

US ROCKIES WATTENBERG PLANNING

**WELD-NAD83-UTMFT13N
3N-67W-04 SWARTZ 2-4HZ PAD
SWARTZ 4-12HZ**

Plan A

Plan: Permit Rev-1

Standard Planning Report

15 December, 2021

Project: WELD-NAD83-UTMFT13N Site: 3N-67W-04 SWARTZ 2-4HZ PAD Well: SWARTZ 4-12HZ Wellbore: Plan A Design: Permit Rev-1										
SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	
3	1762.00	20.43	226.99	1733.32	-163.89	-175.69	1.50	226.99	-172.98	
4	4562.10	20.43	226.99	4357.29	-830.61	-890.41	0.00	0.00	-876.66	
5	5583.60	0.00	0.00	5357.28	-953.52	-1022.17	2.00	180.00	-1006.39	
6	6526.15	0.00	0.00	6299.83	-953.52	-1022.17	0.00	0.00	-1006.39	
7	7644.05	89.43	90.94	7016.00	-965.12	-313.16	8.00	90.94	-297.29	
8	22380.44	89.43	90.94	7162.00	-1206.10	14420.53	0.00	0.00	14438.37	
CASING DETAILS					FORMATION TOP DETAILS					
TVD	MD	Name	Size	TVDPath	MDPath		Formation			
1500.00	1515.80	9 5/8"	9-5/8	707.00	707.33		Fox Hills			
7162.00	22380.44	5.5" CSG	5-1/2	3598.00	3751.84		Parkman			
				4080.00	4266.19		Sussex			
				6841.00	7139.63		Sharon Springs			
				6871.00	7187.30		Niobrara			
				7023.00	8350.91		Nio B			
				7055.00	11580.73		Nio C			
ELEVATION										
GROUND ELEVATION: 4825.00										
RKB = 17' @ 4842ft										
FOOTAGE CALLOUTS										
SHL				LP				BHL		

SURFACE HOLE LOCATION: SWARTZ 4-12HZ						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	14621470.50	1670603.01	40.260110	-104.891800	
DESIGN TARGET DETAILS						
Name		TVD	Northing	Easting	Latitude	Longitude
SWARTZ 4-12HZ KOP		6299.83	14620515.73	1669582.00	40.257491	-104.895463
SWARTZ 4-12HZ LP		7016.00	14620505.00	1670291.02	40.257459	-104.892922
SWARTZ 4-12HZ BHL		7162.00	14620282.00	1685025.00	40.256786	-104.840113

The vertical section plot displays the well path (red line) against True Vertical Depth (4500 usft/in) on the Y-axis (0 to 9000) and Vertical Section at 90.94° (4500 usft/in) on the X-axis (-4500 to 13500). The path starts at the surface, passes through geological formations (Fox Hills, Parkman, Sussex, Sharon Springs, Niobrara, Nio B, Nio C), and ends at the TD Well @ 22380.44ft. Key well path points include: Begin Nudge @ 400.00ft, 9 5/8", Hold Tangent @ 1762.00ft, Begin Drop @ 4562.10ft, Hold Vertical @ 5583.60ft, KOP @ 6526.15ft :: DLS = 8"/100', and End Build @ 7644.05ft. A 5.5" CSG is indicated at the end of the path. A box in the upper right corner provides magnetic field information: Azimuths to True North: Magnetic North: 7.79°, Magnetic Field Strength: 51800.3nT, Dip Angle: 66.61°, Date: 11/26/2021, Model: IGRF2015.

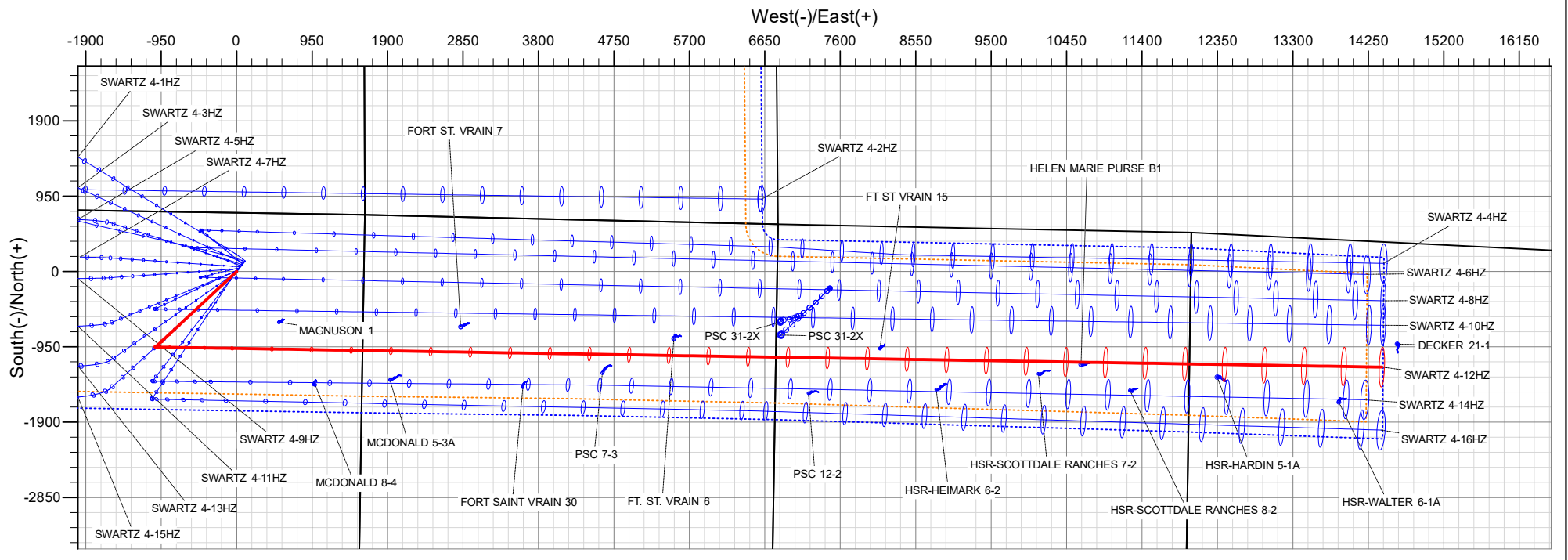
Formation <th>Approx. Depth Range (ft)</th>	Approx. Depth Range (ft)
Fox Hills	0 - 100
Parkman	100 - 200
Sussex	200 - 400
Sharon Springs	400 - 500
Niobrara	500 - 600
Nio B	600 - 700
Nio C	700 - 800

Key Well Path Points:

Point <th>Depth (ft) <th>Description</th> </th>	Depth (ft) <th>Description</th>	Description
Begin Nudge	400.00	9 5/8"
Hold Tangent	1762.00	
Begin Drop	4562.10	
Hold Vertical	5583.60	
KOP	6526.15	DLS = 8"/100'
End Build	7644.05	
TD Well	22380.44	

Magnetic Field Information:

Parameter	Value
Azimuths to True North	Magnetic North: 7.79°
Magnetic Field Strength	51800.3nT
Dip Angle	66.61°
Date	11/26/2021
Model	IGRF2015



Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well SWARTZ 4-12HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4842.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4842.00usft (RIG)
Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-12HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

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

Site		3N-67W-04 SWARTZ 2-4HZ PAD			
Site Position:		Northing:	14,621,599.90 usft	Latitude:	40.260465
From:	Map	Easting:	1,670,705.29 usft	Longitude:	-104.891433
Position Uncertainty:		0.00 usft	Slot Radius:	13-3/16 "	

Well		SWARTZ 4-12HZ				
Well Position	+N/-S	0.00 usft	Northing:	14,621,470.50 usft	Latitude:	40.260110
	+E/-W	0.00 usft	Easting:	1,670,603.01 usft	Longitude:	-104.891800
Position Uncertainty		3.28 usft	Wellhead Elevation:	usft	Ground Level:	4,825.00 usft
Grid Convergence:		0.07 °				

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF202013	11/26/2021	7.86	66.50	51,820.05846289

Design	Permit Rev-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	90.94	

Plan Survey Tool Program	Date	12/8/2021			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	2,000.00	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD	
				Fixed:v2:standard declination	
2	2,000.00	22,380.44	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+II	
				Fixed:v2:Rockies, crustal dec +	

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Wellbore:	Plan A		
Design:	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	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,762.00	20.43	226.99	1,733.32	-163.89	-175.69	1.50	1.50	0.00	226.99	
4,562.10	20.43	226.99	4,357.29	-830.61	-890.41	0.00	0.00	0.00	0.00	
5,583.60	0.00	0.00	5,357.28	-953.52	-1,022.17	2.00	-2.00	0.00	180.00	
6,526.15	0.00	0.00	6,299.83	-953.52	-1,022.17	0.00	0.00	0.00	0.00	
7,644.05	89.43	90.94	7,016.00	-965.12	-313.16	8.00	8.00	8.13	90.94	
22,380.44	89.43	90.94	7,162.00	-1,206.10	14,420.53	0.00	0.00	0.00	0.00	SWARTZ 4-12HZ_BH

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Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-12HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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
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
Begin Nudge @ 400.00ft									
500.00	1.50	226.99	499.99	-0.89	-0.96	-0.94	1.50	1.50	0.00
600.00	3.00	226.99	599.91	-3.57	-3.83	-3.77	1.50	1.50	0.00
700.00	4.50	226.99	699.69	-8.03	-8.61	-8.48	1.50	1.50	0.00
707.33	4.61	226.99	707.00	-8.43	-9.04	-8.90	1.50	1.50	0.00
Fox Hills									
800.00	6.00	226.99	799.27	-14.27	-15.30	-15.06	1.50	1.50	0.00
900.00	7.50	226.99	898.57	-22.29	-23.90	-23.53	1.50	1.50	0.00
1,000.00	9.00	226.99	997.54	-32.08	-34.39	-33.86	1.50	1.50	0.00
1,100.00	10.50	226.99	1,096.09	-43.63	-46.77	-46.05	1.50	1.50	0.00
1,200.00	12.00	226.99	1,194.16	-56.94	-61.04	-60.09	1.50	1.50	0.00
1,300.00	13.50	226.99	1,291.70	-71.99	-77.17	-75.98	1.50	1.50	0.00
1,400.00	15.00	226.99	1,388.62	-88.78	-95.17	-93.70	1.50	1.50	0.00
1,500.00	16.50	226.99	1,484.86	-107.30	-115.02	-113.25	1.50	1.50	0.00
1,515.80	16.74	226.99	1,500.00	-110.38	-118.33	-116.50	1.50	1.50	0.00
9 5/8"									
1,600.00	18.00	226.99	1,580.36	-127.52	-136.70	-134.59	1.50	1.50	0.00
1,700.00	19.50	226.99	1,675.05	-149.45	-160.21	-157.74	1.50	1.50	0.00
1,762.00	20.43	226.99	1,733.32	-163.89	-175.69	-172.98	1.50	1.50	0.00
Hold Tangent @ 1762.00ft									
1,800.00	20.43	226.99	1,768.93	-172.94	-185.39	-182.53	0.00	0.00	0.00
1,900.00	20.43	226.99	1,862.64	-196.75	-210.91	-207.66	0.00	0.00	0.00
2,000.00	20.43	226.99	1,956.35	-220.56	-236.44	-232.79	0.00	0.00	0.00
2,100.00	20.43	226.99	2,050.06	-244.37	-261.96	-257.92	0.00	0.00	0.00
2,200.00	20.43	226.99	2,143.77	-268.18	-287.49	-283.05	0.00	0.00	0.00
2,300.00	20.43	226.99	2,237.48	-291.99	-313.01	-308.18	0.00	0.00	0.00
2,400.00	20.43	226.99	2,331.19	-315.80	-338.54	-333.31	0.00	0.00	0.00
2,500.00	20.43	226.99	2,424.90	-339.61	-364.06	-358.44	0.00	0.00	0.00
2,600.00	20.43	226.99	2,518.61	-363.42	-389.59	-383.57	0.00	0.00	0.00
2,700.00	20.43	226.99	2,612.32	-387.23	-415.11	-408.70	0.00	0.00	0.00
2,800.00	20.43	226.99	2,706.03	-411.04	-440.63	-433.83	0.00	0.00	0.00
2,900.00	20.43	226.99	2,799.74	-434.85	-466.16	-458.96	0.00	0.00	0.00
3,000.00	20.43	226.99	2,893.45	-458.66	-491.68	-484.09	0.00	0.00	0.00
3,100.00	20.43	226.99	2,987.16	-482.47	-517.21	-509.22	0.00	0.00	0.00
3,200.00	20.43	226.99	3,080.87	-506.28	-542.73	-534.35	0.00	0.00	0.00
3,300.00	20.43	226.99	3,174.58	-530.09	-568.26	-559.49	0.00	0.00	0.00
3,400.00	20.43	226.99	3,268.29	-553.91	-593.78	-584.62	0.00	0.00	0.00
3,500.00	20.43	226.99	3,362.00	-577.72	-619.31	-609.75	0.00	0.00	0.00
3,600.00	20.43	226.99	3,455.71	-601.53	-644.83	-634.88	0.00	0.00	0.00
3,700.00	20.43	226.99	3,549.42	-625.34	-670.36	-660.01	0.00	0.00	0.00
3,751.84	20.43	226.99	3,598.00	-637.68	-683.59	-673.04	0.00	0.00	0.00
Parkman									
3,800.00	20.43	226.99	3,643.13	-649.15	-695.88	-685.14	0.00	0.00	0.00
3,900.00	20.43	226.99	3,736.84	-672.96	-721.41	-710.27	0.00	0.00	0.00
4,000.00	20.43	226.99	3,830.55	-696.77	-746.93	-735.40	0.00	0.00	0.00
4,100.00	20.43	226.99	3,924.26	-720.58	-772.46	-760.53	0.00	0.00	0.00
4,200.00	20.43	226.99	4,017.97	-744.39	-797.98	-785.66	0.00	0.00	0.00
4,266.19	20.43	226.99	4,080.00	-760.15	-814.88	-802.30	0.00	0.00	0.00

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Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4842.00usft (RIG)
Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-12HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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)
Sussex									
4,300.00	20.43	226.99	4,111.68	-768.20	-823.50	-810.79	0.00	0.00	0.00
4,400.00	20.43	226.99	4,205.39	-792.01	-849.03	-835.92	0.00	0.00	0.00
4,500.00	20.43	226.99	4,299.10	-815.82	-874.55	-861.05	0.00	0.00	0.00
4,562.10	20.43	226.99	4,357.29	-830.61	-890.41	-876.66	0.00	0.00	0.00
Begin Drop @ 4562.10ft									
4,600.00	19.67	226.99	4,392.90	-839.47	-899.91	-886.01	2.00	-2.00	0.00
4,700.00	17.67	226.99	4,487.63	-861.31	-923.32	-909.06	2.00	-2.00	0.00
4,800.00	15.67	226.99	4,583.42	-880.88	-944.29	-929.72	2.00	-2.00	0.00
4,900.00	13.67	226.99	4,680.15	-898.15	-962.81	-947.95	2.00	-2.00	0.00
5,000.00	11.67	226.99	4,777.71	-913.12	-978.85	-963.74	2.00	-2.00	0.00
5,100.00	9.67	226.99	4,875.98	-925.75	-992.39	-977.07	2.00	-2.00	0.00
5,200.00	7.67	226.99	4,974.83	-936.03	-1,003.42	-987.93	2.00	-2.00	0.00
5,300.00	5.67	226.99	5,074.15	-943.96	-1,011.92	-996.29	2.00	-2.00	0.00
5,400.00	3.67	226.99	5,173.81	-949.51	-1,017.87	-1,002.16	2.00	-2.00	0.00
5,500.00	1.67	226.99	5,273.70	-952.69	-1,021.28	-1,005.51	2.00	-2.00	0.00
5,583.60	0.00	0.00	5,357.28	-953.52	-1,022.17	-1,006.39	2.00	-2.00	0.00
Hold Vertical @ 5583.60ft									
5,600.00	0.00	0.00	5,373.68	-953.52	-1,022.17	-1,006.39	0.00	0.00	0.00
5,700.00	0.00	0.00	5,473.68	-953.52	-1,022.17	-1,006.39	0.00	0.00	0.00
5,800.00	0.00	0.00	5,573.68	-953.52	-1,022.17	-1,006.39	0.00	0.00	0.00
5,900.00	0.00	0.00	5,673.68	-953.52	-1,022.17	-1,006.39	0.00	0.00	0.00
6,000.00	0.00	0.00	5,773.68	-953.52	-1,022.17	-1,006.39	0.00	0.00	0.00
6,100.00	0.00	0.00	5,873.68	-953.52	-1,022.17	-1,006.39	0.00	0.00	0.00
6,200.00	0.00	0.00	5,973.68	-953.52	-1,022.17	-1,006.39	0.00	0.00	0.00
6,300.00	0.00	0.00	6,073.68	-953.52	-1,022.17	-1,006.39	0.00	0.00	0.00
6,400.00	0.00	0.00	6,173.68	-953.52	-1,022.17	-1,006.39	0.00	0.00	0.00
6,500.00	0.00	0.00	6,273.68	-953.52	-1,022.17	-1,006.39	0.00	0.00	0.00
6,526.15	0.00	0.00	6,299.83	-953.52	-1,022.17	-1,006.39	0.00	0.00	0.00
KOP @ 6526.15ft :: DLS = 8°/100'									
6,550.00	1.91	90.94	6,323.68	-953.53	-1,021.77	-1,005.99	8.00	8.00	0.00
6,600.00	5.91	90.94	6,373.55	-953.59	-1,018.37	-1,002.59	8.00	8.00	0.00
6,650.00	9.91	90.94	6,423.07	-953.70	-1,011.49	-995.71	8.00	8.00	0.00
6,700.00	13.91	90.94	6,471.98	-953.87	-1,001.18	-985.39	8.00	8.00	0.00
6,750.00	17.91	90.94	6,520.06	-954.09	-987.48	-971.69	8.00	8.00	0.00
6,800.00	21.91	90.94	6,567.06	-954.37	-970.46	-954.67	8.00	8.00	0.00
6,850.00	25.91	90.94	6,612.76	-954.70	-950.20	-934.41	8.00	8.00	0.00
6,900.00	29.91	90.94	6,656.94	-955.08	-926.81	-911.01	8.00	8.00	0.00
6,950.00	33.91	90.94	6,699.37	-955.52	-900.39	-884.59	8.00	8.00	0.00
7,000.00	37.91	90.94	6,739.86	-956.00	-871.07	-855.27	8.00	8.00	0.00
7,050.00	41.91	90.94	6,778.21	-956.52	-839.01	-823.20	8.00	8.00	0.00
7,100.00	45.91	90.94	6,814.22	-957.09	-804.34	-788.53	8.00	8.00	0.00
7,139.63	49.08	90.94	6,841.00	-957.56	-775.13	-759.32	8.00	8.00	0.00
Sharon Springs									
7,150.00	49.91	90.94	6,847.73	-957.69	-767.25	-751.44	8.00	8.00	0.00
7,187.30	52.89	90.94	6,871.00	-958.17	-738.11	-722.29	8.00	8.00	0.00
Niobrara									
7,200.00	53.91	90.94	6,878.57	-958.34	-727.91	-712.09	8.00	8.00	0.00
7,250.00	57.91	90.94	6,906.59	-959.01	-686.52	-670.70	8.00	8.00	0.00
7,300.00	61.91	90.94	6,931.66	-959.72	-643.27	-627.44	8.00	8.00	0.00
7,350.00	65.91	90.94	6,953.64	-960.46	-598.38	-582.55	8.00	8.00	0.00
7,400.00	69.91	90.94	6,972.45	-961.21	-552.07	-536.23	8.00	8.00	0.00
7,450.00	73.91	90.94	6,987.97	-961.99	-504.56	-488.71	8.00	8.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well SWARTZ 4-12HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4842.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4842.00usft (RIG)
Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-12HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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)
7,500.00	77.91	90.94	7,000.14	-962.78	-456.08	-440.22	8.00	8.00	0.00
7,550.00	81.91	90.94	7,008.90	-963.59	-406.87	-391.01	8.00	8.00	0.00
7,600.00	85.91	90.94	7,014.21	-964.40	-357.17	-341.30	8.00	8.00	0.00
7,644.05	89.43	90.94	7,016.00	-965.12	-313.16	-297.29	8.00	8.00	0.00
End Build @ 7644.05ft									
7,700.00	89.43	90.94	7,016.55	-966.04	-257.23	-241.35	0.00	0.00	0.00
7,800.00	89.43	90.94	7,017.54	-967.67	-157.25	-141.35	0.00	0.00	0.00
7,900.00	89.43	90.94	7,018.53	-969.31	-57.27	-41.36	0.00	0.00	0.00
8,000.00	89.43	90.94	7,019.52	-970.94	42.72	58.64	0.00	0.00	0.00
8,100.00	89.43	90.94	7,020.51	-972.58	142.70	158.63	0.00	0.00	0.00
8,200.00	89.43	90.94	7,021.50	-974.21	242.68	258.63	0.00	0.00	0.00
8,300.00	89.43	90.94	7,022.50	-975.85	342.66	358.62	0.00	0.00	0.00
8,350.91	89.43	90.94	7,023.00	-976.68	393.57	409.54	0.00	0.00	0.00
Nio B									
8,400.00	89.43	90.94	7,023.49	-977.48	442.64	458.62	0.00	0.00	0.00
8,500.00	89.43	90.94	7,024.48	-979.12	542.62	558.61	0.00	0.00	0.00
8,600.00	89.43	90.94	7,025.47	-980.75	642.61	658.61	0.00	0.00	0.00
8,700.00	89.43	90.94	7,026.46	-982.39	742.59	758.60	0.00	0.00	0.00
8,800.00	89.43	90.94	7,027.45	-984.02	842.57	858.60	0.00	0.00	0.00
8,900.00	89.43	90.94	7,028.44	-985.66	942.55	958.59	0.00	0.00	0.00
9,000.00	89.43	90.94	7,029.43	-987.29	1,042.53	1,058.59	0.00	0.00	0.00
9,100.00	89.43	90.94	7,030.42	-988.93	1,142.52	1,158.58	0.00	0.00	0.00
9,200.00	89.43	90.94	7,031.41	-990.56	1,242.50	1,258.58	0.00	0.00	0.00
9,300.00	89.43	90.94	7,032.40	-992.20	1,342.48	1,358.58	0.00	0.00	0.00
9,400.00	89.43	90.94	7,033.39	-993.83	1,442.46	1,458.57	0.00	0.00	0.00
9,500.00	89.43	90.94	7,034.38	-995.47	1,542.44	1,558.57	0.00	0.00	0.00
9,600.00	89.43	90.94	7,035.38	-997.11	1,642.42	1,658.56	0.00	0.00	0.00
9,700.00	89.43	90.94	7,036.37	-998.74	1,742.41	1,758.56	0.00	0.00	0.00
9,800.00	89.43	90.94	7,037.36	-1,000.38	1,842.39	1,858.55	0.00	0.00	0.00
9,900.00	89.43	90.94	7,038.35	-1,002.01	1,942.37	1,958.55	0.00	0.00	0.00
10,000.00	89.43	90.94	7,039.34	-1,003.65	2,042.35	2,058.54	0.00	0.00	0.00
10,100.00	89.43	90.94	7,040.33	-1,005.28	2,142.33	2,158.54	0.00	0.00	0.00
10,200.00	89.43	90.94	7,041.32	-1,006.92	2,242.31	2,258.53	0.00	0.00	0.00
10,300.00	89.43	90.94	7,042.31	-1,008.55	2,342.30	2,358.53	0.00	0.00	0.00
10,400.00	89.43	90.94	7,043.30	-1,010.19	2,442.28	2,458.52	0.00	0.00	0.00
10,500.00	89.43	90.94	7,044.29	-1,011.82	2,542.26	2,558.52	0.00	0.00	0.00
10,600.00	89.43	90.94	7,045.28	-1,013.46	2,642.24	2,658.51	0.00	0.00	0.00
10,700.00	89.43	90.94	7,046.27	-1,015.09	2,742.22	2,758.51	0.00	0.00	0.00
10,800.00	89.43	90.94	7,047.26	-1,016.73	2,842.20	2,858.50	0.00	0.00	0.00
10,900.00	89.43	90.94	7,048.26	-1,018.36	2,942.19	2,958.50	0.00	0.00	0.00
11,000.00	89.43	90.94	7,049.25	-1,020.00	3,042.17	3,058.49	0.00	0.00	0.00
11,100.00	89.43	90.94	7,050.24	-1,021.63	3,142.15	3,158.49	0.00	0.00	0.00
11,200.00	89.43	90.94	7,051.23	-1,023.27	3,242.13	3,258.48	0.00	0.00	0.00
11,300.00	89.43	90.94	7,052.22	-1,024.91	3,342.11	3,358.48	0.00	0.00	0.00
11,400.00	89.43	90.94	7,053.21	-1,026.54	3,442.09	3,458.47	0.00	0.00	0.00
11,500.00	89.43	90.94	7,054.20	-1,028.18	3,542.08	3,558.47	0.00	0.00	0.00
11,580.73	89.43	90.94	7,055.00	-1,029.50	3,622.79	3,639.20	0.00	0.00	0.00
Nio C									
11,600.00	89.43	90.94	7,055.19	-1,029.81	3,642.06	3,658.46	0.00	0.00	0.00
11,700.00	89.43	90.94	7,056.18	-1,031.45	3,742.04	3,758.46	0.00	0.00	0.00
11,800.00	89.43	90.94	7,057.17	-1,033.08	3,842.02	3,858.45	0.00	0.00	0.00
11,900.00	89.43	90.94	7,058.16	-1,034.72	3,942.00	3,958.45	0.00	0.00	0.00
12,000.00	89.43	90.94	7,059.15	-1,036.35	4,041.98	4,058.44	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well SWARTZ 4-12HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4842.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4842.00usft (RIG)
Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-12HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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)
12,100.00	89.43	90.94	7,060.14	-1,037.99	4,141.97	4,158.44	0.00	0.00	0.00
12,200.00	89.43	90.94	7,061.14	-1,039.62	4,241.95	4,258.43	0.00	0.00	0.00
12,300.00	89.43	90.94	7,062.13	-1,041.26	4,341.93	4,358.43	0.00	0.00	0.00
12,400.00	89.43	90.94	7,063.12	-1,042.89	4,441.91	4,458.42	0.00	0.00	0.00
12,500.00	89.43	90.94	7,064.11	-1,044.53	4,541.89	4,558.42	0.00	0.00	0.00
12,600.00	89.43	90.94	7,065.10	-1,046.16	4,641.88	4,658.41	0.00	0.00	0.00
12,700.00	89.43	90.94	7,066.09	-1,047.80	4,741.86	4,758.41	0.00	0.00	0.00
12,800.00	89.43	90.94	7,067.08	-1,049.43	4,841.84	4,858.40	0.00	0.00	0.00
12,900.00	89.43	90.94	7,068.07	-1,051.07	4,941.82	4,958.40	0.00	0.00	0.00
13,000.00	89.43	90.94	7,069.06	-1,052.70	5,041.80	5,058.39	0.00	0.00	0.00
13,100.00	89.43	90.94	7,070.05	-1,054.34	5,141.78	5,158.39	0.00	0.00	0.00
13,200.00	89.43	90.94	7,071.04	-1,055.98	5,241.77	5,258.38	0.00	0.00	0.00
13,300.00	89.43	90.94	7,072.03	-1,057.61	5,341.75	5,358.38	0.00	0.00	0.00
13,400.00	89.43	90.94	7,073.02	-1,059.25	5,441.73	5,458.37	0.00	0.00	0.00
13,500.00	89.43	90.94	7,074.02	-1,060.88	5,541.71	5,558.37	0.00	0.00	0.00
13,600.00	89.43	90.94	7,075.01	-1,062.52	5,641.69	5,658.36	0.00	0.00	0.00
13,700.00	89.43	90.94	7,076.00	-1,064.15	5,741.67	5,758.36	0.00	0.00	0.00
13,800.00	89.43	90.94	7,076.99	-1,065.79	5,841.66	5,858.35	0.00	0.00	0.00
13,900.00	89.43	90.94	7,077.98	-1,067.42	5,941.64	5,958.35	0.00	0.00	0.00
14,000.00	89.43	90.94	7,078.97	-1,069.06	6,041.62	6,058.34	0.00	0.00	0.00
14,100.00	89.43	90.94	7,079.96	-1,070.69	6,141.60	6,158.34	0.00	0.00	0.00
14,200.00	89.43	90.94	7,080.95	-1,072.33	6,241.58	6,258.33	0.00	0.00	0.00
14,300.00	89.43	90.94	7,081.94	-1,073.96	6,341.56	6,358.33	0.00	0.00	0.00
14,400.00	89.43	90.94	7,082.93	-1,075.60	6,441.55	6,458.32	0.00	0.00	0.00
14,500.00	89.43	90.94	7,083.92	-1,077.23	6,541.53	6,558.32	0.00	0.00	0.00
14,600.00	89.43	90.94	7,084.91	-1,078.87	6,641.51	6,658.32	0.00	0.00	0.00
14,700.00	89.43	90.94	7,085.90	-1,080.50	6,741.49	6,758.31	0.00	0.00	0.00
14,800.00	89.43	90.94	7,086.90	-1,082.14	6,841.47	6,858.31	0.00	0.00	0.00
14,900.00	89.43	90.94	7,087.89	-1,083.78	6,941.45	6,958.30	0.00	0.00	0.00
15,000.00	89.43	90.94	7,088.88	-1,085.41	7,041.44	7,058.30	0.00	0.00	0.00
15,100.00	89.43	90.94	7,089.87	-1,087.05	7,141.42	7,158.29	0.00	0.00	0.00
15,200.00	89.43	90.94	7,090.86	-1,088.68	7,241.40	7,258.29	0.00	0.00	0.00
15,300.00	89.43	90.94	7,091.85	-1,090.32	7,341.38	7,358.28	0.00	0.00	0.00
15,400.00	89.43	90.94	7,092.84	-1,091.95	7,441.36	7,458.28	0.00	0.00	0.00
15,500.00	89.43	90.94	7,093.83	-1,093.59	7,541.35	7,558.27	0.00	0.00	0.00
15,600.00	89.43	90.94	7,094.82	-1,095.22	7,641.33	7,658.27	0.00	0.00	0.00
15,700.00	89.43	90.94	7,095.81	-1,096.86	7,741.31	7,758.26	0.00	0.00	0.00
15,800.00	89.43	90.94	7,096.80	-1,098.49	7,841.29	7,858.26	0.00	0.00	0.00
15,900.00	89.43	90.94	7,097.79	-1,100.13	7,941.27	7,958.25	0.00	0.00	0.00
16,000.00	89.43	90.94	7,098.78	-1,101.76	8,041.25	8,058.25	0.00	0.00	0.00
16,100.00	89.43	90.94	7,099.78	-1,103.40	8,141.24	8,158.24	0.00	0.00	0.00
16,200.00	89.43	90.94	7,100.77	-1,105.03	8,241.22	8,258.24	0.00	0.00	0.00
16,300.00	89.43	90.94	7,101.76	-1,106.67	8,341.20	8,358.23	0.00	0.00	0.00
16,400.00	89.43	90.94	7,102.75	-1,108.30	8,441.18	8,458.23	0.00	0.00	0.00
16,500.00	89.43	90.94	7,103.74	-1,109.94	8,541.16	8,558.22	0.00	0.00	0.00
16,600.00	89.43	90.94	7,104.73	-1,111.57	8,641.14	8,658.22	0.00	0.00	0.00
16,700.00	89.43	90.94	7,105.72	-1,113.21	8,741.13	8,758.21	0.00	0.00	0.00
16,800.00	89.43	90.94	7,106.71	-1,114.85	8,841.11	8,858.21	0.00	0.00	0.00
16,900.00	89.43	90.94	7,107.70	-1,116.48	8,941.09	8,958.20	0.00	0.00	0.00
17,000.00	89.43	90.94	7,108.69	-1,118.12	9,041.07	9,058.20	0.00	0.00	0.00
17,100.00	89.43	90.94	7,109.68	-1,119.75	9,141.05	9,158.19	0.00	0.00	0.00
17,200.00	89.43	90.94	7,110.67	-1,121.39	9,241.03	9,258.19	0.00	0.00	0.00
17,300.00	89.43	90.94	7,111.66	-1,123.02	9,341.02	9,358.18	0.00	0.00	0.00
17,400.00	89.43	90.94	7,112.66	-1,124.66	9,441.00	9,458.18	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well SWARTZ 4-12HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4842.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4842.00usft (RIG)
Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-12HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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)
17,500.00	89.43	90.94	7,113.65	-1,126.29	9,540.98	9,558.17	0.00	0.00	0.00
17,600.00	89.43	90.94	7,114.64	-1,127.93	9,640.96	9,658.17	0.00	0.00	0.00
17,700.00	89.43	90.94	7,115.63	-1,129.56	9,740.94	9,758.16	0.00	0.00	0.00
17,800.00	89.43	90.94	7,116.62	-1,131.20	9,840.92	9,858.16	0.00	0.00	0.00
17,900.00	89.43	90.94	7,117.61	-1,132.83	9,940.91	9,958.15	0.00	0.00	0.00
18,000.00	89.43	90.94	7,118.60	-1,134.47	10,040.89	10,058.15	0.00	0.00	0.00
18,100.00	89.43	90.94	7,119.59	-1,136.10	10,140.87	10,158.14	0.00	0.00	0.00
18,200.00	89.43	90.94	7,120.58	-1,137.74	10,240.85	10,258.14	0.00	0.00	0.00
18,300.00	89.43	90.94	7,121.57	-1,139.37	10,340.83	10,358.13	0.00	0.00	0.00
18,400.00	89.43	90.94	7,122.56	-1,141.01	10,440.82	10,458.13	0.00	0.00	0.00
18,500.00	89.43	90.94	7,123.55	-1,142.65	10,540.80	10,558.12	0.00	0.00	0.00
18,600.00	89.43	90.94	7,124.54	-1,144.28	10,640.78	10,658.12	0.00	0.00	0.00
18,700.00	89.43	90.94	7,125.54	-1,145.92	10,740.76	10,758.11	0.00	0.00	0.00
18,800.00	89.43	90.94	7,126.53	-1,147.55	10,840.74	10,858.11	0.00	0.00	0.00
18,900.00	89.43	90.94	7,127.52	-1,149.19	10,940.72	10,958.10	0.00	0.00	0.00
19,000.00	89.43	90.94	7,128.51	-1,150.82	11,040.71	11,058.10	0.00	0.00	0.00
19,100.00	89.43	90.94	7,129.50	-1,152.46	11,140.69	11,158.09	0.00	0.00	0.00
19,200.00	89.43	90.94	7,130.49	-1,154.09	11,240.67	11,258.09	0.00	0.00	0.00
19,300.00	89.43	90.94	7,131.48	-1,155.73	11,340.65	11,358.08	0.00	0.00	0.00
19,400.00	89.43	90.94	7,132.47	-1,157.36	11,440.63	11,458.08	0.00	0.00	0.00
19,500.00	89.43	90.94	7,133.46	-1,159.00	11,540.61	11,558.07	0.00	0.00	0.00
19,600.00	89.43	90.94	7,134.45	-1,160.63	11,640.60	11,658.07	0.00	0.00	0.00
19,700.00	89.43	90.94	7,135.44	-1,162.27	11,740.58	11,758.06	0.00	0.00	0.00
19,800.00	89.43	90.94	7,136.43	-1,163.90	11,840.56	11,858.06	0.00	0.00	0.00
19,900.00	89.43	90.94	7,137.42	-1,165.54	11,940.54	11,958.06	0.00	0.00	0.00
20,000.00	89.43	90.94	7,138.42	-1,167.17	12,040.52	12,058.05	0.00	0.00	0.00
20,100.00	89.43	90.94	7,139.41	-1,168.81	12,140.50	12,158.05	0.00	0.00	0.00
20,200.00	89.43	90.94	7,140.40	-1,170.44	12,240.49	12,258.04	0.00	0.00	0.00
20,300.00	89.43	90.94	7,141.39	-1,172.08	12,340.47	12,358.04	0.00	0.00	0.00
20,400.00	89.43	90.94	7,142.38	-1,173.72	12,440.45	12,458.03	0.00	0.00	0.00
20,500.00	89.43	90.94	7,143.37	-1,175.35	12,540.43	12,558.03	0.00	0.00	0.00
20,600.00	89.43	90.94	7,144.36	-1,176.99	12,640.41	12,658.02	0.00	0.00	0.00
20,700.00	89.43	90.94	7,145.35	-1,178.62	12,740.39	12,758.02	0.00	0.00	0.00
20,800.00	89.43	90.94	7,146.34	-1,180.26	12,840.38	12,858.01	0.00	0.00	0.00
20,900.00	89.43	90.94	7,147.33	-1,181.89	12,940.36	12,958.01	0.00	0.00	0.00
21,000.00	89.43	90.94	7,148.32	-1,183.53	13,040.34	13,058.00	0.00	0.00	0.00
21,100.00	89.43	90.94	7,149.31	-1,185.16	13,140.32	13,158.00	0.00	0.00	0.00
21,200.00	89.43	90.94	7,150.30	-1,186.80	13,240.30	13,257.99	0.00	0.00	0.00
21,300.00	89.43	90.94	7,151.30	-1,188.43	13,340.29	13,357.99	0.00	0.00	0.00
21,400.00	89.43	90.94	7,152.29	-1,190.07	13,440.27	13,457.98	0.00	0.00	0.00
21,500.00	89.43	90.94	7,153.28	-1,191.70	13,540.25	13,557.98	0.00	0.00	0.00
21,600.00	89.43	90.94	7,154.27	-1,193.34	13,640.23	13,657.97	0.00	0.00	0.00
21,700.00	89.43	90.94	7,155.26	-1,194.97	13,740.21	13,757.97	0.00	0.00	0.00
21,800.00	89.43	90.94	7,156.25	-1,196.61	13,840.19	13,857.96	0.00	0.00	0.00
21,875.78	89.43	90.94	7,157.00	-1,197.85	13,915.96	13,933.74	0.00	0.00	0.00
Fort Hayes									
21,900.00	89.43	90.94	7,157.24	-1,198.24	13,940.18	13,957.96	0.00	0.00	0.00
22,000.00	89.43	90.94	7,158.23	-1,199.88	14,040.16	14,057.95	0.00	0.00	0.00
22,100.00	89.43	90.94	7,159.22	-1,201.52	14,140.14	14,157.95	0.00	0.00	0.00
22,200.00	89.43	90.94	7,160.21	-1,203.15	14,240.12	14,257.94	0.00	0.00	0.00
22,300.00	89.43	90.94	7,161.20	-1,204.79	14,340.10	14,357.94	0.00	0.00	0.00
22,380.44	89.43	90.94	7,162.00	-1,206.10	14,420.53	14,438.37	0.00	0.00	0.00
TD Well @ 22380.44ft - 5.5" CSG									

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well SWARTZ 4-12HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4842.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4842.00usft (RIG)
Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-12HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,515.80	1,500.00	9 5/8"	9-5/8	13-1/2	
22,380.44	7,162.00	5.5" CSG	5-1/2	7-7/8	

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
707.33	707.00	Fox Hills			
3,751.84	3,598.00	Parkman			
4,266.19	4,080.00	Sussex			
7,139.63	6,841.00	Sharon Springs			
7,187.30	6,871.00	Niobrara			
8,350.91	7,023.00	Nio B			
11,580.73	7,055.00	Nio C			

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
400.00	400.00	0.00	0.00	Begin Nudge @ 400.00ft
1,762.00	1,733.32	-163.89	-175.69	Hold Tangent @ 1762.00ft
4,562.10	4,357.29	-830.61	-890.41	Begin Drop @ 4562.10ft
5,583.60	5,357.28	-953.52	-1,022.17	Hold Vertical @ 5583.60ft
6,526.15	6,299.83	-953.52	-1,022.17	KOP @ 6526.15ft :: DLS = 8"/100'
7,644.05	7,016.00	-965.12	-313.16	End Build @ 7644.05ft
22,380.44	7,162.00	-1,206.10	14,420.53	TD Well @ 22380.44ft