

# **ENGINEERING CALCS**

**Nasik**

**Cascade Creek 697-15-54**

**CC 697-15-40B**

**CC 697-15-40B**

**Plan: CC 697-15-40BPlan V1**

## **Standard Planning Report - Geographic**

**12 February, 2014**

**Oxy**  
Planning Report - Geographic

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well CC 697-15-40B
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-15-40B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-40B		
<b>Design:</b>	CC 697-15-40BPlan V1		

<b>Project</b>	Nasik, Planning		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	Colorado Central 502		

Site		Cascade Creek 697-15-54, 16-54			
Site Position:		Northing:	625,361.65 ft	Latitude:	39° 31' 9.611 N
From:	Map	Easting:	1,238,150.52 ft	Longitude:	108° 12' 3.264 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.70 °

Well	CC 697-15-40B, CC 697-15-40B					
Well Position	+N/-S	0.00 ft	Northing:	625,333.53 ft	Latitude:	39° 31' 9.330 N
	+E/-W	0.00 ft	Easting:	1,238,140.37 ft	Longitude:	108° 12' 3.383 W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	8,640.00 ft

<b>Wellbore</b>	CC 697-15-40B				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	1/9/2014	10.11	65.65	51,956

<b>Design</b>	CC 697-15-40BPlan V1				
<b>Audit Notes:</b>					
<b>Version:</b>	1	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	61.84	

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,600.00	20.00	61.84	1,579.82	81.53	152.32	2.00	2.00	0.00	61.84	
4,504.22	20.00	61.84	4,308.89	550.30	1,028.05	0.00	0.00	0.00	0.00	
5,504.22	0.00	0.00	5,288.71	631.84	1,180.37	2.00	-2.00	0.00	180.00	
9,441.52	0.00	0.00	9,226.00	631.84	1,180.37	0.00	0.00	0.00	0.00	15-40B BHL

# Oxy

## Planning Report - Geographic

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well CC 697-15-40B
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-15-40B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-40B		
<b>Design:</b>	CC 697-15-40BPlan V1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	625,333.53	1,238,140.37	39° 31' 9.330 N	108° 12' 3.383 W
90.00	0.00	0.00	90.00	0.00	0.00	625,333.53	1,238,140.37	39° 31' 9.330 N	108° 12' 3.383 W
<b>16</b>									
100.00	0.00	0.00	100.00	0.00	0.00	625,333.53	1,238,140.37	39° 31' 9.330 N	108° 12' 3.383 W
200.00	0.00	0.00	200.00	0.00	0.00	625,333.53	1,238,140.37	39° 31' 9.330 N	108° 12' 3.383 W
300.00	0.00	0.00	300.00	0.00	0.00	625,333.53	1,238,140.37	39° 31' 9.330 N	108° 12' 3.383 W
400.00	0.00	0.00	400.00	0.00	0.00	625,333.53	1,238,140.37	39° 31' 9.330 N	108° 12' 3.383 W
500.00	0.00	0.00	500.00	0.00	0.00	625,333.53	1,238,140.37	39° 31' 9.330 N	108° 12' 3.383 W
600.00	0.00	0.00	600.00	0.00	0.00	625,333.53	1,238,140.37	39° 31' 9.330 N	108° 12' 3.383 W
700.00	2.00	61.84	699.98	0.82	1.54	625,334.31	1,238,141.93	39° 31' 9.338 N	108° 12' 3.363 W
800.00	4.00	61.84	799.84	3.29	6.15	625,336.64	1,238,146.62	39° 31' 9.363 N	108° 12' 3.304 W
900.00	6.00	61.84	899.45	7.41	13.84	625,340.53	1,238,154.42	39° 31' 9.403 N	108° 12' 3.206 W
1,000.00	8.00	61.84	998.70	13.16	24.58	625,345.95	1,238,165.33	39° 31' 9.460 N	108° 12' 3.069 W
1,100.00	10.00	61.84	1,097.47	20.54	38.37	625,352.92	1,238,179.33	39° 31' 9.533 N	108° 12' 2.893 W
1,200.00	12.00	61.84	1,195.62	29.54	55.19	625,361.42	1,238,196.41	39° 31' 9.622 N	108° 12' 2.678 W
1,300.00	14.00	61.84	1,293.06	40.16	75.02	625,371.45	1,238,216.55	39° 31' 9.727 N	108° 12' 2.425 W
1,400.00	16.00	61.84	1,389.64	52.37	97.84	625,382.98	1,238,239.72	39° 31' 9.848 N	108° 12' 2.134 W
1,500.00	18.00	61.84	1,485.27	66.17	123.62	625,396.00	1,238,265.90	39° 31' 9.984 N	108° 12' 1.805 W
1,600.00	20.00	61.84	1,579.82	81.53	152.32	625,410.50	1,238,295.04	39° 31' 10.136 N	108° 12' 1.439 W
1,700.00	20.00	61.84	1,673.78	97.68	182.47	625,425.74	1,238,325.66	39° 31' 10.295 N	108° 12' 1.054 W
1,800.00	20.00	61.84	1,767.75	113.82	212.63	625,440.98	1,238,356.28	39° 31' 10.455 N	108° 12' 0.669 W
1,900.00	20.00	61.84	1,861.72	129.96	242.78	625,456.22	1,238,386.90	39° 31' 10.614 N	108° 12' 0.285 W
2,000.00	20.00	61.84	1,955.69	146.10	272.93	625,471.45	1,238,417.52	39° 31' 10.774 N	108° 11' 59.900 W
2,100.00	20.00	61.84	2,049.66	162.24	303.09	625,486.69	1,238,448.14	39° 31' 10.933 N	108° 11' 59.515 W
2,200.00	20.00	61.84	2,143.63	178.38	333.24	625,501.93	1,238,478.76	39° 31' 11.093 N	108° 11' 59.130 W
2,300.00	20.00	61.84	2,237.60	194.52	363.39	625,517.17	1,238,509.38	39° 31' 11.253 N	108° 11' 58.746 W
2,400.00	20.00	61.84	2,331.57	210.66	393.55	625,532.40	1,238,540.00	39° 31' 11.412 N	108° 11' 58.361 W
2,500.00	20.00	61.84	2,425.54	226.80	423.70	625,547.64	1,238,570.62	39° 31' 11.572 N	108° 11' 57.976 W
2,600.00	20.00	61.84	2,519.51	242.94	453.86	625,562.88	1,238,601.24	39° 31' 11.731 N	108° 11' 57.591 W
2,700.00	20.00	61.84	2,613.48	259.08	484.01	625,578.12	1,238,631.87	39° 31' 11.891 N	108° 11' 57.206 W
2,800.00	20.00	61.84	2,707.45	275.23	514.16	625,593.35	1,238,662.49	39° 31' 12.050 N	108° 11' 56.822 W
2,900.00	20.00	61.84	2,801.42	291.37	544.32	625,608.59	1,238,693.11	39° 31' 12.210 N	108° 11' 56.437 W
3,000.00	20.00	61.84	2,895.39	307.51	574.47	625,623.83	1,238,723.73	39° 31' 12.369 N	108° 11' 56.052 W
<b>9 5/8"</b>									
3,100.00	20.00	61.84	2,989.35	323.65	604.62	625,639.07	1,238,754.35	39° 31' 12.529 N	108° 11' 55.667 W
3,200.00	20.00	61.84	3,083.32	339.79	634.78	625,654.30	1,238,784.97	39° 31' 12.688 N	108° 11' 55.282 W
3,300.00	20.00	61.84	3,177.29	355.93	664.93	625,669.54	1,238,815.59	39° 31' 12.848 N	108° 11' 54.898 W
3,400.00	20.00	61.84	3,271.26	372.07	695.09	625,684.78	1,238,846.21	39° 31' 13.007 N	108° 11' 54.513 W
3,500.00	20.00	61.84	3,365.23	388.21	725.24	625,700.02	1,238,876.83	39° 31' 13.167 N	108° 11' 54.128 W
3,600.00	20.00	61.84	3,459.20	404.35	755.39	625,715.25	1,238,907.45	39° 31' 13.326 N	108° 11' 53.743 W
3,700.00	20.00	61.84	3,553.17	420.49	785.55	625,730.49	1,238,938.07	39° 31' 13.486 N	108° 11' 53.358 W
3,800.00	20.00	61.84	3,647.14	436.63	815.70	625,745.73	1,238,968.69	39° 31' 13.645 N	108° 11' 52.974 W
3,900.00	20.00	61.84	3,741.11	452.78	845.85	625,760.97	1,238,999.31	39° 31' 13.805 N	108° 11' 52.589 W
4,000.00	20.00	61.84	3,835.08	468.92	876.01	625,776.20	1,239,029.93	39° 31' 13.964 N	108° 11' 52.204 W
4,100.00	20.00	61.84	3,929.05	485.06	906.16	625,791.44	1,239,060.55	39° 31' 14.124 N	108° 11' 51.819 W
4,200.00	20.00	61.84	4,023.02	501.20	936.32	625,806.68	1,239,091.17	39° 31' 14.283 N	108° 11' 51.434 W
4,300.00	20.00	61.84	4,116.99	517.34	966.47	625,821.92	1,239,121.79	39° 31' 14.443 N	108° 11' 51.050 W
4,400.00	20.00	61.84	4,210.95	533.48	996.62	625,837.15	1,239,152.41	39° 31' 14.603 N	108° 11' 50.665 W
4,500.00	20.00	61.84	4,304.92	549.62	1,026.78	625,852.39	1,239,183.03	39° 31' 14.762 N	108° 11' 50.280 W
4,504.22	20.00	61.84	4,308.89	550.30	1,028.05	625,853.03	1,239,184.32	39° 31' 14.769 N	108° 11' 50.264 W
4,600.00	18.08	61.84	4,399.42	565.05	1,055.60	625,866.95	1,239,212.30	39° 31' 14.915 N	108° 11' 49.912 W
4,700.00	16.08	61.84	4,495.01	578.91	1,081.50	625,880.04	1,239,238.60	39° 31' 15.052 N	108° 11' 49.582 W
4,800.00	14.08	61.84	4,591.56	591.19	1,104.44	625,891.64	1,239,261.90	39° 31' 15.173 N	108° 11' 49.289 W
4,900.00	12.08	61.84	4,688.95	601.88	1,124.40	625,901.72	1,239,282.16	39° 31' 15.278 N	108° 11' 49.034 W

**Oxy**  
Planning Report - Geographic

<b>Database:</b>	HOPSP	<b>Local Co-ordinate Reference:</b>	Well CC 697-15-40B
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-15-40B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-40B		
<b>Design:</b>	CC 697-15-40BPlan V1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude	
5,000.00	10.08	61.84	4,787.08	610.95	1,141.35	625,910.29	1,239,299.37	39° 31' 15.368 N	108° 11' 48.818 W	
5,061.90	8.85	61.84	4,848.14	615.75	1,150.32	625,914.82	1,239,308.49	39° 31' 15.416 N	108° 11' 48.703 W	
<b>Formation 2</b>										
5,100.00	8.08	61.84	4,885.82	618.40	1,155.27	625,917.32	1,239,313.51	39° 31' 15.442 N	108° 11' 48.640 W	
5,200.00	6.08	61.84	4,985.06	624.22	1,166.14	625,922.81	1,239,324.55	39° 31' 15.499 N	108° 11' 48.502 W	
5,300.00	4.08	61.84	5,084.66	628.40	1,173.95	625,926.76	1,239,332.48	39° 31' 15.541 N	108° 11' 48.402 W	
5,400.00	2.08	61.84	5,184.51	630.94	1,178.70	625,929.16	1,239,337.30	39° 31' 15.566 N	108° 11' 48.341 W	
5,500.00	0.08	61.84	5,284.49	631.84	1,180.37	625,930.00	1,239,338.99	39° 31' 15.575 N	108° 11' 48.320 W	
5,504.22	0.00	0.00	5,288.71	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
5,600.00	0.00	0.00	5,384.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
5,700.00	0.00	0.00	5,484.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
5,800.00	0.00	0.00	5,584.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
5,900.00	0.00	0.00	5,684.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
6,000.00	0.00	0.00	5,784.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
6,100.00	0.00	0.00	5,884.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
6,200.00	0.00	0.00	5,984.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
6,300.00	0.00	0.00	6,084.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
6,362.42	0.00	0.00	6,146.90	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
<b>Mesaverde Group Top</b>										
6,400.00	0.00	0.00	6,184.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
6,500.00	0.00	0.00	6,284.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
6,600.00	0.00	0.00	6,384.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
6,602.45	0.00	0.00	6,386.93	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
<b>Williams Fork ("base Ohio Creek")</b>										
6,700.00	0.00	0.00	6,484.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
6,800.00	0.00	0.00	6,584.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
6,900.00	0.00	0.00	6,684.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
7,000.00	0.00	0.00	6,784.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
7,100.00	0.00	0.00	6,884.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
7,184.12	0.00	0.00	6,968.60	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
<b>Williams Fork Shale Marker</b>										
7,200.00	0.00	0.00	6,984.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
7,300.00	0.00	0.00	7,084.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
7,400.00	0.00	0.00	7,184.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
7,500.00	0.00	0.00	7,284.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
7,524.52	0.00	0.00	7,309.00	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
<b>Continuous Top of Gas</b>										
7,600.00	0.00	0.00	7,384.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
7,700.00	0.00	0.00	7,484.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
7,800.00	0.00	0.00	7,584.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
7,900.00	0.00	0.00	7,684.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
8,000.00	0.00	0.00	7,784.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
8,100.00	0.00	0.00	7,884.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
8,200.00	0.00	0.00	7,984.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
8,300.00	0.00	0.00	8,084.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
8,400.00	0.00	0.00	8,184.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
8,500.00	0.00	0.00	8,284.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
8,600.00	0.00	0.00	8,384.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
8,700.00	0.00	0.00	8,484.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
8,800.00	0.00	0.00	8,584.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
8,900.00	0.00	0.00	8,684.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
8,913.81	0.00	0.00	8,698.29	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	
<b>Cameo Coal</b>										
9,000.00	0.00	0.00	8,784.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	

**Oxy**  
Planning Report - Geographic

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well CC 697-15-40B
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-15-40B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-40B		
<b>Design:</b>	CC 697-15-40BPlan V1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
9,100.00	0.00	0.00	8,884.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W
9,200.00	0.00	0.00	8,984.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W
9,300.00	0.00	0.00	9,084.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W
9,336.47	0.00	0.00	9,120.95	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W
<b>Rollins</b>									
9,400.00	0.00	0.00	9,184.49	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W
9,441.52	0.00	0.00	9,226.00	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W
<b>TD - 4 1/2</b>									

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
15-40BSrf - plan hits target center - Point	0.00	358.30	0.00	0.00	0.00	625,333.53	1,238,140.37	39° 31' 9.330 N	108° 12' 3.383 W
15-40B BHL - plan hits target center - Circle (radius 100.00)	0.00	358.30	9,226.00	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W

Casing Points						
Measured Depth (ft)	Vertical Depth (ft)	Name			Casing Diameter (in)	Hole Diameter (in)
90.00	90.00	16			16.000	20.000
3,000.00	2,895.39	9 5/8"			9.625	12.250
9,441.52	9,226.00	4 1/2			4.500	8.750

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,061.90	4,848.14	Formation 2		3.00	19.00
6,362.42	6,146.90	Mesaverde Group Top		6.00	4.00
6,602.45	6,386.93	Williams Fork ("base Ohio Creek")		4.00	24.00
7,184.12	6,968.60	Williams Fork Shale Marker		4.00	43.00
7,524.52	7,309.00	Continuous Top of Gas			
8,913.81	8,698.29	Cameo Coal		5.00	28.00
9,336.47	9,120.95	Rollins		5.00	26.00
9,441.52	9,226.00	TD		0.00	

# **ENGINEERING CALCS**

**Nasik**

**Cascade Creek 697-15-54**

**CC 697-15-40B**

**CC 697-15-40B**

**Plan: CC 697-15-40BPlan V1**

## **Standard Planning Report**

**12 February, 2014**

# Oxy

## Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well CC 697-15-40B
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-15-40B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-40B		
<b>Design:</b>	CC 697-15-40BPlan V1		

<b>Project</b>	Nasik, Planning		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	Colorado Central 502		

<b>Site</b>	Cascade Creek 697-15-54, 16-54		
<b>Site Position:</b>		<b>Northing:</b>	625,361.65 ft
<b>From:</b>	Map	<b>Easting:</b>	1,238,150.52 ft
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in
		<b>Latitude:</b>	39° 31' 9.611 N
		<b>Longitude:</b>	108° 12' 3.264 W
		<b>Grid Convergence:</b>	-1.70 °

<b>Well</b>	CC 697-15-40B, CC 697-15-40B		
<b>Well Position</b>	<b>+N/-S</b>	-28.41 ft	<b>Northing:</b> 625,333.53 ft
	<b>+E/-W</b>	-9.31 ft	<b>Easting:</b> 1,238,140.37 ft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	<b>Latitude:</b> 39° 31' 9.330 N
			<b>Longitude:</b> 108° 12' 3.383 W
			<b>Ground Level:</b> 8,640.00 ft

<b>Wellbore</b>	CC 697-15-40B				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	1/9/2014	10.11	65.65	51,956

<b>Design</b>	CC 697-15-40BPlan V1			
<b>Audit Notes:</b>				
<b>Version:</b>	1	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b> 0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>
	(ft)	(ft)	(ft)	(°)
	0.00	0.00	0.00	61.84

<b>Plan Sections</b>										
<b>Measured Depth</b>	<b>Inclination</b>	<b>Azimuth</b>	<b>Vertical Depth</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Dogleg Rate</b>	<b>Build Rate</b>	<b>Turn Rate</b>	<b>TFO</b>	<b>Target</b>
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)	(°)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,600.00	20.00	61.84	1,579.82	81.53	152.32	2.00	2.00	0.00	61.84	
4,504.22	20.00	61.84	4,308.89	550.30	1,028.05	0.00	0.00	0.00	0.00	
5,504.22	0.00	0.00	5,288.71	631.84	1,180.37	2.00	-2.00	0.00	180.00	
9,441.52	0.00	0.00	9,226.00	631.84	1,180.37	0.00	0.00	0.00	0.00	15-40B BHL

# Oxy Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well CC 697-15-40B
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-15-40B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-40B		
<b>Design:</b>	CC 697-15-40BPlan V1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90.00	0.00	0.00	90.00	0.00	0.00	0.00	0.00	0.00	0.00
16									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	2.00	61.84	699.98	0.82	1.54	1.75	2.00	2.00	0.00
800.00	4.00	61.84	799.84	3.29	6.15	6.98	2.00	2.00	0.00
900.00	6.00	61.84	899.45	7.41	13.84	15.69	2.00	2.00	0.00
1,000.00	8.00	61.84	998.70	13.16	24.58	27.88	2.00	2.00	0.00
1,100.00	10.00	61.84	1,097.47	20.54	38.37	43.52	2.00	2.00	0.00
1,200.00	12.00	61.84	1,195.62	29.54	55.19	62.60	2.00	2.00	0.00
1,300.00	14.00	61.84	1,293.06	40.16	75.02	85.10	2.00	2.00	0.00
1,400.00	16.00	61.84	1,389.64	52.37	97.84	110.98	2.00	2.00	0.00
1,500.00	18.00	61.84	1,485.27	66.17	123.62	140.21	2.00	2.00	0.00
1,600.00	20.00	61.84	1,579.82	81.53	152.32	172.77	2.00	2.00	0.00
1,700.00	20.00	61.84	1,673.78	97.68	182.47	206.97	0.00	0.00	0.00
1,800.00	20.00	61.84	1,767.75	113.82	212.63	241.17	0.00	0.00	0.00
1,900.00	20.00	61.84	1,861.72	129.96	242.78	275.37	0.00	0.00	0.00
2,000.00	20.00	61.84	1,955.69	146.10	272.93	309.58	0.00	0.00	0.00
2,100.00	20.00	61.84	2,049.66	162.24	303.09	343.78	0.00	0.00	0.00
2,200.00	20.00	61.84	2,143.63	178.38	333.24	377.98	0.00	0.00	0.00
2,300.00	20.00	61.84	2,237.60	194.52	363.39	412.18	0.00	0.00	0.00
2,400.00	20.00	61.84	2,331.57	210.66	393.55	446.38	0.00	0.00	0.00
2,500.00	20.00	61.84	2,425.54	226.80	423.70	480.59	0.00	0.00	0.00
2,600.00	20.00	61.84	2,519.51	242.94	453.86	514.79	0.00	0.00	0.00
2,700.00	20.00	61.84	2,613.48	259.08	484.01	548.99	0.00	0.00	0.00
2,800.00	20.00	61.84	2,707.45	275.23	514.16	583.19	0.00	0.00	0.00
2,900.00	20.00	61.84	2,801.42	291.37	544.32	617.39	0.00	0.00	0.00
3,000.00	20.00	61.84	2,895.39	307.51	574.47	651.60	0.00	0.00	0.00
9 5/8"									
3,100.00	20.00	61.84	2,989.35	323.65	604.62	685.80	0.00	0.00	0.00
3,200.00	20.00	61.84	3,083.32	339.79	634.78	720.00	0.00	0.00	0.00
3,300.00	20.00	61.84	3,177.29	355.93	664.93	754.20	0.00	0.00	0.00
3,400.00	20.00	61.84	3,271.26	372.07	695.09	788.40	0.00	0.00	0.00
3,500.00	20.00	61.84	3,365.23	388.21	725.24	822.61	0.00	0.00	0.00
3,600.00	20.00	61.84	3,459.20	404.35	755.39	856.81	0.00	0.00	0.00
3,700.00	20.00	61.84	3,553.17	420.49	785.55	891.01	0.00	0.00	0.00
3,800.00	20.00	61.84	3,647.14	436.63	815.70	925.21	0.00	0.00	0.00
3,900.00	20.00	61.84	3,741.11	452.78	845.85	959.41	0.00	0.00	0.00
4,000.00	20.00	61.84	3,835.08	468.92	876.01	993.62	0.00	0.00	0.00
4,100.00	20.00	61.84	3,929.05	485.06	906.16	1,027.82	0.00	0.00	0.00
4,200.00	20.00	61.84	4,023.02	501.20	936.32	1,062.02	0.00	0.00	0.00
4,300.00	20.00	61.84	4,116.99	517.34	966.47	1,096.22	0.00	0.00	0.00
4,400.00	20.00	61.84	4,210.95	533.48	996.62	1,130.42	0.00	0.00	0.00
4,500.00	20.00	61.84	4,304.92	549.62	1,026.78	1,164.63	0.00	0.00	0.00
4,504.22	20.00	61.84	4,308.89	550.30	1,028.05	1,166.07	0.00	0.00	0.00
4,600.00	18.08	61.84	4,399.42	565.05	1,055.60	1,197.32	2.00	-2.00	0.00
4,700.00	16.08	61.84	4,495.01	578.91	1,081.50	1,226.69	2.00	-2.00	0.00
4,800.00	14.08	61.84	4,591.56	591.19	1,104.44	1,252.72	2.00	-2.00	0.00
4,900.00	12.08	61.84	4,688.95	601.88	1,124.40	1,275.36	2.00	-2.00	0.00



# Oxy Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well CC 697-15-40B
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-15-40B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-40B		
<b>Design:</b>	CC 697-15-40BPlan V1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
5,000.00	10.08	61.84	4,787.08	610.95	1,141.35	1,294.58	2.00	-2.00	0.00	
5,061.90	8.85	61.84	4,848.14	615.75	1,150.32	1,304.76	2.00	-2.00	0.00	
<b>Formation 2</b>										
5,100.00	8.08	61.84	4,885.82	618.40	1,155.27	1,310.37	2.00	-2.00	0.00	
5,200.00	6.08	61.84	4,985.06	624.22	1,166.14	1,322.70	2.00	-2.00	0.00	
5,300.00	4.08	61.84	5,084.66	628.40	1,173.95	1,331.56	2.00	-2.00	0.00	
5,400.00	2.08	61.84	5,184.51	630.94	1,178.70	1,336.94	2.00	-2.00	0.00	
5,500.00	0.08	61.84	5,284.49	631.84	1,180.37	1,338.84	2.00	-2.00	0.00	
5,504.22	0.00	0.00	5,288.71	631.84	1,180.37	1,338.84	2.00	-2.00	0.00	
5,600.00	0.00	0.00	5,384.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
5,700.00	0.00	0.00	5,484.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
5,800.00	0.00	0.00	5,584.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,684.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
6,000.00	0.00	0.00	5,784.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
6,100.00	0.00	0.00	5,884.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
6,200.00	0.00	0.00	5,984.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,084.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
6,362.42	0.00	0.00	6,146.90	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
<b>Mesaverde Group Top</b>										
6,400.00	0.00	0.00	6,184.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,284.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,384.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
6,602.45	0.00	0.00	6,386.93	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
<b>Williams Fork ("base Ohio Creek")</b>										
6,700.00	0.00	0.00	6,484.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,584.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,684.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,784.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
7,100.00	0.00	0.00	6,884.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
7,184.12	0.00	0.00	6,968.60	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
<b>Williams Fork Shale Marker</b>										
7,200.00	0.00	0.00	6,984.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,084.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,184.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,284.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
7,524.52	0.00	0.00	7,309.00	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
<b>Continuous Top of Gas</b>										
7,600.00	0.00	0.00	7,384.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,484.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,584.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,684.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
8,000.00	0.00	0.00	7,784.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
8,100.00	0.00	0.00	7,884.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
8,200.00	0.00	0.00	7,984.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
8,300.00	0.00	0.00	8,084.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
8,400.00	0.00	0.00	8,184.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
8,500.00	0.00	0.00	8,284.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
8,600.00	0.00	0.00	8,384.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
8,700.00	0.00	0.00	8,484.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
8,800.00	0.00	0.00	8,584.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
8,900.00	0.00	0.00	8,684.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
8,913.81	0.00	0.00	8,698.29	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
<b>Cameo Coal</b>										

# Oxy Planning Report

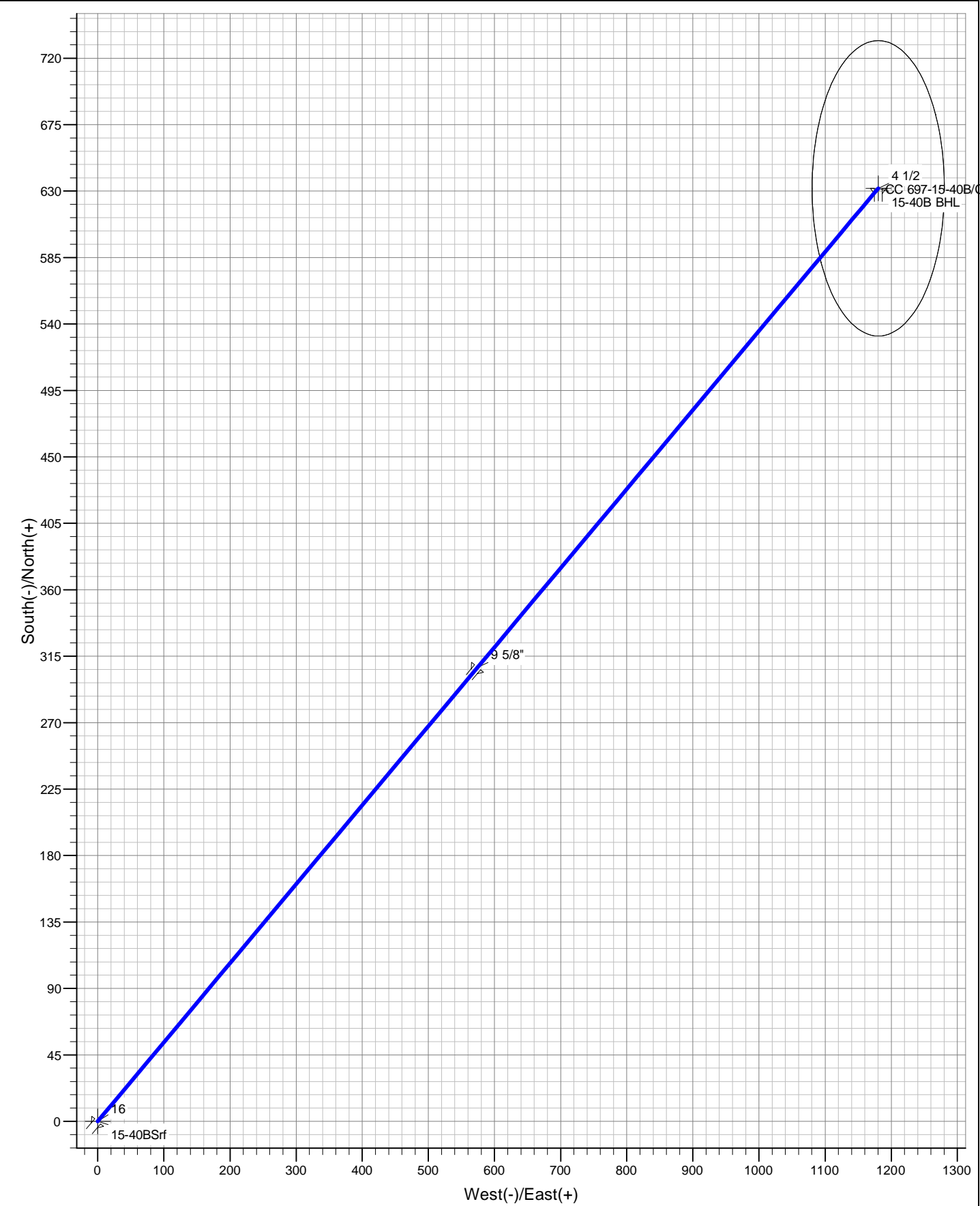
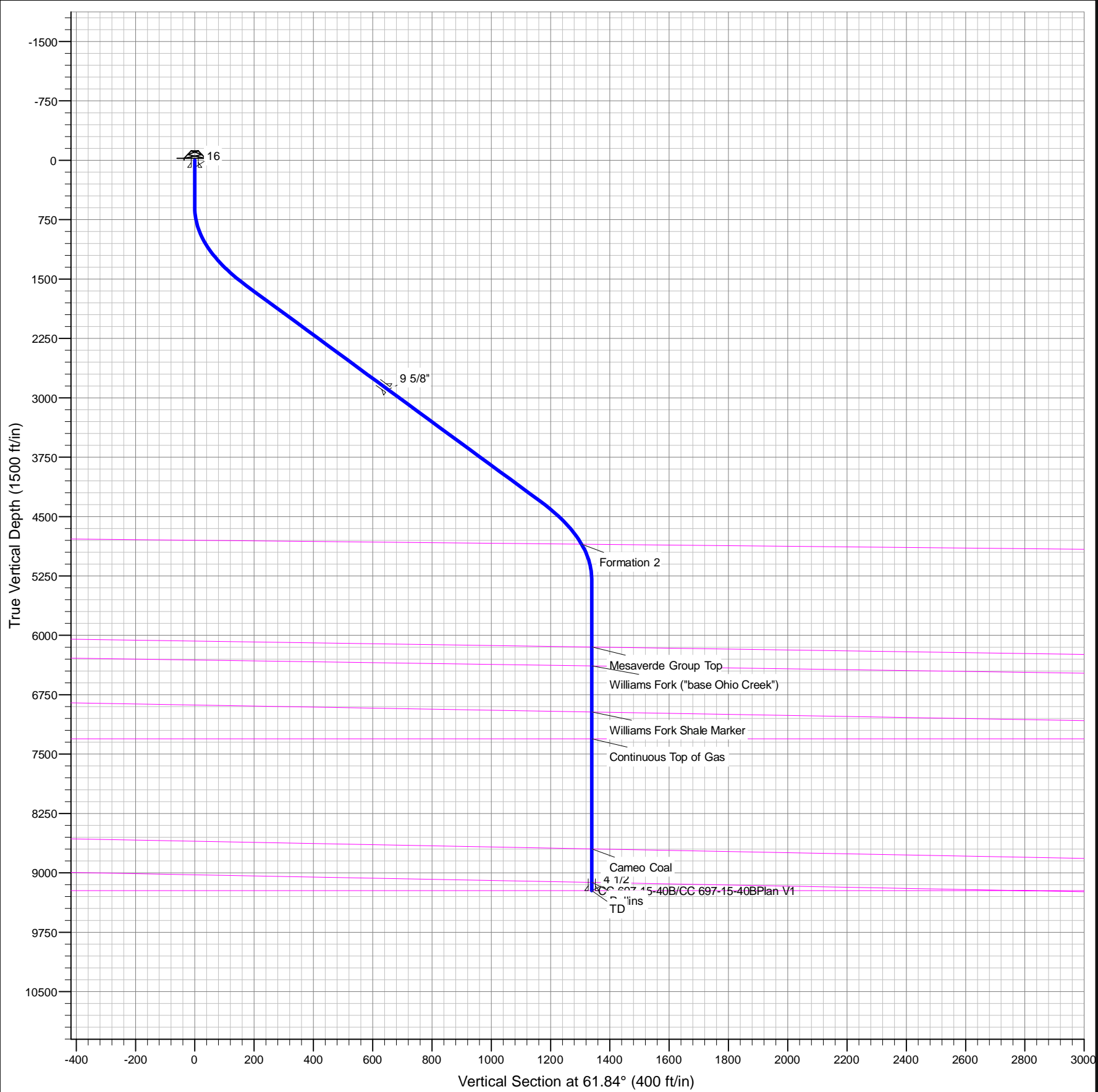
<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well CC 697-15-40B
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8625.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-15-40B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-40B		
<b>Design:</b>	CC 697-15-40BPlan V1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
9,000.00	0.00	0.00	8,784.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
9,100.00	0.00	0.00	8,884.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
9,200.00	0.00	0.00	8,984.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
9,300.00	0.00	0.00	9,084.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
9,336.47	0.00	0.00	9,120.95	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
Rollins										
9,400.00	0.00	0.00	9,184.49	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
9,441.52	0.00	0.00	9,226.00	631.84	1,180.37	1,338.84	0.00	0.00	0.00	
TD - 4 1/2										

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude	
15-40BSrf - plan hits target center - Point	0.00	358.30	0.00	0.00	0.00	625,333.53	1,238,140.37	39° 31' 9.330 N	108° 12' 3.383 W	
15-40B BHL - plan hits target center - Circle (radius 100.00)	0.00	358.30	9,226.00	631.84	1,180.37	625,930.00	1,239,339.00	39° 31' 15.575 N	108° 11' 48.320 W	

Casing Points						
Measured Depth (ft)	Vertical Depth (ft)	Name			Casing Diameter (in)	Hole Diameter (in)
90.00	90.00	16			16.000	20.000
3,000.00	2,895.39	9 5/8"			9.625	12.250
9,441.52	9,226.00	4 1/2			4.500	8.750

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
5,061.90	4,848.14	Formation 2		3.00	19.00	
6,362.42	6,146.90	Mesaverde Group Top		6.00	4.00	
6,602.45	6,386.93	Williams Fork ("base Ohio Creek")		4.00	24.00	
7,184.12	6,968.60	Williams Fork Shale Marker		4.00	43.00	
7,524.52	7,309.00	Continuous Top of Gas				
8,913.81	8,698.29	Cameo Coal		5.00	28.00	
9,336.47	9,120.95	Rollins		5.00	26.00	
9,441.52	9,226.00	TD		0.00		



Plan: CC 697-15-40BPlan V1 (CC 697-15-40B/CC 697-15-40B)		
Created By: Oxy	Date: 11:35, February 12 2014	Name: 15-40BSrf
Checked: _____	Date: _____	- plan hits target center
Reviewed: _____	Date: _____	- plan hits target center
Approved: _____	Date: _____	

DESIGN TARGET DETAILS									
TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape		
0.00	0.00	0.00	625333.53	1238140.37	39° 31' 9.330 N	108° 12' 3.383 W	Point		
226.00	631.84	1180.37	625930.00	1239339.00	39° 31' 15.575 N	108° 11' 48.320 W	Circle (Radius: 100.00)		

T

M

Azimuths to True North

Magnetic North: 10.12°

Magnetic Field

Strength: 51956.0snT

Dip Angle: 65.65°

Date: 1/9/2014

Model: IGRF2010

