

**Weatherford**

Project: COLORADO NORTHERN ZONE - 83  
 Site: WELD\_NICHOLS 6-8HZ PAD  
 Well: NICHOLS 3N-5HZ  
 Wellbore: Wellbore #1  
 Section: Sec. 8-T2N-R65W  
 SHL: 2245' FNL 2406' FWL  
 Design: ACTUAL  
 Latitude: 40.154354  
 Longitude: -104.688559  
 GL: 4912.00  
 KB: 25' RKB + 4912' GL @ 4937.00ft (H&P 307)



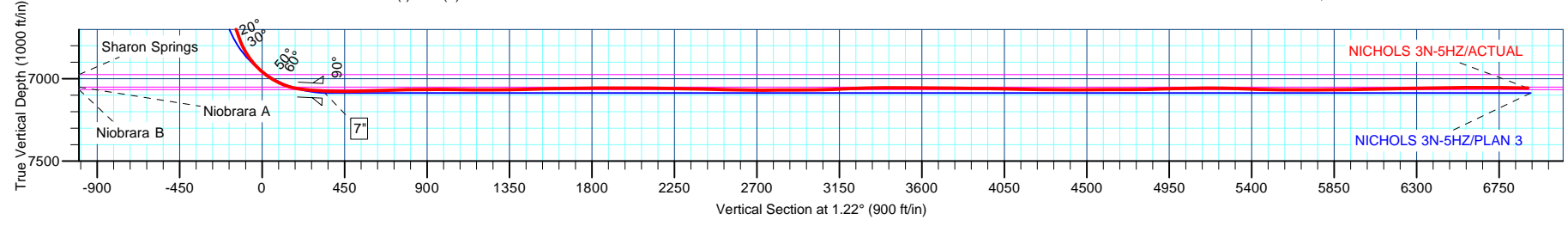
WELL DETAILS: NICHOLS 3N-5HZ						
+N/-S	+E/-W	Northing	Ground Level: Easting	4912.00	Latitude	Slot
0.00	0.00	1300112.19	3226810.42	40.154354	-104.688559	

ANNOTATIONS								
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation
835.00	835.00	0.21	64.46	-0.32	-0.94	-0.34	2.22	TIE ON TO SURFACE GYRO
951.00	951.00	0.38	263.55	-0.27	-1.13	-0.29	2.82	FIRST WFT MWD SURVEY
7073.37	7376.17	86.07	2.45	313.81	-387.65	305.49	978.18	7" CASING SET
7056.37	13933.00	88.89	1.56	6859.95	-255.15	6852.96	7533.66	LAST WFT MWD SURVEY
7057.27	13987.00	89.20	0.74	6913.93	-254.07	6906.95	7587.65	PROJECTION TO TD

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)						
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Nichols 3N-5HZ Revised BHL #2	7088.00	6930.00	-265.00	40.173378	-104.689507	Point

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
3961.00	3999.05	Parkman
4502.00	4540.12	Sussex
6975.00	7066.35	Sharon Springs
7051.00	7223.17	Niobrara A
7066.00	7298.45	Niobrara B

CASING DETAILS			
TVD	MD	Name	Size
7073.37	7376.17	7"	7"





**Weatherford®**

## **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_NICHOLS 6-8HZ PAD**

**NICHOLS 3N-5HZ**

**Wellbore #1**

**Design: ACTUAL**

## **Standard Survey Report**

**30 January, 2013**

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NICHOLS 3N-5HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Site:</b>	WELD_NICHOLS 6-8HZ PAD	<b>MD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Well:</b>	NICHOLS 3N-5HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

<b>Project</b>	COLORADO NORTHERN ZONE - 83		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

<b>Site</b>	WELD_NICHOLS 6-8HZ PAD, Sec. 8-T2N-R65W				
<b>Site Position:</b>		<b>Northing:</b>	1,300,112.19 usft	<b>Latitude:</b>	40.154354
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,226,810.42 usft	<b>Longitude:</b>	-104.688559
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.52 °

<b>Well</b>	NICHOLS 3N-5HZ					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	1,300,112.19 usft	<b>Latitude:</b>	40.154354
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	3,226,810.42 usft	<b>Longitude:</b>	-104.688559
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	4,912.00 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	11/29/2012	8.61	66.81	52,856

<b>Design</b>	ACTUAL				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	25.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	25.00	0.00	0.00	1.22	

<b>Survey Program</b>	<b>Date</b>	1/29/2013			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
125.00	835.00	Survey #1 (Wellbore #1)	NS-GYRO-MS	NORTH SENSING GYROCOMPASSING M/S	
951.00	13,987.00	Survey #2 (Wellbore #1)	MWD+IFR	MWD + IFR CORRECTION	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
25.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125.00	0.34	164.38	125.00	-0.29	0.08	-0.28	0.34	0.34	0.00	
225.00	0.07	254.18	225.00	-0.59	0.10	-0.59	0.35	-0.27	89.80	
325.00	0.14	272.74	325.00	-0.60	-0.08	-0.60	0.08	0.07	18.56	
425.00	0.29	232.00	425.00	-0.75	-0.40	-0.76	0.21	0.15	-40.74	
525.00	0.05	328.58	525.00	-0.87	-0.62	-0.88	0.30	-0.24	96.58	
625.00	0.16	313.35	625.00	-0.73	-0.75	-0.75	0.11	0.11	-15.23	
725.00	0.17	328.71	725.00	-0.51	-0.93	-0.53	0.05	0.01	15.36	
825.00	0.08	40.15	825.00	-0.33	-0.96	-0.35	0.16	-0.09	71.44	
835.00	0.21	64.46	835.00	-0.32	-0.94	-0.34	1.41	1.30	243.10	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NICHOLS 3N-5HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Site:</b>	WELD_NICHOLS 6-8HZ PAD	<b>MD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Well:</b>	NICHOLS 3N-5HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
<b>TIE ON TO SURFACE GYRO</b>									
951.00	0.38	263.55	951.00	-0.27	-1.13	-0.29	0.50	0.15	-138.72
<b>FIRST WFT MWD SURVEY</b>									
1,043.00	2.39	254.29	1,042.96	-0.82	-3.28	-0.89	2.19	2.18	-10.07
1,135.00	4.28	247.09	1,134.80	-2.68	-8.29	-2.86	2.10	2.05	-7.83
1,226.00	5.81	246.01	1,225.45	-5.87	-15.62	-6.21	1.68	1.68	-1.19
1,318.00	7.40	246.03	1,316.84	-10.17	-25.29	-10.71	1.73	1.73	0.02
1,410.00	9.20	239.94	1,407.87	-16.27	-37.07	-17.05	2.17	1.96	-6.62
1,502.00	11.76	240.24	1,498.33	-24.61	-51.58	-25.70	2.78	2.78	0.33
1,593.00	12.59	245.70	1,587.28	-33.29	-68.67	-34.74	1.56	0.91	6.00
1,686.00	13.88	243.68	1,677.81	-42.41	-87.91	-44.27	1.47	1.39	-2.17
1,777.00	12.68	236.34	1,766.38	-52.78	-106.00	-55.03	2.27	-1.32	-8.07
1,869.00	10.63	241.89	1,856.48	-62.38	-121.90	-64.96	2.54	-2.23	6.03
1,964.00	8.85	245.55	1,950.11	-69.53	-136.28	-72.42	1.98	-1.87	3.85
2,249.00	6.74	236.70	2,232.47	-87.79	-170.22	-91.40	0.85	-0.74	-3.11
2,344.00	7.76	232.60	2,326.71	-94.75	-179.97	-98.56	1.20	1.07	-4.32
2,439.00	9.39	239.83	2,420.65	-102.54	-191.77	-106.60	2.05	1.72	7.61
2,534.00	9.60	239.73	2,514.35	-110.43	-205.31	-114.77	0.22	0.22	-0.11
2,629.00	10.15	239.71	2,607.94	-118.64	-219.38	-123.29	0.58	0.58	-0.02
2,724.00	10.93	240.63	2,701.34	-127.28	-234.46	-132.25	0.84	0.82	0.97
2,820.00	11.31	243.94	2,795.54	-135.88	-250.85	-141.19	0.77	0.40	3.45
2,915.00	12.89	243.33	2,888.42	-144.73	-268.68	-150.42	1.67	1.66	-0.64
3,011.00	12.52	243.77	2,982.07	-154.14	-287.59	-160.22	0.40	-0.39	0.46
3,105.00	11.80	242.76	3,073.96	-163.04	-305.27	-169.50	0.80	-0.77	-1.07
3,201.00	9.58	251.79	3,168.30	-170.03	-321.59	-176.84	2.89	-2.31	9.41
3,295.00	7.07	254.45	3,261.30	-174.02	-334.60	-181.11	2.70	-2.67	2.83
3,391.00	6.07	247.90	3,356.67	-177.52	-344.99	-184.82	1.30	-1.04	-6.82
3,485.00	7.21	248.23	3,450.04	-181.58	-355.08	-189.09	1.21	1.21	0.35
3,581.00	8.39	250.95	3,545.15	-186.10	-367.29	-193.87	1.29	1.23	2.83
3,675.00	6.98	251.28	3,638.30	-190.17	-379.18	-198.20	1.50	-1.50	0.35
3,771.00	6.01	251.86	3,733.68	-193.60	-389.48	-201.85	1.01	-1.01	0.60
3,865.00	4.94	252.94	3,827.25	-196.32	-398.03	-204.75	1.14	-1.14	1.15
3,961.00	3.42	274.46	3,923.00	-197.31	-404.84	-205.89	2.25	-1.58	22.42
4,055.00	1.02	287.48	4,016.92	-196.85	-408.43	-205.50	2.59	-2.55	13.85
4,150.00	0.38	76.04	4,111.92	-196.52	-408.93	-205.18	1.43	-0.67	156.38
4,245.00	0.79	46.55	4,206.91	-195.99	-408.15	-204.63	0.52	0.43	-31.04
4,340.00	1.42	341.81	4,301.90	-194.42	-408.04	-203.06	1.37	0.66	-68.15
4,434.00	0.36	331.36	4,395.89	-193.05	-408.55	-201.71	1.14	-1.13	-11.12
4,529.00	1.22	348.84	4,490.88	-191.80	-408.89	-200.46	0.93	0.91	18.40
4,624.00	0.50	59.70	4,585.87	-190.60	-408.72	-199.26	1.22	-0.76	74.59
4,720.00	0.66	26.13	4,681.86	-189.89	-408.12	-198.54	0.38	0.17	-34.97
4,815.00	1.19	344.63	4,776.85	-188.45	-408.14	-197.10	0.86	0.56	-43.68
4,910.00	1.22	340.74	4,871.83	-186.54	-408.73	-195.20	0.09	0.03	-4.09

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NICHOLS 3N-5HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Site:</b>	WELD_NICHOLS 6-8HZ PAD	<b>MD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Well:</b>	NICHOLS 3N-5HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,004.00	1.22	325.35	4,965.81	-184.77	-409.63	-193.45	0.35	0.00	-16.37	
5,099.00	0.78	153.02	5,060.80	-184.52	-409.91	-193.20	2.10	-0.46	-181.40	
5,194.00	1.39	14.88	5,155.80	-183.98	-409.33	-192.65	2.15	0.64	-145.41	
5,289.00	0.36	20.55	5,250.78	-182.59	-408.92	-191.25	1.09	-1.08	5.97	
5,384.00	1.07	22.17	5,345.78	-181.49	-408.49	-190.14	0.75	0.75	1.71	
5,478.00	0.80	22.66	5,439.76	-180.07	-407.90	-188.71	0.29	-0.29	0.52	
5,573.00	1.05	353.37	5,534.75	-178.59	-407.75	-187.23	0.55	0.26	-30.83	
5,668.00	0.63	271.52	5,629.74	-177.71	-408.37	-186.37	1.21	-0.44	-86.16	
5,763.00	0.66	297.83	5,724.74	-177.44	-409.37	-186.12	0.31	0.03	27.69	
5,858.00	0.84	308.35	5,819.73	-176.76	-410.40	-185.46	0.24	0.19	11.07	
5,953.00	0.43	322.12	5,914.72	-176.04	-411.17	-184.76	0.46	-0.43	14.49	
6,048.00	0.78	9.40	6,009.72	-175.12	-411.28	-183.84	0.61	0.37	49.77	
6,144.00	0.89	36.05	6,105.71	-173.88	-410.74	-182.58	0.42	0.11	27.76	
6,238.00	0.76	338.22	6,199.70	-172.71	-410.54	-181.41	0.86	-0.14	-61.52	
6,333.00	0.55	313.76	6,294.69	-171.81	-411.10	-180.52	0.36	-0.22	-25.75	
6,428.00	0.75	354.69	6,389.69	-170.87	-411.49	-179.60	0.52	0.21	43.08	
6,491.00	0.51	318.72	6,452.68	-170.25	-411.71	-178.98	0.72	-0.38	-57.10	
6,536.00	0.56	325.20	6,497.68	-169.92	-411.97	-178.65	0.17	0.11	14.40	
6,567.00	3.63	351.15	6,528.66	-168.83	-412.21	-177.56	10.12	9.90	83.71	
6,599.00	7.82	356.65	6,560.49	-165.65	-412.49	-174.40	13.19	13.09	17.19	
6,631.00	10.09	2.50	6,592.10	-160.68	-412.50	-169.42	7.63	7.09	18.28	
6,662.00	13.12	2.95	6,622.46	-154.45	-412.20	-163.19	9.78	9.77	1.45	
6,694.00	14.43	3.77	6,653.54	-146.84	-411.75	-155.58	4.14	4.09	2.56	
6,726.00	16.51	2.99	6,684.38	-138.32	-411.25	-147.05	6.53	6.50	-2.44	
6,757.00	18.63	3.17	6,713.93	-128.98	-410.74	-137.69	6.84	6.84	0.58	
6,789.00	17.86	1.53	6,744.32	-118.97	-410.33	-127.68	2.89	-2.41	-5.13	
6,821.00	19.28	358.83	6,774.66	-108.78	-410.31	-117.49	5.19	4.44	-8.44	
6,852.00	22.99	0.52	6,803.57	-97.61	-410.36	-106.32	12.13	11.97	5.45	
6,884.00	26.75	0.38	6,832.60	-84.15	-410.25	-92.87	11.75	11.75	-0.44	
6,915.00	30.56	2.25	6,859.79	-69.29	-409.90	-78.01	12.62	12.29	6.03	
6,947.00	33.97	3.08	6,886.85	-52.23	-409.10	-60.93	10.75	10.66	2.59	
6,978.00	38.18	5.68	6,911.90	-34.04	-407.68	-42.71	14.45	13.58	8.39	
7,010.00	42.85	7.08	6,936.22	-13.39	-405.36	-22.02	14.87	14.59	4.38	
7,041.00	46.93	7.29	6,958.18	8.31	-402.62	-0.26	13.17	13.16	0.68	
7,073.00	50.74	5.14	6,979.24	32.25	-400.03	23.73	12.93	11.91	-6.72	
7,104.00	54.79	2.81	6,998.00	56.87	-398.33	48.37	14.37	13.06	-7.52	
7,136.00	59.20	1.54	7,015.42	83.68	-397.32	75.20	14.18	13.78	-3.97	
7,168.00	63.69	1.52	7,030.72	111.77	-396.57	103.30	14.03	14.03	-0.06	
7,199.00	69.21	2.13	7,043.10	140.16	-395.66	131.70	17.90	17.81	1.97	
7,231.00	73.71	2.66	7,053.27	170.47	-394.39	162.03	14.15	14.06	1.66	
7,263.00	79.10	3.26	7,060.79	201.52	-392.79	193.11	16.94	16.84	1.88	
7,295.00	83.55	2.92	7,065.61	233.10	-391.08	224.72	13.95	13.91	-1.06	
7,332.00	84.11	2.21	7,069.59	269.84	-389.44	261.49	2.44	1.51	-1.92	
7,376.17	86.07	2.45	7,073.37	313.81	-387.65	305.49	4.47	4.44	0.53	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NICHOLS 3N-5HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Site:</b>	WELD_NICHOLS 6-8HZ PAD	<b>MD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Well:</b>	NICHOLS 3N-5HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
<b>7" CASING SET</b>									
7,394.00	86.86	2.54	7,074.47	331.59	-386.87	323.28	4.47	4.44	0.53
7,485.00	89.45	1.31	7,077.40	422.48	-383.82	414.22	3.15	2.85	-1.35
7,577.00	91.79	0.93	7,076.40	514.46	-382.02	506.20	2.58	2.54	-0.41
7,669.00	91.85	359.85	7,073.48	606.41	-381.40	598.15	1.18	0.07	-1.17
7,761.00	92.03	359.45	7,070.37	698.35	-381.96	690.06	0.48	0.20	-0.43
7,852.00	90.68	358.72	7,068.22	789.31	-383.41	780.97	1.69	-1.48	-0.80
7,943.00	91.17	358.27	7,066.75	880.27	-385.80	871.85	0.73	0.54	-0.49
8,036.00	89.94	358.76	7,065.85	973.23	-388.21	964.74	1.42	-1.32	0.53
8,128.00	89.32	358.79	7,066.44	1,065.21	-390.18	1,056.66	0.67	-0.67	0.03
8,219.00	88.70	358.85	7,068.01	1,156.17	-392.05	1,147.56	0.68	-0.68	0.07
8,311.00	90.68	0.68	7,068.51	1,248.16	-392.43	1,239.52	2.93	2.15	1.99
8,403.00	90.68	0.23	7,067.42	1,340.15	-391.70	1,331.51	0.49	0.00	-0.49
8,495.00	91.54	0.42	7,065.64	1,432.13	-391.18	1,423.48	0.96	0.93	0.21
8,587.00	91.73	0.18	7,063.01	1,524.09	-390.69	1,515.43	0.33	0.21	-0.26
8,678.00	91.94	0.33	7,060.10	1,615.05	-390.29	1,606.37	0.28	0.23	0.16
8,768.00	90.43	359.77	7,058.24	1,705.02	-390.21	1,696.33	1.79	-1.68	-0.62
8,859.00	89.82	359.37	7,058.04	1,796.02	-390.89	1,787.29	0.80	-0.67	-0.44
8,951.00	89.81	359.40	7,058.34	1,888.01	-391.88	1,879.24	0.03	-0.01	0.03
9,046.00	90.19	359.42	7,058.34	1,983.01	-392.86	1,974.20	0.40	0.40	0.02
9,140.00	90.25	358.66	7,057.97	2,077.00	-394.44	2,068.13	0.81	0.06	-0.81
9,236.00	88.95	358.58	7,058.64	2,172.96	-396.75	2,164.02	1.36	-1.35	-0.08
9,331.00	88.71	357.88	7,060.58	2,267.90	-399.68	2,258.87	0.78	-0.25	-0.74
9,426.00	88.71	358.08	7,062.72	2,362.81	-403.03	2,353.70	0.21	0.00	0.21
9,521.00	88.64	357.88	7,064.92	2,457.73	-406.38	2,448.52	0.22	-0.07	-0.21
9,615.00	88.33	357.72	7,067.40	2,551.63	-409.98	2,542.32	0.37	-0.33	-0.17
9,710.00	89.32	357.22	7,069.35	2,646.51	-414.18	2,637.09	1.17	1.04	-0.53
9,805.00	89.75	357.17	7,070.12	2,741.40	-418.82	2,731.86	0.46	0.45	-0.05
9,900.00	90.49	356.97	7,069.93	2,836.27	-423.68	2,826.61	0.81	0.78	-0.21
9,995.00	90.12	356.64	7,069.42	2,931.12	-428.98	2,921.32	0.52	-0.39	-0.35
10,091.00	91.30	357.77	7,068.23	3,027.00	-433.66	3,017.08	1.70	1.23	1.18
10,186.00	92.34	358.25	7,065.21	3,121.89	-436.95	3,111.88	1.21	1.09	0.51
10,281.00	92.84	1.08	7,060.92	3,216.78	-437.51	3,206.74	3.02	0.53	2.98
10,376.00	91.66	1.11	7,057.19	3,311.69	-435.69	3,301.66	1.24	-1.24	0.03
10,471.00	90.31	1.33	7,055.56	3,406.65	-433.67	3,396.65	1.44	-1.42	0.23
10,566.00	89.88	1.61	7,055.40	3,501.62	-431.24	3,491.64	0.54	-0.45	0.29
10,661.00	89.38	1.02	7,056.01	3,596.59	-429.06	3,586.64	0.81	-0.53	-0.62
10,757.00	89.14	0.58	7,057.25	3,692.57	-427.71	3,682.63	0.52	-0.25	-0.46
10,851.00	89.14	0.61	7,058.66	3,788.56	-426.74	3,776.61	0.03	0.00	0.03
10,946.00	89.75	0.51	7,059.58	3,881.55	-425.81	3,871.60	0.65	0.64	-0.11
11,041.00	88.71	0.44	7,060.86	3,976.54	-425.02	3,966.59	1.10	-1.09	-0.07
11,135.00	88.95	0.75	7,062.78	4,070.51	-424.05	4,060.56	0.42	0.26	0.33
11,230.00	88.83	2.04	7,064.62	4,165.46	-421.73	4,155.54	1.36	-0.13	1.36

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NICHOLS 3N-5HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Site:</b>	WELD_NICHOLS 6-8HZ PAD	<b>MD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Well:</b>	NICHOLS 3N-5HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
11,325.00	89.14	0.93	7,066.30	4,260.41	-419.27	4,250.52	1.21	0.33	-1.17	
11,421.00	89.20	2.17	7,067.69	4,356.37	-416.68	4,346.51	1.29	0.06	1.29	
11,517.00	90.12	3.36	7,068.26	4,452.25	-412.05	4,442.47	1.57	0.96	1.24	
11,612.00	90.74	3.16	7,067.55	4,547.09	-406.64	4,537.41	0.69	0.65	-0.21	
11,706.00	90.18	1.36	7,066.79	4,641.01	-402.94	4,631.38	2.01	-0.60	-1.91	
11,803.00	90.12	2.01	7,066.54	4,737.97	-400.09	4,728.38	0.67	-0.06	0.67	
11,898.00	91.23	358.48	7,065.42	4,832.95	-399.68	4,823.34	3.89	1.17	-3.72	
11,992.00	92.22	358.30	7,062.59	4,926.87	-402.32	4,917.18	1.07	1.05	-0.19	
12,087.00	91.30	359.22	7,059.67	5,021.80	-404.37	5,012.05	1.37	-0.97	0.97	
12,182.00	90.19	1.15	7,058.44	5,116.78	-404.07	5,107.02	2.34	-1.17	2.03	
12,276.00	89.94	3.45	7,058.33	5,210.70	-400.29	5,201.00	2.46	-0.27	2.45	
12,371.00	88.21	3.64	7,059.87	5,305.50	-394.42	5,295.90	1.83	-1.82	0.20	
12,466.00	87.47	6.11	7,063.45	5,400.08	-386.35	5,390.63	2.71	-0.78	2.60	
12,560.00	89.12	5.80	7,066.24	5,493.53	-376.61	5,484.27	1.79	1.76	-0.33	
12,655.00	89.44	6.74	7,067.44	5,587.96	-366.23	5,578.89	1.05	0.34	0.99	
12,750.00	89.88	6.80	7,068.00	5,682.29	-355.03	5,673.44	0.47	0.46	0.06	
12,846.00	90.12	6.60	7,068.00	5,777.64	-343.83	5,769.00	0.33	0.25	-0.21	
12,941.00	90.79	8.09	7,067.25	5,871.85	-331.69	5,863.46	1.72	0.71	1.57	
13,036.00	91.05	9.09	7,065.72	5,965.77	-317.50	5,957.66	1.09	0.27	1.05	
13,131.00	90.68	7.09	7,064.29	6,059.81	-304.13	6,051.96	2.14	-0.39	-2.11	
13,226.00	90.86	4.71	7,063.01	6,154.29	-294.37	6,146.63	2.51	0.19	-2.51	
13,321.00	91.60	4.33	7,060.97	6,248.97	-286.89	6,241.45	0.88	0.78	-0.40	
13,416.00	92.28	4.33	7,057.75	6,343.65	-279.72	6,336.25	0.72	0.72	0.00	
13,511.00	91.29	3.65	7,054.80	6,438.37	-273.11	6,431.09	1.26	-1.04	-0.72	
13,607.00	89.45	2.61	7,054.18	6,534.22	-267.87	6,527.03	2.20	-1.92	-1.08	
13,701.00	89.69	2.16	7,054.88	6,628.13	-263.96	6,621.01	0.54	0.26	-0.48	
13,796.00	90.49	2.30	7,054.73	6,723.06	-260.26	6,716.00	0.85	0.84	0.15	
13,890.00	88.64	2.21	7,055.45	6,816.98	-256.56	6,809.97	1.97	-1.97	-0.10	
13,933.00	88.89	1.56	7,056.37	6,859.95	-255.15	6,852.96	1.62	0.58	-1.51	
<b>LAST WFT MWD SURVEY</b>										
13,987.00	89.20	0.74	7,057.27	6,913.93	-254.07	6,906.95	1.62	0.57	-1.52	
<b>PROJECTION TO TD</b>										

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,376.17	7,073.37	7"	7	8-3/4	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NICHOLS 3N-5HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Site:</b>	WELD_NICHOLS 6-8HZ PAD	<b>MD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Well:</b>	NICHOLS 3N-5HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,999.05	3,881.00	Parkman				
4,540.13	4,422.00	Sussex				
7,066.36	6,895.00	Sharon Springs				
7,223.17	6,971.00	Niobrara A				
7,298.45	6,986.00	Niobrara B				

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
835.00	835.00	-0.32	-0.94	TIE ON TO SURFACE GYRO	
951.00	951.00	-0.27	-1.13	FIRST WFT MWD SURVEY	
7,376.17	7,073.37	313.81	-387.65	7" CASING SET	
13,933.00	7,056.37	6,859.95	-255.15	LAST WFT MWD SURVEY	
13,987.00	7,057.27	6,913.93	-254.07	PROJECTION TO TD	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



**Weatherford®**

## **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_NICHOLS 6-8HZ PAD**

**NICHOLS 3N-5HZ**

**Wellbore #1**

**Design: ACTUAL**

## **Survey Report - Geographic**

**30 January, 2013**



<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NICHOLS 3N-5HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Site:</b>	WELD_NICHOLS 6-8HZ PAD	<b>MD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Well:</b>	NICHOLS 3N-5HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

<b>Project</b>	COLORADO NORTHERN ZONE - 83		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

<b>Site</b>	WELD_NICHOLS 6-8HZ PAD, Sec. 8-T2N-R65W				
<b>Site Position:</b>		<b>Northing:</b>	1,300,112.19 usft	<b>Latitude:</b>	40.154354
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,226,810.42 usft	<b>Longitude:</b>	-104.688559
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.52 °

<b>Well</b>	NICHOLS 3N-5HZ					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	1,300,112.19 usft	<b>Latitude:</b>	40.154354
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	3,226,810.42 usft	<b>Longitude:</b>	-104.688559
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	4,912.00 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	11/29/2012	8.61	66.81	52,856

<b>Design</b>	ACTUAL				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	25.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	25.00	0.00	0.00	1.22	

<b>Survey Program</b>	<b>Date</b>	1/29/2013			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
125.00	835.00	Survey #1 (Wellbore #1)	NS-GYRO-MS	NORTH SENSING GYROCOMPASSING M/S	
951.00	13,987.00	Survey #2 (Wellbore #1)	MWD+IFR	MWD + IFR CORRECTION	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>	
25.00	0.00	0.00	25.00	0.00	0.00	1,300,112.19	3,226,810.42	40.154354	-104.688559	
125.00	0.34	164.38	125.00	-0.29	0.08	1,300,111.90	3,226,810.50	40.154353	-104.688559	
225.00	0.07	254.18	225.00	-0.59	0.10	1,300,111.60	3,226,810.53	40.154352	-104.688559	
325.00	0.14	272.74	325.00	-0.60	-0.08	1,300,111.59	3,226,810.35	40.154352	-104.688560	
425.00	0.29	232.00	425.00	-0.75	-0.40	1,300,111.43	3,226,810.03	40.154352	-104.688561	
525.00	0.05	328.58	525.00	-0.87	-0.62	1,300,111.31	3,226,809.81	40.154352	-104.688561	
625.00	0.16	313.35	625.00	-0.73	-0.75	1,300,111.44	3,226,809.68	40.154352	-104.688562	
725.00	0.17	328.71	725.00	-0.51	-0.93	1,300,111.67	3,226,809.50	40.154353	-104.688563	
825.00	0.08	40.15	825.00	-0.33	-0.96	1,300,111.85	3,226,809.47	40.154353	-104.688563	
835.00	0.21	64.46	835.00	-0.32	-0.94	1,300,111.86	3,226,809.49	40.154353	-104.688563	
<b>TIE ON TO SURFACE GYRO</b>										

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NICHOLS 3N-5HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Site:</b>	WELD_NICHOLS 6-8HZ PAD	<b>MD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Well:</b>	NICHOLS 3N-5HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
951.00	0.38	263.55	951.00	-0.27	-1.13	1,300,111.91	3,226,809.30	40.154353	-104.688563	
<b>FIRST WFT MWD SURVEY</b>										
1,043.00	2.39	254.29	1,042.96	-0.82	-3.28	1,300,111.33	3,226,807.15	40.154352	-104.688571	
1,135.00	4.28	247.09	1,134.80	-2.68	-8.29	1,300,109.43	3,226,802.16	40.154347	-104.688589	
1,226.00	5.81	246.01	1,225.45	-5.87	-15.62	1,300,106.17	3,226,794.85	40.154338	-104.688615	
1,318.00	7.40	246.03	1,316.84	-10.17	-25.29	1,300,101.78	3,226,785.22	40.154326	-104.688650	
1,410.00	9.20	239.94	1,407.87	-16.27	-37.07	1,300,095.58	3,226,773.50	40.154309	-104.688692	
1,502.00	11.76	240.24	1,498.33	-24.61	-51.58	1,300,087.11	3,226,759.07	40.154287	-104.688744	
1,593.00	12.59	245.70	1,587.28	-33.29	-68.67	1,300,078.27	3,226,742.06	40.154263	-104.688805	
1,686.00	13.88	243.68	1,677.81	-42.41	-87.91	1,300,068.98	3,226,722.91	40.154238	-104.688874	
1,777.00	12.68	236.34	1,766.38	-52.78	-106.00	1,300,058.43	3,226,704.91	40.154209	-104.688939	
1,869.00	10.63	241.89	1,856.48	-62.38	-121.90	1,300,048.69	3,226,689.10	40.154183	-104.688995	
1,964.00	8.85	245.55	1,950.11	-69.53	-136.28	1,300,041.41	3,226,674.79	40.154163	-104.689047	
2,249.00	6.74	236.70	2,232.47	-87.79	-170.22	1,300,022.84	3,226,641.01	40.154113	-104.689168	
2,344.00	7.76	232.60	2,326.71	-94.75	-179.97	1,300,015.79	3,226,631.32	40.154094	-104.689203	
2,439.00	9.39	239.83	2,420.65	-102.54	-191.77	1,300,007.90	3,226,619.60	40.154073	-104.689245	
2,534.00	9.60	239.73	2,514.35	-110.43	-205.31	1,299,999.88	3,226,606.13	40.154051	-104.689294	
2,629.00	10.15	239.71	2,607.94	-118.64	-219.38	1,299,991.54	3,226,592.14	40.154028	-104.689344	
2,724.00	10.93	240.63	2,701.34	-127.28	-234.46	1,299,982.76	3,226,577.14	40.154005	-104.689398	
2,820.00	11.31	243.94	2,795.54	-135.88	-250.85	1,299,974.01	3,226,560.83	40.153981	-104.689457	
2,915.00	12.89	243.33	2,888.42	-144.73	-268.68	1,299,965.00	3,226,543.07	40.153957	-104.689520	
3,011.00	12.52	243.77	2,982.07	-154.14	-287.59	1,299,955.43	3,226,524.26	40.153931	-104.689588	
3,105.00	11.80	242.76	3,073.96	-163.04	-305.27	1,299,946.36	3,226,506.65	40.153906	-104.689651	
3,201.00	9.58	251.79	3,168.30	-170.03	-321.59	1,299,939.22	3,226,490.40	40.153887	-104.689710	
3,295.00	7.07	254.45	3,261.30	-174.02	-334.60	1,299,935.11	3,226,477.43	40.153876	-104.689756	
3,391.00	6.07	247.90	3,356.67	-177.52	-344.99	1,299,931.52	3,226,467.07	40.153867	-104.689793	
3,485.00	7.21	248.23	3,450.04	-181.58	-355.08	1,299,927.37	3,226,457.02	40.153856	-104.689830	
3,581.00	8.39	250.95	3,545.15	-186.10	-367.29	1,299,922.74	3,226,444.85	40.153843	-104.689873	
3,675.00	6.98	251.28	3,638.30	-190.17	-379.18	1,299,918.56	3,226,433.00	40.153832	-104.689916	
3,771.00	6.01	251.86	3,733.68	-193.60	-389.48	1,299,915.03	3,226,422.73	40.153823	-104.689953	
3,865.00	4.94	252.94	3,827.25	-196.32	-398.03	1,299,912.23	3,226,414.21	40.153815	-104.689983	
3,961.00	3.42	274.46	3,923.00	-197.31	-404.84	1,299,911.18	3,226,407.41	40.153812	-104.690008	
4,055.00	1.02	287.48	4,016.92	-196.85	-408.43	1,299,911.61	3,226,403.81	40.153814	-104.690020	
4,150.00	0.38	76.04	4,111.92	-196.52	-408.93	1,299,911.94	3,226,403.31	40.153815	-104.690022	
4,245.00	0.79	46.55	4,206.91	-195.99	-408.15	1,299,912.47	3,226,404.08	40.153816	-104.690019	
4,340.00	1.42	341.81	4,301.90	-194.42	-408.04	1,299,914.04	3,226,404.18	40.153820	-104.690019	
4,434.00	0.36	331.36	4,395.89	-193.05	-408.55	1,299,915.40	3,226,403.66	40.153824	-104.690021	
4,529.00	1.22	348.84	4,490.88	-191.80	-408.89	1,299,916.65	3,226,403.31	40.153828	-104.690022	
4,624.00	0.50	59.70	4,585.87	-190.60	-408.72	1,299,917.86	3,226,403.46	40.153831	-104.690021	
4,720.00	0.66	26.13	4,681.86	-189.89	-408.12	1,299,918.57	3,226,404.06	40.153833	-104.690019	
4,815.00	1.19	344.63	4,776.85	-188.45	-408.14	1,299,920.01	3,226,404.03	40.153837	-104.690019	
4,910.00	1.22	340.74	4,871.83	-186.54	-408.73	1,299,921.91	3,226,403.41	40.153842	-104.690022	
5,004.00	1.22	325.35	4,965.81	-184.77	-409.63	1,299,923.67	3,226,402.50	40.153847	-104.690025	
5,099.00	0.78	153.02	5,060.80	-184.52	-409.91	1,299,923.92	3,226,402.21	40.153848	-104.690026	
5,194.00	1.39	14.88	5,155.80	-183.98	-409.33	1,299,924.47	3,226,402.80	40.153849	-104.690024	
5,289.00	0.36	20.55	5,250.78	-182.59	-408.92	1,299,925.86	3,226,403.19	40.153853	-104.690022	
5,384.00	1.07	22.17	5,345.78	-181.49	-408.49	1,299,926.97	3,226,403.62	40.153856	-104.690021	
5,478.00	0.80	22.66	5,439.76	-180.07	-407.90	1,299,928.39	3,226,404.19	40.153860	-104.690019	
5,573.00	1.05	353.37	5,534.75	-178.59	-407.75	1,299,929.87	3,226,404.33	40.153864	-104.690018	
5,668.00	0.63	271.52	5,629.74	-177.71	-408.37	1,299,930.74	3,226,403.70	40.153866	-104.690020	
5,763.00	0.66	297.83	5,724.74	-177.44	-409.37	1,299,931.00	3,226,402.69	40.153867	-104.690024	
5,858.00	0.84	308.35	5,819.73	-176.76	-410.40	1,299,931.68	3,226,401.65	40.153869	-104.690028	
5,953.00	0.43	322.12	5,914.72	-176.04	-411.17	1,299,932.39	3,226,400.88	40.153871	-104.690030	
6,048.00	0.78	9.40	6,009.72	-175.12	-411.28	1,299,933.31	3,226,400.76	40.153873	-104.690031	
6,144.00	0.89	36.05	6,105.71	-173.88	-410.74	1,299,934.56	3,226,401.29	40.153877	-104.690029	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NICHOLS 3N-5HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Site:</b>	WELD_NICHOLS 6-8HZ PAD	<b>MD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Well:</b>	NICHOLS 3N-5HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
6,238.00	0.76	338.22	6,199.70	-172.71	-410.54	1,299,935.73	3,226,401.48	40.153880	-104.690028	
6,333.00	0.55	313.76	6,294.69	-171.81	-411.10	1,299,936.62	3,226,400.91	40.153882	-104.690030	
6,428.00	0.75	354.69	6,389.69	-170.87	-411.49	1,299,937.55	3,226,400.51	40.153885	-104.690031	
6,491.00	0.51	318.72	6,452.68	-170.25	-411.71	1,299,938.17	3,226,400.29	40.153887	-104.690032	
6,536.00	0.56	325.20	6,497.68	-169.92	-411.97	1,299,938.50	3,226,400.03	40.153888	-104.690033	
6,567.00	3.63	351.15	6,528.66	-168.83	-412.21	1,299,939.59	3,226,399.78	40.153891	-104.690034	
6,599.00	7.82	356.65	6,560.49	-165.65	-412.49	1,299,942.77	3,226,399.47	40.153899	-104.690035	
6,631.00	10.09	2.50	6,592.10	-160.68	-412.50	1,299,947.74	3,226,399.42	40.153913	-104.690035	
6,662.00	13.12	2.95	6,622.46	-154.45	-412.20	1,299,953.97	3,226,399.66	40.153930	-104.690034	
6,694.00	14.43	3.77	6,653.54	-146.84	-411.75	1,299,961.58	3,226,400.04	40.153951	-104.690032	
6,726.00	16.51	2.99	6,684.38	-138.32	-411.25	1,299,970.11	3,226,400.46	40.153974	-104.690031	
6,757.00	18.63	3.17	6,713.93	-128.98	-410.74	1,299,979.45	3,226,400.88	40.154000	-104.690029	
6,789.00	17.86	1.53	6,744.32	-118.97	-410.33	1,299,989.47	3,226,401.20	40.154027	-104.690027	
6,821.00	19.28	358.83	6,774.66	-108.78	-410.31	1,299,999.65	3,226,401.13	40.154055	-104.690027	
6,852.00	22.99	0.52	6,803.57	-97.61	-410.36	1,300,010.83	3,226,400.98	40.154086	-104.690027	
6,884.00	26.75	0.38	6,832.60	-84.15	-410.25	1,300,024.28	3,226,400.96	40.154123	-104.690027	
6,915.00	30.56	2.25	6,859.79	-69.29	-409.90	1,300,039.14	3,226,401.18	40.154164	-104.690026	
6,947.00	33.97	3.08	6,886.85	-52.23	-409.10	1,300,056.21	3,226,401.82	40.154211	-104.690023	
6,978.00	38.18	5.68	6,911.90	-34.04	-407.68	1,300,074.41	3,226,403.07	40.154261	-104.690018	
7,010.00	42.85	7.08	6,936.22	-13.39	-405.36	1,300,095.09	3,226,405.20	40.154317	-104.690009	
7,041.00	46.93	7.29	6,958.18	8.31	-402.62	1,300,116.81	3,226,407.74	40.154377	-104.690000	
7,073.00	50.74	5.14	6,979.24	32.25	-400.03	1,300,140.78	3,226,410.12	40.154443	-104.689990	
7,104.00	54.79	2.81	6,998.00	56.87	-398.33	1,300,165.41	3,226,411.59	40.154510	-104.689984	
7,136.00	59.20	1.54	7,015.42	83.68	-397.32	1,300,192.22	3,226,412.35	40.154584	-104.689981	
7,168.00	63.69	1.52	7,030.72	111.77	-396.57	1,300,220.32	3,226,412.85	40.154661	-104.689978	
7,199.00	69.21	2.13	7,043.10	140.16	-395.66	1,300,248.72	3,226,413.49	40.154739	-104.689975	
7,231.00	73.71	2.66	7,053.27	170.47	-394.39	1,300,279.03	3,226,414.49	40.154822	-104.689970	
7,263.00	79.10	3.26	7,060.79	201.52	-392.79	1,300,310.10	3,226,415.81	40.154907	-104.689964	
7,295.00	83.55	2.92	7,065.61	233.10	-391.08	1,300,341.69	3,226,417.22	40.154994	-104.689958	
7,332.00	84.11	2.21	7,069.59	269.84	-389.44	1,300,378.45	3,226,418.53	40.155095	-104.689953	
7,376.17	86.07	2.45	7,073.37	313.81	-387.65	1,300,422.44	3,226,419.92	40.155216	-104.689946	
<b>7" CASING SET</b>										
7,394.00	86.86	2.54	7,074.47	331.59	-386.87	1,300,440.22	3,226,420.53	40.155264	-104.689943	
7,485.00	89.45	1.31	7,077.40	422.48	-383.82	1,300,531.14	3,226,422.75	40.155514	-104.689932	
7,577.00	91.79	0.93	7,076.40	514.46	-382.02	1,300,623.12	3,226,423.71	40.155766	-104.689926	
7,669.00	91.85	359.85	7,073.48	606.41	-381.40	1,300,715.07	3,226,423.49	40.156019	-104.689924	
7,761.00	92.03	359.45	7,070.37	698.35	-381.96	1,300,807.01	3,226,422.09	40.156271	-104.689926	
7,852.00	90.68	358.72	7,068.22	789.31	-383.41	1,300,897.95	3,226,419.81	40.156521	-104.689931	
7,943.00	91.17	358.27	7,066.75	880.27	-385.80	1,300,988.88	3,226,416.58	40.156770	-104.689940	
8,036.00	89.94	358.76	7,065.85	973.23	-388.21	1,301,081.82	3,226,413.32	40.157026	-104.689948	
8,128.00	89.32	358.79	7,066.44	1,065.21	-390.18	1,301,173.77	3,226,410.51	40.157278	-104.689955	
8,219.00	88.70	358.85	7,068.01	1,156.17	-392.05	1,301,264.72	3,226,407.81	40.157528	-104.689962	
8,311.00	90.68	0.68	7,068.51	1,248.16	-392.43	1,301,356.70	3,226,406.59	40.157780	-104.689963	
8,403.00	90.68	0.23	7,067.42	1,340.15	-391.70	1,301,448.70	3,226,406.48	40.158033	-104.689961	
8,495.00	91.54	0.42	7,065.64	1,432.13	-391.18	1,301,540.68	3,226,406.16	40.158285	-104.689959	
8,587.00	91.73	0.18	7,063.01	1,524.09	-390.69	1,301,632.64	3,226,405.80	40.158538	-104.689957	
8,678.00	91.94	0.33	7,060.10	1,615.05	-390.29	1,301,723.59	3,226,405.37	40.158788	-104.689956	
8,768.00	90.43	359.77	7,058.24	1,705.02	-390.21	1,301,813.56	3,226,404.63	40.159035	-104.689955	
8,859.00	89.82	359.37	7,058.04	1,796.02	-390.89	1,301,904.55	3,226,403.11	40.159284	-104.689958	
8,951.00	89.81	359.40	7,058.34	1,888.01	-391.88	1,301,996.53	3,226,401.28	40.159537	-104.689961	
9,046.00	90.19	359.42	7,058.34	1,983.01	-392.86	1,302,091.51	3,226,399.43	40.159798	-104.689965	
9,140.00	90.25	358.66	7,057.97	2,077.00	-394.44	1,302,185.48	3,226,397.00	40.160056	-104.689970	
9,236.00	88.95	358.58	7,058.64	2,172.96	-396.75	1,302,281.42	3,226,393.81	40.160319	-104.689979	
9,331.00	88.71	357.88	7,060.58	2,267.90	-399.68	1,302,376.33	3,226,390.01	40.160580	-104.689989	
9,426.00	88.71	358.08	7,062.72	2,362.81	-403.03	1,302,471.21	3,226,385.79	40.160840	-104.690001	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NICHOLS 3N-5HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Site:</b>	WELD_NICHOLS 6-8HZ PAD	<b>MD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Well:</b>	NICHOLS 3N-5HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,521.00	88.64	357.88	7,064.92	2,457.73	-406.38	1,302,566.09	3,226,381.57	40.161101	-104.690013	
9,615.00	88.33	357.72	7,067.40	2,551.63	-409.98	1,302,659.95	3,226,377.11	40.161359	-104.690026	
9,710.00	89.32	357.22	7,069.35	2,646.51	-414.18	1,302,754.79	3,226,372.05	40.161619	-104.690041	
9,805.00	89.75	357.17	7,070.12	2,741.40	-418.82	1,302,849.63	3,226,366.53	40.161880	-104.690058	
9,900.00	90.49	356.97	7,069.93	2,836.27	-423.68	1,302,944.46	3,226,360.81	40.162140	-104.690075	
9,995.00	90.12	356.64	7,069.42	2,931.12	-428.98	1,303,039.25	3,226,354.64	40.162400	-104.690094	
10,091.00	91.30	357.77	7,068.23	3,027.00	-433.66	1,303,135.08	3,226,349.09	40.162664	-104.690111	
10,186.00	92.34	358.25	7,065.21	3,121.89	-436.95	1,303,229.94	3,226,344.92	40.162924	-104.690123	
10,281.00	92.84	1.08	7,060.92	3,216.78	-437.51	1,303,324.82	3,226,343.50	40.163185	-104.690125	
10,376.00	91.66	1.11	7,057.19	3,311.69	-435.69	1,303,419.74	3,226,344.44	40.163445	-104.690118	
10,471.00	90.31	1.33	7,055.56	3,406.65	-433.67	1,303,514.72	3,226,345.60	40.163706	-104.690111	
10,566.00	89.88	1.61	7,055.40	3,501.62	-431.24	1,303,609.71	3,226,347.16	40.163966	-104.690102	
10,661.00	89.38	1.02	7,056.01	3,596.59	-429.06	1,303,704.69	3,226,348.48	40.164227	-104.690094	
10,757.00	89.14	0.58	7,057.25	3,692.57	-427.71	1,303,800.68	3,226,348.94	40.164491	-104.690090	
10,851.00	89.14	0.61	7,058.66	3,786.56	-426.74	1,303,894.67	3,226,349.05	40.164749	-104.690086	
10,946.00	89.75	0.51	7,059.58	3,881.55	-425.81	1,303,989.67	3,226,349.11	40.165009	-104.690083	
11,041.00	88.71	0.44	7,060.86	3,976.54	-425.02	1,304,084.66	3,226,349.03	40.165270	-104.690080	
11,135.00	88.95	0.75	7,062.78	4,070.51	-424.05	1,304,178.64	3,226,349.15	40.165528	-104.690077	
11,230.00	88.83	2.04	7,064.62	4,165.46	-421.73	1,304,273.61	3,226,350.59	40.165789	-104.690068	
11,325.00	89.14	0.93	7,066.30	4,260.41	-419.27	1,304,368.58	3,226,352.18	40.166049	-104.690059	
11,421.00	89.20	2.17	7,067.69	4,356.37	-416.68	1,304,464.55	3,226,353.90	40.166313	-104.690050	
11,517.00	90.12	3.36	7,068.26	4,452.25	-412.05	1,304,560.47	3,226,357.65	40.166576	-104.690034	
11,612.00	90.74	3.16	7,067.55	4,547.09	-406.64	1,304,655.36	3,226,362.19	40.166836	-104.690014	
11,706.00	90.18	1.36	7,066.79	4,641.01	-402.94	1,304,749.31	3,226,365.03	40.167094	-104.690001	
11,803.00	90.12	2.01	7,066.54	4,737.97	-400.09	1,304,846.29	3,226,367.00	40.167360	-104.689991	
11,898.00	91.23	358.48	7,065.42	4,832.95	-399.68	1,304,941.26	3,226,366.54	40.167621	-104.689989	
11,992.00	92.22	358.30	7,062.59	4,926.87	-402.32	1,305,035.15	3,226,363.04	40.167879	-104.689999	
12,087.00	91.30	359.22	7,059.67	5,021.80	-404.37	1,305,130.06	3,226,360.11	40.168140	-104.690006	
12,182.00	90.19	1.15	7,058.44	5,116.78	-404.07	1,305,225.05	3,226,359.55	40.168400	-104.690005	
12,276.00	89.94	3.45	7,058.33	5,210.70	-400.29	1,305,318.99	3,226,362.46	40.168658	-104.689992	
12,371.00	88.21	3.64	7,059.87	5,305.50	-394.42	1,305,413.85	3,226,367.47	40.168918	-104.689971	
12,466.00	87.47	6.11	7,063.45	5,400.08	-386.35	1,305,508.50	3,226,374.67	40.169178	-104.689942	
12,560.00	89.12	5.80	7,066.24	5,493.53	-376.61	1,305,602.03	3,226,383.56	40.169434	-104.689907	
12,655.00	89.44	6.74	7,067.44	5,587.96	-366.23	1,305,696.54	3,226,393.07	40.169694	-104.689870	
12,750.00	89.88	6.80	7,068.00	5,682.29	-355.03	1,305,790.98	3,226,403.41	40.169953	-104.689830	
12,846.00	90.12	6.60	7,068.00	5,777.64	-343.83	1,305,886.42	3,226,413.74	40.170214	-104.689790	
12,941.00	90.79	8.09	7,067.25	5,871.85	-331.69	1,305,980.74	3,226,425.02	40.170473	-104.689746	
13,036.00	91.05	9.09	7,065.72	5,965.77	-317.50	1,306,074.79	3,226,438.34	40.170731	-104.689695	
13,131.00	90.68	7.09	7,064.29	6,059.81	-304.13	1,306,168.95	3,226,450.85	40.170989	-104.689648	
13,226.00	90.86	4.71	7,063.01	6,154.29	-294.37	1,306,263.51	3,226,459.75	40.171248	-104.689613	
13,321.00	91.60	4.33	7,060.97	6,248.97	-286.89	1,306,358.26	3,226,466.37	40.171508	-104.689586	
13,416.00	92.28	4.33	7,057.75	6,343.65	-279.72	1,306,452.99	3,226,472.67	40.171768	-104.689560	
13,511.00	91.29	3.65	7,054.80	6,438.37	-273.11	1,306,547.77	3,226,478.41	40.172028	-104.689537	
13,607.00	89.45	2.61	7,054.18	6,534.22	-267.87	1,306,643.67	3,226,482.77	40.172291	-104.689518	
13,701.00	89.69	2.16	7,054.88	6,628.13	-263.96	1,306,737.61	3,226,485.82	40.172549	-104.689504	
13,796.00	90.49	2.30	7,054.73	6,723.06	-260.26	1,306,832.57	3,226,488.65	40.172810	-104.689491	
13,890.00	88.64	2.21	7,055.45	6,816.98	-256.56	1,306,926.52	3,226,491.49	40.173068	-104.689477	
13,933.00	88.89	1.56	7,056.37	6,859.95	-255.15	1,306,969.50	3,226,492.51	40.173185	-104.689472	
<b>LAST WFT MWD SURVEY</b>										
13,987.00	89.20	0.74	7,057.27	6,913.93	-254.07	1,307,023.49	3,226,493.10	40.173334	-104.689468	
<b>PROJECTION TO TD</b>										

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NICHOLS 3N-5HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Site:</b>	WELD_NICHOLS 6-8HZ PAD	<b>MD Reference:</b>	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
<b>Well:</b>	NICHOLS 3N-5HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,376.17	7,073.37	7"	7	8-3/4	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,999.05	3,881.00	Parkman				
4,540.13	4,422.00	Sussex				
7,066.36	6,895.00	Sharon Springs				
7,223.17	6,971.00	Niobrara A				
7,298.45	6,986.00	Niobrara B				

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
835.00	835.00	-0.32	-0.94	TIE ON TO SURFACE GYRO	
951.00	951.00	-0.27	-1.13	FIRST WFT MWD SURVEY	
7,376.17	7,073.37	313.81	-387.65	7" CASING SET	
13,933.00	7,056.37	6,859.95	-255.15	LAST WFT MWD SURVEY	
13,987.00	7,057.27	6,913.93	-254.07	PROJECTION TO TD	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_