

Cub Creek Energy, LLC

Location	Weld County, CO	Slot	VAIL 01NC
Field	WATTENBERG	Well	VAIL 01NC
Installation	Vail Pad	Wellbore	VAIL 01NC (Rev 1)

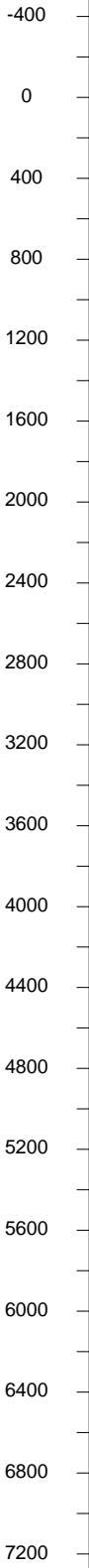
Scale 1 cm = 400 ft

East (Feet) ->

-800 0 800 1600 2400 3200 4000 4800 5600

Scale 1 cm = 200 ft

<- True Vertical Depth (Feet)

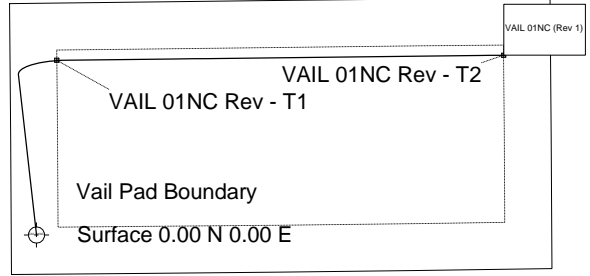


2.00
6.00
9 5/8in Surface Casing
DLS: 2.00 deg/100ft
14.00

20.00
40.00
60.00
80.00
VAIL 01NC Rev - T1
7.0in Intermediate Casing

4 1/2in Production Liner

VAIL 01NC Rev - T2

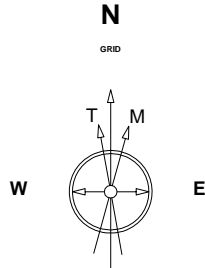


2400

<- North (East) cm = 400 ft

WELL PROFILE DATA

Point	MD	Inc	Azi	TVD	North	East	deg/100ft	V. Sect
KOP	479.00	0.00	353.54	479.00	0.00	0.00	0.00	0.00
End of Build	1287.43	16.17	353.54	1276.74	112.59	-12.76	2.00	28.52
End of Hold	6560.66	16.17	353.54	6341.40	1571.67	-178.09	0.00	398.12
Target VAIL 01NC Rev -	7325.19	90.13	89.34	6813.00	1713.49	298.66	12.00	894.01
T.D. & Target VAIL 01NC	11607.89	90.13	89.34	6803.00	1762.47	4581.07	0.00	4908.41



20-Dec-2014
IGRF Model (1900-2015.0) Dip: 88.95 deg Field: 52721.7 nT
Lat: N40 19 45 8400 Long: W104 57 35.5880 Elev: 4521.00 ft
Magnetic North is 8.51 deg East of True North
GRID North is 0.35 deg East of True North
To correct azimuth from True to GRID subtract 0.35 deg
To correct azimuth from Magnetic to GRID add 8.16 deg

Scale 1 cm = 200 ft

Vertical Section (Feet) ->

Azimuth 68.96 with reference 0.00 N, 0.00 E from Installation Centre

Created by admin
Date plotted 16-Sep-2015
Plot reference is VAIL 01NC (Rev 1).
Ref wellpath is VAIL 01NC (PWP#1).
Coordinates are in Feet reference Installation Centre.
True Vertical Depths are reference Rig Datum.
Measured Depths are reference Rig Datum.
Rig Datum: Planned Datum #1
Rig Datum to Mean Sea Level: 4942.00 ft.
Plot North is aligned to GRID North.



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
VAIL 01NC	40.32940000	-104.95988000	1363299.8308	3150584.7385	0.00N	0.00E	0.00

Declination		
Date	Source	Time
20-Oct-2014	IGRF Model [1900.0-2015.0]	08:52

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Vail Pad	40.32940000	-104.95988000	1363299.8308	3150584.7385	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Summary Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Northing	Easting
21.00	0.00	0.000	21.00	0.00N	0.00E		0.00	1363299.83	3150584.74
500.00	0.00	353.540	500.00	0.00N	0.00E	==>	0.00	1363299.83	3150584.74
11628.89	90.13	89.340	6824.00	1762.47N	4581.07E	==>	4908.41	1365062.22	3155165.61

Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments	
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00		
21.00	0.00	0.000	21.00	0.00N	0.00E	==>	0.00		Rig Datum
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00		Slot Datum
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00		
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00		
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00		
500.00	0.00	353.540	500.00	0.00N	0.00E	==>	0.00		
600.00	2.00	353.540	599.98	1.73N	0.20W	2.00	0.44		
700.00	4.00	353.540	699.84	6.93N	0.79W	2.00	1.76		
800.00	6.00	353.540	799.45	15.59N	1.77W	2.00	3.95		
850.00	7.00	353.540	849.13	21.22N	2.40W	2.00	5.37		9 5/8in Surface Casing
900.00	8.00	353.540	898.70	27.70N	3.14W	2.00	7.02		
1000.00	10.00	353.540	997.47	43.25N	4.90W	2.00	10.95		
1100.00	12.00	353.540	1095.62	62.20N	7.05W	2.00	15.76		
1200.00	14.00	353.540	1193.06	84.56N	9.58W	2.00	21.42		
1300.00	16.00	353.540	1289.64	110.27N	12.50W	2.00	27.93		
1400.00	16.17	353.540	1385.69	137.93N	15.63W	==>	34.94		
1500.00	16.17	353.540	1481.74	165.60N	18.76W	==>	41.95		
1600.00	16.17	353.540	1577.78	193.27N	21.90W	==>	48.96		
1700.00	16.17	353.540	1673.82	220.94N	25.04W	==>	55.97		
1800.00	16.17	353.540	1769.87	248.61N	28.17W	==>	62.98		
1900.00	16.17	353.540	1865.91	276.28N	31.31W	==>	69.98		
2000.00	16.17	353.540	1961.96	303.95N	34.44W	==>	76.99		
2100.00	16.17	353.540	2058.00	331.62N	37.58W	==>	84.00		
2200.00	16.17	353.540	2154.05	359.28N	40.71W	==>	91.01		
2300.00	16.17	353.540	2250.09	386.95N	43.85W	==>	98.02		
2400.00	16.17	353.540	2346.14	414.62N	46.98W	==>	105.03		
2500.00	16.17	353.540	2442.18	442.29N	50.12W	==>	112.04		
2600.00	16.17	353.540	2538.23	469.96N	53.25W	==>	119.05		
2700.00	16.17	353.540	2634.27	497.63N	56.39W	==>	126.06		
2800.00	16.17	353.540	2730.32	525.30N	59.52W	==>	133.07		
2900.00	16.17	353.540	2826.36	552.97N	62.66W	==>	140.07		
3000.00	16.17	353.540	2922.41	580.64N	65.80W	==>	147.08		

All data is in Feet unless otherwise stated
 Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 4942.0ft above Mean Sea Level)
 Vertical Section is from 0.00N 0.00E on azimuth 68.960 degrees
 Bottom hole distance is 4908.41 Feet on azimuth 68.96 degrees from Wellhead
 Calculation method uses Minimum Curvature method
 Prepared by Integrated Petroleum Technologies, Inc.
 Date Printed: 16-Sep-2015



SYS DRILL
Well Design Combined Report
Wellbore: VAIL 01NC (Rev 1)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3100.00	16.17	353.540	3018.45	608.31N	68.93W	==>	154.09	
3200.00	16.17	353.540	3114.49	635.98N	72.07W	==>	161.10	
3300.00	16.17	353.540	3210.54	663.65N	75.20W	==>	168.11	
3400.00	16.17	353.540	3306.58	691.32N	78.34W	==>	175.12	
3500.00	16.17	353.540	3402.63	718.99N	81.47W	==>	182.13	
3600.00	16.17	353.540	3498.67	746.66N	84.61W	==>	189.14	
3700.00	16.17	353.540	3594.72	774.33N	87.74W	==>	196.15	
3800.00	16.17	353.540	3690.76	802.00N	90.88W	==>	203.16	
3900.00	16.17	353.540	3786.81	829.67N	94.01W	==>	210.16	
4000.00	16.17	353.540	3882.85	857.33N	97.15W	==>	217.17	
4100.00	16.17	353.540	3978.90	885.00N	100.28W	==>	224.18	
4200.00	16.17	353.540	4074.94	912.67N	103.42W	==>	231.19	
4300.00	16.17	353.540	4170.99	940.34N	106.55W	==>	238.20	
4400.00	16.17	353.540	4267.03	968.01N	109.69W	==>	245.21	
4500.00	16.17	353.540	4363.07	995.68N	112.83W	==>	252.22	
4600.00	16.17	353.540	4459.12	1023.35N	115.96W	==>	259.23	
4700.00	16.17	353.540	4555.16	1051.02N	119.10W	==>	266.24	
4800.00	16.17	353.540	4651.21	1078.69N	122.23W	==>	273.25	
4900.00	16.17	353.540	4747.25	1106.36N	125.37W	==>	280.26	
5000.00	16.17	353.540	4843.30	1134.03N	128.50W	==>	287.26	
5100.00	16.17	353.540	4939.34	1161.70N	131.64W	==>	294.27	
5200.00	16.17	353.540	5035.39	1189.37N	134.77W	==>	301.28	
5300.00	16.17	353.540	5131.43	1217.04N	137.91W	==>	308.29	
5400.00	16.17	353.540	5227.48	1244.71N	141.04W	==>	315.30	
5500.00	16.17	353.540	5323.52	1272.38N	144.18W	==>	322.31	
5600.00	16.17	353.540	5419.57	1300.05N	147.31W	==>	329.32	
5700.00	16.17	353.540	5515.61	1327.71N	150.45W	==>	336.33	
5800.00	16.17	353.540	5611.65	1355.38N	153.58W	==>	343.34	
5900.00	16.17	353.540	5707.70	1383.05N	156.72W	==>	350.35	
6000.00	16.17	353.540	5803.74	1410.72N	159.86W	==>	357.35	
6100.00	16.17	353.540	5899.79	1438.39N	162.99W	==>	364.36	
6200.00	16.17	353.540	5995.83	1466.06N	166.13W	==>	371.37	
6300.00	16.17	353.540	6091.88	1493.73N	169.26W	==>	378.38	
6400.00	16.17	353.540	6187.92	1521.40N	172.40W	==>	385.39	
6500.00	16.17	353.540	6283.97	1549.07N	175.53W	==>	392.40	
6600.00	16.10	1.460	6380.02	1576.75N	178.32W	12.00	399.74	
6700.00	20.33	38.180	6475.29	1604.37N	167.18W	12.00	420.05	
6800.00	29.12	58.110	6566.19	1630.97N	135.67W	12.00	459.01	
6900.00	39.52	68.840	6648.74	1655.40N	85.16W	12.00	514.93	
7000.00	50.55	75.570	6719.34	1676.58N	17.85W	12.00	585.35	
7100.00	61.85	80.430	6774.91	1693.59N	63.31E	12.00	667.21	
7200.00	73.30	84.340	6813.00	1705.69N	154.78E	12.00	756.92	
7245.15	78.49	85.940	6824.00	1709.39N	198.39E	12.00	798.95	7.0in Intermediate Casing
7300.00	84.81	87.800	6831.96	1712.34N	252.55E	12.00	850.56	
7400.00	90.13	89.340	6833.87	1714.10N	352.47E	==>	944.45	
7500.00	90.13	89.340	6833.64	1715.25N	452.46E	==>	1038.18	
7600.00	90.13	89.340	6833.41	1716.39N	552.45E	==>	1131.92	
7700.00	90.13	89.340	6833.17	1717.54N	652.45E	==>	1225.65	
7800.00	90.13	89.340	6832.94	1718.68N	752.44E	==>	1319.39	
7900.00	90.13	89.340	6832.71	1719.82N	852.43E	==>	1413.12	
8000.00	90.13	89.340	6832.47	1720.97N	952.43E	==>	1506.86	
8100.00	90.13	89.340	6832.24	1722.11N	1052.42E	==>	1600.59	
8200.00	90.13	89.340	6832.01	1723.25N	1152.41E	==>	1694.33	
8300.00	90.13	89.340	6831.77	1724.40N	1252.41E	==>	1788.07	
8400.00	90.13	89.340	6831.54	1725.54N	1352.40E	==>	1881.80	
8500.00	90.13	89.340	6831.31	1726.68N	1452.39E	==>	1975.54	
8600.00	90.13	89.340	6831.07	1727.83N	1552.39E	==>	2069.27	

All data is in Feet unless otherwise stated
Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 4942.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 68.960 degrees
Bottom hole distance is 4908.41 Feet on azimuth 68.96 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 16-Sep-2015



SYS DRILL
Well Design Combined Report
Wellbore: VAIL 01NC (Rev 1)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
8700.00	90.13	89.340	6830.84	1728.97N	1652.38E	==>	2163.01	
8800.00	90.13	89.340	6830.61	1730.12N	1752.37E	==>	2256.74	
8900.00	90.13	89.340	6830.37	1731.26N	1852.37E	==>	2350.48	
9000.00	90.13	89.340	6830.14	1732.40N	1952.36E	==>	2444.21	
9100.00	90.13	89.340	6829.90	1733.55N	2052.35E	==>	2537.95	
9200.00	90.13	89.340	6829.67	1734.69N	2152.35E	==>	2631.68	
9300.00	90.13	89.340	6829.44	1735.83N	2252.34E	==>	2725.42	
9400.00	90.13	89.340	6829.20	1736.98N	2352.33E	==>	2819.15	
9500.00	90.13	89.340	6828.97	1738.12N	2452.33E	==>	2912.89	
9600.00	90.13	89.340	6828.74	1739.26N	2552.32E	==>	3006.62	
9700.00	90.13	89.340	6828.50	1740.41N	2652.31E	==>	3100.36	
9800.00	90.13	89.340	6828.27	1741.55N	2752.30E	==>	3194.09	
9900.00	90.13	89.340	6828.04	1742.70N	2852.30E	==>	3287.83	
10000.00	90.13	89.340	6827.80	1743.84N	2952.29E	==>	3381.57	
10100.00	90.13	89.340	6827.57	1744.98N	3052.28E	==>	3475.30	
10200.00	90.13	89.340	6827.34	1746.13N	3152.28E	==>	3569.04	
10300.00	90.13	89.340	6827.10	1747.27N	3252.27E	==>	3662.77	
10400.00	90.13	89.340	6826.87	1748.41N	3352.26E	==>	3756.51	
10500.00	90.13	89.340	6826.64	1749.56N	3452.26E	==>	3850.24	
10600.00	90.13	89.340	6826.40	1750.70N	3552.25E	==>	3943.98	
10700.00	90.13	89.340	6826.17	1751.84N	3652.24E	==>	4037.71	
10800.00	90.13	89.340	6825.94	1752.99N	3752.24E	==>	4131.45	
10900.00	90.13	89.340	6825.70	1754.13N	3852.23E	==>	4225.18	
11000.00	90.13	89.340	6825.47	1755.28N	3952.22E	==>	4318.92	
11100.00	90.13	89.340	6825.23	1756.42N	4052.22E	==>	4412.65	
11200.00	90.13	89.340	6825.00	1757.56N	4152.21E	==>	4506.39	
11300.00	90.13	89.340	6824.77	1758.71N	4252.20E	==>	4600.12	
11400.00	90.13	89.340	6824.53	1759.85N	4352.20E	==>	4693.86	
11500.00	90.13	89.340	6824.30	1760.99N	4452.19E	==>	4787.60	
11600.00	90.13	89.340	6824.07	1762.14N	4552.18E	==>	4881.33	
11628.89	90.13	89.340	6824.00	1762.47N	4581.07E	==>	4908.41	4 1/2in Production Liner

All data is in Feet unless otherwise stated
Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 4942.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 68.960 degrees
Bottom hole distance is 4908.41 Feet on azimuth 68.96 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 16-Sep-2015



Hole Sections								
Diameter [in]	Start MD[ft]	Start TVD[ft]	Start North[ft]	Start East[ft]	End MD[ft]	End TVD[ft]	End North[ft]	End East[ft]
12 1/4	21.00	21.00	0.00N	0.00E	850.00	849.13	21.22N	2.40W
8 3/4	850.00	849.13	21.22N	2.40W	7245.15	6824.00	1709.39N	198.39E
6 1/8	7245.15	6824.00	1709.39N	198.39E	11628.89	6824.00	1762.47N	4581.07E

Casings								
Name	Top MD[ft]	Top TVD[ft]	Top North[ft]	Top East[ft]	Shoe MD[ft]	Shoe TVD[ft]	Shoe North[ft]	Shoe East[ft]
9 5/8in Surface Casing	21.00	21.00	0.00N	0.00E	850.00	849.13	21.22N	2.40W
7.0in Intermediate Casing	21.00	21.00	0.00N	0.00E	7245.15	6824.00	1709.39N	198.39E
4 1/2in Production Liner	6463.00	6248.43	1538.83N	174.37W	11628.89	6824.00	1762.47N	4581.07E

Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
VAIL 01NC Rev - T1	1713.49N	198.66E	6824.00	40.33410000	-104.95913000	1365013.24	3150783.39
VAIL 01NC Rev - T2	1762.47N	4581.07E	6824.00	40.33416000	-104.94341000	1365062.22	3155165.61

Survey Tool Program					
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
392511	Planned	11628.89	6824.00	ISCWSA MWD	Rev 3 + Fixed Rig + Rotating

Notes



SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: VAIL 01NC (Rev 1)



Ellipse separations are reported ONLY if BOTH wells have uncertainty data
Only Depth and Magnetic Reference Field error terms are correlated across tie points
Scan limit is calculated on CENTRE to CENTRE distance
Summary data uses Closest Approach clearance calculation for all minima
Hole size/Casings ARE included
Hole size/Casings are NOT subtracted from Centre-Centre distance
Confidence limit of 95.00% / 2.80 SD.

Wellbore		
Name	Created	Last Revised
VAIL 01NC (Rev 1)	24-Jun-2015	16-Sep-2015

Well		
Name	Government ID	Last Revised
VAIL 01NC		21-Oct-2014

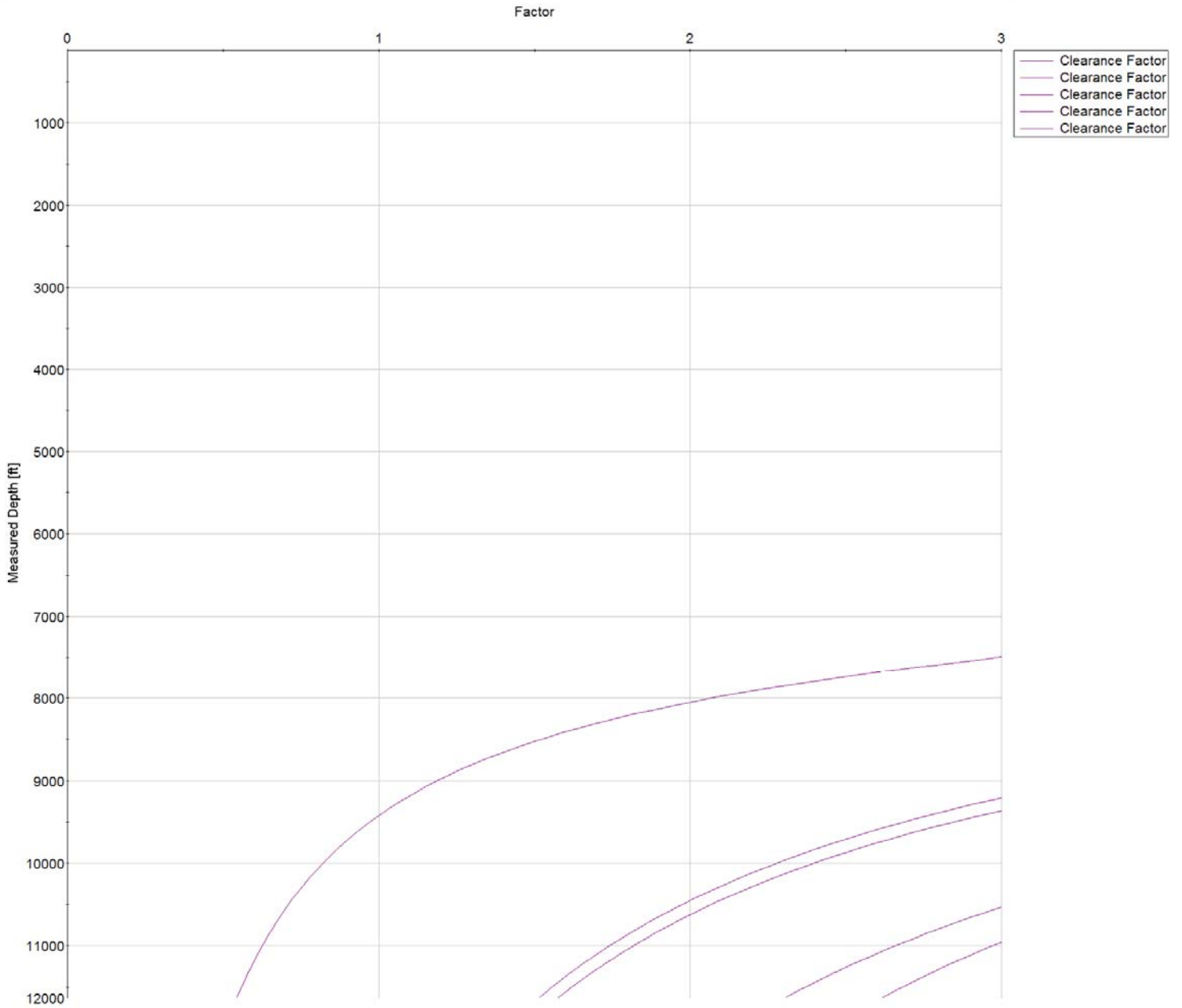
Slot						
Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
VAIL 01NC	40.32940000	-104.95988000	1363299.8308	3150584.7385	0.00N	0.00E

Installation						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Easting	Northing	Coord System Name	North Alignment
Vail Pad	40.32940000	-104.95988000	3150584.7385	1363299.8308	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Clearance Summary							
Offset WellName	Separation [ft]	MD[ft]	Diverging From[ft]	Ellipse Separation [ft]	Ellipse MD[ft]	Clearance Factor	Clearance MD[ft]
VAIL 02C	14.57	500.00	500.00	10.77	521.00	2.31	11628.89
VAIL 03NC	32.79	500.00	500.00	28.98	521.00	4.19	11628.89
VAIL 04NC	47.36	500.00	6582.68	-167.59	11628.89	0.54	11628.89
VAIL 05C	65.58	500.00	7346.19	61.77	521.00	1.52	11628.89
VAIL 06NC	80.15	500.00	11625.90	76.35	521.00	1.58	11625.90
VAIL 07NC	94.72	500.00	500.00	90.92	521.00	2.62	11628.89
VAIL 08C	112.94	500.00	11622.60	109.13	521.00	3.16	11628.89
VAIL 09NC	127.51	500.00	11621.99	123.71	521.00	3.65	11628.89
VAIL 10NC	142.08	500.00	11621.00	138.28	521.00	4.68	11628.89
VAIL 11C	160.30	500.00	11621.00	156.50	521.00	4.90	11628.89
VAIL 12NC	174.87	500.00	11621.00	171.07	521.00	5.59	11628.89

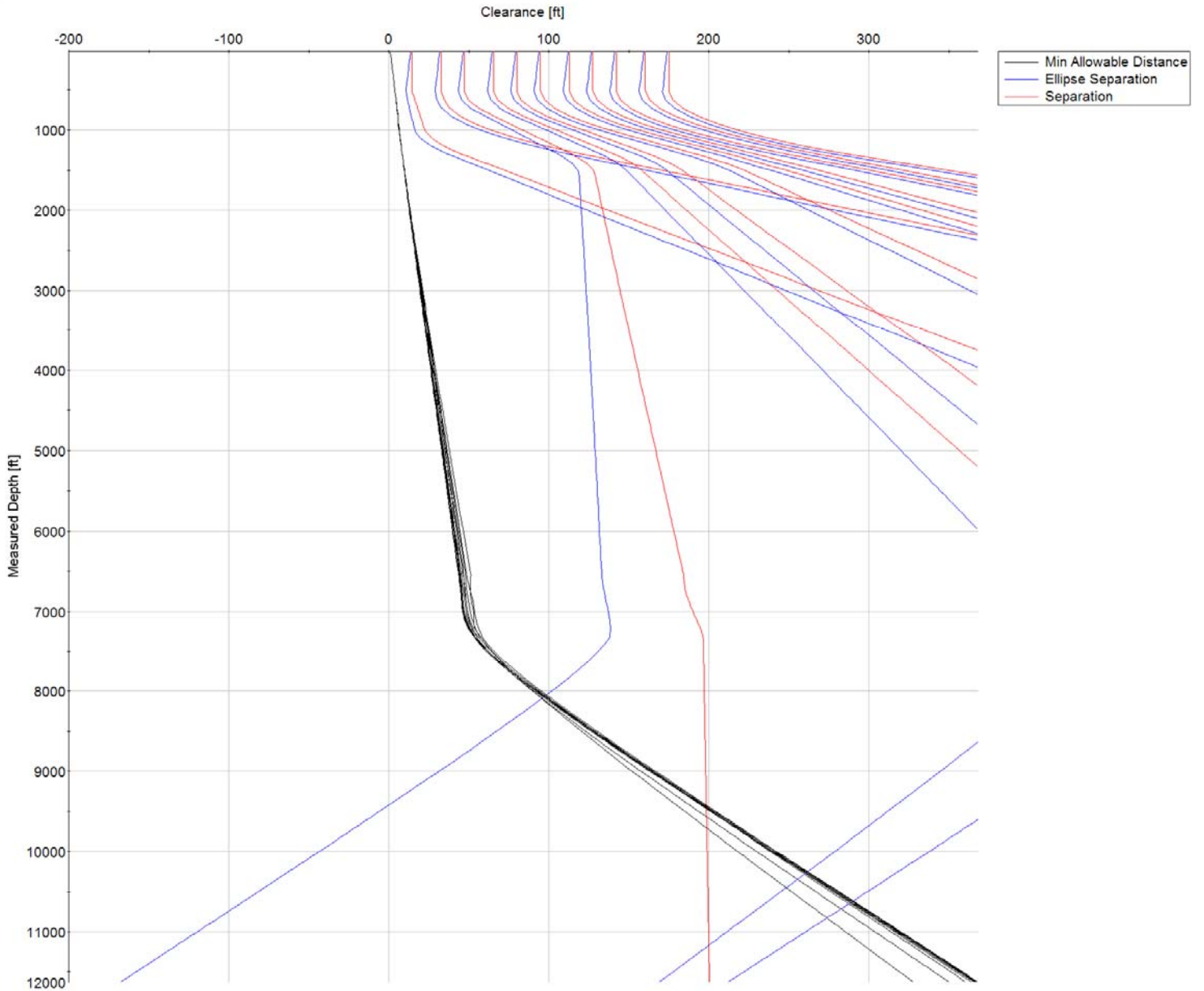


SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: VAIL 01NC (Rev 1)





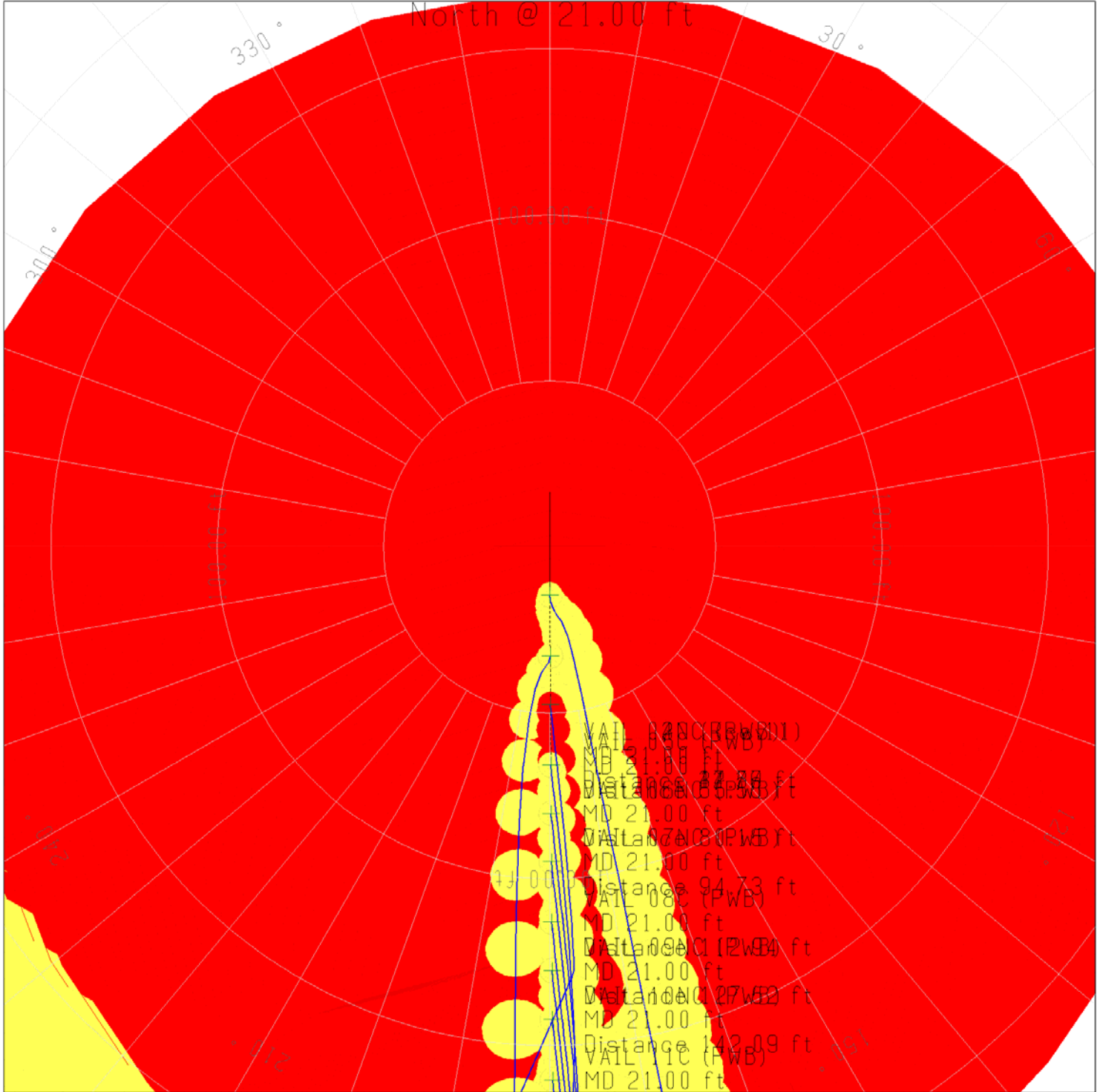
SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: VAIL 01NC (Rev 1)



All data is in Feet unless otherwise stated
Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 4942.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 68.960 degrees
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 16-Sep-2015



SYSDRILL
 Closest Approach + Clearance Factor Summary Report
 Wellbore: VAIL 01NC (Rev 1)



All data is in Feet unless otherwise stated
 Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 4942.0ft above Mean Sea Level)
 Vertical Section is from 0.00N 0.00E on azimuth 68.960 degrees
 Prepared by Integrated Petroleum Technologies, Inc.
 Date Printed: 16-Sep-2015