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Survey Company: MS Energy Services
MWD Surveyor Name: Paul Royar
Survey Type: MWD
Operating Company: ConocoPhillips Company
Well Name & Number: Ruby Federal 100H
API Number: 30-025-43370
Surveyed Depths: 175' – 11,322' MD

Dates Performed: 05/30/2017 – 06/19/2017
Location: Lea County, NM
Job Number: DDMO-170491

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: Paul Royar
Title: MWD Field Specialist
Date: 07-17-2017
Email: proyar@msenergyservices.com

Company:		ConocoPhillips Company																					
Well Name:		Ruby Federal 100H																					
Location:		Lea County, NM																					
Rig:		Trinidad #417				Magnetic Declination:		6.86		REFERENCED TO GRID NORTH													
Job Number:		DDMO-170491																					
API #:		30-025-43370																					
Vertical Section Azimuth:				89.80		Proposed Direction:		89.80															
Survey Calculation Method:				Minimum Curvature																			
PTB:		MD		INC		AZM		TVD		N/S		E/W		VS									
		11,400		95.1		87.5		6045.78		223.62		5464.21		5464.96									
#		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		175		1.70		337.90		174.97		2.41		-0.98		-0.97		2.60		337.90		0.97		0.97	
2		362		1.50		342.20		361.90		7.31		-2.77		-2.74		7.81		339.25		0.12		-0.11	
3		549		1.00		354.90		548.86		11.26		-3.66		-3.62		11.84		341.99		0.30		-0.27	
4		729		0.70		333.60		728.84		13.81		-4.29		-4.24		14.46		342.74		0.24		-0.17	
5		857		0.50		24.00		856.83		15.02		-4.41		-4.36		15.66		343.64		0.42		-0.16	
6		1,045		0.60		13.70		1044.82		16.73		-3.84		-3.79		17.16		347.06		0.07		0.05	
7		1,234		0.30		37.50		1233.82		18.08		-3.31		-3.25		18.38		349.63		0.18		-0.16	
8		1,423		0.20		70.80		1422.81		18.58		-2.70		-2.63		18.78		351.75		0.09		-0.05	
9		1,612		0.30		43.90		1611.81		19.05		-2.04		-1.97		19.16		353.88		0.08		0.05	
10		1,801		0.40		343.70		1800.81		20.04		-1.88		-1.81		20.13		354.63		0.19		0.05	
11		1,990		0.20		238.20		1989.81		20.50		-2.35		-2.28		20.63		353.46		0.26		-0.11	
12		2,111		0.20		300.20		2110.81		20.49		-2.71		-2.64		20.67		352.46		0.17		0.00	
13		2,175		0.40		308.00		2174.81		20.68		-2.98		-2.91		20.90		351.79		0.32		0.31	
14		2,237		0.40		312.70		2236.81		20.96		-3.31		-3.24		21.23		351.02		0.05		0.00	
15		2,301		0.40		306.90		2300.80		21.25		-3.66		-3.58		21.56		350.24		0.06		0.00	
16		2,363		0.40		304.40		2362.80		21.50		-4.01		-3.93		21.87		349.44		0.03		0.00	
17		2,426		0.40		314.10		2425.80		21.78		-4.35		-4.27		22.21		348.71		0.11		0.00	
18		2,489		0.50		318.20		2488.80		22.14		-4.69		-4.61		22.63		348.04		0.17		0.16	
19		2,553		0.60		318.20		2552.80		22.60		-5.10		-5.02		23.16		347.29		0.16		0.16	
20		2,616		0.60		326.00		2615.79		23.12		-5.50		-5.42		23.76		346.61		0.13		0.00	
21		2,679		0.70		329.50		2678.79		23.72		-5.88		-5.80		24.44		346.07		0.17		0.16	
22		2,742		1.20		325.50		2741.78		24.60		-6.45		-6.36		25.43		345.30		0.80		0.79	
23		2,805		1.80		321.40		2804.76		25.91		-7.44		-7.35		26.96		343.98		0.97		0.95	
24		2,868		1.90		331.70		2867.72		27.61		-8.55		-8.46		28.90		342.78		0.55		0.16	
25		2,931		3.10		338.10		2930.66		30.11		-9.68		-9.58		31.62		342.17		1.95		1.90	
26		2,994		3.50		332.30		2993.56		33.39		-11.21		-11.10		35.22		341.44		0.83		0.63	
27		3,057		4.40		331.30		3056.41		37.21		-13.27		-13.14		39.51		340.38		1.43		1.43	
28		3,119		4.20		332.80		3118.23		41.32		-15.45		-15.30		44.11		339.50		0.37		-0.32	
29		3,182		4.90		328.90		3181.04		45.67		-17.89		-17.73		49.05		338.61		1.21		1.11	
30		3,245		5.60		323.40		3243.77		50.44		-21.11		-20.94		54.69		337.29		1.37		1.11	
31		3,308		5.50		325.60		3306.48		55.40		-24.65		-24.46		60.64		336.01		0.37		-0.16	
32		3,371		5.60		319.20		3369.18		60.22		-28.37		-28.16		66.57		334.78		0.99		0.16	
33		3,434		6.10		312.20		3431.85		64.80		-32.86		-32.63		72.65		333.11		1.38		0.79	

Company:		ConocoPhillips Company					Magnetic Declination: 6.86 REFERENCED TO GRID NORTH					
Well Name:		Ruby Federal 100H										
Location:		Lea County, NM										
Rig:		Trinidad #417										
Job Number:		DDMO-170491										
API #:		30-025-43370										
Vertical Section Azimuth:				89.80		Proposed Direction:		89.80				
Survey Calculation Method:				Minimum Curvature								
PTB:	MD		INC		AZM	TVD	N/S		E/W		VS	
	11,400		95.1		87.5	6045.78	223.62		5464.21		5464.96	
#	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	3,497	6.10	313.70	3494.50	69.36	-37.76	-37.51	78.97	331.44	0.25	0.00	
35	3,560	6.10	313.90	3557.14	73.99	-42.59	-42.33	85.37	330.08	0.03	0.00	
36	3,623	6.10	314.10	3619.78	78.64	-47.40	-47.13	91.82	328.92	0.03	0.00	
37	3,686	6.10	313.80	3682.43	83.29	-52.22	-51.93	98.31	327.91	0.05	0.00	
38	3,749	6.20	309.60	3745.06	87.77	-57.26	-56.95	104.80	326.88	0.73	0.16	
39	3,812	6.40	309.60	3807.68	92.18	-62.59	-62.26	111.42	325.82	0.32	0.32	
40	3,875	6.20	309.90	3870.30	96.60	-67.90	-67.56	118.08	324.90	0.32	-0.32	
41	3,938	6.30	310.00	3932.93	101.00	-73.16	-72.81	124.72	324.08	0.16	0.16	
42	4,001	6.40	312.40	3995.54	105.59	-78.40	-78.03	131.52	323.41	0.45	0.16	
43	4,064	6.40	312.20	4058.15	110.32	-83.60	-83.21	138.42	322.85	0.04	0.00	
44	4,127	6.40	312.40	4120.76	115.05	-88.79	-88.39	145.32	322.34	0.04	0.00	
45	4,191	6.40	310.50	4184.36	119.77	-94.14	-93.72	152.34	321.83	0.33	0.00	
46	4,253	6.30	309.20	4245.98	124.16	-99.40	-98.97	159.05	321.32	0.28	-0.16	
47	4,317	6.00	305.20	4309.61	128.31	-104.85	-104.41	165.70	320.74	0.82	-0.47	
48	4,380	5.60	301.60	4372.29	131.82	-110.16	-109.70	171.79	320.11	0.86	-0.63	
49	4,443	5.70	303.40	4434.98	135.15	-115.39	-114.92	177.71	319.51	0.32	0.16	
50	4,506	5.10	313.00	4497.70	138.78	-120.05	-119.57	183.50	319.14	1.72	-0.95	
51	4,569	4.90	314.60	4560.46	142.58	-124.02	-123.52	188.97	318.98	0.39	-0.32	
52	4,631	4.90	313.20	4622.24	146.25	-127.83	-127.32	194.25	318.85	0.19	0.00	
53	4,694	4.90	313.60	4685.01	149.95	-131.74	-131.22	199.60	318.70	0.05	0.00	
54	4,757	5.00	315.40	4747.77	153.76	-135.62	-135.08	205.02	318.59	0.29	0.16	
55	4,820	4.70	312.20	4810.55	157.45	-139.46	-138.91	210.33	318.47	0.64	-0.48	
56	4,883	4.40	311.90	4873.35	160.80	-143.17	-142.61	215.30	318.32	0.48	-0.48	
57	4,946	4.30	309.60	4936.17	163.92	-146.79	-146.21	220.04	318.16	0.32	-0.16	
58	5,009	3.90	301.60	4999.01	166.55	-150.43	-149.85	224.43	317.91	1.11	-0.63	
59	5,072	3.10	291.20	5061.89	168.28	-153.84	-153.26	228.01	317.57	1.62	-1.27	
60	5,135	2.40	283.90	5124.82	169.22	-156.71	-156.12	230.64	317.20	1.24	-1.11	
61	5,198	1.30	274.90	5187.78	169.60	-158.71	-158.11	232.27	316.90	1.80	-1.75	
62	5,261	0.70	279.10	5250.77	169.72	-159.80	-159.20	233.11	316.72	0.96	-0.95	
63	5,325	0.70	268.10	5314.77	169.77	-160.57	-159.98	233.68	316.59	0.21	0.00	
64	5,388	0.70	278.00	5377.76	169.81	-161.34	-160.75	234.23	316.46	0.19	0.00	
65	5,461	1.90	112.90	5450.75	169.40	-160.67	-160.08	233.47	316.52	3.54	1.64	
66	5,524	9.50	110.30	5513.39	167.19	-154.82	-154.24	227.86	317.20	12.07	12.06	
67	5,555	13.80	110.00	5543.75	165.03	-148.94	-148.37	222.31	317.93	13.87	13.87	

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Job Number:		DDMO-170491									
API #:		30-025-43370									
Vertical Section Azimuth:				89.80		Proposed Direction:		89.80			
Survey Calculation Method:				Minimum Curvature							
PTB:	MD	INC	AZM	TVD	N/S	E/W	VS				
	11,400	95.1	87.5	6045.78	223.62	5464.21	5464.96				
#	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	5,586	17.20	107.90	5573.62	162.36	-141.11	-140.54	215.11	319.01	11.11	10.97
69	5,618	18.60	111.30	5604.07	159.05	-131.85	-131.29	206.59	320.34	5.46	4.38
70	5,649	21.60	107.70	5633.18	155.52	-121.80	-121.26	197.54	321.93	10.46	9.68
71	5,681	24.70	103.40	5662.60	152.18	-109.68	-109.15	187.59	324.22	11.03	9.69
72	5,713	28.50	101.50	5691.21	149.10	-95.69	-95.17	177.17	327.31	12.17	11.88
73	5,744	32.40	98.80	5717.93	146.36	-80.23	-79.72	166.91	331.27	13.33	12.58
74	5,776	36.00	95.70	5744.39	144.11	-62.39	-61.89	157.04	336.59	12.50	11.25
75	5,807	39.30	93.40	5768.94	142.62	-43.52	-43.02	149.12	343.03	11.57	10.65
76	5,838	41.70	91.20	5792.51	141.83	-23.41	-22.91	143.74	350.63	9.01	7.74
77	5,870	45.00	89.80	5815.77	141.64	-1.45	-0.95	141.65	359.41	10.74	10.31
78	5,902	48.00	88.80	5837.80	141.93	21.76	22.25	143.59	8.72	9.64	9.38
79	5,933	51.60	87.80	5857.81	142.64	45.42	45.92	149.70	17.66	11.87	11.61
80	5,965	53.30	87.50	5877.31	143.68	70.77	71.27	160.16	26.22	5.36	5.31
81	5,996	55.60	86.40	5895.33	145.02	95.95	96.46	173.89	33.49	7.96	7.42
82	6,028	56.70	86.10	5913.15	146.76	122.47	122.98	191.15	39.84	3.52	3.44
83	6,091	62.30	85.90	5945.12	150.55	176.60	177.12	232.06	49.55	8.89	8.89
84	6,154	68.40	84.80	5971.38	155.20	233.64	234.18	280.49	56.40	9.81	9.68
85	6,217	71.80	86.00	5992.82	159.95	292.68	293.24	333.53	61.34	5.69	5.40
86	6,280	74.10	86.00	6011.29	164.15	352.76	353.33	389.08	65.05	3.65	3.65
87	6,343	77.00	87.00	6027.01	167.87	413.65	414.23	446.41	67.91	4.85	4.60
88	6,406	81.50	89.80	6038.76	169.59	475.49	476.08	504.83	70.37	8.37	7.14
89	6,469	84.50	91.10	6046.44	169.09	538.01	538.60	563.96	72.55	5.18	4.76
90	6,531	85.90	91.10	6051.63	167.91	599.78	600.37	622.84	74.36	2.26	2.26
91	6,587	86.70	91.80	6055.24	166.49	655.65	656.22	676.46	75.75	1.90	1.43
92	6,649	87.30	91.90	6058.49	164.49	717.53	718.10	736.14	77.09	0.98	0.97
93	6,712	88.70	91.70	6060.68	162.52	780.46	781.02	797.20	78.24	2.24	2.22
94	6,775	90.20	91.80	6061.29	160.59	843.43	843.98	858.58	79.22	2.39	2.38
95	6,838	92.20	91.10	6059.97	159.00	906.39	906.94	920.23	80.05	3.36	3.17
96	6,901	94.00	90.60	6056.56	158.06	969.29	969.83	982.09	80.74	2.97	2.86
97	6,963	93.10	88.90	6052.72	158.33	1031.16	1031.71	1043.25	81.27	3.10	-1.45
98	7,026	92.30	88.20	6049.76	159.93	1094.07	1094.62	1105.70	81.68	1.69	-1.27
99	7,090	91.00	88.10	6047.91	161.99	1158.01	1158.57	1169.29	82.04	2.04	-2.03
100	7,153	89.20	87.30	6047.80	164.52	1220.96	1221.52	1231.99	82.33	3.13	-2.86
101	7,216	88.10	86.30	6049.29	168.04	1283.84	1284.42	1294.79	82.54	2.36	-1.75

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	11,400	95.1	87.5	6045.78	223.62	5464.21	5464.96					
#	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	7,342	90.30	86.30	6051.05	176.17	1409.56	1410.16	1420.52	82.88	1.75	1.75	
103	7,468	92.80	86.10	6047.64	184.51	1535.22	1535.86	1546.27	83.15	1.99	1.98	
104	7,594	91.90	85.60	6042.47	193.62	1660.79	1661.45	1672.03	83.35	0.82	-0.71	
105	7,720	89.10	85.70	6041.37	203.18	1786.41	1787.10	1797.92	83.51	2.22	-2.22	
106	7,846	86.40	89.60	6046.32	208.34	1912.17	1912.88	1923.48	83.78	3.76	-2.14	
107	7,971	88.40	89.60	6051.99	209.22	2037.03	2037.75	2047.74	84.14	1.60	1.60	
108	8,097	88.90	91.10	6054.96	208.45	2162.99	2163.70	2173.01	84.50	1.25	0.40	
109	8,223	91.30	90.80	6054.74	206.36	2288.96	2289.67	2298.24	84.85	1.92	1.90	
110	8,349	88.20	89.70	6055.29	205.81	2414.94	2415.64	2423.69	85.13	2.61	-2.46	
111	8,475	88.80	89.00	6058.59	207.24	2540.89	2541.60	2549.33	85.34	0.73	0.48	
112	8,601	88.70	91.00	6061.34	207.24	2666.85	2667.56	2674.89	85.56	1.59	-0.08	
113	8,727	91.20	90.80	6061.45	205.26	2792.83	2793.53	2800.36	85.80	1.99	1.98	
114	8,853	91.50	90.60	6058.48	203.72	2918.78	2919.47	2925.88	86.01	0.29	0.24	
115	8,979	91.60	90.40	6055.07	202.62	3044.73	3045.42	3051.46	86.19	0.18	0.08	
116	9,105	88.50	90.80	6054.96	201.30	3170.71	3171.39	3177.09	86.37	2.48	-2.46	
117	9,231	90.70	90.40	6055.84	199.98	3296.69	3297.37	3302.75	86.53	1.77	1.75	
118	9,357	90.80	89.90	6054.19	199.65	3422.68	3423.35	3428.50	86.66	0.40	0.08	
119	9,483	91.70	89.60	6051.44	200.20	3548.65	3549.32	3554.29	86.77	0.75	0.71	
120	9,609	91.10	89.70	6048.36	200.97	3674.61	3675.28	3680.10	86.87	0.48	-0.48	
121	9,735	89.30	90.60	6047.92	200.64	3800.60	3801.27	3805.89	86.98	1.60	-1.43	
122	9,861	88.80	90.40	6050.01	199.54	3926.57	3927.25	3931.64	87.09	0.43	-0.40	
123	9,987	88.90	91.10	6052.54	197.89	4052.54	4053.20	4057.37	87.20	0.56	0.08	
124	10,113	89.20	91.10	6054.63	195.47	4178.50	4179.15	4183.07	87.32	0.24	0.24	
125	10,239	89.50	90.40	6056.06	193.82	4304.48	4305.13	4308.84	87.42	0.60	0.24	
126	10,366	88.70	89.70	6058.06	193.71	4431.46	4432.11	4435.69	87.50	0.84	-0.63	
127	10,492	90.70	89.30	6058.71	194.81	4557.45	4558.10	4561.61	87.55	1.62	1.59	
128	10,618	89.50	87.60	6058.50	198.22	4683.39	4684.06	4687.59	87.58	1.65	-0.95	
129	10,743	89.00	87.10	6060.13	204.00	4808.25	4808.93	4812.57	87.57	0.57	-0.40	
130	10,870	88.00	89.00	6063.46	208.32	4935.12	4935.82	4939.52	87.58	1.69	-0.79	
131	10,995	90.40	88.90	6065.20	210.61	5060.08	5060.79	5064.46	87.62	1.92	1.92	
132	11,122	91.20	88.50	6063.43	213.49	5187.04	5187.75	5191.43	87.64	0.70	0.63	
133	11,248	93.50	88.00	6058.26	217.33	5312.86	5313.59	5317.30	87.66	1.87	1.83	
134	11,322	95.10	87.50	6052.71	220.23	5386.59	5387.33	5391.09	87.66	2.26	2.16	
PTB:	11,400	95.10	87.50	6045.78	223.62	5464.21	5464.96	5468.78	87.66	0.00	0.00	