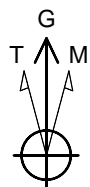


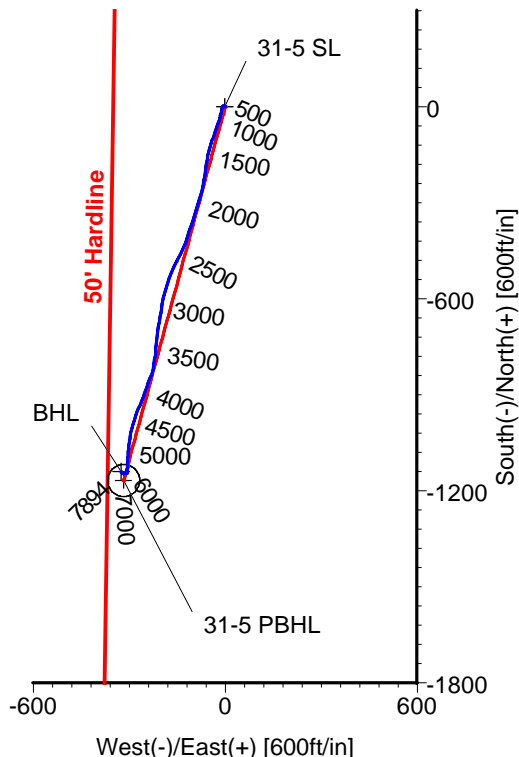
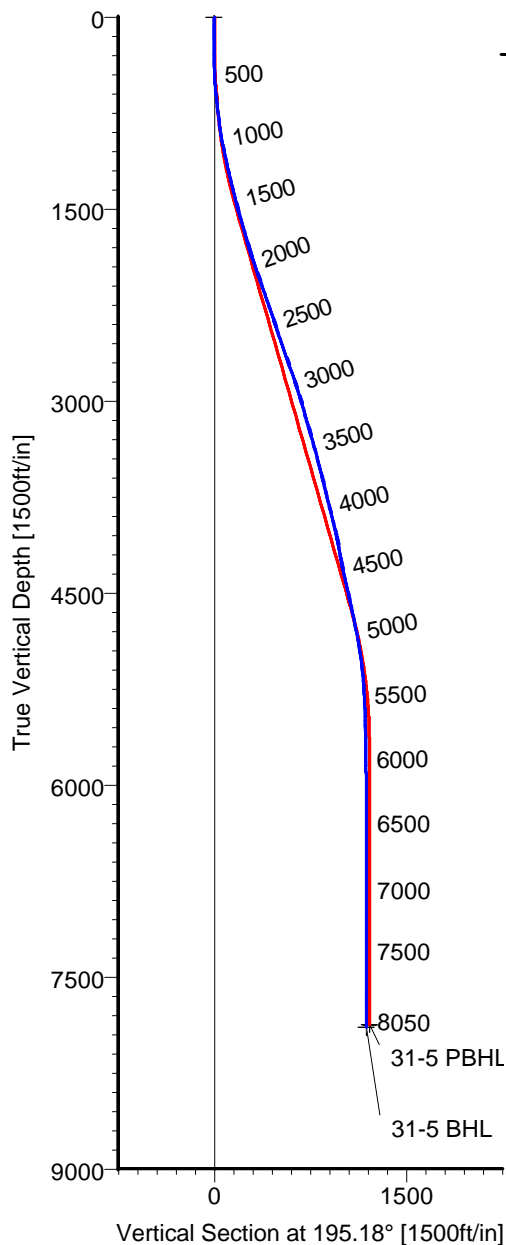
ANADARKO PETROLEUM

Field: Weld County, CO
Site: Vogl 4-5 Pad
Well: 31-5
Wellpath: Original Hole



Azimuths to Grid North
True North: -0.37°
Magnetic North: 8.70°

Magnetic Field
Strength: 53144nT
Dip Angle: 66.88°
Date: 06/02/2010
Model: IGRF2010



LEGEND

- 31-5, Original Hole, Plan #1
- Original Hole

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
31-5 SL	0.00	0.00	0.00	40°10'27.959N	104°55'19.521W	Point
31-5 PBHL	7872.00	-1167.91	-316.88	40°10'16.438N	104°55'23.701W	Circle (Radius: 50)
31-5 BHL	7894.03	-1140.50	-325.21	40°10'16.709N	104°55'23.806W	Point

Wellpath: (31-5/Original Hole)

ALLIS-CHALMERS DIRECTIONAL DRILLING SERVICES
911 Regional Park Drive Houston, Texas 77060
Phone: 713-934-9600 Fax: 713-934-9067

Created By: Ivonne Gonzalez

Date: 07/06/2010



DIRECTIONAL
DRILLING SERVICES

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM		Date: 07/06/2010	Time: 09:53:36	Page: 1
Field: Weld County, CO		Co-ordinate(NE) Reference: Well: 31-5, Grid North		
Site: Vogl 4-5 Pad		Vertical (TVD) Reference: 4830'GL+16'KB 4846.0		
Well: 31-5		Section (VS) Reference: Well (0.00N,0.00E,195.18Azi)		
Wellpath: Original Hole		Survey Calculation Method: Minimum Curvature Db: Adapti		

Field: Weld County, CO	
Map System: US State Plane Coordinate System 1983	Map Zone: Colorado, Northern Zone
Geo Datum: GRS 1980	Coordinate System: Well Centre
Sys Datum: Mean Sea Level	Geomagnetic Model: IGRF2010

Site: Vogl 4-5 Pad	
Site Position:	Northing: 1306931.11 ft
From: Geographic	Easting: 3161486.16 ft
Position Uncertainty: 0.00 ft	Latitude: 40 10 28.092 N
Ground Level: 4830.00 ft	Longitude: 104 55 19.632 W
	North Reference: Grid
	Grid Convergence: 0.37 deg

Well: 31-5	Slot Name: 31-5
Well Position: +N/-S -13.43 ft	Latitude: 40 10 27.959 N
+E/-W 8.69 ft	Longitude: 104 55 19.521 W
Position Uncertainty: 0.00 ft	

Wellpath: Original Hole	Drilled From: Surface
Current Datum: 4830'GL+16'KB	Tie-on Depth: 0.00 ft
Magnetic Data: 06/02/2010	Above System Datum: Mean Sea Level
Field Strength: 53144 nT	Declination: 9.07 deg
Vertical Section: Depth From (TVD)	Mag Dip Angle: 66.88 deg
ft	+N/-S
	+E/-W
	Direction
	deg
0.00	0.00
0.00	0.00
0.00	195.18

Survey Program for Definitive Wellpath		Version: 0	
Date: 07/06/2010	Validated: No	Toolcode	Tool Name
Actual From	To		
ft	ft		
145.00	8005.00	Survey #1 (145.00-8005.00)	MWD
8050.00	8050.00	Survey #2 (8050.00-8050.00)	Project
			Std MWD Projection

Survey										
MD	Incl	Azim	TVD	+N/-S	+E/-W	VS	DLS	Build	Turn	Tool/Comment
ft	deg	deg	ft	ft	ft	ft	deg/100ft	deg/100ft	deg/100ft	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
145.00	1.10	307.50	144.99	0.85	-1.10	-0.53	0.76	0.76	0.00	MWD
173.00	1.10	303.70	172.99	1.16	-1.54	-0.72	0.26	0.00	-13.57	MWD
202.00	1.10	296.00	201.98	1.44	-2.02	-0.86	0.51	0.00	-26.55	MWD
233.00	1.60	313.20	232.97	1.86	-2.61	-1.12	2.06	1.61	55.48	MWD
264.00	1.60	304.40	263.96	2.40	-3.28	-1.46	0.79	0.00	-28.39	MWD
295.00	1.20	279.10	294.95	2.70	-3.96	-1.57	2.34	-1.29	-81.61	MWD
325.00	1.40	287.20	324.94	2.86	-4.62	-1.55	0.90	0.67	27.00	MWD
356.00	1.60	259.70	355.93	2.89	-5.40	-1.38	2.38	0.65	-88.71	MWD
388.00	1.70	220.90	387.92	2.45	-6.15	-0.76	3.44	0.31	-121.25	MWD
417.00	2.10	215.80	416.90	1.70	-6.75	0.13	1.50	1.38	-17.59	MWD
448.00	2.50	209.80	447.88	0.65	-7.41	1.31	1.50	1.29	-19.35	MWD
479.00	3.20	196.50	478.84	-0.77	-8.00	2.83	3.09	2.26	-42.90	MWD
509.00	3.70	204.20	508.79	-2.45	-8.63	4.63	2.27	1.67	25.67	MWD
541.00	4.70	200.20	540.70	-4.62	-9.51	6.95	3.25	3.12	-12.50	MWD
571.00	5.50	192.60	570.58	-7.18	-10.25	9.61	3.48	2.67	-25.33	MWD
602.00	5.80	196.50	601.43	-10.13	-11.01	12.66	1.57	0.97	12.58	MWD
632.00	6.00	198.60	631.27	-13.07	-11.94	15.74	0.98	0.67	7.00	MWD
712.00	6.50	187.70	710.80	-21.52	-13.89	24.41	1.61	0.62	-13.62	MWD
743.00	6.90	190.10	741.59	-25.09	-14.45	28.00	1.57	1.29	7.74	MWD
775.00	6.30	190.10	773.38	-28.72	-15.09	31.67	1.87	-1.87	0.00	MWD
807.00	6.50	191.50	805.18	-32.22	-15.76	35.22	0.79	0.62	4.37	MWD

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM

Field: Weld County, CO

Site: Vogl 4-5 Pad

Well: 31-5

Wellpath: Original Hole

Date: 07/06/2010

Time: 09:53:36

Page: 2

Co-ordinate(NE) Reference: Well: 31-5, Grid North

Vertical (TVD) Reference: 4830'GL+16'KB 4846.0

Section (VS) Reference: Well (0.00N,0.00E,195.18Azi)

Survey Calculation Method: Minimum Curvature

Db: Adapti

Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
838.00	7.40	193.60	835.95	-35.88	-16.58	38.97	3.02	2.90	6.77	MWD
870.00	8.50	193.00	867.64	-40.19	-17.60	43.39	3.45	3.44	-1.87	MWD
901.00	9.20	195.00	898.27	-44.81	-18.75	48.16	2.47	2.26	6.45	MWD
933.00	9.70	200.00	929.84	-49.82	-20.34	53.40	3.00	1.56	15.62	MWD
965.00	10.00	205.60	961.37	-54.86	-22.46	58.82	3.14	0.94	17.50	MWD
997.00	10.60	201.00	992.85	-60.11	-24.72	64.48	3.18	1.87	-14.37	MWD
1028.00	11.30	202.80	1023.29	-65.57	-26.91	70.33	2.51	2.26	5.81	MWD
1060.00	12.00	198.90	1054.63	-71.61	-29.21	76.76	3.29	2.19	-12.19	MWD
1091.00	12.70	196.50	1084.91	-77.92	-31.22	83.38	2.80	2.26	-7.74	MWD
1123.00	12.80	195.80	1116.12	-84.71	-33.18	90.44	0.58	0.31	-2.19	MWD
1155.00	12.80	200.80	1147.33	-91.43	-35.41	97.51	3.46	0.00	15.62	MWD
1187.00	12.70	199.30	1178.54	-98.07	-37.83	104.55	1.08	-0.31	-4.69	MWD
1218.00	13.20	200.70	1208.75	-104.59	-40.21	111.47	1.90	1.61	4.52	MWD
1250.00	13.00	200.30	1239.92	-111.39	-42.75	118.69	0.69	-0.62	-1.25	MWD
1282.00	13.60	198.10	1271.06	-118.34	-45.16	126.04	2.45	1.87	-6.87	MWD
1314.00	13.20	197.50	1302.19	-125.40	-47.43	133.44	1.32	-1.25	-1.87	MWD
1345.00	13.60	195.80	1332.34	-132.28	-49.49	140.63	1.81	1.29	-5.48	MWD
1377.00	13.70	193.60	1363.44	-139.59	-51.40	148.18	1.65	0.31	-6.87	MWD
1409.00	14.30	189.80	1394.49	-147.16	-52.97	155.90	3.43	1.87	-11.87	MWD
1440.00	14.60	187.70	1424.51	-154.81	-54.14	163.58	1.95	0.97	-6.77	MWD
1472.00	14.40	188.40	1455.49	-162.74	-55.26	171.53	0.83	-0.62	2.19	MWD
1535.00	16.40	191.50	1516.23	-179.21	-58.18	188.19	3.43	3.17	4.92	MWD
1599.00	16.20	188.00	1577.66	-196.90	-61.23	206.06	1.57	-0.31	-5.47	MWD
1662.00	16.20	189.80	1638.15	-214.27	-63.94	223.53	0.80	0.00	2.86	MWD
1726.00	15.80	187.00	1699.68	-231.71	-66.53	241.05	1.36	-0.62	-4.37	MWD
1789.00	16.00	190.10	1760.27	-248.77	-69.09	258.18	1.38	0.32	4.92	MWD
1853.00	16.50	197.80	1821.72	-266.11	-73.42	276.05	3.45	0.78	12.03	MWD
1916.00	18.50	196.80	1881.80	-284.20	-79.04	294.98	3.21	3.17	-1.59	MWD
1979.00	19.20	195.80	1941.42	-303.74	-84.75	315.33	1.22	1.11	-1.59	MWD
2043.00	19.70	195.40	2001.77	-324.26	-90.48	336.64	0.81	0.78	-0.62	MWD
2106.00	19.20	201.00	2061.18	-344.17	-97.02	357.57	3.06	-0.79	8.89	MWD
2170.00	19.00	197.90	2121.65	-363.91	-103.99	378.44	1.62	-0.31	-4.84	MWD
2234.00	19.40	198.20	2182.09	-383.92	-110.51	399.47	0.64	0.62	0.47	MWD
2297.00	19.50	198.90	2241.50	-403.81	-117.19	420.41	0.40	0.16	1.11	MWD
2360.00	18.50	198.20	2301.07	-423.26	-123.71	440.88	1.63	-1.59	-1.11	MWD
2424.00	18.50	202.40	2361.76	-442.29	-130.75	461.10	2.08	0.00	6.56	MWD
2488.00	18.80	208.80	2422.41	-460.72	-139.59	481.19	3.23	0.47	10.00	MWD
2551.00	19.20	206.00	2481.98	-478.92	-149.02	501.23	1.58	0.63	-4.44	MWD
2615.00	19.40	207.40	2542.38	-497.82	-158.53	521.96	0.79	0.31	2.19	MWD
2678.00	19.40	200.30	2601.81	-516.92	-166.98	542.61	3.74	0.00	-11.27	MWD
2742.00	19.40	203.10	2662.18	-536.67	-174.83	563.73	1.45	0.00	4.37	MWD
2805.00	19.00	196.50	2721.68	-556.13	-181.85	584.34	3.50	-0.63	-10.48	MWD
2869.00	19.00	195.40	2782.19	-576.16	-187.58	605.18	0.56	0.00	-1.72	MWD
2932.00	19.00	194.30	2841.76	-595.99	-192.83	625.69	0.57	0.00	-1.75	MWD
2996.00	17.80	188.70	2902.49	-615.76	-196.89	645.83	3.34	-1.87	-8.75	MWD
3059.00	18.30	187.30	2962.39	-635.08	-199.60	665.19	1.05	0.79	-2.22	MWD
3123.00	15.70	191.20	3023.59	-653.55	-202.56	683.79	4.43	-4.06	6.09	MWD
3186.00	15.50	189.40	3084.27	-670.22	-205.59	700.67	0.83	-0.32	-2.86	MWD
3250.00	16.00	188.70	3145.87	-687.37	-208.32	717.94	0.84	0.78	-1.09	MWD
3313.00	16.90	190.80	3206.29	-704.95	-211.35	735.70	1.71	1.43	3.33	MWD
3377.00	16.00	184.20	3267.68	-722.89	-213.74	753.63	3.24	-1.41	-10.31	MWD
3440.00	16.00	186.60	3328.24	-740.17	-215.37	770.74	1.05	0.00	3.81	MWD
3503.00	15.10	183.10	3388.93	-756.99	-216.82	787.35	2.06	-1.43	-5.56	MWD

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM
Field: Weld County, CO
Site: Vogl 4-5 Pad
Well: 31-5
Wellpath: Original Hole

Date: 07/06/2010 **Time:** 09:53:36 **Page:** 3
Co-ordinate(NE) Reference: Well: 31-5, Grid North
Vertical (TVD) Reference: 4830'GL+16'KB 4846.0
Section (VS) Reference: Well (0.00N,0.00E,195.18Azi)
Survey Calculation Method: Minimum Curvature **Db:** Adapti

Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
3566.00	15.30	184.90	3449.73	-773.47	-217.97	803.55	0.81	0.32	2.86	MWD
3630.00	15.00	189.10	3511.51	-790.06	-220.00	820.10	1.78	-0.47	6.56	MWD
3693.00	14.40	189.40	3572.44	-805.84	-222.57	836.00	0.96	-0.95	0.48	MWD
3757.00	13.70	195.10	3634.53	-821.01	-225.84	851.50	2.42	-1.09	8.91	MWD
3820.00	13.20	197.20	3695.80	-835.08	-229.92	866.15	1.11	-0.79	3.33	MWD
3882.00	14.10	200.70	3756.05	-848.91	-234.68	880.74	1.97	1.45	5.65	MWD
3947.00	14.80	198.90	3819.00	-864.17	-240.17	896.90	1.28	1.08	-2.77	MWD
4010.00	13.70	203.10	3880.06	-878.64	-245.70	912.32	2.40	-1.75	6.67	MWD
4074.00	13.70	196.50	3942.24	-892.88	-250.83	927.41	2.44	0.00	-10.31	MWD
4137.00	13.40	201.00	4003.49	-906.85	-255.56	942.13	1.74	-0.48	7.14	MWD
4200.00	12.00	200.00	4064.95	-919.82	-260.42	955.92	2.25	-2.22	-1.59	MWD
4264.00	10.40	208.00	4127.73	-931.18	-265.41	968.18	3.48	-2.50	12.50	MWD
4327.00	10.70	206.70	4189.67	-941.42	-270.70	979.46	0.61	0.48	-2.06	MWD
4391.00	10.60	199.60	4252.57	-952.27	-275.35	991.15	2.05	-0.16	-11.09	MWD
4454.00	12.30	197.90	4314.31	-964.12	-279.35	1003.63	2.75	2.70	-2.70	MWD
4518.00	12.70	198.20	4376.79	-977.29	-283.65	1017.46	0.63	0.62	0.47	MWD
4581.00	12.50	196.80	4438.28	-990.40	-287.78	1031.19	0.58	-0.32	-2.22	MWD
4645.00	12.70	194.70	4500.73	-1003.83	-291.57	1045.15	0.78	0.31	-3.28	MWD
4708.00	13.00	188.70	4562.16	-1017.53	-294.40	1059.12	2.17	0.48	-9.52	MWD
4771.00	12.50	188.70	4623.61	-1031.28	-296.50	1072.93	0.79	-0.79	0.00	MWD
4803.00	11.80	188.70	4654.89	-1037.94	-297.52	1079.63	2.19	-2.19	0.00	MWD
4835.00	11.10	188.40	4686.25	-1044.22	-298.46	1085.94	2.20	-2.19	-0.94	MWD
4866.00	11.40	188.00	4716.66	-1050.20	-299.33	1091.94	1.00	0.97	-1.29	MWD
4898.00	11.40	187.70	4748.02	-1056.47	-300.19	1098.21	0.19	0.00	-0.94	MWD
4930.00	11.80	186.60	4779.37	-1062.85	-300.99	1104.58	1.43	1.25	-3.44	MWD
4962.00	11.40	186.60	4810.72	-1069.25	-301.73	1110.95	1.25	-1.25	0.00	MWD
4993.00	11.10	185.90	4841.12	-1075.26	-302.39	1116.92	1.06	-0.97	-2.26	MWD
5025.00	10.90	185.60	4872.53	-1081.33	-303.00	1122.94	0.65	-0.62	-0.94	MWD
5057.00	10.40	184.50	4903.98	-1087.22	-303.52	1128.77	1.69	-1.56	-3.44	MWD
5089.00	9.70	183.80	4935.49	-1092.79	-303.93	1134.25	2.22	-2.19	-2.19	MWD
5120.00	8.80	182.70	4966.09	-1097.77	-304.21	1139.12	2.96	-2.90	-3.55	MWD
5152.00	7.90	182.40	4997.75	-1102.41	-304.42	1143.66	2.82	-2.81	-0.94	MWD
5184.00	7.00	181.30	5029.48	-1106.56	-304.56	1147.69	2.85	-2.81	-3.44	MWD
5216.00	6.50	180.60	5061.26	-1110.32	-304.62	1151.34	1.58	-1.56	-2.19	MWD
5247.00	5.80	180.30	5092.08	-1113.64	-304.65	1154.55	2.26	-2.26	-0.97	MWD
5279.00	5.50	181.00	5123.92	-1116.79	-304.68	1157.60	0.96	-0.94	2.19	MWD
5311.00	5.10	183.10	5155.79	-1119.74	-304.78	1160.48	1.39	-1.25	6.56	MWD
5343.00	4.60	183.10	5187.67	-1122.44	-304.93	1163.13	1.56	-1.56	0.00	MWD
5375.00	4.20	185.90	5219.58	-1124.89	-305.12	1165.54	1.42	-1.25	8.75	MWD
5406.00	3.70	185.90	5250.50	-1127.01	-305.34	1167.64	1.61	-1.61	0.00	MWD
5438.00	3.30	185.60	5282.44	-1128.96	-305.54	1169.57	1.25	-1.25	-0.94	MWD
5470.00	2.80	187.30	5314.40	-1130.65	-305.72	1171.25	1.59	-1.56	5.31	MWD
5502.00	2.60	185.60	5346.36	-1132.15	-305.89	1172.74	0.67	-0.62	-5.31	MWD
5533.00	2.50	185.60	5377.33	-1133.52	-306.03	1174.10	0.32	-0.32	0.00	MWD
5565.00	2.10	185.90	5409.31	-1134.80	-306.16	1175.37	1.25	-1.25	0.94	MWD
5597.00	1.80	183.80	5441.29	-1135.88	-306.25	1176.44	0.96	-0.94	-6.56	MWD
5692.00	1.10	170.10	5536.26	-1138.27	-306.19	1178.73	0.82	-0.74	-14.42	MWD
5787.00	1.10	160.20	5631.24	-1140.03	-305.73	1180.30	0.20	0.00	-10.42	MWD
5883.00	1.10	179.60	5727.22	-1141.81	-305.41	1181.95	0.39	0.00	20.21	MWD
5978.00	1.10	206.30	5822.20	-1143.54	-305.81	1183.72	0.53	0.00	28.11	MWD
6073.00	0.90	222.80	5917.19	-1144.91	-306.72	1185.27	0.37	-0.21	17.37	MWD
6167.00	0.90	240.10	6011.18	-1145.82	-307.86	1186.45	0.29	0.00	18.40	MWD
6262.00	0.90	254.50	6106.17	-1146.39	-309.23	1187.36	0.24	0.00	15.16	MWD
6357.00	0.70	260.80	6201.16	-1146.68	-310.52	1187.98	0.23	-0.21	6.63	MWD

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM
Field: Weld County, CO
Site: Vogl 4-5 Pad
Well: 31-5
Wellpath: Original Hole

Date: 07/06/2010 **Time:** 09:53:36 **Page:** 4
Co-ordinate(NE) Reference: Well: 31-5, Grid North
Vertical (TVD) Reference: 4830'GL+16'KB 4846.0
Section (VS) Reference: Well (0.00N,0.00E,195.18Azi)
Survey Calculation Method: Minimum Curvature **Db:** Adapti

Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
6453.00	0.50	279.80	6297.15	-1146.70	-311.51	1188.26	0.29	-0.21	19.79	MWD
6548.00	0.50	305.10	6392.15	-1146.40	-312.26	1188.16	0.23	0.00	26.63	MWD
6738.00	0.50	297.00	6582.14	-1145.54	-313.67	1187.71	0.04	0.00	-4.26	MWD
6833.00	0.50	272.70	6677.14	-1145.33	-314.46	1187.71	0.22	0.00	-25.58	MWD
6928.00	0.30	279.80	6772.14	-1145.27	-315.12	1187.83	0.22	-0.21	7.47	MWD
7023.00	0.50	280.10	6867.13	-1145.16	-315.77	1187.89	0.21	0.21	0.32	MWD
7119.00	0.50	268.90	6963.13	-1145.09	-316.60	1188.04	0.10	0.00	-11.67	MWD
7215.00	0.70	263.60	7059.12	-1145.17	-317.60	1188.37	0.22	0.21	-5.52	MWD
7309.00	0.70	198.90	7153.12	-1145.77	-318.36	1189.16	0.80	0.00	-68.83	MWD
7405.00	0.30	284.30	7249.12	-1146.27	-318.79	1189.75	0.77	-0.42	88.96	MWD
7500.00	0.20	299.80	7344.11	-1146.12	-319.18	1189.71	0.13	-0.11	16.32	MWD
7595.00	0.30	304.40	7439.11	-1145.90	-319.53	1189.58	0.11	0.11	4.84	MWD
7690.00	0.50	302.30	7534.11	-1145.54	-320.08	1189.38	0.21	0.21	-2.21	MWD
7785.00	0.90	306.10	7629.10	-1144.88	-321.03	1188.99	0.42	0.42	4.00	MWD
7880.00	1.40	319.90	7724.09	-1143.55	-322.38	1188.06	0.60	0.53	14.53	MWD
8005.00	1.40	315.60	7849.05	-1141.29	-324.44	1186.42	0.08	0.00	-3.44	MWD
8027.96	1.40	315.60	7872.00	-1140.89	-324.83	1186.14	0.00	0.00	0.00	31-5 PBHL
8050.00	1.40	315.60	7894.03	-1140.50	-325.21	1185.87	0.00	0.00	0.00	31-5 BHL

Targets

Name	Description		TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<---- Latitude ---->			----> Longitude ---->		
	Dip.	Dir.						Deg	Min	Sec	Deg	Min	Sec
31-5 SL			0.00	0.00	0.00	1306917.683161	1494.85	40	10	27.959 N	104	55	19.521 W
31-5 PBHL			7872.00	-1167.91	-316.88	1305749.783161	1177.97	40	10	16.438 N	104	55	23.701 W
-Circle (Radius: 50)													
31-5 BHL			7894.03	-1140.50	-325.21	1305777.183161	1169.64	40	10	16.709 N	104	55	23.806 W