

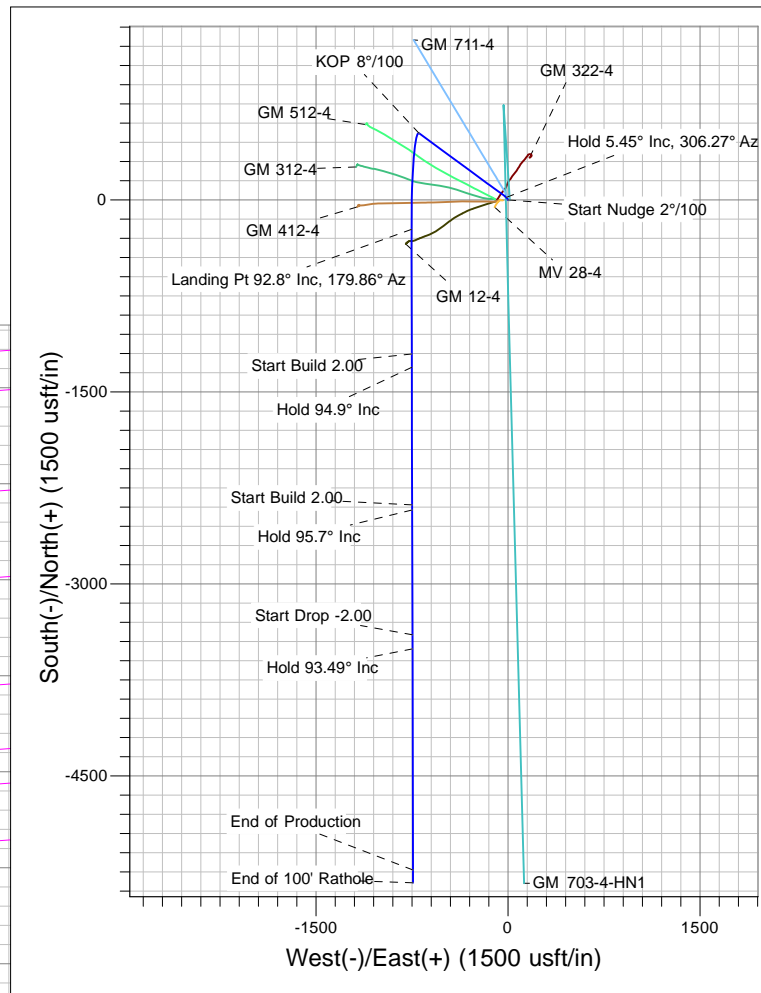
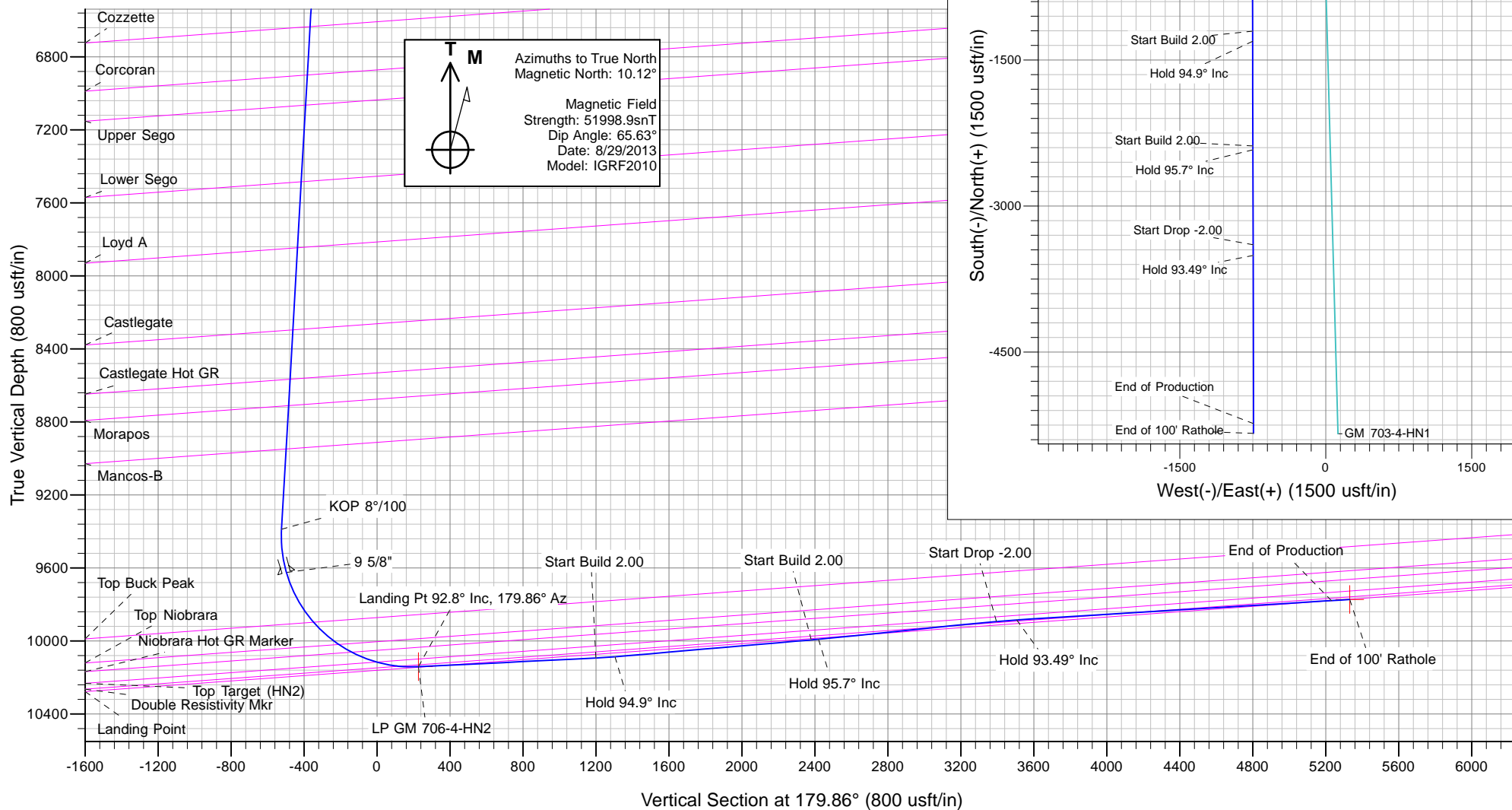


Well Name: GM 706-4-HN2
Surface Location: MV 28-4 Pad
North American Datum 1983 , US State Plane 1983 , Colorado Central Zone
Ground Elevation: 5681.00
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.00 0.00 1605944.54 2261170.56 39.46787 -108.11742 B16
WELL @ 5706.00usft (Original Well Elev)

Project: GV 04-07S-096W
Site: MV 28-4 Pad
Well: GM 706-4-HN2
Plan #4 29Oct13 kjs

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Departure	Annotation
120.00	120.00	0.00	0.00	0.00	0.00	0.00	0.00	Start Nudge 2°/100
526.53	527.53	5.45	306.27	21.34	-13.36	-21.38	25.62	Hold 5.45° Inc, 306.27° Az
9387.72	9428.98	5.45	306.27	521.63	-695.22	-523.32	871.33	KOP 8°/100
10141.00	10629.28	92.80	179.86	-228.46	-754.21	226.61	1633.67	Landing Pt 92.8° Inc, 179.86° Az
10093.39	11603.83	92.80	179.86	-1201.84	-751.80	1200.00	2607.05	Start Build 2.00
10086.34	11708.83	94.90	179.86	-1306.60	-751.54	1304.76	2711.81	Hold 94.9° Inc
9994.16	12788.02	94.90	179.86	-2381.84	-748.88	2380.00	3787.05	Start Build 2.00
9990.47	12828.02	95.70	179.86	-2421.67	-748.78	2419.83	3826.88	Hold 95.7° Inc
9893.13	13808.05	95.70	179.86	-3396.85	-746.36	3395.01	4802.07	Start Drop -2.00
9884.29	13918.43	93.49	179.86	-3506.87	-746.09	3505.03	4912.09	Hold 93.49° Inc
9778.89	15648.58	93.49	179.86	-5233.80	-741.81	5231.97	6639.02	End of Production
9772.80	15748.58	93.49	179.86	-5333.61	-741.56	5331.78	6738.84	End of 100' Rathole





PICEANCE VLY NAD 83

GV 04-07S-096W

MV 28-4 Pad

GM 706-4-HN2 - Slot B16

Wellbore #1

Plan: Plan #4 29Oct13 kjs

Standard Planning Report - Geographic

29 October, 2013



IBM Global Services
Planning Report - Geographic

Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well GM 706-4-HN2 - Slot B16
Company:	PICEANCE VLY NAD 83	TVD Reference:	WELL @ 5706.00usft (Original Well Elev)
Project:	GV 04-07S-096W	MD Reference:	WELL @ 5706.00usft (Original Well Elev)
Site:	MV 28-4 Pad	North Reference:	True
Well:	GM 706-4-HN2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #4 29Oct13 kjs		

Project	GV 04-07S-096W, Garfield County, CO, 04-07S-096W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		Using geodetic scale factor

Site	MV 28-4 Pad			
Site Position:		Northing:	1,605,943.00 usft	Latitude: 39.46786
From:	Map	Easting:	2,261,130.35 usft	Longitude: -108.11756
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence: -1.65 °

Well	GM 706-4-HN2 - Slot B16			
Well Position	+N/-S	0.00 usft	Northing:	1,605,944.54 usft
	+E/-W	0.00 usft	Easting:	2,261,170.56 usft
Position Uncertainty	0.00 usft		Wellhead Elevation:	Ground Level: 5,681.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/29/2013	10.12	65.63	51,999

Design	Plan #4 29Oct13 kjs			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	179.86

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
120.00	0.00	0.00	120.00	0.00	0.00	0.00	0.00	0.00	0.00	
392.48	5.45	335.00	392.07	11.74	-5.47	2.00	2.00	0.00	335.00	
527.53	5.45	306.27	526.53	21.34	-13.36	2.00	0.00	-21.28	-104.26	
9,428.98	5.45	306.27	9,387.71	521.63	-695.22	0.00	0.00	0.00	0.00	
10,629.28	92.80	179.86	10,141.00	-228.46	-754.21	8.00	7.28	-10.53	-126.07	LP GM 706-4-HN2
11,603.83	92.80	179.86	10,093.39	-1,201.84	-751.80	0.00	0.00	0.00	0.00	
11,708.83	94.90	179.86	10,086.34	-1,306.60	-751.54	2.00	2.00	0.00	0.00	
12,788.02	94.90	179.86	9,994.16	-2,381.84	-748.88	0.00	0.00	0.00	0.00	
12,828.02	95.70	179.86	9,990.47	-2,421.67	-748.78	2.00	2.00	0.00	0.00	
13,808.05	95.70	179.86	9,893.13	-3,396.85	-746.36	0.00	0.00	0.00	0.00	
13,918.43	93.49	179.86	9,884.29	-3,506.86	-746.09	2.00	-2.00	0.00	-180.00	
15,748.59	93.49	179.86	9,772.80	-5,333.62	-741.56	0.00	0.00	0.00	0.00	TD / PBHL GM 706-4



IBM Global Services
Planning Report - Geographic

Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well GM 706-4-HN2 - Slot B16
Company:	PICEANCE VLY NAD 83	TVD Reference:	WELL @ 5706.00usft (Original Well Elev)
Project:	GV 04-07S-096W	MD Reference:	WELL @ 5706.00usft (Original Well Elev)
Site:	MV 28-4 Pad	North Reference:	True
Well:	GM 706-4-HN2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #4 29Oct13 kjs		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	1,605,944.54	2,261,170.56	39.46787	-108.11742	
120.00	0.00	0.00	120.00	0.00	0.00	1,605,944.54	2,261,170.56	39.46787	-108.11742	
Start Nudge 2°/100										
200.00	1.60	335.00	199.99	1.01	-0.47	1,605,945.56	2,261,170.12	39.46787	-108.11742	
392.48	5.45	335.00	392.07	11.74	-5.47	1,605,956.43	2,261,165.43	39.46790	-108.11744	
400.00	5.41	333.46	399.56	12.38	-5.78	1,605,957.08	2,261,165.14	39.46790	-108.11744	
527.53	5.45	306.27	526.53	21.34	-13.36	1,605,966.26	2,261,157.83	39.46793	-108.11747	
Hold 5.45° Inc, 306.27° Az										
600.00	5.45	306.27	598.68	25.42	-18.91	1,605,970.49	2,261,152.40	39.46794	-108.11749	
800.00	5.45	306.27	797.77	36.66	-34.23	1,605,982.17	2,261,137.41	39.46797	-108.11754	
1,000.00	5.45	306.27	996.87	47.90	-49.55	1,605,993.84	2,261,122.42	39.46800	-108.11760	
1,200.00	5.45	306.27	1,195.96	59.14	-64.87	1,606,005.52	2,261,107.43	39.46803	-108.11765	
1,400.00	5.45	306.27	1,395.06	70.38	-80.19	1,606,017.20	2,261,092.44	39.46806	-108.11770	
1,600.00	5.45	306.27	1,594.15	81.62	-95.51	1,606,028.87	2,261,077.45	39.46809	-108.11776	
1,800.00	5.45	306.27	1,793.25	92.86	-110.83	1,606,040.55	2,261,062.46	39.46812	-108.11781	
1,822.86	5.45	306.27	1,816.00	94.14	-112.58	1,606,041.88	2,261,060.75	39.46813	-108.11782	
Top of "G" Sand										
1,852.99	5.45	306.27	1,846.00	95.84	-114.89	1,606,043.64	2,261,058.49	39.46813	-108.11783	
Base of "G" Sand										
2,000.00	5.45	306.27	1,992.34	104.10	-126.15	1,606,052.23	2,261,047.47	39.46816	-108.11787	
2,139.29	5.45	306.27	2,131.00	111.93	-136.82	1,606,060.36	2,261,037.03	39.46818	-108.11790	
Top Fort Union										
2,200.00	5.45	306.27	2,191.44	115.34	-141.47	1,606,063.90	2,261,032.48	39.46819	-108.11792	
2,400.00	5.45	306.27	2,390.53	126.58	-156.79	1,606,075.58	2,261,017.49	39.46822	-108.11798	
2,443.66	5.45	306.27	2,434.00	129.04	-160.14	1,606,078.13	2,261,014.22	39.46822	-108.11799	
Base Fort Union										
2,469.78	5.45	306.27	2,460.00	130.50	-162.14	1,606,079.65	2,261,012.26	39.46823	-108.11799	
13 3/8"										
2,509.96	5.45	306.27	2,500.00	132.76	-165.21	1,606,082.00	2,261,009.25	39.46823	-108.11801	
Surface Casing										
2,600.00	5.45	306.27	2,589.63	137.82	-172.11	1,606,087.26	2,261,002.50	39.46825	-108.11803	
2,800.00	5.45	306.27	2,788.72	149.06	-187.43	1,606,098.93	2,260,987.51	39.46828	-108.11808	
3,000.00	5.45	306.27	2,987.82	160.30	-202.75	1,606,110.61	2,260,972.52	39.46831	-108.11814	
3,200.00	5.45	306.27	3,186.91	171.54	-218.07	1,606,122.29	2,260,957.53	39.46834	-108.11819	
3,391.95	5.45	306.27	3,378.00	182.33	-232.78	1,606,133.49	2,260,943.15	39.46837	-108.11824	
Mesaverde										
3,400.00	5.45	306.27	3,386.01	182.78	-233.39	1,606,133.96	2,260,942.54	39.46837	-108.11825	
3,600.00	5.45	306.27	3,585.11	194.02	-248.71	1,606,145.64	2,260,927.55	39.46840	-108.11830	
3,800.00	5.45	306.27	3,784.20	205.26	-264.03	1,606,157.32	2,260,912.56	39.46843	-108.11836	
4,000.00	5.45	306.27	3,983.30	216.51	-279.35	1,606,168.99	2,260,897.57	39.46846	-108.11841	
4,200.00	5.45	306.27	4,182.39	227.75	-294.67	1,606,180.67	2,260,882.59	39.46850	-108.11846	
4,400.00	5.45	306.27	4,381.49	238.99	-309.99	1,606,192.35	2,260,867.60	39.46853	-108.11852	
4,541.15	5.45	306.27	4,522.00	246.92	-320.81	1,606,200.59	2,260,857.02	39.46855	-108.11856	
Approx. Top Gas										
4,600.00	5.45	306.27	4,580.58	250.23	-325.31	1,606,204.02	2,260,852.61	39.46856	-108.11857	
4,800.00	5.45	306.27	4,779.68	261.47	-340.63	1,606,215.70	2,260,837.62	39.46859	-108.11863	
5,000.00	5.45	306.27	4,978.77	272.71	-355.95	1,606,227.38	2,260,822.63	39.46862	-108.11868	
5,200.00	5.45	306.27	5,177.87	283.95	-371.28	1,606,239.05	2,260,807.64	39.46865	-108.11874	
5,400.00	5.45	306.27	5,376.96	295.19	-386.60	1,606,250.73	2,260,792.65	39.46868	-108.11879	
5,600.00	5.45	306.27	5,576.06	306.43	-401.92	1,606,262.41	2,260,777.66	39.46871	-108.11884	
5,800.00	5.45	306.27	5,775.15	317.67	-417.24	1,606,274.08	2,260,762.67	39.46874	-108.11890	
5,859.11	5.45	306.27	5,834.00	320.99	-421.76	1,606,277.53	2,260,758.24	39.46875	-108.11891	
Cameo Coals										



IBM Global Services
Planning Report - Geographic

Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well GM 706-4-HN2 - Slot B16
Company:	PICEANCE VLY NAD 83	TVD Reference:	WELL @ 5706.00usft (Original Well Elev)
Project:	GV 04-07S-096W	MD Reference:	WELL @ 5706.00usft (Original Well Elev)
Site:	MV 28-4 Pad	North Reference:	True
Well:	GM 706-4-HN2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #4 29Oct13 kjs		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
6,000.00	5.45	306.27	5,974.25	328.91	-432.56	1,606,285.76	2,260,747.68	39.46877	-108.11895	
6,200.00	5.45	306.27	6,173.34	340.15	-447.88	1,606,297.44	2,260,732.69	39.46880	-108.11901	
6,363.40	5.45	306.27	6,336.00	349.33	-460.39	1,606,306.98	2,260,720.44	39.46883	-108.11905	
Rollins SS										
6,400.00	5.45	306.27	6,372.44	351.39	-463.20	1,606,309.11	2,260,717.70	39.46883	-108.11906	
6,600.00	5.45	306.27	6,571.53	362.63	-478.52	1,606,320.79	2,260,702.71	39.46887	-108.11912	
6,662.53	5.45	306.27	6,633.78	366.15	-483.31	1,606,324.44	2,260,698.02	39.46888	-108.11913	
Cozzette										
6,800.00	5.45	306.27	6,770.63	373.87	-493.84	1,606,332.47	2,260,687.72	39.46890	-108.11917	
6,928.83	5.45	306.27	6,898.88	381.11	-503.71	1,606,339.99	2,260,678.07	39.46892	-108.11920	
Corcoran										
7,000.00	5.45	306.27	6,969.73	385.11	-509.16	1,606,344.14	2,260,672.73	39.46893	-108.11922	
7,095.27	5.45	306.27	7,064.56	390.47	-516.46	1,606,349.70	2,260,665.59	39.46894	-108.11925	
Upper Sego										
7,200.00	5.45	306.27	7,168.82	396.35	-524.48	1,606,355.82	2,260,657.74	39.46896	-108.11928	
7,400.00	5.45	306.27	7,367.92	407.59	-539.80	1,606,367.50	2,260,642.75	39.46899	-108.11933	
7,516.91	5.45	306.27	7,484.29	414.16	-548.75	1,606,374.32	2,260,633.99	39.46901	-108.11936	
Lower Sego										
7,600.00	5.45	306.27	7,567.01	418.83	-555.12	1,606,379.17	2,260,627.76	39.46902	-108.11939	
7,800.00	5.45	306.27	7,766.11	430.07	-570.44	1,606,390.85	2,260,612.77	39.46905	-108.11944	
7,880.04	5.45	306.27	7,845.79	434.57	-576.57	1,606,395.52	2,260,606.78	39.46906	-108.11946	
Loyd A										
8,000.00	5.45	306.27	7,965.20	441.31	-585.76	1,606,402.53	2,260,597.78	39.46908	-108.11950	
8,200.00	5.45	306.27	8,164.30	452.56	-601.08	1,606,414.20	2,260,582.80	39.46911	-108.11955	
8,331.94	5.45	306.27	8,295.64	459.97	-611.19	1,606,421.91	2,260,572.91	39.46913	-108.11959	
Castlegate										
8,400.00	5.45	306.27	8,363.39	463.80	-616.40	1,606,425.88	2,260,567.81	39.46914	-108.11960	
8,600.00	5.45	306.27	8,562.49	475.04	-631.72	1,606,437.56	2,260,552.82	39.46917	-108.11966	
8,603.29	5.45	306.27	8,565.76	475.22	-631.97	1,606,437.75	2,260,552.57	39.46917	-108.11966	
Castlegate Hot GR										
8,748.54	5.45	306.27	8,710.36	483.38	-643.10	1,606,446.23	2,260,541.68	39.46920	-108.11970	
Morapos										
8,800.00	5.45	306.27	8,761.58	486.28	-647.04	1,606,449.23	2,260,537.83	39.46920	-108.11971	
8,987.61	5.45	306.27	8,948.34	496.82	-661.41	1,606,460.19	2,260,523.77	39.46923	-108.11976	
Mancos-B										
9,000.00	5.45	306.27	8,960.68	497.52	-662.36	1,606,460.91	2,260,522.84	39.46924	-108.11977	
9,200.00	5.45	306.27	9,159.77	508.76	-677.68	1,606,472.59	2,260,507.85	39.46927	-108.11982	
9,400.00	5.45	306.27	9,358.87	520.00	-693.00	1,606,484.26	2,260,492.86	39.46930	-108.11987	
9,428.98	5.45	306.27	9,387.72	521.63	-695.22	1,606,485.95	2,260,490.69	39.46930	-108.11988	
KOP 8°/100										
9,600.00	11.35	202.65	9,557.49	510.86	-708.31	1,606,475.57	2,260,477.29	39.46927	-108.11993	
9,669.04	16.57	195.08	9,624.47	495.07	-713.49	1,606,459.94	2,260,471.66	39.46923	-108.11995	
9 5/8"										
9,800.00	26.80	188.84	9,746.02	447.73	-722.91	1,606,412.89	2,260,460.88	39.46910	-108.11998	
9,983.16	41.31	185.10	9,897.37	346.16	-734.70	1,606,311.70	2,260,446.17	39.46882	-108.12002	
Top Buck Peak										
10,000.00	42.65	184.87	9,909.89	334.93	-735.68	1,606,300.51	2,260,444.87	39.46879	-108.12003	
10,168.30	56.04	183.05	10,019.29	207.84	-744.27	1,606,173.72	2,260,432.62	39.46844	-108.12006	
Top Niobrara										
10,200.00	58.57	182.77	10,036.41	181.20	-745.63	1,606,147.13	2,260,430.50	39.46837	-108.12006	
10,250.37	62.58	182.36	10,061.15	137.38	-747.59	1,606,103.39	2,260,427.28	39.46825	-108.12007	
Niobrara Hot GR Marker										



IBM Global Services
Planning Report - Geographic

Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well GM 706-4-HN2 - Slot B16
Company:	PICEANCE VLY NAD 83	TVD Reference:	WELL @ 5706.00usft (Original Well Elev)
Project:	GV 04-07S-096W	MD Reference:	WELL @ 5706.00usft (Original Well Elev)
Site:	MV 28-4 Pad	North Reference:	True
Well:	GM 706-4-HN2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #4 29Oct13 kjs		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
10,397.78	74.34	181.31	10,115.18	0.58	-751.93	1,605,966.78	2,260,419.00	39.46787	-108.12008	
Top Target (HN2)										
10,400.00	74.51	181.30	10,115.77	-1.56	-751.97	1,605,964.64	2,260,418.89	39.46787	-108.12008	
10,522.32	84.27	180.52	10,138.27	-121.63	-753.86	1,605,844.68	2,260,413.54	39.46754	-108.12009	
Double Resistivity Mkr										
10,600.00	90.46	180.04	10,141.83	-199.19	-754.24	1,605,767.17	2,260,410.94	39.46732	-108.12009	
10,629.28	92.80	179.86	10,141.00	-228.46	-754.21	1,605,737.91	2,260,410.12	39.46724	-108.12009	
Landing Pt 92.8° Inc, 179.86° Az - LP GM 706-4-HN2										
10,774.36	92.80	179.86	10,133.91	-373.36	-753.85	1,605,593.06	2,260,406.30	39.46684	-108.12009	
Landing Point										
10,800.00	92.80	179.86	10,132.66	-398.97	-753.79	1,605,567.46	2,260,405.63	39.46677	-108.12009	
11,000.00	92.80	179.86	10,122.89	-598.73	-753.29	1,605,367.78	2,260,400.37	39.46623	-108.12009	
11,200.00	92.80	179.86	10,113.12	-798.49	-752.80	1,605,168.10	2,260,395.11	39.46568	-108.12009	
11,400.00	92.80	179.86	10,103.35	-998.25	-752.30	1,604,968.41	2,260,389.85	39.46513	-108.12008	
11,600.00	92.80	179.86	10,093.58	-1,198.01	-751.81	1,604,768.73	2,260,384.59	39.46458	-108.12008	
11,603.83	92.80	179.86	10,093.39	-1,201.84	-751.80	1,604,764.91	2,260,384.49	39.46457	-108.12008	
Start Build 2.00										
11,611.03	92.94	179.86	10,093.03	-1,209.03	-751.78	1,604,757.72	2,260,384.30	39.46455	-108.12008	
T2										
11,708.83	94.90	179.86	10,086.34	-1,306.60	-751.54	1,604,660.19	2,260,381.73	39.46428	-108.12008	
Hold 94.9° Inc										
11,800.00	94.90	179.86	10,078.56	-1,397.43	-751.31	1,604,569.39	2,260,379.34	39.46403	-108.12008	
12,000.00	94.90	179.86	10,061.47	-1,596.70	-750.82	1,604,370.20	2,260,374.09	39.46349	-108.12008	
12,200.00	94.90	179.86	10,044.39	-1,795.97	-750.33	1,604,171.01	2,260,368.84	39.46294	-108.12008	
12,241.41	94.90	179.86	10,040.85	-1,837.23	-750.23	1,604,129.77	2,260,367.76	39.46283	-108.12008	
T3										
12,400.00	94.90	179.86	10,027.31	-1,995.24	-749.83	1,603,971.82	2,260,363.60	39.46239	-108.12008	
12,600.00	94.90	179.86	10,010.22	-2,194.51	-749.34	1,603,772.63	2,260,358.35	39.46185	-108.12007	
12,788.02	94.90	179.86	9,994.16	-2,381.84	-748.88	1,603,585.37	2,260,353.42	39.46133	-108.12007	
Start Build 2.00										
12,789.06	94.92	179.86	9,994.07	-2,382.88	-748.87	1,603,584.33	2,260,353.39	39.46133	-108.12007	
T4										
12,800.00	95.14	179.86	9,993.11	-2,393.77	-748.85	1,603,573.44	2,260,353.10	39.46130	-108.12007	
12,828.02	95.70	179.86	9,990.47	-2,421.67	-748.78	1,603,545.55	2,260,352.37	39.46122	-108.12007	
Hold 95.7° Inc										
13,000.00	95.70	179.86	9,973.39	-2,592.80	-748.35	1,603,374.49	2,260,347.86	39.46075	-108.12007	
13,200.00	95.70	179.86	9,953.52	-2,791.81	-747.86	1,603,175.56	2,260,342.62	39.46021	-108.12007	
13,329.69	95.70	179.86	9,940.64	-2,920.85	-747.54	1,603,046.56	2,260,339.23	39.45985	-108.12007	
T5										
13,400.00	95.70	179.86	9,933.66	-2,990.82	-747.37	1,602,976.62	2,260,337.38	39.45966	-108.12007	
13,600.00	95.70	179.86	9,913.80	-3,189.83	-746.88	1,602,777.69	2,260,332.14	39.45911	-108.12007	
13,800.00	95.70	179.86	9,893.93	-3,388.84	-746.38	1,602,578.76	2,260,326.90	39.45857	-108.12006	
13,808.05	95.70	179.86	9,893.13	-3,396.85	-746.36	1,602,570.75	2,260,326.69	39.45854	-108.12006	
Start Drop -2.00										
13,808.82	95.68	179.86	9,893.06	-3,397.62	-746.36	1,602,569.98	2,260,326.67	39.45854	-108.12006	
T6										
13,918.43	93.49	179.86	9,884.29	-3,506.87	-746.09	1,602,460.77	2,260,323.80	39.45824	-108.12006	
Hold 93.49° Inc										
14,000.00	93.49	179.86	9,879.32	-3,588.28	-745.89	1,602,379.39	2,260,321.65	39.45802	-108.12006	
14,200.00	93.49	179.86	9,867.14	-3,787.91	-745.39	1,602,179.84	2,260,316.40	39.45747	-108.12006	
14,400.00	93.49	179.86	9,854.95	-3,987.54	-744.90	1,601,980.29	2,260,311.14	39.45692	-108.12006	
14,600.00	93.49	179.86	9,842.77	-4,187.17	-744.40	1,601,780.73	2,260,305.88	39.45637	-108.12006	



IBM Global Services
Planning Report - Geographic

Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well GM 706-4-HN2 - Slot B16
Company:	PICEANCE VLY NAD 83	TVD Reference:	WELL @ 5706.00usft (Original Well Elev)
Project:	GV 04-07S-096W	MD Reference:	WELL @ 5706.00usft (Original Well Elev)
Site:	MV 28-4 Pad	North Reference:	True
Well:	GM 706-4-HN2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #4 29Oct13 kjs		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
14,624.85	93.49	179.86	9,841.25	-4,211.98	-744.34	1,601,755.94	2,260,305.23	39.45631	-108.12006	
T7										
14,800.00	93.49	179.86	9,830.59	-4,386.80	-743.91	1,601,581.18	2,260,300.63	39.45583	-108.12005	
15,000.00	93.49	179.86	9,818.40	-4,586.42	-743.41	1,601,381.63	2,260,295.37	39.45528	-108.12005	
15,200.00	93.49	179.86	9,806.22	-4,786.05	-742.92	1,601,182.08	2,260,290.12	39.45473	-108.12005	
15,359.09	93.49	179.86	9,796.53	-4,944.84	-742.52	1,601,023.35	2,260,285.94	39.45429	-108.12005	
T8										
15,400.00	93.49	179.86	9,794.04	-4,985.68	-742.42	1,600,982.53	2,260,284.86	39.45418	-108.12005	
15,600.00	93.49	179.86	9,781.85	-5,185.31	-741.93	1,600,782.98	2,260,279.61	39.45363	-108.12005	
15,648.58	93.49	179.86	9,778.89	-5,233.80	-741.81	1,600,734.51	2,260,278.33	39.45350	-108.12005	
End of Production										
15,748.58	93.49	179.86	9,772.80	-5,333.61	-741.56	1,600,634.74	2,260,275.70	39.45323	-108.12005	
End of 100' Rathole										
15,748.59	93.49	179.86	9,772.80	-5,333.62	-741.56	1,600,634.73	2,260,275.70	39.45323	-108.12005	
TD / PBHL GM 706-4-HN2										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
TD / PBHL GM 706-4-HI	0.00	0.00	9,772.80	-5,333.62	-741.56	1,600,634.73	2,260,275.70	39.45323	-108.12005	
- plan hits target center										
- Point										
LP GM 706-4-HN2	0.00	0.00	10,141.00	-228.46	-754.21	1,605,737.91	2,260,410.12	39.46724	-108.12009	
- plan hits target center										
- Point										

Casing Points							Casing Diameter (in)	Hole Diameter (in)
Measured Depth (usft)	Vertical Depth (usft)	Name						
2,469.78	2,460.00	13 3/8"					13.375	17.500
9,669.04	9,624.47	9 5/8"					9.625	12.250



Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well GM 706-4-HN2 - Slot B16
Company:	PICEANCE VLY NAD 83	TVD Reference:	WELL @ 5706.00usft (Original Well Elev)
Project:	GV 04-07S-096W	MD Reference:	WELL @ 5706.00usft (Original Well Elev)
Site:	MV 28-4 Pad	North Reference:	True
Well:	GM 706-4-HN2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #4 29Oct13 kjs		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,822.86	1,816.00	Top of "G" Sand				
1,852.99	1,846.00	Base of "G" Sand				
2,139.29	2,131.00	Top Fort Union				
2,443.66	2,434.00	Base Fort Union				
2,509.96	2,500.00	Surface Casing				
3,391.95	3,378.00	Mesaverde				
4,541.15	4,522.00	Approx. Top Gas				
5,859.11	5,834.00	Cameo Coals				
6,363.40	6,336.00	Rollins SS				
6,662.53	6,633.78	Cozzette		-4.17	179.86	
6,928.83	6,898.88	Corcoran		-4.17	179.86	
7,095.27	7,064.56	Upper Sego		-4.17	179.86	
7,516.91	7,484.29	Lower Sego		-4.17	179.86	
7,880.04	7,845.79	Loyd A		-4.17	179.86	
8,331.94	8,295.64	Castlegate		-4.17	179.86	
8,603.29	8,565.76	Castlegate Hot GR		-4.17	179.86	
8,748.54	8,710.36	Morapos		-4.17	179.86	
8,987.61	8,948.34	Mancos-B		-4.17	179.86	
9,983.16	9,897.37	Top Buck Peak		-4.17	179.86	
10,168.30	10,019.29	Top Niobrara		-4.17	179.86	
10,250.37	10,061.15	Niobrara Hot GR Marker		-4.17	179.86	
10,397.78	10,115.18	Top Target (HN2)		-4.17	179.86	
10,774.36	10,133.91	Landing Point		-4.17	179.86	
10,522.32	10,138.27	Double Resistivity Mkr		-4.17	179.86	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
120.00	120.00	0.00	0.00	Start Nudge 2°/100	
527.53	526.53	21.34	-13.36	Hold 5.45° Inc, 306.27° Az	
9,428.98	9,387.72	521.63	-695.22	KOP 8°/100	
10,629.28	10,141.00	-228.46	-754.21	Landing Pt 92.8° Inc, 179.86° Az	
11,603.83	10,093.39	-1,201.84	-751.80	Start Build 2.00	
11,708.83	10,086.34	-1,306.60	-751.54	Hold 94.9° Inc	
12,788.02	9,994.16	-2,381.84	-748.88	Start Build 2.00	
12,828.02	9,990.47	-2,421.67	-748.78	Hold 95.7° Inc	
13,808.05	9,893.13	-3,396.85	-746.36	Start Drop -2.00	
13,918.43	9,884.29	-3,506.87	-746.09	Hold 93.49° Inc	
15,648.58	9,778.89	-5,233.80	-741.81	End of Production	
15,748.58	9,772.80	-5,333.61	-741.56	End of 100' Rathole	