

MARATHON OIL COMPANY

Location: COLORADO Slot: SLOT#02 CROW VALLEY 7-62-23-2H (320'FNL & 2036'FWL, SEC.23)
Field: WELD COUNTY (NAD 83, GRID NORTH) Well: CROW VALLEY 7-62-23-2H
Facility: SEC.23-T7N-R62W Wellbore: CROW VALLEY 7-62-23-2H PWB

Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	31.00	0.000	179.776	31.00	0.00	0.00	0.00	0.00
End of Tangent	2900.00	0.000	179.776	2900.00	0.00	0.00	0.00	0.00
End of Build	3200.00	6.000	179.776	3199.45	-15.69	0.06	2.00	15.69
End of Tangent	3250.00	6.000	179.776	3249.18	-20.92	0.08	0.00	20.92
End of Drop	3550.00	0.000	179.776	3548.63	-36.61	0.14	2.00	36.61
End of Tangent	6005.41	0.000	179.776	6004.04	-36.61	0.14	0.00	36.61
End of Build (J)	6905.41	90.000	179.776	6577.00	-609.57	2.38	10.00	609.57
End of Tangent (J)	10764.71	90.000	179.776	6577.00	-4468.83	17.46	0.00	4468.87

Location Information

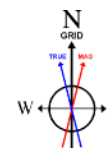
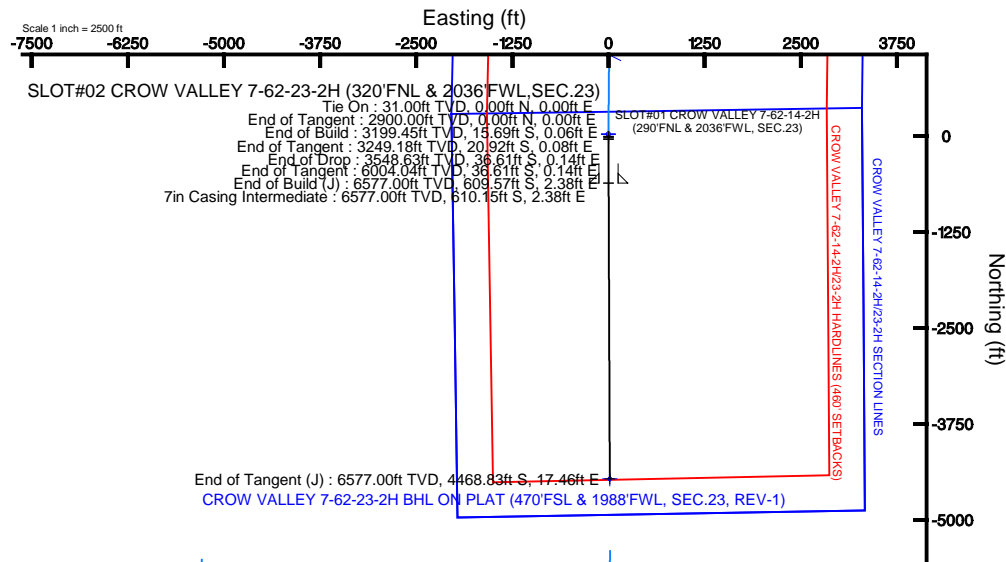
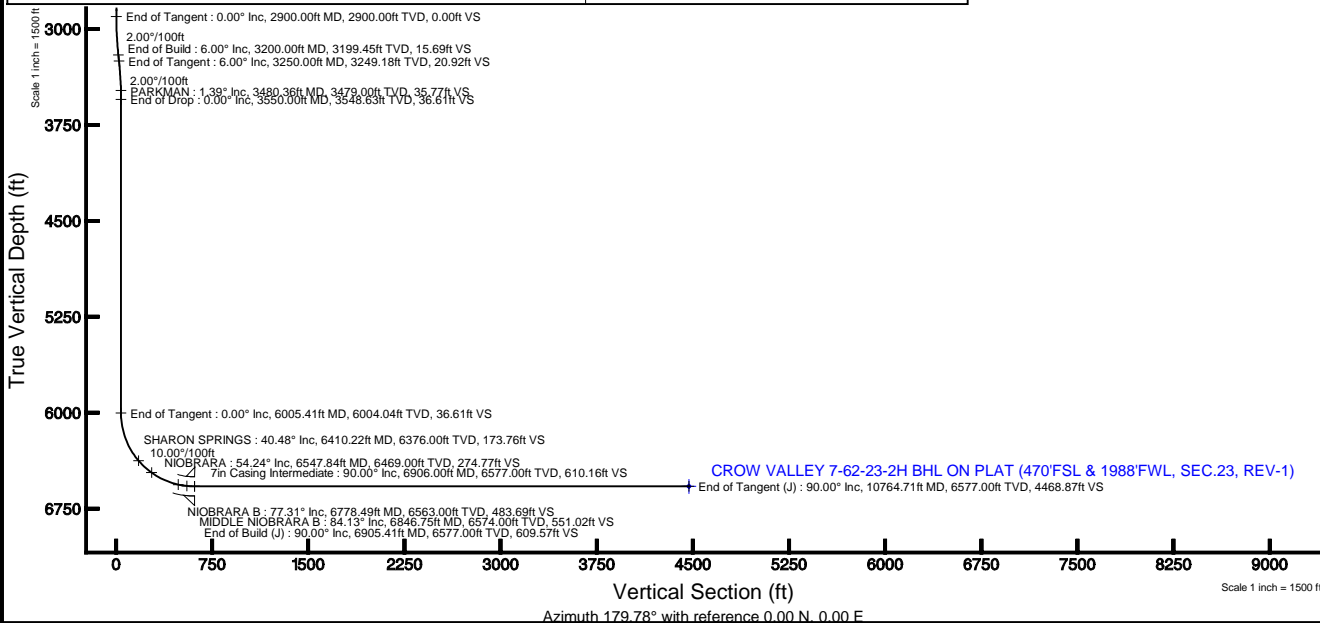
Facility Name			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SEC.23-T7N-R62W			3335969.000	1451378.230	40°33'58.132"N	104°17'27.786"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SLOT#02 CROW VALLEY 7-62-23-2H (320'FNL & 2036'FWL, SEC.23)	-29.99	0.44	3335969.440	1451348.240	40°33'57.835"N	104°17'27.786"W
H&P 321 (RKB) to Mud line (At Slot: SLOT#02 CROW VALLEY 7-62-23-2H (320'FNL & 2036'FWL, SEC.23))					4916R	
Mean Sea Level to Mud line (At Slot: SLOT#02 CROW VALLEY 7-62-23-2H (320'FNL & 2036'FWL, SEC.23))					0R	
H&P 321 (RKB) to Mean Sea Level					4916R	

Targets

Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
CROW VALLEY 7-62-14-2H23-2H SECTION LINES	0.00	29.99	-0.44	3335969.00	1451378.23	40°33'58.132"N	104°17'27.786"W	
CROW VALLEY 7-62-14-2H23-2H SECTION LINES		0.00	29.99	-0.44	3335969.00	1451378.23	40°33'58.132"N	104°17'27.786"W
CROW VALLEY 7-62-23-2H BHL ON PLAT (470'FSL & 1988'FWL, SEC.23, REV-1)	10764.71	6577.00	-4468.83	17.46	3335886.90	1446879.54	40°33'13.679"N	104°17'28.349"W
CROW VALLEY 7-62-14-2H23-2H HARDLINES (480' SETBACKS)		6987.00	29.99	-0.44	3335969.00	1451378.23	40°33'58.132"N	104°17'27.786"W

Plot reference wellpath is CROW VALLEY 7-62-23-2H (REV-A.0) PWP

True vertical depths are referenced to H&P 321 (RKB)	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
Measured depths are referenced to H&P 321 (RKB)	North Reference: Grid north
H&P 321 (RKB) to Mean Sea Level: 4916 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: SLOT#02 CROW VALLEY 7-62-23-2H (320'FNL & 2036'FWL, SEC.23)): 0 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: cookdanm on 2/6/2012



BGGM (1945.0 to 2013.0) Dip: 67.22° Field: 53195 nT
Magnetic North is 8.52 degrees East of True North (at 2/6/2012)
Grid North is 0.78 degrees East of True North
To correct azimuth from True to Grid subtract 0.78 degrees
To correct azimuth from Magnetic to Grid add 7.74 degrees
For example: if the Magnetic North Azimuth = 90 degs, then the Grid North Azimuth = 90 + 7.74 = 97.74



Planned Wellpath Report

CROW VALLEY 7-62-23-2H (REV-A.0) PWP

Page 1 of 6



REFERENCE WELLPATH IDENTIFICATION

Operator	MARATHON OIL COMPANY	Slot	SLOT#02 CROW VALLEY 7-62-23-2H (320'FNL & 2036'FWL,SEC.23)
Area	COLORADO	Well	CROW VALLEY 7-62-23-2H
Field	WELD COUNTY (NAD 83, GRID NORTH)	Wellbore	CROW VALLEY 7-62-23-2H PWB
Facility	SEC.23-T7N-R62W		

REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	Software System	WellArchitect® 3.0.2
North Reference	Grid	User	Cookdanm
Scale	0.999972	Report Generated	2/6/2012 at 4:43:31 PM
Convergence at slot	0.78° East	Database/Source file	WA_Denver/CROW_VALLEY_7-62-23-2H_PWB.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-29.99	0.44	3335869.44	1451348.24	40°33'57.835"N	104°17'27.786"W
Facility Reference Pt			3335869.00	1451378.23	40°33'58.132"N	104°17'27.786"W
Field Reference Pt			3476081.76	1512960.14	40°43'43.704"N	103°46'55.829"W

WELLPATH DATUM

Calculation method	Minimum curvature	H&P 321 (RKB) to Facility Vertical Datum	4916.00ft
Horizontal Reference Pt	Slot	H&P 321 (RKB) to Mean Sea Level	4916.00ft
Vertical Reference Pt	H&P 321 (RKB)	H&P 321 (RKB) to Mud Line at Slot (SLOT#02 CROW VALLEY 7-62-23-2H (320'FNL & 2036'FWL,SEC.23))	4916.00ft
MD Reference Pt	H&P 321 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	179.78°



Planned Wellpath Report

CROW VALLEY 7-62-23-2H (REV-A.0) PWP

Page 2 of 6



REFERENCE WELLPATH IDENTIFICATION

Operator	MARATHON OIL COMPANY	Slot	SLOT#02 CROW VALLEY 7-62-23-2H (320'FNL & 2036'FWL,SEC.23)
Area	COLORADO	Well	CROW VALLEY 7-62-23-2H
Field	WELD COUNTY (NAD 83, GRID NORTH)	Wellbore	CROW VALLEY 7-62-23-2H PWB
Facility	SEC.23-T7N-R62W		

WELLPATH DATA (122 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
0.00†	0.000	179.776	0.00	0.00	0.00	0.00	0.00	
31.00	0.000	179.776	31.00	0.00	0.00	0.00	0.00	Tie On
131.00†	0.000	179.776	131.00	0.00	0.00	0.00	0.00	
231.00†	0.000	179.776	231.00	0.00	0.00	0.00	0.00	
331.00†	0.000	179.776	331.00	0.00	0.00	0.00	0.00	
431.00†	0.000	179.776	431.00	0.00	0.00	0.00	0.00	
450.00†	0.000	179.776	450.00	0.00	0.00	0.00	0.00	PIERRE
531.00†	0.000	179.776	531.00	0.00	0.00	0.00	0.00	
631.00†	0.000	179.776	631.00	0.00	0.00	0.00	0.00	
731.00†	0.000	179.776	731.00	0.00	0.00	0.00	0.00	
831.00†	0.000	179.776	831.00	0.00	0.00	0.00	0.00	
931.00†	0.000	179.776	931.00	0.00	0.00	0.00	0.00	
1031.00†	0.000	179.776	1031.00	0.00	0.00	0.00	0.00	
1131.00†	0.000	179.776	1131.00	0.00	0.00	0.00	0.00	
1231.00†	0.000	179.776	1231.00	0.00	0.00	0.00	0.00	
1331.00†	0.000	179.776	1331.00	0.00	0.00	0.00	0.00	
1431.00†	0.000	179.776	1431.00	0.00	0.00	0.00	0.00	
1531.00†	0.000	179.776	1531.00	0.00	0.00	0.00	0.00	
1631.00†	0.000	179.776	1631.00	0.00	0.00	0.00	0.00	
1731.00†	0.000	179.776	1731.00	0.00	0.00	0.00	0.00	
1831.00†	0.000	179.776	1831.00	0.00	0.00	0.00	0.00	
1931.00†	0.000	179.776	1931.00	0.00	0.00	0.00	0.00	
2031.00†	0.000	179.776	2031.00	0.00	0.00	0.00	0.00	
2131.00†	0.000	179.776	2131.00	0.00	0.00	0.00	0.00	
2231.00†	0.000	179.776	2231.00	0.00	0.00	0.00	0.00	
2331.00†	0.000	179.776	2331.00	0.00	0.00	0.00	0.00	
2431.00†	0.000	179.776	2431.00	0.00	0.00	0.00	0.00	
2531.00†	0.000	179.776	2531.00	0.00	0.00	0.00	0.00	
2631.00†	0.000	179.776	2631.00	0.00	0.00	0.00	0.00	
2731.00†	0.000	179.776	2731.00	0.00	0.00	0.00	0.00	
2831.00†	0.000	179.776	2831.00	0.00	0.00	0.00	0.00	
2900.00	0.000	179.776	2900.00	0.00	0.00	0.00	0.00	End of Tangent
2931.00†	0.620	179.776	2931.00	0.17	-0.17	0.00	2.00	
3031.00†	2.620	179.776	3030.95	2.99	-2.99	0.01	2.00	
3131.00†	4.620	179.776	3130.75	9.31	-9.31	0.04	2.00	
3200.00	6.000	179.776	3199.45	15.69	-15.69	0.06	2.00	End of Build
3231.00†	6.000	179.776	3230.28	18.93	-18.93	0.07	0.00	
3250.00	6.000	179.776	3249.18	20.92	-20.92	0.08	0.00	End of Tangent
3331.00†	4.380	179.776	3329.84	28.25	-28.25	0.11	2.00	
3431.00†	2.380	179.776	3429.66	34.14	-34.14	0.13	2.00	
3480.36†	1.393	179.776	3479.00	35.77	-35.77	0.14	2.00	PARKMAN
3531.00†	0.380	179.776	3529.63	36.55	-36.55	0.14	2.00	
3550.00	0.000	179.776	3548.63	36.61	-36.61	0.14	2.00	End of Drop
3631.00†	0.000	179.776	3629.63	36.61	-36.61	0.14	0.00	
3731.00†	0.000	179.776	3729.63	36.61	-36.61	0.14	0.00	



Planned Wellpath Report

CROW VALLEY 7-62-23-2H (REV-A.0) PWP

Page 3 of 6



REFERENCE WELLPATH IDENTIFICATION

Operator	MARATHON OIL COMPANY	Slot	SLOT#02 CROW VALLEY 7-62-23-2H (320'FNL & 2036'FWL,SEC.23)
Area	COLORADO	Well	CROW VALLEY 7-62-23-2H
Field	WELD COUNTY (NAD 83, GRID NORTH)	Wellbore	CROW VALLEY 7-62-23-2H PWB
Facility	SEC.23-T7N-R62W		

WELLPATH DATA (122 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
3831.00†	0.000	179.776	3829.63	36.61	-36.61	0.14	0.00	
3931.00†	0.000	179.776	3929.63	36.61	-36.61	0.14	0.00	
4031.00†	0.000	179.776	4029.63	36.61	-36.61	0.14	0.00	
4131.00†	0.000	179.776	4129.63	36.61	-36.61	0.14	0.00	
4231.00†	0.000	179.776	4229.63	36.61	-36.61	0.14	0.00	
4331.00†	0.000	179.776	4329.63	36.61	-36.61	0.14	0.00	
4431.00†	0.000	179.776	4429.63	36.61	-36.61	0.14	0.00	
4531.00†	0.000	179.776	4529.63	36.61	-36.61	0.14	0.00	
4631.00†	0.000	179.776	4629.63	36.61	-36.61	0.14	0.00	
4731.00†	0.000	179.776	4729.63	36.61	-36.61	0.14	0.00	
4831.00†	0.000	179.776	4829.63	36.61	-36.61	0.14	0.00	
4931.00†	0.000	179.776	4929.63	36.61	-36.61	0.14	0.00	
5031.00†	0.000	179.776	5029.63	36.61	-36.61	0.14	0.00	
5131.00†	0.000	179.776	5129.63	36.61	-36.61	0.14	0.00	
5231.00†	0.000	179.776	5229.63	36.61	-36.61	0.14	0.00	
5331.00†	0.000	179.776	5329.63	36.61	-36.61	0.14	0.00	
5431.00†	0.000	179.776	5429.63	36.61	-36.61	0.14	0.00	
5531.00†	0.000	179.776	5529.63	36.61	-36.61	0.14	0.00	
5631.00†	0.000	179.776	5629.63	36.61	-36.61	0.14	0.00	
5731.00†	0.000	179.776	5729.63	36.61	-36.61	0.14	0.00	
5831.00†	0.000	179.776	5829.63	36.61	-36.61	0.14	0.00	
5931.00†	0.000	179.776	5929.63	36.61	-36.61	0.14	0.00	
6005.41	0.000	179.776	6004.04	36.61	-36.61	0.14	0.00	End of Tangent
6031.00†	2.559	179.776	6029.62	37.18	-37.18	0.15	10.00	
6131.00†	12.559	179.776	6128.63	50.32	-50.32	0.20	10.00	
6231.00†	22.559	179.776	6223.85	80.45	-80.45	0.31	10.00	
6331.00†	32.559	179.776	6312.39	126.66	-126.66	0.49	10.00	
6410.22†	40.480	179.776	6376.00	173.76	-173.76	0.68	10.00	SHARON SPRINGS
6431.00†	42.559	179.776	6391.56	187.54	-187.54	0.73	10.00	
6531.00†	52.559	179.776	6458.96	261.24	-261.24	1.02	10.00	
6547.84†	54.243	179.776	6469.00	274.77	-274.76	1.07	10.00	NIOBRARA
6631.00†	62.559	179.776	6512.53	345.53	-345.53	1.35	10.00	
6731.00†	72.559	179.776	6550.66	437.84	-437.84	1.71	10.00	
6778.49†	77.308	179.776	6563.00	483.69	-483.68	1.89	10.00	NIOBRARA B
6831.00†	82.559	179.776	6572.17	535.37	-535.36	2.09	10.00	
6846.75†	84.134	179.776	6574.00	551.02	-551.01	2.15	10.00	MIDDLE NIOBRARA B
6905.41	90.000	179.776	6577.00	609.57	-609.57	2.38	10.00	End of Build (J)
6931.00†	90.000	179.776	6577.00	635.16	-635.15	2.48	0.00	
7031.00†	90.000	179.776	6577.00	735.16	-735.15	2.87	0.00	
7131.00†	90.000	179.776	6577.00	835.16	-835.15	3.26	0.00	
7231.00†	90.000	179.776	6577.00	935.16	-935.15	3.65	0.00	
7331.00†	90.000	179.776	6577.00	1035.16	-1035.15	4.04	0.00	
7431.00†	90.000	179.776	6577.00	1135.16	-1135.15	4.44	0.00	
7531.00†	90.000	179.776	6577.00	1235.16	-1235.15	4.83	0.00	
7631.00†	90.000	179.776	6577.00	1335.16	-1335.15	5.22	0.00	



Planned Wellpath Report

CROW VALLEY 7-62-23-2H (REV-A.0) PWP

Page 4 of 6



REFERENCE WELLPATH IDENTIFICATION

Operator	MARATHON OIL COMPANY	Slot	SLOT#02 CROW VALLEY 7-62-23-2H (320'FNL & 2036'FWL,SEC.23)
Area	COLORADO	Well	CROW VALLEY 7-62-23-2H
Field	WELD COUNTY (NAD 83, GRID NORTH)	Wellbore	CROW VALLEY 7-62-23-2H PWB
Facility	SEC.23-T7N-R62W		

WELLPATH DATA (122 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
7731.00†	90.000	179.776	6577.00	1435.16	-1435.15	5.61	0.00	
7831.00†	90.000	179.776	6577.00	1535.16	-1535.15	6.00	0.00	
7931.00†	90.000	179.776	6577.00	1635.16	-1635.15	6.39	0.00	
8031.00†	90.000	179.776	6577.00	1735.16	-1735.15	6.78	0.00	
8131.00†	90.000	179.776	6577.00	1835.16	-1835.15	7.17	0.00	
8231.00†	90.000	179.776	6577.00	1935.16	-1935.14	7.56	0.00	
8331.00†	90.000	179.776	6577.00	2035.16	-2035.14	7.95	0.00	
8431.00†	90.000	179.776	6577.00	2135.16	-2135.14	8.34	0.00	
8531.00†	90.000	179.776	6577.00	2235.16	-2235.14	8.73	0.00	
8631.00†	90.000	179.776	6577.00	2335.16	-2335.14	9.12	0.00	
8731.00†	90.000	179.776	6577.00	2435.16	-2435.14	9.51	0.00	
8831.00†	90.000	179.776	6577.00	2535.16	-2535.14	9.91	0.00	
8931.00†	90.000	179.776	6577.00	2635.16	-2635.14	10.30	0.00	
9031.00†	90.000	179.776	6577.00	2735.16	-2735.14	10.69	0.00	
9131.00†	90.000	179.776	6577.00	2835.16	-2835.14	11.08	0.00	
9231.00†	90.000	179.776	6577.00	2935.16	-2935.14	11.47	0.00	
9331.00†	90.000	179.776	6577.00	3035.16	-3035.14	11.86	0.00	
9431.00†	90.000	179.776	6577.00	3135.16	-3135.14	12.25	0.00	
9531.00†	90.000	179.776	6577.00	3235.16	-3235.13	12.64	0.00	
9631.00†	90.000	179.776	6577.00	3335.16	-3335.13	13.03	0.00	
9731.00†	90.000	179.776	6577.00	3435.16	-3435.13	13.42	0.00	
9831.00†	90.000	179.776	6577.00	3535.16	-3535.13	13.81	0.00	
9931.00†	90.000	179.776	6577.00	3635.16	-3635.13	14.20	0.00	
10031.00†	90.000	179.776	6577.00	3735.16	-3735.13	14.59	0.00	
10131.00†	90.000	179.776	6577.00	3835.16	-3835.13	14.98	0.00	
10231.00†	90.000	179.776	6577.00	3935.16	-3935.13	15.38	0.00	
10331.00†	90.000	179.776	6577.00	4035.16	-4035.13	15.77	0.00	
10431.00†	90.000	179.776	6577.00	4135.16	-4135.13	16.16	0.00	
10531.00†	90.000	179.776	6577.00	4235.16	-4235.13	16.55	0.00	
10631.00†	90.000	179.776	6577.00	4335.16	-4335.13	16.94	0.00	
10731.00†	90.000	179.776	6577.00	4435.16	-4435.13	17.33	0.00	
10764.71	90.000	179.776	6577.00 [†]	4468.87	-4468.83	17.46	0.00	End of Tangent (J)

HOLE & CASING SECTIONS - Ref Wellbore: CROW VALLEY 7-62-23-2H PWB Ref Wellpath: CROW VALLEY 7-62-23-2H (REV-A.0) PWP

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
7in Casing Intermediate	31.00	6906.00	6875.00	31.00	6577.00	0.00	0.00	-610.15	2.38



Planned Wellpath Report

CROW VALLEY 7-62-23-2H (REV-A.0) PWP

Page 5 of 6



REFERENCE WELLPATH IDENTIFICATION

Operator	MARATHON OIL COMPANY	Slot	SLOT#02 CROW VALLEY 7-62-23-2H (320'FNL & 2036'FWL,SEC.23)
Area	COLORADO	Well	CROW VALLEY 7-62-23-2H
Field	WELD COUNTY (NAD 83, GRID NORTH)	Wellbore	CROW VALLEY 7-62-23-2H PWB
Facility	SEC.23-T7N-R62W		

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
CROW VALLEY 7-62-14-2H/23-2H SECTION 23		0.00	29.99	-0.44	3335869.00	1451378.23	40°33'58.132"N	104°17'27.786"W	polygon
CROW VALLEY 7-62-14-2H/23-2H SECTION LINES		0.00	29.99	-0.44	3335869.00	1451378.23	40°33'58.132"N	104°17'27.786"W	polygon
1) CROW VALLEY 7-62-23-2H BHL ON PLAT (470'FSL & 1988'FWL, SEC.23, REV-1)	10764.71	6577.00	-4468.83	17.46	3335886.90	1446879.54	40°33'13.679"N	104°17'28.349"W	point
CROW VALLEY 7-62-14-2H/23-2H HARDLINES (460' SETBACKS)		6587.00	29.99	-0.44	3335869.00	1451378.23	40°33'58.132"N	104°17'27.786"W	polygon

SURVEY PROGRAM - Ref Wellbore: CROW VALLEY 7-62-23-2H PWB Ref Wellpath: CROW VALLEY 7-62-23-2H (REV-A.0) PWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
31.00	10764.71	NaviTrak (Standard)		CROW VALLEY 7-62-23-2H PWB



Planned Wellpath Report

CROW VALLEY 7-62-23-2H (REV-A.0) PWP

Page 6 of 6

**REFERENCE WELLPATH IDENTIFICATION**

Operator	MARATHON OIL COMPANY	Slot	SLOT#02 CROW VALLEY 7-62-23-2H (320'FNL & 2036'FWL,SEC.23)
Area	COLORADO	Well	CROW VALLEY 7-62-23-2H
Field	WELD COUNTY (NAD 83, GRID NORTH)	Wellbore	CROW VALLEY 7-62-23-2H PWB
Facility	SEC.23-T7N-R62W		

WELLPATH COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
450.00	0.000	179.776	450.00	PIERRE
3480.36	1.393	179.776	3479.00	PARKMAN
6410.22	40.480	179.776	6376.00	SHARON SPRINGS
6547.84	54.243	179.776	6469.00	NIOBRARA
6778.49	77.308	179.776	6563.00	NIOBRARA B
6846.75	84.134	179.776	6574.00	MIDDLE NIOBRARA B