

EXTRACTION OIL & GAS

ADAMS COUNTY

Sec 13-T1S-R66W

WARBLER 13W-27-19

OWB

Plan: PROPOSAL 1

Standard Planning Report

07 February, 2023



Project: ADAMS COUNTY
Site: Sec 13-T1S-R66W
Well: WARBLER 13W-27-19
Wellbore: OWB
Design: PROPOSAL 1



Azimuths to True North
Magnetic North: 7.66°

Magnetic Field
Strength: 51596.6nT
Dip Angle: 66.26°
Date: 9/6/2022
Model: IGRF2020

WELL DETAILS: WARBLER 13W-27-19

+N/-S	+E/-W	Northing	Easting	5081.00 Latitude	Longitude	Slot
0.00	0.00	1229639.45	3218576.86	39.961105°N	104.720231°W	

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
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	1489.50	21.79	259.38	1463.42	-37.74	-201.18	2.00	259.38	202.16	
4	7227.10	21.79	259.38	6791.08	-430.41	-2294.50	0.00	0.00	2305.75	
5	7913.10	90.00	269.97	7154.00	-457.36	-2827.94	10.00	11.39	2839.74	LP-WARBLER 13W-19
6	21505.33	90.00	269.97	7154.00	-464.49	-16420.16	0.00	0.00	16426.73	PBHL-WARBLER 13W-19

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	Start Build 2.00
1489.50	21.79	259.38	1463.42	-37.74	-201.18	202.16	204.69	Start 5737.61 hold at 1489.50 MD
7227.10	21.79	259.38	6791.08	-430.41	-2294.50	2305.75	2334.52	Start DLS 10.00 TFO 11.39
7913.10	90.00	269.97	7154.00	-457.36	-2827.94	2839.74	2869.10	Start DLS 0.00 TFO 90.00
21505.33	90.00	269.97	7154.00	-464.49	-16420.16	16426.73	16461.33	TD at 21505.33

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
LP-WARBLER 13W-19	7154.00	-457.36	-2827.94	1229157.25	3215753.14	39.959849°N	104.730319°W	Point
- plan hits target center								
PBHL-WARBLER 13W-19	7154.00	-464.49	-16420.16	1229030.61	3202161.91	39.959815°N	104.778806°W	Point
- plan hits target center								

FORMATION TOP DETAILS

TVDPth	MDPth	Formation
24.00	24.00	Alluvium
69.00	69.00	Arapahoe
1024.00	1029.04	Laramie-Fox Hills Formation
1294.00	1309.19	Pierre Formation
1749.00	1797.05	Upper Pierre aquifer
2144.00	2222.44	Base of Upper Pierre aquifer
3524.00	3708.63	Larimer ("Parkman") sandstone
3594.00	3784.02	Pierre Formation
4774.00	5054.81	Terry ("Sussex") sandstone
4994.00	5291.74	Pierre Formation
5614.00	5959.45	Hygiene ("Shannon") sandstone
5694.00	6045.60	Pierre Formation
7064.00	7587.15	Sharon Springs Member
7154.00	7913.10	Niobrara Formation

PROJECT DETAILS: ADAMS COUNTY

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone

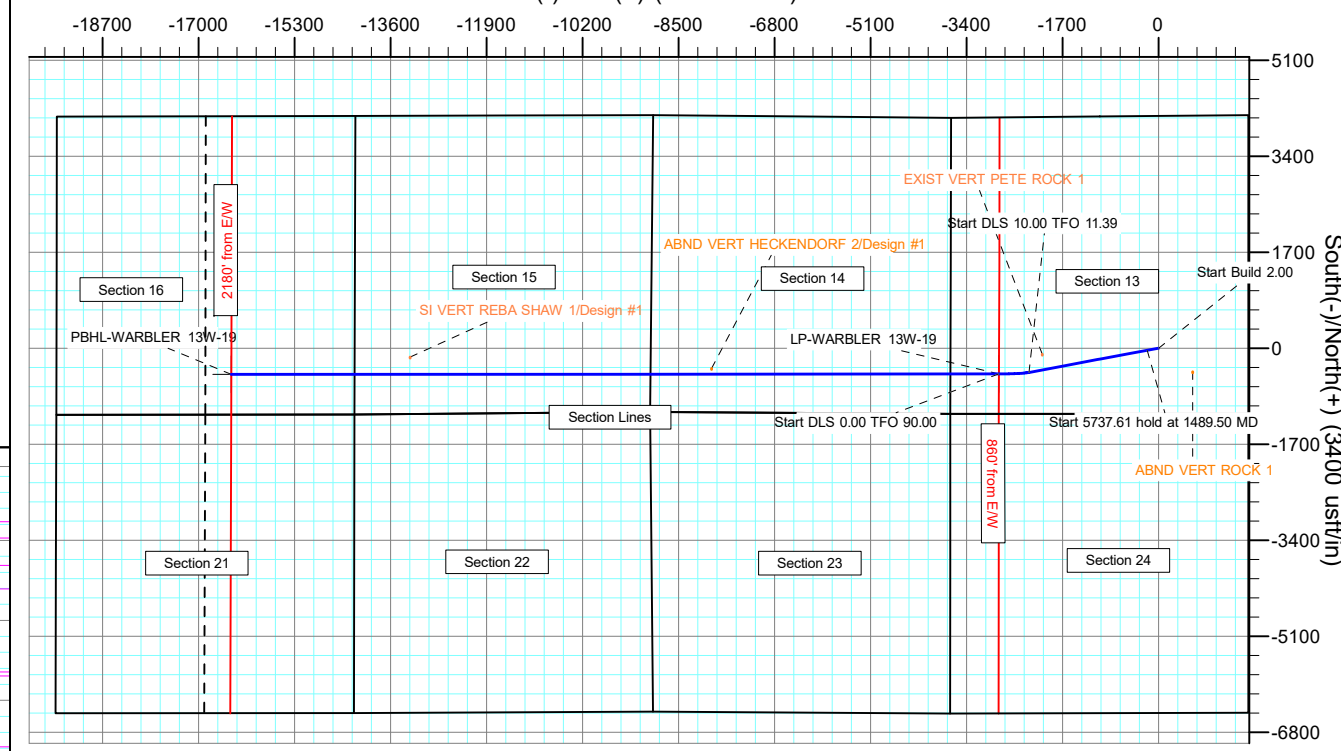
System Datum: Mean Sea Level

SHL:
1169' FSL, 1587' FEL
Sec 13-T1S-R66W

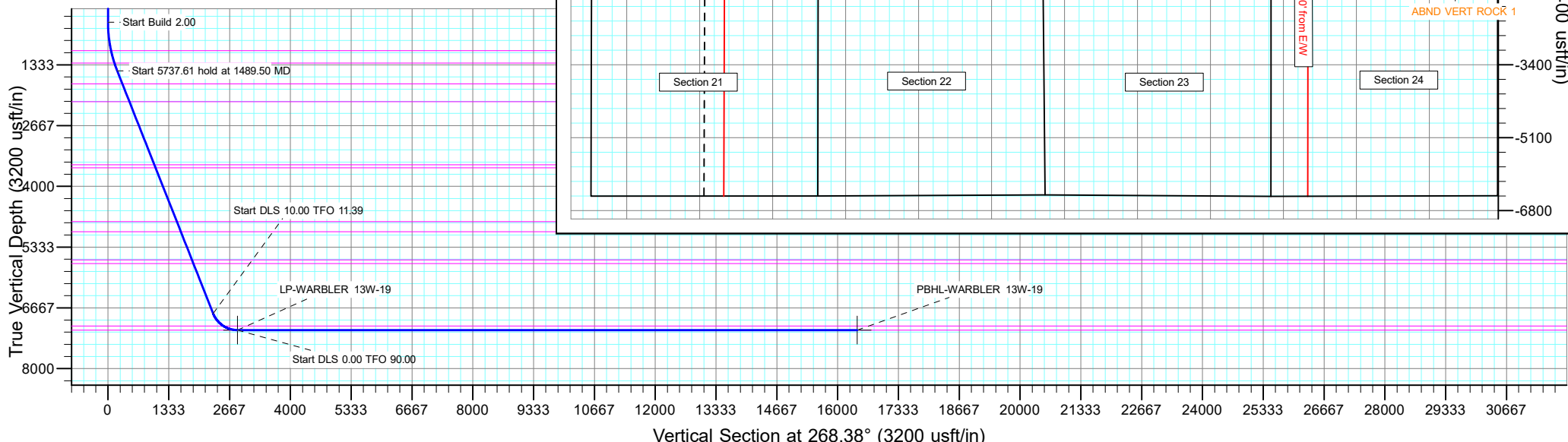
LP*
712' FSL, 860' FWL
Sec 13-T1S-R66W

BHL:
717' FSL, 2180' FEL
Sec 16-T1S-R66W

West(-)/East(+) (3400 usft/in)



South(-)/North(+) (3400 usft/in)



Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well Warbler 13W-27-19
Company:	EXTRACTION OIL & GAS	TVD Reference:	KB 25' @ 5106.00usft
Project:	ADAMS COUNTY	MD Reference:	KB 25' @ 5106.00usft
Site:	Sec 13-T1S-R66W	North Reference:	True
Well:	WARBLER 13W-27-19	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Project	ADAMS COUNTY		
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		Sec 13-T1S-R66W			
Site Position:		Northing:	1,228,437.67 usft	Latitude:	39.957894°N
From:	Lat/Long	Easting:	3,214,899.03 usft	Longitude:	104.733388°W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.50 °

Well	WARBLER 13W-27-19					
Well Position	+N/-S	1,169.97 usft	Northing:	1,229,639.45 usft	Latitude:	39.961105°N
	+E/-W	3,688.19 usft	Easting:	3,218,576.86 usft	Longitude:	104.720231°W
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	5,081.00 usft

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	9/6/2022	7.66	66.26	51,596.64128921

Design	PROPOSAL 1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	268.38

Plan Survey Tool Program	Date	2/7/2023			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	21,505.15	PROPOSAL 1 (OWB)	MWD OWSG	
				OWSG MWD - Standard	

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	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	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,489.50	21.79	259.38	1,463.42	-37.74	-201.18	2.00	2.00	0.00	259.38	
7,227.10	21.79	259.38	6,791.08	-430.41	-2,294.50	0.00	0.00	0.00	0.00	
7,913.10	90.00	269.97	7,154.00	-457.36	-2,827.94	10.00	9.94	1.54	11.39	LP-WARBLER 13W-1
21,505.33	90.00	269.97	7,154.00	-464.49	-16,420.17	0.00	0.00	0.00	0.00	PBHL-WARBLER 13W-1

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well WARBLER 13W-27-19
Company:	EXTRACTION OIL & GAS	TVD Reference:	KB 25' @ 5106.00usft
Project:	ADAMS COUNTY	MD Reference:	KB 25' @ 5106.00usft
Site:	Sec 13-T1S-R66W	North Reference:	True
Well:	WARBLER 13W-27-19	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	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
24.00	0.00	0.00	24.00	0.00	0.00	0.00	0.00	0.00	0.00
Alluvium									
69.00	0.00	0.00	69.00	0.00	0.00	0.00	0.00	0.00	0.00
Arapahoe									
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
Start Build 2.00									
500.00	2.00	259.38	499.98	-0.32	-1.72	1.72	2.00	2.00	0.00
600.00	4.00	259.38	599.84	-1.29	-6.86	6.89	2.00	2.00	0.00
700.00	6.00	259.38	699.45	-2.89	-15.42	15.50	2.00	2.00	0.00
800.00	8.00	259.38	798.70	-5.14	-27.40	27.54	2.00	2.00	0.00
900.00	10.00	259.38	897.47	-8.02	-42.78	42.99	2.00	2.00	0.00
1,000.00	12.00	259.38	995.62	-11.54	-61.53	61.83	2.00	2.00	0.00
1,029.04	12.58	259.38	1,024.00	-12.68	-67.61	67.94	2.00	2.00	0.00
Laramie-Fox Hills Formation									
1,100.00	14.00	259.38	1,093.06	-15.69	-83.64	84.05	2.00	2.00	0.00
1,200.00	16.00	259.38	1,189.64	-20.46	-109.07	109.61	2.00	2.00	0.00
1,300.00	18.00	259.38	1,285.27	-25.85	-137.81	138.49	2.00	2.00	0.00
1,309.19	18.18	259.38	1,294.00	-26.38	-140.61	141.30	2.00	2.00	0.00
Pierre Formation									
1,400.00	20.00	259.38	1,379.82	-31.85	-169.81	170.64	2.00	2.00	0.00
1,489.50	21.79	259.38	1,463.42	-37.74	-201.18	202.16	2.00	2.00	0.00
Start 5737.61 hold at 1489.50 MD									
1,500.00	21.79	259.38	1,473.18	-38.46	-205.01	206.02	0.00	0.00	0.00
1,600.00	21.79	259.38	1,566.03	-45.30	-241.49	242.68	0.00	0.00	0.00
1,700.00	21.79	259.38	1,658.89	-52.14	-277.98	279.34	0.00	0.00	0.00
1,797.05	21.79	259.38	1,749.00	-58.79	-313.39	314.92	0.00	0.00	0.00
Upper Pierre aquifer									
1,800.00	21.79	259.38	1,751.74	-58.99	-314.46	316.00	0.00	0.00	0.00
1,900.00	21.79	259.38	1,844.60	-65.83	-350.95	352.67	0.00	0.00	0.00
2,000.00	21.79	259.38	1,937.45	-72.68	-387.43	389.33	0.00	0.00	0.00
2,100.00	21.79	259.38	2,030.31	-79.52	-423.92	425.99	0.00	0.00	0.00
2,200.00	21.79	259.38	2,123.16	-86.36	-460.40	462.66	0.00	0.00	0.00
2,222.44	21.79	259.38	2,144.00	-87.90	-468.59	470.89	0.00	0.00	0.00
Base of Upper Pierre aquifer									
2,300.00	21.79	259.38	2,216.02	-93.21	-496.88	499.32	0.00	0.00	0.00
2,400.00	21.79	259.38	2,308.87	-100.05	-533.37	535.98	0.00	0.00	0.00
2,500.00	21.79	259.38	2,401.73	-106.89	-569.85	572.65	0.00	0.00	0.00
2,600.00	21.79	259.38	2,494.58	-113.74	-606.34	609.31	0.00	0.00	0.00
2,700.00	21.79	259.38	2,587.44	-120.58	-642.82	645.97	0.00	0.00	0.00
2,800.00	21.79	259.38	2,680.29	-127.43	-679.30	682.64	0.00	0.00	0.00
2,900.00	21.79	259.38	2,773.15	-134.27	-715.79	719.30	0.00	0.00	0.00
3,000.00	21.79	259.38	2,866.00	-141.11	-752.27	755.96	0.00	0.00	0.00
3,100.00	21.79	259.38	2,958.86	-147.96	-788.76	792.63	0.00	0.00	0.00
3,200.00	21.79	259.38	3,051.71	-154.80	-825.24	829.29	0.00	0.00	0.00
3,300.00	21.79	259.38	3,144.57	-161.65	-861.73	865.95	0.00	0.00	0.00
3,400.00	21.79	259.38	3,237.42	-168.49	-898.21	902.62	0.00	0.00	0.00
3,500.00	21.79	259.38	3,330.28	-175.33	-934.69	939.28	0.00	0.00	0.00
3,600.00	21.79	259.38	3,423.13	-182.18	-971.18	975.94	0.00	0.00	0.00
3,700.00	21.79	259.38	3,515.99	-189.02	-1,007.66	1,012.60	0.00	0.00	0.00

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well Warbler 13W-27-19
Company:	EXTRACTION OIL & GAS	TVD Reference:	KB 25' @ 5106.00usft
Project:	ADAMS COUNTY	MD Reference:	KB 25' @ 5106.00usft
Site:	Sec 13-T1S-R66W	North Reference:	True
Well:	WARBLER 13W-27-19	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
3,708.63	21.79	259.38	3,524.00	-189.61	-1,010.81	1,015.77	0.00	0.00	0.00	
Larimer ("Parkman") sandstone										
3,784.02	21.79	259.38	3,594.00	-194.77	-1,038.32	1,043.41	0.00	0.00	0.00	
Pierre Formation										
3,800.00	21.79	259.38	3,608.84	-195.86	-1,044.15	1,049.27	0.00	0.00	0.00	
3,900.00	21.79	259.38	3,701.70	-202.71	-1,080.63	1,085.93	0.00	0.00	0.00	
4,000.00	21.79	259.38	3,794.55	-209.55	-1,117.12	1,122.59	0.00	0.00	0.00	
4,100.00	21.79	259.38	3,887.41	-216.40	-1,153.60	1,159.26	0.00	0.00	0.00	
4,200.00	21.79	259.38	3,980.26	-223.24	-1,190.08	1,195.92	0.00	0.00	0.00	
4,300.00	21.79	259.38	4,073.12	-230.08	-1,226.57	1,232.58	0.00	0.00	0.00	
4,400.00	21.79	259.38	4,165.97	-236.93	-1,263.05	1,269.25	0.00	0.00	0.00	
4,500.00	21.79	259.38	4,258.83	-243.77	-1,299.54	1,305.91	0.00	0.00	0.00	
4,600.00	21.79	259.38	4,351.68	-250.61	-1,336.02	1,342.57	0.00	0.00	0.00	
4,700.00	21.79	259.38	4,444.54	-257.46	-1,372.51	1,379.24	0.00	0.00	0.00	
4,800.00	21.79	259.38	4,537.39	-264.30	-1,408.99	1,415.90	0.00	0.00	0.00	
4,900.00	21.79	259.38	4,630.25	-271.15	-1,445.47	1,452.56	0.00	0.00	0.00	
5,000.00	21.79	259.38	4,723.10	-277.99	-1,481.96	1,489.23	0.00	0.00	0.00	
5,054.81	21.79	259.38	4,774.00	-281.74	-1,501.96	1,509.32	0.00	0.00	0.00	
Terry ("Sussex") sandstone										
5,100.00	21.79	259.38	4,815.96	-284.83	-1,518.44	1,525.89	0.00	0.00	0.00	
5,200.00	21.79	259.38	4,908.81	-291.68	-1,554.93	1,562.55	0.00	0.00	0.00	
5,291.74	21.79	259.38	4,994.00	-297.96	-1,588.40	1,596.19	0.00	0.00	0.00	
Pierre Formation										
5,300.00	21.79	259.38	5,001.67	-298.52	-1,591.41	1,599.22	0.00	0.00	0.00	
5,400.00	21.79	259.38	5,094.52	-305.37	-1,627.89	1,635.88	0.00	0.00	0.00	
5,500.00	21.79	259.38	5,187.38	-312.21	-1,664.38	1,672.54	0.00	0.00	0.00	
5,600.00	21.79	259.38	5,280.23	-319.05	-1,700.86	1,709.20	0.00	0.00	0.00	
5,700.00	21.79	259.38	5,373.09	-325.90	-1,737.35	1,745.87	0.00	0.00	0.00	
5,800.00	21.79	259.38	5,465.94	-332.74	-1,773.83	1,782.53	0.00	0.00	0.00	
5,900.00	21.79	259.38	5,558.80	-339.58	-1,810.32	1,819.19	0.00	0.00	0.00	
5,959.45	21.79	259.38	5,614.00	-343.65	-1,832.01	1,840.99	0.00	0.00	0.00	
Hygiene ("Shannon") sandstone										
6,000.00	21.79	259.38	5,651.65	-346.43	-1,846.80	1,855.86	0.00	0.00	0.00	
6,045.60	21.79	259.38	5,694.00	-349.55	-1,863.44	1,872.58	0.00	0.00	0.00	
Pierre Formation										
6,100.00	21.79	259.38	5,744.51	-353.27	-1,883.28	1,892.52	0.00	0.00	0.00	
6,200.00	21.79	259.38	5,837.36	-360.12	-1,919.77	1,929.18	0.00	0.00	0.00	
6,300.00	21.79	259.38	5,930.22	-366.96	-1,956.25	1,965.85	0.00	0.00	0.00	
6,400.00	21.79	259.38	6,023.07	-373.80	-1,992.74	2,002.51	0.00	0.00	0.00	
6,500.00	21.79	259.38	6,115.93	-380.65	-2,029.22	2,039.17	0.00	0.00	0.00	
6,600.00	21.79	259.38	6,208.78	-387.49	-2,065.71	2,075.84	0.00	0.00	0.00	
6,700.00	21.79	259.38	6,301.64	-394.33	-2,102.19	2,112.50	0.00	0.00	0.00	
6,800.00	21.79	259.38	6,394.49	-401.18	-2,138.67	2,149.16	0.00	0.00	0.00	
6,900.00	21.79	259.38	6,487.35	-408.02	-2,175.16	2,185.83	0.00	0.00	0.00	
7,000.00	21.79	259.38	6,580.20	-414.87	-2,211.64	2,222.49	0.00	0.00	0.00	
7,100.00	21.79	259.38	6,673.06	-421.71	-2,248.13	2,259.15	0.00	0.00	0.00	
7,200.00	21.79	259.38	6,765.91	-428.55	-2,284.61	2,295.82	0.00	0.00	0.00	
7,227.10	21.79	259.38	6,791.08	-430.41	-2,294.50	2,305.75	0.00	0.00	0.00	
Start DLS 10.00 TFO 11.39										
7,250.00	24.04	260.49	6,812.17	-431.96	-2,303.28	2,314.57	10.00	9.82	4.85	
7,300.00	28.97	262.34	6,856.90	-435.26	-2,325.34	2,336.71	10.00	9.86	3.71	
7,350.00	33.92	263.70	6,899.55	-438.41	-2,351.22	2,362.68	10.00	9.90	2.71	
7,400.00	38.88	264.74	6,939.78	-441.38	-2,380.73	2,392.26	10.00	9.92	2.09	

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well WARBLER 13W-27-19
Company:	EXTRACTION OIL & GAS	TVD Reference:	KB 25' @ 5106.00usft
Project:	ADAMS COUNTY	MD Reference:	KB 25' @ 5106.00usft
Site:	Sec 13-T1S-R66W	North Reference:	True
Well:	WARBLER 13W-27-19	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,450.00	43.85	265.58	6,977.29	-444.16	-2,413.65	2,425.24	10.00	9.94	1.68
7,500.00	48.83	266.28	7,011.80	-446.71	-2,449.72	2,461.37	10.00	9.95	1.40
7,550.00	53.80	266.89	7,043.04	-449.03	-2,488.66	2,500.37	10.00	9.96	1.21
7,587.15	57.50	267.29	7,064.00	-450.59	-2,519.29	2,531.02	10.00	9.96	1.08
Sharon Springs Member									
7,600.00	58.78	267.42	7,070.78	-451.09	-2,530.19	2,541.94	10.00	9.96	1.02
7,650.00	63.77	267.89	7,094.81	-452.88	-2,573.99	2,585.77	10.00	9.96	0.95
7,700.00	68.75	268.33	7,114.93	-454.38	-2,619.72	2,631.52	10.00	9.97	0.88
7,750.00	73.73	268.74	7,131.00	-455.59	-2,667.03	2,678.85	10.00	9.97	0.82
7,800.00	78.72	269.13	7,142.90	-456.49	-2,715.57	2,727.39	10.00	9.97	0.78
7,850.00	83.71	269.51	7,150.54	-457.08	-2,764.97	2,776.78	10.00	9.97	0.75
7,900.00	88.69	269.87	7,153.85	-457.34	-2,814.84	2,826.65	10.00	9.97	0.74
7,913.10	90.00	269.97	7,154.00	-457.36	-2,827.94	2,839.74	10.00	9.97	0.73
Start DLS 0.00 TFO 90.00 - Niobrara Formation									
8,000.00	90.00	269.97	7,154.00	-457.41	-2,914.84	2,926.61	0.00	0.00	0.00
8,100.00	90.00	269.97	7,154.00	-457.46	-3,014.84	3,026.57	0.00	0.00	0.00
8,200.00	90.00	269.97	7,154.00	-457.51	-3,114.84	3,126.53	0.00	0.00	0.00
8,300.00	90.00	269.97	7,154.00	-457.57	-3,214.84	3,226.49	0.00	0.00	0.00
8,400.00	90.00	269.97	7,154.00	-457.62	-3,314.84	3,326.45	0.00	0.00	0.00
8,500.00	90.00	269.97	7,154.00	-457.67	-3,414.84	3,426.41	0.00	0.00	0.00
8,600.00	90.00	269.97	7,154.00	-457.72	-3,514.84	3,526.38	0.00	0.00	0.00
8,700.00	90.00	269.97	7,154.00	-457.77	-3,614.84	3,626.34	0.00	0.00	0.00
8,800.00	90.00	269.97	7,154.00	-457.83	-3,714.84	3,726.30	0.00	0.00	0.00
8,900.00	90.00	269.97	7,154.00	-457.88	-3,814.84	3,826.26	0.00	0.00	0.00
9,000.00	90.00	269.97	7,154.00	-457.93	-3,914.84	3,926.22	0.00	0.00	0.00
9,100.00	90.00	269.97	7,154.00	-457.98	-4,014.84	4,026.18	0.00	0.00	0.00
9,200.00	90.00	269.97	7,154.00	-458.04	-4,114.84	4,126.14	0.00	0.00	0.00
9,300.00	90.00	269.97	7,154.00	-458.09	-4,214.84	4,226.11	0.00	0.00	0.00
9,400.00	90.00	269.97	7,154.00	-458.14	-4,314.84	4,326.07	0.00	0.00	0.00
9,500.00	90.00	269.97	7,154.00	-458.19	-4,414.84	4,426.03	0.00	0.00	0.00
9,600.00	90.00	269.97	7,154.00	-458.25	-4,514.84	4,525.99	0.00	0.00	0.00
9,700.00	90.00	269.97	7,154.00	-458.30	-4,614.84	4,625.95	0.00	0.00	0.00
9,800.00	90.00	269.97	7,154.00	-458.35	-4,714.84	4,725.91	0.00	0.00	0.00
9,900.00	90.00	269.97	7,154.00	-458.40	-4,814.84	4,825.87	0.00	0.00	0.00
10,000.00	90.00	269.97	7,154.00	-458.46	-4,914.84	4,925.84	0.00	0.00	0.00
10,100.00	90.00	269.97	7,154.00	-458.51	-5,014.84	5,025.80	0.00	0.00	0.00
10,200.00	90.00	269.97	7,154.00	-458.56	-5,114.84	5,125.76	0.00	0.00	0.00
10,300.00	90.00	269.97	7,154.00	-458.61	-5,214.84	5,225.72	0.00	0.00	0.00
10,400.00	90.00	269.97	7,154.00	-458.67	-5,314.84	5,325.68	0.00	0.00	0.00
10,500.00	90.00	269.97	7,154.00	-458.72	-5,414.84	5,425.64	0.00	0.00	0.00
10,600.00	90.00	269.97	7,154.00	-458.77	-5,514.84	5,525.61	0.00	0.00	0.00
10,700.00	90.00	269.97	7,154.00	-458.82	-5,614.84	5,625.57	0.00	0.00	0.00
10,800.00	90.00	269.97	7,154.00	-458.88	-5,714.84	5,725.53	0.00	0.00	0.00
10,900.00	90.00	269.97	7,154.00	-458.93	-5,814.84	5,825.49	0.00	0.00	0.00
11,000.00	90.00	269.97	7,154.00	-458.98	-5,914.84	5,925.45	0.00	0.00	0.00
11,100.00	90.00	269.97	7,154.00	-459.03	-6,014.84	6,025.41	0.00	0.00	0.00
11,200.00	90.00	269.97	7,154.00	-459.09	-6,114.84	6,125.37	0.00	0.00	0.00
11,300.00	90.00	269.97	7,154.00	-459.14	-6,214.84	6,225.34	0.00	0.00	0.00
11,400.00	90.00	269.97	7,154.00	-459.19	-6,314.84	6,325.30	0.00	0.00	0.00
11,500.00	90.00	269.97	7,154.00	-459.24	-6,414.84	6,425.26	0.00	0.00	0.00
11,600.00	90.00	269.97	7,154.00	-459.29	-6,514.84	6,525.22	0.00	0.00	0.00
11,700.00	90.00	269.97	7,154.00	-459.35	-6,614.84	6,625.18	0.00	0.00	0.00
11,800.00	90.00	269.97	7,154.00	-459.40	-6,714.84	6,725.14	0.00	0.00	0.00
11,900.00	90.00	269.97	7,154.00	-459.45	-6,814.84	6,825.10	0.00	0.00	0.00

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well Warbler 13W-27-19
Company:	EXTRACTION OIL & GAS	TVD Reference:	KB 25' @ 5106.00usft
Project:	ADAMS COUNTY	MD Reference:	KB 25' @ 5106.00usft
Site:	Sec 13-T1S-R66W	North Reference:	True
Well:	WARBLER 13W-27-19	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
12,000.00	90.00	269.97	7,154.00	-459.50	-6,914.84	6,925.07	0.00	0.00	0.00	
12,100.00	90.00	269.97	7,154.00	-459.56	-7,014.84	7,025.03	0.00	0.00	0.00	
12,200.00	90.00	269.97	7,154.00	-459.61	-7,114.84	7,124.99	0.00	0.00	0.00	
12,300.00	90.00	269.97	7,154.00	-459.66	-7,214.84	7,224.95	0.00	0.00	0.00	
12,400.00	90.00	269.97	7,154.00	-459.71	-7,314.84	7,324.91	0.00	0.00	0.00	
12,500.00	90.00	269.97	7,154.00	-459.77	-7,414.84	7,424.87	0.00	0.00	0.00	
12,600.00	90.00	269.97	7,154.00	-459.82	-7,514.84	7,524.83	0.00	0.00	0.00	
12,700.00	90.00	269.97	7,154.00	-459.87	-7,614.84	7,624.80	0.00	0.00	0.00	
12,800.00	90.00	269.97	7,154.00	-459.92	-7,714.84	7,724.76	0.00	0.00	0.00	
12,900.00	90.00	269.97	7,154.00	-459.98	-7,814.84	7,824.72	0.00	0.00	0.00	
13,000.00	90.00	269.97	7,154.00	-460.03	-7,914.84	7,924.68	0.00	0.00	0.00	
13,100.00	90.00	269.97	7,154.00	-460.08	-8,014.84	8,024.64	0.00	0.00	0.00	
13,200.00	90.00	269.97	7,154.00	-460.13	-8,114.84	8,124.60	0.00	0.00	0.00	
13,300.00	90.00	269.97	7,154.00	-460.19	-8,214.84	8,224.57	0.00	0.00	0.00	
13,400.00	90.00	269.97	7,154.00	-460.24	-8,314.84	8,324.53	0.00	0.00	0.00	
13,500.00	90.00	269.97	7,154.00	-460.29	-8,414.84	8,424.49	0.00	0.00	0.00	
13,600.00	90.00	269.97	7,154.00	-460.34	-8,514.84	8,524.45	0.00	0.00	0.00	
13,700.00	90.00	269.97	7,154.00	-460.40	-8,614.84	8,624.41	0.00	0.00	0.00	
13,800.00	90.00	269.97	7,154.00	-460.45	-8,714.84	8,724.37	0.00	0.00	0.00	
13,900.00	90.00	269.97	7,154.00	-460.50	-8,814.84	8,824.33	0.00	0.00	0.00	
14,000.00	90.00	269.97	7,154.00	-460.55	-8,914.84	8,924.30	0.00	0.00	0.00	
14,100.00	90.00	269.97	7,154.00	-460.60	-9,014.84	9,024.26	0.00	0.00	0.00	
14,200.00	90.00	269.97	7,154.00	-460.66	-9,114.84	9,124.22	0.00	0.00	0.00	
14,300.00	90.00	269.97	7,154.00	-460.71	-9,214.84	9,224.18	0.00	0.00	0.00	
14,400.00	90.00	269.97	7,154.00	-460.76	-9,314.84	9,324.14	0.00	0.00	0.00	
14,500.00	90.00	269.97	7,154.00	-460.81	-9,414.84	9,424.10	0.00	0.00	0.00	
14,600.00	90.00	269.97	7,154.00	-460.87	-9,514.84	9,524.06	0.00	0.00	0.00	
14,700.00	90.00	269.97	7,154.00	-460.92	-9,614.84	9,624.03	0.00	0.00	0.00	
14,800.00	90.00	269.97	7,154.00	-460.97	-9,714.84	9,723.99	0.00	0.00	0.00	
14,900.00	90.00	269.97	7,154.00	-461.02	-9,814.84	9,823.95	0.00	0.00	0.00	
15,000.00	90.00	269.97	7,154.00	-461.08	-9,914.84	9,923.91	0.00	0.00	0.00	
15,100.00	90.00	269.97	7,154.00	-461.13	-10,014.84	10,023.87	0.00	0.00	0.00	
15,200.00	90.00	269.97	7,154.00	-461.18	-10,114.84	10,123.83	0.00	0.00	0.00	
15,300.00	90.00	269.97	7,154.00	-461.23	-10,214.84	10,223.79	0.00	0.00	0.00	
15,400.00	90.00	269.97	7,154.00	-461.29	-10,314.84	10,323.76	0.00	0.00	0.00	
15,500.00	90.00	269.97	7,154.00	-461.34	-10,414.84	10,423.72	0.00	0.00	0.00	
15,600.00	90.00	269.97	7,154.00	-461.39	-10,514.84	10,523.68	0.00	0.00	0.00	
15,700.00	90.00	269.97	7,154.00	-461.44	-10,614.84	10,623.64	0.00	0.00	0.00	
15,800.00	90.00	269.97	7,154.00	-461.50	-10,714.84	10,723.60	0.00	0.00	0.00	
15,900.00	90.00	269.97	7,154.00	-461.55	-10,814.84	10,823.56	0.00	0.00	0.00	
16,000.00	90.00	269.97	7,154.00	-461.60	-10,914.84	10,923.53	0.00	0.00	0.00	
16,100.00	90.00	269.97	7,154.00	-461.65	-11,014.84	11,023.49	0.00	0.00	0.00	
16,200.00	90.00	269.97	7,154.00	-461.71	-11,114.84	11,123.45	0.00	0.00	0.00	
16,300.00	90.00	269.97	7,154.00	-461.76	-11,214.84	11,223.41	0.00	0.00	0.00	
16,400.00	90.00	269.97	7,154.00	-461.81	-11,314.84	11,323.37	0.00	0.00	0.00	
16,500.00	90.00	269.97	7,154.00	-461.86	-11,414.84	11,423.33	0.00	0.00	0.00	
16,600.00	90.00	269.97	7,154.00	-461.92	-11,514.84	11,523.29	0.00	0.00	0.00	
16,700.00	90.00	269.97	7,154.00	-461.97	-11,614.84	11,623.26	0.00	0.00	0.00	
16,800.00	90.00	269.97	7,154.00	-462.02	-11,714.84	11,723.22	0.00	0.00	0.00	
16,900.00	90.00	269.97	7,154.00	-462.07	-11,814.84	11,823.18	0.00	0.00	0.00	
17,000.00	90.00	269.97	7,154.00	-462.12	-11,914.84	11,923.14	0.00	0.00	0.00	
17,100.00	90.00	269.97	7,154.00	-462.18	-12,014.84	12,023.10	0.00	0.00	0.00	
17,200.00	90.00	269.97	7,154.00	-462.23	-12,114.84	12,123.06	0.00	0.00	0.00	
17,300.00	90.00	269.97	7,154.00	-462.28	-12,214.84	12,223.02	0.00	0.00	0.00	

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well Warbler 13W-27-19
Company:	EXTRACTION OIL & GAS	TVD Reference:	KB 25' @ 5106.00usft
Project:	ADAMS COUNTY	MD Reference:	KB 25' @ 5106.00usft
Site:	Sec 13-T1S-R66W	North Reference:	True
Well:	WARBLER 13W-27-19	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
17,400.00	90.00	269.97	7,154.00	-462.33	-12,314.84	12,322.99	0.00	0.00	0.00
17,500.00	90.00	269.97	7,154.00	-462.39	-12,414.84	12,422.95	0.00	0.00	0.00
17,600.00	90.00	269.97	7,154.00	-462.44	-12,514.84	12,522.91	0.00	0.00	0.00
17,700.00	90.00	269.97	7,154.00	-462.49	-12,614.84	12,622.87	0.00	0.00	0.00
17,800.00	90.00	269.97	7,154.00	-462.54	-12,714.84	12,722.83	0.00	0.00	0.00
17,900.00	90.00	269.97	7,154.00	-462.60	-12,814.84	12,822.79	0.00	0.00	0.00
18,000.00	90.00	269.97	7,154.00	-462.65	-12,914.84	12,922.76	0.00	0.00	0.00
18,100.00	90.00	269.97	7,154.00	-462.70	-13,014.84	13,022.72	0.00	0.00	0.00
18,200.00	90.00	269.97	7,154.00	-462.75	-13,114.84	13,122.68	0.00	0.00	0.00
18,300.00	90.00	269.97	7,154.00	-462.81	-13,214.84	13,222.64	0.00	0.00	0.00
18,400.00	90.00	269.97	7,154.00	-462.86	-13,314.84	13,322.60	0.00	0.00	0.00
18,500.00	90.00	269.97	7,154.00	-462.91	-13,414.84	13,422.56	0.00	0.00	0.00
18,600.00	90.00	269.97	7,154.00	-462.96	-13,514.84	13,522.52	0.00	0.00	0.00
18,700.00	90.00	269.97	7,154.00	-463.02	-13,614.84	13,622.49	0.00	0.00	0.00
18,800.00	90.00	269.97	7,154.00	-463.07	-13,714.84	13,722.45	0.00	0.00	0.00
18,900.00	90.00	269.97	7,154.00	-463.12	-13,814.84	13,822.41	0.00	0.00	0.00
19,000.00	90.00	269.97	7,154.00	-463.17	-13,914.84	13,922.37	0.00	0.00	0.00
19,100.00	90.00	269.97	7,154.00	-463.23	-14,014.84	14,022.33	0.00	0.00	0.00
19,200.00	90.00	269.97	7,154.00	-463.28	-14,114.84	14,122.29	0.00	0.00	0.00
19,300.00	90.00	269.97	7,154.00	-463.33	-14,214.84	14,222.25	0.00	0.00	0.00
19,400.00	90.00	269.97	7,154.00	-463.38	-14,314.84	14,322.22	0.00	0.00	0.00
19,500.00	90.00	269.97	7,154.00	-463.43	-14,414.84	14,422.18	0.00	0.00	0.00
19,600.00	90.00	269.97	7,154.00	-463.49	-14,514.84	14,522.14	0.00	0.00	0.00
19,700.00	90.00	269.97	7,154.00	-463.54	-14,614.84	14,622.10	0.00	0.00	0.00
19,800.00	90.00	269.97	7,154.00	-463.59	-14,714.84	14,722.06	0.00	0.00	0.00
19,900.00	90.00	269.97	7,154.00	-463.64	-14,814.84	14,822.02	0.00	0.00	0.00
20,000.00	90.00	269.97	7,154.00	-463.70	-14,914.84	14,921.98	0.00	0.00	0.00
20,100.00	90.00	269.97	7,154.00	-463.75	-15,014.84	15,021.95	0.00	0.00	0.00
20,200.00	90.00	269.97	7,154.00	-463.80	-15,114.84	15,121.91	0.00	0.00	0.00
20,300.00	90.00	269.97	7,154.00	-463.85	-15,214.84	15,221.87	0.00	0.00	0.00
20,400.00	90.00	269.97	7,154.00	-463.91	-15,314.84	15,321.83	0.00	0.00	0.00
20,500.00	90.00	269.97	7,154.00	-463.96	-15,414.84	15,421.79	0.00	0.00	0.00
20,600.00	90.00	269.97	7,154.00	-464.01	-15,514.84	15,521.75	0.00	0.00	0.00
20,700.00	90.00	269.97	7,154.00	-464.06	-15,614.84	15,621.72	0.00	0.00	0.00
20,800.00	90.00	269.97	7,154.00	-464.12	-15,714.84	15,721.68	0.00	0.00	0.00
20,900.00	90.00	269.97	7,154.00	-464.17	-15,814.84	15,821.64	0.00	0.00	0.00
21,000.00	90.00	269.97	7,154.00	-464.22	-15,914.84	15,921.60	0.00	0.00	0.00
21,100.00	90.00	269.97	7,154.00	-464.27	-16,014.84	16,021.56	0.00	0.00	0.00
21,200.00	90.00	269.97	7,154.00	-464.33	-16,114.84	16,121.52	0.00	0.00	0.00
21,300.00	90.00	269.97	7,154.00	-464.38	-16,214.84	16,221.48	0.00	0.00	0.00
21,400.00	90.00	269.97	7,154.00	-464.43	-16,314.84	16,321.45	0.00	0.00	0.00
21,505.33	90.00	269.97	7,154.00	-464.49	-16,420.16	16,426.73	0.00	0.00	0.00
TD at 21505.33									

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well WARBLER 13W-27-19
Company:	EXTRACTION OIL & GAS	TVD Reference:	KB 25' @ 5106.00usft
Project:	ADAMS COUNTY	MD Reference:	KB 25' @ 5106.00usft
Site:	Sec 13-T1S-R66W	North Reference:	True
Well:	WARBLER 13W-27-19	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LP-WARBLER 13W-19 - plan hits target center - Point	0.00	0.00	7,154.00	-457.36	-2,827.94	1,229,157.25	3,215,753.14	39.959849°N	104.730319°W
PBHL-WARBLER 13W- - plan hits target center - Point	0.00	0.00	7,154.00	-464.49	-16,420.17	1,229,030.61	3,202,161.92	39.959815°N	104.778806°W

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
24.00	24.00	Alluvium				
69.00	69.00	Arapahoe				
1,029.04	1,024.00	Laramie-Fox Hills Formation				
1,309.19	1,294.00	Pierre Formation				
1,797.05	1,749.00	Upper Pierre aquifer				
2,222.44	2,144.00	Base of Upper Pierre aquifer				
3,708.63	3,524.00	Larimer ("Parkman") sandstone				
3,784.02	3,594.00	Pierre Formation				
5,054.81	4,774.00	Terry ("Sussex") sandstone				
5,291.74	4,994.00	Pierre Formation				
5,959.45	5,614.00	Hygiene ("Shannon") sandstone				
6,045.60	5,694.00	Pierre Formation				
7,587.15	7,064.00	Sharon Springs Member				
7,913.10	7,154.00	Niobrara Formation				

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	Start Build 2.00
1,489.50	1,463.42	-37.74	-201.18	Start 5737.61 hold at 1489.50 MD
7,227.10	6,791.08	-430.41	-2,294.50	Start DLS 10.00 TFO 11.39
7,913.10	7,154.00	-457.36	-2,827.94	Start DLS 0.00 TFO 90.00
21,505.33	7,154.00	-464.49	-16,420.16	TD at 21505.33