

WELL DETAILS: HIGHWAY 160 15C-2HZ

GL 5102' & KB 17' @ 5119.00ft (ASSUMED)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1274884.31	3212560.05	40.0854489	-104.7403120

## SECTION DETAILS

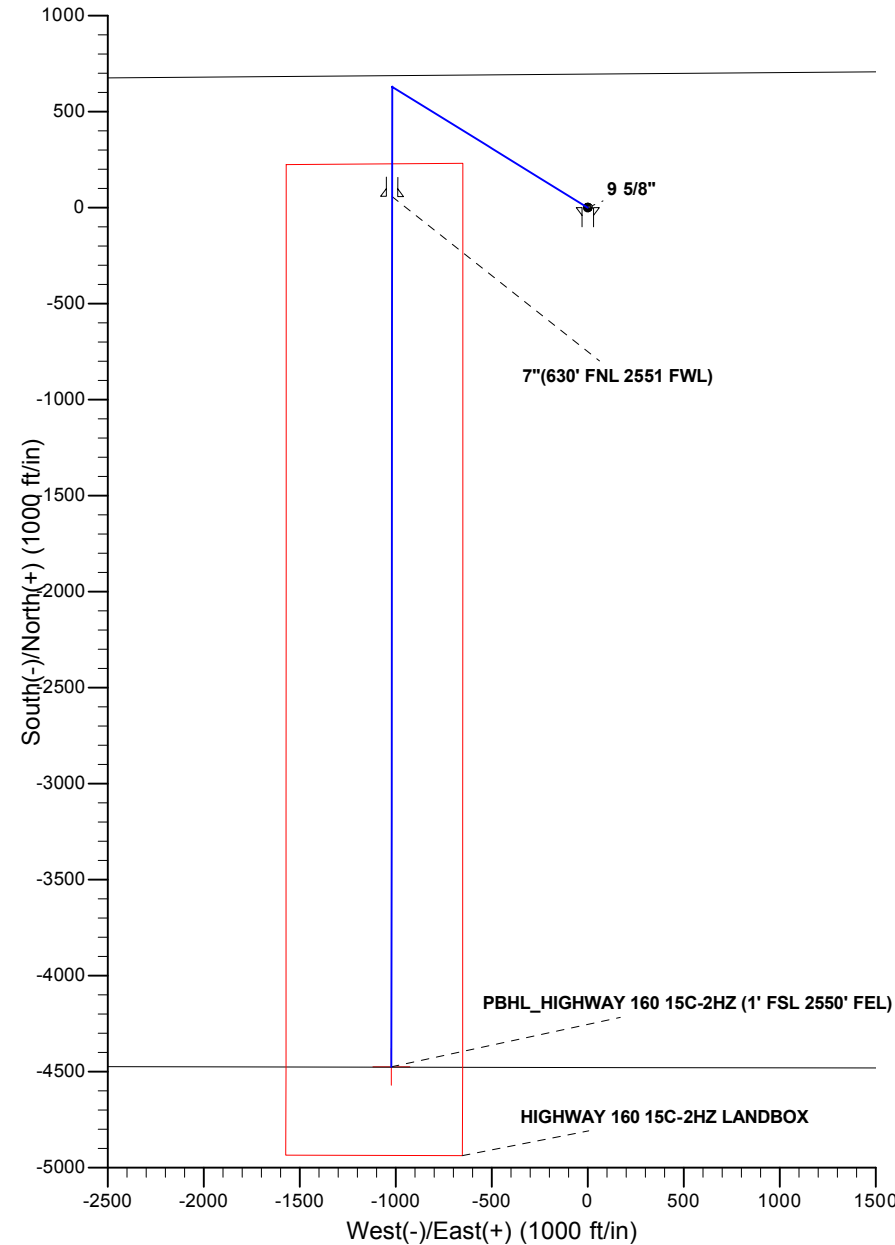
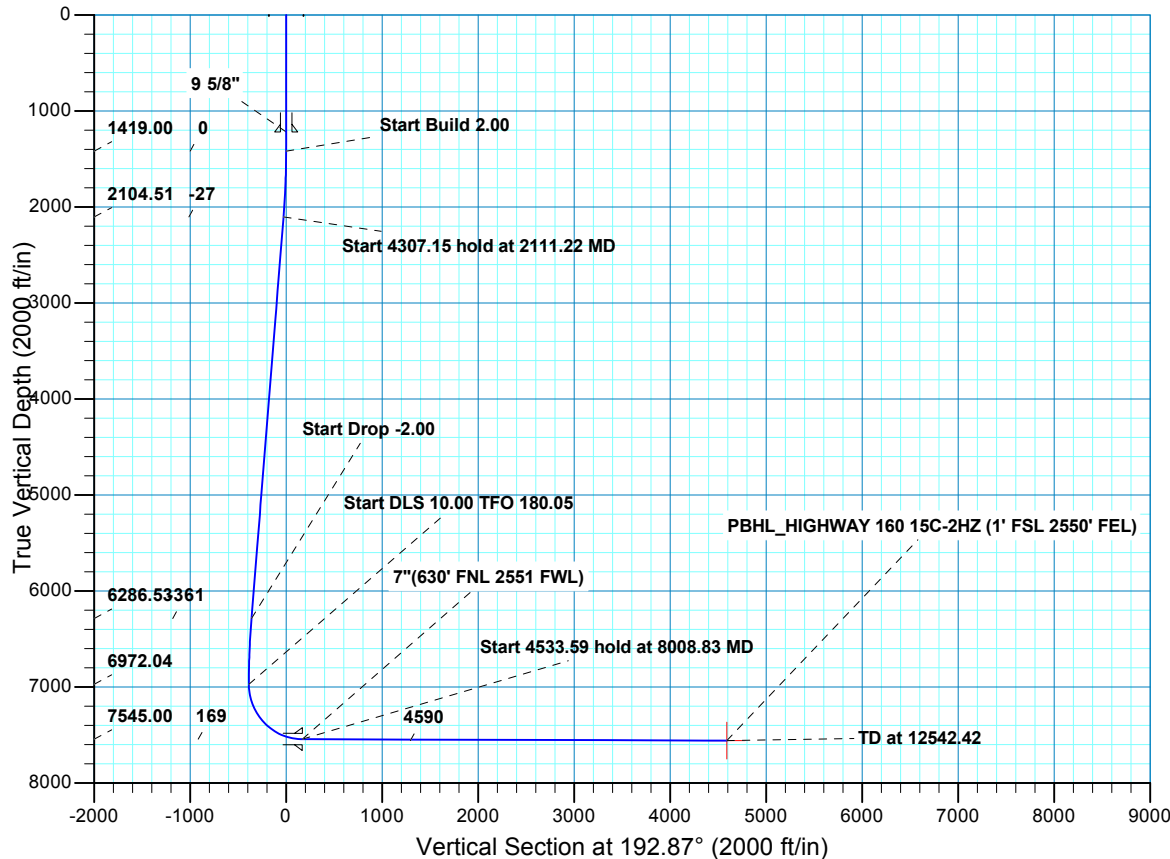
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1419.00	0.00	0.00	1419.00	0.00	0.00	0.00	0.00	0.00	
2111.22	13.84	301.75	2104.51	43.80	-70.77	2.00	301.75	-26.94	
6418.38	13.84	301.75	6286.53	586.20	-947.14	0.00	0.00	-360.53	
7110.60	0.00	0.00	6972.04	630.00	-1017.91	2.00	180.00	-387.46	
8008.83	89.82	180.05	7545.00	58.81	-1018.40	10.00	180.05	169.49	
12542.42	89.82	180.05	7559.00	-4474.75	-1022.31	0.00	0.004590.04		PBHL_HIGHWAY 160 15C-2HZ (1' FSL 2550' FEL)

## FORMATION TOP DETAILS

TVDPath	MDPath	Formation	Inc
1169.00	1169.00	Fox Hills Base	0.00
4421.00	4497.03	Parkman	13.84
5459.00	5566.08	Sussex	13.84
7170.00	7312.73	Sharon Springs	20.21
7206.00	7351.60	Niobrara A	24.10
7286.00	7442.87	Niobrara B	33.23
7369.00	7549.14	Niobrara C	43.85
7516.00	7827.53	Fort Hays	71.69
7540.00	7934.87	Codell	82.43

## CASING DETAILS

TVD	MD	Name	Size
1219.00	1219.00	9 5/8"	9.625
7545.00	8008.83	7"	7.000





# Scientific Drilling

## **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**HIGHWAY 160 2-2HZ PAD**

**HIGHWAY 160 15C-2HZ**

**OH**

**Plan: PLAN #1 PRELIMINARY**

## **Standard Planning Report**

**17 June, 2013**

<b>Database:</b>	EDM5000-RobertS-Local	<b>Local Co-ordinate Reference:</b>	Well HIGHWAY 160 15C-2HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL 5102' & KB 17' @ 5119.00ft (ASSUMED)
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL 5102' & KB 17' @ 5119.00ft (ASSUMED)
<b>Site:</b>	HIGHWAY 160 2-2HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	HIGHWAY 160 15C-2HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1 PRELIMINARY		

<b>Project</b>	COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
<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>	HIGHWAY 160 2-2HZ PAD, SECTION 2 T1N R66W			
<b>Site Position:</b>		<b>Northing:</b>	1,274,974.30 usft	<b>Latitude:</b> 40.0856960
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,212,558.72 usft	<b>Longitude:</b> -104.7403140
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> 0.49 °

<b>Well</b>	HIGHWAY 160 15C-2HZ, 696 FNL 1532 FEL			
<b>Well Position</b>	<b>+N/-S</b>	-89.99 ft	<b>Northing:</b>	1,274,884.31 usft
	<b>+E/-W</b>	0.56 ft	<b>Easting:</b>	3,212,560.05 usft
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	<b>Ground Level:</b> 5,102.00 ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	BGGM2013	2013/06/17	8.58	66.72	52,687

<b>Design</b>	PLAN #1 PRELIMINARY			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	192.87

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,419.00	0.00	0.00	1,419.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,111.22	13.84	301.75	2,104.51	43.80	-70.77	2.00	2.00	0.00	301.75	
6,418.38	13.84	301.75	6,286.53	586.20	-947.14	0.00	0.00	0.00	0.00	
7,110.60	0.00	0.00	6,972.04	630.00	-1,017.91	2.00	-2.00	0.00	180.00	
8,008.83	89.82	180.05	7,545.00	58.81	-1,018.40	10.00	10.00	-20.03	180.05	
12,542.42	89.82	180.05	7,559.00	-4,474.75	-1,022.31	0.00	0.00	0.00	0.00	PBHL_HIGHWAY 160

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<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL 5102' & KB 17' @ 5119.00ft (ASSUMED)
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL 5102' & KB 17' @ 5119.00ft (ASSUMED)
<b>Site:</b>	HIGHWAY 160 2-2HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	HIGHWAY 160 15C-2HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1 PRELIMINARY		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,169.00	0.00	0.00	1,169.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills Base</b>									
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,219.00	0.00	0.00	1,219.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>9 5/8"</b>									
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,419.00	0.00	0.00	1,419.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Start Build 2.00</b>									
1,500.00	1.62	301.75	1,499.99	0.60	-0.97	-0.37	2.00	2.00	0.00
1,600.00	3.62	301.75	1,599.88	3.01	-4.86	-1.85	2.00	2.00	0.00
1,700.00	5.62	301.75	1,699.55	7.25	-11.71	-4.46	2.00	2.00	0.00
1,800.00	7.62	301.75	1,798.88	13.31	-21.51	-8.19	2.00	2.00	0.00
1,900.00	9.62	301.75	1,897.74	21.20	-34.26	-13.04	2.00	2.00	0.00
2,000.00	11.62	301.75	1,996.03	30.90	-49.93	-19.00	2.00	2.00	0.00
2,100.00	13.62	301.75	2,093.60	42.40	-68.50	-26.08	2.00	2.00	0.00
2,111.22	13.84	301.75	2,104.51	43.80	-70.77	-26.94	2.00	2.00	0.00
<b>Start 4307.15 hold at 2111.22 MD</b>									
2,200.00	13.84	301.75	2,190.70	54.98	-88.83	-33.81	0.00	0.00	0.00
2,300.00	13.84	301.75	2,287.80	67.57	-109.18	-41.56	0.00	0.00	0.00
2,400.00	13.84	301.75	2,384.89	80.17	-129.53	-49.30	0.00	0.00	0.00
2,500.00	13.84	301.75	2,481.99	92.76	-149.87	-57.05	0.00	0.00	0.00
2,600.00	13.84	301.75	2,579.08	105.35	-170.22	-64.79	0.00	0.00	0.00
2,700.00	13.84	301.75	2,676.18	117.94	-190.57	-72.54	0.00	0.00	0.00
2,800.00	13.84	301.75	2,773.27	130.54	-210.91	-80.28	0.00	0.00	0.00
2,900.00	13.84	301.75	2,870.37	143.13	-231.26	-88.03	0.00	0.00	0.00
3,000.00	13.84	301.75	2,967.46	155.72	-251.61	-95.77	0.00	0.00	0.00
3,100.00	13.84	301.75	3,064.56	168.32	-271.95	-103.52	0.00	0.00	0.00
3,200.00	13.84	301.75	3,161.65	180.91	-292.30	-111.26	0.00	0.00	0.00
3,300.00	13.84	301.75	3,258.75	193.50	-312.65	-119.01	0.00	0.00	0.00
3,400.00	13.84	301.75	3,355.84	206.10	-332.99	-126.75	0.00	0.00	0.00
3,500.00	13.84	301.75	3,452.94	218.69	-353.34	-134.50	0.00	0.00	0.00
3,600.00	13.84	301.75	3,550.03	231.28	-373.69	-142.24	0.00	0.00	0.00
3,700.00	13.84	301.75	3,647.13	243.87	-394.04	-149.99	0.00	0.00	0.00
3,800.00	13.84	301.75	3,744.22	256.47	-414.38	-157.73	0.00	0.00	0.00
3,900.00	13.84	301.75	3,841.32	269.06	-434.73	-165.48	0.00	0.00	0.00
4,000.00	13.84	301.75	3,938.41	281.65	-455.08	-173.22	0.00	0.00	0.00
4,100.00	13.84	301.75	4,035.51	294.25	-475.42	-180.97	0.00	0.00	0.00
4,200.00	13.84	301.75	4,132.60	306.84	-495.77	-188.71	0.00	0.00	0.00
4,300.00	13.84	301.75	4,229.70	319.43	-516.12	-196.46	0.00	0.00	0.00
4,400.00	13.84	301.75	4,326.79	332.03	-536.46	-204.20	0.00	0.00	0.00
4,497.03	13.84	301.75	4,421.00	344.24	-556.21	-211.72	0.00	0.00	0.00

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<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL 5102' & KB 17' @ 5119.00ft (ASSUMED)
<b>Site:</b>	HIGHWAY 160 2-2HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	HIGHWAY 160 15C-2HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1 PRELIMINARY		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
<b>Parkman</b>									
4,500.00	13.84	301.75	4,423.89	344.62	-556.81	-211.95	0.00	0.00	0.00
4,600.00	13.84	301.75	4,520.98	357.21	-577.16	-219.69	0.00	0.00	0.00
4,700.00	13.84	301.75	4,618.08	369.80	-597.50	-227.44	0.00	0.00	0.00
4,800.00	13.84	301.75	4,715.17	382.40	-617.85	-235.18	0.00	0.00	0.00
4,900.00	13.84	301.75	4,812.27	394.99	-638.20	-242.93	0.00	0.00	0.00
5,000.00	13.84	301.75	4,909.36	407.58	-658.55	-250.67	0.00	0.00	0.00
5,100.00	13.84	301.75	5,006.46	420.18	-678.89	-258.42	0.00	0.00	0.00
5,200.00	13.84	301.75	5,103.55	432.77	-699.24	-266.16	0.00	0.00	0.00
5,300.00	13.84	301.75	5,200.65	445.36	-719.59	-273.91	0.00	0.00	0.00
5,400.00	13.84	301.75	5,297.74	457.96	-739.93	-281.65	0.00	0.00	0.00
5,500.00	13.84	301.75	5,394.84	470.55	-760.28	-289.40	0.00	0.00	0.00
5,566.08	13.84	301.75	5,459.00	478.87	-773.73	-294.52	0.00	0.00	0.00
<b>Sussex</b>									
5,600.00	13.84	301.75	5,491.93	483.14	-780.63	-297.14	0.00	0.00	0.00
5,700.00	13.84	301.75	5,589.03	495.74	-800.97	-304.89	0.00	0.00	0.00
5,800.00	13.84	301.75	5,686.12	508.33	-821.32	-312.63	0.00	0.00	0.00
5,900.00	13.84	301.75	5,783.22	520.92	-841.67	-320.38	0.00	0.00	0.00
6,000.00	13.84	301.75	5,880.31	533.51	-862.02	-328.12	0.00	0.00	0.00
6,100.00	13.84	301.75	5,977.41	546.11	-882.36	-335.87	0.00	0.00	0.00
6,200.00	13.84	301.75	6,074.50	558.70	-902.71	-343.61	0.00	0.00	0.00
6,300.00	13.84	301.75	6,171.60	571.29	-923.06	-351.36	0.00	0.00	0.00
6,400.00	13.84	301.75	6,268.69	583.89	-943.40	-359.10	0.00	0.00	0.00
6,418.38	13.84	301.75	6,286.53	586.20	-947.14	-360.53	0.00	0.00	0.00
<b>Start Drop -2.00</b>									
6,500.00	12.21	301.75	6,366.05	595.88	-962.79	-366.48	2.00	-2.00	0.00
6,600.00	10.21	301.75	6,464.14	606.12	-979.32	-372.78	2.00	-2.00	0.00
6,700.00	8.21	301.75	6,562.84	614.54	-992.93	-377.96	2.00	-2.00	0.00
6,800.00	6.21	301.75	6,662.05	621.15	-1,003.61	-382.02	2.00	-2.00	0.00
6,900.00	4.21	301.75	6,761.63	625.93	-1,011.33	-384.96	2.00	-2.00	0.00
7,000.00	2.21	301.75	6,861.47	628.88	-1,016.09	-386.77	2.00	-2.00	0.00
7,100.00	0.21	301.75	6,961.44	629.99	-1,017.89	-387.46	2.00	-2.00	0.00
7,110.60	0.00	0.00	6,972.04	630.00	-1,017.91	-387.46	2.00	-2.00	0.00
<b>Start DLS 10.00 TFO 180.05</b>									
7,200.00	8.94	180.05	7,061.08	623.04	-1,017.92	-380.68	10.00	10.00	0.00
7,300.00	18.94	180.05	7,158.01	598.98	-1,017.94	-357.22	10.00	10.00	0.00
7,312.73	20.21	180.05	7,170.00	594.72	-1,017.94	-353.06	10.00	10.00	0.00
<b>Sharon Springs</b>									
7,351.60	24.10	180.05	7,206.00	580.06	-1,017.95	-338.77	10.00	10.00	0.00
<b>Niobrara A</b>									
7,400.00	28.94	180.05	7,249.29	558.45	-1,017.97	-317.70	10.00	10.00	0.00
7,442.87	33.23	180.05	7,286.00	536.32	-1,017.99	-296.12	10.00	10.00	0.00
<b>Niobrara B</b>									
7,500.00	38.94	180.05	7,332.15	502.69	-1,018.02	-263.33	10.00	10.00	0.00
7,549.14	43.85	180.05	7,369.00	470.20	-1,018.05	-231.65	10.00	10.00	0.00
<b>Niobrara C</b>									
7,600.00	48.94	180.05	7,404.06	433.39	-1,018.08	-195.75	10.00	10.00	0.00
7,700.00	58.94	180.05	7,462.85	352.65	-1,018.15	-117.03	10.00	10.00	0.00
7,800.00	68.94	180.05	7,506.73	262.93	-1,018.23	-29.55	10.00	10.00	0.00
7,827.53	71.69	180.05	7,516.00	237.01	-1,018.25	-4.27	10.00	10.00	0.00
<b>Fort Hays</b>									
7,900.00	78.94	180.05	7,534.36	166.96	-1,018.31	64.04	10.00	10.00	0.00
7,934.87	82.43	180.05	7,540.00	132.55	-1,018.34	97.58	10.00	10.00	0.00

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<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL 5102' & KB 17' @ 5119.00ft (ASSUMED)
<b>Site:</b>	HIGHWAY 160 2-2HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	HIGHWAY 160 15C-2HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1 PRELIMINARY		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
<b>Codell</b>									
8,000.00	88.94	180.05	7,544.90	67.64	-1,018.39	160.88	10.00	10.00	0.00
8,008.83	89.82	180.05	7,545.00	58.81	-1,018.40	169.49	10.00	10.00	0.00
<b>Start 4533.59 hold at 8008.83 MD - 7"(630' FNL 2551 FWL)</b>									
8,100.00	89.82	180.05	7,545.28	-32.36	-1,018.48	258.38	0.00	0.00	0.00
8,200.00	89.82	180.05	7,545.59	-132.36	-1,018.57	355.89	0.00	0.00	0.00
8,300.00	89.82	180.05	7,545.89	-232.36	-1,018.65	453.40	0.00	0.00	0.00
8,400.00	89.82	180.05	7,546.20	-332.36	-1,018.74	550.90	0.00	0.00	0.00
8,500.00	89.82	180.05	7,546.51	-432.35	-1,018.82	648.41	0.00	0.00	0.00
8,600.00	89.82	180.05	7,546.82	-532.35	-1,018.91	745.92	0.00	0.00	0.00
8,700.00	89.82	180.05	7,547.13	-632.35	-1,019.00	843.42	0.00	0.00	0.00
8,800.00	89.82	180.05	7,547.44	-732.35	-1,019.08	940.93	0.00	0.00	0.00
8,900.00	89.82	180.05	7,547.75	-832.35	-1,019.17	1,038.44	0.00	0.00	0.00
9,000.00	89.82	180.05	7,548.06	-932.35	-1,019.26	1,135.94	0.00	0.00	0.00
9,100.00	89.82	180.05	7,548.37	-1,032.35	-1,019.34	1,233.45	0.00	0.00	0.00
9,200.00	89.82	180.05	7,548.67	-1,132.35	-1,019.43	1,330.96	0.00	0.00	0.00
9,300.00	89.82	180.05	7,548.98	-1,232.35	-1,019.51	1,428.46	0.00	0.00	0.00
9,400.00	89.82	180.05	7,549.29	-1,332.35	-1,019.60	1,525.97	0.00	0.00	0.00
9,500.00	89.82	180.05	7,549.60	-1,432.35	-1,019.69	1,623.48	0.00	0.00	0.00
9,600.00	89.82	180.05	7,549.91	-1,532.35	-1,019.77	1,720.99	0.00	0.00	0.00
9,700.00	89.82	180.05	7,550.22	-1,632.35	-1,019.86	1,818.49	0.00	0.00	0.00
9,800.00	89.82	180.05	7,550.53	-1,732.35	-1,019.94	1,916.00	0.00	0.00	0.00
9,900.00	89.82	180.05	7,550.84	-1,832.35	-1,020.03	2,013.51	0.00	0.00	0.00
10,000.00	89.82	180.05	7,551.15	-1,932.35	-1,020.12	2,111.01	0.00	0.00	0.00
10,100.00	89.82	180.05	7,551.46	-2,032.35	-1,020.20	2,208.52	0.00	0.00	0.00
10,200.00	89.82	180.05	7,551.76	-2,132.35	-1,020.29	2,306.03	0.00	0.00	0.00
10,300.00	89.82	180.05	7,552.07	-2,232.35	-1,020.37	2,403.53	0.00	0.00	0.00
10,400.00	89.82	180.05	7,552.38	-2,332.34	-1,020.46	2,501.04	0.00	0.00	0.00
10,500.00	89.82	180.05	7,552.69	-2,432.34	-1,020.55	2,598.55	0.00	0.00	0.00
10,600.00	89.82	180.05	7,553.00	-2,532.34	-1,020.63	2,696.05	0.00	0.00	0.00
10,700.00	89.82	180.05	7,553.31	-2,632.34	-1,020.72	2,793.56	0.00	0.00	0.00
10,800.00	89.82	180.05	7,553.62	-2,732.34	-1,020.80	2,891.07	0.00	0.00	0.00
10,900.00	89.82	180.05	7,553.93	-2,832.34	-1,020.89	2,988.57	0.00	0.00	0.00
11,000.00	89.82	180.05	7,554.24	-2,932.34	-1,020.98	3,086.08	0.00	0.00	0.00
11,100.00	89.82	180.05	7,554.54	-3,032.34	-1,021.06	3,183.59	0.00	0.00	0.00
11,200.00	89.82	180.05	7,554.85	-3,132.34	-1,021.15	3,281.10	0.00	0.00	0.00
11,300.00	89.82	180.05	7,555.16	-3,232.34	-1,021.24	3,378.60	0.00	0.00	0.00
11,400.00	89.82	180.05	7,555.47	-3,332.34	-1,021.32	3,476.11	0.00	0.00	0.00
11,500.00	89.82	180.05	7,555.78	-3,432.34	-1,021.41	3,573.62	0.00	0.00	0.00
11,600.00	89.82	180.05	7,556.09	-3,532.34	-1,021.49	3,671.12	0.00	0.00	0.00
11,700.00	89.82	180.05	7,556.40	-3,632.34	-1,021.58	3,768.63	0.00	0.00	0.00
11,800.00	89.82	180.05	7,556.71	-3,732.34	-1,021.67	3,866.14	0.00	0.00	0.00
11,900.00	89.82	180.05	7,557.02	-3,832.34	-1,021.75	3,963.64	0.00	0.00	0.00
12,000.00	89.82	180.05	7,557.32	-3,932.34	-1,021.84	4,061.15	0.00	0.00	0.00
12,100.00	89.82	180.05	7,557.63	-4,032.34	-1,021.92	4,158.66	0.00	0.00	0.00
12,200.00	89.82	180.05	7,557.94	-4,132.34	-1,022.01	4,256.16	0.00	0.00	0.00
12,300.00	89.82	180.05	7,558.25	-4,232.34	-1,022.10	4,353.67	0.00	0.00	0.00
12,400.00	89.82	180.05	7,558.56	-4,332.33	-1,022.18	4,451.18	0.00	0.00	0.00
12,500.00	89.82	180.05	7,558.87	-4,432.33	-1,022.27	4,548.68	0.00	0.00	0.00
12,542.42	89.82	180.05	7,559.00	-4,474.75	-1,022.31	4,590.04	0.00	0.00	0.00
<b>TD at 12542.42 - PBHL_HIGHWAY 160 15C-2HZ (1' FSL 2550' FEL)</b>									

<b>Database:</b>	EDM5000-RobertS-Local	<b>Local Co-ordinate Reference:</b>	Well HIGHWAY 160 15C-2HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL 5102' & KB 17' @ 5119.00ft (ASSUMED)
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL 5102' & KB 17' @ 5119.00ft (ASSUMED)
<b>Site:</b>	HIGHWAY 160 2-2HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	HIGHWAY 160 15C-2HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1 PRELIMINARY		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
PBHL_HIGHWAY 160 1	0.00	0.00	7,559.00	-4,474.75	-1,022.31	1,270,400.98	3,211,576.12	40.0731650	-104.7439650
- plan hits target center									
- Point									

Casing Points					
Measured Depth	Vertical Depth	Name		Casing Diameter	Hole Diameter
(ft)	(ft)			(in)	(in)
1,219.00	1,219.00	9 5/8"		9.625	12.250
8,008.83	7,545.00	7"(630' FNL 2551 FWL)		7.000	7.500

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(ft)	(ft)			(°)	(°)	
1,169.00	1,169.00	Fox Hills Base				
4,497.03	4,421.00	Parkman				
5,566.08	5,459.00	Sussex				
7,312.73	7,170.00	Sharon Springs				
7,351.60	7,206.00	Niobrara A				
7,442.87	7,286.00	Niobrara B				
7,549.14	7,369.00	Niobrara C				
7,827.53	7,516.00	Fort Hays				
7,934.87	7,540.00	Codell				

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S	+E/-W	
(ft)	(ft)	(ft)	(ft)	
1,419.00	1,419.00	0.00	0.00	Start Build 2.00
2,111.22	2,104.51	43.80	-70.77	Start 4307.15 hold at 2111.22 MD
6,418.38	6,286.53	586.20	-947.14	Start Drop -2.00
7,110.60	6,972.04	630.00	-1,017.91	Start DLS 10.00 TFO 180.05
8,008.83	7,545.00	58.81	-1,018.40	Start 4533.59 hold at 8008.83 MD
12,542.42	7,559.00	-4,474.75	-1,022.31	TD at 12542.42