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MS Energy Services Survey Data Certification

MS Energy Job Number: DDMO-170745
Survey Type: MWD
Operating Company: Black River Water Management Co LLC
Well Name & Number: Rustler Breaks SWD2
Location: Eddy County, NM
API Number: 30-015-44240
Tie In Depth: 454' MD
Surveyed Depths: 610' – 14,661' MD
Projected TD Survey: 14,716' MD
Dates Performed: 08/11/2017 – 09/18/2017

I certify that the data is true, correct and complete and within the limitations of the tool set forth by MS Energy Services; 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 Energy Services.

Digitally signed by:

Christopher Morasch

MWD Surveyor Name:

Chris Morasch

Date:

10-16-2017

Email:

cmorasch@msenergyservices.com

V08.04.02

Company:	Black River Water Management Co. LLC
Well Name:	Rustler Breaks SWD2
Location:	Eddy County, NM
Rig:	Patterson #810
Job Number:	DDMO-170745
API #:	30-015-44240

Magnetic Declination: 7.17 REFERENCED TO GRID NORTH

Vertical Section Azimuth:	0.00	Proposed Direction:	0.00
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Survey Calculation Method:

PTB:	MD	INC	Minimum Curvature	AZM	TVD	N/S	EW	N/S	Surface	Distance	EW	Closure	Azm	DLS/	VS	BUR/
	14.716		1.6	99.3	14700.03	46.75	-104.85	46.75						100	100'	

#	Depth	Inc	Azm	TVD	N/S	EW	Surface	Distance	EW	Closure	Azm	DLS/	VS	BUR/
	Feet	Degrees	Degrees	Feet	Feet	Feet	Vert Sec							
TIE IN	454	0.33	66.47	453.90	-2.51	14.06	-2.51	14.28	100.12					
1	610	0.40	310.10	609.71	-1.98	14.06	-1.98	14.19	98.02	0.40	0.04			
2	796	0.40	300.40	795.70	-1.23	13.00	-1.23	13.06	95.42	0.04	0.00			
3	978	0.80	99.00	977.70	-1.11	13.71	-1.11	13.75	94.63	0.65	0.22			
4	1,169	1.30	127.90	1168.67	-2.65	16.73	-2.65	16.94	99.00	0.37	0.26			
5	1,359	0.90	134.60	1358.63	-5.02	19.50	-5.02	20.13	104.45	0.22	-0.21			
6	1,550	2.20	101.70	1549.56	-6.82	24.15	-6.82	25.10	105.77	0.80	0.68			
7	1,741	5.10	100.90	1740.15	-9.17	36.08	-9.17	37.23	104.26	1.52	1.52			
8	1,932	7.10	92.10	1930.07	-11.21	56.22	-11.21	57.32	101.27	1.15	1.05			
9	2,028	8.60	90.20	2025.16	-11.45	69.32	-11.45	70.26	99.38	1.59	1.56			
10	2,059	8.70	91.60	2055.81	-11.52	73.99	-11.52	74.88	98.85	0.75	0.32			
11	2,091	8.70	93.10	2087.44	-11.72	78.82	-11.72	79.69	98.46	0.71	0.00			
12	2,124	8.40	94.70	2120.08	-12.05	83.72	-12.05	84.58	98.19	1.16	-0.91			
13	2,155	8.40	94.90	2150.74	-12.43	88.23	-12.43	89.10	98.02	0.09	0.00			
14	2,187	8.60	94.40	2182.39	-12.82	92.94	-12.82	93.82	97.85	0.67	0.62			
15	2,219	8.50	94.70	2214.04	-13.19	97.69	-13.19	98.57	97.69	0.34	-0.31			
16	2,314	7.60	95.90	2308.10	-14.41	110.93	-14.41	111.86	97.40	0.96	-0.95			
17	2,346	7.00	96.00	2339.84	-14.84	114.98	-14.84	115.93	97.35	1.88	-1.88			
18	2,378	6.40	98.10	2371.62	-15.29	118.68	-15.29	119.66	97.34	2.02	-2.19			
19	2,410	5.70	99.50	2403.44	-15.80	122.01	-15.80	123.03	97.38	2.24	-3.67			
20	2,440	4.60	103.80	2433.32	-16.34	124.65	-16.34	125.72	97.47	3.88	-0.50			
21	2,601	3.80	99.60	2593.89	-18.77	136.18	-18.77	137.47	97.85	0.53	-0.50			
22	2,696	0.80	43.60	2688.81	-18.81	139.74	-18.81	141.01	97.67	3.60	-3.16			
23	2,792	1.40	317.60	2784.80	-17.46	139.42	-17.46	140.51	97.14	1.63	0.63			
24	2,887	2.20	305.00	2879.75	-15.56	137.14	-15.56	138.02	96.47	0.93	0.84			
25	2,982	2.30	301.40	2974.67	-13.52	134.02	-13.52	134.70	95.76	0.18	0.11			
26	3,077	2.10	302.10	3069.60	-11.60	130.92	-11.60	131.43	95.06	0.21	-0.21			
27	3,172	2.30	298.40	3164.53	-9.77	127.77	-9.77	128.14	94.37	0.26	0.21			
28	3,267	2.30	307.30	3259.46	-7.71	124.57	-7.71	124.81	93.54	0.38	0.00			
29	3,362	2.20	303.50	3354.39	-5.54	121.54	-5.54	121.66	92.61	0.19	-0.11			
30	3,458	2.40	305.30	3450.31	-3.37	118.36	-3.37	118.41	91.63	0.22	0.21			
31	3,553	2.30	307.20	3545.23	-1.06	115.22	-1.06	115.22	90.53	0.13	-0.11			
32	3,648	2.50	303.40	3640.14	1.23	111.97	1.23	111.98	89.37	0.27	0.21			
33	3,744	2.30	296.60	3736.06	3.24	108.50	3.24	108.55	88.29	0.36	-0.21			



SURVEY CALCULATION PROGRAM

10/13/17 14:11

V09.04.02

Company:		Black River Water Management Co. LLC														
Well Name:		Ruster Breaks SWD2														
Location:		Eddy County, NM														
Rig:		Patterson #810														
Job Number:		DDMO-170745														
API #:		30-015-44240														
Vertical Section Azimuth:		0.00														
Survey Calculation Method:		Minimum Curvature														
PTB:	MD			INC		AZM		TVD		N/S		EW		Closure		VS
	14.716			1.6		99.3		14700.03		46.75		-104.85		46.75		
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	EW Feet	Surface Vert Sec	Distance	Azm	DLS/ 100	BUR/ 100'					
34	3.839	2.40	297.10	3830.98	5.00	105.02	5.00	105.14	87.27	0.11	0.11					
35	3.934	2.30	297.50	3925.90	6.79	101.56	6.79	101.79	86.18	0.11	-0.11					
36	4.029	2.20	297.90	4020.83	8.52	98.26	8.52	98.63	85.04	0.11	-0.11					
37	4.124	2.00	289.60	4115.76	9.93	95.09	9.93	95.60	84.04	0.38	-0.21					
38	4.220	1.80	288.90	4211.71	10.98	92.08	10.98	92.73	83.20	0.21	-0.21					
39	4.315	2.10	293.60	4306.66	12.16	89.08	12.16	89.90	82.22	0.36	0.32					
40	4.410	2.00	278.70	4401.60	13.11	85.84	13.11	86.84	81.32	0.57	-0.11					
41	4.505	1.80	283.90	4496.54	13.72	82.75	13.72	83.88	80.59	0.28	-0.21					
42	4.600	1.80	272.80	4591.50	14.15	79.82	14.15	81.06	79.95	0.37	0.00					
43	4.695	1.80	273.20	4686.45	14.31	76.84	14.31	78.16	79.45	0.01	0.00					
44	4.790	1.70	265.60	4781.41	14.28	73.94	14.28	75.31	79.07	0.27	-0.11					
45	4.886	1.60	261.50	4877.37	13.98	71.20	13.98	72.55	78.89	0.16	-0.10					
46	4.981	1.70	258.90	4972.33	13.51	68.50	13.51	69.82	78.85	0.13	0.11					
47	5.075	1.80	260.70	5066.28	13.00	65.68	13.00	66.95	78.80	0.12	0.11					
48	5.170	1.90	256.80	5161.23	12.40	62.67	12.40	63.89	78.81	0.17	0.11					
49	5.265	2.40	254.50	5256.17	11.51	59.22	11.51	60.33	79.00	0.53	0.53					
50	5.361	2.30	256.00	5352.09	10.51	55.41	10.51	56.40	79.27	0.12	-0.10					
51	5.456	2.00	241.80	5447.02	9.26	52.10	9.26	52.92	79.92	0.64	-0.32					
52	5.551	2.00	238.30	5541.96	7.61	49.23	7.61	49.82	81.22	0.13	0.00					
53	5.647	2.30	237.10	5637.89	5.68	46.19	5.68	46.54	82.99	0.32	0.31					
54	5.742	2.30	232.60	5732.82	3.49	43.08	3.49	43.22	85.37	0.19	0.00					
55	5.836	2.20	236.30	5826.74	1.34	40.08	1.34	40.10	88.08	0.19	-0.11					
56	5.930	2.50	238.00	5920.67	-0.75	36.84	-0.75	36.84	91.16	0.33	0.32					
57	6.025	2.50	243.00	6015.58	-2.79	33.23	-2.79	33.35	94.79	0.23	0.00					
58	6.120	2.50	247.60	6110.49	-4.52	29.47	-4.52	29.82	98.71	0.21	0.00					
59	6.213	2.20	248.40	6203.41	-5.95	25.94	-5.95	26.61	102.91	0.32	-0.32					
60	6.308	2.10	253.40	6298.34	-7.11	22.57	-7.11	23.67	107.49	0.22	-0.11					
61	6.403	2.30	251.60	6393.27	-8.21	19.10	-8.21	20.79	113.27	0.22	0.21					
62	6.498	2.30	259.10	6488.19	-9.18	15.42	-9.18	17.94	120.76	0.32	0.00					
63	6.593	2.50	264.80	6583.11	-9.72	11.48	-9.72	15.05	130.27	0.33	0.21					
64	6.689	2.60	260.10	6679.02	-10.29	7.25	-10.29	12.59	144.83	0.24	0.10					
65	6.784	3.00	261.00	6773.90	-11.05	2.67	-11.05	11.37	166.40	0.42	0.42					
66	6.879	2.80	257.90	6868.78	-11.92	-2.05	-11.92	12.10	189.77	0.27	-0.21					
67	6.975	2.80	255.60	6964.67	-13.00	-6.62	-13.00	14.58	206.98	0.12	0.00					

V09.04.02

Company: Black River Water Management Co. LLC
Well Name: Rustler Breaks SWD2
Location: Eddy County, NM

Rig: Patterson #810
Job Number: DDMO-170745
API #: 30-015-44240
Magnetic Declination: 7.17
REFERENCED TO GRID NORTH

Vertical Section Azimuth: 0.00
Proposed Direction: 0.00

Survey Calculation Method:

PTB:	Minimum Curvature		TVD	N/S	E/W	Surface Vert Sec	Distance	Closure	Azim	DLS/ 100	VS 46.75	BUR/ 100'
	MD	INC										

#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Distance	Closure	Azim	DLS/ 100	VS 46.75	BUR/ 100'
68	7.070	2.90	256.70	7059.55	-14.13	-11.20	-14.13	18.03	218.41	0.12	0.12	0.11	
69	7.163	2.50	257.40	7152.44	-15.11	-15.47	-15.11	21.63	225.67	0.43	0.43	-0.43	
70	7.258	2.40	261.60	7247.36	-15.85	-19.46	-15.85	25.10	230.83	0.22	0.22	-0.11	
71	7.353	2.50	260.50	7342.27	-16.49	-23.47	-16.49	28.68	234.92	0.12	0.12	0.11	
72	7.448	2.40	259.40	7437.18	-17.19	-27.47	-17.19	32.41	237.96	0.12	0.12	-0.11	
73	7.543	2.40	259.50	7532.10	-17.92	-31.38	-17.92	36.14	240.27	0.00	0.00	0.00	
74	7.638	2.40	265.80	7627.02	-18.43	-35.32	-18.43	39.84	242.44	0.28	0.28	0.00	
75	7.733	2.10	268.20	7721.94	-18.63	-39.04	-18.63	43.26	244.49	0.33	0.33	-0.32	
76	7.828	1.70	277.40	7816.89	-18.50	-42.18	-18.50	46.06	246.31	0.53	0.53	-0.42	
77	7.924	1.60	280.50	7912.85	-18.08	-44.91	-18.08	48.41	248.08	0.14	0.14	-0.10	
78	8.019	1.50	278.60	8007.82	-17.65	-47.45	-17.65	50.62	249.60	0.12	0.12	-0.11	
79	8.114	1.70	281.20	8102.78	-17.19	-50.06	-17.19	52.93	251.05	0.22	0.22	0.21	
80	8.209	1.90	284.00	8197.73	-16.53	-52.97	-16.53	55.49	252.66	0.23	0.23	0.21	
81	8.304	2.10	283.70	8292.68	-15.74	-56.19	-15.74	58.35	254.35	0.21	0.21	0.21	
82	8.399	2.10	280.60	8387.61	-15.01	-59.59	-15.01	61.45	255.86	0.12	0.12	0.00	
83	8.495	2.00	266.70	8483.55	-14.78	-62.99	-14.78	64.70	256.79	0.53	0.53	-0.10	
84	8.590	2.40	261.50	8578.48	-15.17	-66.61	-15.17	68.32	257.17	0.47	0.47	0.42	
85	8.685	2.90	259.10	8673.38	-15.92	-70.94	-15.92	72.70	257.35	0.54	0.54	0.53	
86	8.780	3.30	257.50	8768.24	-16.97	-75.97	-16.97	77.84	257.41	0.43	0.43	0.42	
87	8.876	3.60	269.10	8864.07	-17.61	-81.68	-17.61	83.56	257.83	0.79	0.79	0.31	
88	8.971	3.80	276.60	8958.87	-17.30	-87.79	-17.30	89.48	258.85	0.55	0.55	0.21	
89	9.066	4.00	279.20	9053.65	-16.40	-94.19	-16.40	95.60	260.12	0.28	0.28	0.21	
90	9.161	4.20	285.50	9148.41	-14.95	-100.81	-14.95	101.91	261.57	0.52	0.52	0.21	
91	9.256	3.80	287.00	9243.18	-13.10	-107.17	-13.10	107.97	263.03	0.44	0.44	-0.42	
92	9.350	4.00	293.20	9336.96	-10.89	-113.17	-10.89	113.69	264.50	0.50	0.50	0.21	
93	9.445	3.90	303.30	9431.73	-7.81	-118.91	-7.81	119.17	266.24	0.74	0.74	-0.11	
94	9.541	4.20	304.10	9527.49	-4.05	-124.55	-4.05	124.62	268.14	0.32	0.32	0.31	
95	9.635	4.50	303.60	9621.22	-0.08	-130.47	-0.08	130.47	269.96	0.32	0.32	0.32	
96	9.729	4.80	303.70	9714.91	4.14	-136.82	4.14	136.88	271.73	0.32	0.32	0.32	
97	9.816	5.10	307.20	9801.59	8.50	-142.92	8.50	143.18	273.40	0.49	0.49	0.34	
98	9.915	5.00	308.60	9900.20	13.85	-149.80	13.85	150.44	275.28	0.16	0.16	-0.10	
99	10.021	4.10	308.40	10005.87	19.09	-156.38	19.09	157.54	276.96	0.85	0.85	-0.85	
100	10.116	2.30	308.70	10100.72	22.39	-160.53	22.39	162.08	277.94	1.89	1.89	-1.89	
101	10.211	0.80	309.50	10195.68	24.00	-162.53	24.00	164.29	278.40	1.58	1.58	-1.58	



SURVEY CALCULATION PROGRAM

10/13/17 14:11

V08.04.02

Company:	Black River Water Management Co. LLC
Well Name:	Rustler Breaks SWD2
Location:	Eddy County, NM
Rig:	Patterson #810
Job Number:	DDMO-170745
API #:	30-015-44240
Vertical Section Azimuth:	0.00
Proposed Direction:	0.00

Magnetic Declination: 7.17 REFERENCED TO GRID NORTH

Survey Calculation Method:	Minimum Curvature
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PTB:	MD	INC	INC	AZM	TVD	EW	N/S	Surface	Distance	EW	Azm	DLS/	VS
	14.716		1.6	99.3	14700.03		46.75		-104.85			46.75	

#	Depth	Inc	Azm	TVD	N/S	EW	Surface	Distance	EW	Azm	DLS/	VS
	Feet	Degrees	Degrees	Feet	Feet	Feet	Feet	Feet	Feet	Feet	100'	100'
102	10.306	0.50	84.00	10290.68	24.47	-162.63	24.47	164.46	278.56	1.27	-0.32	
103	10.401	0.90	90.90	10385.67	24.50	-161.47	24.50	163.32	278.63	0.43	0.42	
104	10.497	1.30	83.60	10481.65	24.61	-159.64	24.61	161.52	278.76	0.44	0.42	
105	10.592	1.30	80.70	10576.63	24.90	-157.50	24.90	159.46	278.99	0.07	0.00	
106	10.687	1.10	80.10	10671.61	25.24	-155.54	25.24	157.57	279.22	0.21	-0.21	
107	10.782	0.70	88.60	10766.59	25.41	-154.06	25.41	156.14	279.36	0.44	-0.42	
108	10.877	1.10	44.80	10861.58	26.07	-152.84	26.07	155.04	279.68	0.81	0.42	
109	10.972	1.40	43.70	10956.56	27.55	-151.39	27.55	153.88	280.31	0.32	0.32	
110	11.067	1.70	56.00	11051.53	29.18	-149.42	29.18	152.25	281.05	0.47	0.32	
111	11.162	1.50	61.50	11146.49	30.56	-147.16	30.56	150.30	281.73	0.27	-0.21	
112	11.257	1.30	62.70	11241.46	31.65	-145.11	31.65	148.52	282.30	0.21	-0.21	
113	11.352	1.30	62.20	11336.44	32.65	-143.20	32.65	146.88	282.84	0.01	0.00	
114	11.443	1.20	62.60	11427.41	33.57	-141.44	33.57	145.37	283.35	0.11	-0.11	
115	11.538	1.30	58.00	11522.39	34.59	-139.65	34.59	143.87	283.91	0.15	0.11	
116	11.633	1.10	55.00	11617.37	35.69	-137.98	35.69	142.52	284.50	0.22	-0.21	
117	11.728	1.10	52.10	11712.35	36.77	-136.52	36.77	141.38	285.08	0.06	0.00	
118	11.824	1.20	52.70	11808.33	37.95	-134.99	37.95	140.22	285.70	0.10	0.10	
119	11.919	1.20	56.00	11903.31	39.11	-133.37	39.11	138.99	286.34	0.07	0.00	
120	12.014	1.10	58.20	11998.29	40.14	-131.78	40.14	137.75	286.94	0.12	-0.11	
121	12.109	1.10	60.40	12093.28	41.07	-130.21	41.07	136.53	287.51	0.04	0.00	
122	12.204	0.90	63.90	12188.26	41.85	-128.74	41.85	135.38	288.01	0.22	-0.21	
123	12.299	0.70	61.00	12283.25	42.46	-127.57	42.46	134.45	288.41	0.21	-0.21	
124	12.393	0.60	43.70	12377.25	43.10	-126.72	43.10	133.85	288.78	0.23	-0.11	
125	12.489	0.60	44.40	12473.24	43.82	-126.03	43.82	133.43	289.17	0.01	0.00	
126	12.585	0.40	52.50	12569.24	44.38	-125.41	44.38	133.03	289.49	0.22	-0.21	
127	12.681	0.50	42.60	12665.24	44.89	-124.86	44.89	132.68	289.78	0.13	0.10	
128	12.776	0.40	66.00	12760.23	45.33	-124.28	45.33	132.29	290.04	0.22	-0.11	
129	12.871	0.40	62.60	12855.23	45.62	-123.68	45.62	131.82	290.25	0.02	0.00	
130	12.967	0.40	94.40	12951.23	45.75	-123.05	45.75	131.28	290.40	0.23	0.00	
131	13.062	0.50	100.00	13046.22	45.65	-122.31	45.65	130.55	290.47	0.11	0.11	
132	13.157	0.40	127.10	13141.22	45.38	-121.63	45.38	129.82	290.46	0.24	-0.11	
133	13.253	0.50	118.60	13237.22	44.98	-121.00	44.98	129.09	290.39	0.12	0.10	
134	13.348	0.30	117.60	13332.22	44.66	-120.42	44.66	128.43	290.35	0.21	-0.21	
135	13.443	0.60	117.40	13427.21	44.32	-119.75	44.32	127.69	290.31	0.32	0.32	

V09.04.02

Company:	Black River Water Management Co. LLC
Well Name:	Ruster Breaks SWD2
Location:	Eddy County, NM
Rig:	Patterson #810
Job Number:	DDMO-170745
API #:	30-015-44240

Magnetic Declination: 7.17 REFERENCED TO GRID NORTH

Vertical Section Azimuth:	0.00	Proposed Direction:	0.00
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Survey Calculation Method:	Minimum Curvature	TVD	N/S	EW	Distance	Closure	DLS/	VS
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PTB:	MD	INC	AZM	TVD	N/S	EW	VS
	14.716	1.6	99.3	14700.03	46.75	-104.85	46.75

#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	EW Feet	Surface Vert Sec	Distance	Closure	DLS/ 100	VS BUR/ 100'
136	13,540	0.60	102.90	13524.21	43.97	-118.81	43.97	126.68	290.31	0.16	0.00
137	13,572	0.60	129.50	13556.21	43.83	-118.51	43.83	126.36	290.30	0.86	0.00
138	13,604	0.70	128.40	13588.20	43.60	-118.23	43.60	126.02	290.24	0.31	0.31
139	13,624	0.80	119.80	13608.20	43.46	-118.02	43.46	125.76	290.22	0.75	0.50
140	13,759	0.60	109.80	13743.19	42.75	-116.53	42.75	124.13	290.14	0.17	-0.15
141	13,853	0.40	91.40	13837.19	42.57	-115.74	42.57	123.32	290.20	0.27	-0.21
142	13,947	0.90	7.60	13931.18	43.30	-115.32	43.30	123.18	290.58	1.00	0.53
143	14,041	1.00	352.50	14025.17	44.84	-115.33	44.84	123.74	291.25	0.29	0.11
144	14,134	1.00	4.90	14118.16	46.46	-115.36	46.46	124.36	291.93	0.23	0.00
145	14,229	1.10	40.40	14213.14	47.98	-114.70	47.98	124.33	292.70	0.68	0.11
146	14,323	1.00	81.80	14307.13	48.78	-113.30	48.78	123.36	293.29	0.80	-0.11
147	14,417	1.00	116.30	14401.11	48.53	-111.76	48.53	121.84	293.47	0.63	0.00
148	14,511	1.20	113.40	14495.10	47.78	-110.12	47.78	120.04	293.46	0.22	0.21
149	14,605	1.60	97.30	14589.07	47.22	-107.91	47.22	117.79	293.63	0.59	0.43
150	14,661	1.60	99.30	14645.05	47.00	-106.37	47.00	116.29	293.84	0.10	0.00