#### SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
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
686.88	6.55	246.70	685.93	-9.87	-22.92	1.50	-10.13
4590.53	6.55	246.70	4564.07	-186.13	-432.08	0.00	-190.94
5027.41	0.00	0.00	5000.00	-196.00	-455.00	1.50	-201.07
6377.93	0.00	0.00	6350.52	-196.00	-455.00	0.00	-201.07
7376.88	89.90	0.89	6987.14	439.49	-445.10	9.00	434.49
12200.14	89.90	0.89	6995.14	5262.16	-370.00	0.00	5257.70
14384.68	89.91	4.01	6998.76	7444.43	-276.67	0.14	7440.87
17546.08	89.90	359.50	7004.00	10603.53	-180.00	0.14	10600.86

#### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SWARTZ 1N-12HZ PBHL	7004.00	10603.53	-180.00	14585640.36	1750653.84	40.161095	-104.605439



# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well SWARTZ 1N-12HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4973.00usft (D Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4973.00usft (D Rig)
<b>Site:</b>	2N-65W-13 Swartz 16-13HZ Pad	<b>North Reference:</b>	True
<b>Well:</b>	SWARTZ 1N-12HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan B		
<b>Design:</b>	Permit Rev-1		

<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-13 Swartz 16-13HZ Pad											
Site Position:						Northing:			14,575,037.83 usft			Latitude:			40.131978		
From:			Lat/Long			Easting:			1,750,820.88 usft			Longitude:			-104.605010		
Position Uncertainty:			0.00 usft			Slot Radius:			13-3/16 "			Grid Convergence:			0.25		

Well	SWARTZ 1N-12HZ					
Well Position	+N-S	-0.36 usft	Northing:	14,575,037.74 usft	Latitude:	40.131977
	+E-W	60.10 usft	Easting:	1,750,880.98 usft	Longitude:	-104.604795
Position Uncertainty		3.28 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,956.00 usft

<b>Wellbore</b>	Plan B				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	7/29/2015	8.20	66.72	52,572.23510194

<b>Design</b>	Permit Rev-1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<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	0.64

<b>Plan Survey Tool Program</b>	<b>Date</b>	12/15/2016			
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>	
1	0.00	250.00	Permit Rev-1 (Plan B)	APC_ISCWSA REV 2 MWI Fixed:v2:Rockies, crustal dex	
2	1,500.00	17,545.69	Permit Rev-1 (Plan B)	APC_ISCWSA REV 2 MWI Fixed:v2:crustal field declinat	

# Corporate Planning Report

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<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4973.00usft (D Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4973.00usft (D Rig)
<b>Site:</b>	2N-65W-13 Swartz 16-13HZ Pad	<b>North Reference:</b>	True
<b>Well:</b>	SWARTZ 1N-12HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan B		
<b>Design:</b>	Permit Rev-1		

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	
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00	
686.88	6.55	246.70	685.93	-9.87	-22.92	1.50	1.50	0.00	246.70	
4,590.53	6.55	246.70	4,564.07	-186.13	-432.08	0.00	0.00	0.00	0.00	
5,027.41	0.00	0.00	5,000.00	-196.00	-455.00	1.50	-1.50	0.00	180.00	
6,377.93	0.00	0.00	6,350.52	-196.00	-455.00	0.00	0.00	0.00	0.00	
7,376.88	89.91	0.89	6,987.14	439.49	-445.10	9.00	9.00	0.00	0.89	
12,200.14	89.91	0.89	6,995.14	5,262.16	-370.00	0.00	0.00	0.00	0.00	SWARTZ 1N-12HZ
14,384.68	89.91	4.01	6,998.76	7,444.43	-276.67	0.14	0.00	0.14	90.00	
17,546.08	89.91	359.50	7,004.00	10,603.53	-180.00	0.14	0.00	-0.14	-90.01	SWARTZ 1N-12HZ

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<b>Site:</b>	2N-65W-13 Swartz 16-13HZ Pad	<b>North Reference:</b>	True
<b>Well:</b>	SWARTZ 1N-12HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan B		
<b>Design:</b>	Permit Rev-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
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	246.70	300.00	-0.13	-0.30	-0.13	1.50	1.50	0.00
400.00	2.25	246.70	399.96	-1.17	-2.70	-1.20	1.50	1.50	0.00
500.00	3.75	246.70	499.82	-3.24	-7.51	-3.32	1.50	1.50	0.00
600.00	5.25	246.70	599.51	-6.34	-14.72	-6.50	1.50	1.50	0.00
686.88	6.55	246.70	685.93	-9.87	-22.92	-10.13	1.50	1.50	0.00
700.00	6.55	246.70	698.96	-10.47	-24.30	-10.74	0.00	0.00	0.00
800.00	6.55	246.70	798.31	-14.98	-34.78	-15.37	0.00	0.00	0.00
900.00	6.55	246.70	897.66	-19.50	-45.26	-20.00	0.00	0.00	0.00
1,000.00	6.55	246.70	997.00	-24.01	-55.74	-24.63	0.00	0.00	0.00
1,100.00	6.55	246.70	1,096.35	-28.53	-66.22	-29.26	0.00	0.00	0.00
1,200.00	6.55	246.70	1,195.70	-33.04	-76.70	-33.90	0.00	0.00	0.00
1,300.00	6.55	246.70	1,295.04	-37.56	-87.18	-38.53	0.00	0.00	0.00
1,377.46	6.55	246.70	1,372.00	-41.05	-95.30	-42.12	0.00	0.00	0.00
Fox Hills Mkr									
1,400.00	6.55	246.70	1,394.39	-42.07	-97.67	-43.16	0.00	0.00	0.00
1,500.00	6.55	246.70	1,493.74	-46.59	-108.15	-47.79	0.00	0.00	0.00
1,506.31	6.55	246.70	1,500.00	-46.87	-108.81	-48.08	0.00	0.00	0.00
9 5/8"									
1,600.00	6.55	246.70	1,593.08	-51.10	-118.63	-52.42	0.00	0.00	0.00
1,700.00	6.55	246.70	1,692.43	-55.62	-129.11	-57.06	0.00	0.00	0.00
1,800.00	6.55	246.70	1,791.78	-60.13	-139.59	-61.69	0.00	0.00	0.00
1,900.00	6.55	246.70	1,891.12	-64.65	-150.07	-66.32	0.00	0.00	0.00
2,000.00	6.55	246.70	1,990.47	-69.16	-160.55	-70.95	0.00	0.00	0.00
2,100.00	6.55	246.70	2,089.82	-73.68	-171.04	-75.58	0.00	0.00	0.00
2,200.00	6.55	246.70	2,189.16	-78.19	-181.52	-80.21	0.00	0.00	0.00
2,300.00	6.55	246.70	2,288.51	-82.71	-192.00	-84.85	0.00	0.00	0.00
2,400.00	6.55	246.70	2,387.86	-87.22	-202.48	-89.48	0.00	0.00	0.00
2,500.00	6.55	246.70	2,487.20	-91.74	-212.96	-94.11	0.00	0.00	0.00
2,600.00	6.55	246.70	2,586.55	-96.25	-223.44	-98.74	0.00	0.00	0.00
2,700.00	6.55	246.70	2,685.90	-100.77	-233.92	-103.37	0.00	0.00	0.00
2,800.00	6.55	246.70	2,785.24	-105.28	-244.41	-108.01	0.00	0.00	0.00
2,900.00	6.55	246.70	2,884.59	-109.80	-254.89	-112.64	0.00	0.00	0.00
3,000.00	6.55	246.70	2,983.94	-114.31	-265.37	-117.27	0.00	0.00	0.00
3,100.00	6.55	246.70	3,083.28	-118.83	-275.85	-121.90	0.00	0.00	0.00
3,200.00	6.55	246.70	3,182.63	-123.34	-286.33	-126.53	0.00	0.00	0.00
3,300.00	6.55	246.70	3,281.97	-127.86	-296.81	-131.17	0.00	0.00	0.00
3,400.00	6.55	246.70	3,381.32	-132.37	-307.29	-135.80	0.00	0.00	0.00
3,500.00	6.55	246.70	3,480.67	-136.89	-317.78	-140.43	0.00	0.00	0.00
3,600.00	6.55	246.70	3,580.01	-141.40	-328.26	-145.06	0.00	0.00	0.00
3,700.00	6.55	246.70	3,679.36	-145.92	-338.74	-149.69	0.00	0.00	0.00
3,800.00	6.55	246.70	3,778.71	-150.43	-349.22	-154.32	0.00	0.00	0.00
3,900.00	6.55	246.70	3,878.05	-154.95	-359.70	-158.96	0.00	0.00	0.00
4,000.00	6.55	246.70	3,977.40	-159.46	-370.18	-163.59	0.00	0.00	0.00
4,081.13	6.55	246.70	4,058.00	-163.13	-378.69	-167.35	0.00	0.00	0.00
Parkman									
4,100.00	6.55	246.70	4,076.75	-163.98	-380.66	-168.22	0.00	0.00	0.00
4,200.00	6.55	246.70	4,176.09	-168.49	-391.15	-172.85	0.00	0.00	0.00
4,300.00	6.55	246.70	4,275.44	-173.01	-401.63	-177.48	0.00	0.00	0.00
4,400.00	6.55	246.70	4,374.79	-177.52	-412.11	-182.12	0.00	0.00	0.00

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<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4973.00usft (D Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4973.00usft (D Rig)
<b>Site:</b>	2N-65W-13 Swartz 16-13HZ Pad	<b>North Reference:</b>	True
<b>Well:</b>	SWARTZ 1N-12HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan B		
<b>Design:</b>	Permit Rev-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)
4,474.70	6.55	246.70	4,449.00	-180.90	-419.94	-185.58	0.00	0.00	0.00
<b>Sussex</b>									
4,500.00	6.55	246.70	4,474.13	-182.04	-422.59	-186.75	0.00	0.00	0.00
4,590.53	6.55	246.70	4,564.07	-186.13	-432.08	-190.94	0.00	0.00	0.00
4,600.00	6.41	246.70	4,573.48	-186.55	-433.06	-191.38	1.50	-1.50	0.00
4,700.00	4.91	246.70	4,672.99	-190.45	-442.12	-195.38	1.50	-1.50	0.00
4,800.00	3.41	246.70	4,772.73	-193.32	-448.78	-198.32	1.50	-1.50	0.00
4,900.00	1.91	246.70	4,872.61	-195.16	-453.05	-200.21	1.50	-1.50	0.00
5,000.00	0.41	246.70	4,972.59	-195.96	-454.91	-201.03	1.50	-1.50	0.00
5,027.41	0.00	0.00	5,000.00	-196.00	-455.00	-201.07	1.50	-1.50	0.00
5,100.00	0.00	0.00	5,072.59	-196.00	-455.00	-201.07	0.00	0.00	0.00
5,200.00	0.00	0.00	5,172.59	-196.00	-455.00	-201.07	0.00	0.00	0.00
5,300.00	0.00	0.00	5,272.59	-196.00	-455.00	-201.07	0.00	0.00	0.00
5,400.00	0.00	0.00	5,372.59	-196.00	-455.00	-201.07	0.00	0.00	0.00
5,500.00	0.00	0.00	5,472.59	-196.00	-455.00	-201.07	0.00	0.00	0.00
5,600.00	0.00	0.00	5,572.59	-196.00	-455.00	-201.07	0.00	0.00	0.00
5,700.00	0.00	0.00	5,672.59	-196.00	-455.00	-201.07	0.00	0.00	0.00
5,800.00	0.00	0.00	5,772.59	-196.00	-455.00	-201.07	0.00	0.00	0.00
5,900.00	0.00	0.00	5,872.59	-196.00	-455.00	-201.07	0.00	0.00	0.00
6,000.00	0.00	0.00	5,972.59	-196.00	-455.00	-201.07	0.00	0.00	0.00
6,100.00	0.00	0.00	6,072.59	-196.00	-455.00	-201.07	0.00	0.00	0.00
6,200.00	0.00	0.00	6,172.59	-196.00	-455.00	-201.07	0.00	0.00	0.00
6,300.00	0.00	0.00	6,272.59	-196.00	-455.00	-201.07	0.00	0.00	0.00
6,377.93	0.00	0.00	6,350.52	-196.00	-455.00	-201.07	0.00	0.00	0.00
6,400.00	1.99	0.89	6,372.59	-195.62	-454.99	-200.69	9.00	9.00	0.00
6,500.00	10.99	0.89	6,471.84	-184.33	-454.82	-189.40	9.00	9.00	0.00
6,600.00	19.99	0.89	6,568.12	-157.66	-454.40	-162.73	9.00	9.00	0.00
6,700.00	28.99	0.89	6,659.03	-116.27	-453.76	-121.33	9.00	9.00	0.00
6,800.00	37.99	0.89	6,742.34	-61.16	-452.90	-66.21	9.00	9.00	0.00
6,900.00	46.99	0.89	6,816.01	6.31	-451.85	1.26	9.00	9.00	0.00
6,934.73	50.11	0.89	6,839.00	32.33	-451.44	27.29	9.00	9.00	0.00
<b>Sharon Springs</b>									
7,000.00	55.99	0.89	6,878.22	84.46	-450.63	79.43	9.00	9.00	0.00
7,023.50	58.10	0.89	6,891.00	104.18	-450.33	99.14	9.00	9.00	0.00
<b>Niobrara</b>									
7,100.00	64.99	0.89	6,927.43	171.39	-449.28	166.36	9.00	9.00	0.00
7,187.93	72.90	0.89	6,959.00	253.37	-448.00	248.35	9.00	9.00	0.00
<b>Nio B</b>									
7,200.00	73.99	0.89	6,962.44	264.94	-447.82	259.92	9.00	9.00	0.00
7,300.00	82.99	0.89	6,982.38	362.81	-446.30	357.81	9.00	9.00	0.00
7,376.88	89.91	0.89	6,987.14	439.49	-445.10	434.49	9.00	9.00	0.00
<b>Top of Production - SWARTZ 1N-12HZ_PHL</b>									
7,400.00	89.91	0.89	6,987.18	462.61	-444.74	457.61	0.00	0.00	0.00
7,500.00	89.91	0.89	6,987.35	562.59	-443.19	557.61	0.00	0.00	0.00
7,600.00	89.91	0.89	6,987.51	662.58	-441.63	657.61	0.00	0.00	0.00
7,700.00	89.91	0.89	6,987.68	762.57	-440.07	757.61	0.00	0.00	0.00
7,800.00	89.91	0.89	6,987.84	862.56	-438.52	857.61	0.00	0.00	0.00
7,900.00	89.91	0.89	6,988.01	962.55	-436.96	957.61	0.00	0.00	0.00
8,000.00	89.91	0.89	6,988.18	1,062.53	-435.40	1,057.60	0.00	0.00	0.00
8,100.00	89.91	0.89	6,988.34	1,162.52	-433.84	1,157.60	0.00	0.00	0.00
8,200.00	89.91	0.89	6,988.51	1,262.51	-432.29	1,257.60	0.00	0.00	0.00
8,300.00	89.91	0.89	6,988.67	1,362.50	-430.73	1,357.60	0.00	0.00	0.00
8,400.00	89.91	0.89	6,988.84	1,462.48	-429.17	1,457.60	0.00	0.00	0.00
8,500.00	89.91	0.89	6,989.01	1,562.47	-427.62	1,557.60	0.00	0.00	0.00

# Corporate Planning Report

Database: PLANNING  
Company: US ROCKIES WATTENBERG PLANNING  
Project: WELD-NAD83-UTMFT13N  
Site: 2N-65W-13 Swartz 16-13HZ Pad  
Well: SWARTZ 1N-12HZ  
Wellbore: Plan B  
Design: Permit Rev-1

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:

Well SWARTZ 1N-12HZ  
RKB = 17' @ 4973.00usft (D Rig)  
RKB = 17' @ 4973.00usft (D Rig)  
True  
Minimum Curvature

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)
8,600.00	89.91	0.89	6,989.17	1,662.46	-426.06	1,657.60	0.00	0.00	0.00
8,700.00	89.91	0.89	6,989.34	1,762.45	-424.50	1,757.60	0.00	0.00	0.00
8,800.00	89.91	0.89	6,989.50	1,862.44	-422.94	1,857.60	0.00	0.00	0.00
8,900.00	89.91	0.89	6,989.67	1,962.42	-421.39	1,957.59	0.00	0.00	0.00
9,000.00	89.91	0.89	6,989.83	2,062.41	-419.83	2,057.59	0.00	0.00	0.00
9,100.00	89.91	0.89	6,990.00	2,162.40	-418.27	2,157.59	0.00	0.00	0.00
9,200.00	89.91	0.89	6,990.17	2,262.39	-416.72	2,257.59	0.00	0.00	0.00
9,300.00	89.91	0.89	6,990.33	2,362.37	-415.16	2,357.59	0.00	0.00	0.00
9,400.00	89.91	0.89	6,990.50	2,462.36	-413.60	2,457.59	0.00	0.00	0.00
9,500.00	89.91	0.89	6,990.66	2,562.35	-412.04	2,557.59	0.00	0.00	0.00
9,600.00	89.91	0.89	6,990.83	2,662.34	-410.49	2,657.59	0.00	0.00	0.00
9,700.00	89.91	0.89	6,990.99	2,762.33	-408.93	2,757.59	0.00	0.00	0.00
9,800.00	89.91	0.89	6,991.16	2,862.31	-407.37	2,857.58	0.00	0.00	0.00
9,900.00	89.91	0.89	6,991.33	2,962.30	-405.82	2,957.58	0.00	0.00	0.00
10,000.00	89.91	0.89	6,991.49	3,062.29	-404.26	3,057.58	0.00	0.00	0.00
10,100.00	89.91	0.89	6,991.66	3,162.28	-402.70	3,157.58	0.00	0.00	0.00
10,200.00	89.91	0.89	6,991.82	3,262.26	-401.14	3,257.58	0.00	0.00	0.00
10,300.00	89.91	0.89	6,991.99	3,362.25	-399.59	3,357.58	0.00	0.00	0.00
10,400.00	89.91	0.89	6,992.16	3,462.24	-398.03	3,457.58	0.00	0.00	0.00
10,500.00	89.91	0.89	6,992.32	3,562.23	-396.47	3,557.58	0.00	0.00	0.00
10,600.00	89.91	0.89	6,992.49	3,662.21	-394.92	3,657.58	0.00	0.00	0.00
10,700.00	89.91	0.89	6,992.65	3,762.20	-393.36	3,757.57	0.00	0.00	0.00
10,800.00	89.91	0.89	6,992.82	3,862.19	-391.80	3,857.57	0.00	0.00	0.00
10,900.00	89.91	0.89	6,992.98	3,962.18	-390.24	3,957.57	0.00	0.00	0.00
11,000.00	89.91	0.89	6,993.15	4,062.17	-388.69	4,057.57	0.00	0.00	0.00
11,100.00	89.91	0.89	6,993.32	4,162.15	-387.13	4,157.57	0.00	0.00	0.00
11,200.00	89.91	0.89	6,993.48	4,262.14	-385.57	4,257.57	0.00	0.00	0.00
11,300.00	89.91	0.89	6,993.65	4,362.13	-384.02	4,357.57	0.00	0.00	0.00
11,400.00	89.91	0.89	6,993.81	4,462.12	-382.46	4,457.57	0.00	0.00	0.00
11,500.00	89.91	0.89	6,993.98	4,562.10	-380.90	4,557.57	0.00	0.00	0.00
11,600.00	89.91	0.89	6,994.15	4,662.09	-379.34	4,657.56	0.00	0.00	0.00
11,700.00	89.91	0.89	6,994.31	4,762.08	-377.79	4,757.56	0.00	0.00	0.00
11,800.00	89.91	0.89	6,994.48	4,862.07	-376.23	4,857.56	0.00	0.00	0.00
11,900.00	89.91	0.89	6,994.64	4,962.06	-374.67	4,957.56	0.00	0.00	0.00
12,000.00	89.91	0.89	6,994.81	5,062.04	-373.12	5,057.56	0.00	0.00	0.00
12,100.00	89.91	0.89	6,994.97	5,162.03	-371.56	5,157.56	0.00	0.00	0.00
12,200.00	89.91	0.89	6,995.14	5,262.02	-370.00	5,257.56	0.00	0.00	0.00
12,200.14	89.91	0.89	6,995.14	5,262.16	-370.00	5,257.70	0.00	0.00	0.00
SWARTZ 1N-12HZ_PITL1									
12,300.00	89.91	1.03	6,995.31	5,362.00	-368.32	5,357.56	0.14	0.00	0.14
12,400.00	89.91	1.18	6,995.47	5,461.99	-366.39	5,457.55	0.14	0.00	0.14
12,500.00	89.91	1.32	6,995.64	5,561.96	-364.21	5,557.55	0.14	0.00	0.14
12,600.00	89.91	1.46	6,995.80	5,661.93	-361.79	5,657.54	0.14	0.00	0.14
12,700.00	89.91	1.60	6,995.97	5,761.90	-359.11	5,757.53	0.14	0.00	0.14
12,800.00	89.91	1.75	6,996.13	5,861.85	-356.19	5,857.51	0.14	0.00	0.14
12,900.00	89.91	1.89	6,996.30	5,961.80	-353.01	5,957.49	0.14	0.00	0.14
13,000.00	89.91	2.03	6,996.47	6,061.74	-349.59	6,057.46	0.14	0.00	0.14
13,100.00	89.91	2.17	6,996.63	6,161.68	-345.92	6,157.43	0.14	0.00	0.14
13,200.00	89.91	2.32	6,996.80	6,261.60	-342.00	6,257.39	0.14	0.00	0.14
13,300.00	89.91	2.46	6,996.96	6,361.51	-337.83	6,357.34	0.14	0.00	0.14
13,400.00	89.91	2.60	6,997.13	6,461.41	-333.42	6,457.29	0.14	0.00	0.14
13,500.00	89.91	2.74	6,997.29	6,561.31	-328.75	6,557.22	0.14	0.00	0.14
13,600.00	89.91	2.89	6,997.46	6,661.18	-323.84	6,657.15	0.14	0.00	0.14

# Corporate Planning Report

**Database:** PLANNING  
**Company:** US ROCKIES WATTENBERG PLANNING  
**Project:** WELD-NAD83-UTMFT13N  
**Site:** 2N-65W-13 Swartz 16-13HZ Pad  
**Well:** SWARTZ 1N-12HZ  
**Wellbore:** Plan B  
**Design:** Permit Rev-1

**Local Co-ordinate Reference:**  
**TVD Reference:**  
**MD Reference:**  
**North Reference:**  
**Survey Calculation Method:**

Well SWARTZ 1N-12HZ  
 RKB = 17' @ 4973.00usft (D Rig)  
 RKB = 17' @ 4973.00usft (D Rig)  
 True  
 Minimum Curvature

## 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)
13,700.00	89.91	3.03	6,997.63	6,761.05	-318.68	6,757.07	0.14	0.00	0.14
13,800.00	89.91	3.17	6,997.79	6,860.90	-313.27	6,856.98	0.14	0.00	0.14
13,900.00	89.91	3.31	6,997.96	6,960.74	-307.61	6,956.87	0.14	0.00	0.14
14,000.00	89.91	3.46	6,998.12	7,060.57	-301.71	7,056.76	0.14	0.00	0.14
14,100.00	89.91	3.60	6,998.29	7,160.38	-295.55	7,156.63	0.14	0.00	0.14
14,200.00	89.91	3.74	6,998.45	7,260.17	-289.15	7,256.49	0.14	0.00	0.14
14,300.00	89.91	3.88	6,998.62	7,359.95	-282.50	7,356.34	0.14	0.00	0.14
14,384.68	89.91	4.01	6,998.76	7,444.43	-276.67	7,440.87	0.14	0.00	0.14
14,400.00	89.91	3.98	6,998.79	7,459.71	-275.60	7,456.17	0.14	0.00	-0.14
14,500.00	89.91	3.84	6,998.95	7,559.48	-268.78	7,556.01	0.14	0.00	-0.14
14,600.00	89.91	3.70	6,999.12	7,659.27	-262.21	7,655.86	0.14	0.00	-0.14
14,700.00	89.91	3.56	6,999.28	7,759.06	-255.88	7,755.72	0.14	0.00	-0.14
14,800.00	89.91	3.41	6,999.45	7,858.88	-249.80	7,855.60	0.14	0.00	-0.14
14,900.00	89.91	3.27	6,999.61	7,958.71	-243.97	7,955.49	0.14	0.00	-0.14
15,000.00	89.91	3.13	6,999.78	8,058.55	-238.39	8,055.39	0.14	0.00	-0.14
15,100.00	89.91	2.99	6,999.94	8,158.41	-233.06	8,155.30	0.14	0.00	-0.14
15,200.00	89.91	2.84	7,000.11	8,258.28	-227.97	8,255.22	0.14	0.00	-0.14
15,300.00	89.91	2.70	7,000.28	8,358.16	-223.13	8,355.15	0.14	0.00	-0.14
15,400.00	89.91	2.56	7,000.44	8,458.06	-218.55	8,455.09	0.14	0.00	-0.14
15,500.00	89.91	2.42	7,000.61	8,557.96	-214.21	8,555.04	0.14	0.00	-0.14
15,600.00	89.91	2.27	7,000.77	8,657.88	-210.11	8,654.99	0.14	0.00	-0.14
15,700.00	89.91	2.13	7,000.94	8,757.81	-206.27	8,754.96	0.14	0.00	-0.14
15,800.00	89.91	1.99	7,001.10	8,857.74	-202.68	8,854.93	0.14	0.00	-0.14
15,900.00	89.91	1.85	7,001.27	8,957.69	-199.33	8,954.90	0.14	0.00	-0.14
16,000.00	89.91	1.70	7,001.44	9,057.64	-196.24	9,054.88	0.14	0.00	-0.14
16,100.00	89.91	1.56	7,001.60	9,157.60	-193.39	9,154.87	0.14	0.00	-0.14
16,200.00	89.90	1.42	7,001.77	9,257.56	-190.79	9,254.85	0.14	0.00	-0.14
16,300.00	89.90	1.28	7,001.93	9,357.53	-188.44	9,354.85	0.14	0.00	-0.14
16,400.00	89.90	1.13	7,002.10	9,457.51	-186.33	9,454.84	0.14	0.00	-0.14
16,500.00	89.90	0.99	7,002.27	9,557.50	-184.48	9,554.84	0.14	0.00	-0.14
16,600.00	89.90	0.85	7,002.43	9,657.48	-182.88	9,654.84	0.14	0.00	-0.14
16,700.00	89.90	0.71	7,002.60	9,757.47	-181.52	9,754.84	0.14	0.00	-0.14
16,800.00	89.90	0.56	7,002.76	9,857.47	-180.41	9,854.84	0.14	0.00	-0.14
16,900.00	89.90	0.42	7,002.93	9,957.46	-179.55	9,954.84	0.14	0.00	-0.14
17,000.00	89.90	0.28	7,003.09	10,057.46	-178.94	10,054.83	0.14	0.00	-0.14
17,100.00	89.90	0.14	7,003.26	10,157.46	-178.58	10,154.83	0.14	0.00	-0.14
17,200.00	89.90	359.99	7,003.43	10,257.46	-178.47	10,254.83	0.14	0.00	-0.14
17,300.00	89.90	359.85	7,003.59	10,357.46	-178.61	10,354.82	0.14	0.00	-0.14
17,400.00	89.90	359.71	7,003.76	10,457.46	-178.99	10,454.81	0.14	0.00	-0.14
17,500.00	89.91	359.57	7,003.92	10,557.46	-179.62	10,554.79	0.14	0.00	-0.14
17,546.08	89.91	359.50	7,004.00	10,603.53	-180.00	10,600.86	0.14	0.00	-0.14
SWARTZ 1N-12HZ_PBHL									



# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well SWARTZ 1N-12HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4973.00usft (D Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4973.00usft (D Rig)
<b>Site:</b>	2N-65W-13 Swartz 16-13HZ Pad	<b>North Reference:</b>	True
<b>Well:</b>	SWARTZ 1N-12HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan B		
<b>Design:</b>	Permit Rev-1		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
SWARTZ 1N-12HZ_P - plan hits target center - Point	0.00	0.00	6,987.14	439.49	-445.10	14,575,475.24	1,750,433.93	40.133184	-104.606388
SWARTZ 1N-12HZ_P - plan hits target center - Point	0.00	0.00	6,995.14	5,262.16	-370.00	14,580,298.20	1,750,487.59	40.146427	-104.606119
SWARTZ 1N-12HZ_P - plan hits target center - Point	0.00	0.00	7,004.00	10,603.53	-180.00	14,585,640.36	1,750,653.84	40.161095	-104.605439

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,506.31	1,500.00	9 5/8"	9-5/8	13-1/2	
7,376.88	6,987.14	Top of Production	5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,377.46	1,372.00	Fox Hills Mkr				
4,081.13	4,058.00	Parkman				
4,474.70	4,449.00	Sussex				
6,934.73	6,839.00	Sharon Springs				
7,023.50	6,891.00	Niobrara				
7,187.93	6,959.00	Nio B				