

NGL WATER SOLUTIONS DJ			
Location	DJ Basin	Slot	SWD #4
Field	Wattenberg	Well	W SWD #4
Installation	South Weld	Wellbore	W SWD #4 (PWB) - 02

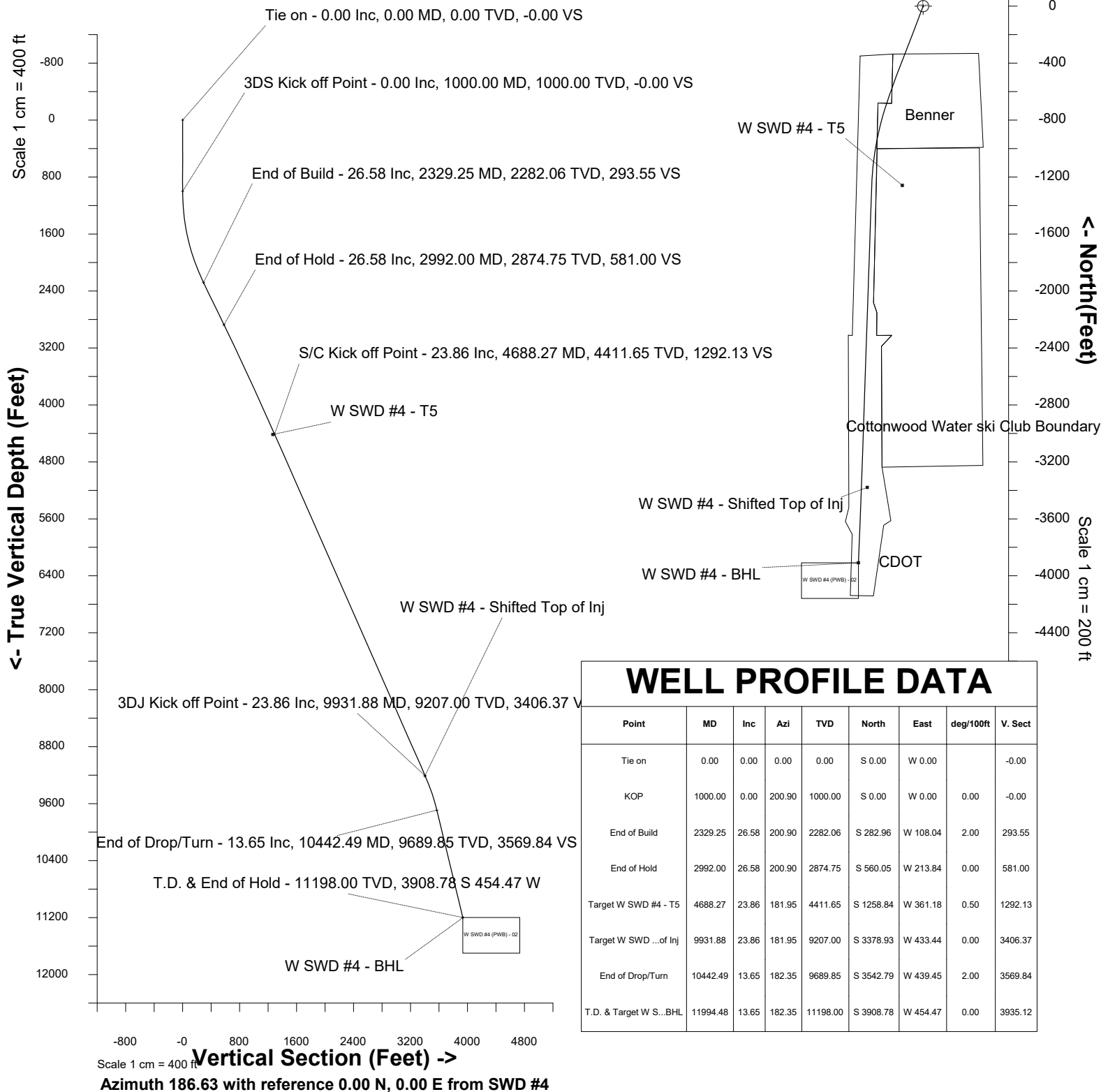
Slot	SWD #4
Well	W SWD #4
Wellbore	W SWD #4 (PWB) - 02

Mar-21-2018
 EMM-2015 [2000.0-2020.0] Dip: 66.41 deg Field: 52073.6 nT
 Lat: N40 1 28.540 Long: W104 48 59.5382 Elev: 9853.01 ft
 Magnetic North is 8.21 deg East of True North
 GRID North is 0.44 deg East of True North
 To correct azimuth from True to GRID subtract 0.44 deg
 To correct azimuth from Magnetic to GRID add 7.76 deg

Created by	admin
Date plotted	5-Sep-2018

Plot reference is W SWD #4 (PWB) - 02.
 Ref wellpath is W SWD #4 (PWP#1).
 Coordinates are in Feet reference SWD #4.
 True Vertical Depths are reference Rig Datum.
 Measured Depths are reference Rig Datum.
 Rig Datum: Planned Datum #1
 Rig Datum to Mean Sea Level: 4952.00 ft.
 Plot North is aligned to GRID North.

East (Feet) ->





SYSDRILL
Well Design Combined Report
Wellbore: W SWD #4 (PWB) - 02



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
SWD #4	40.02492000	-104.81656000	1252662.1200	3191396.3110	118.34N	6.96W	0.00

Declination		
Date	Source	Time
Mar-21-2018	EMM-2015 [2000.0-2020.0]	13:51

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
South Weld	40.02459500	-104.81653840	1252543.7808	3191403.2724	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Summary Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	Vertical Depth SS	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]
0.00	0.00	0.000	0.00	-4952.00	0.00N	0.00E		0.00
1000.00	0.00	200.900	1000.00	-3952.00	0.00N	0.00E	==>	0.00
2329.25	26.58	200.900	2282.06	-2669.94	282.96S	108.04W	2.00	293.55
2992.00	26.58	200.900	2874.75	-2077.25	560.05S	213.84W	==>	581.00
4688.27	23.86	181.950	4411.65	-540.35	1258.84S	361.18W	0.50	1292.13
9931.88	23.86	181.950	9207.00	4255.00	3378.93S	433.44W	==>	3406.37
10442.49	13.65	182.350	9689.85	4737.85	3542.79S	439.45W	2.00	3569.84
11994.48	13.65	182.350	11198.00	6246.00	3908.78S	454.47W	==>	3935.12

Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Station Position (Latitude)	Station Position (Longitude)
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00	40.02492000	-104.81656000
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	40.02492000	-104.81656000
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	40.02492000	-104.81656000
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	40.02492000	-104.81656000
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	40.02492000	-104.81656000
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	40.02492000	-104.81656000
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	40.02492000	-104.81656000
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	40.02492000	-104.81656000
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	40.02492000	-104.81656000
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	40.02492000	-104.81656000
1000.00	0.00	200.900	1000.00	0.00N	0.00E	==>	0.00	40.02492000	-104.81656000
1100.00	2.00	200.900	1099.98	1.63S	0.62W	2.00	1.69	40.02491554	-104.81656227
1200.00	4.00	200.900	1199.84	6.52S	2.49W	2.00	6.76	40.02490216	-104.81656907
1300.00	6.00	200.900	1299.45	14.66S	5.60W	2.00	15.21	40.02487987	-104.81658039
1400.00	8.00	200.900	1398.70	26.05S	9.94W	2.00	27.02	40.02484871	-104.81659623
1500.00	10.00	200.900	1497.47	40.66S	15.52W	2.00	42.18	40.02480872	-104.81661655
1600.00	12.00	200.900	1595.62	58.48S	22.33W	2.00	60.67	40.02475993	-104.81664134
1700.00	14.00	200.900	1693.06	79.50S	30.35W	2.00	82.47	40.02470242	-104.81667057
1800.00	16.00	200.900	1789.64	103.68S	39.59W	2.00	107.55	40.02463624	-104.81670419
1900.00	18.00	200.900	1885.27	130.99S	50.01W	2.00	135.89	40.02456149	-104.81674218
2000.00	20.00	200.900	1979.82	161.40S	61.63W	2.00	167.44	40.02447825	-104.81678448
2100.00	22.00	200.900	2073.17	194.88S	74.41W	2.00	202.17	40.02438663	-104.81683104
2200.00	24.00	200.900	2165.21	231.38S	88.35W	2.00	240.04	40.02428673	-104.81688181
2300.00	26.00	200.900	2255.84	270.86S	103.42W	2.00	280.99	40.02417867	-104.81693671
2400.00	26.58	200.900	2345.33	312.55S	119.34W	==>	324.24	40.02406459	-104.81699469
2500.00	26.58	200.900	2434.76	354.35S	135.30W	==>	367.61	40.02395016	-104.81705283
2600.00	26.58	200.900	2524.19	396.16S	151.26W	==>	410.98	40.02383574	-104.81711098
2700.00	26.58	200.900	2613.62	437.97S	167.22W	==>	454.35	40.02372131	-104.81716912
2800.00	26.58	200.900	2703.04	479.78S	183.19W	==>	497.73	40.02360688	-104.81722727
2900.00	26.58	200.900	2792.47	521.59S	199.15W	==>	541.10	40.02349245	-104.81728542

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 4952.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 186.630 degrees
Bottom hole distance is 3935.12 Feet on azimuth 186.63 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 5-Sep-2018

Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Station Position (Latitude)	Station Position (Longitude)
3000.00	26.57	200.820	2881.90	563.40S	215.11W	0.50	584.47	40.02337803	-104.81734355
3023.00	26.51	200.590	2902.47	573.01S	218.75W	0.50	594.44	40.02335172	-104.81735679
3100.00	26.34	199.810	2971.43	605.17S	230.58W	0.50	627.75	40.02326368	-104.81739993
3200.00	26.13	198.790	3061.13	646.89S	245.19W	0.50	670.88	40.02314947	-104.81745326
3283.00	25.95	197.940	3135.70	681.47S	256.68W	0.50	706.55	40.02305479	-104.81749520
3300.00	25.92	197.760	3150.99	688.55S	258.95W	0.50	713.85	40.02303541	-104.81750353
3400.00	25.72	196.710	3241.01	730.14S	271.86W	0.50	756.65	40.02292151	-104.81755074
3500.00	25.52	195.640	3331.18	771.67S	283.90W	0.50	799.29	40.02280778	-104.81759489
3600.00	25.34	194.560	3421.49	813.12S	295.09W	0.50	841.76	40.02269422	-104.81763598
3700.00	25.16	193.470	3511.94	854.50S	305.42W	0.50	884.06	40.02258084	-104.81767400
3800.00	24.99	192.360	3602.51	895.81S	314.89W	0.50	926.18	40.02246766	-104.81770894
3887.00	24.85	191.380	3681.41	931.68S	322.43W	0.50	962.68	40.02236936	-104.81773685
3900.00	24.83	191.230	3693.21	937.03S	323.50W	0.50	968.13	40.02235468	-104.81774082
4000.00	24.67	190.100	3784.03	978.18S	331.25W	0.50	1009.89	40.02224191	-104.81776961
4100.00	24.53	188.950	3874.95	1019.23S	338.14W	0.50	1051.46	40.02212936	-104.81779533
4200.00	24.39	187.780	3965.97	1060.20S	344.16W	0.50	1092.85	40.02201703	-104.81781796
4300.00	24.27	186.610	4057.09	1101.07S	349.32W	0.50	1134.05	40.02190495	-104.81783752
4400.00	24.15	185.420	4148.30	1141.85S	353.62W	0.50	1175.05	40.02179310	-104.81785399
4500.00	24.04	184.230	4239.59	1182.53S	357.06W	0.50	1215.85	40.02168151	-104.81786737
4600.00	23.94	183.020	4330.95	1223.11S	359.63W	0.50	1256.46	40.02157018	-104.81787767
4688.27	23.86	181.950	4411.65	1258.84S	361.18W	0.50	1292.13	40.02147213	-104.81788420
4700.00	23.86	181.950	4422.37	1263.58S	361.35W	==>	1296.86	40.02145911	-104.81788491
4800.00	23.86	181.950	4513.82	1304.01S	362.72W	==>	1337.18	40.02134816	-104.81789094
4900.00	23.86	181.950	4605.28	1344.44S	364.10W	==>	1377.50	40.02123720	-104.81789697
5000.00	23.86	181.950	4696.73	1384.88S	365.48W	==>	1417.82	40.02112624	-104.81790300
5100.00	23.86	181.950	4788.18	1425.31S	366.86W	==>	1458.14	40.02101529	-104.81790903
5200.00	23.86	181.950	4879.63	1465.74S	368.24W	==>	1498.46	40.02090433	-104.81791506
5300.00	23.86	181.950	4971.08	1506.17S	369.61W	==>	1538.78	40.02079338	-104.81792109
5400.00	23.86	181.950	5062.53	1546.60S	370.99W	==>	1579.10	40.02068242	-104.81792712
5500.00	23.86	181.950	5153.98	1587.04S	372.37W	==>	1619.42	40.02057146	-104.81793315
5600.00	23.86	181.950	5245.44	1627.47S	373.75W	==>	1659.74	40.02046051	-104.81793918
5700.00	23.86	181.950	5336.89	1667.90S	375.13W	==>	1700.06	40.02034955	-104.81794521
5800.00	23.86	181.950	5428.34	1708.33S	376.50W	==>	1740.38	40.02023859	-104.81795124
5900.00	23.86	181.950	5519.79	1748.76S	377.88W	==>	1780.70	40.02012764	-104.81795727
6000.00	23.86	181.950	5611.24	1789.19S	379.26W	==>	1821.02	40.02001668	-104.81796330
6100.00	23.86	181.950	5702.69	1829.63S	380.64W	==>	1861.34	40.01990573	-104.81796933
6200.00	23.86	181.950	5794.14	1870.06S	382.02W	==>	1901.66	40.01979477	-104.81797536
6300.00	23.86	181.950	5885.60	1910.49S	383.39W	==>	1941.98	40.01968381	-104.81798139
6400.00	23.86	181.950	5977.05	1950.92S	384.77W	==>	1982.31	40.01957286	-104.81798742
6500.00	23.86	181.950	6068.50	1991.35S	386.15W	==>	2022.63	40.01946190	-104.81799345
6600.00	23.86	181.950	6159.95	2031.79S	387.53W	==>	2062.95	40.01935094	-104.81799948
6700.00	23.86	181.950	6251.40	2072.22S	388.91W	==>	2103.27	40.01923999	-104.81800551
6800.00	23.86	181.950	6342.85	2112.65S	390.29W	==>	2143.59	40.01912903	-104.81801154
6900.00	23.86	181.950	6434.30	2153.08S	391.66W	==>	2183.91	40.01901808	-104.81801757
7000.00	23.86	181.950	6525.76	2193.51S	393.04W	==>	2224.23	40.01890712	-104.81802360
7100.00	23.86	181.950	6617.21	2233.95S	394.42W	==>	2264.55	40.01879616	-104.81802963
7200.00	23.86	181.950	6708.66	2274.38S	395.80W	==>	2304.87	40.01868521	-104.81803566
7300.00	23.86	181.950	6800.11	2314.81S	397.18W	==>	2345.19	40.01857425	-104.81804169
7400.00	23.86	181.950	6891.56	2355.24S	398.55W	==>	2385.51	40.01846329	-104.81804772
7500.00	23.86	181.950	6983.01	2395.67S	399.93W	==>	2425.83	40.01835234	-104.81805375
7600.00	23.86	181.950	7074.46	2436.10S	401.31W	==>	2466.15	40.01824138	-104.81805978
7700.00	23.86	181.950	7165.92	2476.54S	402.69W	==>	2506.47	40.01813042	-104.81806581
7800.00	23.86	181.950	7257.37	2516.97S	404.07W	==>	2546.79	40.01801947	-104.81807184
7900.00	23.86	181.950	7348.82	2557.40S	405.44W	==>	2587.11	40.01790851	-104.81807787
8000.00	23.86	181.950	7440.27	2597.83S	406.82W	==>	2627.43	40.01779756	-104.81808390
8100.00	23.86	181.950	7531.72	2638.26S	408.20W	==>	2667.75	40.01768660	-104.81808993
8200.00	23.86	181.950	7623.17	2678.70S	409.58W	==>	2708.07	40.01757564	-104.81809596
8300.00	23.86	181.950	7714.62	2719.13S	410.96W	==>	2748.39	40.01746469	-104.81810199
8400.00	23.86	181.950	7806.08	2759.56S	412.33W	==>	2788.71	40.01735373	-104.81810802

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 4952.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 186.630 degrees
Bottom hole distance is 3935.12 Feet on azimuth 186.63 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 5-Sep-2018



SYS DRILL
Well Design Combined Report
Wellbore: W SWD #4 (PWB) - 02



Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Station Position (Latitude)	Station Position (Longitude)
8500.00	23.86	181.950	7897.53	2799.99S	413.71W	==>	2829.04	40.01724277	-104.81811405
8600.00	23.86	181.950	7988.98	2840.42S	415.09W	==>	2869.36	40.01713182	-104.81812008
8700.00	23.86	181.950	8080.43	2880.85S	416.47W	==>	2909.68	40.01702086	-104.81812611
8800.00	23.86	181.950	8171.88	2921.29S	417.85W	==>	2950.00	40.01690991	-104.81813214
8900.00	23.86	181.950	8263.33	2961.72S	419.22W	==>	2990.32	40.01679895	-104.81813817
9000.00	23.86	181.950	8354.78	3002.15S	420.60W	==>	3030.64	40.01668799	-104.81814420
9100.00	23.86	181.950	8446.24	3042.58S	421.98W	==>	3070.96	40.01657704	-104.81815023
9200.00	23.86	181.950	8537.69	3083.01S	423.36W	==>	3111.28	40.01646608	-104.81815626
9300.00	23.86	181.950	8629.14	3123.45S	424.74W	==>	3151.60	40.01635512	-104.81816229
9400.00	23.86	181.950	8720.59	3163.88S	426.11W	==>	3191.92	40.01624417	-104.81816832
9500.00	23.86	181.950	8812.04	3204.31S	427.49W	==>	3232.24	40.01613321	-104.81817435
9600.00	23.86	181.950	8903.49	3244.74S	428.87W	==>	3272.56	40.01602225	-104.81818038
9700.00	23.86	181.950	8994.94	3285.17S	430.25W	==>	3312.88	40.01591130	-104.81818641
9800.00	23.86	181.950	9086.40	3325.61S	431.63W	==>	3353.20	40.01580034	-104.81819244
9900.00	23.86	181.950	9177.85	3366.04S	433.00W	==>	3393.52	40.01568939	-104.81819847
9931.88	23.86	181.950	9207.00	3378.93S	433.44W	==>	3406.37	40.01565402	-104.81820039
10000.00	22.50	181.990	9269.62	3405.73S	434.36W	2.00	3433.10	40.01558047	-104.81820441
10100.00	20.50	182.040	9362.66	3442.35S	435.65W	2.00	3469.63	40.01547995	-104.81821001
10200.00	18.50	182.110	9456.92	3475.71S	436.86W	2.00	3502.91	40.01538841	-104.81821524
10300.00	16.50	182.190	9552.28	3505.76S	437.99W	2.00	3532.89	40.01530595	-104.81822009
10400.00	14.50	182.300	9648.64	3532.47S	439.03W	2.00	3559.53	40.01523267	-104.81822455
10500.00	13.65	182.350	9745.74	3556.35S	440.01W	==>	3583.37	40.01516712	-104.81822869
10600.00	13.65	182.350	9842.91	3579.94S	440.97W	==>	3606.91	40.01510240	-104.81823279
10700.00	13.65	182.350	9940.09	3603.52S	441.94W	==>	3630.45	40.01503769	-104.81823689
10800.00	13.65	182.350	10037.26	3627.10S	442.91W	==>	3653.98	40.01497298	-104.81824100
10900.00	13.65	182.350	10134.44	3650.68S	443.88W	==>	3677.52	40.01490827	-104.81824510
11000.00	13.65	182.350	10231.61	3674.26S	444.85W	==>	3701.05	40.01484355	-104.81824920
11100.00	13.65	182.350	10328.79	3697.85S	445.81W	==>	3724.59	40.01477884	-104.81825330
11200.00	13.65	182.350	10425.96	3721.43S	446.78W	==>	3748.13	40.01471413	-104.81825741
11300.00	13.65	182.350	10523.14	3745.01S	447.75W	==>	3771.66	40.01464942	-104.81826151
11400.00	13.65	182.350	10620.31	3768.59S	448.72W	==>	3795.20	40.01458470	-104.81826561
11500.00	13.65	182.350	10717.49	3792.17S	449.68W	==>	3818.73	40.01451999	-104.81826971
11600.00	13.65	182.350	10814.66	3815.76S	450.65W	==>	3842.27	40.01445528	-104.81827382
11700.00	13.65	182.350	10911.84	3839.34S	451.62W	==>	3865.81	40.01439057	-104.81827792
11800.00	13.65	182.350	11009.01	3862.92S	452.59W	==>	3889.34	40.01432585	-104.81828202
11900.00	13.65	182.350	11106.19	3886.50S	453.56W	==>	3912.88	40.01426114	-104.81828612
11994.48	13.65	182.350	11198.00	3908.78S	454.47W	==>	3935.12	40.01420000	-104.81829000

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Vertical Section is from 0.00N 0.00E on azimuth 186.630 degrees
Bottom hole distance is 3935.12 Feet on azimuth 186.63 degrees from Wellhead
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Comments								
MD[ft]	TVD[ft]	North[ft]	East[ft]	Comment	Latitude	Longitude	Grid Northing	Grid Easting
3023.00	2902.47	573.01S	218.75W	ENTERS CDOT #1	40.0233 5172	-104.817 35679	1252089 .13	3191177 .57
3283.00	3135.70	681.47S	256.68W	EXIT CDOT	40.0230 5479	-104.817 49520	1251980 .67	3191139 .64
3887.00	3681.41	931.68S	322.43W	ENTERS CDOT #2	40.0223 6936	-104.817 73685	1251730 .47	3191073 .89

Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
W SWD #4 - BHL	3908.78S	454.47W	11198.00	40.01420000	-104.81829000	1248753.48	3190941.86
W SWD #4 - Shifted Top of Inj	3378.93S	392.44W	9207.00	40.01565315	-104.81805402	1249283.32	3191003.88
W SWD #4 - T5	1258.84S	146.19W	4411.65	40.02146759	-104.81711658	1251403.33	3191250.13

Survey Tool Program					
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
682582	Planned	11994.48	11198.00	ISCWSA MWD	Rev 4 + SAG + FLT

Notes