Enseco Survey Report

09 March, 2011

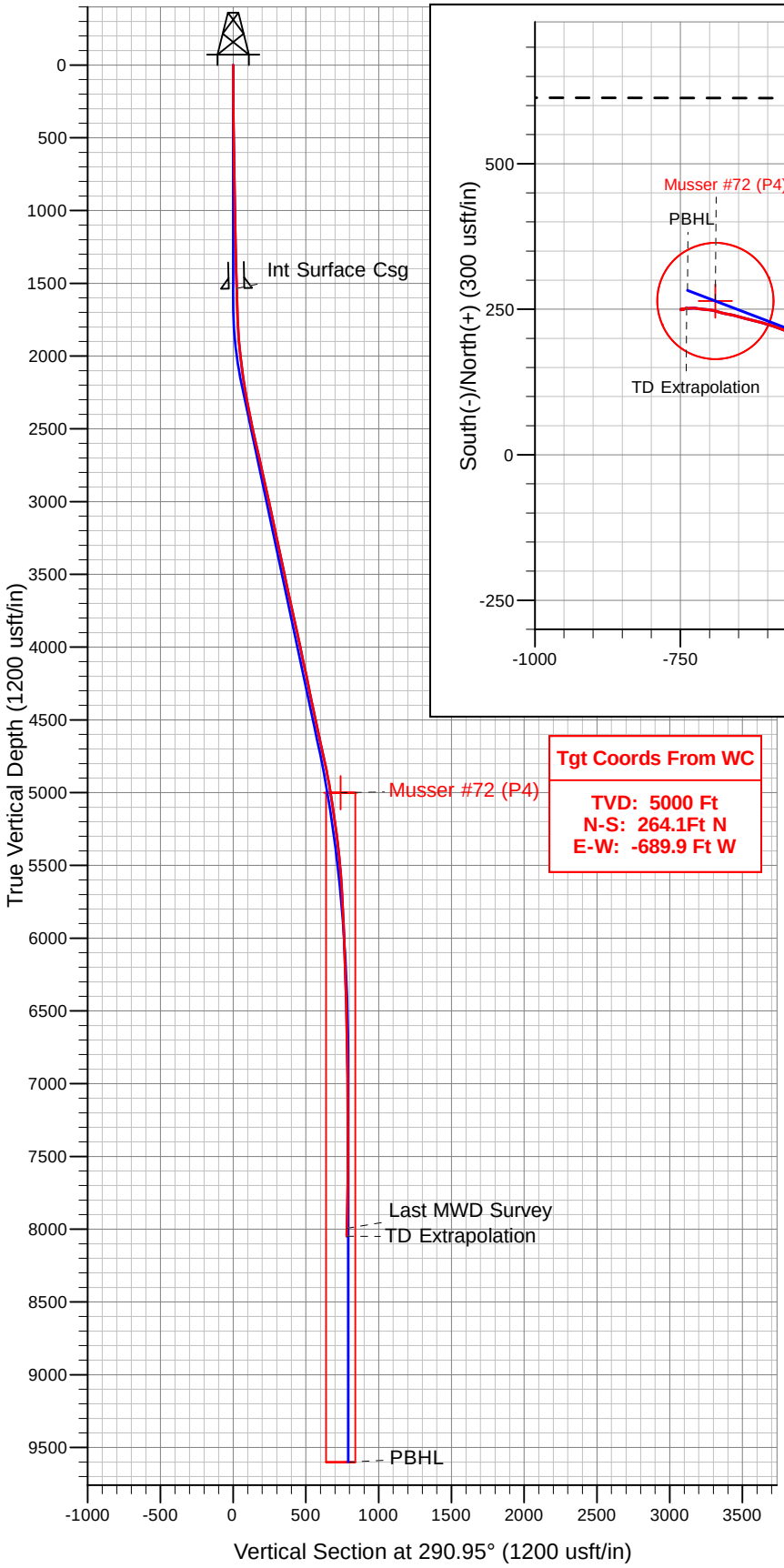
Wexpro Company

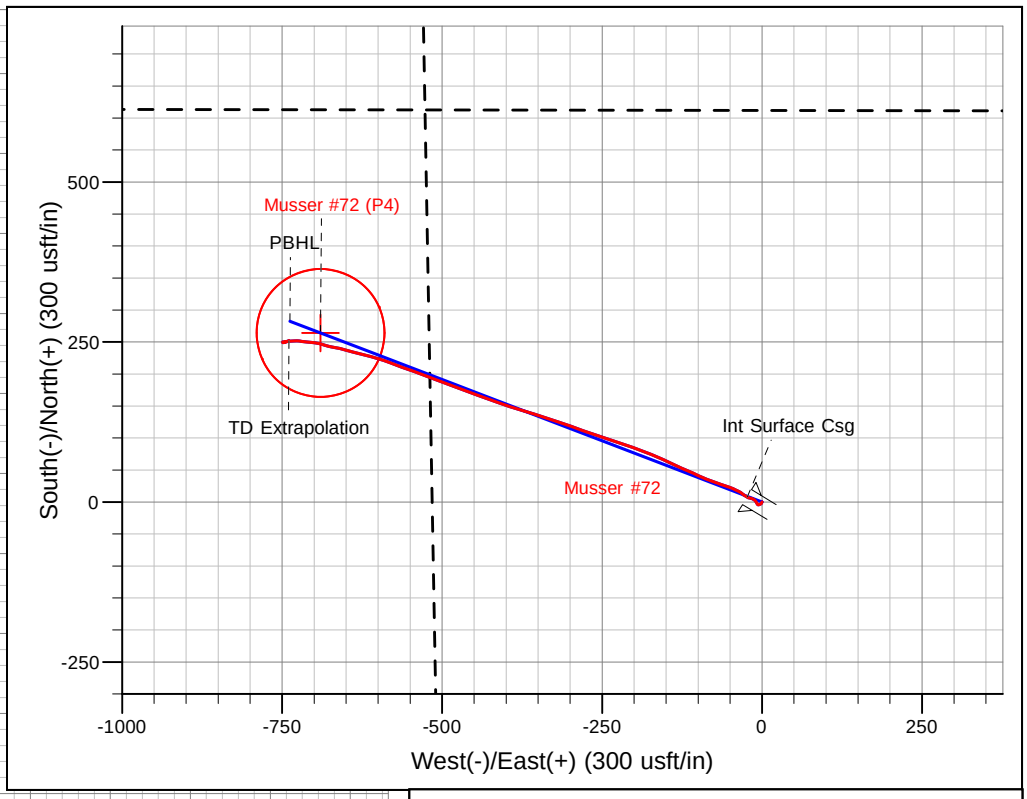
Moffat County, Colorado
Sec 5, T11N, R97W, 6 PM
Musser #72

11055-159

Survey: Final Surveys to TD

Wexpro Company
Project: Moffat County, Colorado
Site: Sec 5, T11N, R97W, 6 PM
Well: Musser #72
Wellbore: 11055-159
Design: Final Surveys





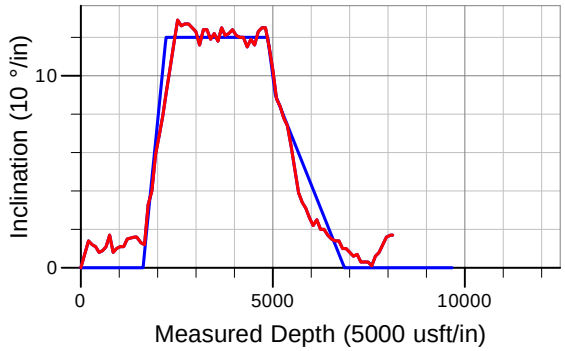
Tgt Coords From WC

TVD: 5000 Ft
N-S: 264.1Ft N
E-W: -689.9 Ft W

Ref Information: Well Center

Geodetic System: US State Plane 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone
Northing: 1597800.11
Easting: 2223938.95
Latitude: 40° 56' 26.080 N
Longitude: 108° 18' 33.625 W

Ground Elevation: 6739.9
KB Elevation: Actual Kb @ 6767.9usft (SST-88)



ANNOTATIONS

TVD	MD	Inc	Azm	Vs	Annotation
1534.7	1535.0	1.38	301.39	24.6	Int Surface Csg
7993.9	8065.0	1.70	67.10	781.6	Last MWD Survey
8048.9	8120.0	1.70	67.10	780.4	TD Extrapolation

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Musser #72
Company:	Wexpro Company	**TVD Reference:**	Actual Kb @ 6767.9usft (SST-88)
Project:	Moffat County, Colorado	**MD Reference:**	Actual Kb @ 6767.9usft (SST-88)
Site:	Sec 5, T11N, R97W, 6 PM	**North Reference:**	True
Well:	Musser #72	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	11055-159		
Design:	Final Surveys		

Project Moffat County, Colorado

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site Sec 5, T11N, R97W, 6 PM

Site Position:		**Northing:**	1,595,742.41 usft	**Latitude:**	40° 56' 6.022 N
From:	Lat/Long	**Easting:**	2,224,780.29 usft	**Longitude:**	108° 18' 21.820 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16"	**Grid Convergence:**	-1.81 °

Well Musser #72

Well Position	**+N/-S**	2,030.0 usft	**Northing:**	1,597,800.11 usft	**Latitude:**	40° 56' 26.080 N
	+E/-W	-906.0 usft	**Easting:**	2,223,938.95 usft	**Longitude:**	108° 18' 33.625 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	6,767.9 usft	**Ground Level:**	6,739.9 usft

Wellbore 11055-159

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/31/2010	10.79	66.88	53,058

Design Final Surveys

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	290.95

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Musser #72
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Project:	Moffat County, Colorado	**MD Reference:**	Actual Kb @ 6767.9usft (SST-88)
Site:	Sec 5, T11N, R97W, 6 PM	**North Reference:**	True
Well:	Musser #72	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	11055-159		
Design:	Final Surveys		

Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	6,767.90	0.0	0.0	0.0	0.00	0.00	0.00
205.0	1.40	208.30	205.0	6,562.92	-2.2	-1.2	0.3	0.68	0.68	0.00
296.0	1.20	251.00	296.0	6,471.94	-3.5	-2.6	1.2	1.06	-0.22	46.92
387.0	1.10	252.60	386.9	6,380.96	-4.1	-4.3	2.6	0.12	-0.11	1.76
478.0	0.80	261.00	477.9	6,289.97	-4.4	-5.8	3.8	0.36	-0.33	9.23
569.0	0.90	322.20	568.9	6,198.98	-4.0	-6.9	5.0	0.96	0.11	67.25
660.0	1.10	329.70	659.9	6,107.99	-2.6	-7.8	6.3	0.26	0.22	8.24
751.0	1.70	334.00	750.9	6,017.02	-0.7	-8.8	8.0	0.67	0.66	4.73
842.0	0.80	325.90	841.9	5,926.04	1.1	-9.7	9.5	1.01	-0.99	-8.90
933.0	1.00	309.20	932.8	5,835.06	2.1	-10.7	10.7	0.36	0.22	-18.35
1,025.0	1.10	304.80	1,024.8	5,743.07	3.1	-12.1	12.4	0.14	0.11	-4.78
1,117.0	1.10	303.20	1,116.8	5,651.09	4.1	-13.5	14.1	0.03	0.00	-1.74
1,211.0	1.50	302.70	1,210.8	5,557.11	5.3	-15.3	16.2	0.43	0.43	-0.53
1,403.0	1.60	268.20	1,402.7	5,365.18	6.5	-20.1	21.1	0.48	0.05	-17.97
1,458.0	1.60	294.10	1,457.7	5,310.20	6.8	-21.6	22.6	1.30	0.00	47.09
Int Surface Csg										
1,535.0	**1.38**	**301.39**	**1,534.7**	**5,233.23**	**7.7**	**-23.3**	**24.6**	**0.38**	**-0.28**	**9.47**
1,566.0	1.30	305.00	1,565.7	5,202.23	8.1	-24.0	25.3	0.38	-0.26	11.63
1,662.0	1.20	295.10	1,661.6	5,106.26	9.2	-25.8	27.3	0.25	-0.10	-10.31
1,757.0	3.30	310.60	1,756.6	5,011.33	11.4	-28.7	30.9	2.28	2.21	16.32
1,852.0	4.00	301.40	1,851.4	4,916.53	14.9	-33.6	36.7	0.96	0.74	-9.68
1,948.0	5.90	296.50	1,947.0	4,820.89	18.8	-40.9	44.9	2.03	1.98	-5.10
2,043.0	6.90	291.20	2,041.4	4,726.48	23.1	-50.6	55.5	1.22	1.05	-5.58
2,139.0	7.90	286.00	2,136.6	4,631.28	27.0	-62.3	67.8	1.25	1.04	-5.42
2,234.0	9.20	289.30	2,230.6	4,537.34	31.3	-75.8	81.9	1.46	1.37	3.47
2,329.0	10.40	294.80	2,324.2	4,443.72	37.4	-90.7	98.1	1.60	1.26	5.79
2,425.0	11.70	293.90	2,418.4	4,349.51	45.0	-107.5	116.5	1.37	1.35	-0.94
2,520.0	12.90	293.40	2,511.2	4,256.69	53.1	-126.0	136.7	1.27	1.26	-0.53
2,616.0	12.60	296.30	2,604.8	4,163.05	62.0	-145.2	157.8	0.74	-0.31	3.02
2,712.0	12.70	292.10	2,698.5	4,069.38	70.6	-164.4	178.8	0.96	0.10	-4.37
2,807.0	12.70	292.50	2,791.2	3,976.71	78.5	-183.7	199.7	0.09	0.00	0.42
2,903.0	12.50	288.10	2,884.9	3,883.02	85.8	-203.4	220.6	1.02	-0.21	-4.58
2,998.0	12.30	289.10	2,977.7	3,790.23	92.3	-222.7	241.0	0.31	-0.21	1.05
3,094.0	11.60	287.70	3,071.6	3,696.31	98.6	-241.5	260.8	0.79	-0.73	-1.46
3,190.0	12.40	288.30	3,165.5	3,602.41	104.7	-260.5	280.8	0.84	0.83	0.62
3,285.0	12.40	290.40	3,258.3	3,509.63	111.5	-279.8	301.1	0.47	0.00	2.21
3,380.0	11.90	288.80	3,351.1	3,416.76	118.2	-298.6	321.1	0.63	-0.53	-1.68
3,475.0	12.20	288.80	3,444.1	3,323.85	124.6	-317.4	341.0	0.32	0.32	0.00
3,571.0	11.80	289.00	3,538.0	3,229.95	131.1	-336.3	360.9	0.42	-0.42	0.21
3,666.0	12.50	287.00	3,630.8	3,137.08	137.2	-355.3	380.9	0.86	0.74	-2.11
3,762.0	12.10	287.40	3,724.6	3,043.28	143.3	-374.8	401.3	0.43	-0.42	0.42
3,857.0	12.20	286.10	3,817.5	2,950.41	149.0	-394.0	421.2	0.31	0.11	-1.37
3,953.0	12.40	290.40	3,911.3	2,856.61	155.5	-413.4	441.6	0.98	0.21	4.48
4,048.0	12.10	290.70	4,004.1	2,763.77	162.5	-432.2	461.8	0.32	-0.32	0.32
4,144.0	12.00	290.00	4,098.0	2,669.89	169.5	-451.0	481.8	0.18	-0.10	-0.73
4,239.0	12.00	289.70	4,190.9	2,576.96	176.2	-469.6	501.6	0.07	0.00	-0.32
4,335.0	11.50	291.10	4,284.9	2,482.98	183.0	-487.9	521.1	0.60	-0.52	1.46
4,430.0	11.90	290.70	4,378.0	2,389.95	189.9	-505.9	540.4	0.43	0.42	-0.42
4,526.0	11.60	290.50	4,471.9	2,295.96	196.8	-524.2	559.9	0.32	-0.31	-0.21
4,621.0	12.30	289.30	4,564.9	2,203.02	203.5	-542.7	579.6	0.78	0.74	-1.26
4,717.0	12.50	290.00	4,658.6	2,109.26	210.4	-562.1	600.2	0.26	0.21	0.73
4,812.0	12.50	290.70	4,751.4	2,016.51	217.5	-581.4	620.8	0.16	0.00	0.74
4,907.0	11.50	287.20	4,844.3	1,923.59	224.0	-600.1	640.5	1.30	-1.05	-3.68
5,003.0	10.30	284.20	4,938.6	1,829.32	228.9	-617.5	658.6	1.38	-1.25	-3.12

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Musser #72
Company:	Wexpro Company	**TVD Reference:**	Actual Kb @ 6767.9usft (SST-88)
Project:	Moffat County, Colorado	**MD Reference:**	Actual Kb @ 6767.9usft (SST-88)
Site:	Sec 5, T11N, R97W, 6 PM	**North Reference:**	True
Well:	Musser #72	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	11055-159		
Design:	Final Surveys		

Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,098.0	8.80	283.90	5,032.3	1,735.64	232.7	-632.8	674.2	1.58	-1.58	-0.32
5,193.0	8.40	286.00	5,126.2	1,641.71	236.4	-646.6	688.3	0.54	-0.42	2.21
5,289.0	7.80	282.80	5,221.2	1,546.67	239.8	-659.7	701.8	0.78	-0.62	-3.33
5,384.0	7.40	280.50	5,315.4	1,452.50	242.3	-672.0	714.2	0.53	-0.42	-2.42
5,480.0	6.30	288.10	5,410.7	1,357.18	245.1	-683.0	725.5	1.48	-1.15	7.92
5,575.0	5.10	282.30	5,505.2	1,262.66	247.6	-692.1	734.9	1.40	-1.26	-6.11
5,670.0	3.90	274.70	5,600.0	1,167.95	248.8	-699.5	742.2	1.41	-1.26	-8.00
5,766.0	3.40	282.50	5,695.8	1,072.14	249.6	-705.5	748.1	0.73	-0.52	8.12
5,861.0	3.10	267.50	5,790.6	977.29	250.1	-710.8	753.3	0.95	-0.32	-15.79
5,957.0	2.60	271.70	5,886.5	881.41	250.1	-715.6	757.7	0.56	-0.52	4.37
6,052.0	2.20	291.80	5,981.4	786.50	250.8	-719.4	761.6	0.97	-0.42	21.16
6,147.0	2.50	272.40	6,076.3	691.57	251.6	-723.2	765.3	0.89	0.32	-20.42
6,243.0	2.00	275.60	6,172.3	595.65	251.8	-727.0	768.9	0.54	-0.52	3.33
6,338.0	2.00	258.00	6,267.2	500.71	251.7	-730.2	771.9	0.64	0.00	-18.53
6,433.0	1.70	276.80	6,362.1	405.75	251.5	-733.2	774.7	0.71	-0.32	19.79
6,529.0	1.50	262.80	6,458.1	309.79	251.5	-735.9	777.2	0.46	-0.21	-14.58
6,624.0	1.40	271.20	6,553.1	214.82	251.4	-738.3	779.4	0.25	-0.11	8.84
6,720.0	1.40	257.80	6,649.1	118.85	251.1	-740.6	781.5	0.34	0.00	-13.96
6,815.0	1.00	272.80	6,744.0	23.87	250.9	-742.6	783.2	0.53	-0.42	15.79
6,911.0	1.00	253.50	6,840.0	-72.11	250.7	-744.2	784.7	0.35	0.00	-20.10
7,006.0	0.80	245.70	6,935.0	-167.10	250.2	-745.6	785.8	0.25	-0.21	-8.21
7,101.0	0.60	272.10	7,030.0	-262.10	250.0	-746.7	786.7	0.39	-0.21	27.79
7,197.0	0.70	278.40	7,126.0	-358.09	250.1	-747.8	787.8	0.13	0.10	6.56
7,292.0	0.30	277.20	7,221.0	-453.09	250.2	-748.6	788.6	0.42	-0.42	-1.26
7,387.0	0.30	193.90	7,316.0	-548.09	250.0	-748.9	788.8	0.42	0.00	-87.68
7,483.0	0.30	187.90	7,412.0	-644.08	249.5	-749.0	788.7	0.03	0.00	-6.25
7,578.0	0.10	166.60	7,507.0	-739.08	249.2	-749.0	788.6	0.22	-0.21	-22.42
7,673.0	0.60	98.20	7,602.0	-834.08	249.0	-748.5	788.1	0.60	0.53	-72.00
7,769.0	0.80	82.60	7,698.0	-930.07	249.0	-747.4	787.0	0.29	0.21	-16.25
7,960.0	1.60	69.40	7,888.9	-1,121.03	250.1	-743.6	783.8	0.44	0.42	-6.91
Last MWD Survey										
8,065.0	**1.70**	**67.10**	**7,993.9**	**-1,225.99**	**251.3**	**-740.7**	**781.6**	**0.11**	**0.10**	**-2.19**
TD Extrapolation										
8,120.0	**1.70**	**67.10**	**8,048.9**	**-1,280.96**	**251.9**	**-739.2**	**780.4**	**0.00**	**0.00**	**0.00**

Casing Points

MD (usft)	TVD (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,535.0	1,534.7	Int Surface Csg	9-5/8	12-1/4

Survey Annotations

MD (usft)	TVD (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1,535.0	1,534.7	7.7	-23.3	Int Surface Csg
8,065.0	7,993.9	251.3	-740.7	Last MWD Survey
8,120.0	8,048.9	251.9	-739.2	TD Extrapolation