



## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
McCaffrey 16-36	-100.00	-4350.39	216.20	1502332.03	3438492.29	40°42'05.585N103°55'06.550W		Point
SL 4-36	0.00	0.00	0.00	1506682.42	3438276.09	40°42'48.603N103°55'08.350W		Point
PBHL 4-36	6430.00	-4361.40	176.46	1502321.02	3438452.55	40°42'05.483N103°55'07.069W		Point

## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	8.26	0.00	0.00	0.00	0.00	0.00	0.00	
2	1540.00	0.00	8.26	1540.00	0.00	0.00	0.00	8.26	0.00	
3	1827.21	4.31	8.26	1826.94	10.68	1.55	1.50	0.00	-10.64	
4	5826.25	4.31	8.26	5814.68	307.98	44.73	0.00	0.00	-306.68	
5	6768.70	90.00	178.48	6430.00	-263.00	67.75	10.00	170.19	264.70	
6	10868.54	90.00	178.48	6430.00	-4361.40	176.46	0.00	0.00	4364.55	PBHL 4-36

# Precision Directional Services, Inc.

## Planning Report

<b>Company:</b> CARRIZO OIL & GAS, INC.		<b>Date:</b> 10/30/2013	<b>Time:</b> 13:00:52	<b>Page:</b> 1
<b>Field:</b> Niobrara CONZ'83		<b>Co-ordinate(NE) Reference:</b> Well: 4-36-9-59, Grid North		
<b>Site:</b> Castor 4-36-9-59 Pad		<b>Vertical (TVD) Reference:</b> 4890'PE+17'KB 4907.0		
<b>Well:</b> 4-36-9-59		<b>Section (VS) Reference:</b> Well (0.00N,0.00E,178.48Azi)		
<b>Wellpath:</b> Original Hole		<b>Plan:</b> Plan #3		

  

<b>Field:</b> Niobrara CONZ'83	
<b>Map System:</b> US State Plane Coordinate System 1983	<b>Map Zone:</b> Colorado, Northern Zone
<b>Geo Datum:</b> GRS 1980	<b>Coordinate System:</b> Well Centre
<b>Sys Datum:</b> Mean Sea Level	<b>Geomagnetic Model:</b> IGRF2010

  

<b>Site:</b> Castor 4-36-9-59 Pad Weld County, CO renamed 9-9-13	
<b>Site Position:</b>	<b>Northing:</b> 1506682.42 ft
<b>From:</b> Map	<b>Easting:</b> 3438276.09 ft
<b>Position Uncertainty:</b> 0.00 ft	<b>Latitude:</b> 40 42 48.603 N
<b>Ground Level:</b> 4890.00 ft	<b>Longitude:</b> 103 55 8.350 W
	<b>North Reference:</b> Grid
	<b>Grid Convergence:</b> 1.02 deg

  

<b>Well:</b> 4-36-9-59	<b>Slot Name:</b> 4-36
<b>Well Position:</b> +N/-S 0.00 ft	<b>Latitude:</b> 40 42 48.603 N
+E/-W 0.00 ft	<b>Longitude:</b> 103 55 8.350 W
<b>Position Uncertainty:</b> 0.00 ft	

  

<b>Wellpath:</b> Original Hole		<b>Drilled From:</b> Surface
<b>Current Datum:</b> 4890'PE+17'KB	<b>Height</b> 4907.00 ft	<b>Tie-on Depth:</b> 0.00 ft
<b>Magnetic Data:</b> 11/20/2013		<b>Above System Datum:</b> Mean Sea Level
<b>Field Strength:</b> 53164 nT		<b>Declination:</b> 8.10 deg
<b>Vertical Section:</b> Depth From (TVD)	+N/-S	<b>Mag Dip Angle:</b> 67.35 deg
ft	ft	<b>+E/-W</b>
		ft
0.00	0.00	0.00
		178.48

  

<b>Plan:</b> Plan #3	<b>Date Composed:</b> 10/30/2013
<b>Principal:</b> No	<b>Version:</b> 1
	<b>Tied-to:</b> From Surface

  

Plan Section Information										
MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	TFO deg	Target
0.00	0.00	8.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1540.00	0.00	8.26	1540.00	0.00	0.00	0.00	0.00	0.00	8.26	
1827.21	4.31	8.26	1826.94	10.68	1.55	1.50	1.50	0.00	0.00	
5826.25	4.31	8.26	5814.68	307.98	44.73	0.00	0.00	0.00	0.00	
6768.70	90.00	178.48	6430.00	-263.00	67.75	10.00	9.09	18.06	170.19	
10868.54	90.00	178.48	6430.00	-4361.40	176.46	0.00	0.00	0.00	0.00	PBHL 4-36

  

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
1440.00	0.00	8.26	1440.00	0.00	0.00	0.00	0.00	0.00	0.00	9 5/8"
1540.00	0.00	8.26	1540.00	0.00	0.00	0.00	0.00	0.00	0.00	
1640.00	1.50	8.26	1639.99	1.30	0.19	-1.29	1.50	1.50	0.00	
1740.00	3.00	8.26	1739.91	5.18	0.75	-5.16	1.50	1.50	0.00	
1827.21	4.31	8.26	1826.94	10.68	1.55	-10.64	1.50	1.50	0.00	
1840.00	4.31	8.26	1839.69	11.63	1.69	-11.58	0.00	0.00	0.00	
1940.00	4.31	8.26	1939.41	19.07	2.77	-18.99	0.00	0.00	0.00	
2040.00	4.31	8.26	2039.13	26.50	3.85	-26.39	0.00	0.00	0.00	
2140.00	4.31	8.26	2138.85	33.93	4.93	-33.79	0.00	0.00	0.00	
2240.00	4.31	8.26	2238.56	41.37	6.01	-41.19	0.00	0.00	0.00	
2340.00	4.31	8.26	2338.28	48.80	7.09	-48.60	0.00	0.00	0.00	
2440.00	4.31	8.26	2438.00	56.24	8.17	-56.00	0.00	0.00	0.00	
2540.00	4.31	8.26	2537.72	63.67	9.25	-63.40	0.00	0.00	0.00	
2640.00	4.31	8.26	2637.43	71.10	10.33	-70.81	0.00	0.00	0.00	
2740.00	4.31	8.26	2737.15	78.54	11.41	-78.21	0.00	0.00	0.00	

# Precision Directional Services, Inc.

## Planning Report

**Company:** CARRIZO OIL & GAS, INC.  
**Field:** Niobrara CONZ'83  
**Site:** Castor 4-36-9-59 Pad  
**Well:** 4-36-9-59  
**Wellpath:** Original Hole

**Date:** 10/30/2013  
**Co-ordinate(NE) Reference:** Well: 4-36-9-59, Grid North  
**Vertical (TVD) Reference:** 4890'PE+17'KB 4907.0  
**Section (VS) Reference:** Well (0.00N,0.00E,178.48Azi)  
**Plan:** Plan #3

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### 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
2840.00	4.31	8.26	2836.87	85.97	12.49	-85.61	0.00	0.00	0.00	
2940.00	4.31	8.26	2936.59	93.41	13.57	-93.01	0.00	0.00	0.00	
3040.00	4.31	8.26	3036.30	100.84	14.64	-100.42	0.00	0.00	0.00	
3140.00	4.31	8.26	3136.02	108.28	15.72	-107.82	0.00	0.00	0.00	
3240.00	4.31	8.26	3235.74	115.71	16.80	-115.22	0.00	0.00	0.00	
3340.00	4.31	8.26	3335.45	123.14	17.88	-122.63	0.00	0.00	0.00	
3440.00	4.31	8.26	3435.17	130.58	18.96	-130.03	0.00	0.00	0.00	
3540.00	4.31	8.26	3534.89	138.01	20.04	-137.43	0.00	0.00	0.00	
3640.00	4.31	8.26	3634.61	145.45	21.12	-144.84	0.00	0.00	0.00	
3740.00	4.31	8.26	3734.32	152.88	22.20	-152.24	0.00	0.00	0.00	
3840.00	4.31	8.26	3834.04	160.31	23.28	-159.64	0.00	0.00	0.00	
3940.00	4.31	8.26	3933.76	167.75	24.36	-167.04	0.00	0.00	0.00	
4040.00	4.31	8.26	4033.48	175.18	25.44	-174.45	0.00	0.00	0.00	
4140.00	4.31	8.26	4133.19	182.62	26.52	-181.85	0.00	0.00	0.00	
4240.00	4.31	8.26	4232.91	190.05	27.60	-189.25	0.00	0.00	0.00	
4340.00	4.31	8.26	4332.63	197.49	28.68	-196.66	0.00	0.00	0.00	
4440.00	4.31	8.26	4432.35	204.92	29.76	-204.06	0.00	0.00	0.00	
4540.00	4.31	8.26	4532.06	212.35	30.84	-211.46	0.00	0.00	0.00	
4640.00	4.31	8.26	4631.78	219.79	31.92	-218.86	0.00	0.00	0.00	
4740.00	4.31	8.26	4731.50	227.22	33.00	-226.27	0.00	0.00	0.00	
4840.00	4.31	8.26	4831.22	234.66	34.08	-233.67	0.00	0.00	0.00	
4940.00	4.31	8.26	4930.93	242.09	35.16	-241.07	0.00	0.00	0.00	
5040.00	4.31	8.26	5030.65	249.52	36.24	-248.48	0.00	0.00	0.00	
5140.00	4.31	8.26	5130.37	256.96	37.32	-255.88	0.00	0.00	0.00	
5240.00	4.31	8.26	5230.09	264.39	38.40	-263.28	0.00	0.00	0.00	
5340.00	4.31	8.26	5329.80	271.83	39.48	-270.68	0.00	0.00	0.00	
5440.00	4.31	8.26	5429.52	279.26	40.56	-278.09	0.00	0.00	0.00	
5540.00	4.31	8.26	5529.24	286.70	41.64	-285.49	0.00	0.00	0.00	
5640.00	4.31	8.26	5628.96	294.13	42.72	-292.89	0.00	0.00	0.00	
5740.00	4.31	8.26	5728.67	301.56	43.80	-300.30	0.00	0.00	0.00	
5826.25	4.31	8.26	5814.68	307.98	44.73	-306.68	0.00	0.00	0.00	
5840.00	2.96	12.80	5828.40	308.83	44.88	-307.53	10.00	-9.79	33.00	
5940.00	7.17	172.64	5928.20	305.16	46.25	-303.82	10.00	4.20	159.84	
6040.00	17.15	176.10	6025.83	284.21	48.06	-282.84	10.00	9.98	3.46	
6140.00	27.14	177.05	6118.34	246.63	50.24	-245.21	10.00	9.99	0.95	
6240.00	37.14	177.51	6202.91	193.56	52.73	-192.10	10.00	10.00	0.46	
6340.00	47.13	177.80	6276.97	126.62	55.46	-125.10	10.00	10.00	0.29	
6440.00	57.13	178.01	6338.28	47.83	58.33	-46.26	10.00	10.00	0.21	
6540.00	67.13	178.17	6384.96	-40.42	61.27	42.03	10.00	10.00	0.16	
6568.68	70.00	178.21	6395.44	-67.10	62.11	68.72	10.00	10.00	0.15	7"
6640.00	77.13	178.31	6415.61	-135.43	64.18	137.08	10.00	10.00	0.14	
6740.00	87.13	178.44	6429.28	-234.32	66.98	236.01	10.00	10.00	0.13	
6768.70	90.00	178.48	6430.00	-263.00	67.75	264.70	10.00	10.00	0.13	
6840.00	90.00	178.48	6430.00	-334.27	69.64	336.00	0.00	0.00	0.00	
6940.00	90.00	178.48	6430.00	-434.24	72.29	436.00	0.00	0.00	0.00	
7040.00	90.00	178.48	6430.00	-534.20	74.94	536.00	0.00	0.00	0.00	
7140.00	90.00	178.48	6430.00	-634.17	77.59	636.00	0.00	0.00	0.00	
7240.00	90.00	178.48	6430.00	-734.13	80.25	736.00	0.00	0.00	0.00	
7340.00	90.00	178.48	6430.00	-834.10	82.90	836.00	0.00	0.00	0.00	
7440.00	90.00	178.48	6430.00	-934.06	85.55	936.00	0.00	0.00	0.00	
7540.00	90.00	178.48	6430.00	-1034.03	88.20	1036.00	0.00	0.00	0.00	
7640.00	90.00	178.48	6430.00	-1133.99	90.85	1136.00	0.00	0.00	0.00	
7740.00	90.00	178.48	6430.00	-1233.96	93.50	1236.00	0.00	0.00	0.00	
7840.00	90.00	178.48	6430.00	-1333.92	96.16	1336.00	0.00	0.00	0.00	

# Precision Directional Services, Inc.

## Planning Report

**Company:** CARRIZO OIL & GAS, INC.  
**Field:** Niobrara CONZ'83  
**Site:** Castor 4-36-9-59 Pad  
**Well:** 4-36-9-59  
**Wellpath:** Original Hole

**Date:** 10/30/2013  
**Co-ordinate(NE) Reference:** Well: 4-36-9-59, Grid North  
**Vertical (TVD) Reference:** 4890'PE+17'KB 4907.0  
**Section (VS) Reference:** Well (0.00N,0.00E,178.48Azi)  
**Plan:** Plan #3

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### 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
7940.00	90.00	178.48	6430.00	-1433.89	98.81	1436.00	0.00	0.00	0.00	
8040.00	90.00	178.48	6430.00	-1533.85	101.46	1536.00	0.00	0.00	0.00	
8140.00	90.00	178.48	6430.00	-1633.82	104.11	1636.00	0.00	0.00	0.00	
8240.00	90.00	178.48	6430.00	-1733.78	106.76	1736.00	0.00	0.00	0.00	
8340.00	90.00	178.48	6430.00	-1833.75	109.41	1836.00	0.00	0.00	0.00	
8440.00	90.00	178.48	6430.00	-1933.71	112.06	1936.00	0.00	0.00	0.00	
8540.00	90.00	178.48	6430.00	-2033.68	114.72	2036.00	0.00	0.00	0.00	
8640.00	90.00	178.48	6430.00	-2133.64	117.37	2136.00	0.00	0.00	0.00	
8740.00	90.00	178.48	6430.00	-2233.61	120.02	2236.00	0.00	0.00	0.00	
8840.00	90.00	178.48	6430.00	-2333.57	122.67	2336.00	0.00	0.00	0.00	
8940.00	90.00	178.48	6430.00	-2433.53	125.32	2436.00	0.00	0.00	0.00	
9040.00	90.00	178.48	6430.00	-2533.50	127.97	2536.00	0.00	0.00	0.00	
9140.00	90.00	178.48	6430.00	-2633.46	130.62	2636.00	0.00	0.00	0.00	
9240.00	90.00	178.48	6430.00	-2733.43	133.28	2736.00	0.00	0.00	0.00	
9340.00	90.00	178.48	6430.00	-2833.39	135.93	2836.00	0.00	0.00	0.00	
9440.00	90.00	178.48	6430.00	-2933.36	138.58	2936.00	0.00	0.00	0.00	
9540.00	90.00	178.48	6430.00	-3033.32	141.23	3036.00	0.00	0.00	0.00	
9640.00	90.00	178.48	6430.00	-3133.29	143.88	3136.00	0.00	0.00	0.00	
9740.00	90.00	178.48	6430.00	-3233.25	146.53	3236.00	0.00	0.00	0.00	
9840.00	90.00	178.48	6430.00	-3333.22	149.19	3336.00	0.00	0.00	0.00	
9940.00	90.00	178.48	6430.00	-3433.18	151.84	3436.00	0.00	0.00	0.00	
10040.00	90.00	178.48	6430.00	-3533.15	154.49	3536.00	0.00	0.00	0.00	
10140.00	90.00	178.48	6430.00	-3633.11	157.14	3636.00	0.00	0.00	0.00	
10240.00	90.00	178.48	6430.00	-3733.08	159.79	3736.00	0.00	0.00	0.00	
10340.00	90.00	178.48	6430.00	-3833.04	162.44	3836.00	0.00	0.00	0.00	
10440.00	90.00	178.48	6430.00	-3933.01	165.09	3936.00	0.00	0.00	0.00	
10540.00	90.00	178.48	6430.00	-4032.97	167.75	4036.00	0.00	0.00	0.00	
10640.00	90.00	178.48	6430.00	-4132.94	170.40	4136.00	0.00	0.00	0.00	
10740.00	90.00	178.48	6430.00	-4232.90	173.05	4236.00	0.00	0.00	0.00	
10840.00	90.00	178.48	6430.00	-4332.87	175.70	4336.00	0.00	0.00	0.00	
10868.54	90.00	178.48	6430.00	-4361.40	176.46	4364.55	0.00	0.00	0.00	PBHL 4-36

### Targets

Name	Description Dip.	Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<--- Latitude --->			<--- Longitude --->		
McCaffrey 16-36			-100.00	-4350.39	216.20	1502332.03	3438492.29	40	42	5.585 N	103	55	6.550 W
SL 4-36			0.00	0.00	0.00	1506682.42	3438276.09	40	42	48.603 N	103	55	8.350 W
PBHL 4-36			6430.00	-4361.40	176.46	1502321.02	3438452.55	40	42	5.483 N	103	55	7.069 W

### Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
1440.00	1440.00	9.625	12.250	9 5/8"
6568.68	6395.44	7.000	8.500	7"