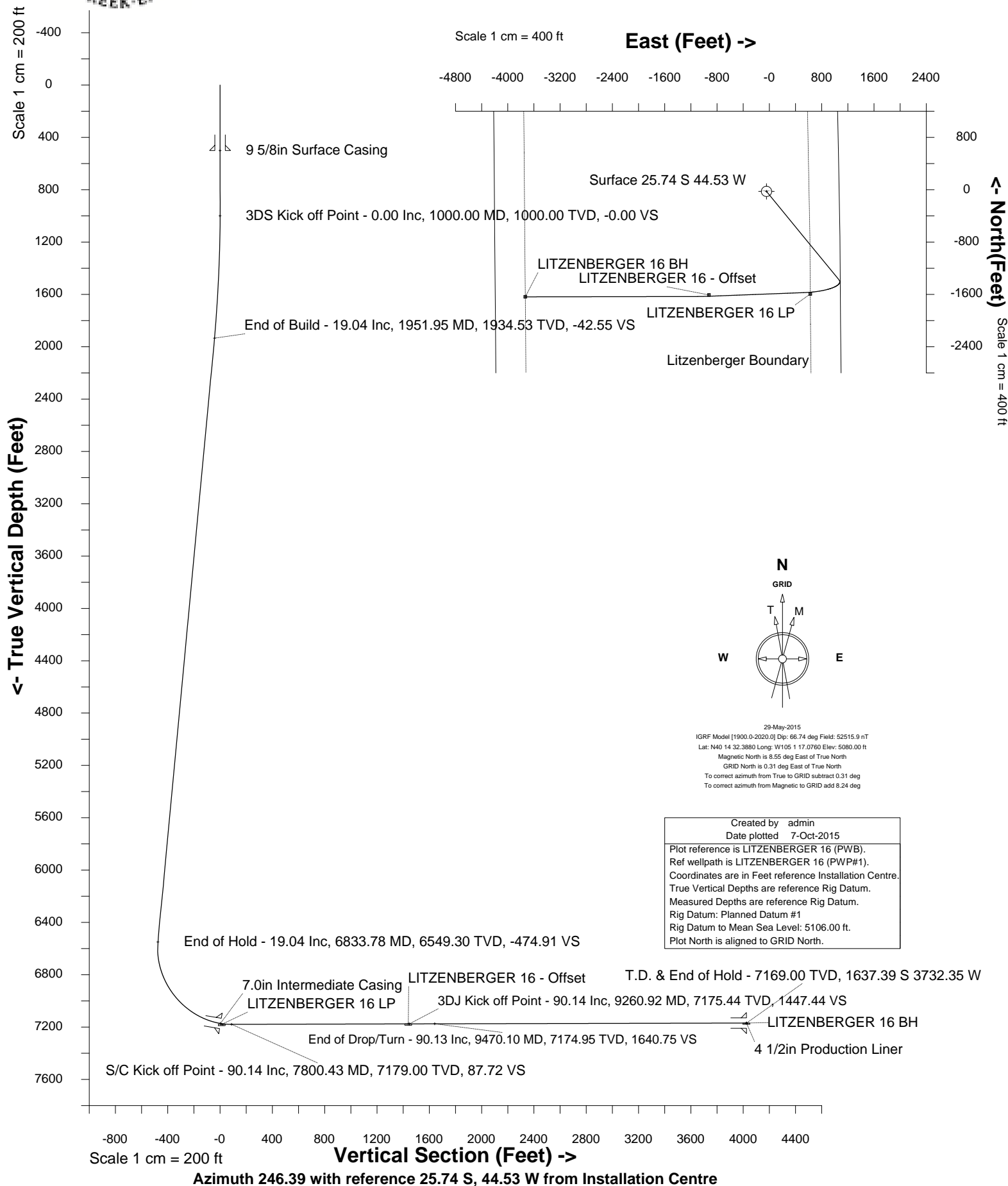




# Cub Creek Energy, LLC

Location	Weld County, CO	Slot	LITZENBERGER 16
Field	WATTENBERG	Well	LITZENBERGER 16
Installation	Litzenberger Pad - Finalized	Wellbore	LITZENBERGER 16 (PWB)





SYSDRILL  
Well Design Combined Report  
Wellbore: LITZENBERGER 16 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
LITZENBERGER 16	40.24226000	-105.02157000	1331457.4117	3133557.0952	25.74S	44.53W	0.00

Declination		
Date	Source	Time
29-May-2015	IGRF Model [1900.0-2020.0]	11:25

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Litzenberger Pad - Finalized	40.24233000	-105.02141000	1331483.1524	3133601.6223	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
25.00	0.00	0.000	25.00	0.00N	0.00E		0.00	1331457.41	3133557.10
1000.00	0.00	140.640	1000.00	0.00N	0.00E	==>	0.00	1331457.41	3133557.10
12069.54	90.13	269.890	7169.00	1611.64S	3687.82W	==>	4024.60	1329845.84	3129869.44

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 Slot Datum
25.00	0.00	0.000	25.00	0.00N	0.00E	==>	0.00	
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	9 5/8in Surface Casing
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	
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	
1000.00	0.00	140.640	1000.00	0.00N	0.00E	==>	0.00	
1100.00	2.00	140.640	1099.98	1.35S	1.11E	2.00	-0.47	
1200.00	4.00	140.640	1199.84	5.40S	4.43E	2.00	-1.89	
1300.00	6.00	140.640	1299.45	12.13S	9.95E	2.00	-4.26	
1400.00	8.00	140.640	1398.70	21.56S	17.68E	2.00	-7.57	
1500.00	10.00	140.640	1497.47	33.65S	27.60E	2.00	-11.82	
1600.00	12.00	140.640	1595.62	48.40S	39.70E	2.00	-17.00	
1700.00	14.00	140.640	1693.06	65.79S	53.97E	2.00	-23.10	
1800.00	16.00	140.640	1789.64	85.81S	70.38E	2.00	-30.13	
1900.00	18.00	140.640	1885.27	108.41S	88.92E	2.00	-38.07	
2000.00	19.04	140.640	1979.95	133.29S	109.33E	==>	-46.80	
2100.00	19.04	140.640	2074.48	158.51S	130.01E	==>	-55.66	
2200.00	19.04	140.640	2169.01	183.73S	150.70E	==>	-64.52	
2300.00	19.04	140.640	2263.54	208.95S	171.39E	==>	-73.37	
2400.00	19.04	140.640	2358.07	234.18S	192.08E	==>	-82.23	
2500.00	19.04	140.640	2452.60	259.40S	212.77E	==>	-91.09	
2600.00	19.04	140.640	2547.13	284.62S	233.45E	==>	-99.94	
2700.00	19.04	140.640	2641.66	309.84S	254.14E	==>	-108.80	
2800.00	19.04	140.640	2736.19	335.06S	274.83E	==>	-117.66	
2900.00	19.04	140.640	2830.72	360.29S	295.52E	==>	-126.51	
3000.00	19.04	140.640	2925.25	385.51S	316.21E	==>	-135.37	
3100.00	19.04	140.640	3019.78	410.73S	336.89E	==>	-144.23	
3200.00	19.04	140.640	3114.30	435.95S	357.58E	==>	-153.08	
3300.00	19.04	140.640	3208.83	461.17S	378.27E	==>	-161.94	
3400.00	19.04	140.640	3303.36	486.40S	398.96E	==>	-170.80	
3500.00	19.04	140.640	3397.89	511.62S	419.65E	==>	-179.65	

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 5106.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 246.390 degrees  
Bottom hole distance is 4024.60 Feet on azimuth 246.39 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Integrated Petroleum Technologies, Inc.  
Date Printed: 7-Oct-2015



SYSDRILL  
Well Design Combined Report  
Wellbore: LITZENBERGER 16 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3600.00	19.04	140.640	3492.42	536.84S	440.33E	==>	-188.51	
3700.00	19.04	140.640	3586.95	562.06S	461.02E	==>	-197.37	
3800.00	19.04	140.640	3681.48	587.28S	481.71E	==>	-206.22	
3900.00	19.04	140.640	3776.01	612.51S	502.40E	==>	-215.08	
4000.00	19.04	140.640	3870.54	637.73S	523.09E	==>	-223.94	
4100.00	19.04	140.640	3965.07	662.95S	543.77E	==>	-232.79	
4200.00	19.04	140.640	4059.60	688.17S	564.46E	==>	-241.65	
4300.00	19.04	140.640	4154.13	713.40S	585.15E	==>	-250.51	
4400.00	19.04	140.640	4248.66	738.62S	605.84E	==>	-259.36	
4500.00	19.04	140.640	4343.19	763.84S	626.53E	==>	-268.22	
4600.00	19.04	140.640	4437.72	789.06S	647.21E	==>	-277.08	
4700.00	19.04	140.640	4532.25	814.28S	667.90E	==>	-285.93	
4800.00	19.04	140.640	4626.78	839.51S	688.59E	==>	-294.79	
4900.00	19.04	140.640	4721.31	864.73S	709.28E	==>	-303.65	
5000.00	19.04	140.640	4815.84	889.95S	729.97E	==>	-312.50	
5100.00	19.04	140.640	4910.37	915.17S	750.65E	==>	-321.36	
5200.00	19.04	140.640	5004.90	940.39S	771.34E	==>	-330.22	
5300.00	19.04	140.640	5099.43	965.62S	792.03E	==>	-339.07	
5400.00	19.04	140.640	5193.96	990.84S	812.72E	==>	-347.93	
5500.00	19.04	140.640	5288.49	1016.06S	833.41E	==>	-356.79	
5600.00	19.04	140.640	5383.02	1041.28S	854.09E	==>	-365.64	
5700.00	19.04	140.640	5477.55	1066.50S	874.78E	==>	-374.50	
5800.00	19.04	140.640	5572.08	1091.73S	895.47E	==>	-383.36	
5900.00	19.04	140.640	5666.60	1116.95S	916.16E	==>	-392.21	
6000.00	19.04	140.640	5761.13	1142.17S	936.85E	==>	-401.07	
6100.00	19.04	140.640	5855.66	1167.39S	957.53E	==>	-409.93	
6200.00	19.04	140.640	5950.19	1192.62S	978.22E	==>	-418.78	
6300.00	19.04	140.640	6044.72	1217.84S	998.91E	==>	-427.64	
6400.00	19.04	140.640	6139.25	1243.06S	1019.60E	==>	-436.50	
6500.00	19.04	140.640	6233.78	1268.28S	1040.29E	==>	-445.35	
6600.00	19.04	140.640	6328.31	1293.50S	1060.97E	==>	-454.21	
6700.00	19.04	140.640	6422.84	1318.73S	1081.66E	==>	-463.07	
6800.00	19.04	140.640	6517.37	1343.95S	1102.35E	==>	-471.92	
6900.00	15.99	161.590	6612.51	1369.49S	1119.08E	10.50	-477.02	
7000.00	16.52	199.700	6708.78	1396.02S	1118.64E	10.50	-465.99	
7100.00	22.48	226.090	6803.18	1422.74S	1100.01E	10.50	-438.23	
7200.00	30.87	240.360	6892.55	1448.76S	1063.84E	10.50	-394.66	
7300.00	40.19	248.750	6973.88	1473.21S	1011.32E	10.50	-336.75	
7400.00	49.92	254.370	7044.47	1495.27S	944.22E	10.50	-266.43	
7500.00	59.84	258.560	7101.95	1514.20S	864.78E	10.50	-186.05	
7600.00	69.88	261.980	7144.38	1529.37S	775.66E	10.50	-98.32	
7700.00	79.98	264.970	7170.36	1540.26S	679.86E	10.50	-6.17	
7710.00	80.99	265.260	7172.01	1541.10S	670.03E	10.50	3.17	7.0in Intermediate Casing
7800.00	90.10	267.790	7179.00	1546.52S	580.57E	10.50	87.31	
7900.00	90.14	267.800	7178.76	1550.36S	480.65E	==>	180.41	
8000.00	90.14	267.800	7178.51	1554.20S	380.72E	==>	273.52	
8100.00	90.14	267.800	7178.27	1558.03S	280.79E	==>	366.62	
8200.00	90.14	267.800	7178.03	1561.87S	180.87E	==>	459.72	
8300.00	90.14	267.800	7177.78	1565.71S	80.94E	==>	552.82	
8400.00	90.14	267.800	7177.54	1569.54S	18.99W	==>	645.92	
8500.00	90.14	267.800	7177.30	1573.38S	118.91W	==>	739.02	
8600.00	90.14	267.800	7177.05	1577.22S	218.84W	==>	832.12	
8700.00	90.14	267.800	7176.81	1581.05S	318.76W	==>	925.22	
8800.00	90.14	267.800	7176.57	1584.89S	418.69W	==>	1018.32	
8900.00	90.14	267.800	7176.32	1588.73S	518.62W	==>	1111.42	
9000.00	90.14	267.800	7176.08	1592.57S	618.54W	==>	1204.52	
9100.00	90.14	267.800	7175.84	1596.40S	718.47W	==>	1297.62	
9200.00	90.14	267.800	7175.59	1600.24S	818.39W	==>	1390.72	
9300.00	90.14	268.190	7175.35	1603.94S	918.32W	1.00	1483.77	
9400.00	90.13	269.190	7175.11	1606.23S	1018.30W	1.00	1576.30	

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 5106.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 246.390 degrees  
Bottom hole distance is 4024.60 Feet on azimuth 246.39 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Integrated Petroleum Technologies, Inc.  
Date Printed: 7-Oct-2015



SYSDRILL  
Well Design Combined Report  
Wellbore: LITZENBERGER 16 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9500.00	90.13	269.890	7174.88	1606.84S	1118.29W	==>	1668.17	
9600.00	90.13	269.890	7174.65	1607.03S	1218.29W	==>	1759.88	
9700.00	90.13	269.890	7174.42	1607.21S	1318.29W	==>	1851.58	
9800.00	90.13	269.890	7174.20	1607.40S	1418.29W	==>	1943.29	
9900.00	90.13	269.890	7173.97	1607.59S	1518.29W	==>	2035.00	
10000.00	90.13	269.890	7173.74	1607.78S	1618.29W	==>	2126.70	
10100.00	90.13	269.890	7173.51	1607.96S	1718.29W	==>	2218.41	
10200.00	90.13	269.890	7173.28	1608.15S	1818.29W	==>	2310.12	
10300.00	90.13	269.890	7173.05	1608.34S	1918.29W	==>	2401.82	
10400.00	90.13	269.890	7172.82	1608.52S	2018.29W	==>	2493.53	
10500.00	90.13	269.890	7172.59	1608.71S	2118.29W	==>	2585.24	
10600.00	90.13	269.890	7172.36	1608.90S	2218.29W	==>	2676.94	
10700.00	90.13	269.890	7172.14	1609.08S	2318.29W	==>	2768.65	
10800.00	90.13	269.890	7171.91	1609.27S	2418.29W	==>	2860.35	
10900.00	90.13	269.890	7171.68	1609.46S	2518.29W	==>	2952.06	
11000.00	90.13	269.890	7171.45	1609.64S	2618.29W	==>	3043.77	
11100.00	90.13	269.890	7171.22	1609.83S	2718.29W	==>	3135.47	
11200.00	90.13	269.890	7170.99	1610.02S	2818.29W	==>	3227.18	
11300.00	90.13	269.890	7170.76	1610.21S	2918.29W	==>	3318.89	
11400.00	90.13	269.890	7170.53	1610.39S	3018.29W	==>	3410.59	
11500.00	90.13	269.890	7170.30	1610.58S	3118.29W	==>	3502.30	
11600.00	90.13	269.890	7170.07	1610.77S	3218.28W	==>	3594.01	
11700.00	90.13	269.890	7169.85	1610.95S	3318.28W	==>	3685.71	
11800.00	90.13	269.890	7169.62	1611.14S	3418.28W	==>	3777.42	
11900.00	90.13	269.890	7169.39	1611.33S	3518.28W	==>	3869.12	
12000.00	90.13	269.890	7169.16	1611.51S	3618.28W	==>	3960.83	
12069.54	90.13	269.890	7169.00	1611.64S	3687.82W	==>	4024.60	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 5106.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 246.390 degrees  
Bottom hole distance is 4024.60 Feet on azimuth 246.39 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Integrated Petroleum Technologies, Inc.  
Date Printed: 7-Oct-2015

Survey Tool Program					
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
391537	Planned	12069.54	7169.00	ISCWSA MWD	Rev 3 + Fixed Rig + Rotating



SYSDRILL  
Closest Approach + Clearance Factor Summary Report  
Wellbore: LITZENBERGER 16 (PWB)



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
LITZENBERGER 16 (PWB)	17-Jun-2015	7-Oct-2015

Well		
Name	Government ID	Last Revised
LITZENBERGER 16		16-Jun-2015

Slot						
Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
LITZENBERGER 16	40.24226000	-105.02157000	1331457.4117	3133557.0952	25.74S	44.53W

Installation						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Easting	Northing	Coord System Name	North Alignment
Litzenberger Pad - Finalized	40.24233000	-105.02141000	3133601.6223	1331483.1524	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]
LITZENBERGER 17	11.23	1078.61	9457.41	-30.74	12069.54	0.87	12069.54
LITZENBERGER 15	15.20	1292.49	12069.54	-5.46	12069.54	0.98	12069.54
LITZENBERGER 18	24.28	1206.10	9425.00	-9.71	12069.54	0.97	12069.54
LITZENBERGER 9	25.50	650.00	12069.54	20.82	746.78	4.91	861.61
LITZENBERGER 8	28.55	1025.66	12069.54	21.93	1042.06	4.22	1091.27
LITZENBERGER 14	29.38	1226.40	12069.54	21.32	1325.00	1.64	12069.54
LITZENBERGER 12	30.51	600.00	12069.54	26.16	681.17	2.95	12069.54
LITZENBERGER 7	37.11	1042.06	12069.54	30.36	1074.87	5.31	1140.49
LITZENBERGER 11	39.92	550.00	12069.54	36.06	582.74	3.44	12069.54
LITZENBERGER 19	40.79	1173.29	9375.39	33.12	1238.91	1.96	12069.54
LITZENBERGER 13	45.10	1261.75	12069.54	36.90	1337.34	1.96	12069.54
LITZENBERGER 6	47.94	1058.46	1058.46	41.11	1074.87	6.81	1140.49
LITZENBERGER 10	51.43	500.72	12069.54	47.78	484.32	3.94	12069.54
LITZENBERGER 20	52.16	1140.49	9470.10	44.75	1173.29	2.33	12069.54
LITZENBERGER 5	58.57	1069.34	12069.54	51.67	1074.87	7.22	12069.54
LITZENBERGER 21	65.54	1107.68	9425.00	58.32	1140.49	2.93	12069.54
LITZENBERGER 4	69.89	1065.55	12069.54	62.98	1074.87	7.90	12069.54
Kintz #2	79.11	1782.40	9271.43	59.94	9244.16	1.52	9244.16
LITZENBERGER 22	81.53	1091.27	9408.20	74.40	1107.68	3.61	12069.54
LITZENBERGER 3	85.99	1042.06	12069.54	79.18	1058.46	8.91	12069.54
LITZENBERGER 23	92.48	1028.52	9441.01	85.61	1058.46	4.10	12069.54
LITZENBERGER 2	95.20	1036.72	12069.54	88.35	1042.06	9.04	12069.54

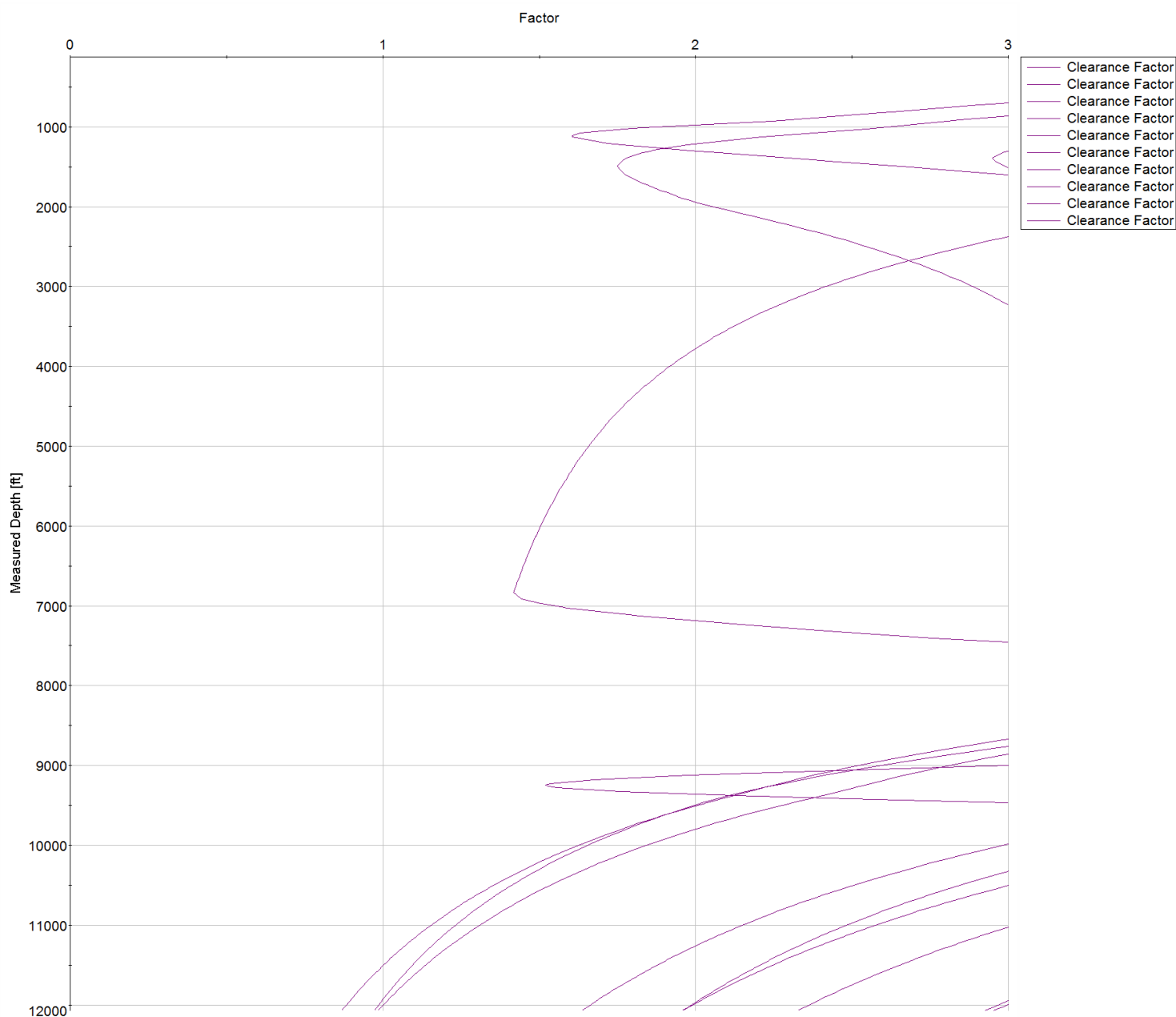
All data is in Feet unless otherwise stated  
Coordinates are from Slot MD's are from Rig and TVD's are from Rig ( Planned Datum #1 5106.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 246.390 degrees  
Prepared by Integrated Petroleum Technologies, Inc.  
Date Printed: 7-Oct-2015



SYSDRILL  
Closest Approach + Clearance Factor Summary Report  
Wellbore: LITZENBERGER 16 (PWB)



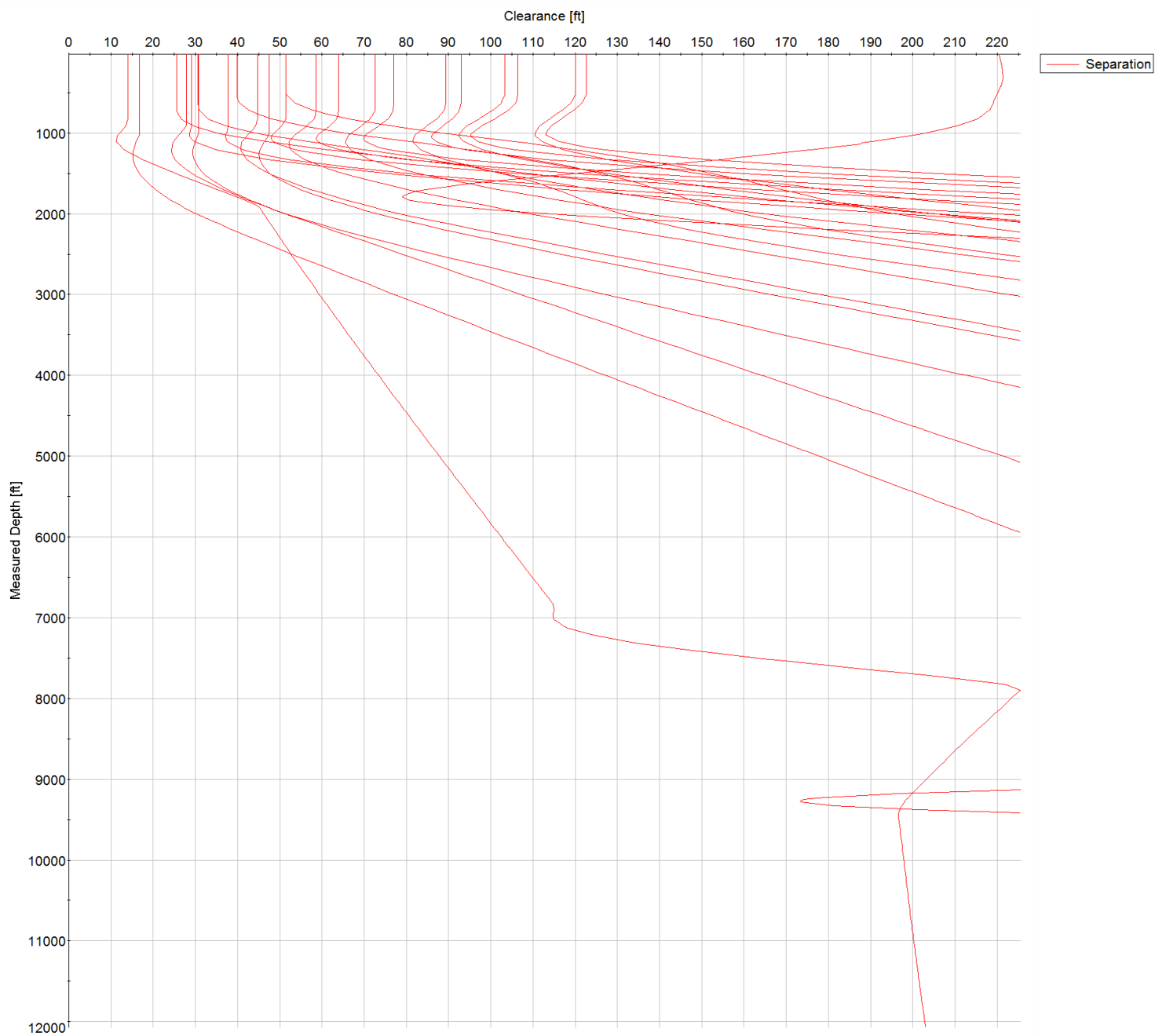
Clearance Summary							
Offset WellName	Separation [ft]	MD[ft]	Diverging From[ft]	Ellipse Separation [ft]	Ellipse MD[ft]	Clearance Factor	Clearance MD[ft]
LITZENBERGER 24	110.40	1010.72	9425.00	103.62	1042.06	4.59	12069.54
LITZENBERGER 1	113.03	1009.25	12069.54	106.31	1025.66	9.87	12069.54
Kintz #1	236.94	1238.91	8126.39	222.59	1370.14	14.23	1845.87
Billings #2A-18H	1823.10	10294.03	10294.03	1427.32	10325.00	4.60	10325.00
Billings #2B-18H	2176.90	10286.53	10286.53	1781.89	10294.03	5.51	10294.03



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 5106.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 246.390 degrees  
Prepared by Integrated Petroleum Technologies, Inc.  
Date Printed: 7-Oct-2015



SYSDRILL  
Closest Approach + Clearance Factor Summary Report  
Wellbore: LITZENBERGER 16 (PWB)



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 5106.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 246.390 degrees  
Prepared by Integrated Petroleum Technologies, Inc.  
Date Printed: 7-Oct-2015



