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MS Directional Survey Data Certification

JUL 19 2019

DISTRICT II-ARTESIA O.C.D.

MS Directional Job Number: MSMO-63727
Survey Type: MWD
Operating Company: Murchison Oil & Gas LLC
Well Name & Number: Rock Ridge Federal WCXY #002H
Location: Eddy County, NM
API Number: 30-015-45729
Tie In Depth: Surface
Surveyed Depths: 168' – 14,344' MD
Projected TD Survey: 14,413' MD
Dates Performed: 04/11/2019 – 05/31/2019

I certify that the data is true, correct and complete and within the limitations of the tool set forth by MS Directional; that I am authorized and qualified to make this report and that I have reviewed this report and find it conforms to the principles and procedures as set forth by MS Directional.

Digitally signed by:

MWD Surveyor Name: Sam Finley

Date: 06-18-2019

Email: Samuel.Finley@msdir.com

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Company:		Murchison Oil & Gas LLC										
Well Name:		Rock Ridge Federal WCXY #002H										
Location:		Eddy County, NM										
Rig:		Latshaw #7				Magnetic Declination:		6.87		REFERENCED TO GRID NORTH		
Job Number:		MSMO-63727										
API #:		30-015-45729										
Vertical Section Azimuth:				269.57		Proposed Direction:		269.57				
Survey Calculation Method:				Minimum Curvature								
PTB:	MD		INC		AZM	TVD	N/S	E/W		VS		
	14.413		93		266.8	9713.73	-52.73	-4592.32		4592.58		
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance Azm		DLS/ 100	BUR/ 100'	
TIE IN	0	0.00	0.00	0.00	0.00	0.00		0.00				
1	168	2.50	310.80	167.95	2.39	-2.77	2.76	3.66	310.80	1.49	1.49	
2	228	2.10	313.10	227.90	4.00	-4.57	4.54	6.07	311.22	0.68	-0.67	
3	293	2.30	320.70	292.85	5.82	-6.26	6.22	8.55	312.92	0.54	0.31	
4	390	2.20	321.50	389.78	8.79	-8.65	8.59	12.33	315.43	0.11	-0.10	
5	431	1.60	338.70	430.75	9.94	-9.35	9.28	13.65	316.73	2.00	-1.46	
6	520	0.50	23.70	519.74	11.45	-9.65	9.56	14.97	319.88	1.46	-1.24	
7	609	0.60	353.20	608.73	12.27	-9.55	9.45	15.54	322.11	0.34	0.11	
8	640	0.80	32.40	639.73	12.61	-9.45	9.36	15.76	323.15	1.63	0.65	
9	729	0.90	121.50	728.73	12.77	-8.52	8.43	15.35	326.29	1.34	0.11	
10	819	0.80	144.40	818.72	11.89	-7.55	7.46	14.09	327.58	0.39	-0.11	
11	909	1.10	119.30	908.70	10.96	-6.43	6.35	12.71	329.58	0.56	0.33	
12	1,002	1.50	161.00	1001.68	9.37	-5.26	5.19	10.74	330.69	1.07	0.43	
13	1,097	2.00	176.10	1096.64	6.54	-4.74	4.69	8.08	324.06	0.71	0.53	
14	1,190	2.60	184.50	1189.56	2.82	-4.80	4.78	5.56	300.43	0.74	0.65	
15	1,284	2.20	161.20	1283.48	-1.02	-4.38	4.39	4.50	256.95	1.11	-0.43	
16	1,379	2.20	160.20	1378.41	-4.46	-3.18	3.21	5.47	215.48	0.04	0.00	
17	1,474	2.30	128.90	1473.34	-7.37	-1.08	1.13	7.45	188.30	1.28	0.11	
18	1,568	2.50	120.10	1567.26	-9.58	2.17	-2.09	9.82	167.26	0.45	0.21	
19	1,661	3.10	125.40	1660.15	-12.06	5.97	-5.88	13.45	153.66	0.70	0.65	
20	1,755	3.10	121.50	1754.01	-14.86	10.21	-10.10	18.03	145.50	0.22	0.00	
21	1,850	3.30	111.70	1848.86	-17.21	14.94	-14.81	22.79	139.04	0.61	0.21	
22	1,944	3.50	111.40	1942.70	-19.26	20.13	-19.98	27.85	133.74	0.21	0.21	
23	2,039	3.50	116.50	2037.52	-21.61	25.42	-25.26	33.36	130.37	0.33	0.00	
24	2,133	4.00	121.30	2131.32	-24.59	30.79	-30.60	39.41	128.62	0.63	0.53	
25	2,227	4.00	113.70	2225.09	-27.61	36.59	-36.38	45.84	127.04	0.56	0.00	
26	2,322	4.00	112.60	2319.86	-30.22	42.69	-42.46	52.30	125.30	0.08	0.00	
27	2,416	4.80	109.50	2413.58	-32.79	49.42	-49.17	59.31	123.57	0.89	0.85	
28	2,510	4.50	109.10	2507.27	-35.31	56.61	-56.35	66.72	121.95	0.32	-0.32	
29	2,603	4.60	110.80	2599.98	-37.83	63.55	-63.26	73.95	120.77	0.18	0.11	
30	2,698	3.70	99.90	2694.73	-39.71	70.13	-69.83	80.59	119.52	1.26	-0.95	
31	2,792	3.60	91.70	2788.54	-40.32	76.06	-75.76	86.09	117.93	0.56	-0.11	
32	2,886	4.00	90.60	2882.33	-40.44	82.29	-81.99	91.69	116.17	0.43	0.43	
33	2,980	4.40	91.80	2976.08	-40.59	89.18	-88.87	97.98	114.47	0.44	0.43	

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Location:		Eddy County, NM										
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Job Number:		MSMO-63727										
API #:		30-015-45729										
Vertical Section Azimuth:			269.57			Proposed Direction:		269.57				
Survey Calculation Method:			Minimum Curvature									
PTB:	MD	INC		AZM		TVD	N/S	E/W		VS		
	14,413	93		266.8		9713.73	-52.73	-4592.32		4592.58		
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance Azm		DLS/ 100	BUR/ 100'	
34	3,074	4.90	91.90	3069.77	-40.83	96.79	-96.48	105.05	112.87	0.53	0.53	
35	3,168	4.80	98.00	3163.44	-41.51	104.70	-104.38	112.63	111.63	0.56	-0.11	
36	3,262	3.40	112.60	3257.20	-43.13	111.17	-110.84	119.24	111.21	1.85	-1.49	
37	3,357	3.30	116.60	3352.03	-45.44	116.21	-115.87	124.78	111.36	0.27	-0.11	
38	3,451	3.80	117.70	3445.85	-48.10	121.39	-121.03	130.57	111.62	0.54	0.53	
39	3,546	4.00	114.60	3540.63	-50.94	127.19	-126.80	137.01	111.83	0.31	0.21	
40	3,639	4.40	114.20	3633.38	-53.76	133.39	-132.99	143.82	111.95	0.43	0.43	
41	3,733	4.40	109.90	3727.11	-56.46	140.07	-139.64	151.02	111.95	0.35	0.00	
42	3,828	4.40	103.80	3821.83	-58.57	147.04	-146.59	158.27	111.72	0.49	0.00	
43	3,922	4.80	107.30	3915.52	-60.60	154.29	-153.84	165.77	111.44	0.52	0.43	
44	4,016	5.30	105.00	4009.16	-62.89	162.24	-161.77	174.01	111.19	0.57	0.53	
45	4,111	5.10	100.60	4103.77	-64.81	170.63	-170.14	182.52	110.80	0.47	-0.21	
46	4,205	4.00	97.00	4197.47	-65.97	177.99	-177.49	189.83	110.34	1.21	-1.17	
47	4,299	3.50	96.90	4291.27	-66.72	184.10	-183.59	195.81	109.92	0.53	-0.53	
48	4,394	3.90	98.50	4386.07	-67.54	190.17	-189.66	201.81	109.55	0.43	0.42	
49	4,488	3.90	99.10	4479.85	-68.52	196.49	-195.97	208.09	109.23	0.04	0.00	
50	4,582	4.00	94.80	4573.63	-69.30	202.91	-202.39	214.42	108.86	0.33	0.11	
51	4,677	4.60	94.10	4668.36	-69.85	210.01	-209.48	221.32	108.40	0.63	0.63	
52	4,771	3.90	100.20	4762.10	-70.69	216.92	-216.38	228.15	108.05	0.89	-0.74	
53	4,865	4.00	104.80	4855.88	-72.09	223.23	-222.69	234.59	107.90	0.35	0.11	
54	4,959	3.90	105.70	4949.66	-73.79	229.48	-228.92	241.05	107.83	0.13	-0.11	
55	5,053	3.80	105.10	5043.45	-75.47	235.57	-234.99	247.36	107.76	0.11	-0.11	
56	5,147	3.10	118.30	5137.28	-77.49	240.81	-240.22	252.97	107.84	1.12	-0.74	
57	5,242	1.70	120.30	5232.19	-79.42	244.29	-243.69	256.87	108.01	1.48	-1.47	
58	5,335	0.60	141.10	5325.17	-80.49	245.79	-245.18	258.63	108.13	1.25	-1.18	
59	5,430	0.40	75.20	5420.17	-80.79	246.42	-245.81	259.33	108.15	0.60	-0.21	
60	5,524	0.50	158.90	5514.17	-81.09	246.89	-246.27	259.86	108.18	0.64	0.11	
61	5,619	0.10	317.00	5609.16	-81.42	246.98	-246.36	260.05	108.25	0.63	-0.42	
62	5,713	0.50	146.80	5703.16	-81.70	247.15	-246.53	260.30	108.29	0.64	0.43	
63	5,807	0.50	158.60	5797.16	-82.43	247.52	-246.90	260.88	108.42	0.11	0.00	
64	5,901	0.60	154.30	5891.16	-83.25	247.88	-247.25	261.49	108.56	0.12	0.11	
65	5,996	0.30	121.90	5986.15	-83.83	248.31	-247.67	262.08	108.65	0.40	-0.32	
66	6,089	0.60	138.40	6079.15	-84.32	248.84	-248.20	262.74	108.72	0.35	0.32	
67	6,184	0.20	67.30	6174.15	-84.63	249.32	-248.68	263.30	108.75	0.60	-0.42	

05/04/02

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Rig:	Latshaw #7					Magnetic Declination:	6.87	REFERENCED TO GRID NORTH			
Job Number:	MSMO-63727										
API #:	30-015-45729										
Vertical Section Azimuth:					269.57	Proposed Direction:		269.57			
Survey Calculation Method:					Minimum Curvature						
PTB:	MD		INC		AZM	TVD	N/S	E/W		VS	
	14,413		93		266.8	9713.73	-52.73	-4592.32		4592.58	
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance Azm		DLS/ 100	BUR/ 100'
68	6,278	0.30	121.80	6268.15	-84.70	249.68	-249.04	263.66	108.74	0.26	0.11
69	6,372	0.60	201.20	6362.14	-85.29	249.72	-249.07	263.88	108.86	0.66	0.32
70	6,466	0.30	257.10	6456.14	-85.80	249.30	-248.65	263.65	108.99	0.53	-0.32
71	6,560	0.60	184.90	6550.14	-86.35	249.02	-248.36	263.56	109.12	0.62	0.32
72	6,655	0.70	201.80	6645.13	-87.38	248.76	-248.10	263.66	109.35	0.23	0.11
73	6,750	0.60	230.20	6740.13	-88.24	248.16	-247.49	263.38	109.57	0.35	-0.11
74	6,844	0.60	214.90	6834.12	-88.96	247.50	-246.83	263.00	109.77	0.17	0.00
75	6,938	0.30	264.00	6928.12	-89.39	246.97	-246.30	262.65	109.90	0.49	-0.32
76	7,033	0.80	318.50	7023.12	-88.91	246.29	-245.61	261.85	109.85	0.71	0.53
77	7,127	1.50	352.10	7117.10	-87.20	245.68	-245.02	260.70	109.54	1.00	0.74
78	7,220	0.70	339.60	7210.08	-85.47	245.32	-244.67	259.78	109.21	0.89	-0.86
79	7,315	1.20	302.30	7305.07	-84.39	244.28	-243.63	258.44	109.06	0.81	0.53
80	7,410	0.50	45.20	7400.06	-83.57	243.73	-243.09	257.66	108.93	1.47	-0.74
81	7,504	0.70	92.20	7494.05	-83.30	244.59	-243.96	258.39	108.81	0.55	0.21
82	7,599	0.60	106.20	7589.05	-83.46	245.65	-245.02	259.44	108.77	0.20	-0.11
83	7,693	0.70	118.10	7683.04	-83.87	246.63	-245.99	260.50	108.78	0.18	0.11
84	7,787	0.50	166.70	7777.04	-84.54	247.23	-246.59	261.28	108.88	0.56	-0.21
85	7,882	0.60	221.20	7872.03	-85.32	247.00	-246.35	261.32	109.06	0.54	0.11
86	7,976	0.80	249.50	7966.03	-85.92	246.06	-245.41	260.63	109.25	0.42	0.21
87	8,071	1.40	260.10	8061.01	-86.35	244.30	-243.64	259.11	109.47	0.66	0.63
88	8,166	1.00	263.80	8155.99	-86.64	242.33	-241.67	257.35	109.67	0.43	-0.42
89	8,261	1.10	254.00	8250.97	-86.98	240.63	-239.97	255.86	109.87	0.22	0.11
90	8,355	1.30	272.20	8344.95	-87.19	238.69	-238.03	254.12	110.07	0.46	0.21
91	8,450	0.30	292.20	8439.94	-87.05	237.39	-236.73	252.84	110.14	1.08	-1.05
92	8,544	0.60	269.90	8533.94	-86.96	236.67	-236.01	252.14	110.17	0.36	0.32
93	8,638	0.90	260.80	8627.93	-87.08	235.45	-234.79	251.03	110.30	0.34	0.32
94	8,733	0.70	274.50	8722.92	-87.15	234.13	-233.47	249.83	110.42	0.29	-0.21
95	8,826	1.30	253.30	8815.91	-87.41	232.55	-231.89	248.44	110.60	0.75	0.65
96	8,920	1.40	247.10	8909.88	-88.16	230.48	-229.81	246.76	110.93	0.19	0.11
97	8,968	1.50	249.50	8957.87	-88.61	229.35	-228.68	245.87	111.12	0.24	0.21
98	9,031	1.50	250.20	9020.84	-89.18	227.80	-227.12	244.63	111.38	0.03	0.00
99	9,125	1.30	248.30	9114.82	-89.99	225.65	-224.97	242.93	111.74	0.22	-0.21
100	9,218	1.20	254.80	9207.79	-90.64	223.73	-223.04	241.39	112.05	0.19	-0.11
101	9,312	8.30	280.90	9301.42	-89.61	216.11	-215.43	233.95	112.52	7.70	7.55

Page 3

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	14,413	93	266.8	9713.73	-52.73	-4592.32	4592.58				
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Azm	DLS/ 100	BUR/ 100'
102	9,359	13.10	284.90	9347.59	-87.60	207.62	-206.96	225.35	112.87	10.33	10.21
103	9,406	16.10	276.10	9393.07	-85.53	195.99	-195.35	213.84	113.58	7.92	6.38
104	9,453	15.70	279.70	9438.27	-83.77	183.24	-182.61	201.48	114.57	2.26	-0.85
105	9,503	18.80	283.90	9486.02	-80.69	168.75	-168.14	187.05	115.56	6.68	6.20
106	9,550	25.60	281.10	9529.51	-76.92	151.41	-150.83	169.83	116.93	14.64	14.47
107	9,597	32.70	281.00	9570.53	-72.53	128.96	-128.41	147.96	119.36	15.11	15.11
108	9,644	37.60	282.10	9608.95	-67.10	102.46	-101.95	122.48	123.22	10.51	10.43
109	9,691	41.70	281.20	9645.13	-61.06	73.09	-72.63	95.24	129.87	8.81	8.72
110	9,738	45.20	276.00	9679.26	-56.27	41.15	-40.73	69.72	143.82	10.64	7.45
111	9,785	52.20	276.30	9710.26	-52.49	6.07	-5.68	52.84	173.40	14.90	14.89
112	9,832	56.90	275.90	9737.51	-48.42	-31.99	32.35	58.04	213.45	10.02	10.00
113	9,879	62.00	275.70	9761.39	-44.34	-72.24	72.58	84.77	238.46	10.86	10.85
114	9,926	68.00	274.80	9781.25	-40.45	-114.64	114.94	121.57	250.57	12.88	12.77
115	9,973	72.00	274.10	9797.32	-37.03	-158.67	158.94	162.93	256.86	8.62	8.51
116	10,020	75.50	271.20	9810.47	-34.95	-203.73	203.99	206.71	260.27	9.51	7.45
117	10,067	80.80	268.40	9820.12	-35.12	-249.71	249.96	252.16	261.99	12.69	11.28
118	10,114	85.60	269.30	9825.68	-36.06	-296.35	296.61	298.54	263.06	10.39	10.21
119	10,161	90.00	269.80	9827.49	-36.43	-343.30	343.57	345.23	263.94	9.42	9.36
120	10,255	91.20	269.00	9826.50	-37.41	-437.29	437.56	438.89	265.11	1.53	1.28
121	10,349	90.30	268.70	9825.27	-39.30	-531.26	531.54	532.71	265.77	1.01	-0.96
122	10,441	92.60	270.20	9822.94	-40.18	-623.22	623.50	624.51	266.31	2.98	2.50
123	10,534	92.80	269.70	9818.56	-40.26	-716.12	716.40	717.25	266.78	0.58	0.22
124	10,628	92.90	269.50	9813.89	-40.92	-810.00	810.28	811.03	267.11	0.24	0.11
125	10,722	91.30	269.80	9810.44	-41.49	-903.93	904.22	904.88	267.37	1.73	-1.70
126	10,816	91.40	269.70	9808.23	-41.90	-997.90	998.19	998.78	267.60	0.15	0.11
127	10,910	91.50	269.30	9805.85	-42.72	-1091.87	1092.16	1092.70	267.76	0.44	0.11
128	11,003	91.80	269.00	9803.17	-44.10	-1184.82	1185.12	1185.64	267.87	0.46	0.32
129	11,097	92.10	269.00	9799.98	-45.74	-1278.75	1279.06	1279.57	267.95	0.32	0.32
130	11,191	91.70	269.80	9796.86	-46.72	-1372.69	1373.01	1373.49	268.05	0.95	-0.43
131	11,285	92.50	269.70	9793.41	-47.13	-1466.63	1466.94	1467.39	268.16	0.86	0.85
132	11,380	92.60	269.60	9789.19	-47.71	-1561.53	1561.85	1562.26	268.25	0.15	0.11
133	11,474	92.00	269.60	9785.42	-48.37	-1655.45	1655.77	1656.16	268.33	0.64	-0.64
134	11,569	91.60	269.00	9782.43	-49.53	-1750.40	1750.72	1751.10	268.38	0.76	-0.42
135	11,664	91.60	269.00	9779.78	-51.19	-1845.35	1845.68	1846.06	268.41	0.00	0.00

Company:		Murchison Oil & Gas LLC												
Well Name:		Rock Ridge Federal WCXY #002H												
Location:		Eddy County, NM												
Rig:		Latshaw #7			Magnetic Declination:		6.87		REFERENCED TO GRID NORTH					
Job Number:		MSMO-63727												
API #:		30-015-45729												
Vertical Section Azimuth:				269.57		Proposed Direction:		269.57						
Survey Calculation Method:				Minimum Curvature										
PTB:	MD		INC		AZM		TVD		N/S		E/W		VS	
	14,413		93		266.8		9713.73		-52.73		-4592.32		4592.58	
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance		Azm	DLS/ 100	BUR/ 100'		
136	11,758	91.40	268.70	9777.32	-53.07	-1939.30	1939.64	1940.02	268.43	0.38	-0.21			
137	11,852	91.30	271.20	9775.10	-53.15	-2033.26	2033.61	2033.96	268.50	2.66	-0.11			
138	11,946	90.80	270.60	9773.38	-51.68	-2127.24	2127.56	2127.86	268.61	0.83	-0.53			
139	12,040	92.00	270.90	9771.08	-50.45	-2221.20	2221.51	2221.77	268.70	1.32	1.28			
140	12,135	90.10	270.60	9769.34	-49.20	-2316.17	2316.47	2316.69	268.78	2.02	-2.00			
141	12,230	90.20	270.50	9769.09	-48.29	-2411.16	2411.46	2411.65	268.85	0.15	0.11			
142	12,324	91.90	270.80	9767.37	-47.23	-2505.14	2505.42	2505.58	268.92	1.84	1.81			
143	12,419	91.40	269.80	9764.64	-46.73	-2600.10	2600.37	2600.52	268.97	1.18	-0.53			
144	12,513	92.30	269.60	9761.60	-47.22	-2694.05	2694.32	2694.46	269.00	0.98	0.96			
145	12,607	88.70	270.60	9760.78	-47.06	-2788.02	2788.30	2788.42	269.03	3.97	-3.83			
146	12,701	89.20	270.80	9762.50	-45.91	-2882.00	2882.27	2882.37	269.09	0.57	0.53			
147	12,796	89.60	270.90	9763.50	-44.50	-2976.99	2977.24	2977.32	269.14	0.43	0.42			
148	12,891	89.00	270.20	9764.66	-43.59	-3071.97	3072.21	3072.28	269.19	0.97	-0.63			
149	12,984	89.90	271.10	9765.55	-42.53	-3164.96	3165.19	3165.25	269.23	1.37	0.97			
150	13,078	91.60	271.30	9764.32	-40.56	-3258.93	3259.14	3259.18	269.29	1.82	1.81			
151	13,173	92.80	271.80	9760.68	-38.00	-3353.82	3354.01	3354.04	269.35	1.37	1.26			
152	13,267	90.70	270.40	9757.80	-36.19	-3447.75	3447.93	3447.94	269.40	2.68	-2.23			
153	13,360	92.10	271.00	9755.53	-35.06	-3540.72	3540.88	3540.89	269.43	1.64	1.51			
154	13,454	91.80	271.00	9752.33	-33.42	-3634.65	3634.80	3634.80	269.47	0.32	-0.32			
155	13,548	91.20	270.50	9749.87	-32.19	-3728.61	3728.74	3728.75	269.51	0.83	-0.64			
156	13,642	92.20	270.80	9747.08	-31.12	-3822.56	3822.68	3822.68	269.53	1.11	1.06			
157	13,735	92.40	270.50	9743.35	-30.07	-3915.48	3915.59	3915.59	269.56	0.39	0.22			
158	13,829	91.20	268.60	9740.40	-30.81	-4009.42	4009.54	4009.54	269.56	2.39	-1.28			
159	13,923	92.70	269.00	9737.20	-32.77	-4103.34	4103.47	4103.47	269.54	1.65	1.60			
160	14,017	93.20	269.00	9732.36	-34.41	-4197.20	4197.34	4197.35	269.53	0.53	0.53			
161	14,111	92.40	267.50	9727.77	-37.28	-4291.04	4291.20	4291.21	269.50	1.81	-0.85			
162	14,206	92.30	267.00	9723.88	-41.83	-4385.86	4386.05	4386.05	269.45	0.54	-0.11			
163	14,299	92.90	267.20	9719.66	-46.53	-4478.64	4478.86	4478.88	269.40	0.68	0.65			
164	14,344	93.00	266.80	9717.34	-48.89	-4523.52	4523.76	4523.78	269.38	0.92	0.22			
PTB:	14,413	93.00	266.80	9713.73	-52.73	-4592.32	4592.58	4592.62	269.34	0.00	0.00			