



Weatherford®

Weatherford
2000 Oil Drive
Casper, WY 82604

Survey Certification

Operating Company:	Anadarko Petroleum Corp.
Well Name:	Nichols 29N-5HZ
State:	Colorado
County:	Weld
API Number:	05-123-35871
Datum:	NAD 83
Survey Calculation Method:	Minimum Curvature
North Reference:	True North

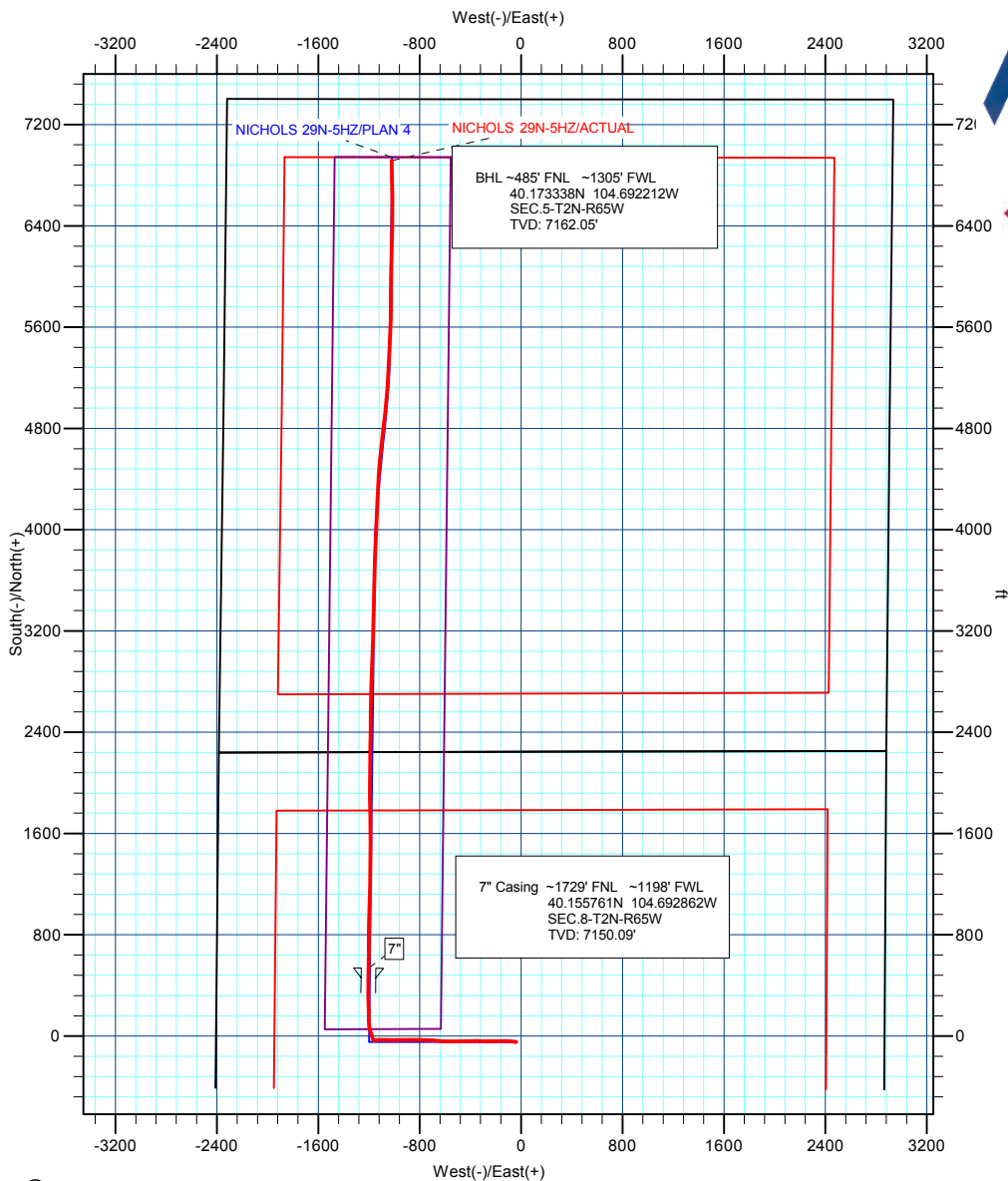
I, John R. Morgan, hereby certify the attached
directional survey run from the measure depth of 952.00 feet
to the measured depth of 13,982.00 feet as accurate and true
to the best of my knowledge.

Signature

11-Jan-13

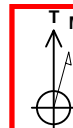
Date

John Morgan
Directional Planning
Weatherford - Rockies District



Weatherford

Project: COLORADO NORTHERN ZONE - 83
 Site: WELD NICHOLS 6-8HZ PAD
 Well: NICHOLS 29N-5HZ
 Wellbore: Wellbore #1
 Section: Sec. 8-T2N-R65W
 SHL: 2291' FNL 2369' FWL
 Design: ACTUAL
 Latitude: 40.154226
 Longitude: -104.688695
 GL: 4912.00
 KB: 25' RKB + 4912' GL @ 4937.00ft (H&P 307)



Azimuths to True North
 Magnetic North: 8.61°

Magnetic Field
 Strength: 52855.9snT
 Dip Angle: 66.81°
 Date: 11/29/2012
 Model: IGRF2010

WELL DETAILS: NICHOLS 29N-5HZ

+N/-S	+E/-W	Northing	Ground Level: Easting	4912.00 Latitude	Longitude	Slot
-46.63	-38.01	1300065.21	3226772.83	40.154226	-104.688695	

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Departure	Annotation
789.99	790.00	0.17	358.43	-47.80	-41.20	-0.71	3.97	TIE ON TO SURFACE GYRO
951.99	952.00	0.10	292.84	-47.50	-41.34	-0.40	4.35	FIRST WFT MWD SURVEY
7150.09	7572.22	84.55	0.99	512.66	-1202.84	715.58	1682.78	SET 7" CASING
7161.06	13928.00	88.95	359.38	6861.56	-1020.19	6977.65	8037.34	LAST WFT MWD SURVEY
7162.05	13982.00	88.95	359.38	6915.55	-1020.78	7031.20	8091.33	PROJECTION TO TD

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

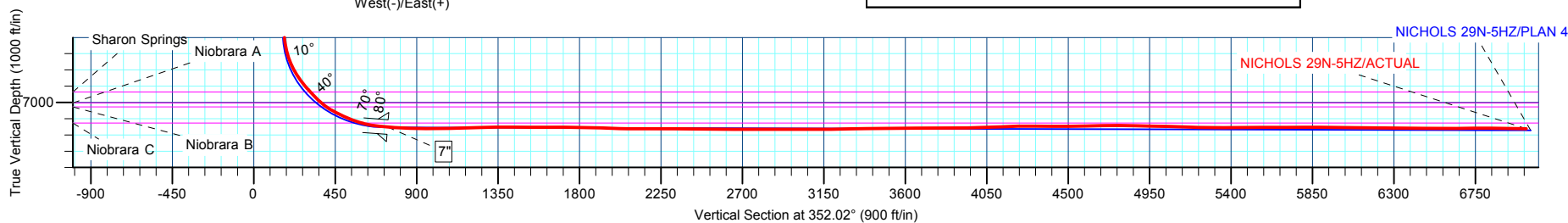
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
NICHOLS 29N-5HZ Rev. 2 BHL	7172.00	6941.06	-1018.00	40.173408	-104.692202	Point

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
3943.00	4009.38	Parkman
4484.00	4569.45	Sussex
6936.00	7099.78	Sharon Springs
7004.00	7191.48	Niobrara A
7028.00	7228.29	Niobrara B
7127.00	7447.97	Niobrara C

CASING DETAILS

TVD	MD	Name	Size
7150.09	7572.22	7"	7"





Weatherford®

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_NICHOLS 6-8HZ PAD

NICHOLS 29N-5HZ

Wellbore #1

Design: ACTUAL

Standard Survey Report

03 January, 2013

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well NICHOLS 29N-5HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Site:	WELD_NICHOLS 6-8HZ PAD	MD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Well:	NICHOLS 29N-5HZ	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL	Database:	edmp

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

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

Well	NICHOLS 29N-5HZ					
Well Position	+N/-S	0.00 ft	Northing:	1,300,065.21 usft	Latitude:	40.154226
	+E/-W	0.00 ft	Easting:	3,226,772.84 usft	Longitude:	-104.688695
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,912.00 ft

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

Design	ACTUAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	25.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	25.00	0.00	0.00	352.02	

Survey Program	Date	1/3/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
125.00	790.00	Surface Gyro (Wellbore #1)	NS-GYRO-MS	NORTH SENSING GYROCOMPASSING M/S	
952.00	13,982.00	Survey #2 (Wellbore #1)	MWD	MWD - STANDARD	

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)	
25.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	
125.00	0.51	230.37	125.00	-0.28	-0.34	-0.23	0.51	0.51	0.00	
225.00	0.40	262.59	225.00	-0.61	-1.03	-0.46	0.27	-0.11	32.22	
325.00	0.28	292.58	324.99	-0.56	-1.60	-0.34	0.21	-0.12	29.99	
425.00	0.51	233.14	424.99	-0.74	-2.19	-0.43	0.44	0.23	-59.44	
525.00	0.28	254.96	524.99	-1.07	-2.78	-0.67	0.27	-0.23	21.82	
625.00	0.18	234.19	624.99	-1.22	-3.14	-0.77	0.13	-0.10	-20.77	
725.00	0.07	59.99	724.99	-1.28	-3.22	-0.83	0.25	-0.11	-174.20	
790.00	0.17	358.43	789.99	-1.17	-3.18	-0.71	0.23	0.15	-94.71	
TIE ON TO SURFACE GYRO										

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well NICHOLS 29N-5HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Site:	WELD_NICHOLS 6-8HZ PAD	MD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Well:	NICHOLS 29N-5HZ	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL	Database:	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)
952.00	0.10	292.84	951.99	-0.87	-3.32	-0.40	0.10	-0.04	-40.49
FIRST WFT MWD SURVEY									
1,043.00	2.60	279.27	1,042.96	-0.51	-5.43	0.25	2.75	2.75	-14.91
1,135.00	4.60	276.12	1,134.77	0.22	-11.16	1.77	2.18	2.17	-3.42
1,227.00	6.29	278.65	1,226.35	1.37	-19.81	4.11	1.85	1.84	2.75
1,318.00	8.28	278.21	1,316.61	3.06	-31.22	7.36	2.19	2.19	-0.48
1,410.00	9.77	271.97	1,407.47	4.27	-45.58	10.56	1.94	1.62	-6.78
1,503.00	10.83	272.91	1,498.97	4.99	-62.20	13.57	1.15	1.14	1.01
1,594.00	11.94	273.59	1,588.18	6.01	-80.13	17.08	1.23	1.22	0.75
1,686.00	14.05	271.76	1,677.82	6.95	-100.79	20.87	2.34	2.29	-1.99
1,778.00	14.39	269.89	1,767.00	7.27	-123.39	24.33	0.62	0.37	-2.03
1,870.00	12.84	266.89	1,856.41	6.69	-145.03	26.76	1.85	-1.68	-3.26
1,965.00	12.57	268.17	1,949.09	5.79	-165.90	28.77	0.41	-0.28	1.35
2,060.00	12.63	270.01	2,041.80	5.46	-186.62	31.32	0.43	0.06	1.94
2,154.00	12.59	268.76	2,133.53	5.24	-207.14	33.95	0.29	-0.04	-1.33
2,249.00	12.10	268.01	2,226.34	4.67	-227.44	36.20	0.54	-0.52	-0.79
2,344.00	11.23	269.46	2,319.37	4.24	-246.64	38.44	0.97	-0.92	1.53
2,439.00	11.50	274.26	2,412.51	4.86	-265.34	41.64	1.04	0.28	5.05
2,534.00	10.54	273.89	2,505.76	6.15	-283.45	45.44	1.01	-1.01	-0.39
2,628.00	9.13	274.07	2,598.38	7.26	-299.47	48.77	1.50	-1.50	0.19
2,723.00	10.35	270.26	2,692.01	7.84	-315.52	51.56	1.45	1.28	-4.01
2,818.00	10.73	267.01	2,785.40	7.41	-332.88	53.55	0.74	0.40	-3.42
2,914.00	11.46	266.12	2,879.61	6.30	-351.32	55.01	0.78	0.76	-0.93
3,008.00	12.55	268.20	2,971.55	5.35	-370.85	56.78	1.25	1.16	2.21
3,104.00	13.89	270.30	3,065.01	5.08	-392.80	59.56	1.48	1.40	2.19
3,198.00	15.16	272.04	3,156.00	5.58	-416.37	63.33	1.43	1.35	1.85
3,293.00	13.80	267.03	3,247.99	5.43	-440.10	66.48	1.95	-1.43	-5.27
3,388.00	13.15	267.58	3,340.37	4.39	-462.21	68.51	0.70	-0.68	0.58
3,483.00	13.23	268.85	3,432.86	3.71	-483.87	70.85	0.32	0.08	1.34
3,578.00	13.88	269.52	3,525.22	3.40	-506.14	73.63	0.70	0.68	0.71
3,673.00	14.92	269.67	3,617.23	3.24	-529.76	76.75	1.10	1.09	0.16
3,768.00	15.52	272.08	3,708.90	3.63	-554.69	80.60	0.92	0.63	2.54
3,864.00	13.64	271.08	3,801.80	4.31	-578.85	84.62	1.98	-1.96	-1.04
3,959.00	13.78	277.20	3,894.10	5.94	-601.27	89.35	1.53	0.15	6.44
4,054.00	14.42	276.53	3,986.24	8.70	-624.25	95.28	0.70	0.67	-0.71
4,149.00	15.90	275.69	4,077.93	11.33	-648.95	101.32	1.57	1.56	-0.88
4,244.00	15.92	273.52	4,169.29	13.42	-674.91	106.99	0.63	0.02	-2.28
4,339.00	14.92	271.64	4,260.87	14.57	-700.14	111.63	1.18	-1.05	-1.98
4,434.00	14.09	270.26	4,352.84	14.98	-723.93	115.33	0.95	-0.87	-1.45
4,529.00	14.71	269.41	4,444.86	14.90	-747.55	118.54	0.69	0.65	-0.89
4,624.00	14.18	272.51	4,536.86	15.29	-771.24	122.21	0.99	-0.56	3.26
4,718.00	14.58	271.84	4,627.91	16.17	-794.57	126.33	0.46	0.43	-0.71
4,813.00	15.61	270.92	4,719.63	16.76	-819.30	130.34	1.11	1.08	-0.97

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well NICHOLS 29N-5HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Site:	WELD_NICHOLS 6-8HZ PAD	MD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Well:	NICHOLS 29N-5HZ	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL	Database:	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)
4,908.00	15.56	271.14	4,811.14	17.22	-844.82	134.34	0.08	-0.05	0.23
5,003.00	15.99	269.82	4,902.56	17.43	-870.64	138.13	0.59	0.45	-1.39
5,098.00	14.50	269.88	4,994.22	17.37	-895.62	141.54	1.57	-1.57	0.06
5,195.00	12.76	265.30	5,088.48	16.47	-918.44	143.81	2.11	-1.79	-4.72
5,289.00	12.94	268.69	5,180.13	15.37	-939.31	145.63	0.82	0.19	3.61
5,384.00	13.11	269.38	5,272.69	15.01	-960.72	148.24	0.24	0.18	0.73
5,480.00	11.44	270.06	5,366.49	14.91	-981.13	150.97	1.75	-1.74	0.71
5,575.00	11.82	270.68	5,459.54	15.03	-1,000.28	153.75	0.42	0.40	0.65
5,670.00	11.14	271.38	5,552.64	15.37	-1,019.18	156.71	0.73	-0.72	0.74
5,765.00	11.21	272.62	5,645.84	16.01	-1,037.58	159.90	0.26	0.07	1.31
5,860.00	11.99	271.07	5,738.90	16.62	-1,056.67	163.15	0.88	0.82	-1.63
5,955.00	13.24	268.77	5,831.60	16.57	-1,077.41	165.98	1.42	1.32	-2.42
6,049.00	9.18	265.26	5,923.79	15.72	-1,095.66	167.67	4.38	-4.32	-3.73
6,144.00	7.05	263.13	6,017.83	14.39	-1,109.00	168.21	2.26	-2.24	-2.24
6,239.00	4.96	262.58	6,112.31	13.17	-1,118.86	168.37	2.20	-2.20	-0.58
6,334.00	2.26	261.88	6,207.11	12.37	-1,124.79	168.40	2.84	-2.84	-0.74
6,428.00	0.14	217.80	6,301.08	12.02	-1,126.69	168.32	2.30	-2.26	-46.89
6,524.00	0.22	43.88	6,397.08	12.06	-1,126.64	168.35	0.37	0.08	-181.17
6,619.00	0.16	47.43	6,492.08	12.28	-1,126.41	168.54	0.06	-0.06	3.74
6,651.00	0.16	32.71	6,524.08	12.35	-1,126.36	168.60	0.13	0.00	-46.00
6,682.00	0.10	240.12	6,555.08	12.37	-1,126.36	168.62	0.82	-0.19	-492.23
6,714.00	1.62	327.56	6,587.08	12.74	-1,126.62	169.02	5.06	4.75	273.25
6,746.00	5.76	336.25	6,619.00	14.59	-1,127.51	170.98	13.02	12.94	27.16
6,777.00	9.37	339.91	6,649.73	18.39	-1,129.01	174.94	11.74	11.65	11.81
6,809.00	12.74	340.90	6,681.13	24.17	-1,131.06	180.96	10.55	10.53	3.09
6,841.00	16.24	340.14	6,712.11	31.71	-1,133.73	188.80	10.95	10.94	-2.38
6,873.00	19.45	340.80	6,742.57	40.96	-1,137.00	198.41	10.05	10.03	2.06
6,904.00	21.52	339.56	6,771.60	51.16	-1,140.69	209.02	6.82	6.68	-4.00
6,936.00	26.83	340.69	6,800.79	63.48	-1,145.13	221.84	16.66	16.59	3.53
6,967.00	30.14	342.91	6,828.03	77.53	-1,149.73	236.39	11.21	10.68	7.16
6,999.00	32.78	346.56	6,855.33	93.64	-1,154.11	252.95	10.17	8.25	11.41
7,031.00	35.19	349.25	6,881.86	111.12	-1,157.84	270.79	8.88	7.53	8.41
7,062.00	38.13	352.71	6,906.73	129.40	-1,160.72	289.29	11.59	9.48	11.16
7,094.00	40.00	355.82	6,931.58	149.46	-1,162.73	309.43	8.46	5.84	9.72
7,126.00	40.16	358.88	6,956.06	170.04	-1,163.68	329.94	6.18	0.50	9.56
7,157.00	42.30	359.52	6,979.38	190.46	-1,163.96	350.21	7.04	6.90	2.06
7,189.00	46.22	359.69	7,002.29	212.79	-1,164.11	372.34	12.26	12.25	0.53
7,221.00	50.92	359.00	7,023.46	236.78	-1,164.39	396.13	14.78	14.69	-2.16
7,253.00	55.91	358.44	7,042.52	262.46	-1,164.97	421.65	15.66	15.59	-1.75
7,285.00	60.29	358.50	7,059.43	289.61	-1,165.69	448.63	13.69	13.69	0.19
7,317.00	61.45	358.43	7,075.01	317.55	-1,166.44	476.41	3.63	3.63	-0.22
7,348.00	63.32	358.49	7,089.38	345.01	-1,167.18	503.70	6.03	6.03	0.19
7,379.00	65.78	359.21	7,102.70	372.99	-1,167.74	531.49	8.21	7.94	2.32
7,411.00	69.07	359.51	7,114.98	402.53	-1,168.07	560.80	10.32	10.28	0.94

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well NICHOLS 29N-5HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Site:	WELD_NICHOLS 6-8HZ PAD	MD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Well:	NICHOLS 29N-5HZ	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL	Database:	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)
7,443.00	72.45	0.79	7,125.52	432.74	-1,167.99	590.70	11.22	10.56	4.00
7,474.00	75.66	1.36	7,134.04	462.54	-1,167.43	620.13	10.50	10.35	1.84
7,505.00	78.95	2.21	7,140.85	492.76	-1,166.48	649.93	10.94	10.61	2.74
7,536.00	81.94	1.29	7,146.00	523.31	-1,165.55	680.06	10.08	9.65	-2.97
7,556.00	83.91	1.15	7,148.46	543.16	-1,165.13	699.65	9.87	9.85	-0.70
7,572.22	84.55	0.99	7,150.09	559.29	-1,164.83	715.58	4.07	3.95	-0.99
SET 7" CASING									
7,654.00	87.78	0.18	7,155.56	640.87	-1,164.00	796.26	4.07	3.95	-0.99
7,746.00	87.47	359.73	7,159.37	732.79	-1,164.07	887.30	0.59	-0.34	-0.49
7,837.00	89.45	0.56	7,161.82	823.75	-1,163.84	977.35	2.36	2.18	0.91
7,928.00	91.54	1.32	7,161.03	914.73	-1,162.35	1,067.24	2.44	2.30	0.84
8,020.00	92.04	1.69	7,158.16	1,006.66	-1,159.93	1,157.94	0.68	0.54	0.40
8,112.00	92.16	1.69	7,154.79	1,098.55	-1,157.22	1,248.57	0.13	0.13	0.00
8,204.00	90.43	1.60	7,152.71	1,190.49	-1,154.58	1,339.25	1.88	-1.88	-0.10
8,295.00	89.51	0.67	7,152.75	1,281.47	-1,152.78	1,429.10	1.44	-1.01	-1.02
8,387.00	89.57	0.40	7,153.49	1,373.46	-1,151.92	1,520.08	0.30	0.07	-0.29
8,479.00	89.81	0.31	7,153.99	1,465.46	-1,151.35	1,611.11	0.28	0.26	-0.10
8,571.00	90.74	0.71	7,153.55	1,557.45	-1,150.53	1,702.10	1.10	1.01	0.43
8,662.00	88.68	359.48	7,154.01	1,648.44	-1,150.38	1,792.19	2.64	-2.26	-1.35
8,754.00	88.28	359.30	7,156.45	1,740.41	-1,151.36	1,883.39	0.48	-0.43	-0.20
8,846.00	87.65	358.70	7,159.72	1,832.33	-1,152.96	1,974.65	0.95	-0.68	-0.65
8,938.00	89.29	359.13	7,162.17	1,924.28	-1,154.70	2,065.95	1.84	1.78	0.47
9,033.00	90.44	0.54	7,162.40	2,019.28	-1,154.98	2,160.07	1.92	1.21	1.48
9,128.00	89.03	0.54	7,162.84	2,114.27	-1,154.08	2,254.01	1.48	-1.48	0.00
9,223.00	90.00	1.03	7,163.64	2,209.26	-1,152.78	2,347.90	1.14	1.02	0.52
9,317.00	89.38	0.31	7,164.15	2,303.25	-1,151.68	2,440.83	1.01	-0.66	-0.77
9,412.00	89.63	1.11	7,164.97	2,398.23	-1,150.50	2,534.73	0.88	0.26	0.84
9,508.00	89.38	0.02	7,165.80	2,494.22	-1,149.56	2,629.66	1.16	-0.26	-1.14
9,603.00	90.12	0.92	7,166.21	2,589.22	-1,148.78	2,723.63	1.23	0.78	0.95
9,698.00	90.49	1.95	7,165.71	2,684.19	-1,146.40	2,817.35	1.15	0.39	1.08
9,794.00	89.51	1.09	7,165.71	2,780.15	-1,143.85	2,912.03	1.36	-1.02	-0.90
9,888.00	90.18	1.83	7,165.96	2,874.12	-1,141.46	3,004.75	1.06	0.71	0.79
9,984.00	89.82	1.42	7,165.96	2,970.08	-1,138.74	3,099.41	0.57	-0.38	-0.43
10,078.00	90.74	2.66	7,165.50	3,064.02	-1,135.39	3,191.97	1.64	0.98	1.32
10,173.00	91.50	2.13	7,163.65	3,158.91	-1,131.42	3,285.40	0.98	0.80	-0.56
10,269.00	90.99	1.72	7,161.56	3,254.84	-1,128.20	3,379.94	0.68	-0.53	-0.43
10,364.00	90.37	1.09	7,160.43	3,349.80	-1,125.87	3,473.66	0.93	-0.65	-0.66
10,458.00	90.56	1.54	7,159.67	3,443.77	-1,123.71	3,566.43	0.52	0.20	0.48
10,553.00	90.12	1.45	7,159.11	3,538.74	-1,121.23	3,660.13	0.47	-0.46	-0.09
10,648.00	90.37	1.61	7,158.70	3,633.70	-1,118.69	3,753.82	0.31	0.26	0.17
10,743.00	89.32	0.46	7,158.96	3,728.68	-1,116.98	3,847.65	1.64	-1.11	-1.21
10,838.00	91.97	2.42	7,157.89	3,823.64	-1,114.59	3,941.35	3.47	2.79	2.06
10,933.00	92.41	2.16	7,154.26	3,918.49	-1,110.80	4,034.75	0.54	0.46	-0.27

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well NICHOLS 29N-5HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Site:	WELD_NICHOLS 6-8HZ PAD	MD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Well:	NICHOLS 29N-5HZ	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL	Database:	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)
11,029.00	92.47	1.86	7,150.17	4,014.34	-1,107.44	4,129.21	0.32	0.06	-0.31
11,124.00	91.48	2.58	7,146.90	4,109.21	-1,103.76	4,222.65	1.29	-1.04	0.76
11,219.00	89.51	3.64	7,146.08	4,204.06	-1,098.60	4,315.87	2.35	-2.07	1.12
11,315.00	89.26	2.76	7,147.11	4,299.91	-1,093.25	4,410.04	0.95	-0.26	-0.92
11,410.00	90.86	2.68	7,147.01	4,394.80	-1,088.74	4,503.39	1.69	1.68	-0.08
11,505.00	90.93	3.75	7,145.52	4,489.64	-1,083.41	4,596.57	1.13	0.07	1.13
11,600.00	91.05	5.00	7,143.88	4,584.34	-1,076.16	4,689.35	1.32	0.13	1.32
11,695.00	90.06	5.81	7,142.96	4,678.91	-1,067.22	4,781.77	1.35	-1.04	0.85
11,789.00	88.64	7.04	7,144.03	4,772.31	-1,056.70	4,872.80	2.00	-1.51	1.31
11,884.00	88.58	6.39	7,146.33	4,866.63	-1,045.59	4,964.67	0.69	-0.06	-0.68
11,978.00	88.40	6.00	7,148.81	4,960.05	-1,035.45	5,055.77	0.46	-0.19	-0.41
12,073.00	87.88	6.01	7,151.89	5,054.48	-1,025.52	5,147.91	0.55	-0.55	0.01
12,168.00	88.52	3.52	7,154.88	5,149.10	-1,017.63	5,240.51	2.70	0.67	-2.62
12,262.00	90.37	3.33	7,155.79	5,242.92	-1,012.02	5,332.65	1.98	1.97	-0.20
12,358.00	90.31	2.85	7,155.22	5,338.78	-1,006.84	5,426.86	0.50	-0.06	-0.50
12,453.00	90.00	2.90	7,154.96	5,433.66	-1,002.08	5,520.16	0.33	-0.33	0.05
12,548.00	90.53	2.83	7,154.52	5,528.54	-997.33	5,613.46	0.56	0.56	-0.07
12,643.00	90.00	1.88	7,154.08	5,623.46	-993.43	5,706.92	1.15	-0.56	-1.00
12,738.00	90.19	1.05	7,153.92	5,718.42	-991.00	5,800.63	0.90	0.20	-0.87
12,833.00	89.75	0.86	7,153.97	5,813.41	-989.41	5,894.48	0.50	-0.46	-0.20
12,928.00	89.57	0.61	7,154.54	5,908.40	-988.20	5,988.38	0.32	-0.19	-0.26
13,023.00	88.71	359.57	7,155.96	6,003.39	-988.05	6,082.42	1.42	-0.91	-1.09
13,119.00	89.32	1.67	7,157.61	6,099.36	-987.01	6,177.32	2.28	0.64	2.19
13,214.00	89.14	1.39	7,158.89	6,194.32	-984.47	6,271.01	0.35	-0.19	-0.29
13,308.00	90.06	1.14	7,159.55	6,288.29	-982.40	6,363.79	1.01	0.98	-0.27
13,402.00	89.75	1.29	7,159.70	6,382.27	-980.40	6,456.58	0.37	-0.33	0.16
13,498.00	89.51	1.16	7,160.32	6,478.25	-978.35	6,551.34	0.28	-0.25	-0.14
13,593.00	90.55	359.64	7,160.27	6,573.24	-977.69	6,645.32	1.94	1.09	-1.60
13,688.00	90.31	359.49	7,159.56	6,668.24	-978.41	6,739.50	0.30	-0.25	-0.16
13,783.00	89.69	358.35	7,159.56	6,763.22	-980.20	6,833.81	1.37	-0.65	-1.20
13,878.00	89.38	359.73	7,160.33	6,858.20	-981.79	6,928.09	1.49	-0.33	1.45
13,928.00	88.95	359.38	7,161.06	6,908.19	-982.18	6,977.65	1.11	-0.86	-0.70
LAST WFT MWD SURVEY									
13,982.00	88.95	359.38	7,162.05	6,962.18	-982.76	7,031.20	0.00	0.00	0.00
PROJECTION TO TD									

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,572.22	7,150.09	7"	7	8-3/4

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well NICHOLS 29N-5HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Site:	WELD_NICHOLS 6-8HZ PAD	MD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Well:	NICHOLS 29N-5HZ	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL	Database:	edmp

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,009.38	3,943.00	Parkman			
4,569.45	4,484.00	Sussex			
7,099.78	6,936.00	Sharon Springs			
7,191.48	7,004.00	Niobrara A			
7,228.29	7,028.00	Niobrara B			
7,447.97	7,127.00	Niobrara C			

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
790.00	789.99	-1.17	-3.18	TIE ON TO SURFACE GYRO
952.00	951.99	-0.87	-3.32	FIRST WFT MWD SURVEY
7,572.22	7,150.09	559.29	-1,164.83	SET 7" CASING
13,928.00	7,161.06	6,908.19	-982.18	LAST WFT MWD SURVEY
13,982.00	7,162.05	6,962.18	-982.76	PROJECTION TO TD

Checked By: _____	Approved By: _____	Date: _____
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Weatherford®

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_NICHOLS 6-8HZ PAD

NICHOLS 29N-5HZ

Wellbore #1

Design: ACTUAL

Survey Report - Geographic

03 January, 2013

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well NICHOLS 29N-5HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Site:	WELD_NICHOLS 6-8HZ PAD	MD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Well:	NICHOLS 29N-5HZ	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL	Database:	edmp

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

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

Well	NICHOLS 29N-5HZ					
Well Position	+N/-S	0.00 ft	Northing:	1,300,065.21 usft	Latitude:	40.154226
	+E/-W	0.00 ft	Easting:	3,226,772.84 usft	Longitude:	-104.688695
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,912.00 ft

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

Design	ACTUAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	25.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	25.00	0.00	0.00	352.02	

Survey Program	Date	1/3/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
125.00	790.00	Surface Gyro (Wellbore #1)	NS-GYRO-MS	NORTH SENSING GYROCOMPASSING M/S	
952.00	13,982.00	Survey #2 (Wellbore #1)	MWD	MWD - STANDARD	

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
25.00	0.00	0.00	25.00	0.00	0.00	1,300,065.21	3,226,772.84	40.154226	-104.688695
125.00	0.51	230.37	125.00	-0.28	-0.34	1,300,064.92	3,226,772.50	40.154225	-104.688696
225.00	0.40	262.59	225.00	-0.61	-1.03	1,300,064.59	3,226,771.81	40.154224	-104.688699
325.00	0.28	292.58	324.99	-0.56	-1.60	1,300,064.63	3,226,771.24	40.154225	-104.688701
425.00	0.51	233.14	424.99	-0.74	-2.19	1,300,064.45	3,226,770.66	40.154224	-104.688703
525.00	0.28	254.96	524.99	-1.07	-2.78	1,300,064.12	3,226,770.07	40.154223	-104.688705
625.00	0.18	234.19	624.99	-1.22	-3.14	1,300,063.96	3,226,769.71	40.154223	-104.688706
725.00	0.07	59.99	724.99	-1.28	-3.22	1,300,063.90	3,226,769.63	40.154223	-104.688707
790.00	0.17	358.43	789.99	-1.17	-3.18	1,300,064.02	3,226,769.66	40.154223	-104.688707
TIE ON TO SURFACE GYRO									

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well NICHOLS 29N-5HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Site:	WELD_NICHOLS 6-8HZ PAD	MD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Well:	NICHOLS 29N-5HZ	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL	Database:	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
952.00	0.10	292.84	951.99	-0.87	-3.32	1,300,064.31	3,226,769.52	40.154224	-104.688707
FIRST WFT MWD SURVEY									
1,043.00	2.60	279.27	1,042.96	-0.51	-5.43	1,300,064.65	3,226,767.41	40.154225	-104.688715
1,135.00	4.60	276.12	1,134.77	0.22	-11.16	1,300,065.33	3,226,761.68	40.154227	-104.688735
1,227.00	6.29	278.65	1,226.35	1.37	-19.81	1,300,066.40	3,226,753.01	40.154230	-104.688766
1,318.00	8.28	278.21	1,316.61	3.06	-31.22	1,300,067.98	3,226,741.58	40.154234	-104.688807
1,410.00	9.77	271.97	1,407.47	4.27	-45.58	1,300,069.07	3,226,727.21	40.154238	-104.688858
1,503.00	10.83	272.91	1,498.97	4.99	-62.20	1,300,069.63	3,226,710.60	40.154240	-104.688918
1,594.00	11.94	273.59	1,588.18	6.01	-80.13	1,300,070.49	3,226,692.65	40.154243	-104.688982
1,686.00	14.05	271.76	1,677.82	6.95	-100.79	1,300,071.24	3,226,671.98	40.154245	-104.689056
1,778.00	14.39	269.89	1,767.00	7.27	-123.39	1,300,071.35	3,226,649.39	40.154246	-104.689137
1,870.00	12.84	266.89	1,856.41	6.69	-145.03	1,300,070.58	3,226,627.75	40.154244	-104.689214
1,965.00	12.57	268.17	1,949.09	5.79	-165.90	1,300,069.48	3,226,606.89	40.154242	-104.689289
2,060.00	12.63	270.01	2,041.80	5.46	-186.62	1,300,068.97	3,226,586.17	40.154241	-104.689363
2,154.00	12.59	268.76	2,133.53	5.24	-207.14	1,300,068.56	3,226,565.66	40.154240	-104.689436
2,249.00	12.10	268.01	2,226.34	4.67	-227.44	1,300,067.80	3,226,545.36	40.154239	-104.689509
2,344.00	11.23	269.46	2,319.37	4.24	-246.64	1,300,067.19	3,226,526.17	40.154238	-104.689578
2,439.00	11.50	274.26	2,412.51	4.86	-265.34	1,300,067.64	3,226,507.47	40.154239	-104.689645
2,534.00	10.54	273.89	2,505.76	6.15	-283.45	1,300,068.77	3,226,489.34	40.154243	-104.689709
2,628.00	9.13	274.07	2,598.38	7.26	-299.47	1,300,069.73	3,226,473.32	40.154246	-104.689767
2,723.00	10.35	270.26	2,692.01	7.84	-315.52	1,300,070.16	3,226,457.26	40.154248	-104.689824
2,818.00	10.73	267.01	2,785.40	7.41	-332.88	1,300,069.58	3,226,439.90	40.154246	-104.689886
2,914.00	11.46	266.12	2,879.61	6.30	-351.32	1,300,068.30	3,226,421.47	40.154243	-104.689952
3,008.00	12.55	268.20	2,971.55	5.35	-370.85	1,300,067.17	3,226,401.95	40.154241	-104.690022
3,104.00	13.89	270.30	3,065.01	5.08	-392.80	1,300,066.70	3,226,380.01	40.154240	-104.690101
3,198.00	15.16	272.04	3,156.00	5.58	-416.37	1,300,066.98	3,226,356.44	40.154241	-104.690185
3,293.00	13.80	267.03	3,247.99	5.43	-440.10	1,300,066.62	3,226,332.71	40.154241	-104.690270
3,388.00	13.15	267.58	3,340.37	4.39	-462.21	1,300,065.37	3,226,310.61	40.154238	-104.690349
3,483.00	13.23	268.85	3,432.86	3.71	-483.87	1,300,064.50	3,226,288.95	40.154236	-104.690426
3,578.00	13.88	269.52	3,525.22	3.40	-506.14	1,300,063.98	3,226,266.69	40.154235	-104.690506
3,673.00	14.92	269.67	3,617.23	3.24	-529.76	1,300,063.60	3,226,243.07	40.154235	-104.690591
3,768.00	15.52	272.08	3,708.90	3.63	-554.69	1,300,063.76	3,226,218.13	40.154236	-104.690680
3,864.00	13.64	271.08	3,801.80	4.31	-578.85	1,300,064.22	3,226,193.97	40.154238	-104.690766
3,959.00	13.78	277.20	3,894.10	5.94	-601.27	1,300,065.65	3,226,171.53	40.154242	-104.690846
4,054.00	14.42	276.53	3,986.24	8.70	-624.25	1,300,068.20	3,226,148.53	40.154250	-104.690929
4,149.00	15.90	275.69	4,077.93	11.33	-648.95	1,300,070.61	3,226,123.81	40.154257	-104.691017
4,244.00	15.92	273.52	4,169.29	13.42	-674.91	1,300,072.46	3,226,097.84	40.154263	-104.691110
4,339.00	14.92	271.64	4,260.87	14.57	-700.14	1,300,073.38	3,226,072.60	40.154266	-104.691200
4,434.00	14.09	270.26	4,352.84	14.98	-723.93	1,300,073.56	3,226,048.80	40.154267	-104.691285
4,529.00	14.71	269.41	4,444.86	14.90	-747.55	1,300,073.28	3,226,025.18	40.154267	-104.691370
4,624.00	14.18	272.51	4,536.86	15.29	-771.24	1,300,073.45	3,226,001.49	40.154268	-104.691454
4,718.00	14.58	271.84	4,627.91	16.17	-794.57	1,300,074.12	3,225,978.16	40.154270	-104.691538
4,813.00	15.61	270.92	4,719.63	16.76	-819.30	1,300,074.48	3,225,953.42	40.154272	-104.691626
4,908.00	15.56	271.14	4,811.14	17.22	-844.82	1,300,074.70	3,225,927.90	40.154273	-104.691718
5,003.00	15.99	269.82	4,902.56	17.43	-870.64	1,300,074.68	3,225,902.07	40.154274	-104.691810
5,098.00	14.50	269.88	4,994.22	17.37	-895.62	1,300,074.39	3,225,877.10	40.154274	-104.691899
5,195.00	12.76	265.30	5,088.48	16.47	-918.44	1,300,073.27	3,225,854.28	40.154271	-104.691981
5,289.00	12.94	268.69	5,180.13	15.37	-939.31	1,300,071.99	3,225,833.43	40.154268	-104.692056
5,384.00	13.11	269.38	5,272.69	15.01	-960.72	1,300,071.44	3,225,812.02	40.154267	-104.692132
5,480.00	11.44	270.06	5,366.49	14.91	-981.13	1,300,071.14	3,225,791.62	40.154267	-104.692205
5,575.00	11.82	270.68	5,459.54	15.03	-1,000.28	1,300,071.09	3,225,772.47	40.154267	-104.692274
5,670.00	11.14	271.38	5,552.64	15.37	-1,019.18	1,300,071.26	3,225,753.56	40.154268	-104.692341
5,765.00	11.21	272.62	5,645.84	16.01	-1,037.58	1,300,071.73	3,225,735.16	40.154270	-104.692407
5,860.00	11.99	271.07	5,738.90	16.62	-1,056.67	1,300,072.16	3,225,716.06	40.154272	-104.692476
5,955.00	13.24	268.77	5,831.60	16.57	-1,077.41	1,300,071.92	3,225,695.32	40.154271	-104.692550

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well NICHOLS 29N-5HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Site:	WELD_NICHOLS 6-8HZ PAD	MD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Well:	NICHOLS 29N-5HZ	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL	Database:	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,049.00	9.18	265.26	5,923.79	15.72	-1,095.66	1,300,070.90	3,225,677.08	40.154269	-104.692615
6,144.00	7.05	263.13	6,017.83	14.39	-1,109.00	1,300,069.46	3,225,663.76	40.154266	-104.692663
6,239.00	4.96	262.58	6,112.31	13.17	-1,118.86	1,300,068.14	3,225,653.91	40.154262	-104.692698
6,334.00	2.26	261.88	6,207.11	12.37	-1,124.79	1,300,067.29	3,225,647.98	40.154260	-104.692719
6,428.00	0.14	217.80	6,301.08	12.02	-1,126.69	1,300,066.92	3,225,646.08	40.154259	-104.692726
6,524.00	0.22	43.88	6,397.08	12.06	-1,126.64	1,300,066.96	3,225,646.14	40.154259	-104.692726
6,619.00	0.16	47.43	6,492.08	12.28	-1,126.41	1,300,067.19	3,225,646.36	40.154260	-104.692725
6,651.00	0.16	32.71	6,524.08	12.35	-1,126.36	1,300,067.25	3,225,646.42	40.154260	-104.692725
6,682.00	0.10	240.12	6,555.08	12.37	-1,126.36	1,300,067.28	3,225,646.42	40.154260	-104.692725
6,714.00	1.62	327.56	6,587.08	12.74	-1,126.62	1,300,067.64	3,225,646.15	40.154261	-104.692726
6,746.00	5.76	336.25	6,619.00	14.59	-1,127.51	1,300,069.49	3,225,645.24	40.154266	-104.692729
6,777.00	9.37	339.91	6,649.73	18.39	-1,129.01	1,300,073.27	3,225,643.71	40.154276	-104.692734
6,809.00	12.74	340.90	6,681.13	24.17	-1,131.06	1,300,079.03	3,225,641.61	40.154292	-104.692742
6,841.00	16.24	340.14	6,712.11	31.71	-1,133.73	1,300,086.55	3,225,638.86	40.154313	-104.692751
6,873.00	19.45	340.80	6,742.57	40.96	-1,137.00	1,300,095.76	3,225,635.51	40.154338	-104.692763
6,904.00	21.52	339.56	6,771.60	51.16	-1,140.69	1,300,105.93	3,225,631.73	40.154366	-104.692776
6,936.00	26.83	340.69	6,800.79	63.48	-1,145.13	1,300,118.21	3,225,627.18	40.154400	-104.692792
6,967.00	30.14	342.91	6,828.03	77.53	-1,149.73	1,300,132.22	3,225,622.45	40.154439	-104.692809
6,999.00	32.78	346.56	6,855.33	93.64	-1,154.11	1,300,148.29	3,225,617.92	40.154483	-104.692824
7,031.00	35.19	349.25	6,881.86	111.12	-1,157.84	1,300,165.74	3,225,614.03	40.154531	-104.692838
7,062.00	38.13	352.71	6,906.73	129.40	-1,160.72	1,300,183.99	3,225,610.98	40.154581	-104.692848
7,094.00	40.00	355.82	6,931.58	149.46	-1,162.73	1,300,204.03	3,225,608.79	40.154636	-104.692855
7,126.00	40.16	358.88	6,956.06	170.04	-1,163.68	1,300,224.59	3,225,607.65	40.154693	-104.692858
7,157.00	42.30	359.52	6,979.38	190.46	-1,163.96	1,300,245.02	3,225,607.18	40.154749	-104.692859
7,189.00	46.22	359.69	7,002.29	212.79	-1,164.11	1,300,267.34	3,225,606.83	40.154810	-104.692860
7,221.00	50.92	359.00	7,023.46	236.78	-1,164.39	1,300,291.32	3,225,606.33	40.154876	-104.692861
7,253.00	55.91	358.44	7,042.52	262.46	-1,164.97	1,300,317.00	3,225,605.52	40.154946	-104.692863
7,285.00	60.29	358.50	7,059.43	289.61	-1,165.69	1,300,344.14	3,225,604.54	40.155021	-104.692866
7,317.00	61.45	358.43	7,075.01	317.55	-1,166.44	1,300,372.08	3,225,603.54	40.155098	-104.692868
7,348.00	63.32	358.49	7,089.38	345.01	-1,167.18	1,300,399.53	3,225,602.55	40.155173	-104.692871
7,379.00	65.78	359.21	7,102.70	372.99	-1,167.74	1,300,427.50	3,225,601.73	40.155250	-104.692873
7,411.00	69.07	359.51	7,114.98	402.53	-1,168.07	1,300,457.04	3,225,601.13	40.155331	-104.692874
7,443.00	72.45	0.79	7,125.52	432.74	-1,167.99	1,300,487.25	3,225,600.94	40.155414	-104.692874
7,474.00	75.66	1.36	7,134.04	462.54	-1,167.43	1,300,517.05	3,225,601.23	40.155496	-104.692872
7,505.00	78.95	2.21	7,140.85	492.76	-1,166.48	1,300,547.28	3,225,601.89	40.155579	-104.692869
7,536.00	81.94	1.29	7,146.00	523.31	-1,165.55	1,300,577.84	3,225,602.55	40.155663	-104.692865
7,566.00	83.91	1.15	7,148.46	543.16	-1,165.13	1,300,597.68	3,225,602.79	40.155717	-104.692864
7,572.22	84.55	0.99	7,150.09	559.29	-1,164.83	1,300,613.82	3,225,602.94	40.155761	-104.692863
SET 7" CASING									
7,654.00	87.78	0.18	7,155.56	640.87	-1,164.00	1,300,695.41	3,225,603.03	40.155985	-104.692860
7,746.00	87.47	359.73	7,159.37	732.79	-1,164.07	1,300,787.32	3,225,602.11	40.156238	-104.692860
7,837.00	89.45	0.56	7,161.82	823.75	-1,163.84	1,300,878.28	3,225,601.51	40.156487	-104.692859
7,928.00	91.54	1.32	7,161.03	914.73	-1,162.35	1,300,969.27	3,225,602.17	40.156737	-104.692854
8,020.00	92.04	1.69	7,158.16	1,006.66	-1,159.93	1,301,061.21	3,225,603.75	40.156989	-104.692845
8,112.00	92.16	1.69	7,154.79	1,098.55	-1,157.22	1,301,153.13	3,225,605.62	40.157242	-104.692835
8,204.00	90.43	1.60	7,152.71	1,190.49	-1,154.58	1,301,245.09	3,225,607.41	40.157494	-104.692826
8,295.00	89.51	0.67	7,152.75	1,281.47	-1,152.78	1,301,336.08	3,225,608.38	40.157744	-104.692820
8,387.00	89.57	0.40	7,153.49	1,373.46	-1,151.92	1,301,428.07	3,225,608.40	40.157996	-104.692817
8,479.00	89.81	0.31	7,153.99	1,465.46	-1,151.35	1,301,520.07	3,225,608.13	40.158249	-104.692815
8,571.00	90.74	0.71	7,153.55	1,557.45	-1,150.53	1,301,612.07	3,225,608.11	40.158501	-104.692812
8,662.00	88.68	359.48	7,154.01	1,648.44	-1,150.38	1,301,703.06	3,225,607.43	40.158751	-104.692811
8,754.00	88.28	359.30	7,156.45	1,740.41	-1,151.36	1,301,795.01	3,225,605.61	40.159004	-104.692815
8,846.00	87.65	358.70	7,159.72	1,832.33	-1,152.96	1,301,886.92	3,225,603.16	40.159256	-104.692820
8,938.00	89.29	359.13	7,162.17	1,924.28	-1,154.70	1,301,978.84	3,225,600.58	40.159508	-104.692827
9,033.00	90.44	0.54	7,162.40	2,019.28	-1,154.98	1,302,073.83	3,225,599.44	40.159769	-104.692828

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well NICHOLS 29N-5HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Site:	WELD_NICHOLS 6-8HZ PAD	MD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Well:	NICHOLS 29N-5HZ	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL	Database:	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,128.00	89.03	0.54	7,162.84	2,114.27	-1,154.08	1,302,168.83	3,225,599.46	40.160030	-104.692824
9,223.00	90.00	1.03	7,163.64	2,209.26	-1,152.78	1,302,263.82	3,225,599.89	40.160291	-104.692820
9,317.00	89.38	0.31	7,164.15	2,303.25	-1,151.68	1,302,357.82	3,225,600.13	40.160549	-104.692816
9,412.00	89.63	1.11	7,164.97	2,398.23	-1,150.50	1,302,452.82	3,225,600.44	40.160809	-104.692812
9,508.00	89.38	0.02	7,165.80	2,494.22	-1,149.56	1,302,548.81	3,225,600.51	40.161073	-104.692808
9,603.00	90.12	0.92	7,166.21	2,589.22	-1,148.78	1,302,643.81	3,225,600.42	40.161334	-104.692806
9,698.00	90.49	1.95	7,165.71	2,684.19	-1,146.40	1,302,738.79	3,225,601.93	40.161594	-104.692797
9,794.00	89.51	1.09	7,165.71	2,780.15	-1,143.85	1,302,834.78	3,225,603.60	40.161858	-104.692788
9,888.00	90.18	1.83	7,165.96	2,874.12	-1,141.46	1,302,928.76	3,225,605.13	40.162116	-104.692779
9,984.00	89.82	1.42	7,165.96	2,970.08	-1,138.74	1,303,024.74	3,225,606.98	40.162379	-104.692770
10,078.00	90.74	2.66	7,165.50	3,064.02	-1,135.39	1,303,118.71	3,225,609.46	40.162637	-104.692758
10,173.00	91.50	2.13	7,163.65	3,158.91	-1,131.42	1,303,213.64	3,225,612.56	40.162898	-104.692743
10,269.00	90.99	1.72	7,161.56	3,254.84	-1,128.20	1,303,309.58	3,225,614.91	40.163161	-104.692732
10,364.00	90.37	1.09	7,160.43	3,349.80	-1,125.87	1,303,404.56	3,225,616.37	40.163422	-104.692724
10,458.00	90.56	1.54	7,159.67	3,443.77	-1,123.71	1,303,498.55	3,225,617.67	40.163680	-104.692716
10,553.00	90.12	1.45	7,159.11	3,538.74	-1,121.23	1,303,593.54	3,225,619.28	40.163940	-104.692707
10,648.00	90.37	1.61	7,158.70	3,633.70	-1,118.69	1,303,688.52	3,225,620.95	40.164201	-104.692698
10,743.00	89.32	0.46	7,158.96	3,728.68	-1,116.98	1,303,783.51	3,225,621.79	40.164462	-104.692692
10,838.00	91.97	2.42	7,157.89	3,823.64	-1,114.59	1,303,878.48	3,225,623.31	40.164722	-104.692683
10,933.00	92.41	2.16	7,154.26	3,918.49	-1,110.80	1,303,973.37	3,225,626.23	40.164983	-104.692670
11,029.00	92.47	1.86	7,150.17	4,014.34	-1,107.44	1,304,069.25	3,225,628.72	40.165246	-104.692658
11,124.00	91.48	2.58	7,146.90	4,109.21	-1,103.76	1,304,164.15	3,225,631.53	40.165506	-104.692645
11,219.00	89.51	3.64	7,146.08	4,204.06	-1,098.60	1,304,259.04	3,225,635.82	40.165767	-104.692626
11,315.00	89.26	2.76	7,147.11	4,299.91	-1,093.25	1,304,354.93	3,225,640.30	40.166030	-104.692607
11,410.00	90.86	2.68	7,147.01	4,394.80	-1,088.74	1,304,449.86	3,225,643.94	40.166290	-104.692591
11,505.00	90.93	3.75	7,145.52	4,489.64	-1,083.41	1,304,544.74	3,225,648.40	40.166551	-104.692572
11,600.00	91.05	5.00	7,143.88	4,584.34	-1,076.16	1,304,639.51	3,225,654.78	40.166811	-104.692546
11,695.00	90.06	5.81	7,142.96	4,678.91	-1,067.22	1,304,734.16	3,225,662.86	40.167070	-104.692514
11,789.00	88.64	7.04	7,144.03	4,772.31	-1,056.70	1,304,827.65	3,225,672.52	40.167327	-104.692476
11,884.00	88.58	6.39	7,146.33	4,866.63	-1,045.59	1,304,922.07	3,225,682.76	40.167586	-104.692437
11,978.00	88.40	6.00	7,148.81	4,960.05	-1,035.45	1,305,015.57	3,225,692.05	40.167842	-104.692400
12,073.00	87.88	6.01	7,151.89	5,054.48	-1,025.52	1,305,110.09	3,225,701.12	40.168101	-104.692365
12,168.00	88.52	3.52	7,154.88	5,149.10	-1,017.63	1,305,204.77	3,225,708.14	40.168361	-104.692337
12,262.00	90.37	3.33	7,155.79	5,242.92	-1,012.02	1,305,298.64	3,225,712.89	40.168618	-104.692317
12,358.00	90.31	2.85	7,155.22	5,338.78	-1,006.84	1,305,394.55	3,225,717.19	40.168882	-104.692298
12,453.00	90.00	2.90	7,154.96	5,433.66	-1,002.08	1,305,489.47	3,225,721.09	40.169142	-104.692281
12,548.00	90.53	2.83	7,154.52	5,528.54	-997.33	1,305,584.38	3,225,724.97	40.169403	-104.692264
12,643.00	90.00	1.88	7,154.08	5,623.46	-993.43	1,305,679.33	3,225,728.00	40.169663	-104.692250
12,738.00	90.19	1.05	7,153.92	5,718.42	-991.00	1,305,774.32	3,225,729.56	40.169924	-104.692241
12,833.00	89.75	0.86	7,153.97	5,813.41	-989.41	1,305,869.32	3,225,730.28	40.170185	-104.692236
12,928.00	89.57	0.61	7,154.54	5,908.40	-988.20	1,305,964.31	3,225,730.63	40.170445	-104.692231
13,023.00	88.71	359.57	7,155.96	6,003.39	-988.05	1,306,059.30	3,225,729.91	40.170706	-104.692231
13,119.00	89.32	1.67	7,157.61	6,099.36	-987.01	1,306,155.28	3,225,730.07	40.170970	-104.692227
13,214.00	89.14	1.39	7,158.89	6,194.32	-984.47	1,306,250.25	3,225,731.74	40.171230	-104.692218
13,308.00	90.06	1.14	7,159.55	6,288.29	-982.40	1,306,344.24	3,225,732.95	40.171488	-104.692211
13,402.00	89.75	1.29	7,159.70	6,382.27	-980.40	1,306,438.24	3,225,734.08	40.171746	-104.692204
13,498.00	89.51	1.16	7,160.32	6,478.25	-978.35	1,306,534.23	3,225,735.26	40.172010	-104.692196
13,593.00	90.55	359.64	7,160.27	6,573.24	-977.69	1,306,629.22	3,225,735.05	40.172270	-104.692194
13,688.00	90.31	359.49	7,159.56	6,668.24	-978.41	1,306,724.21	3,225,733.46	40.172531	-104.692197
13,783.00	89.69	358.35	7,159.56	6,763.22	-980.20	1,306,819.17	3,225,730.80	40.172792	-104.692203
13,878.00	89.38	359.73	7,160.33	6,858.20	-981.79	1,306,914.13	3,225,728.34	40.173053	-104.692209
13,928.00	88.95	359.38	7,161.06	6,908.19	-982.18	1,306,964.12	3,225,727.50	40.173190	-104.692210
LAST WFT MWD SURVEY									
13,982.00	88.95	359.38	7,162.05	6,962.18	-982.76	1,307,018.10	3,225,726.42	40.173338	-104.692212
PROJECTION TO TD									

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well NICHOLS 29N-5HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Site:	WELD_NICHOLS 6-8HZ PAD	MD Reference:	25' RKB + 4912' GL @ 4937.00ft (H&P 307)
Well:	NICHOLS 29N-5HZ	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL	Database:	edmp

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,572.22	7,150.09	7"	7	8-3/4	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,009.38	3,943.00	Parkman			
4,569.45	4,484.00	Sussex			
7,099.78	6,936.00	Sharon Springs			
7,191.48	7,004.00	Niobrara A			
7,228.29	7,028.00	Niobrara B			
7,447.97	7,127.00	Niobrara C			

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
790.00	789.99	-1.17	-3.18	TIE ON TO SURFACE GYRO	
952.00	951.99	-0.87	-3.32	FIRST WFT MWD SURVEY	
7,572.22	7,150.09	559.29	-1,164.83	SET 7" CASING	
13,928.00	7,161.06	6,908.19	-982.18	LAST WFT MWD SURVEY	
13,982.00	7,162.05	6,962.18	-982.76	PROJECTION TO TD	

Checked By: _____	Approved By: _____	Date: _____
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