



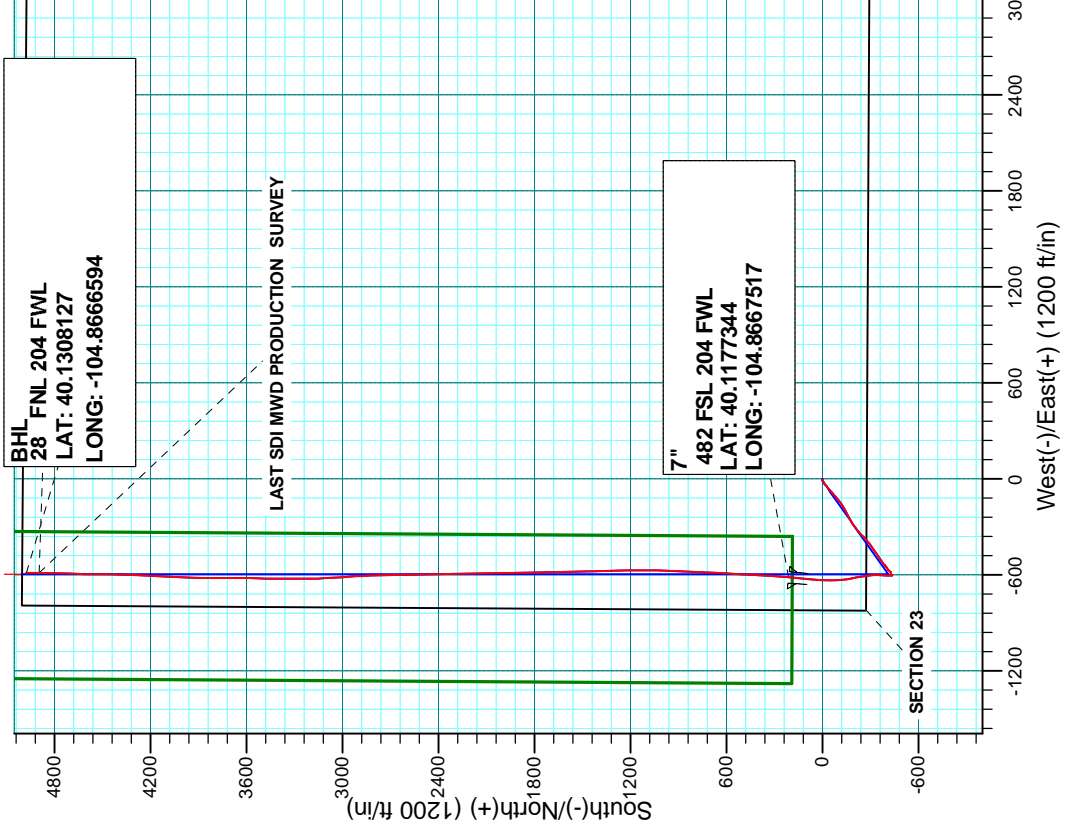
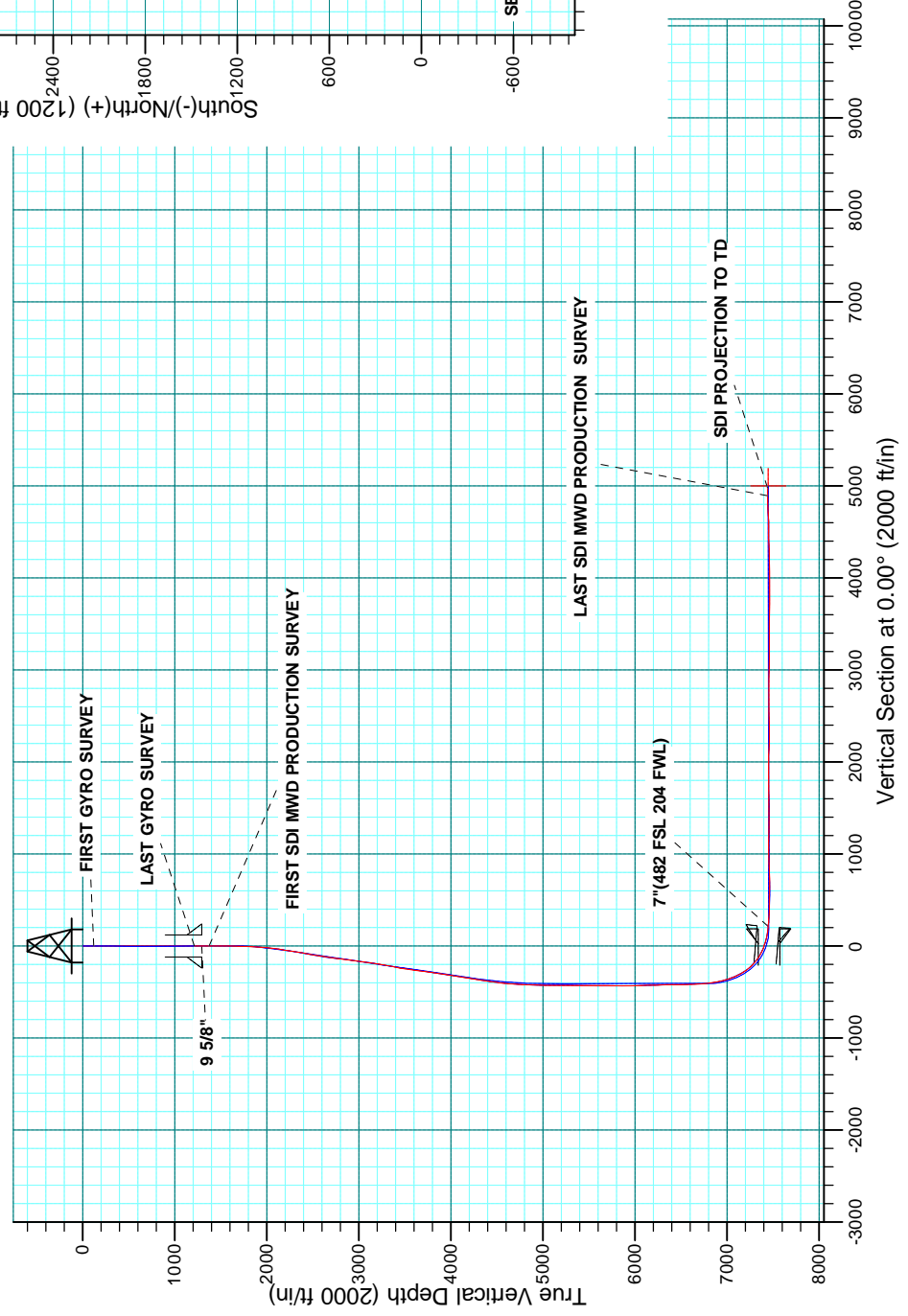
Project: COLORADO NORTHERN ZONE - 83
Site: SPOTTED 35-23HZ PAD
Well: SPOTTED 30N-23HZ
Wellbore: OH
Design: OH



WELL DETAILS: SPOTTED 30N-23HZ			
GL 4966 & KB 25 @ 4991.00ft (H&P 311)			
+N/-S	+E/-W	Northing	Easting
0.00	0.00	1286160.35	3177715.14
Latitude	Longitude		
40.1171550	-104.8645540		

PROJECT DETAILS: COLORADO NORTHERN ZONE - 83	
Geodetic System:	US State Plane 1983
Datum:	North American Datum 1983
Ellipsoid:	GRS 1980
Zone:	Colorado Northern Zone
Location:	SWSW SECTION 23 T2N R67W
System Datum:	Mean Sea Level

CASING DETAILS		
TVD	MD	Name
7450.17	7878.00	7"





Scientific Drilling

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

SPOTTED 35-23HZ PAD

SPOTTED 30N-23HZ

OH

Design: OH

Standard Survey Report

17 June, 2014

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well SPOTTED 30N-23HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
Site:	SPOTTED 35-23HZ PAD	MD Reference:	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
Well:	SPOTTED 30N-23HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales

Project	COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	SPOTTED 35-23HZ PAD, SWSW SECTION 23 T2N R67W				
Site Position:		Northing:	1,286,160.43 usft	Latitude:	40.1171540
From:	Lat/Long	Easting:	3,177,774.99 usft	Longitude:	-104.8643400
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.41 °

Well	SPOTTED 30N-23HZ, 275 FSL 820 FWL					
Well Position	+N/-S	0.00 ft	Northing:	1,286,160.35 usft	Latitude:	40.1171550
	+E/-W	0.00 ft	Easting:	3,177,715.14 usft	Longitude:	-104.8645540
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	4,966.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	5/22/2014	8.55	66.69	52,577

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

Survey Program	Date	6/17/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
25.00	1,215.00	Survey #1 SURFACE GYRO (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,374.00	12,646.00	Survey #2 SDI MWD PRODUCTION (OH)	SDI_MWD+CRUST_1.0	SDI MWD + Crustal anomaly, Version 1.0	

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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125.00	0.67	245.82	125.00	-0.24	-0.53	-0.24	0.67	0.67	0.00	
FIRST GYRO SURVEY										
225.00	0.75	224.64	224.99	-0.94	-1.53	-0.94	0.27	0.08	-21.18	
325.00	0.68	220.95	324.98	-1.86	-2.38	-1.86	0.08	-0.07	-3.69	
425.00	0.18	316.94	424.98	-2.19	-2.87	-2.19	0.72	-0.50	95.99	
525.00	0.38	226.34	524.98	-2.31	-3.22	-2.31	0.42	0.20	-90.60	
625.00	0.36	121.19	624.98	-2.70	-3.19	-2.70	0.59	-0.02	-105.15	
725.00	0.26	351.45	724.98	-2.64	-2.95	-2.64	0.56	-0.10	-129.74	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well SPOTTED 30N-23HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
Site:	SPOTTED 35-23HZ PAD	MD Reference:	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
Well:	SPOTTED 30N-23HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales

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)	
825.00	0.45	271.59	824.98	-2.40	-3.38	-2.40	0.48	0.19	-79.86	
925.00	0.29	204.44	924.97	-2.62	-3.88	-2.62	0.43	-0.16	-67.15	
1,025.00	0.19	36.64	1,024.97	-2.72	-3.88	-2.72	0.48	-0.10	-167.80	
1,125.00	0.31	320.49	1,124.97	-2.38	-3.96	-2.38	0.32	0.12	-76.15	
1,215.00	0.67	302.49	1,214.97	-1.91	-4.56	-1.91	0.43	0.40	-20.00	
LAST GYRO SURVEY										
1,374.00	0.46	254.09	1,373.96	-1.58	-5.95	-1.58	0.32	-0.13	-30.44	
FIRST SDI MWD PRODUCTION SURVEY										
1,466.00	0.41	260.75	1,465.96	-1.74	-6.63	-1.74	0.08	-0.05	7.24	
1,573.00	1.21	275.12	1,572.95	-1.70	-8.14	-1.70	0.77	0.75	13.43	
1,753.00	5.18	242.20	1,752.64	-5.32	-17.22	-5.32	2.34	2.21	-18.29	
1,844.00	5.65	242.08	1,843.24	-9.33	-24.81	-9.33	0.52	0.52	-0.13	
1,936.00	6.70	233.42	1,934.70	-14.65	-33.13	-14.65	1.52	1.14	-9.41	
2,027.00	8.36	230.18	2,024.91	-22.05	-42.47	-22.05	1.88	1.82	-3.56	
2,119.00	12.40	229.76	2,115.39	-32.72	-55.15	-32.72	4.39	4.39	-0.46	
2,210.00	14.55	227.23	2,203.88	-46.79	-71.00	-46.79	2.45	2.36	-2.78	
2,302.00	14.69	230.88	2,292.90	-62.00	-88.54	-62.00	1.01	0.15	3.97	
2,393.00	15.54	227.42	2,380.76	-77.53	-106.47	-77.53	1.36	0.93	-3.80	
2,484.00	16.96	233.16	2,468.12	-93.74	-126.07	-93.74	2.35	1.56	6.31	
2,576.00	14.46	233.69	2,556.68	-108.59	-146.06	-108.59	2.72	-2.72	0.58	
2,667.00	13.56	232.62	2,644.97	-121.79	-163.70	-121.79	1.03	-0.99	-1.18	
2,759.00	14.16	238.54	2,734.30	-134.21	-181.87	-134.21	1.67	0.65	6.43	
2,941.00	16.59	248.39	2,909.80	-155.41	-225.03	-155.41	1.96	1.34	5.41	
3,033.00	16.25	238.39	2,998.07	-166.99	-248.20	-166.99	3.09	-0.37	-10.87	
3,124.00	15.15	234.92	3,085.67	-180.50	-268.78	-180.50	1.59	-1.21	-3.81	
3,216.00	15.23	237.07	3,174.46	-193.98	-288.76	-193.98	0.62	0.09	2.34	
3,307.00	15.14	233.90	3,262.28	-207.48	-308.40	-207.48	0.92	-0.10	-3.48	
3,401.00	15.00	227.60	3,353.06	-222.92	-327.30	-222.92	1.75	-0.15	-6.70	
3,496.00	12.76	224.28	3,445.28	-238.72	-343.70	-238.72	2.50	-2.36	-3.49	
3,684.00	13.03	229.65	3,628.54	-267.31	-374.35	-267.31	0.65	0.14	2.86	
3,779.00	12.02	233.08	3,721.28	-280.18	-390.42	-280.18	1.32	-1.06	3.61	
3,967.00	12.48	229.78	3,905.01	-305.06	-421.58	-305.06	0.45	0.24	-1.76	
4,156.00	15.63	237.58	4,088.34	-331.91	-458.68	-331.91	1.94	1.67	4.13	
4,250.00	16.14	235.54	4,178.75	-346.09	-480.14	-346.09	0.80	0.54	-2.17	
4,344.00	17.21	233.82	4,268.80	-361.69	-502.14	-361.69	1.25	1.14	-1.83	
4,439.00	15.20	233.84	4,360.02	-377.34	-523.54	-377.34	2.12	-2.12	0.02	
4,533.00	12.74	235.34	4,451.23	-390.50	-542.02	-390.50	2.65	-2.62	1.60	
4,627.00	9.62	227.92	4,543.44	-401.67	-556.38	-401.67	3.65	-3.32	-7.89	
4,722.00	6.93	229.26	4,637.44	-410.73	-566.62	-410.73	2.84	-2.83	1.41	
4,816.00	5.80	226.15	4,730.86	-417.72	-574.34	-417.72	1.26	-1.20	-3.31	
4,910.00	5.01	228.67	4,824.44	-423.72	-580.85	-423.72	0.88	-0.84	2.68	
5,004.00	3.23	256.11	4,918.21	-427.07	-586.50	-427.07	2.77	-1.89	29.19	
5,099.00	2.15	265.28	5,013.10	-427.86	-590.87	-427.86	1.22	-1.14	9.65	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well SPOTTED 30N-23HZ
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Site:	SPOTTED 35-23HZ PAD	MD Reference:	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
Well:	SPOTTED 30N-23HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales

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)	
5,193.00	1.60	259.99	5,107.05	-428.23	-593.92	-428.23	0.61	-0.59	-5.63	
5,382.00	1.36	241.98	5,295.99	-429.74	-598.50	-429.74	0.28	-0.13	-9.53	
5,476.00	1.25	215.99	5,389.96	-431.09	-600.09	-431.09	0.63	-0.12	-27.65	
5,665.00	0.87	180.71	5,578.93	-434.20	-601.32	-434.20	0.39	-0.20	-18.67	
5,853.00	0.11	274.28	5,766.93	-435.61	-601.52	-435.61	0.47	-0.40	49.77	
5,947.00	0.41	333.13	5,860.93	-435.30	-601.76	-435.30	0.39	0.32	62.61	
6,042.00	0.82	321.19	5,955.92	-434.47	-602.34	-434.47	0.45	0.43	-12.57	
6,136.00	0.84	343.42	6,049.91	-433.29	-602.96	-433.29	0.34	0.02	23.65	
6,231.00	2.03	0.92	6,144.88	-430.94	-603.13	-430.94	1.32	1.25	18.42	
6,325.00	1.86	358.85	6,238.82	-427.75	-603.13	-427.75	0.20	-0.18	-2.20	
6,419.00	1.90	355.77	6,332.77	-424.67	-603.28	-424.67	0.12	0.04	-3.28	
6,514.00	1.70	359.22	6,427.73	-421.69	-603.41	-421.69	0.24	-0.21	3.63	
6,608.00	1.63	358.36	6,521.69	-418.96	-603.47	-418.96	0.08	-0.07	-0.91	
6,702.00	1.93	355.56	6,615.64	-416.04	-603.63	-416.04	0.33	0.32	-2.98	
6,796.00	2.02	353.88	6,709.59	-412.82	-603.93	-412.82	0.11	0.10	-1.79	
6,843.00	2.68	357.83	6,756.55	-410.90	-604.06	-410.90	1.45	1.40	8.40	
6,890.00	5.79	356.24	6,803.41	-407.43	-604.26	-407.43	6.62	6.62	-3.38	
6,937.00	9.93	11.08	6,849.97	-401.09	-603.63	-401.09	9.74	8.81	31.57	
6,985.00	12.43	10.79	6,897.05	-391.95	-601.87	-391.95	5.21	5.21	-0.60	
7,079.00	16.46	0.96	6,988.07	-368.68	-599.75	-368.68	5.00	4.29	-10.46	
7,173.00	22.89	356.63	7,076.54	-337.08	-600.60	-337.08	7.01	6.84	-4.61	
7,268.00	29.45	353.74	7,161.76	-295.38	-604.24	-295.38	7.03	6.91	-3.04	
7,362.00	39.78	350.16	7,239.03	-242.63	-611.92	-242.63	11.20	10.99	-3.81	
7,409.00	45.91	348.95	7,273.47	-211.22	-617.73	-211.22	13.16	13.04	-2.57	
7,457.00	51.92	349.35	7,305.00	-175.70	-624.53	-175.70	12.54	12.52	0.83	
7,504.00	56.13	353.04	7,332.61	-138.13	-630.32	-138.13	10.98	8.96	7.85	
7,551.00	59.80	357.14	7,357.54	-98.45	-633.70	-98.45	10.75	7.81	8.72	
7,598.00	63.98	359.94	7,379.69	-57.02	-634.74	-57.02	10.33	8.89	5.96	
7,645.00	67.01	2.90	7,399.18	-14.28	-633.66	-14.28	8.62	6.45	6.30	
7,692.00	70.95	3.87	7,416.04	29.51	-631.07	29.51	8.60	8.38	2.06	
7,740.00	76.12	4.54	7,429.64	75.40	-627.69	75.40	10.85	10.77	1.40	
7,787.00	79.98	5.92	7,439.37	121.18	-623.50	121.18	8.70	8.21	2.94	
7,838.00	84.12	5.71	7,446.42	171.42	-618.38	171.42	8.13	8.12	-0.41	
7,878.00	85.13	5.10	7,450.17	211.07	-614.63	211.07	2.94	2.51	-1.53	
7"(482 FSL 204 FWL)										
7,945.00	86.81	4.08	7,454.88	277.68	-609.28	277.68	2.94	2.51	-1.52	
8,039.00	87.65	2.98	7,459.42	371.39	-603.50	371.39	1.47	0.89	-1.17	
8,228.00	88.72	3.50	7,465.41	559.99	-592.83	559.99	0.63	0.57	0.28	
8,322.00	89.90	2.44	7,466.54	653.86	-587.96	653.86	1.69	1.26	-1.13	
8,417.00	91.14	2.53	7,465.68	748.76	-583.84	748.76	1.31	1.31	0.09	
8,511.00	92.22	2.14	7,462.92	842.64	-580.01	842.64	1.22	1.15	-0.41	
8,606.00	91.68	1.38	7,459.69	937.54	-577.09	937.54	0.98	-0.57	-0.80	
8,700.00	90.60	1.54	7,457.82	1,031.49	-574.70	1,031.49	1.16	-1.15	0.17	
8,889.00	89.09	358.91	7,458.33	1,220.47	-573.96	1,220.47	1.60	-0.80	-1.39	

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales

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)	
9,077.00	90.13	358.63	7,459.61	1,408.41	-577.99	1,408.41	0.57	0.55	-0.15	
9,171.00	90.91	358.24	7,458.76	1,502.38	-580.56	1,502.38	0.93	0.83	-0.41	
9,360.00	91.35	359.40	7,455.03	1,691.29	-584.45	1,691.29	0.66	0.23	0.61	
9,548.00	90.03	358.76	7,452.77	1,879.25	-587.47	1,879.25	0.78	-0.70	-0.34	
9,737.00	88.32	358.78	7,455.49	2,068.18	-591.53	2,068.18	0.90	-0.90	0.01	
10,020.00	89.80	359.66	7,460.13	2,351.11	-595.38	2,351.11	0.61	0.52	0.31	
10,114.00	90.44	359.49	7,459.94	2,445.10	-596.07	2,445.10	0.70	0.68	-0.18	
10,208.00	90.97	359.63	7,458.78	2,539.09	-596.80	2,539.09	0.58	0.56	0.15	
10,303.00	91.41	358.85	7,456.81	2,634.06	-598.06	2,634.06	0.94	0.46	-0.82	
10,397.00	89.93	358.52	7,455.71	2,728.03	-600.21	2,728.03	1.61	-1.57	-0.35	
10,492.00	89.29	357.30	7,456.35	2,822.96	-603.68	2,822.96	1.45	-0.67	-1.28	
10,586.00	89.33	355.57	7,457.49	2,916.77	-609.52	2,916.77	1.84	0.04	-1.84	
10,775.00	89.63	357.23	7,459.20	3,105.38	-621.39	3,105.38	0.89	0.16	0.88	
10,869.00	89.33	358.43	7,460.05	3,199.31	-624.95	3,199.31	1.32	-0.32	1.28	
11,152.00	89.50	1.88	7,462.94	3,482.25	-624.18	3,482.25	1.22	0.06	1.22	
11,246.00	89.63	1.36	7,463.66	3,576.21	-621.52	3,576.21	0.57	0.14	-0.55	
11,341.00	89.87	359.73	7,464.07	3,671.20	-620.62	3,671.20	1.73	0.25	-1.72	
11,529.00	89.60	0.44	7,464.94	3,859.20	-620.34	3,859.20	0.40	-0.14	0.38	
11,718.00	91.48	3.69	7,463.16	4,048.03	-613.53	4,048.03	1.99	0.99	1.72	
11,812.00	91.85	3.04	7,460.43	4,141.83	-608.02	4,141.83	0.80	0.39	-0.69	
12,001.00	90.47	1.95	7,456.60	4,330.60	-599.79	4,330.60	0.93	-0.73	-0.58	
12,095.00	90.47	1.20	7,455.83	4,424.57	-597.21	4,424.57	0.80	0.00	-0.80	
12,190.00	90.81	0.59	7,454.77	4,519.55	-595.73	4,519.55	0.74	0.36	-0.64	
12,284.00	91.65	1.08	7,452.75	4,613.51	-594.36	4,613.51	1.03	0.89	0.52	
12,376.00	92.63	1.01	7,449.32	4,705.43	-592.68	4,705.43	1.07	1.07	-0.08	
12,564.00	91.74	0.75	7,442.15	4,893.27	-589.79	4,893.27	0.49	-0.47	-0.14	
LAST SDI MWD PRODUCTION SURVEY										
12,646.00	91.74	0.75	7,439.66	4,975.23	-588.72	4,975.23	0.00	0.00	0.00	
SDI PROJECTION TO TD										

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
7,878.00	7,450.17	7"(482 FSL 204 FWL)	7.000	7.500	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well SPOTTED 30N-23HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
Site:	SPOTTED 35-23HZ PAD	MD Reference:	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
Well:	SPOTTED 30N-23HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
125.00	125.00	-0.24	-0.53	FIRST GYRO SURVEY
1,215.00	1,214.97	-1.91	-4.56	LAST GYRO SURVEY
1,374.00	1,373.96	-1.58	-5.95	FIRST SDI MWD PRODUCTION SURVEY
12,564.00	7,442.15	4,893.27	-589.79	LAST SDI MWD PRODUCTION SURVEY
12,646.00	7,439.66	4,975.23	-588.72	SDI PROJECTION TO TD

Checked By: _____ Approved By: _____ Date: _____