

HOBBS OGD
OCT 19 20157821 Will Rogers Blvd.
Fort Worth, Texas 76140817.568.1038 (office)
817.568.1499 (fax)
www.msenergyservices.com

State of Texas

County of Tarrant

I, ANTHONY ZACCARDO, certify that; I am employed by MS Energy Services;
that I did on the day(s) of 7/23/15 through 8/14/15 conduct or supervise
the taking of MWD survey(s) from a depth of 1,320 feet to a depth of 15,391
feet: that the data is true, correct, complete and within the limitations of the tool set forth by MS Energy
Services; that I am authorized and qualified to make this report; that this survey(s) was / were
conducted at the request of MURCHISON OIL & GAS, INC.
for the JACKSON UNIT 29H, API No. 30-025-41767
in LEA County / Parish, NEW MEXICO; and that I have
reviewed this report and find that it conforms to the principles and procedures as set forth by
MS Energy Services.

Signature: Anthony Zaccardo
Title: MWD Specialist

DEC 14 2015

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N09.04.02

Company: Murchison Oil & Gas, Inc.

Well Name: Jackson Unit 29H

Location: Lea County, NM

Rig: Cactus #136

Job Number: DDMO-150408

API #: 30-025-41767

Vertical Section Azimuth: 359.60

Survey Calculation Method: Minimum Curvature

PTB: MD 15.440 INC 98.2 AZM 356.3

TVD 10838.06 E/W 4732.46 N/S 4732.91

Proposed Direction: 359.60

Magnetic Declination: 6.85

REFERENCED TO GRID NORTH

#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	TVD Feet	N/S Feet	Surface Vert Sec	Distance	Closure Azimuth	DLS/ 100'	BUR/ 100'
TIE IN	1,214	0.30	185.85	1213.92	-12.55	3.39	-12.57	13.00	164.88	0.19	0.19	
1	1,320	0.50	183.50	1319.92	-13.29	3.33	-13.31	13.70	165.92	0.19	0.19	
2	1,414	0.70	219.50	1413.91	-14.14	2.94	-14.16	14.44	168.24	0.44	0.21	
3	1,509	0.30	192.90	1508.91	-14.83	2.52	-14.85	15.04	170.36	0.48	-0.42	
4	1,602	0.60	218.10	1601.91	-15.45	2.16	-15.47	15.60	172.03	0.38	0.32	
5	1,696	0.30	263.10	1695.90	-15.87	1.62	-15.88	15.95	174.19	0.47	-0.32	
6	1,791	0.90	270.70	1790.90	-15.89	0.62	-15.89	15.90	177.76	0.64	0.63	
7	1,885	0.60	262.00	1884.89	-15.95	-0.60	-15.94	15.96	182.16	0.34	-0.32	
8	1,980	1.10	239.40	1979.88	-16.48	-1.88	-16.47	16.59	186.51	0.62	0.53	
9	2,076	1.30	253.80	2075.86	-17.25	-3.72	-17.23	17.65	192.16	0.38	0.21	
10	2,170	1.20	254.20	2169.84	-17.82	-5.69	-17.78	18.71	197.71	0.11	-0.11	
11	2,265	1.50	264.40	2264.81	-18.21	-7.88	-18.16	19.85	203.41	0.40	0.32	
12	2,360	1.20	239.20	2359.78	-18.84	-9.98	-18.77	21.32	207.90	0.69	-0.32	
13	2,455	1.40	260.10	2454.76	-19.55	-11.97	-19.47	22.93	211.49	0.54	0.21	
14	2,550	0.70	214.20	2549.74	-20.23	-13.44	-20.14	24.29	213.60	1.10	-0.74	
15	2,646	0.50	179.90	2645.74	-21.13	-13.77	-21.04	25.23	213.09	0.42	-0.21	
16	2,741	1.00	229.30	2740.73	-22.09	-14.40	-21.99	26.37	213.10	0.81	0.53	
17	2,837	1.10	243.10	2836.72	-23.05	-15.86	-22.94	27.98	214.52	0.28	0.10	
18	2,931	1.20	222.40	2930.70	-24.19	-17.33	-24.07	29.75	215.61	0.45	0.11	
19	3,026	1.10	231.30	3025.68	-25.49	-18.71	-25.36	31.62	216.27	0.22	-0.11	
20	3,121	1.00	233.30	3120.66	-26.56	-20.08	-26.42	33.30	217.10	0.11	-0.11	
21	3,216	1.10	265.30	3215.65	-27.13	-21.66	-26.98	34.71	218.60	0.62	0.11	
22	3,310	1.00	253.30	3309.63	-27.44	-23.34	-27.27	36.02	220.39	0.26	-0.11	
23	3,405	1.10	250.70	3404.62	-27.98	-25.00	-27.80	37.52	221.78	0.12	0.11	
24	3,499	1.40	242.90	3498.59	-28.80	-26.87	-28.61	39.39	223.02	0.37	0.32	
25	3,594	1.80	241.40	3593.56	-30.04	-29.21	-29.84	41.91	224.20	0.42	0.42	
26	3,689	1.10	260.20	3688.53	-30.91	-31.42	-30.69	44.08	225.47	0.88	-0.74	
27	3,784	1.20	238.40	3783.51	-31.59	-33.17	-31.36	45.80	226.40	0.47	0.11	
28	3,879	1.70	252.60	3878.48	-32.53	-35.36	-32.28	48.05	227.39	0.64	0.53	
29	3,971	1.30	241.40	3970.44	-33.44	-37.58	-33.18	50.30	228.34	0.54	-0.43	
30	4,066	0.80	179.40	4065.43	-34.62	-38.52	-34.35	51.79	228.05	1.22	-0.53	
31	4,160	0.70	136.00	4159.42	-35.69	-38.11	-35.42	52.21	226.88	0.60	-0.11	



SURVEY CALCULATION PROGRAM

10/1/15 14:39

Company:		Murchison Oil & Gas, Inc.									
Well Name:		Jackson Unit 29H									
Location:		Lea County, NM									
Rig:		Cactus #136									
Job Number:		DDMO-150408									
API #:		30-025-41767									
Vertical Section Azimuth:		359.60									
Survey Calculation Method:		Minimum Curvature									
PTB:		MD		INC		AZM		TVD		VS	
		15.440		98.2		356.3		10838.06		4732.91	
		Depth		Inc		Azim		TVD		VS	
		Feet		Degrees		Degrees		Feet		Feet	
#											
32		4.255		1.00		118.20		4254.41		-36.50	
33		4.349		2.00		118.10		4348.38		-37.66	
34		4.444		2.50		104.80		4443.31		-38.97	
35		4.538		1.70		84.70		4537.24		-39.36	
36		4.631		1.50		86.70		4630.21		-39.16	
37		4.725		2.50		106.00		4724.15		-39.66	
38		4.820		2.60		124.70		4819.06		-41.46	
39		4.914		1.90		113.40		4912.99		-43.29	
40		5.009		1.60		131.00		5007.94		-44.78	
41		5.105		1.20		141.30		5103.91		-46.45	
42		5.202		1.10		147.50		5200.89		-48.03	
43		5.295		1.10		154.90		5293.88		-49.59	
44		5.390		1.00		151.10		5388.86		-51.14	
45		5.484		1.10		149.20		5482.84		-52.63	
46		5.579		1.20		153.70		5577.83		-54.31	
47		5.673		1.20		144.40		5671.81		-55.99	
48		5.767		1.10		144.60		5765.79		-57.53	
49		5.861		1.20		144.90		5859.77		-59.07	
50		5.955		1.10		139.40		5953.75		-60.56	
51		6.050		1.20		137.40		6048.73		-61.98	
52		6.144		1.10		149.40		6142.71		-63.48	
53		6.238		0.90		148.90		6236.70		-64.89	
54		6.332		0.90		141.70		6330.68		-66.10	
55		6.426		0.90		143.00		6424.67		-67.27	
56		6.520		0.90		137.60		6518.66		-68.41	
57		6.615		0.90		138.40		6613.65		-69.52	
58		6.710		1.00		136.80		6708.64		-70.68	
59		6.804		1.00		134.60		6802.62		-71.85	
60		6.900		1.00		139.30		6898.61		-73.07	
61		6.994		0.90		142.50		6992.59		-74.28	
62		7.089		0.80		139.70		7087.58		-75.38	
63		7.184		0.80		139.80		7182.58		-76.39	
64		7.279		0.90		148.80		7277.56		-77.54	

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009.04.02

Company: Murchison Oil & Gas, Inc.

Well Name: Jackson Unit 29H

Location: Lea County, NM

Rig: Cactus #136

Job Number: DDMO-150408

API #: 30-025-41767

Vertical Section Azimuth: 359.60

Survey Calculation Method: Minimum Curvature

PTB: MD 15.440 INC 98.2 AZM 356.3

Depth Feet Inc Degrees Azm Degrees TVD Feet N/S Feet

65 7.373 1.00 140.90 7371.55 -78.80 12.45 -78.89 79.78 171.03 0.18 0.11

66 7.467 1.10 133.10 7465.54 -80.06 13.62 -80.15 81.21 170.34 0.19 0.11

67 7.562 1.30 135.10 7560.52 -81.44 15.05 -81.55 82.82 169.53 0.22 0.21

68 7.656 1.10 123.80 7654.49 -82.70 16.55 -82.82 84.34 168.68 0.33 -0.21

69 7.751 1.30 119.00 7749.47 -83.73 -83.86 18.25 -83.86 85.70 167.70 0.24 0.21

70 7.844 1.20 113.30 7842.45 -84.63 -84.77 20.07 -84.77 86.97 166.66 0.17 -0.11

71 7.938 1.10 112.60 7936.43 -85.36 -85.51 21.80 -85.51 88.10 165.67 0.11 -0.11

72 8.032 1.30 100.50 8030.41 -85.91 -86.07 23.69 -86.07 89.11 164.59 0.34 0.21

73 8.127 1.30 112.80 8125.39 -86.52 -86.70 25.74 -86.70 90.27 163.43 0.29 0.00

74 8.221 1.80 109.10 8219.35 -87.42 -87.61 28.12 -87.61 91.83 162.17 0.54 0.53

75 8.316 3.20 117.20 8314.26 -89.12 -89.34 31.89 -89.34 94.65 160.31 1.52 1.47

76 8.410 1.10 51.60 8408.20 -89.75 -90.00 34.93 -90.00 96.31 158.74 3.11 -2.23

77 8.504 1.10 49.50 8502.18 -88.61 -88.86 36.32 -88.86 95.76 157.71 0.04 0.00

78 8.599 1.00 60.00 8597.17 -87.60 -87.86 37.73 -87.86 95.38 156.70 0.23 -0.11

79 8.693 0.70 44.50 8691.16 -86.78 -87.05 38.84 -87.05 95.08 155.89 0.40 -0.32

80 8.788 0.90 61.70 8786.15 -86.01 -86.29 39.91 -86.29 94.82 155.11 0.33 0.21

81 8.883 0.40 66.00 8881.14 -85.53 -85.81 40.87 -85.81 94.79 154.46 0.53 -0.53

82 8.977 0.80 59.80 8975.13 -84.63 -84.92 41.73 -84.92 94.75 153.87 0.43 0.43

83 9.071 0.50 75.20 9069.13 -84.29 -84.59 42.70 -84.59 94.79 152.73 0.37 -0.32

84 9.166 0.50 55.60 9164.13 -83.81 -84.12 43.44 -84.12 94.66 152.31 0.16 -0.11

85 9.259 0.40 41.30 9257.12 -83.00 -83.31 44.56 -83.31 94.21 151.77 0.43 0.42

86 9.354 0.80 32.10 9352.12 -81.71 -82.02 44.83 -82.02 93.20 151.25 0.61 0.11

87 9.448 0.90 23.20 9446.11 -80.52 -80.83 44.94 -80.83 92.21 150.83 0.51 -0.32

88 9.543 0.60 20.30 9541.10 -79.67 -79.98 45.28 -79.98 91.64 150.39 0.11 -0.11

89 9.638 0.50 354.30 9636.09 -78.21 -78.52 45.40 -78.52 90.41 149.88 0.28 -0.21

90 9.733 0.70 352.30 9731.09 -77.21 -77.53 45.37 -77.53 89.52 149.60 0.22 -0.21

91 9.828 0.80 357.10 9826.09 -76.15 -76.47 45.21 -76.47 88.56 149.30 0.32 0.32

92 9.923 0.30 313.20 9921.08 -74.82 -75.13 44.80 -75.13 87.21 149.09 0.65 -0.53

93 10.017 0.40 299.80 10015.08 -74.60 -74.91 44.65 -74.91 86.94 149.10 1.10 0.25

94 10.112 0.30 10244.07 10110.07 -74.60 -74.91 44.65 -74.91 86.94 149.10 1.10 0.25

95 10.206 0.40 10244.07 10204.07 -74.60 -74.91 44.65 -74.91 86.94 149.10 1.10 0.25

96 10.246 0.50 10244.07 10244.07 -74.60 -74.91 44.65 -74.91 86.94 149.10 1.10 0.25



SURVEY CALCULATION PROGRAM

10/1/15 14:39

[illegible]

009.04.02

Company: Murchison Oil & Gas, Inc.

Well Name: Jackson Unit 29H

Location: Lea County, NM

Rig: Cactus #136

Job Number: DDMO-150408

API #: 30-025-41767

Vertical Section Azimuth: 359.60

Survey Calculation Method: Minimum Curvature

PTB: MD 15.440 INC 98.2 AZM 356.3

TVD 10838.06 E/W 4732.46 Surface Distance Closure E/W Azm

Depth Feet Inc Degrees Azm Degrees TVD Feet N/S Feet

129 12.294 89.60 0.30 10892.93 1591.39 -6.75 1591.40 1591.40 359.76 0.24 -0.21

130 12.388 90.20 0.20 10893.09 1685.39 -6.34 1685.39 1685.40 359.78 0.65 0.64

131 12.483 90.50 0.20 10892.51 1780.38 -6.01 1780.38 1780.39 359.81 0.32 0.32

132 12.577 89.20 359.60 10892.76 1874.38 -6.17 1874.38 1874.39 359.81 1.52 -1.38

133 12.672 89.90 359.80 10893.50 1969.38 -6.67 1969.38 1969.39 359.81 0.77 0.74

134 12.767 90.80 359.80 10892.92 2064.37 -7.00 2064.37 2064.39 359.81 0.95 0.95

135 12.862 90.20 0.30 10892.09 2159.37 -6.92 2159.36 2159.38 359.82 0.82 -0.63

136 12.956 90.60 0.40 10891.44 2253.36 -6.34 2253.35 2253.37 359.84 0.44 0.43

137 13.051 89.40 0.90 10891.44 2348.36 -5.26 2348.34 2348.36 359.87 1.37 -1.26

138 13.145 89.40 1.00 10892.42 2442.34 -3.71 2442.30 2442.34 359.91 0.11 0.00

139 13.239 90.30 1.00 10892.67 2536.32 -2.07 2536.28 2536.32 359.95 0.96 0.96

140 13.334 91.40 0.60 10891.26 2631.30 -0.74 2631.24 2631.30 359.98 1.23 1.16

141 13.428 89.40 0.20 10890.60 2725.29 -0.08 2725.23 2725.29 360.00 2.17 -2.13

142 13.522 89.90 0.10 10891.18 2819.29 0.16 2819.22 2819.29 0.00 0.54 0.53

143 13.616 88.80 358.40 10892.24 2913.27 -1.07 2913.21 2913.27 359.98 2.15 -1.17

144 13.711 88.90 358.80 10894.15 3008.22 -3.39 3008.17 3008.22 359.94 0.43 0.11

145 13.805 89.20 357.80 10895.71 3102.17 -6.18 3102.13 3102.17 359.89 1.11 0.32

146 13.899 89.10 357.60 10897.10 3196.08 -9.95 3196.07 3196.10 359.82 0.24 -0.11

147 13.994 89.30 357.40 10898.43 3290.98 -14.09 3291.00 3291.01 359.75 0.30 0.21

148 14.088 89.80 357.60 10899.17 3384.89 -18.19 3384.93 3384.94 359.69 0.57 0.53

149 14.183 89.40 357.90 10899.83 3479.81 -21.92 3479.88 3479.88 359.64 0.53 -0.42

150 14.276 89.50 358.20 10900.72 3572.75 -25.09 3572.84 3572.84 359.60 0.34 0.11

151 14.466 90.50 357.90 10900.72 3762.64 -31.55 3762.77 3762.77 359.52 0.55 0.53

152 14.560 91.10 357.20 10899.41 3856.55 -35.57 3856.70 3856.71 359.47 0.98 0.64

153 14.654 91.70 357.00 10897.11 3950.40 -40.32 3950.58 3950.60 359.42 0.67 0.64

154 14.749 91.70 357.50 10894.30 4045.25 -44.88 4045.46 4045.49 359.36 0.53 0.53

155 14.843 92.20 357.50 10891.10 4139.10 -48.98 4139.34 4139.39 359.32 0.65 0.64

156 14.937 92.80 357.40 10887.00 4232.92 -53.15 4233.19 4233.25 359.28 1.04 0.95

157 15.032 93.70 357.00 10881.61 4327.65 -57.79 4327.95 4328.04 359.23 1.11 1.06

158 15.126 94.70 356.70 10874.73 4421.26 -62.94 4421.59 4421.70 359.18 1.26 1.26

159 15.221 95.90 356.70 10865.95 4515.69 -68.38 4516.06 4516.21 359.13 1.26 1.38

160 15.315 97.20 356.30 10855.23 4608.90 -74.08 4609.31 4609.50 359.08 1.45 1.38



SURVEY CALCULATION PROGRAM

10/1/15 14:39

V095.04.02

Company:	Murchison Oil & Gas, Inc.											
Well Name:	Jackson Unit 29H											
Location:	Lea County, NM											
Rig:	Cactus #136											
Job Number:	DDMO-150408											
API #:	30-025-41767											
Vertical Section Azimuth:	359.60					Proposed Direction:					359.60	
Survey Calculation Method:						Minimum Curvature						
PTB:	MD		INC		AZM		TVD		N/S		VS	
	15,440		98.2		356.3		10838.06		4732.46		4732.91	
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Azm	DLS/ 100	BUR/ 100'	
161	15,391	98.20	356.30	10845.05	4684.06	-78.94	4684.50	4684.72	359.03	1.32	1.32	

Magnetic Declination: 6.85
REFERENCED TO GRID NORTH