

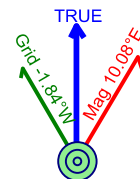


**Job Number:** 15xxxC  
**Company:** Black Hills Plateau Production  
**Lease/Well:** Winter Flats 10-31-99CH  
**Location:** Mesa County, CO  
**Rig Name:**  
**State/County:** CO/ Mesa  
**Country:** USA



**Elev. GL:** 6094.00 ft    **RKB:** 24.00 ft  
**System:** US State Plane 1983  
**Group:** Colorado Central Zone  
**Datum:** GRS80  
**Mag. Decl.:** 10.08° (C:\HawkEye\IGRF2015.MIF)  
**Grid Conv.:** -1.84412 W  
**Date:** Wednesday, May 20, 2015

### NOVA Directional Inc. Survey Report

Calculated by HawkEye Software  
 Minimum Curvature Method  
 Vertical Section Plane 146.00°  
 Northing (US ft): 1544534.79    Easting (US ft): 2172603.65  
 Latitude: 39°17'30.9466" N    Longitude: -108°25'26.3071" W  
 Section 10, T9S, R99W, Sixth Principal Meridian, Mesa County, CO  
 Direction Reference: True North



Measured Depth (Ft)	INC Deg	AZM Deg	TVD (Ft)	NS (Ft)	EW (Ft)	VS (Ft)	DLS °/100 Ft	Latitude Dec. Deg	Longitude Dec. Deg
<b>Surface</b>									
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.2919296	-108.4239742
<b>Casing 10 3/4 "</b>									
1000.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00	39.2919296	-108.4239742
<b>Tangent - Build @ 2.00°/ 100 Ft</b>									
1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	39.2919296	-108.4239742
1130.00	0.60	100.00	1130.00	-0.03	0.15	0.11	2.00	39.2919295	-108.4239736
1160.00	1.20	100.00	1160.00	-0.11	0.62	0.44	2.00	39.2919293	-108.4239720
1190.00	1.80	100.00	1189.99	-0.25	1.39	0.98	2.00	39.2919289	-108.4239693
1220.00	2.40	100.00	1219.96	-0.44	2.47	1.75	2.00	39.2919284	-108.4239654
1250.00	3.00	100.00	1249.93	-0.68	3.87	2.73	2.00	39.2919277	-108.4239605
1280.00	3.60	100.00	1279.88	-0.98	5.57	3.93	2.00	39.2919269	-108.4239545
1310.00	4.20	100.00	1309.81	-1.34	7.58	5.34	2.00	39.2919259	-108.4239474
1340.00	4.80	100.00	1339.72	-1.74	9.89	6.98	2.00	39.2919248	-108.4239392
1370.00	5.40	100.00	1369.60	-2.21	12.52	8.83	2.00	39.2919235	-108.4239299
1400.00	6.00	100.00	1399.45	-2.72	15.46	10.90	2.00	39.2919221	-108.4239196
1430.00	6.60	100.00	1429.27	-3.30	18.70	13.19	2.00	39.2919206	-108.4239081
1460.00	7.20	100.00	1459.05	-3.92	22.25	15.69	2.00	39.2919188	-108.4238956
1490.00	7.80	100.00	1488.80	-4.60	26.10	18.41	2.00	39.2919170	-108.4238820
1520.00	8.40	100.00	1518.50	-5.34	30.27	21.35	2.00	39.2919150	-108.4238672
1550.00	9.00	100.00	1548.15	-6.12	34.73	24.50	2.00	39.2919128	-108.4238515
1580.00	9.60	100.00	1577.76	-6.97	39.51	27.87	2.00	39.2919105	-108.4238346
<b>Begin Hold @ 9.90°,100.00° Azm</b>									
1595.00	9.90	100.00	1592.54	-7.41	42.01	29.63	2.00	39.2919093	-108.4238257
<b>Cameo</b>									
1873.61	9.90	100.00	1867.00	-15.73	89.18	62.91	0.00	39.2918864	-108.4236591
<b>Rollins</b>									
2289.81	9.90	100.00	2277.00	-28.15	159.65	112.61	0.00	39.2918523	-108.4234101
<b>Cozzette</b>									
2443.09	9.90	100.00	2428.00	-32.73	185.61	130.92	0.00	39.2918398	-108.4233184
2595.00	9.90	100.00	2577.65	-37.26	211.33	149.06	0.00	39.2918273	-108.4232275
<b>Corcoran</b>									
2662.35	9.90	100.00	2644.00	-39.27	222.73	157.11	0.00	39.2918218	-108.4231872
<b>Mancos</b>									
2893.80	9.90	100.00	2872.00	-46.18	261.92	184.75	0.00	39.2918028	-108.4230487
<b>Mancos A</b>									
3290.71	9.90	100.00	3263.00	-58.03	329.12	232.15	0.00	39.2917703	-108.4228113
3595.00	9.90	100.00	3562.76	-67.12	380.64	268.50	0.00	39.2917453	-108.4226292
<b>MOAB</b>									
3976.93	9.90	100.00	3939.00	-78.52	445.31	314.11	0.00	39.2917140	-108.4224007
<b>Mancos B</b>									
4401.25	9.90	100.00	4357.00	-91.19	517.16	364.79	0.00	39.2916792	-108.4221469

Measured Depth (Ft)	INC Deg	AZM Deg	TVD (Ft)	NS (Ft)	EW (Ft)	VS (Ft)	DLS °/100 Ft	Latitude Dec. Deg	Longitude Dec. Deg
4595.00	9.90	100.00	4547.87	-96.97	549.96	387.93	0.00	39.2916633	-108.4220310
 <b>Niobrara</b>									
5409.25	9.90	100.00	5350.00	-121.28	687.83	485.18	0.00	39.2915966	-108.4215439
 <b>Casing 7 5/8 "</b>									
5459.00	9.90	100.00	5399.00	-122.77	696.25	491.12	0.00	39.2915925	-108.4215141
5595.00	9.90	100.00	5532.98	-126.83	719.28	507.36	0.00	39.2915814	-108.4214327
<b>KOP - Build and Turn @ 8.00°/100 Ft</b>									
5706.24	9.90	100.00	5642.56	-130.15	738.11	520.65	0.00	39.2915722	-108.4213662
5736.24	11.68	108.62	5672.03	-131.57	743.53	524.85	8.00	39.2915684	-108.4213470
5766.24	13.65	114.88	5701.30	-134.03	749.62	530.30	8.00	39.2915616	-108.4213255
5796.24	15.74	119.55	5730.32	-137.52	756.38	536.97	8.00	39.2915520	-108.4213017
5826.24	17.91	123.14	5759.03	-142.05	763.78	544.87	8.00	39.2915396	-108.4212755
5856.24	20.13	125.96	5787.40	-147.61	771.82	553.97	8.00	39.2915243	-108.4212471
5886.24	22.38	128.24	5815.35	-154.17	780.49	564.26	8.00	39.2915063	-108.4212165
5916.24	24.66	130.12	5842.86	-161.74	789.76	575.72	8.00	39.2914855	-108.4211837
5946.24	26.96	131.70	5869.87	-170.30	799.62	588.33	8.00	39.2914620	-108.4211489
5976.24	29.27	133.05	5896.32	-179.83	810.06	602.07	8.00	39.2914358	-108.4211120
6006.24	31.60	134.22	5922.19	-190.32	821.05	616.91	8.00	39.2914070	-108.4210731
6036.24	33.93	135.24	5947.41	-201.75	832.59	632.84	8.00	39.2913756	-108.4210324
6066.24	36.28	136.15	5971.96	-214.10	844.63	649.81	8.00	39.2913417	-108.4209898
6096.24	38.63	136.96	5995.77	-227.34	857.17	667.80	8.00	39.2913054	-108.4209455
6126.24	40.98	137.69	6018.82	-241.46	870.19	686.79	8.00	39.2912666	-108.4208995
6156.24	43.34	138.35	6041.05	-256.43	883.66	706.73	8.00	39.2912255	-108.4208520
6186.24	45.70	138.96	6062.44	-272.22	897.55	727.59	8.00	39.2911822	-108.4208029
6216.24	48.07	139.52	6082.94	-288.81	911.84	749.33	8.00	39.2911366	-108.4207524
6246.24	50.43	140.04	6102.53	-306.16	926.52	771.92	8.00	39.2910890	-108.4207005
6276.24	52.80	140.53	6121.15	-324.25	941.54	795.32	8.00	39.2910393	-108.4206474
6306.24	55.17	140.98	6138.79	-343.05	956.89	819.48	8.00	39.2909877	-108.4205932
6336.24	57.55	141.42	6155.41	-362.51	972.54	844.37	8.00	39.2909343	-108.4205379
6366.24	59.92	141.82	6170.98	-382.61	988.46	869.94	8.00	39.2908791	-108.4204817
6396.24	62.30	142.21	6185.47	-403.31	1004.62	896.14	8.00	39.2908222	-108.4204246
6426.24	64.67	142.59	6198.86	-424.58	1021.00	922.93	8.00	39.2907638	-108.4203667
6456.24	67.05	142.95	6211.13	-446.38	1037.56	950.26	8.00	39.2907040	-108.4203082
6486.24	69.43	143.29	6222.25	-468.66	1054.28	978.08	8.00	39.2906428	-108.4202491
6516.24	71.81	143.63	6232.21	-491.40	1071.13	1006.35	8.00	39.2905804	-108.4201896
6546.24	74.19	143.96	6240.98	-514.55	1088.07	1035.02	8.00	39.2905168	-108.4201297
6576.24	76.57	144.28	6248.55	-538.06	1105.08	1064.03	8.00	39.2904522	-108.4200696
6606.24	78.95	144.59	6254.91	-561.91	1122.13	1093.33	8.00	39.2903868	-108.4200094
6636.24	81.33	144.90	6260.05	-586.04	1139.19	1122.88	8.00	39.2903205	-108.4199491
6666.24	83.71	145.20	6263.96	-610.42	1156.23	1152.62	8.00	39.2902536	-108.4198889
6696.24	86.09	145.50	6266.62	-635.00	1173.22	1182.50	8.00	39.2901861	-108.4198289
6726.24	88.47	145.80	6268.04	-659.74	1190.13	1212.46	8.00	39.2901182	-108.4197692
6756.24	90.85	146.10	6268.22	-684.60	1206.92	1242.46	8.00	39.2900499	-108.4197098
<b>Target - Hold @ 91.64°,146.20° Azm</b>									
6766.19	91.64	146.20	6268.00	-692.86	1212.46	1252.41	8.00	39.2900272	-108.4196903
7766.19	91.64	146.20	6239.33	-1523.51	1768.53	2251.99	0.00	39.2877465	-108.4177258
8766.19	91.64	146.20	6210.65	-2354.15	2324.59	3251.57	0.00	39.2854658	-108.4157614
9766.19	91.64	146.20	6181.97	-3184.80	2880.65	4251.16	0.00	39.2831850	-108.4137971
10766.19	91.64	146.20	6153.30	-4015.44	3436.71	5250.74	0.00	39.2809042	-108.4118330
11766.19	91.64	146.20	6124.62	-4846.09	3992.77	6250.32	0.00	39.2786234	-108.4098690
12766.19	91.64	146.20	6095.94	-5676.74	4548.83	7249.90	0.00	39.2763425	-108.4079052
13766.19	91.64	146.20	6067.26	-6507.38	5104.90	8249.49	0.00	39.2740616	-108.4059414
14766.19	91.64	146.20	6038.59	-7338.03	5660.96	9249.07	0.00	39.2717806	-108.4039778
15766.19	91.64	146.20	6009.91	-8168.68	6217.02	10248.65	0.00	39.2694996	-108.4020143
<b>CH - Proposed End of Lateral</b>									
16530.15	91.64	146.20	5988.00	-8803.26	6641.83	11012.30	0.00	39.2677570	-108.4005144



Job ID : 15xxxC  
Company : Black Hills Plateau Production  
Lease/Well : Winter Flats 10-31-99CH  
Location : Mesa County, CO  
Rig Name :

Elevation (To MSL) : 6094 ft  
RKB : 24 ft  
North Reference : True North  
Latitude : 39°17'30.9466" N  
Longitude : -108°25'26.3070" W



CRITICAL POINTS - WINTER FLATS 10-31-99CH PLAN 5-20-15										
MD	Inc	Azm	TVD	EW	NS	VS	CI	Cldir	DLS	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00	0.00	
1595.00	9.90	100.00	1592.54	42.01	-7.41	29.63	42.66	100.00	2.00	
5706.24	9.90	100.00	5642.56	738.11	-130.15	520.65	749.50	100.00	0.00	
6766.19	91.64	146.20	6268.00	1212.46	-692.86	1252.41	1396.47	119.75	8.00	
16530.15	91.64	146.20	5988.00	6641.83	-8803.26	11012.29	11027.75	142.97	0.00	

CURVES LEGEND :  
Winter Flats 10-31-99AH plan 5-20-15  
Winter Flats 10-31-99BH plan 5-20-15  
Winter Flats 10-31-99CH plan 5-20-15  
Winter Flats 10-31-99DH plan 5-20-15

