

US ROCKIES WATTENBERG PLANNING

**WELD-NAD83-UTMFT13N
2N-67W-20 ALFALFA 8-20HZ PAD
ALFALFA 20-2HZ**

Plan B

Plan: Permit Rev-1

Standard Planning Report

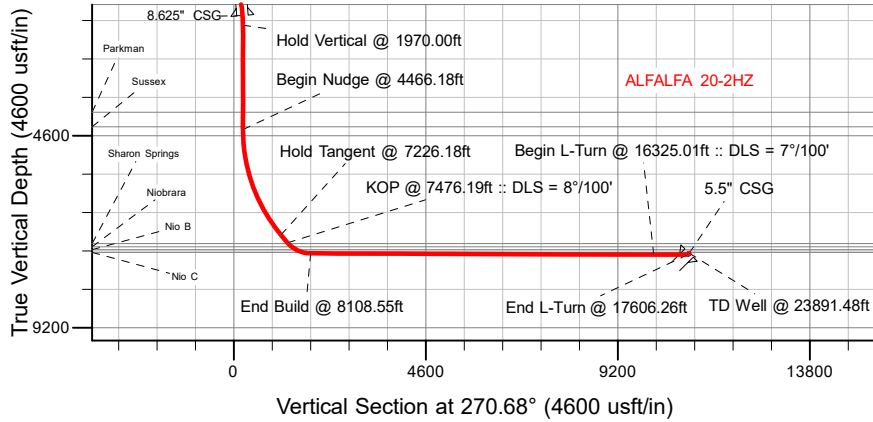
11 May, 2024

Project: WELD-NAD83-UTMFT13N
 Site: 2N-67W-20 ALFALFA 8-20HZ PAD
 Well: ALFALFA 20-2HZ
 Wellbore: Plan B
 Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

CASING DETAILS

TVD	MD	Name	Size
1721.00	1740.68	8.625" CSG	8-5/8
7411.00	23891.48	5.5" CSG	5-1/2

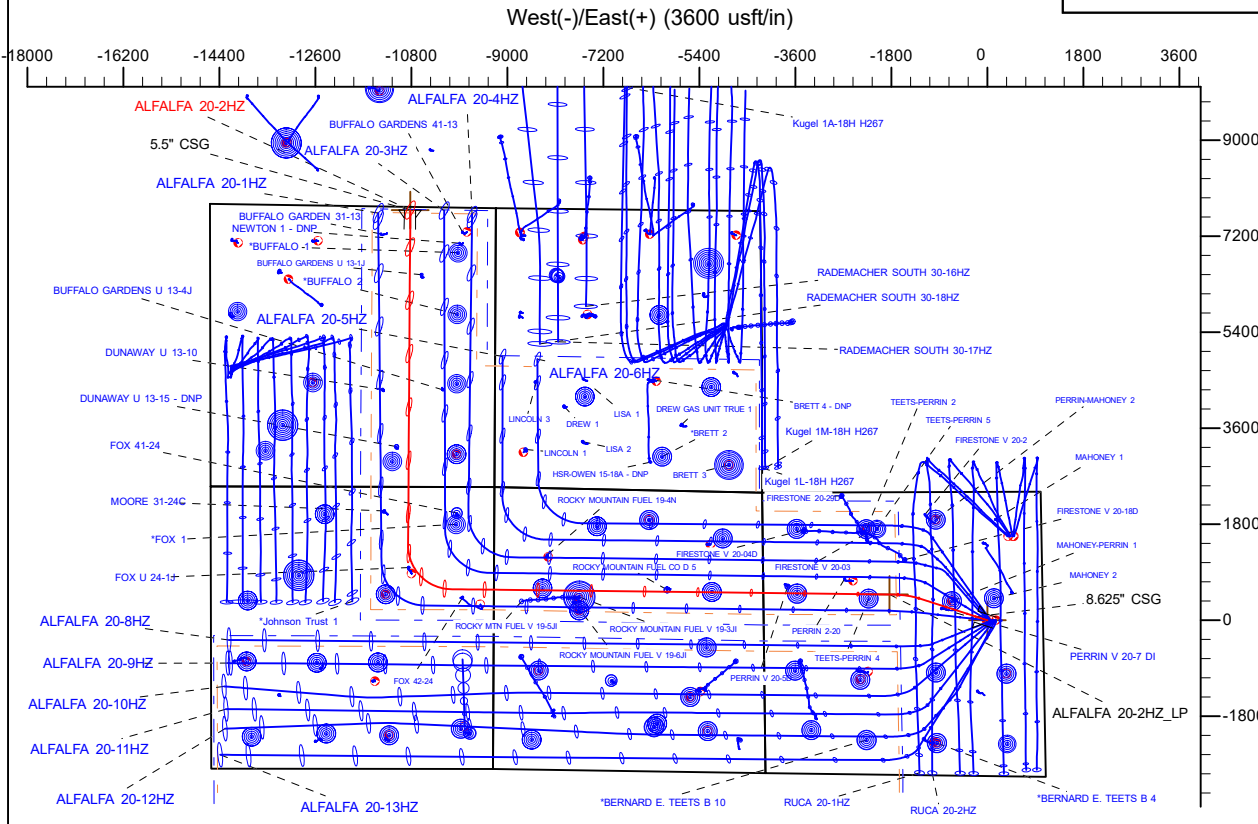


SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
220.00	0.00	0.00	220.00	0.00	0.00	0.00	0.00	0.00	
1220.00	15.00	287.80	1208.62	39.79	-123.92	1.50	287.80	124.39	
1970.00	0.00	0.00	1950.08	69.63	-216.87	2.00	180.00	217.68	
4466.18	0.00	0.00	4446.26	69.63	-216.87	0.00	0.00	217.68	
7226.18	41.40	287.80	6972.28	361.42	-1125.68	1.50	287.80	1129.89	
7476.19	41.40	287.80	7159.82	411.96	-1283.10	0.00	0.00	1287.90	
8108.55	89.78	270.68	7415.00	484.40	-1834.64	8.00	-22.40	1840.26	
16325.01	89.78	270.68	7446.55	581.91	-10050.46	0.00	0.00	10056.66	
17606.26	90.31	0.37	7445.24	1405.60	-10859.25	7.00	89.69	10875.17	
23891.48	90.31	0.37	7411.00	7690.60	-10819.07	0.00	0.00	10909.58	ALFALFA 20-2HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	Northing	Easting	Latitude	Longitude
ALFALFA 20-2HZ_SHL	0.00	14572100.49	1665885.95	40.124549	-104.908889
ALFALFA 20-2HZ_LP	7415.00	14572583.01	1664050.81	40.125879	-104.915452
ALFALFA 20-2HZ_BHL	7411.00	14579780.00	1655059.00	40.145662	-104.947604



SHL
2399' FNL
1059' FEL

LP
1915' FNL
2364' FWL

BHL
60' FNL
1604' FEL

WELL DETAILS: ALFALFA 20-2HZ

GL = 4976'

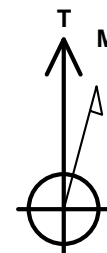
RKB = 17' @ 4993.00usft (RIG)

Plan: Permit Rev-1 (ALFALFA 20-2HZ/Plan B)

Date: 5/11/2024

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1073.00	1080.25	Fox Hills
4031.00	4050.92	Parkman
4384.00	4403.92	Sussex
7181.00	7504.90	Sharon Springs
7259.00	7621.36	Niobrara
7328.00	7748.67	Nio B
7393.00	7930.44	Nio C



Azimuths to True North
 Magnetic North: 7.70°

Magnetic Field
 Strength: 51593.2nT
 Dip Angle: 66.34°
 Date: 5/9/2023
 Model: IGRF2020

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well ALFALFA 20-2HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4993.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4993.00usft (RIG)
Site:	2N-67W-20 ALFALFA 8-20HZ PAD	North Reference:	True
Well:	ALFALFA 20-2HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan B		
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 2N-67W-20 ALFALFA 8-20HZ PAD			
Site Position:		Northing:	14,572,100.51 usft
From:	Map	Easting:	1,665,870.96 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	40.124550
		Longitude:	-104.908943

Well ALFALFA 20-2HZ			
Well Position	+N/-S	0.00 usft	Northing: 14,572,100.49 usft
	+E/-W	0.00 usft	Easting: 1,665,885.95 usft
Position Uncertainty		3.28 usft	Wellhead Elevation: usft
Grid Convergence:		0.06 °	Ground Level: 4,976.00 usft

Wellbore Plan B					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF202013	5/9/2023	7.70	66.34	51,593.15243985

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	270.68

Plan Survey Tool Program		Date 5/11/2024		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	1,721.00 Permit Rev-1 (Plan B)	APC_ISCWSA REV 2 MWD+I	Fixed:v2:crustal field declinatio
2	1,721.00	23,891.48 Permit Rev-1 (Plan B)	APC_ISCWSA REV 2 MWD+I	Fixed:v2:Rockies, crustal dec +

Planning Report

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Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4993.00usft (RIG)
Site:	2N-67W-20 ALFALFA 8-20HZ PAD	North Reference:	True
Well:	ALFALFA 20-2HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan B		
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	
220.00	0.00	0.00	220.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,220.00	15.00	287.80	1,208.62	39.79	-123.92	1.50	1.50	0.00	287.80	
1,970.00	0.00	0.00	1,950.08	69.63	-216.87	2.00	-2.00	0.00	180.00	
4,466.18	0.00	0.00	4,446.26	69.63	-216.87	0.00	0.00	0.00	0.00	
7,226.18	41.40	287.80	6,972.28	361.42	-1,125.68	1.50	1.50	0.00	287.80	
7,476.19	41.40	287.80	7,159.82	411.96	-1,283.10	0.00	0.00	0.00	0.00	
8,108.55	89.78	270.68	7,415.00	484.40	-1,834.64	8.00	7.65	-2.71	-22.40	
16,325.01	89.78	270.68	7,446.55	581.91	-10,050.46	0.00	0.00	0.00	0.00	
17,606.26	90.31	0.37	7,445.24	1,405.60	-10,859.25	7.00	0.04	7.00	89.69	
23,891.48	90.31	0.37	7,411.00	7,690.60	-10,819.07	0.00	0.00	0.00	0.00	ALFALFA 20-2HZ_BH

Planning Report

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Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4993.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4993.00usft (RIG)
Site:	2N-67W-20 ALFALFA 8-20HZ PAD	North Reference:	True
Well:	ALFALFA 20-2HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan B		
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	0.00
100.00	0.00	0.00	100.00	0.00	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	0.00
220.00	0.00	0.00	220.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 220.00ft										
300.00	1.20	287.80	299.99	0.26	-0.80	0.80	1.50	1.50	0.00	
400.00	2.70	287.80	399.93	1.30	-4.04	4.05	1.50	1.50	0.00	
500.00	4.20	287.80	499.75	3.14	-9.77	9.80	1.50	1.50	0.00	
600.00	5.70	287.80	599.37	5.77	-17.98	18.05	1.50	1.50	0.00	
700.00	7.20	287.80	698.74	9.21	-28.68	28.79	1.50	1.50	0.00	
800.00	8.70	287.80	797.77	13.44	-41.85	42.00	1.50	1.50	0.00	
900.00	10.20	287.80	896.41	18.45	-57.48	57.69	1.50	1.50	0.00	
1,000.00	11.70	287.80	994.59	24.26	-75.56	75.85	1.50	1.50	0.00	
1,080.25	12.90	287.80	1,073.00	29.49	-91.84	92.19	1.50	1.50	0.00	
Fox Hills										
1,100.00	13.20	287.80	1,092.24	30.85	-96.09	96.45	1.50	1.50	0.00	
1,200.00	14.70	287.80	1,189.28	38.22	-119.04	119.49	1.50	1.50	0.00	
1,220.00	15.00	287.80	1,208.62	39.79	-123.92	124.39	1.50	1.50	0.00	
Drop Vertical @ 1220.00ft										
1,300.00	13.40	287.80	1,286.17	45.79	-142.61	143.14	2.00	-2.00	0.00	
1,400.00	11.40	287.80	1,383.83	52.35	-163.05	163.66	2.00	-2.00	0.00	
1,500.00	9.40	287.80	1,482.18	57.87	-180.24	180.91	2.00	-2.00	0.00	
1,600.00	7.40	287.80	1,581.11	62.33	-194.15	194.87	2.00	-2.00	0.00	
1,700.00	5.40	287.80	1,680.48	65.74	-204.76	205.53	2.00	-2.00	0.00	
1,740.68	4.59	287.80	1,721.00	66.82	-208.13	208.91	2.00	-2.00	0.00	
8.625" CSG										
1,800.00	3.40	287.80	1,780.18	68.09	-212.06	212.86	2.00	-2.00	0.00	
1,900.00	1.40	287.80	1,880.08	69.37	-216.05	216.86	2.00	-2.00	0.00	
1,970.00	0.00	0.00	1,950.08	69.63	-216.87	217.68	2.00	-2.00	0.00	
Hold Vertical @ 1970.00ft										
2,000.00	0.00	0.00	1,980.08	69.63	-216.87	217.68	0.00	0.00	0.00	
2,100.00	0.00	0.00	2,080.08	69.63	-216.87	217.68	0.00	0.00	0.00	
2,200.00	0.00	0.00	2,180.08	69.63	-216.87	217.68	0.00	0.00	0.00	
2,300.00	0.00	0.00	2,280.08	69.63	-216.87	217.68	0.00	0.00	0.00	
2,400.00	0.00	0.00	2,380.08	69.63	-216.87	217.68	0.00	0.00	0.00	
2,500.00	0.00	0.00	2,480.08	69.63	-216.87	217.68	0.00	0.00	0.00	
2,600.00	0.00	0.00	2,580.08	69.63	-216.87	217.68	0.00	0.00	0.00	
2,700.00	0.00	0.00	2,680.08	69.63	-216.87	217.68	0.00	0.00	0.00	
2,800.00	0.00	0.00	2,780.08	69.63	-216.87	217.68	0.00	0.00	0.00	
2,900.00	0.00	0.00	2,880.08	69.63	-216.87	217.68	0.00	0.00	0.00	
3,000.00	0.00	0.00	2,980.08	69.63	-216.87	217.68	0.00	0.00	0.00	
3,100.00	0.00	0.00	3,080.08	69.63	-216.87	217.68	0.00	0.00	0.00	
3,200.00	0.00	0.00	3,180.08	69.63	-216.87	217.68	0.00	0.00	0.00	
3,300.00	0.00	0.00	3,280.08	69.63	-216.87	217.68	0.00	0.00	0.00	
3,400.00	0.00	0.00	3,380.08	69.63	-216.87	217.68	0.00	0.00	0.00	
3,500.00	0.00	0.00	3,480.08	69.63	-216.87	217.68	0.00	0.00	0.00	
3,600.00	0.00	0.00	3,580.08	69.63	-216.87	217.68	0.00	0.00	0.00	
3,700.00	0.00	0.00	3,680.08	69.63	-216.87	217.68	0.00	0.00	0.00	
3,800.00	0.00	0.00	3,780.08	69.63	-216.87	217.68	0.00	0.00	0.00	
3,900.00	0.00	0.00	3,880.08	69.63	-216.87	217.68	0.00	0.00	0.00	
4,000.00	0.00	0.00	3,980.08	69.63	-216.87	217.68	0.00	0.00	0.00	
4,050.92	0.00	0.00	4,031.00	69.63	-216.87	217.68	0.00	0.00	0.00	
Parkman										

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well ALFALFA 20-2HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4993.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4993.00usft (RIG)
Site:	2N-67W-20 ALFALFA 8-20HZ PAD	North Reference:	True
Well:	ALFALFA 20-2HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan B		
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)
4,100.00	0.00	0.00	4,080.08	69.63	-216.87	217.68	0.00	0.00	0.00
4,200.00	0.00	0.00	4,180.08	69.63	-216.87	217.68	0.00	0.00	0.00
4,300.00	0.00	0.00	4,280.08	69.63	-216.87	217.68	0.00	0.00	0.00
4,400.00	0.00	0.00	4,380.08	69.63	-216.87	217.68	0.00	0.00	0.00
4,403.92	0.00	0.00	4,384.00	69.63	-216.87	217.68	0.00	0.00	0.00
Sussex									
4,466.18	0.00	0.00	4,446.26	69.63	-216.87	217.68	0.00	0.00	0.00
Begin Nudge @ 4466.18ft									
4,500.00	0.51	287.80	4,480.08	69.67	-217.01	217.82	1.50	1.50	0.00
4,600.00	2.01	287.80	4,580.05	70.34	-219.10	219.92	1.50	1.50	0.00
4,700.00	3.51	287.80	4,679.93	71.81	-223.68	224.51	1.50	1.50	0.00
4,800.00	5.01	287.80	4,779.65	74.08	-230.75	231.61	1.50	1.50	0.00
4,900.00	6.51	287.80	4,879.15	77.15	-240.30	241.20	1.50	1.50	0.00
5,000.00	8.01	287.80	4,978.34	81.01	-252.32	253.27	1.50	1.50	0.00
5,100.00	9.51	287.80	5,077.17	85.67	-266.82	267.82	1.50	1.50	0.00
5,200.00	11.01	287.80	5,175.57	91.11	-283.77	284.83	1.50	1.50	0.00
5,300.00	12.51	287.80	5,273.47	97.34	-303.17	304.31	1.50	1.50	0.00
5,400.00	14.01	287.80	5,370.80	104.35	-325.01	326.22	1.50	1.50	0.00
5,500.00	15.51	287.80	5,467.50	112.14	-349.26	350.57	1.50	1.50	0.00
5,600.00	17.01	287.80	5,563.50	120.69	-375.91	377.32	1.50	1.50	0.00
5,700.00	18.51	287.80	5,658.73	130.02	-404.95	406.47	1.50	1.50	0.00
5,800.00	20.01	287.80	5,753.14	140.10	-436.35	437.99	1.50	1.50	0.00
5,900.00	21.51	287.80	5,846.64	150.93	-470.10	471.86	1.50	1.50	0.00
6,000.00	23.01	287.80	5,939.19	162.51	-506.16	508.05	1.50	1.50	0.00
6,100.00	24.51	287.80	6,030.71	174.83	-544.52	546.55	1.50	1.50	0.00
6,200.00	26.01	287.80	6,121.15	187.87	-585.14	587.33	1.50	1.50	0.00
6,300.00	27.51	287.80	6,210.44	201.63	-628.01	630.35	1.50	1.50	0.00
6,400.00	29.01	287.80	6,298.52	216.10	-673.08	675.60	1.50	1.50	0.00
6,500.00	30.51	287.80	6,385.33	231.27	-720.34	723.03	1.50	1.50	0.00
6,600.00	32.01	287.80	6,470.81	247.14	-769.74	772.62	1.50	1.50	0.00
6,700.00	33.51	287.80	6,554.91	263.68	-821.26	824.33	1.50	1.50	0.00
6,800.00	35.01	287.80	6,637.56	280.88	-874.85	878.12	1.50	1.50	0.00
6,900.00	36.51	287.80	6,718.70	298.75	-930.49	933.97	1.50	1.50	0.00
7,000.00	38.01	287.80	6,798.30	317.25	-988.13	991.82	1.50	1.50	0.00
7,100.00	39.51	287.80	6,876.27	336.39	-1,047.73	1,051.65	1.50	1.50	0.00
7,200.00	41.01	287.80	6,952.59	356.14	-1,109.26	1,113.41	1.50	1.50	0.00
7,226.18	41.40	287.80	6,972.28	361.42	-1,125.68	1,129.89	1.50	1.50	0.00
Hold Tangent @ 7226.18ft									
7,300.00	41.40	287.80	7,027.66	376.34	-1,172.16	1,176.54	0.00	0.00	0.00
7,400.00	41.40	287.80	7,102.67	396.56	-1,235.12	1,239.74	0.00	0.00	0.00
7,476.19	41.40	287.80	7,159.82	411.96	-1,283.10	1,287.90	0.00	0.00	0.00
KOP @ 7476.19ft :: DLS = 8°/100'									
7,500.00	43.17	286.74	7,177.43	416.71	-1,298.39	1,303.25	8.00	7.42	-4.45
7,504.90	43.53	286.53	7,181.00	417.67	-1,301.62	1,306.49	8.00	7.44	-4.28
Sharon Springs									
7,550.00	46.90	284.72	7,212.76	426.28	-1,332.44	1,337.41	8.00	7.48	-4.01
7,600.00	50.67	282.94	7,245.70	435.25	-1,368.96	1,374.03	8.00	7.54	-3.57
7,621.36	52.29	282.24	7,259.00	438.89	-1,385.27	1,390.38	8.00	7.57	-3.29
Niobrara									
7,650.00	54.47	281.34	7,276.09	443.59	-1,407.77	1,412.94	8.00	7.60	-3.13
7,700.00	58.28	279.88	7,303.77	451.24	-1,448.68	1,453.94	8.00	7.62	-2.91
7,748.67	62.00	278.58	7,328.00	458.00	-1,490.34	1,495.67	8.00	7.65	-2.68
Nio B									

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well ALFALFA 20-2HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4993.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4993.00usft (RIG)
Site:	2N-67W-20 ALFALFA 8-20HZ PAD	North Reference:	True
Well:	ALFALFA 20-2HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan B		
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)	
7,750.00	62.10	278.54	7,328.63	458.18	-1,491.50	1,496.83	8.00	7.67	-2.58	
7,800.00	65.94	277.30	7,350.52	464.36	-1,536.01	1,541.41	8.00	7.68	-2.50	
7,850.00	69.79	276.12	7,369.35	469.77	-1,582.00	1,587.47	8.00	7.70	-2.35	
7,900.00	73.65	275.00	7,385.03	474.36	-1,629.25	1,634.76	8.00	7.71	-2.24	
7,930.44	76.00	274.34	7,393.00	476.75	-1,658.52	1,664.06	8.00	7.72	-2.16	
Nio C										
7,950.00	77.51	273.93	7,397.48	478.13	-1,677.51	1,683.07	8.00	7.73	-2.13	
8,000.00	81.38	272.89	7,406.64	481.05	-1,726.57	1,732.16	8.00	7.73	-2.09	
8,050.00	85.25	271.86	7,412.46	483.10	-1,776.18	1,781.79	8.00	7.74	-2.04	
8,100.00	89.12	270.85	7,414.92	484.28	-1,826.09	1,831.71	8.00	7.74	-2.02	
8,108.55	89.78	270.68	7,415.00	484.40	-1,834.64	1,840.26	8.00	7.74	-2.02	
End Build @ 8108.55ft										
8,200.00	89.78	270.68	7,415.35	485.48	-1,926.09	1,931.71	0.00	0.00	0.00	
8,300.00	89.78	270.68	7,415.73	486.67	-2,026.08	2,031.71	0.00	0.00	0.00	
8,400.00	89.78	270.68	7,416.12	487.86	-2,126.07	2,131.71	0.00	0.00	0.00	
8,500.00	89.78	270.68	7,416.50	489.04	-2,226.06	2,231.71	0.00	0.00	0.00	
8,600.00	89.78	270.68	7,416.89	490.23	-2,326.06	2,331.71	0.00	0.00	0.00	
8,700.00	89.78	270.68	7,417.27	491.42	-2,426.05	2,431.71	0.00	0.00	0.00	
8,800.00	89.78	270.68	7,417.65	492.60	-2,526.04	2,531.71	0.00	0.00	0.00	
8,900.00	89.78	270.68	7,418.04	493.79	-2,626.03	2,631.71	0.00	0.00	0.00	
9,000.00	89.78	270.68	7,418.42	494.98	-2,726.02	2,731.71	0.00	0.00	0.00	
9,100.00	89.78	270.68	7,418.81	496.16	-2,826.02	2,831.71	0.00	0.00	0.00	
9,200.00	89.78	270.68	7,419.19	497.35	-2,926.01	2,931.71	0.00	0.00	0.00	
9,300.00	89.78	270.68	7,419.57	498.54	-3,026.00	3,031.70	0.00	0.00	0.00	
9,400.00	89.78	270.68	7,419.96	499.72	-3,125.99	3,131.70	0.00	0.00	0.00	
9,500.00	89.78	270.68	7,420.34	500.91	-3,225.99	3,231.70	0.00	0.00	0.00	
9,600.00	89.78	270.68	7,420.73	502.10	-3,325.98	3,331.70	0.00	0.00	0.00	
9,700.00	89.78	270.68	7,421.11	503.28	-3,425.97	3,431.70	0.00	0.00	0.00	
9,800.00	89.78	270.68	7,421.49	504.47	-3,525.96	3,531.70	0.00	0.00	0.00	
9,900.00	89.78	270.68	7,421.88	505.66	-3,625.95	3,631.70	0.00	0.00	0.00	
10,000.00	89.78	270.68	7,422.26	506.84	-3,725.95	3,731.70	0.00	0.00	0.00	
10,100.00	89.78	270.68	7,422.65	508.03	-3,825.94	3,831.70	0.00	0.00	0.00	
10,200.00	89.78	270.68	7,423.03	509.22	-3,925.93	3,931.70	0.00	0.00	0.00	
10,300.00	89.78	270.68	7,423.41	510.40	-4,025.92	4,031.70	0.00	0.00	0.00	
10,400.00	89.78	270.68	7,423.80	511.59	-4,125.92	4,131.70	0.00	0.00	0.00	
10,500.00	89.78	270.68	7,424.18	512.78	-4,225.91	4,231.70	0.00	0.00	0.00	
10,600.00	89.78	270.68	7,424.57	513.97	-4,325.90	4,331.69	0.00	0.00	0.00	
10,700.00	89.78	270.68	7,424.95	515.15	-4,425.89	4,431.69	0.00	0.00	0.00	
10,800.00	89.78	270.68	7,425.33	516.34	-4,525.88	4,531.69	0.00	0.00	0.00	
10,900.00	89.78	270.68	7,425.72	517.53	-4,625.88	4,631.69	0.00	0.00	0.00	
11,000.00	89.78	270.68	7,426.10	518.71	-4,725.87	4,731.69	0.00	0.00	0.00	
11,100.00	89.78	270.68	7,426.49	519.90	-4,825.86	4,831.69	0.00	0.00	0.00	
11,200.00	89.78	270.68	7,426.87	521.09	-4,925.85	4,931.69	0.00	0.00	0.00	
11,300.00	89.78	270.68	7,427.25	522.27	-5,025.85	5,031.69	0.00	0.00	0.00	
11,400.00	89.78	270.68	7,427.64	523.46	-5,125.84	5,131.69	0.00	0.00	0.00	
11,500.00	89.78	270.68	7,428.02	524.65	-5,225.83	5,231.69	0.00	0.00	0.00	
11,600.00	89.78	270.68	7,428.40	525.83	-5,325.82	5,331.69	0.00	0.00	0.00	
11,700.00	89.78	270.68	7,428.79	527.02	-5,425.81	5,431.69	0.00	0.00	0.00	
11,800.00	89.78	270.68	7,429.17	528.21	-5,525.81	5,531.69	0.00	0.00	0.00	
11,900.00	89.78	270.68	7,429.56	529.39	-5,625.80	5,631.69	0.00	0.00	0.00	
12,000.00	89.78	270.68	7,429.94	530.58	-5,725.79	5,731.68	0.00	0.00	0.00	
12,100.00	89.78	270.68	7,430.32	531.77	-5,825.78	5,831.68	0.00	0.00	0.00	
12,200.00	89.78	270.68	7,430.71	532.95	-5,925.78	5,931.68	0.00	0.00	0.00	
12,300.00	89.78	270.68	7,431.09	534.14	-6,025.77	6,031.68	0.00	0.00	0.00	

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well ALFALFA 20-2HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4993.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4993.00usft (RIG)
Site:	2N-67W-20 ALFALFA 8-20HZ PAD	North Reference:	True
Well:	ALFALFA 20-2HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan B		
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)
12,400.00	89.78	270.68	7,431.48	535.33	-6,125.76	6,131.68	0.00	0.00	0.00
12,500.00	89.78	270.68	7,431.86	536.51	-6,225.75	6,231.68	0.00	0.00	0.00
12,600.00	89.78	270.68	7,432.24	537.70	-6,325.74	6,331.68	0.00	0.00	0.00
12,700.00	89.78	270.68	7,432.63	538.89	-6,425.74	6,431.68	0.00	0.00	0.00
12,800.00	89.78	270.68	7,433.01	540.07	-6,525.73	6,531.68	0.00	0.00	0.00
12,900.00	89.78	270.68	7,433.40	541.26	-6,625.72	6,631.68	0.00	0.00	0.00
13,000.00	89.78	270.68	7,433.78	542.45	-6,725.71	6,731.68	0.00	0.00	0.00
13,100.00	89.78	270.68	7,434.16	543.63	-6,825.71	6,831.68	0.00	0.00	0.00
13,200.00	89.78	270.68	7,434.55	544.82	-6,925.70	6,931.68	0.00	0.00	0.00
13,300.00	89.78	270.68	7,434.93	546.01	-7,025.69	7,031.67	0.00	0.00	0.00
13,400.00	89.78	270.68	7,435.32	547.20	-7,125.68	7,131.67	0.00	0.00	0.00
13,500.00	89.78	270.68	7,435.70	548.38	-7,225.67	7,231.67	0.00	0.00	0.00
13,600.00	89.78	270.68	7,436.08	549.57	-7,325.67	7,331.67	0.00	0.00	0.00
13,700.00	89.78	270.68	7,436.47	550.76	-7,425.66	7,431.67	0.00	0.00	0.00
13,800.00	89.78	270.68	7,436.85	551.94	-7,525.65	7,531.67	0.00	0.00	0.00
13,900.00	89.78	270.68	7,437.24	553.13	-7,625.64	7,631.67	0.00	0.00	0.00
14,000.00	89.78	270.68	7,437.62	554.32	-7,725.64	7,731.67	0.00	0.00	0.00
14,100.00	89.78	270.68	7,438.00	555.50	-7,825.63	7,831.67	0.00	0.00	0.00
14,200.00	89.78	270.68	7,438.39	556.69	-7,925.62	7,931.67	0.00	0.00	0.00
14,300.00	89.78	270.68	7,438.77	557.88	-8,025.61	8,031.67	0.00	0.00	0.00
14,400.00	89.78	270.68	7,439.16	559.06	-8,125.60	8,131.67	0.00	0.00	0.00
14,500.00	89.78	270.68	7,439.54	560.25	-8,225.60	8,231.67	0.00	0.00	0.00
14,600.00	89.78	270.68	7,439.92	561.44	-8,325.59	8,331.67	0.00	0.00	0.00
14,700.00	89.78	270.68	7,440.31	562.62	-8,425.58	8,431.66	0.00	0.00	0.00
14,800.00	89.78	270.68	7,440.69	563.81	-8,525.57	8,531.66	0.00	0.00	0.00
14,900.00	89.78	270.68	7,441.08	565.00	-8,625.57	8,631.66	0.00	0.00	0.00
15,000.00	89.78	270.68	7,441.46	566.18	-8,725.56	8,731.66	0.00	0.00	0.00
15,100.00	89.78	270.68	7,441.84	567.37	-8,825.55	8,831.66	0.00	0.00	0.00
15,200.00	89.78	270.68	7,442.23	568.56	-8,925.54	8,931.66	0.00	0.00	0.00
15,300.00	89.78	270.68	7,442.61	569.74	-9,025.53	9,031.66	0.00	0.00	0.00
15,400.00	89.78	270.68	7,443.00	570.93	-9,125.53	9,131.66	0.00	0.00	0.00
15,500.00	89.78	270.68	7,443.38	572.12	-9,225.52	9,231.66	0.00	0.00	0.00
15,600.00	89.78	270.68	7,443.76	573.30	-9,325.51	9,331.66	0.00	0.00	0.00
15,700.00	89.78	270.68	7,444.15	574.49	-9,425.50	9,431.66	0.00	0.00	0.00
15,800.00	89.78	270.68	7,444.53	575.68	-9,525.50	9,531.66	0.00	0.00	0.00
15,900.00	89.78	270.68	7,444.92	576.87	-9,625.49	9,631.66	0.00	0.00	0.00
16,000.00	89.78	270.68	7,445.30	578.05	-9,725.48	9,731.66	0.00	0.00	0.00
16,100.00	89.78	270.68	7,445.68	579.24	-9,825.47	9,831.65	0.00	0.00	0.00
16,200.00	89.78	270.68	7,446.07	580.43	-9,925.46	9,931.65	0.00	0.00	0.00
16,300.00	89.78	270.68	7,446.45	581.61	-10,025.46	10,031.65	0.00	0.00	0.00
16,325.01	89.78	270.68	7,446.55	581.91	-10,050.46	10,056.66	0.00	0.00	0.00
Begin L-Turn @ 16325.01ft :: DLS = 7°/100'									
16,350.00	89.79	272.43	7,446.64	582.59	-10,075.44	10,081.65	7.00	0.04	7.00
16,400.00	89.81	275.93	7,446.82	586.23	-10,125.30	10,131.55	7.00	0.04	7.00
16,450.00	89.83	279.43	7,446.97	592.91	-10,174.85	10,181.17	7.00	0.04	7.00
16,500.00	89.85	282.93	7,447.11	602.60	-10,223.89	10,230.32	7.00	0.04	7.00
16,550.00	89.87	286.43	7,447.23	615.27	-10,272.25	10,278.83	7.00	0.04	7.00
16,600.00	89.90	289.93	7,447.33	630.87	-10,319.75	10,326.51	7.00	0.04	7.00
16,650.00	89.92	293.43	7,447.41	649.34	-10,366.20	10,373.18	7.00	0.05	7.00
16,700.00	89.94	296.93	7,447.48	670.61	-10,411.45	10,418.67	7.00	0.05	7.00
16,750.00	89.96	300.43	7,447.52	694.60	-10,455.30	10,462.81	7.00	0.05	7.00
16,800.00	89.99	303.93	7,447.54	721.22	-10,497.62	10,505.44	7.00	0.05	7.00
16,850.00	90.01	307.43	7,447.54	750.38	-10,538.23	10,546.39	7.00	0.05	7.00

Planning Report

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Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4993.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4993.00usft (RIG)
Site:	2N-67W-20 ALFALFA 8-20HZ PAD	North Reference:	True
Well:	ALFALFA 20-2HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan B		
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)
16,900.00	90.03	310.93	7,447.52	781.96	-10,576.98	10,585.51	7.00	0.05	7.00
16,950.00	90.06	314.43	7,447.48	815.85	-10,613.73	10,622.67	7.00	0.05	7.00
17,000.00	90.08	317.93	7,447.42	851.92	-10,648.35	10,657.71	7.00	0.05	7.00
17,050.00	90.10	321.43	7,447.34	890.04	-10,680.70	10,690.51	7.00	0.05	7.00
17,100.00	90.13	324.93	7,447.24	930.05	-10,710.66	10,720.94	7.00	0.04	7.00
17,150.00	90.15	328.43	7,447.12	971.83	-10,738.12	10,748.90	7.00	0.04	7.00
17,200.00	90.17	331.93	7,446.98	1,015.20	-10,762.98	10,774.27	7.00	0.04	7.00
17,250.00	90.19	335.43	7,446.82	1,060.01	-10,785.15	10,796.97	7.00	0.04	7.00
17,300.00	90.21	338.93	7,446.65	1,106.09	-10,804.54	10,816.90	7.00	0.04	7.00
17,350.00	90.23	342.43	7,446.46	1,153.26	-10,821.08	10,834.00	7.00	0.04	7.00
17,400.00	90.25	345.93	7,446.25	1,201.36	-10,834.71	10,848.20	7.00	0.04	7.00
17,450.00	90.26	349.43	7,446.03	1,250.20	-10,845.38	10,859.45	7.00	0.03	7.00
17,500.00	90.28	352.93	7,445.79	1,299.60	-10,853.04	10,867.70	7.00	0.03	7.00
17,550.00	90.30	356.43	7,445.54	1,349.38	-10,857.68	10,872.93	7.00	0.03	7.00
17,600.00	90.31	359.93	7,445.27	1,399.34	-10,859.27	10,875.11	7.00	0.03	7.00
17,606.26	90.31	0.37	7,445.24	1,405.60	-10,859.25	10,875.17	7.00	0.03	7.00
End L-Turn @ 17606.26ft									
17,700.00	90.31	0.37	7,444.73	1,499.34	-10,858.65	10,875.68	0.00	0.00	0.00
17,800.00	90.31	0.37	7,444.18	1,599.34	-10,858.01	10,876.23	0.00	0.00	0.00
17,900.00	90.31	0.37	7,443.64	1,699.33	-10,857.37	10,876.78	0.00	0.00	0.00
18,000.00	90.31	0.37	7,443.09	1,799.33	-10,856.74	10,877.33	0.00	0.00	0.00
18,100.00	90.31	0.37	7,442.55	1,899.33	-10,856.10	10,877.87	0.00	0.00	0.00
18,200.00	90.31	0.37	7,442.00	1,999.32	-10,855.46	10,878.42	0.00	0.00	0.00
18,300.00	90.31	0.37	7,441.46	2,099.32	-10,854.82	10,878.97	0.00	0.00	0.00
18,400.00	90.31	0.37	7,440.91	2,199.32	-10,854.18	10,879.52	0.00	0.00	0.00
18,500.00	90.31	0.37	7,440.37	2,299.31	-10,853.54	10,880.06	0.00	0.00	0.00
18,600.00	90.31	0.37	7,439.83	2,399.31	-10,852.90	10,880.61	0.00	0.00	0.00
18,700.00	90.31	0.37	7,439.28	2,499.31	-10,852.26	10,881.16	0.00	0.00	0.00
18,800.00	90.31	0.37	7,438.74	2,599.30	-10,851.62	10,881.71	0.00	0.00	0.00
18,900.00	90.31	0.37	7,438.19	2,699.30	-10,850.98	10,882.25	0.00	0.00	0.00
19,000.00	90.31	0.37	7,437.65	2,799.29	-10,850.34	10,882.80	0.00	0.00	0.00
19,100.00	90.31	0.37	7,437.10	2,899.29	-10,849.70	10,883.35	0.00	0.00	0.00
19,200.00	90.31	0.37	7,436.56	2,999.29	-10,849.06	10,883.90	0.00	0.00	0.00
19,300.00	90.31	0.37	7,436.01	3,099.28	-10,848.43	10,884.44	0.00	0.00	0.00
19,400.00	90.31	0.37	7,435.47	3,199.28	-10,847.79	10,884.99	0.00	0.00	0.00
19,500.00	90.31	0.37	7,434.92	3,299.28	-10,847.15	10,885.54	0.00	0.00	0.00
19,600.00	90.31	0.37	7,434.38	3,399.27	-10,846.51	10,886.09	0.00	0.00	0.00
19,700.00	90.31	0.37	7,433.83	3,499.27	-10,845.87	10,886.63	0.00	0.00	0.00
19,800.00	90.31	0.37	7,433.29	3,599.27	-10,845.23	10,887.18	0.00	0.00	0.00
19,900.00	90.31	0.37	7,432.74	3,699.26	-10,844.59	10,887.73	0.00	0.00	0.00
20,000.00	90.31	0.37	7,432.20	3,799.26	-10,843.95	10,888.28	0.00	0.00	0.00
20,100.00	90.31	0.37	7,431.65	3,899.26	-10,843.31	10,888.82	0.00	0.00	0.00
20,200.00	90.31	0.37	7,431.11	3,999.25	-10,842.67	10,889.37	0.00	0.00	0.00
20,300.00	90.31	0.37	7,430.56	4,099.25	-10,842.03	10,889.92	0.00	0.00	0.00
20,400.00	90.31	0.37	7,430.02	4,199.25	-10,841.39	10,890.47	0.00	0.00	0.00
20,500.00	90.31	0.37	7,429.48	4,299.24	-10,840.75	10,891.01	0.00	0.00	0.00
20,600.00	90.31	0.37	7,428.93	4,399.24	-10,840.12	10,891.56	0.00	0.00	0.00
20,700.00	90.31	0.37	7,428.39	4,499.23	-10,839.48	10,892.11	0.00	0.00	0.00
20,800.00	90.31	0.37	7,427.84	4,599.23	-10,838.84	10,892.66	0.00	0.00	0.00
20,900.00	90.31	0.37	7,427.30	4,699.23	-10,838.20	10,893.20	0.00	0.00	0.00
21,000.00	90.31	0.37	7,426.75	4,799.22	-10,837.56	10,893.75	0.00	0.00	0.00
21,100.00	90.31	0.37	7,426.21	4,899.22	-10,836.92	10,894.30	0.00	0.00	0.00
21,200.00	90.31	0.37	7,425.66	4,999.22	-10,836.28	10,894.85	0.00	0.00	0.00
21,300.00	90.31	0.37	7,425.12	5,099.21	-10,835.64	10,895.39	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well ALFALFA 20-2HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4993.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4993.00usft (RIG)
Site:	2N-67W-20 ALFALFA 8-20HZ PAD	North Reference:	True
Well:	ALFALFA 20-2HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan B		
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)
21,400.00	90.31	0.37	7,424.57	5,199.21	-10,835.00	10,895.94	0.00	0.00	0.00
21,500.00	90.31	0.37	7,424.03	5,299.21	-10,834.36	10,896.49	0.00	0.00	0.00
21,600.00	90.31	0.37	7,423.48	5,399.20	-10,833.72	10,897.04	0.00	0.00	0.00
21,700.00	90.31	0.37	7,422.94	5,499.20	-10,833.08	10,897.58	0.00	0.00	0.00
21,800.00	90.31	0.37	7,422.39	5,599.20	-10,832.44	10,898.13	0.00	0.00	0.00
21,900.00	90.31	0.37	7,421.85	5,699.19	-10,831.80	10,898.68	0.00	0.00	0.00
22,000.00	90.31	0.37	7,421.30	5,799.19	-10,831.17	10,899.23	0.00	0.00	0.00
22,100.00	90.31	0.37	7,420.76	5,899.19	-10,830.53	10,899.77	0.00	0.00	0.00
22,200.00	90.31	0.37	7,420.21	5,999.18	-10,829.89	10,900.32	0.00	0.00	0.00
22,300.00	90.31	0.37	7,419.67	6,099.18	-10,829.25	10,900.87	0.00	0.00	0.00
22,400.00	90.31	0.37	7,419.12	6,199.17	-10,828.61	10,901.42	0.00	0.00	0.00
22,500.00	90.31	0.37	7,418.58	6,299.17	-10,827.97	10,901.96	0.00	0.00	0.00
22,600.00	90.31	0.37	7,418.04	6,399.17	-10,827.33	10,902.51	0.00	0.00	0.00
22,700.00	90.31	0.37	7,417.49	6,499.16	-10,826.69	10,903.06	0.00	0.00	0.00
22,800.00	90.31	0.37	7,416.95	6,599.16	-10,826.05	10,903.61	0.00	0.00	0.00
22,900.00	90.31	0.37	7,416.40	6,699.16	-10,825.41	10,904.16	0.00	0.00	0.00
23,000.00	90.31	0.37	7,415.86	6,799.15	-10,824.77	10,904.70	0.00	0.00	0.00
23,100.00	90.31	0.37	7,415.31	6,899.15	-10,824.13	10,905.25	0.00	0.00	0.00
23,200.00	90.31	0.37	7,414.77	6,999.15	-10,823.49	10,905.80	0.00	0.00	0.00
23,300.00	90.31	0.37	7,414.22	7,099.14	-10,822.86	10,906.35	0.00	0.00	0.00
23,400.00	90.31	0.37	7,413.68	7,199.14	-10,822.22	10,906.89	0.00	0.00	0.00
23,500.00	90.31	0.37	7,413.13	7,299.14	-10,821.58	10,907.44	0.00	0.00	0.00
23,600.00	90.31	0.37	7,412.59	7,399.13	-10,820.94	10,907.99	0.00	0.00	0.00
23,700.00	90.31	0.37	7,412.04	7,499.13	-10,820.30	10,908.54	0.00	0.00	0.00
23,800.00	90.31	0.37	7,411.50	7,599.13	-10,819.66	10,909.08	0.00	0.00	0.00
23,891.48	90.31	0.37	7,411.00	7,690.60	-10,819.07	10,909.58	0.00	0.00	0.00
TD Well @ 23891.48ft - 5.5" CSG									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,740.68	1,721.00	8.625" CSG	8-5/8	12-1/4	
23,891.48	7,411.00	5.5" CSG	5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,080.25	1,073.00	Fox Hills				
4,050.92	4,031.00	Parkman				
4,403.92	4,384.00	Sussex				
7,504.90	7,181.00	Sharon Springs				
7,621.36	7,259.00	Niobrara				
7,748.67	7,328.00	Nio B				
7,930.44	7,393.00	Nio C				

Planning Report

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Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4993.00usft (RIG)
Site:	2N-67W-20 ALFALFA 8-20HZ PAD	North Reference:	True
Well:	ALFALFA 20-2HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan B		
Design:	Permit Rev-1		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
220.00	220.00	0.00	0.00	Begin Nudge @ 220.00ft
1,220.00	1,208.62	39.79	-123.92	Drop Vertical @ 1220.00ft
1,970.00	1,950.08	69.63	-216.87	Hold Vertical @ 1970.00ft
4,466.18	4,446.26	69.63	-216.87	Begin Nudge @ 4466.18ft
7,226.18	6,972.28	361.42	-1,125.68	Hold Tangent @ 7226.18ft
7,476.19	7,159.82	411.96	-1,283.10	KOP @ 7476.19ft :: DLS = 8°/100'
8,108.55	7,415.00	484.40	-1,834.64	End Build @ 8108.55ft
16,325.01	7,446.55	581.91	-10,050.46	Begin L-Turn @ 16325.01ft :: DLS = 7°/100'
17,606.26	7,445.24	1,405.60	-10,859.25	End Build @ 17606.26ft
23,891.48	7,411.00	7,690.60	-10,819.07	TD Well @ 23891.48ft