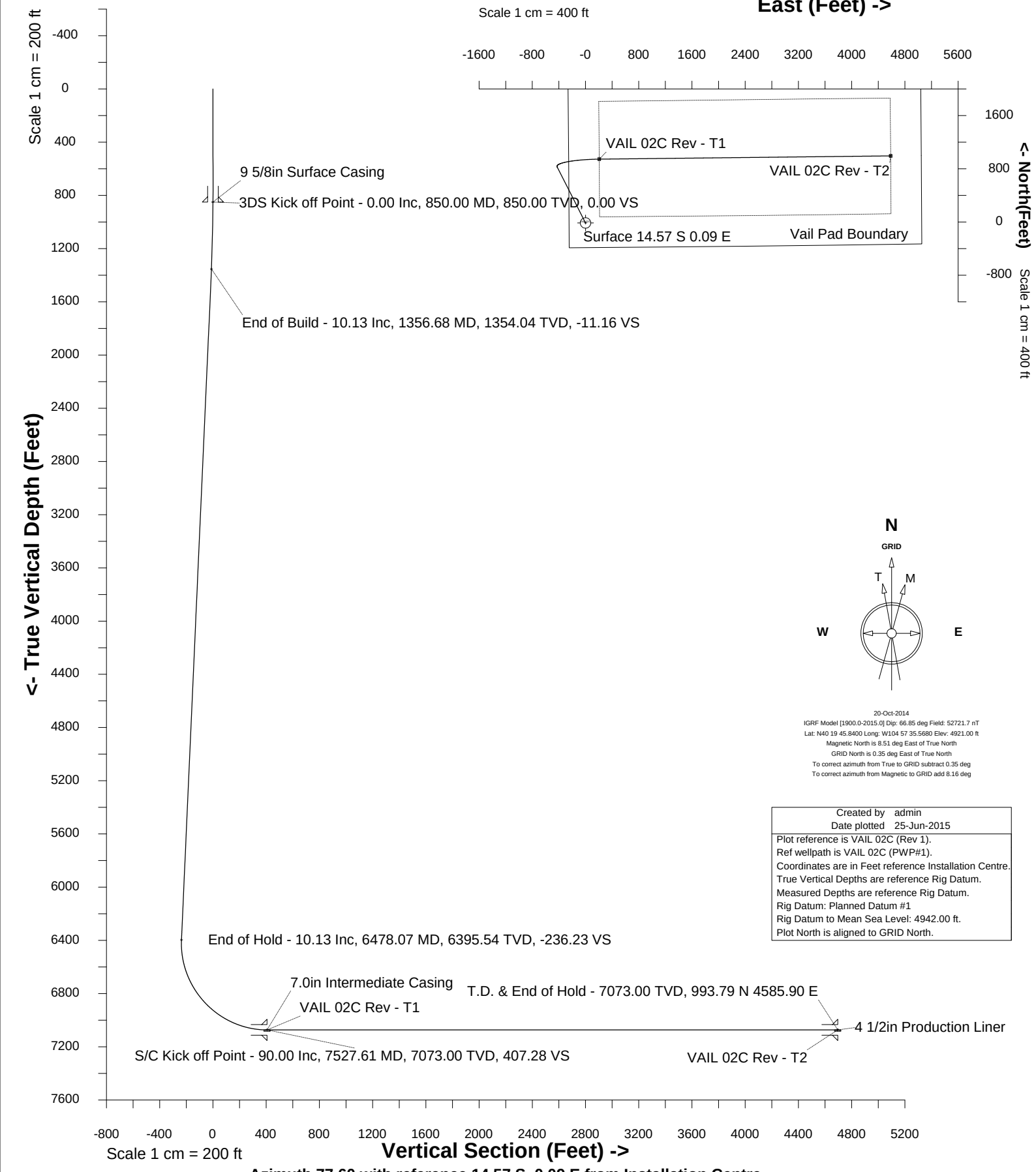
Cub Creek Energy, LLC

Location	**Weld County, CO**	**Slot**	**VAIL 02C**
Field	**WATTENBERG**	**Well**	**VAIL 02C**
Installation	**Vail Pad**	**Wellbore**	**VAIL 02C (Rev 1)**



20-Oct-2014
IGRF Model [1900.0-2015.0] Dip: 66.85 deg Field: 52721.7 nT
Lat: N40 19 45.8400 Long: W104 57 35.5680 Elev: 4921.00 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

Created by	admin
Date plotted	25-Jun-2015

Plot reference is VAIL 02C (Rev 1).
Ref wellpath is VAIL 02C (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.

SYSDRILL
Well Design Combined Report
Wellbore: VAIL 02C (Rev 1)

Wellhead Details

Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
VAIL 02C	40.32936000	-104.95988000	1363285.2594	3150584.8273	14.57S	0.09E	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	1363285.26	3150584.83
850.00	0.00	333.130	850.00	0.00N	0.00E	==>	0.00	1363285.26	3150584.83
11907.65	90.00	89.360	7073.00	1008.37N	4585.81E	==>	4695.36	1364293.58	3155170.43

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	Rig Datum
21.00	0.00	0.000	21.00	0.00N	0.00E	==>	0.00	Slot Datum
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	
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	0.000	500.00	0.00N	0.00E	==>	0.00	
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	
850.00	0.00	333.130	850.00	0.00N	0.00E	==>	0.00	9 5/8in Surface Casing
900.00	1.00	333.130	900.00	0.39N	0.20W	2.00	-0.11	
1000.00	3.00	333.130	999.93	3.50N	1.77W	2.00	-0.98	
1100.00	5.00	333.130	1099.68	9.72N	4.93W	2.00	-2.72	
1200.00	7.00	333.130	1199.13	19.05N	9.65W	2.00	-5.33	
1300.00	9.00	333.130	1298.15	31.46N	15.94W	2.00	-8.81	
1400.00	10.13	333.130	1396.69	46.67N	23.64W	==>	-13.07	
1500.00	10.13	333.130	1495.13	62.36N	31.59W	==>	-17.46	
1600.00	10.13	333.130	1593.57	78.06N	39.54W	==>	-21.86	
1700.00	10.13	333.130	1692.01	93.75N	47.49W	==>	-26.25	
1800.00	10.13	333.130	1790.45	109.45N	55.44W	==>	-30.64	
1900.00	10.13	333.130	1888.89	125.14N	63.39W	==>	-35.04	
2000.00	10.13	333.130	1987.33	140.84N	71.34W	==>	-39.43	
2100.00	10.13	333.130	2085.77	156.53N	79.30W	==>	-43.83	
2200.00	10.13	333.130	2184.21	172.23N	87.25W	==>	-48.22	
2300.00	10.13	333.130	2282.65	187.93N	95.20W	==>	-52.62	
2400.00	10.13	333.130	2381.09	203.62N	103.15W	==>	-57.01	
2500.00	10.13	333.130	2479.53	219.32N	111.10W	==>	-61.41	
2600.00	10.13	333.130	2577.97	235.01N	119.05W	==>	-65.80	
2700.00	10.13	333.130	2676.41	250.71N	127.00W	==>	-70.20	
2800.00	10.13	333.130	2774.85	266.40N	134.95W	==>	-74.59	
2900.00	10.13	333.130	2873.29	282.10N	142.90W	==>	-78.99	
3000.00	10.13	333.130	2971.73	297.79N	150.85W	==>	-83.38	
3100.00	10.13	333.130	3070.17	313.49N	158.80W	==>	-87.77	
3200.00	10.13	333.130	3168.61	329.19N	166.75W	==>	-92.17	
3300.00	10.13	333.130	3267.05	344.88N	174.71W	==>	-96.56	
3400.00	10.13	333.130	3365.49	360.58N	182.66W	==>	-100.96	

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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 77.600 degrees
Bottom hole distance is 4695.36 Feet on azimuth 77.60 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 25-Jun-2015

SYSDRILL
Well Design Combined Report
Wellbore: VAIL 02C (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
3500.00	10.13	333.130	3463.93	376.27N	190.61W	==>	-105.35	
3600.00	10.13	333.130	3562.37	391.97N	198.56W	==>	-109.75	
3700.00	10.13	333.130	3660.81	407.66N	206.51W	==>	-114.14	
3800.00	10.13	333.130	3759.25	423.36N	214.46W	==>	-118.54	
3900.00	10.13	333.130	3857.69	439.05N	222.41W	==>	-122.93	
4000.00	10.13	333.130	3956.13	454.75N	230.36W	==>	-127.33	
4100.00	10.13	333.130	4054.57	470.44N	238.31W	==>	-131.72	
4200.00	10.13	333.130	4153.01	486.14N	246.26W	==>	-136.12	
4300.00	10.13	333.130	4251.45	501.84N	254.21W	==>	-140.51	
4400.00	10.13	333.130	4349.89	517.53N	262.17W	==>	-144.90	
4500.00	10.13	333.130	4448.33	533.23N	270.12W	==>	-149.30	
4600.00	10.13	333.130	4546.77	548.92N	278.07W	==>	-153.69	
4700.00	10.13	333.130	4645.21	564.62N	286.02W	==>	-158.09	
4800.00	10.13	333.130	4743.65	580.31N	293.97W	==>	-162.48	
4900.00	10.13	333.130	4842.09	596.01N	301.92W	==>	-166.88	
5000.00	10.13	333.130	4940.53	611.70N	309.87W	==>	-171.27	
5100.00	10.13	333.130	5038.97	627.40N	317.82W	==>	-175.67	
5200.00	10.13	333.130	5137.41	643.09N	325.77W	==>	-180.06	
5300.00	10.13	333.130	5235.85	658.79N	333.72W	==>	-184.46	
5400.00	10.13	333.130	5334.29	674.49N	341.67W	==>	-188.85	
5500.00	10.13	333.130	5432.73	690.18N	349.62W	==>	-193.25	
5600.00	10.13	333.130	5531.17	705.88N	357.58W	==>	-197.64	
5700.00	10.13	333.130	5629.61	721.57N	365.53W	==>	-202.03	
5800.00	10.13	333.130	5728.05	737.27N	373.48W	==>	-206.43	
5900.00	10.13	333.130	5826.49	752.96N	381.43W	==>	-210.82	
6000.00	10.13	333.130	5924.93	768.66N	389.38W	==>	-215.22	
6100.00	10.13	333.130	6023.37	784.35N	397.33W	==>	-219.61	
6200.00	10.13	333.130	6121.81	800.05N	405.28W	==>	-224.01	
6300.00	10.13	333.130	6220.25	815.75N	413.23W	==>	-228.40	
6400.00	10.13	333.130	6318.69	831.44N	421.18W	==>	-232.80	
6500.00	9.44	344.030	6417.15	847.14N	428.76W	9.00	-236.82	
6600.00	11.18	35.160	6515.73	862.99N	425.42W	9.00	-230.16	
6700.00	17.93	59.660	6612.55	878.72N	406.51W	9.00	-208.31	
6800.00	26.05	70.220	6705.23	893.97N	372.49W	9.00	-171.81	
6900.00	34.59	75.920	6791.49	908.34N	324.19W	9.00	-121.55	
7000.00	43.30	79.560	6869.20	921.48N	262.81W	9.00	-58.78	
7100.00	52.09	82.190	6936.45	933.08N	189.86W	9.00	14.96	
7200.00	60.92	84.240	6991.59	942.85N	107.13W	9.00	97.85	
7300.00	69.78	85.970	7033.25	950.54N	16.66W	9.00	187.86	
7400.00	78.66	87.520	7060.41	955.97N	79.32E	9.00	282.77	
7500.00	87.55	88.970	7072.41	959.00N	178.45E	9.00	380.24	
7527.00	89.95	89.350	7073.00	959.40N	205.44E	9.00	406.68	7.0in Intermediate Casing
7600.00	90.00	89.360	7073.00	960.21N	278.43E	==>	478.15	
7700.00	90.00	89.360	7073.00	961.33N	378.43E	==>	576.05	
7800.00	90.00	89.360	7073.00	962.45N	478.42E	==>	673.95	
7900.00	90.00	89.360	7073.00	963.57N	578.41E	==>	771.85	
8000.00	90.00	89.360	7073.00	964.68N	678.41E	==>	869.75	
8100.00	90.00	89.360	7073.00	965.80N	778.40E	==>	967.65	
8200.00	90.00	89.360	7073.00	966.92N	878.39E	==>	1065.55	
8300.00	90.00	89.360	7073.00	968.04N	978.39E	==>	1163.45	
8400.00	90.00	89.360	7073.00	969.16N	1078.38E	==>	1261.35	
8500.00	90.00	89.360	7073.00	970.27N	1178.38E	==>	1359.25	
8600.00	90.00	89.360	7073.00	971.39N	1278.37E	==>	1457.16	
8700.00	90.00	89.360	7073.00	972.51N	1378.36E	==>	1555.06	
8800.00	90.00	89.360	7073.00	973.63N	1478.36E	==>	1652.96	
8900.00	90.00	89.360	7073.00	974.74N	1578.35E	==>	1750.86	
9000.00	90.00	89.360	7073.00	975.86N	1678.34E	==>	1848.76	
9100.00	90.00	89.360	7073.00	976.98N	1778.34E	==>	1946.66	
9200.00	90.00	89.360	7073.00	978.10N	1878.33E	==>	2044.56	
9300.00	90.00	89.360	7073.00	979.22N	1978.33E	==>	2142.46	

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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 77.600 degrees
Bottom hole distance is 4695.36 Feet on azimuth 77.60 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 25-Jun-2015

Interpolated Wellpath

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9400.00	90.00	89.360	7073.00	980.33N	2078.32E	==>	2240.36	
9500.00	90.00	89.360	7073.00	981.45N	2178.31E	==>	2338.26	
9600.00	90.00	89.360	7073.00	982.57N	2278.31E	==>	2436.16	
9700.00	90.00	89.360	7073.00	983.69N	2378.30E	==>	2534.06	
9800.00	90.00	89.360	7073.00	984.80N	2478.29E	==>	2631.96	
9900.00	90.00	89.360	7073.00	985.92N	2578.29E	==>	2729.86	
10000.00	90.00	89.360	7073.00	987.04N	2678.28E	==>	2827.76	
10100.00	90.00	89.360	7073.00	988.16N	2778.28E	==>	2925.67	
10200.00	90.00	89.360	7073.00	989.28N	2878.27E	==>	3023.57	
10300.00	90.00	89.360	7073.00	990.39N	2978.26E	==>	3121.47	
10400.00	90.00	89.360	7073.00	991.51N	3078.26E	==>	3219.37	
10500.00	90.00	89.360	7073.00	992.63N	3178.25E	==>	3317.27	
10600.00	90.00	89.360	7073.00	993.75N	3278.24E	==>	3415.17	
10700.00	90.00	89.360	7073.00	994.87N	3378.24E	==>	3513.07	
10800.00	90.00	89.360	7073.00	995.98N	3478.23E	==>	3610.97	
10900.00	90.00	89.360	7073.00	997.10N	3578.23E	==>	3708.87	
11000.00	90.00	89.360	7073.00	998.22N	3678.22E	==>	3806.77	
11100.00	90.00	89.360	7073.00	999.34N	3778.21E	==>	3904.67	
11200.00	90.00	89.360	7073.00	1000.45N	3878.21E	==>	4002.57	
11300.00	90.00	89.360	7073.00	1001.57N	3978.20E	==>	4100.47	
11400.00	90.00	89.360	7073.00	1002.69N	4078.19E	==>	4198.37	
11500.00	90.00	89.360	7073.00	1003.81N	4178.19E	==>	4296.28	
11600.00	90.00	89.360	7073.00	1004.93N	4278.18E	==>	4394.18	
11700.00	90.00	89.360	7073.00	1006.04N	4378.18E	==>	4492.08	
11800.00	90.00	89.360	7073.00	1007.16N	4478.17E	==>	4589.98	
11900.00	90.00	89.360	7073.00	1008.28N	4578.16E	==>	4687.88	
11907.65	90.00	89.360	7073.00	1008.37N	4585.81E	==>	4695.36	4 1/2in Production Liner

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SYSDRILL
Well Design Combined Report
Wellbore: VAIL 02C (Rev 1)

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	850.00	0.00N	0.00E
8 3/4	850.00	850.00	0.00N	0.00E	7527.00	7073.00	959.40N	205.44E
6 1/8	7527.00	7073.00	959.40N	205.44E	11907.65	7073.00	1008.37N	4585.81E

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	850.00	0.00N	0.00E
7.0in Intermediate Casing	21.00	21.00	0.00N	0.00E	7527.00	7073.00	959.40N	205.44E
4 1/2in Production Liner	6531.00	6447.75	852.04N	429.40W	11907.65	7073.00	1008.37N	4585.81E

Targets

Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
VAIL 02C Rev - T2	1008.37N	4585.81E	7073.00	40.33205000	-104.94341000	1364293.58	3155170.43
VAIL 02C Rev - T1	959.40N	206.05E	7073.00	40.33199000	-104.95912000	1364244.62	3150790.87

Survey Tool Program

Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
392532	Planned	11907.65	7073.00	ISCWSA MWD	Rev 3 + Fixed Rig + Rotating

Notes

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Bottom hole distance is 4695.36 Feet on azimuth 77.60 degrees from Wellhead
Calculation method uses Minimum Curvature method
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SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: VAIL 02C (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 02C (Rev 1)	24-Jun-2015	25-Jun-2015

Well

Name	Government ID	Last Revised
VAIL 02C		21-Oct-2014

Slot

Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
VAIL 02C	40.32936000	-104.95988000	1363285.2594	3150584.8273	14.57S	0.09E

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 01NC	11.68	1155.43	11907.65	4.10	1221.00	1.52	1251.31
VAIL 03NC	18.21	857.61	7521.80	12.52	850.00	2.24	11907.65
VAIL 04NC	32.79	850.00	7649.51	23.10	1907.48	1.78	11907.65
VAIL 05C	49.59	2186.35	7117.02	-35.83	11907.65	0.90	11907.65
VAIL 06NC	60.76	2530.90	7648.95	41.27	2744.10	1.26	11907.65
VAIL 07NC	80.15	850.00	7636.89	74.34	850.00	1.32	11907.65
VAIL 08C	98.36	850.00	11905.99	-35.10	11905.99	0.91	11905.99
VAIL 09NC	112.94	850.00	11904.86	107.13	850.00	1.81	11907.65
VAIL 10NC	127.51	850.00	7643.80	123.48	850.00	4.38	11907.65
VAIL 11C	145.72	850.00	11902.75	141.70	850.00	4.32	11907.65
VAIL 12NC	160.30	850.00	7642.11	156.27	850.00	5.75	11907.65
VAIL #1	247.20	8142.52	8142.52	176.83	8142.52	3.51	8141.08
NLB #1-3-12	546.05	10439.35	10439.35	379.42	10470.48	3.25	10503.28
NLB #2-1-12	738.16	10496.97	10496.97	566.66	10536.09	4.27	10585.30
UPRC #11-8I8	847.81	6500.66	6500.66	795.30	6500.66	16.07	6566.28
HSR-MAPLEWOOD ACRES #12-7	2336.18	11907.65	11907.65	2142.24	11907.65	12.05	11907.65
ABRAMS #1	2459.46	7602.55	7602.55	2404.16	7681.76	28.34	9371.39

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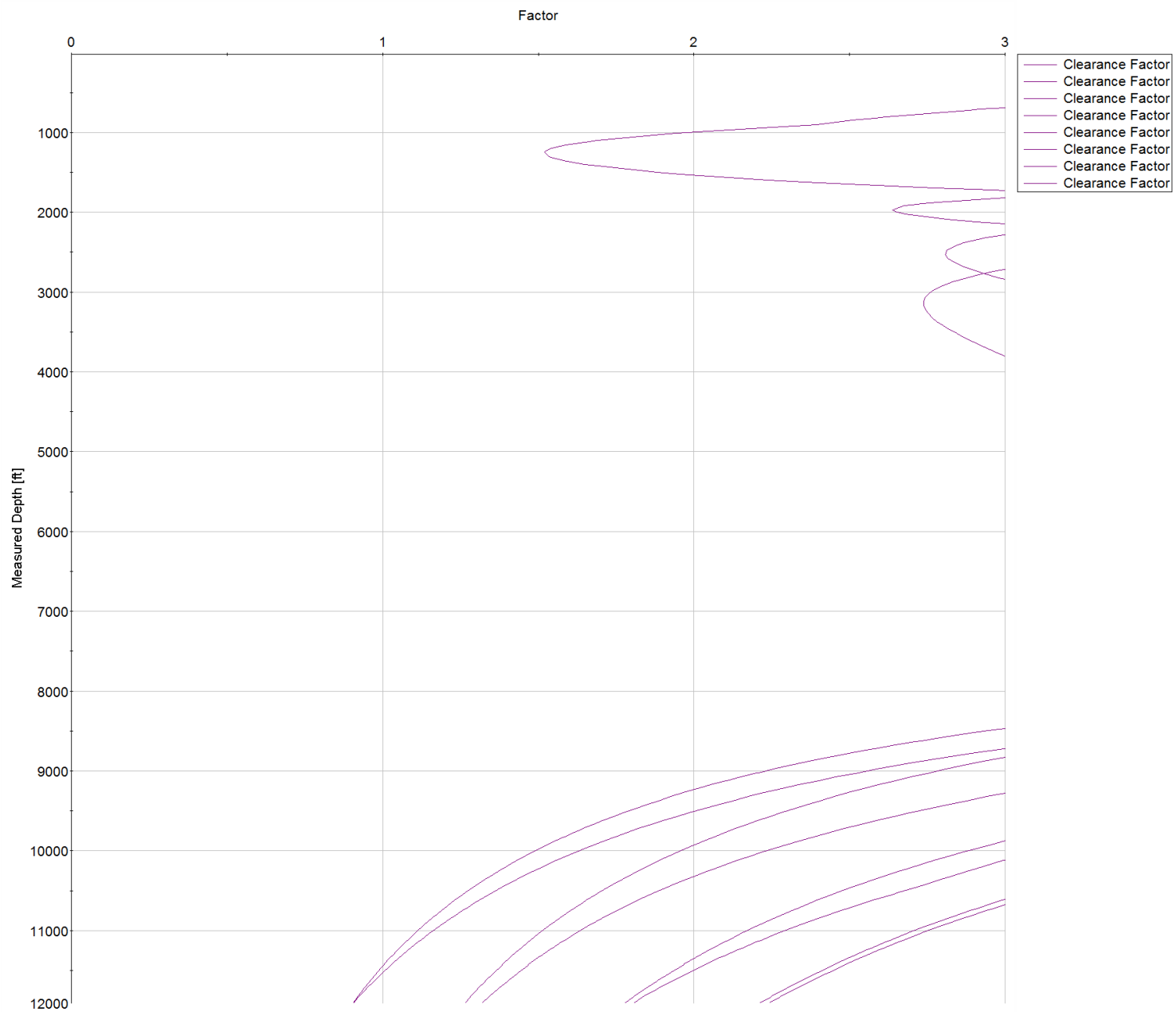
Vertical Section is from 0.00N 0.00E on azimuth 77.600 degrees
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 25-Jun-2015

SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: VAIL 02C (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 77.600 degrees
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 25-Jun-2015

SYSDRILL
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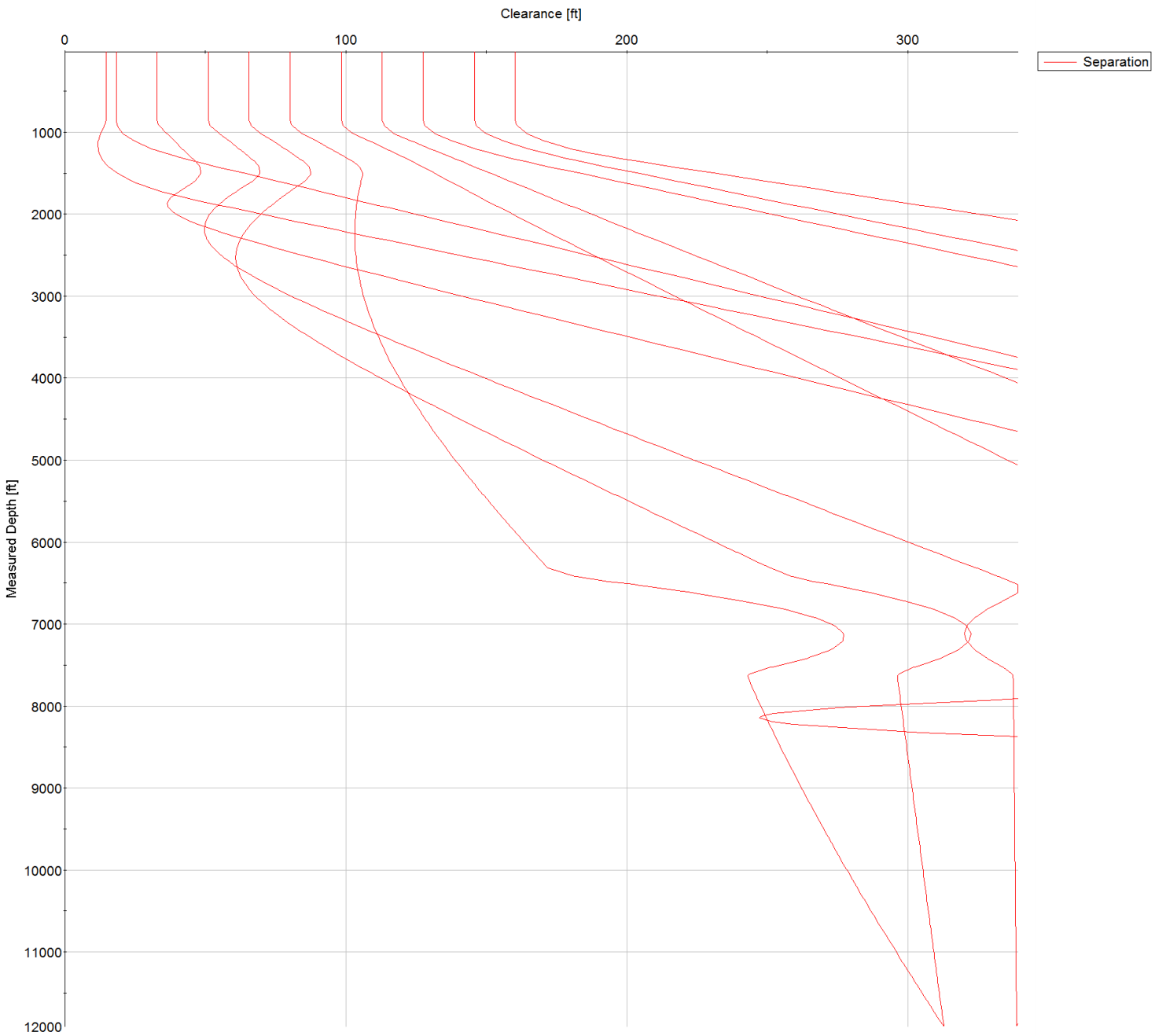

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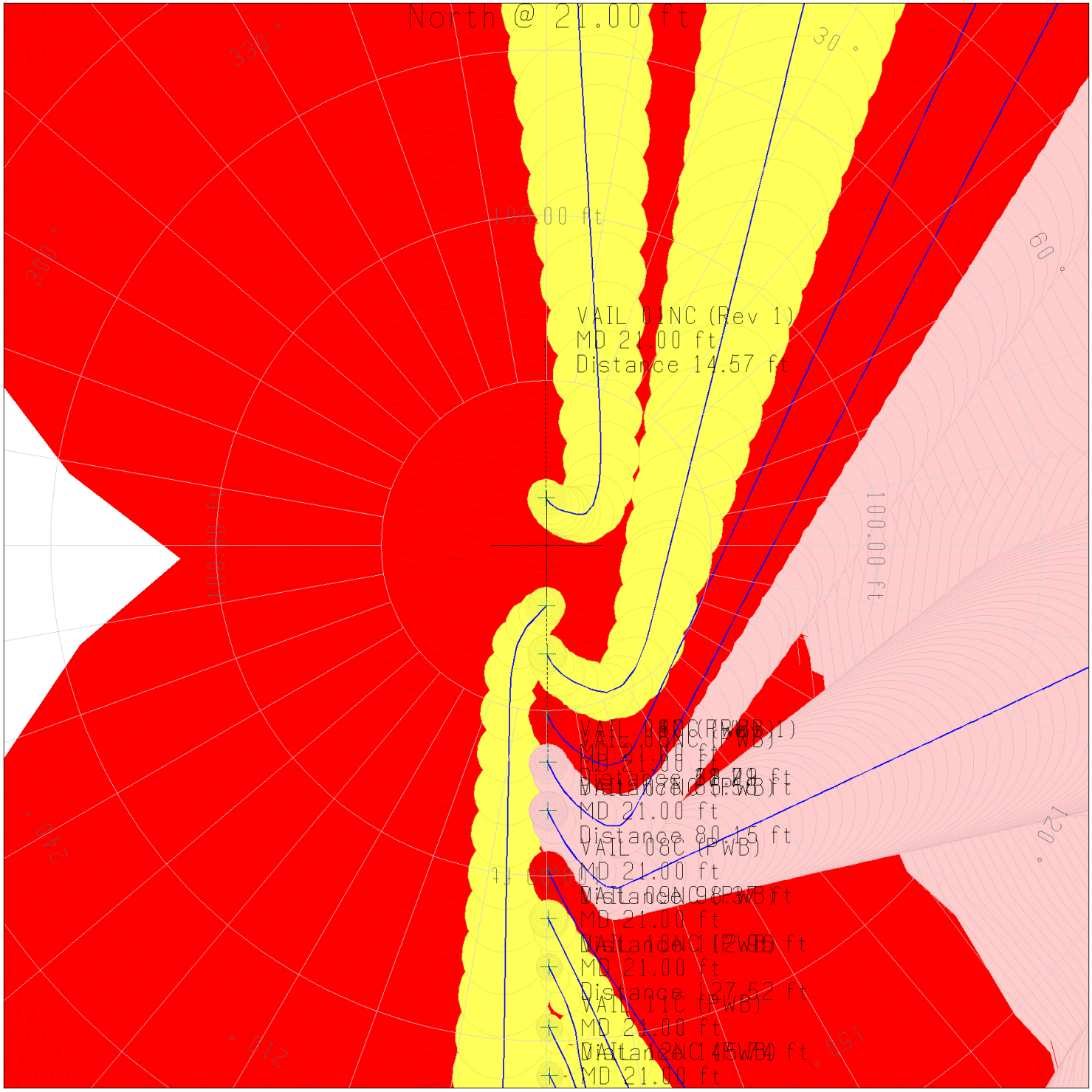

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