

**Provide Signature Page for
Directional Survey**

30-015-44376

SURVEYS

Customer: Marathon Oil
Well: [REDACTED]
Field/Block: Wolfcamp Y
Co./Parish: Eddy County
State: New Mexico

PGS Job #: LNM1334317
MWD Operator: Ronnie Watson
Directional Driller: Johnny Gabrielson
Date of First Survey: October 13, 2017
Date of Last Survey: November 5, 2017



Total Correction: 7.51 East Grid
Vertical Section Plane: 88.33 Nominal Dip Angle: 60.07 Magnetic Field Strength: 0.480

Measured		Coordinates		Closure		Vib/Shk									
Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle	DLS	Temp (°F)	Color	Date	Time	Flow Rate	
Survey's are tied into: Gyro										Date Received:					
Company:															
Tie-in	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00						
1	182	0.6	178.2	182.00	0.00	-0.95	0.03	0.95	178.20	0.33	82 °F		10/13/17	03:12	811 (gpm)
2	213	0.8	170.8	212.99	0.03	-1.33	0.07	1.33	177.00	0.71	82 °F		10/13/17	03:29	811 (gpm)
3	304	0.9	134.1	303.98	0.61	-2.45	0.68	2.55	164.41	0.60	85 °F		10/13/17	04:05	836 (gpm)
4	396	0.8	136.3	395.97	1.55	-3.42	1.65	3.80	154.28	0.11	91 °F		10/13/17	04:48	833 (gpm)
5	423	0.9	133.0	422.97	1.82	-3.70	1.93	4.17	152.43	0.41	91 °F		10/13/17	05:26	833 (gpm)
6	508	0.6	97.8	507.96	2.74	-4.22	2.86	5.10	145.84	0.63	82 °F		10/22/17	20:30	551 (gpm)
7	599	0.4	295.4	598.96	2.92	-4.14	3.05	5.14	143.68	1.09	82 °F		10/22/17	21:30	604 (gpm)
8	691	1.2	285.0	690.95	1.72	-3.76	1.83	4.18	154.08	0.88	82 °F		10/23/17	00:19	619 (gpm)
9	783	2.0	281.8	782.92	-0.77	-3.18	-0.68	3.25	192.00	0.87	93 °F		10/23/17	01:30	619 (gpm)
10	875	1.4	293.1	874.88	-3.35	-2.41	-3.28	4.07	233.69	0.74	97 °F		10/23/17	02:14	619 (gpm)
11	967	1.0	287.2	966.86	-5.13	-1.73	-5.08	5.37	251.17	0.45	102 °F		10/23/17	03:12	619 (gpm)
12	1,059	1.5	282.8	1,058.83	-7.06	-1.23	-7.02	7.13	260.08	0.55	109 °F		10/23/17	04:17	733 (gpm)
13	1,153	1.6	297.8	1,152.80	-9.39	-0.34	-9.38	9.39	267.90	0.44	109 °F		10/23/17	05:00	749 (gpm)
14	1,248	0.8	314.8	1,247.78	-11.00	0.74	-11.03	11.05	273.85	0.91	109 °F		10/23/17	05:37	749 (gpm)
15	1,342	0.8	306.6	1,341.77	-11.97	1.60	-12.02	12.13	277.56	0.12	109 °F		10/23/17	06:38	749 (gpm)
16	1,437	2.2	302.5	1,436.73	-14.00	2.97	-14.09	14.40	281.91	1.48	113 °F		10/23/17	07:41	749 (gpm)
17	1,531	3.0	288.8	1,530.64	-17.80	4.73	-17.94	18.55	284.78	1.07	115 °F		10/23/17	08:23	749 (gpm)
18	1,626	3.0	253.1	1,625.52	-22.52	4.81	-22.67	23.18	281.98	1.94	115 °F		10/23/17	09:08	749 (gpm)
19	1,720	3.5	220.0	1,719.37	-26.80	1.90	-26.87	26.94	274.04	2.03	115 °F		10/23/17	10:18	749 (gpm)
20	1,814	4.5	208.5	1,813.14	-30.57	-3.54	-30.48	30.68	263.37	1.36	117 °F		10/23/17	11:39	749 (gpm)
21	1,922	5.1	211.8	1,920.76	-35.34	-11.34	-35.03	36.82	252.05	0.61	120 °F		10/23/17	13:16	749 (gpm)
22	1,995	5.2	216.3	1,993.47	-39.17	-16.77	-38.69	42.17	246.57	0.57	86 °F		10/25/17	02:57	599 (gpm)
23	2,090	6.6	218.9	2,087.97	-45.37	-24.49	-44.67	50.94	241.27	1.50	88 °F		10/25/17	03:44	599 (gpm)
24	2,184	8.5	216.8	2,181.15	-53.20	-34.25	-52.23	62.46	236.74	2.04	88 °F		10/25/17	04:20	599 (gpm)
25	2,278	10.6	215.6	2,273.84	-62.76	-46.85	-61.42	77.25	232.67	2.24	91 °F		10/25/17	04:50	599 (gpm)

MWD SURVEYS

Customer: Marathon Oil
Well: Cypress Fee 4H
Field/Block: Wolfcamp Y
Co./Parish: Eddy County
State: New Mexico

PGS Job #: LNM1334317
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Total Correction: 7.51 East Grid
Vertical Section Plane: 88.33 Nominal Dip Angle: 60.07 Magnetic Field Strength: 0.480

Measured Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	Coordinates		Closure		DLS	Temp (°F)	Vib/Shk Color	Date	Time	Flow Rate
					+N / -S	+E / -W	Dist.	Angle						
26	2,373	11.1	216.4	2,367.14	-73.69	-61.31	-71.94	94.52	229.56	0.55	91 °F	10/25/17	05:19	599 (gpm)
27	2,467	11.3	216.2	2,459.35	-84.92	-76.03	-82.74	112.37	227.42	0.22	94 °F	10/25/17	05:45	599 (gpm)
28	2,562	11.2	216.9	2,552.52	-96.39	-90.92	-93.78	130.62	225.89	0.18	98 °F	10/25/17	06:20	599 (gpm)
29	2,656	10.8	216.6	2,644.80	-107.54	-105.29	-104.51	148.35	224.79	0.43	102 °F	10/25/17	06:48	599 (gpm)
30	2,751	10.8	216.6	2,738.11	-118.56	-119.58	-115.13	165.99	223.91	0.00	102 °F	10/25/17	07:20	599 (gpm)
31	2,845	9.8	214.3	2,830.60	-128.72	-133.26	-124.89	182.63	223.14	1.15	102 °F	10/25/17	07:46	599 (gpm)
32	2,939	9.2	213.8	2,923.31	-137.78	-146.11	-133.57	197.97	222.43	0.64	104 °F	10/25/17	08:11	599 (gpm)
33	3,034	10.0	215.5	3,016.98	-147.17	-159.14	-142.59	213.67	221.86	0.89	104 °F	10/25/17	08:51	599 (gpm)
34	3,128	10.1	216.7	3,109.54	-157.21	-172.39	-152.25	230.00	221.45	0.25	106 °F	10/25/17	09:17	599 (gpm)
35	3,222	10.6	217.4	3,202.01	-167.78	-185.87	-162.43	246.84	221.15	0.55	106 °F	10/25/17	09:43	599 (gpm)
36	3,317	10.2	215.9	3,295.45	-178.41	-199.62	-172.67	263.94	220.86	0.51	108 °F	10/25/17	10:08	599 (gpm)
37	3,411	9.9	216.1	3,388.00	-188.44	-212.89	-182.31	280.29	220.58	0.32	108 °F	10/25/17	10:36	599 (gpm)
38	3,505	9.9	215.9	3,480.60	-198.31	-225.97	-191.81	296.40	220.33	0.04	109 °F	10/25/17	11:06	599 (gpm)
39	3,599	9.8	216.1	3,573.22	-208.14	-238.98	-201.26	312.44	220.10	0.11	111 °F	10/25/17	11:31	599 (gpm)
40	3,694	9.9	215.3	3,666.82	-218.01	-252.18	-210.75	328.64	219.89	0.18	111 °F	10/25/17	11:55	599 (gpm)
41	3,788	9.7	215.2	3,759.45	-227.62	-265.24	-219.98	344.59	219.67	0.21	111 °F	10/25/17	12:19	599 (gpm)
42	3,883	9.6	214.8	3,853.10	-237.13	-278.29	-229.11	360.47	219.46	0.13	113 °F	10/25/17	12:44	599 (gpm)
43	3,977	10.6	216.3	3,945.64	-247.11	-291.69	-238.71	376.91	219.30	1.10	113 °F	10/25/17	13:27	599 (gpm)
44	4,072	10.7	215.5	4,039.01	-257.81	-305.91	-249.00	394.44	219.14	0.19	113 °F	10/25/17	13:58	599 (gpm)
45	4,166	10.1	215.5	4,131.46	-268.06	-319.73	-258.85	411.38	218.99	0.64	113 °F	10/25/17	14:32	599 (gpm)
46	4,260	9.6	215.6	4,224.08	-277.79	-332.81	-268.20	427.43	218.86	0.53	113 °F	10/25/17	15:06	599 (gpm)
47	4,354	10.1	215.6	4,316.69	-287.53	-345.88	-277.56	443.48	218.75	0.53	113 °F	10/25/17	15:46	599 (gpm)
48	4,449	10.4	216.3	4,410.17	-297.85	-359.57	-287.49	460.37	218.64	0.34	115 °F	10/25/17	16:16	599 (gpm)
49	4,543	9.4	215.7	4,502.77	-307.73	-372.64	-296.99	476.51	218.55	1.07	117 °F	10/25/17	16:47	599 (gpm)
50	4,638	10.0	216.6	4,596.41	-317.54	-385.56	-306.44	492.51	218.48	0.65	118 °F	10/25/17	17:42	599 (gpm)
51	4,732	10.1	217.0	4,688.97	-327.75	-398.70	-316.26	508.90	218.42	0.13	118 °F	10/25/17	18:20	599 (gpm)
52	4,827	9.8	216.1	4,782.54	-337.90	-411.88	-326.04	525.31	218.36	0.36	118 °F	10/25/17	18:54	599 (gpm)
53	4,921	10.3	216.0	4,875.10	-347.94	-425.15	-335.69	541.70	218.29	0.53	118 °F	10/25/17	19:36	599 (gpm)

MWD SURVEYS

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Well: Cypress Fee 4H
Field/Block: Wolfcamp Y
Co./Parish: Eddy County
State: New Mexico

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Total Correction: 7.51 East Grid
Vertical Section Plane: 88.33 Nominal Dip Angle: 60.07 Magnetic Field Strength: 0.480

	Measured		Coordinates				Closure		DLS	Temp (°F)	Vib/Shk Color	Date	Time	Flow Rate
	Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle					
54	5,015	10.0	217.3	4,967.63	-358.21	-438.44	-345.58	558.26	218.25	0.40	120 °F	10/25/17	20:00	599 (gpm)
55	5,110	9.5	216.8	5,061.26	-368.27	-451.28	-355.27	574.34	218.21	0.53	120 °F	10/25/17	20:26	599 (gpm)
56	5,204	8.9	215.3	5,154.05	-377.47	-463.42	-364.12	589.36	218.16	0.69	120 °F	10/25/17	21:10	599 (gpm)
57	5,299	8.6	213.4	5,247.94	-385.97	-475.35	-372.28	603.78	218.07	0.44	120 °F	10/25/17	21:39	599 (gpm)
58	5,393	8.1	211.7	5,340.95	-393.65	-486.85	-379.63	617.37	217.95	0.59	120 °F	10/25/17	22:08	599 (gpm)
59	5,487	7.5	212.3	5,434.08	-400.72	-497.67	-386.39	630.06	217.83	0.64	120 °F	10/25/17	22:44	599 (gpm)
60	5,582	6.5	211.6	5,528.37	-407.14	-507.49	-392.52	641.57	217.72	1.06	120 °F	10/25/17	23:17	599 (gpm)
61	5,676	5.1	210.1	5,621.88	-412.26	-515.64	-397.40	651.01	217.62	1.50	122 °F	10/25/17	23:51	599 (gpm)
62	5,770	4.6	214.1	5,715.55	-416.66	-522.37	-401.61	658.91	217.55	0.64	122 °F	10/26/17	00:54	599 (gpm)
63	5,865	3.5	227.6	5,810.31	-421.09	-527.48	-405.89	665.57	217.58	1.52	122 °F	10/26/17	01:28	599 (gpm)
64	5,959	4.8	229.5	5,904.06	-426.32	-531.97	-410.99	672.24	217.69	1.39	124 °F	10/26/17	02:28	599 (gpm)
65	6,054	5.6	220.4	5,998.67	-432.53	-538.08	-417.02	680.77	217.78	1.21	124 °F	10/26/17	03:09	552 (gpm)
66	6,148	6.0	220.4	6,092.19	-438.89	-545.32	-423.18	690.26	217.81	0.43	124 °F	10/26/17	04:09	552 (gpm)
67	6,243	5.1	222.1	6,186.74	-445.14	-552.23	-429.23	699.43	217.86	0.96	124 °F	10/26/17	05:14	552 (gpm)
68	6,337	5.1	223.1	6,280.37	-450.97	-558.38	-434.88	707.75	217.91	0.09	124 °F	10/26/17	05:57	552 (gpm)
69	6,431	5.1	223.0	6,374.00	-456.85	-564.49	-440.59	716.08	217.97	0.01	124 °F	10/26/17	06:42	552 (gpm)
70	6,526	5.6	221.1	6,468.59	-462.97	-571.07	-446.51	724.91	218.02	0.56	124 °F	10/26/17	07:23	552 (gpm)
71	6,620	4.8	218.7	6,562.20	-468.63	-577.60	-451.99	733.42	218.04	0.88	126 °F	10/26/17	08:20	552 (gpm)
72	6,714	4.2	218.6	6,655.91	-473.40	-583.36	-456.59	740.80	218.05	0.64	126 °F	10/26/17	09:01	552 (gpm)
73	6,809	3.0	218.9	6,750.72	-477.27	-588.01	-460.33	746.76	218.06	1.26	127 °F	10/26/17	09:44	552 (gpm)
74	6,903	2.8	224.3	6,844.60	-480.52	-591.57	-463.47	751.51	218.08	0.36	129 °F	10/26/17	10:27	552 (gpm)
75	6,997	2.1	225.6	6,938.51	-483.43	-594.42	-466.31	755.50	218.11	0.75	118 °F	10/27/17	02:37	548 (gpm)
76	7,091	1.4	218.6	7,032.47	-485.44	-596.52	-468.26	758.35	218.13	0.78	120 °F	10/27/17	03:24	548 (gpm)
77	7,186	1.2	226.1	7,127.44	-486.93	-598.11	-469.70	760.50	218.14	0.28	120 °F	10/27/17	04:03	548 (gpm)
78	7,280	1.0	229.3	7,221.43	-488.29	-599.33	-471.03	762.28	218.16	0.22	122 °F	10/27/17	05:10	548 (gpm)
79	7,375	0.8	243.1	7,316.41	-489.54	-600.17	-472.25	763.69	218.20	0.31	124 °F	10/27/17	06:08	548 (gpm)
80	7,469	0.6	244.8	7,410.41	-490.58	-600.68	-473.28	764.73	218.23	0.21	124 °F	10/27/17	07:01	548 (gpm)
81	7,564	0.3	244.8	7,505.40	-491.27	-601.00	-473.95	765.39	218.26	0.32	124 °F	10/27/17	07:55	548 (gpm)

MWD SURVEYS

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Well: **Cypress Fee 4H**
Field/Block: **Wolfcamp Y**
Co./Parish: **Eddy County**
State: **New Mexico**

PGS Job #: **LNM1334317**
MWD Operator: **Ronnie Watson**
Directional Driller: **Johnny Gabrielson**
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Vertical Section Plane: **88.33** Nominal Dip Angle: **60.07** Magnetic Field Strength: **0.480**

	Measured Depth	Coordinates				Closure				Vib/Shk Color	Date	Time	Flow Rate		
		Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle					DLS	Temp (°F)
82	7,658	0.1	167.3	7,599.40	-491.48	-601.18	-474.16	765.67	218.26	0.31	126 °F	Green	10/27/17	08:44	548 (gpm)
83	7,753	1.0	80.6	7,694.40	-490.64	-601.13	-473.32	765.11	218.22	1.05	126 °F	Green	10/27/17	09:26	548 (gpm)
84	7,847	2.2	84.2	7,788.36	-488.03	-600.81	-470.72	763.25	218.08	1.28	127 °F	Green	10/27/17	10:07	548 (gpm)
85	7,942	2.3	98.8	7,883.29	-484.33	-600.92	-467.02	761.06	217.85	0.61	129 °F	Green	10/27/17	10:59	548 (gpm)
86	8,036	1.9	94.6	7,977.22	-480.93	-601.33	-463.60	759.29	217.63	0.46	131 °F	Green	10/27/17	11:52	548 (gpm)
87	8,131	1.7	125.9	8,072.18	-478.25	-602.28	-460.89	758.40	217.42	1.04	131 °F	Green	10/27/17	12:48	548 (gpm)
88	8,225	2.0	161.9	8,166.13	-476.68	-604.66	-459.25	759.29	217.22	1.25	133 °F	Green	10/27/17	13:34	548 (gpm)
89	8,319	1.7	161.5	8,260.08	-475.81	-607.54	-458.30	761.02	217.03	0.32	135 °F	Green	10/27/17	14:27	548 (gpm)
90	8,414	1.3	175.1	8,355.05	-475.34	-609.95	-457.76	762.62	216.89	0.56	135 °F	Green	10/27/17	15:55	548 (gpm)
91	8,508	5.9	90.8	8,448.87	-470.45	-611.08	-452.83	760.58	216.54	6.29	135 °F	Green	10/27/17	17:16	548 (gpm)
92	8,603	16.0	85.0	8,542.03	-452.45	-610.01	-434.86	749.14	215.48	10.68	133 °F	Green	10/27/17	19:03	506 (gpm)
93	8,697	22.9	85.0	8,630.61	-421.23	-607.28	-403.70	729.22	213.61	7.34	133 °F	Green	10/27/17	21:06	506 (gpm)
94	8,792	29.5	86.9	8,715.80	-379.34	-604.40	-361.88	704.46	210.91	7.00	133 °F	Green	10/27/17	22:56	506 (gpm)
95	8,886	38.3	89.8	8,793.75	-326.98	-603.05	-309.54	677.85	207.17	9.52	135 °F	Green	10/28/17	00:34	510 (gpm)
96	8,981	43.0	90.0	8,865.81	-265.13	-602.94	-247.67	651.83	202.33	4.95	135 °F	Green	10/28/17	03:45	510 (gpm)
97	9,048	46.7	90.6	8,913.30	-217.92	-603.20	-200.43	635.62	198.38	5.56	135 °F	Green	10/28/17	05:21	510 (gpm)
98	9,122	49.4	90.0	8,962.76	-162.92	-603.48	-145.40	620.75	193.55	3.70	140 °F	Green	10/31/17	21:19	323 (gpm)
99	9,216	63.7	86.3	9,014.46	-84.72	-600.75	-67.24	604.50	186.39	15.56	145 °F	Green	10/31/17	23:40	323 (gpm)
100	9,311	74.1	86.2	9,048.61	3.73	-594.96	21.08	595.33	177.97	10.95	149 °F	Green	11/01/17	01:47	323 (gpm)
101	9,405	78.7	85.2	9,070.71	94.97	-588.10	112.16	598.70	169.20	5.00	149 °F	Green	11/01/17	03:01	323 (gpm)
102	9,500	81.3	86.3	9,087.20	188.43	-581.17	205.45	616.42	160.53	2.96	154 °F	Green	11/01/17	04:28	323 (gpm)
103	9,594	83.5	86.2	9,099.63	281.53	-575.08	298.42	647.89	152.57	2.34	154 °F	Green	11/01/17	05:46	323 (gpm)
104	9,689	85.4	86.8	9,108.82	376.04	-569.30	392.79	691.66	145.40	2.10	156 °F	Green	11/01/17	07:41	323 (gpm)
105	9,783	87.0	85.5	9,115.05	469.76	-563.01	486.37	744.00	139.18	2.19	156 °F	Green	11/01/17	08:30	323 (gpm)
106	9,878	88.4	86.2	9,118.86	564.59	-556.14	581.04	804.30	133.75	1.65	162 °F	Green	11/01/17	09:51	323 (gpm)
107	9,972	90.6	90.4	9,119.68	658.56	-553.35	674.97	872.80	129.35	5.04	163 °F	Green	11/01/17	11:11	323 (gpm)
108	10,067	90.4	89.2	9,118.85	753.52	-553.02	769.96	947.98	125.69	1.28	165 °F	Green	11/01/17	12:08	323 (gpm)
109	10,161	90.6	88.4	9,118.03	847.51	-551.05	863.94	1,024.72	122.53	0.88	167 °F	Green	11/01/17	13:44	323 (gpm)

MWD SURVEYS

Customer: Marathon Oil
Well: Oilless 1334317
Field/Block: Wolfcamp Y
Co./Parish: Eddy County
State: New Mexico

PGS Job #: LNM1334317
MWD Operator: Ronnie Watson
Directional Driller: Johnny Gabrielson
Date of First Survey: October 13, 2017
Date of Last Survey: November 5, 2017



Total Correction: 7.51 East Grid
Vertical Section Plane: 88.33 Nominal Dip Angle: 60.07 Magnetic Field Strength: 0.480

Measured					Coordinates		Closure					Vib/Shk	Date	Time	Flow Rate
Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle	DLS	Temp (°F)	Color				
110	10,256	89.8	89.9	9,117.70	942.50	-549.64	958.93	1,105.28	119.82	1.79	153 °F		11/02/17	05:08	323 (gpm)
111	10,350	88.0	88.9	9,119.51	1,036.46	-548.66	1,052.90	1,187.27	117.52	2.19	153 °F		11/02/17	06:09	323 (gpm)
112	10,444	87.2	88.4	9,123.44	1,130.38	-546.44	1,146.79	1,270.32	115.48	1.00	153 °F		11/02/17	06:53	323 (gpm)
113	10,539	87.8	88.2	9,127.59	1,225.28	-543.63	1,241.66	1,355.45	113.65	0.67	156 °F		11/02/17	07:53	323 (gpm)
114	10,633	87.7	88.0	9,131.28	1,319.21	-540.51	1,335.53	1,440.76	112.03	0.24	160 °F		11/02/17	08:42	323 (gpm)
115	10,728	89.7	87.3	9,133.43	1,414.18	-536.62	1,430.42	1,527.77	110.56	2.23	162 °F		11/02/17	10:09	323 (gpm)
116	10,822	91.5	87.9	9,132.45	1,508.16	-532.68	1,524.33	1,614.72	109.26	2.02	162 °F		11/02/17	11:15	323 (gpm)
117	10,917	91.0	87.8	9,130.38	1,603.13	-529.12	1,619.24	1,703.50	108.10	0.54	163 °F		11/02/17	12:13	323 (gpm)
118	11,011	91.1	87.4	9,128.65	1,697.11	-525.19	1,713.14	1,791.84	107.04	0.44	163 °F		11/02/17	13:09	323 (gpm)
119	11,106	90.8	89.1	9,127.08	1,792.09	-522.29	1,808.08	1,882.00	106.11	1.82	165 °F		11/02/17	14:38	323 (gpm)
120	11,200	89.0	89.6	9,127.24	1,886.07	-521.22	1,902.07	1,972.19	105.32	1.99	165 °F		11/02/17	16:16	323 (gpm)
121	11,295	88.2	89.3	9,129.56	1,981.02	-520.31	1,997.04	2,063.70	104.60	0.90	167 °F		11/02/17	17:38	323 (gpm)
122	11,389	88.3	89.6	9,132.43	2,074.96	-519.41	2,090.99	2,154.53	103.95	0.34	171 °F		11/02/17	07:31	312 (gpm)
123	11,484	87.5	89.1	9,135.92	2,169.88	-518.33	2,185.92	2,246.53	103.34	0.99	171 °F		11/02/17	20:26	312 (gpm)
124	11,578	87.0	88.8	9,140.43	2,263.77	-516.61	2,279.79	2,337.59	102.77	0.62	174 °F		11/02/17	21:40	312 (gpm)
125	11,673	87.6	88.0	9,144.90	2,358.66	-513.96	2,374.65	2,429.63	102.21	1.05	174 °F		11/02/17	23:35	312 (gpm)
126	11,768	89.2	86.3	9,147.55	2,453.60	-509.24	2,469.49	2,521.45	101.65	2.46	178 °F		11/03/17	01:28	316 (gpm)
127	11,862	88.5	84.9	9,149.44	2,547.47	-502.03	2,563.19	2,611.89	101.08	1.66	180 °F		11/03/17	02:50	316 (gpm)
128	11,957	89.9	86.3	9,150.77	2,642.35	-494.74	2,657.90	2,703.55	100.54	2.08	180 °F		11/03/17	05:01	318 (gpm)
129	12,052	90.7	89.0	9,150.27	2,737.33	-490.84	2,752.80	2,796.22	100.11	2.96	180 °F		11/03/17	07:33	318 (gpm)
130	12,146	90.5	88.7	9,149.28	2,831.32	-488.96	2,846.78	2,888.47	99.75	0.38	181 °F		11/03/17	09:41	318 (gpm)
131	12,241	90.4	88.1	9,148.54	2,926.32	-486.31	2,941.74	2,981.66	99.39	0.64	158 °F		11/04/17	04:41	318 (gpm)
132	12,335	90.1	89.8	9,148.13	3,020.31	-484.58	3,035.72	3,074.15	99.07	1.84	167 °F		11/04/17	05:51	318 (gpm)
133	12,430	89.9	91.4	9,148.13	3,115.23	-485.58	3,130.71	3,168.14	98.82	1.70	167 °F		11/04/17	07:52	318 (gpm)
134	12,524	88.3	90.8	9,149.60	3,209.11	-487.38	3,224.68	3,261.30	98.59	1.82	167 °F		11/04/17	09:31	300 (gpm)
135	12,619	87.7	90.2	9,152.92	3,303.98	-488.21	3,319.62	3,355.32	98.37	0.89	167 °F		11/04/17	10:22	300 (gpm)
136	12,714	87.5	89.3	9,156.90	3,398.87	-487.80	3,414.53	3,449.20	98.13	0.97	172 °F		11/04/17	11:12	300 (gpm)
137	12,809	85.4	87.4	9,162.78	3,493.67	-485.07	3,509.30	3,542.67	97.87	2.98	176 °F		11/04/17	11:56	300 (gpm)

MWD SURVEYS

Customer: Marathon Oil
Well: Cypress Fee 4H
Field/Block: Wolfcamp Y
Co./Parish: Eddy County
State: New Mexico

PGS Job #: LNM1334317
MWD Operator: Ronnie Watson
Directional Driller: Johnny Gabrielson
Date of First Survey: October 13, 2017
Date of Last Survey: November 5, 2017



Total Correction: 7.51 East Grid

Vertical Section Plane: 88.33 Nominal Dip Angle: 60.07 Magnetic Field Strength: 0.480

Measured		Coordinates						Closure		Vib/Shk					
Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle	DLS	Temp (°F)	Color	Date	Time	Flow Rate	
138	12,903	86.4	86.1	9,169.50	3,587.39	-479.75	3,602.91	3,634.71	97.58	1.74	176 °F	Green	11/04/17	17:46	300 (gpm)
139	12,998	89.5	84.8	9,172.90	3,682.20	-472.22	3,697.53	3,727.56	97.28	3.54	174 °F	Green	11/04/17	19:49	300 (gpm)
140	13,092	91.9	87.1	9,171.75	3,776.10	-465.58	3,791.28	3,819.76	97.00	3.54	180 °F	Green	11/04/17	21:42	300 (gpm)
141	13,187	92.5	86.1	9,168.10	3,870.98	-459.95	3,886.04	3,913.16	96.75	1.23	180 °F	Green	11/05/17	00:00	300 (gpm)
142	13,281	93.6	88.0	9,163.10	3,964.82	-455.12	3,979.77	4,005.71	96.52	2.33	174 °F	Green	11/05/17	02:08	300 (gpm)
143	13,376	92.4	90.5	9,158.13	4,059.67	-453.88	4,074.63	4,099.83	96.36	2.92	174 °F	Green	11/05/17	07:44	300 (gpm)
144	13,470	89.6	92.3	9,156.49	4,153.51	-456.18	4,168.57	4,193.46	96.25	3.54	176 °F	Green	11/05/17	11:36	300 (gpm)
145	13,564	88.8	92.0	9,157.80	4,247.29	-459.70	4,262.50	4,287.21	96.16	0.91	180 °F	Green	11/05/17	12:37	300 (gpm)
146	13,603	88.8	92.0	9,158.62	4,286.20	-461.07	4,301.46	4,326.10	96.12	0.00	180 °F	Green	11/05/17	13:07	300 (gpm)
PTB	13,673	88.8	92.0	9,160.08	4,356.04	-463.51	4,371.40	4,395.91	96.05	0.00	180 °F	Green	11/05/17		TD