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30-015-44619

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SURVEY REPORT

STERLING STATE 23-27-20 TB #4H

PRECISION DRILLING 594

2/9/2018



Scientific Drilling

The Ultimate Partner In Wellbore Placement

SURVEY REPORT

STERLING STATE 23-27-20 TB #4H COMPUTED

CUSTOMER	MARATHON OIL	SDI JOB NO.	OP.007606
PROJECT	STERLING STATE 23-27-20 TB #4H	SDI DISTRICT	Midland
FIELD	SPRABERRY	SDI KIT/UNIT	KIT MUD PULSE

SITE INFORMATION

Site Name	STERLING STATE 23-27-20	Section	-
Lat/Long	32° 17' 4.337" N, 104° 12' 27.98" W	Township	-
Northing	467,254.93 ft	Range	-
Easting	538,802.63 ft		

MAP INFORMATION

North Reference	Grid North
Grid Correction	-0.07 deg
System	US State Plane 1927
Datum	North American Datum 1927 (Clarke 1866)
Map Zone	New Mexico East: 3001

**WELL INFORMATION**

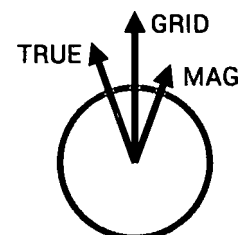
Lat/Long	32° 17' 4.337" N, 104° 12' 27.98" W
Northing	467,254.93 ft
Easting	538,802.63 ft
UWI	30015446190000

DEPTH AND ELEVATION REFERENCE

Ground Level	3181 ft above Mean Sea Level
Reference Datum	RKB
Reference Height	25 ft above G.L.
Reference Elevation	3206 ft

VERTICAL SECTION REFERENCE

+N/-S	0 ft
+E/-W	0 ft
Proposal Direction	359.80°
Calculation Method	Minimum Curvature

**GEOMAGNETIC REFERENCE INFORMATION**

Local Gravity: 998.527 mG [computed]

MD	MODEL	DATE	DECLINATION	TRUE TO GRID	MAG TO GRID
0-13641 ft	HDGM	18 Jan 2018	7.38°	subtract 0.07°	add 7.31°

WELL NOTES**OPERATORS**

C. OTT, R. ROSE

SDI Operator Name (Printed)

SIGNATURE

DATE

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00	0.00
74.12	0.19	257.54	74.12	-0.03	-0.03	-0.12	0.26	0.12	257.54
263.35	1.22	192.64	263.33	-2.06	-2.06	-0.87	0.61	2.24	202.83
353.88	1.27	237.11	353.84	-3.54	-3.55	-1.92	1.04	4.03	208.45
444.70	1.34	228.30	444.64	-4.79	-4.80	-3.56	0.23	5.97	216.56
536.71	1.14	224.15	536.63	-6.15	-6.17	-5.00	0.24	7.94	219.01
610.00	1.27	216.41	609.90	-7.33	-7.35	-5.99	0.28	9.48	219.19
689.00	1.26	216.84	688.88	-8.72	-8.75	-7.03	0.02	11.22	218.79
780.00	0.84	211.51	779.87	-10.09	-10.12	-7.98	0.47	12.88	218.26
871.00	0.59	206.62	870.86	-11.08	-11.11	-8.54	0.28	14.01	217.55
963.00	0.60	188.82	962.86	-11.98	-12.01	-8.83	0.20	14.91	216.31
1054.00	0.59	187.86	1053.85	-12.92	-12.95	-8.96	0.02	15.75	214.68
1143.00	1.52	135.71	1142.84	-14.23	-14.26	-8.20	1.40	16.45	209.91
1233.00	5.91	123.00	1232.63	-17.63	-17.64	-3.48	4.93	17.98	191.16
1323.00	8.35	121.37	1321.92	-23.59	-23.57	5.99	2.72	24.32	165.73
1412.00	7.83	121.06	1410.04	-30.12	-30.06	16.70	0.59	34.39	150.94
1501.00	7.96	120.32	1498.19	-36.39	-36.30	27.22	0.19	45.37	143.13
1591.00	8.31	118.44	1587.29	-42.67	-42.54	38.32	0.48	57.25	137.99
1680.00	8.64	117.40	1675.32	-48.86	-48.68	49.91	0.41	69.72	134.29
1770.00	9.02	118.80	1764.25	-55.41	-55.19	62.10	0.48	83.08	131.63
1859.00	9.03	121.46	1852.15	-62.46	-62.20	74.17	0.47	96.80	129.98
1948.00	8.36	126.04	1940.12	-69.95	-69.65	85.36	1.09	110.17	129.21
2038.00	7.94	129.72	2029.22	-77.81	-77.47	95.43	0.74	122.92	129.07
2210.00	7.65	130.22	2199.63	-92.85	-92.45	113.31	0.17	146.24	129.21
2300.00	7.70	131.70	2288.82	-100.76	-100.33	122.38	0.23	158.26	129.35
2389.00	7.78	130.45	2377.01	-108.67	-108.21	131.42	0.21	170.24	129.47
2478.00	7.56	130.48	2465.21	-116.41	-115.92	140.46	0.24	182.12	129.53
2568.00	7.04	140.44	2554.49	-124.53	-124.02	148.47	1.52	193.45	129.87
2657.00	7.12	141.29	2642.81	-133.06	-132.52	155.39	0.15	204.23	130.46
2746.00	6.91	141.49	2731.14	-141.57	-141.01	162.17	0.24	214.90	131.01
2835.00	7.04	140.64	2819.49	-150.00	-149.41	168.96	0.19	225.55	131.49
2925.00	8.13	138.05	2908.70	-159.02	-158.41	176.71	1.27	237.32	131.87

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
3015.00	8.24	138.82	2997.78	-168.64	-167.99	185.21	0.17	250.05	132.21
3104.00	9.96	136.46	3085.66	-179.05	-178.37	194.71	1.98	264.06	132.49
3193.00	9.82	137.81	3173.34	-190.29	-189.57	205.11	0.30	279.29	132.75
3283.00	9.73	137.81	3262.03	-201.64	-200.89	215.37	0.10	294.52	133.01
3372.00	9.40	138.74	3349.79	-212.71	-211.93	225.21	0.41	309.24	133.26
3461.00	11.23	139.60	3437.35	-224.81	-223.99	235.62	2.06	325.09	133.55
3550.00	11.43	139.82	3524.62	-238.18	-237.32	246.93	0.24	342.48	133.86
3639.00	11.39	140.67	3611.86	-251.76	-250.86	258.19	0.20	359.99	134.18
3729.00	11.64	141.41	3700.05	-265.77	-264.83	269.48	0.33	377.83	134.50
3818.00	11.70	142.02	3787.21	-279.94	-278.97	280.64	0.15	395.70	134.83
3908.00	11.53	142.04	3875.36	-294.27	-293.25	291.79	0.19	413.69	135.14
3997.00	10.72	135.25	3962.69	-307.20	-306.14	303.09	1.73	430.80	135.29
4086.00	10.41	136.60	4050.18	-318.96	-317.87	314.44	0.45	447.12	135.31
4175.00	9.71	139.45	4137.82	-330.55	-329.41	324.85	0.96	462.65	135.40
4264.00	9.39	138.42	4225.58	-341.72	-340.55	334.55	0.41	477.39	135.51
4354.00	9.37	139.20	4314.38	-352.79	-351.59	344.21	0.14	492.03	135.61
4444.00	9.67	142.39	4403.14	-364.36	-363.12	353.61	0.67	506.85	135.76
4533.00	8.97	142.08	4490.96	-375.78	-374.52	362.43	0.79	521.17	135.94
4622.00	8.78	140.59	4578.90	-386.53	-385.24	371.01	0.33	534.84	136.08
4711.00	9.28	135.87	4666.80	-396.96	-395.64	380.32	1.00	548.79	136.13
4801.00	9.06	136.48	4755.65	-407.34	-405.98	390.25	0.27	563.13	136.13
4891.00	8.74	137.04	4844.56	-417.51	-416.12	399.79	0.37	577.05	136.15
4980.00	8.15	136.46	4932.60	-427.07	-425.64	408.75	0.66	590.12	136.16
5069.00	8.98	133.07	5020.60	-436.42	-434.96	418.17	1.08	603.37	136.13
5158.00	8.92	133.04	5108.52	-445.90	-444.41	428.28	0.06	617.19	136.06
5248.00	8.73	132.67	5197.46	-455.33	-453.80	438.40	0.22	630.98	135.99
5337.00	8.51	132.97	5285.45	-464.43	-462.87	448.19	0.25	644.30	135.92
5426.00	8.37	132.41	5373.49	-473.32	-471.73	457.79	0.18	657.34	135.86
5516.00	7.16	132.44	5462.66	-481.56	-479.93	466.77	1.35	669.48	135.80
5605.00	6.72	132.73	5551.01	-488.86	-487.20	474.68	0.50	680.21	135.75
5694.00	5.83	133.65	5639.47	-495.53	-493.85	481.77	1.01	689.93	135.71
5784.00	5.26	140.93	5729.05	-501.91	-500.21	487.68	1.00	698.60	135.73

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
5873.00	4.17	142.26	5817.75	-507.65	-505.93	492.23	1.23	705.87	135.79
5963.00	3.16	138.71	5907.57	-512.11	-510.38	495.87	1.15	711.60	135.83
6052.00	2.22	135.51	5996.47	-515.19	-513.45	498.69	1.07	715.77	135.84
6142.00	2.33	142.78	6086.40	-517.90	-516.15	501.02	0.34	719.33	135.85
6231.00	1.49	160.40	6175.35	-520.43	-518.68	502.50	1.14	722.18	135.91
6321.00	1.30	201.27	6265.32	-522.48	-520.73	502.52	1.10	723.67	136.02
6410.00	1.22	196.11	6354.30	-524.33	-522.58	501.90	0.16	724.56	136.16
6499.00	1.19	202.28	6443.28	-526.09	-524.34	501.28	0.15	725.41	136.29
6589.00	0.40	345.31	6533.28	-526.64	-524.90	500.85	1.70	725.51	136.34
6678.00	0.65	326.41	6622.27	-525.92	-524.17	500.49	0.33	724.74	136.32
6767.00	0.74	312.24	6711.27	-525.11	-523.37	499.79	0.22	723.67	136.32
6857.00	0.60	313.77	6801.26	-524.39	-522.65	499.02	0.16	722.62	136.33
6946.00	0.42	236.06	6890.26	-524.25	-522.51	498.41	0.74	722.10	136.35
7036.00	0.77	216.12	6980.25	-524.91	-523.18	497.78	0.44	722.15	136.43
7125.00	1.04	213.75	7069.24	-526.06	-524.33	496.98	0.31	722.44	136.53
7214.00	0.96	220.05	7158.23	-527.30	-525.58	496.05	0.15	722.70	136.66
7304.00	0.81	223.89	7248.22	-528.34	-526.61	495.12	0.18	722.82	136.77
7393.00	0.91	213.93	7337.21	-529.38	-527.65	494.29	0.20	723.01	136.87
7482.00	1.07	199.62	7426.19	-530.74	-529.02	493.62	0.33	723.55	136.98
7572.00	1.32	187.07	7516.17	-532.56	-530.85	493.21	0.40	724.60	137.10
7661.00	1.33	181.66	7605.15	-534.61	-532.90	493.05	0.14	726.00	137.22
7750.00	1.01	160.00	7694.13	-536.38	-534.67	493.29	0.61	727.46	137.30
7840.00	1.76	148.92	7784.11	-538.31	-536.59	494.27	0.88	729.54	137.35
7930.00	2.53	147.92	7874.04	-541.18	-539.46	496.04	0.86	732.85	137.40
8019.00	2.39	130.65	7962.96	-544.07	-542.33	498.49	0.84	736.62	137.41
8108.00	2.29	114.26	8051.89	-546.02	-544.27	501.52	0.76	740.11	137.34
8198.00	2.14	124.03	8141.82	-547.71	-545.95	504.56	0.45	743.40	137.26
8288.00	1.97	62.73	8231.77	-547.95	-546.18	507.32	2.33	745.44	137.11
8333.00	5.51	25.71	8276.68	-545.65	-543.88	508.94	9.14	744.87	136.90
8377.00	9.59	8.84	8320.29	-540.13	-538.35	510.42	10.46	741.86	136.53
8422.00	15.31	2.30	8364.21	-530.48	-528.70	511.24	13.07	735.45	135.96
8467.00	18.58	5.44	8407.26	-517.40	-515.62	512.16	7.55	726.75	135.19

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
8511.00	20.85	9.67	8448.68	-502.71	-500.92	514.14	6.08	717.81	134.25
8556.00	24.62	8.13	8490.17	-485.54	-483.74	516.81	8.47	707.88	133.11
8600.00	27.23	12.68	8529.75	-466.65	-464.84	520.32	7.46	697.72	131.78
8645.00	29.56	8.95	8569.33	-445.65	-443.83	524.31	6.51	686.93	130.25
8689.00	32.58	4.36	8607.02	-423.12	-421.28	526.90	8.72	674.61	128.64
8734.00	36.41	2.29	8644.10	-397.69	-395.85	528.35	8.90	660.19	126.84
8779.00	40.23	359.61	8679.40	-369.80	-367.96	528.79	9.24	644.21	124.83
8824.00	44.32	357.33	8712.69	-339.55	-337.71	527.96	9.72	626.73	122.60
8868.00	46.10	357.60	8743.69	-308.35	-306.51	526.58	4.06	609.29	120.20
8913.00	48.76	357.89	8774.13	-275.23	-273.40	525.27	5.93	592.16	117.50
8957.00	52.70	357.99	8801.97	-241.19	-239.37	524.05	8.95	576.13	114.55
8987.00	54.56	358.49	8819.76	-217.05	-215.22	523.31	6.35	565.84	112.36
9034.00	57.55	359.11	8846.01	-178.07	-176.25	522.50	6.46	551.42	108.64
9066.00	61.68	359.70	8862.19	-150.47	-148.65	522.21	13.00	542.96	105.89
9088.00	65.47	0.12	8871.98	-130.77	-128.95	522.18	17.29	537.87	103.87
9118.00	70.75	0.65	8883.16	-102.95	-101.13	522.37	17.69	532.07	100.96
9148.00	76.88	0.70	8891.52	-74.16	-72.33	522.71	20.43	527.69	97.88
9204.00	85.58	359.25	8900.05	-18.87	-17.04	522.68	15.74	522.96	91.87
9293.00	86.31	357.28	8906.35	69.87	71.69	519.99	2.36	524.91	82.15
9383.00	87.48	355.78	8911.23	159.59	161.39	514.55	2.12	539.27	72.59
9472.00	88.02	353.21	8914.73	248.13	249.90	506.02	2.95	564.36	63.72
9561.00	89.36	350.69	8916.76	336.27	337.99	493.56	3.21	598.19	55.60
9651.00	90.54	349.29	8916.84	424.95	426.62	477.91	2.03	640.62	48.25
9740.00	95.79	347.78	8911.93	512.07	513.68	460.26	6.14	689.71	41.86
9798.00	98.02	348.19	8904.96	568.42	569.99	448.27	3.91	725.15	38.18
9921.00	91.11	357.59	8895.16	689.94	691.45	433.17	9.47	815.93	32.07
10011.00	88.96	2.99	8895.10	779.89	781.41	433.63	6.46	893.67	29.03
10100.00	89.19	3.91	8896.54	868.70	870.24	438.99	1.06	974.69	26.77
10189.00	89.93	3.17	8897.21	957.51	959.07	444.49	1.17	1057.06	24.87
10278.00	89.70	5.14	8897.50	1046.25	1047.83	450.93	2.22	1140.74	23.28
10368.00	90.24	4.95	8897.55	1135.87	1137.48	458.84	0.63	1226.54	21.97
10458.00	90.94	4.85	8896.63	1225.51	1227.14	466.53	0.79	1312.83	20.82

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
10547.00	89.46	4.14	8896.32	1314.21	1315.87	473.50	1.84	1398.47	19.79
10637.00	90.24	3.30	8896.55	1403.99	1405.68	479.34	1.26	1485.16	18.83
10726.00	91.54	2.52	8895.17	1492.85	1494.55	483.86	1.71	1570.92	17.94
10816.00	90.20	2.27	8893.80	1582.74	1584.46	487.63	1.52	1657.79	17.11
10905.00	89.93	1.02	8893.70	1671.70	1673.42	490.18	1.44	1743.73	16.33
10994.00	88.49	2.01	8894.92	1760.64	1762.37	492.53	1.97	1829.90	15.61
11083.00	88.02	0.68	8897.63	1849.57	1851.31	494.62	1.58	1916.24	14.96
11173.00	88.93	0.22	8900.03	1939.53	1941.27	495.33	1.13	2003.47	14.31
11262.00	88.99	358.88	8901.65	2028.51	2030.25	494.64	1.51	2089.64	13.69
11351.00	89.70	0.01	8902.66	2117.50	2119.24	493.78	1.49	2176.00	13.12
11440.00	90.67	359.75	8902.38	2206.50	2208.24	493.59	1.13	2262.73	12.60
11530.00	91.65	359.41	8900.56	2296.48	2298.22	492.92	1.15	2350.48	12.11
11619.00	90.37	358.82	8898.99	2385.46	2387.19	491.55	1.58	2437.27	11.64
11708.00	89.06	0.44	8899.44	2474.45	2476.18	490.98	2.34	2524.39	11.22
11797.00	87.18	358.65	8902.36	2563.40	2565.12	490.28	2.92	2611.56	10.82
11886.00	87.34	0.99	8906.61	2652.29	2654.01	490.00	2.63	2698.87	10.46
11975.00	89.23	2.27	8909.28	2741.20	2742.93	492.54	2.56	2786.80	10.18
12065.00	90.20	2.02	8909.72	2831.12	2832.87	495.90	1.12	2875.94	9.93
12155.00	90.03	0.94	8909.54	2921.08	2922.84	498.23	1.22	2965.00	9.67
12244.00	88.76	359.38	8910.48	3010.07	3011.83	498.47	2.26	3052.80	9.40
12334.00	89.03	358.66	8912.22	3100.04	3101.79	496.93	0.85	3141.35	9.10
12423.00	88.62	1.69	8914.05	3189.01	3190.77	497.20	3.43	3229.27	8.86
12513.00	91.65	2.19	8913.84	3278.94	3280.70	500.24	3.40	3318.62	8.67
12602.00	92.62	1.77	8910.52	3367.81	3369.59	503.31	1.19	3406.97	8.50
12691.00	93.19	1.05	8906.01	3456.66	3458.44	505.51	1.03	3495.19	8.32
12781.00	90.17	359.89	8903.37	3546.60	3548.39	506.25	3.60	3584.32	8.12
12870.00	90.57	359.33	8902.79	3635.60	3637.39	505.64	0.78	3672.36	7.91
12960.00	90.64	358.73	8901.84	3725.58	3727.37	504.12	0.67	3761.30	7.70
13049.00	90.10	357.21	8901.27	3814.53	3816.31	500.96	1.82	3849.05	7.48
13139.00	89.19	355.96	8901.82	3904.39	3906.14	495.59	1.71	3937.46	7.23
13228.00	88.99	357.17	8903.23	3993.23	3994.97	490.26	1.38	4024.94	7.00
13318.00	90.57	359.43	8903.58	4083.19	4084.92	487.59	3.06	4113.92	6.81

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
13407.00	90.17	0.31	8903.00	4172.19	4173.92	487.39	1.09	4202.28	6.66
13496.00	89.80	359.06	8903.03	4261.19	4262.91	486.91	1.46	4290.63	6.52
13579.00	87.82	357.27	8904.75	4344.13	4345.85	484.25	3.21	4372.74	6.36
13641.00	87.82	357.27	8907.11	4406.02	4407.73	481.31	0.00	4433.93	6.23