



Stryker Energy Directional Services, LLC

SURVEY CALCULATION REPORT

Minimum Curvature Calculations

- FINAL -

Operator: Mewbourne Oil Company
Lease Name: Zircon 1 HE State #2H
API /Job Number: 30-015-41731 C131174
Comments: Tie-in to Vaughn Energy Gyro Survey
Survey Company: Stryker Energy Directional Services, LLC

12/19/13

Target KBTVD: 8,147 Feet
Target Angle: 91.15 Degrees
Section Plane: 262.96 Degrees
Declination Corrected to Grid: 7.37 Degrees
Bit to Survey Offset: 62 Feet

Lead Driller: Gary Burow

Survey Number	Measured Depth	Drift (Degrees)	Azimuth (Degrees)	Course Length	TVD (Feet)	Vertical Section	+N/-S (Feet)	+E/-W (Feet)	BUR	DLS	KBTVD	+Above -Below Target	Distance From Proposed Line	Distance from Plan
T/I	7567	0.46	304.51	N/A	7,561.73	89.2	137.35	-106.87	N/A	0.0	7563.5	583.5	127.2	-9.38
1	7647	1.60	260.70	80	7,641.72	90.6	137.4	-108.2	1.4	1.6	7643.5	503.5	149.6	13.00
2	7679	5.60	210.40	32	7,673.65	92.0	135.9	-109.5	12.5	14.8	7675.5	471.5	148.3	148.32
3	7711	10.60	204.10	32	7,705.32	94.5	131.9	-111.5	15.6	15.8	7707.2	439.8	144.6	144.56
4	7742	15.40	211.10	31	7,735.52	98.5	125.8	-114.8	15.5	16.3	7737.5	409.5	138.9	138.88
5	7774	20.00	212.90	32	7,766.00	104.6	117.5	-119.9	14.4	14.5	7768.1	378.9	131.3	131.34
6	7806	23.20	211.30	32	7,795.75	112.0	107.5	-126.2	10.0	10.2	7798.0	349.0	122.2	122.20
7	7838	21.70	209.70	32	7,825.32	119.5	97.0	-132.4	-4.7	5.1	7827.7	319.3	112.5	112.51
8	7869	24.00	217.60	31	7,853.89	127.4	87.0	-139.1	7.4	12.4	7856.4	290.6	103.4	103.43
9	7901	27.60	220.40	32	7,882.70	137.4	76.2	-147.8	11.3	11.9	7885.4	261.6	93.8	93.78
10	7933	31.60	223.40	32	7,910.52	149.3	64.5	-158.4	12.5	13.3	7913.5	233.5	83.4	83.43
11	7964	35.90	228.70	31	7,936.29	163.1	52.6	-170.8	13.9	16.8	7939.6	207.5	73.1	73.13
12	7996	37.60	233.10	32	7,961.94	179.3	40.5	-185.7	5.3	9.8	7965.5	181.5	63.0	62.98
13	8028	39.40	237.50	32	7,986.99	197.0	29.2	-202.1	5.6	10.2	7990.9	156.1	53.8	53.76
14	8059	41.80	242.40	31	8,010.53	215.5	19.1	-219.5	7.7	12.9	8014.8	132.2	45.9	45.90
15	8091	44.00	245.20	32	8,033.97	236.1	9.5	-239.1	6.9	9.1	8038.7	108.3	38.8	38.76
16	8123	47.20	248.70	32	8,056.36	258.1	0.6	-260.1	10.0	12.7	8061.5	85.5	32.5	32.47
17	8155	50.50	252.60	32	8,077.42	281.6	-7.4	-282.8	10.3	13.8	8083.1	64.0	27.4	27.36
18	8186	55.40	252.80	31	8,096.09	305.9	-14.7	-306.5	15.8	15.8	8102.2	44.8	23.0	22.95
19	8218	58.50	255.20	32	8,113.54	332.4	-22.1	-332.2	9.7	11.5	8120.2	26.8	18.8	18.79
20	8250	62.90	255.60	32	8,129.20	360.1	-29.1	-359.2	13.8	13.8	8136.4	10.6	15.1	15.12



Stryker Energy Directional Services, LLC

SURVEY CALCULATION REPORT

Minimum Curvature Calculations

Operator: Mewbourne Oil Company
 Lease Name: Zircon 1 HE State #2H
 API /Job Number: 30-015-41731 C131174
 Comments: Tie-in to Vaughn Energy Gyro Survey
 Survey Company: Stryker Energy Directional Services, LLC

12/19/13

Target KBTVD: 8,147 Feet
 Target Angle: 91.15 Degrees
 Section Plane: 262.96 Degrees
 Declination Corrected to Grid: 7.37 Degrees
 Bit to Survey Offset: 62 Feet

Lead Driller: Gary Burow

Survey Number	Measured Depth	Drift (Degrees)	Azimuth (Degrees)	Course Length	TVD (Feet)	Vertical Section	+N/-S (Feet)	+E/-W (Feet)	BUR	DLS	KBTVD	+Above -Below Target	Distance From Proposed Line	Distance from Plan
21	8282	67.70	255.20	32	8,142.57	388.9	-36.5	-387.4	15.0	15.0	8150.3	-3.3	11.3	11.29
22	8313	73.80	255.40	31	8,152.78	417.9	-43.9	-415.7	19.7	19.7	8161.1	-14.1	7.4	7.40
23	8345	79.50	255.90	32	8,160.17	448.8	-51.6	-445.8	17.8	17.9	8169.1	-22.1	3.4	3.44
24	8361	81.80	256.80	16	8,162.77	464.4	-55.3	-461.1	14.4	15.4	8172.1	-25.0	1.6	1.62
25	8435	89.20	263.70	74	8,168.58	538.0	-67.8	-533.8	10.0	13.6	8179.3	-32.3	-1.8	-1.84
26	8467	90.60	265.10	32	8,168.63	570.0	-70.9	-565.6	4.4	6.2	8180.0	-33.0	-1.0	-1.04
27	8530	91.90	265.20	63	8,167.26	633.0	-76.2	-628.4	2.1	2.1	8179.9	-32.9	1.4	1.37
28	8625	92.70	265.20	95	8,163.44	727.8	-84.2	-723.0	0.8	0.8	8178.0	-31.0	5.1	5.08
29	8720	93.90	264.70	95	8,157.98	822.6	-92.5	-817.4	1.3	1.4	8174.4	-27.4	8.4	8.37
30	8815	92.90	264.70	95	8,152.34	917.4	-101.3	-911.8	-1.1	1.1	8170.7	-23.7	11.3	11.25
31	8910	93.30	263.30	95	8,147.20	1,012.2	-111.2	-1,006.2	0.4	1.5	8167.5	-20.4	13.0	12.98
32	9005	93.30	263.70	95	8,141.74	1,107.1	-121.9	-1,100.4	0.0	0.4	8163.9	-16.9	13.9	13.87
33	9100	91.50	262.80	95	8,137.76	1,202.0	-133.1	-1,194.7	-1.9	2.1	8161.8	-14.8	14.3	14.35
34	9195	94.00	262.30	95	8,133.20	1,296.8	-145.4	-1,288.7	2.6	2.7	8159.1	-12.1	13.7	13.67
35	9290	92.10	261.40	95	8,128.15	1,391.7	-158.8	-1,382.6	-2.0	2.2	8156.0	-9.0	11.8	11.83
36	9384	92.80	263.10	94	8,124.13	1,485.6	-171.5	-1,475.7	0.7	2.0	8153.8	-6.8	10.7	10.67
37	9479	89.30	265.40	95	8,122.39	1,580.5	-181.0	-1,570.1	-3.7	4.4	8154.0	-7.0	12.8	12.81
38	9574	92.10	265.10	95	8,121.23	1,675.4	-188.9	-1,664.8	2.9	3.0	8154.7	-7.7	16.6	16.60
39	9668	92.00	265.40	94	8,117.86	1,769.3	-196.6	-1,758.4	-0.1	0.3	8153.3	-6.2	20.4	20.36
40	9763	92.90	267.50	95	8,113.80	1,864.0	-202.5	-1,853.1	0.9	2.4	8151.1	-4.1	26.1	26.13
41	9857	92.10	265.20	94	8,109.70	1,957.7	-208.5	-1,946.8	-0.9	2.6	8148.9	-1.8	31.7	31.68



Stryker Energy Directional Services, LLC

SURVEY CALCULATION REPORT

Minimum Curvature Calculations

Operator: Mewbourne Oil Company
 Lease Name: Zircon 1 HE State #2H
 API /Job Number: 30-015-41731 C131174
 Comments: Tie-in to Vaughn Energy Gyro Survey
 Survey Company: Stryker Energy Directional Services, LLC

12/19/13

Target KBTVD: 8,147 Feet
 Target Angle: 91.15 Degrees
 Section Plane: 262.96 Degrees
 Declination Corrected to Grid: 7.37 Degrees
 Bit to Survey Offset: 62 Feet

Lead Driller: Gary Burow

Survey Number	Measured Depth	Drift (Degrees)	Azimuth (Degrees)	Course Length	TVD (Feet)	Vertical Section	+N/-S (Feet)	+E/-W (Feet)	BUR	DLS	KBTVD	+Above -Below Target	Distance From Proposed Line	Distance from Plan
42	9952	89.80	264.70	95	8,108.13	2,052.6	-216.9	-2,041.4	-2.4	2.5	8149.2	-2.2	35.0	34.98
43	10047	90.70	263.30	95	8,107.71	2,147.6	-226.8	-2,135.9	0.9	1.8	8150.7	-3.6	36.7	36.71
44	10142	94.50	262.40	95	8,103.41	2,242.5	-238.6	-2,230.1	4.0	4.1	8148.3	-1.2	36.5	36.52
45	10237	93.20	262.10	95	8,097.03	2,337.3	-251.4	-2,324.0	-1.4	1.4	8143.8	3.2	35.3	35.35
46	10332	91.60	261.00	95	8,093.05	2,432.1	-265.3	-2,417.8	-1.7	2.0	8141.7	5.3	33.0	33.01
47	10427	90.30	260.30	95	8,091.47	2,527.0	-280.8	-2,511.6	-1.4	1.6	8142.0	5.0	29.2	29.19
48	10522	86.50	260.00	95	8,094.13	2,621.8	-297.0	-2,605.1	-4.0	4.0	8146.6	0.5	24.5	24.53
49	10617	88.90	258.60	95	8,097.94	2,716.5	-314.6	-2,698.3	2.5	2.9	8152.3	-5.2	18.5	18.47
50	10712	92.20	258.70	95	8,097.03	2,811.3	-333.3	-2,791.5	3.5	3.5	8153.3	-6.2	11.3	11.33
51	10807	94.60	259.10	95	8,091.39	2,905.8	-351.6	-2,884.5	2.5	2.6	8149.5	-2.5	4.6	4.62
52	10901	93.30	258.40	94	8,084.92	2,999.4	-369.9	-2,976.5	-1.4	1.6	8144.9	2.1	-2.3	-2.26
53	10996	93.00	257.70	95	8,079.70	3,093.9	-389.5	-3,069.3	-0.3	0.8	8141.6	5.4	-10.4	-10.38
54	11091	93.70	259.30	95	8,074.15	3,188.4	-408.4	-3,162.2	0.7	1.8	8137.9	9.1	-17.8	-17.76
55	11186	92.10	262.10	95	8,069.34	3,283.2	-423.7	-3,255.8	-1.7	3.4	8135.0	12.0	-21.5	-21.50
56	11249	91.50	262.80	63	8,067.36	3,346.1	-432.0	-3,318.2	-1.0	1.5	8134.3	12.7	-22.1	-22.06
57	11281	89.90	262.60	32	8,066.97	3,378.1	-436.1	-3,350.0	-5.0	5.0	8134.5	12.5	-22.2	-22.20
58	11344	89.20	262.40	63	8,067.46	3,441.1	-444.3	-3,412.4	-1.1	1.2	8136.3	10.7	-22.7	-22.71
59	11407	88.50	262.40	63	8,068.73	3,504.1	-452.6	-3,474.8	-1.1	1.1	8138.8	8.2	-23.3	-23.32
60	11471	88.00	262.80	64	8,070.68	3,568.1	-460.9	-3,538.3	-0.8	1.0	8142.1	5.0	-23.7	-23.72
61	11565	88.10	263.50	94	8,073.88	3,662.0	-472.1	-3,631.6	0.1	0.8	8147.1	-0.1	-23.4	-23.41
62	11629	87.80	262.80	64	8,076.17	3,726.0	-479.7	-3,695.1	-0.5	1.2	8150.7	-3.7	-23.2	-23.20



Stryker Energy Directional Services, LLC

SURVEY CALCULATION REPORT

Minimum Curvature Calculations

Operator: Mewbourne Oil Company
 Lease Name: Zircon 1 HE State #2H
 API /Job Number: 30-015-41731 C131174
 Comments: Tie-in to Vaughn Energy Gyro Survey
 Survey Company: Stryker Energy Directional Services, LLC

12/19/13

Target KBTVD: 8,147 Feet
 Target Angle: 91.15 Degrees
 Section Plane: 262.96 Degrees
 Declination Corrected to Grid: 7.37 Degrees
 Bit to Survey Offset: 62 Feet

Lead Driller: Gary Burow

Survey Number	Measured Depth	Drift (Degrees)	Azimuth (Degrees)	Course Length	TVD (Feet)	Vertical Section	+N/-S (Feet)	+E/-W (Feet)	BUR	DLS	KBTVD	+Above -Below Target	Distance From Proposed Line	Distance from Plan
63	11660	89.10	262.80	31	8,077.01	3,757.0	-483.6	-3,725.8	4.2	4.2	8152.2	-5.1	-23.3	-23.29
64	11692	88.50	262.60	32	8,077.68	3,789.0	-487.6	-3,757.5	-1.9	2.0	8153.5	-6.4	-23.4	-23.43
65	11723	89.00	260.50	31	8,078.36	3,820.0	-492.2	-3,788.2	1.6	7.0	8154.8	-7.7	-24.2	-24.20
66	11755	90.30	261.70	32	8,078.55	3,851.9	-497.1	-3,819.8	4.1	5.5	8155.6	-8.6	-25.2	-25.23
67	11787	92.20	262.40	32	8,077.85	3,883.9	-501.6	-3,851.5	5.9	6.3	8155.5	-8.5	-25.7	-25.74
68	11850	95.80	260.70	63	8,073.46	3,946.7	-510.8	-3,913.6	5.7	6.3	8152.4	-5.4	-27.3	-27.29
69	11945	95.40	263.70	95	8,064.19	4,041.2	-523.6	-4,007.3	-0.4	3.2	8145.0	2.0	-28.5	-28.54
70	12039	94.60	265.90	94	8,056.00	4,134.8	-532.1	-4,100.5	-0.9	2.5	8138.7	8.3	-25.5	-25.53
71	12071	93.60	266.80	32	8,053.71	4,166.7	-534.1	-4,132.4	-3.1	4.2	8137.1	10.0	-23.6	-23.64
72	12103	93.00	268.10	32	8,051.87	4,198.5	-535.6	-4,164.3	-1.9	4.5	8135.9	11.2	-21.1	-21.14
73	12134	92.50	268.60	31	8,050.38	4,229.3	-536.5	-4,195.2	-1.6	2.3	8135.0	12.0	-18.2	-18.23
74	12166	92.10	268.80	32	8,049.10	4,261.2	-537.2	-4,227.2	-1.3	1.4	8134.3	12.7	-15.0	-15.04
75	12197	91.40	270.00	31	8,048.15	4,291.9	-537.5	-4,258.2	-2.3	4.5	8134.0	13.0	-11.6	-11.56
76	12229	89.90	270.00	32	8,047.79	4,323.7	-537.5	-4,290.2	-4.7	4.7	8134.3	12.8	-7.6	-7.64
77	12261	89.30	270.20	32	8,048.01	4,355.5	-537.4	-4,322.2	-1.9	2.0	8135.1	11.9	-3.7	-3.66
78	12292	89.20	270.30	31	8,048.41	4,386.2	-537.3	-4,353.2	-0.3	0.5	8136.2	10.9	0.3	0.27
79	12324	88.50	270.00	32	8,049.06	4,417.9	-537.2	-4,385.2	-2.2	2.4	8137.4	9.6	4.3	4.27
80	12356	87.60	269.60	32	8,050.15	4,449.7	-537.3	-4,417.1	-2.8	3.1	8139.2	7.9	8.1	8.08
81	12419	86.60	269.30	63	8,053.33	4,512.2	-537.9	-4,480.1	-1.6	1.7	8143.6	3.4	15.2	15.19
82	12514	84.90	269.10	95	8,060.37	4,606.4	-539.3	-4,574.8	-1.8	1.8	8152.5	-5.5	25.5	25.49
83	12568	84.60	269.10	54	8,065.31	4,659.8	-540.1	-4,628.5	-0.6	0.6	8158.5	-11.5	31.2	31.24



Stryker Energy Directional Services, LLC

SURVEY CALCULATION REPORT

Minimum Curvature Calculations

Operator: Mewbourne Oil Company
 Lease Name: Zircon 1 HE State #2H
 API /Job Number: 30-015-41731 C131174
 Comments: Tie-in to Vaughn Energy Gyro Survey
 Survey Company: Stryker Energy Directional Services, LLC

12/19/13

Target KBTVD: 8,147 Feet
 Target Angle: 91:15 Degrees
 Section Plane: 262.96 Degrees
 Declination Corrected to Grid: 7.37 Degrees
 Bit to Survey Offset: 62 Feet

Lead Driller: Gary Burow

Survey Number	Measured Depth	Drift (Degrees)	Azimuth (Degrees)	Course Length	TVD (Feet)	Vertical Section	+N/-S (Feet)	+E/-W (Feet)	BUR	DLS	KBTVD	+Above -Below Target	Distance From Proposed Line	Distance from Plan
Bit	12630	85.90	269.10	62	8,070.45	4,721.3	-541.1	-4,690.3	2.1	2.1	8164.9	-17.9	37.9	-335.15

Closure Distance: 4659.9 Feet
 Closure Direction: 263.3 Degrees
 Distance from Line: 31.2 Feet Right of Section Line

Curve				Lateral Targets								
Target	1	2	3	Target	1	2	3	4	5	6	7	8
VS	600.4			MD	9500	10000	10500	11000	11500	12000	12500	12630
TVD	8165			TVD	8115	8105	8095	8085	8075	8065	8055	8053
				INC	85.3							

Closure Distance @ EOH: 4721.4 Feet
 Closure Direction @ EOH: 263.4 Degrees
 Distance from line @ EOH: 37.9 Feet Right of Section Line