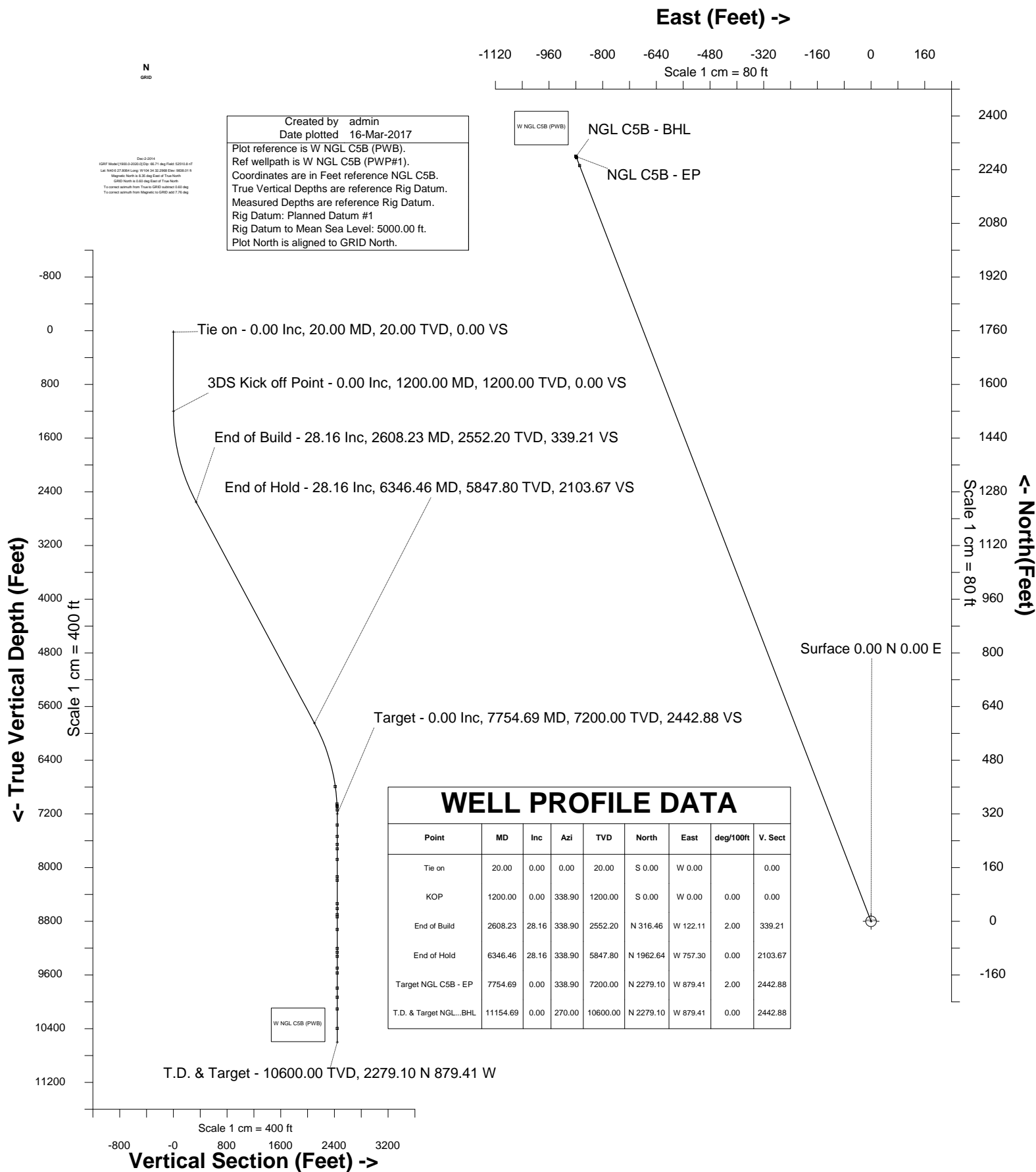




# NGL WATER SOLUTIONS DJ

Location DJ Basin  
Field Wattenberg  
Installation C5 Wells

Slot NGL C5B  
Well W NGL C5B  
Wellbore W NGL C5B (PWB)





### Wellhead Details

Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
NGL C5B	N40 6 26.8056	W104 34 31.7964	1283334.8333	3258589.5267	100.86S	39.94E	0.00

### Declination

Date	Source	Time
Dec-2-2014	IGRF Model [1900.0-2020.0]	08:20

### Installation Details

Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
C5 Wells	N40 6 27.8064	W104 34 32.2968	1283435.6919	3258549.5931	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
20.00	0.00	0.000	20.00	0.00N	0.00E		0.00	1283334.83	3258589.53
1200.00	0.00	338.900	1200.00	0.00N	0.00E	==>	0.00	1283334.83	3258589.53
2608.23	28.16	338.900	2552.20	316.46N	122.11W	2.00	339.21	1283651.28	3258467.42
6346.46	28.16	338.900	5847.80	1962.64N	757.30W	==>	2103.67	1285297.39	3257832.26
7754.69	0.00	338.900	7200.00	2279.10N	879.41W	2.00	2442.88	1285613.84	3257710.16
11154.69	0.00	270.000	10600.00	2279.10N	879.41W	==>	2442.88	1285613.84	3257710.16

### 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
20.00	0.00	0.000	20.00	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	
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	
1200.00	0.00	338.900	1200.00	0.00N	0.00E	==>	0.00	
1300.00	2.00	338.900	1299.98	1.63N	0.63W	2.00	1.75	
1400.00	4.00	338.900	1399.84	6.51N	2.51W	2.00	6.98	
1500.00	6.00	338.900	1499.45	14.64N	5.65W	2.00	15.69	
1600.00	8.00	338.900	1598.70	26.01N	10.04W	2.00	27.88	
1700.00	10.00	338.900	1697.47	40.60N	15.67W	2.00	43.52	
1800.00	12.00	338.900	1795.62	58.41N	22.54W	2.00	62.60	
1900.00	14.00	338.900	1893.06	79.39N	30.63W	2.00	85.10	
2000.00	16.00	338.900	1989.64	103.54N	39.95W	2.00	110.98	
2100.00	18.00	338.900	2085.27	130.81N	50.47W	2.00	140.21	
2200.00	20.00	338.900	2179.82	161.19N	62.19W	2.00	172.77	
2300.00	22.00	338.900	2273.17	194.62N	75.09W	2.00	208.60	
2400.00	24.00	338.900	2365.21	231.07N	89.16W	2.00	247.67	
2500.00	26.00	338.900	2455.84	270.50N	104.37W	2.00	289.93	
2600.00	28.00	338.900	2544.94	312.85N	120.71W	2.00	335.33	
2700.00	28.16	338.900	2633.10	356.88N	137.70W	==>	382.52	
2800.00	28.16	338.900	2721.26	400.91N	154.69W	==>	429.72	
2900.00	28.16	338.900	2809.42	444.95N	171.69W	==>	476.92	
3000.00	28.16	338.900	2897.58	488.98N	188.68W	==>	524.12	
3100.00	28.16	338.900	2985.74	533.02N	205.67W	==>	571.32	

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 5000.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 338.900 degrees  
Bottom hole distance is 2442.88 Feet on azimuth 338.90 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by IPT  
Date Printed: 16-Mar-2017



SYS DRILL  
Well Design Combined Report  
Wellbore: W NGL C5B (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3200.00	28.16	338.900	3073.90	577.06N	222.66W	==>	618.52	
3300.00	28.16	338.900	3162.06	621.09N	239.65W	==>	665.72	
3400.00	28.16	338.900	3250.22	665.13N	256.64W	==>	712.93	
3500.00	28.16	338.900	3338.38	709.16N	273.64W	==>	760.13	
3600.00	28.16	338.900	3426.54	753.20N	290.63W	==>	807.33	
3700.00	28.16	338.900	3514.70	797.24N	307.62W	==>	854.53	
3800.00	28.16	338.900	3602.86	841.27N	324.61W	==>	901.73	
3900.00	28.16	338.900	3691.02	885.31N	341.60W	==>	948.93	
4000.00	28.16	338.900	3779.18	929.35N	358.59W	==>	996.13	
4100.00	28.16	338.900	3867.34	973.38N	375.59W	==>	1043.33	
4200.00	28.16	338.900	3955.49	1017.42N	392.58W	==>	1090.53	
4300.00	28.16	338.900	4043.65	1061.45N	409.57W	==>	1137.73	
4400.00	28.16	338.900	4131.81	1105.49N	426.56W	==>	1184.93	
4500.00	28.16	338.900	4219.97	1149.53N	443.55W	==>	1232.13	
4600.00	28.16	338.900	4308.13	1193.56N	460.54W	==>	1279.33	
4700.00	28.16	338.900	4396.29	1237.60N	477.54W	==>	1326.53	
4800.00	28.16	338.900	4484.45	1281.64N	494.53W	==>	1373.73	
4900.00	28.16	338.900	4572.61	1325.67N	511.52W	==>	1420.93	
5000.00	28.16	338.900	4660.77	1369.71N	528.51W	==>	1468.14	
5100.00	28.16	338.900	4748.93	1413.74N	545.50W	==>	1515.34	
5200.00	28.16	338.900	4837.09	1457.78N	562.49W	==>	1562.54	
5300.00	28.16	338.900	4925.25	1501.82N	579.49W	==>	1609.74	
5400.00	28.16	338.900	5013.41	1545.85N	596.48W	==>	1656.94	
5500.00	28.16	338.900	5101.57	1589.89N	613.47W	==>	1704.14	
5600.00	28.16	338.900	5189.73	1633.92N	630.46W	==>	1751.34	
5700.00	28.16	338.900	5277.89	1677.96N	647.45W	==>	1798.54	
5800.00	28.16	338.900	5366.05	1722.00N	664.44W	==>	1845.74	
5900.00	28.16	338.900	5454.21	1766.03N	681.44W	==>	1892.94	
6000.00	28.16	338.900	5542.37	1810.07N	698.43W	==>	1940.14	
6100.00	28.16	338.900	5630.53	1854.11N	715.42W	==>	1987.34	
6200.00	28.16	338.900	5718.68	1898.14N	732.41W	==>	2034.54	
6300.00	28.16	338.900	5806.84	1942.18N	749.40W	==>	2081.74	
6400.00	27.09	338.900	5895.24	1985.80N	766.23W	2.00	2128.50	
6500.00	25.09	338.900	5985.04	2026.83N	782.07W	2.00	2172.48	
6600.00	23.09	338.900	6076.32	2064.92N	796.76W	2.00	2213.30	
6700.00	21.09	338.900	6168.98	2100.01N	810.30W	2.00	2250.92	
6800.00	19.09	338.900	6262.88	2132.06N	822.67W	2.00	2285.27	
6900.00	17.09	338.900	6357.93	2161.03N	833.85W	2.00	2316.33	
7000.00	15.09	338.900	6454.01	2186.89N	843.83W	2.00	2344.04	
7100.00	13.09	338.900	6551.00	2209.61N	852.59W	2.00	2368.39	
7200.00	11.09	338.900	6648.77	2229.16N	860.13W	2.00	2389.34	
7300.00	9.09	338.900	6747.22	2245.51N	866.44W	2.00	2406.87	
7400.00	7.09	338.900	6846.22	2258.64N	871.51W	2.00	2420.95	
7500.00	5.09	338.900	6945.65	2268.54N	875.33W	2.00	2431.56	
7600.00	3.09	338.900	7045.39	2275.20N	877.90W	2.00	2438.70	
7700.00	1.09	338.900	7145.31	2278.61N	879.22W	2.00	2442.36	
7800.00	0.00	338.900	7245.31	2279.10N	879.41W	==>	2442.88	
7900.00	0.00	338.900	7345.31	2279.10N	879.41W	==>	2442.88	
8000.00	0.00	338.900	7445.31	2279.10N	879.41W	==>	2442.88	
8100.00	0.00	338.900	7545.31	2279.10N	879.41W	==>	2442.88	
8200.00	0.00	338.900	7645.31	2279.10N	879.41W	==>	2442.88	
8300.00	0.00	338.900	7745.31	2279.10N	879.41W	==>	2442.88	
8400.00	0.00	338.900	7845.31	2279.10N	879.41W	==>	2442.88	
8500.00	0.00	338.900	7945.31	2279.10N	879.41W	==>	2442.88	
8600.00	0.00	338.900	8045.31	2279.10N	879.41W	==>	2442.88	
8700.00	0.00	338.900	8145.31	2279.10N	879.41W	==>	2442.88	
8800.00	0.00	338.900	8245.31	2279.10N	879.41W	==>	2442.88	
8900.00	0.00	338.900	8345.31	2279.10N	879.41W	==>	2442.88	
9000.00	0.00	338.900	8445.31	2279.10N	879.41W	==>	2442.88	

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Date Printed: 16-Mar-2017



SYS DRILL  
Well Design Combined Report  
Wellbore: W NGL C5B (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9100.00	0.00	338.900	8545.31	2279.10N	879.41W	==>	2442.88	
9200.00	0.00	338.900	8645.31	2279.10N	879.41W	==>	2442.88	
9300.00	0.00	338.900	8745.31	2279.10N	879.41W	==>	2442.88	
9400.00	0.00	338.900	8845.31	2279.10N	879.41W	==>	2442.88	
9500.00	0.00	338.900	8945.31	2279.10N	879.41W	==>	2442.88	
9600.00	0.00	338.900	9045.31	2279.10N	879.41W	==>	2442.88	
9700.00	0.00	338.900	9145.31	2279.10N	879.41W	==>	2442.88	
9800.00	0.00	338.900	9245.31	2279.10N	879.41W	==>	2442.88	
9900.00	0.00	338.900	9345.31	2279.10N	879.41W	==>	2442.88	
10000.00	0.00	338.900	9445.31	2279.10N	879.41W	==>	2442.88	
10100.00	0.00	338.900	9545.31	2279.10N	879.41W	==>	2442.88	
10200.00	0.00	338.900	9645.31	2279.10N	879.41W	==>	2442.88	
10300.00	0.00	338.900	9745.31	2279.10N	879.41W	==>	2442.88	
10400.00	0.00	338.900	9845.31	2279.10N	879.41W	==>	2442.88	
10500.00	0.00	338.900	9945.31	2279.10N	879.41W	==>	2442.88	
10600.00	0.00	338.900	10045.31	2279.10N	879.41W	==>	2442.88	
10700.00	0.00	338.900	10145.31	2279.10N	879.41W	==>	2442.88	
10800.00	0.00	338.900	10245.31	2279.10N	879.41W	==>	2442.88	
10900.00	0.00	338.900	10345.31	2279.10N	879.41W	==>	2442.88	
11000.00	0.00	338.900	10445.31	2279.10N	879.41W	==>	2442.88	
11100.00	0.00	338.900	10545.31	2279.10N	879.41W	==>	2442.88	
11154.69	0.00	270.000	10600.00	2279.10N	879.41W	==>	2442.88	

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Bottom hole distance is 2442.88 Feet on azimuth 338.90 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by IPT  
Date Printed: 16-Mar-2017



## Targets

Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
NGL C5B - BHL	2279.10N	879.41W	10600.00	N40 6 49.4172	W104 34 42.8088	1285613.84	3257710.16
NGL C5B - EP	2279.10N	879.41W	7200.00	N40 6 49.4172	W104 34 42.8088	1285613.84	3257710.16

## Formations

Formation Name	Formation MD	Formation TVD
Niobrara	7345.30	6792.00
Ft Hays	7606.62	7052.00
Codell	7631.65	7077.00
Carlile	7647.66	7093.00
Greenhorn	7696.68	7142.00
X-Bentonite	7920.69	7366.00
J Sand	8089.69	7535.00
Skull Creek	8208.69	7654.00
Dakota	8274.69	7720.00
Morrison	8432.69	7878.00
Entrada	8690.69	8136.00
Lykins	8744.69	8190.00
Forelle	9092.69	8538.00
Minnekahta	9166.69	8612.00
Blaine	9254.69	8700.00
Lyons	9287.69	8733.00
L Satanka	9476.69	8922.00
Wolfcamp	9758.69	9204.00
Amazon	9817.69	9263.00
Council Grove	9876.69	9322.00
Admire	10052.69	9498.00
Virgil	10124.69	9570.00
Missouri	10350.69	9796.00
Fountain	10487.69	9933.00
Des Moines	10660.69	10106.00
Atoka	10950.69	10396.00

## Notes