



# **Waterflood Progress Report**

**2014**

**East Manson Unit #4**

**Section 7 (LSD's 4, 5, & 12) TWP 14 RNG 28 W1M**

**Section 12 TWP 14 RNG 29 W1M**

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Figure 1: Rate vs Time of EMU #4

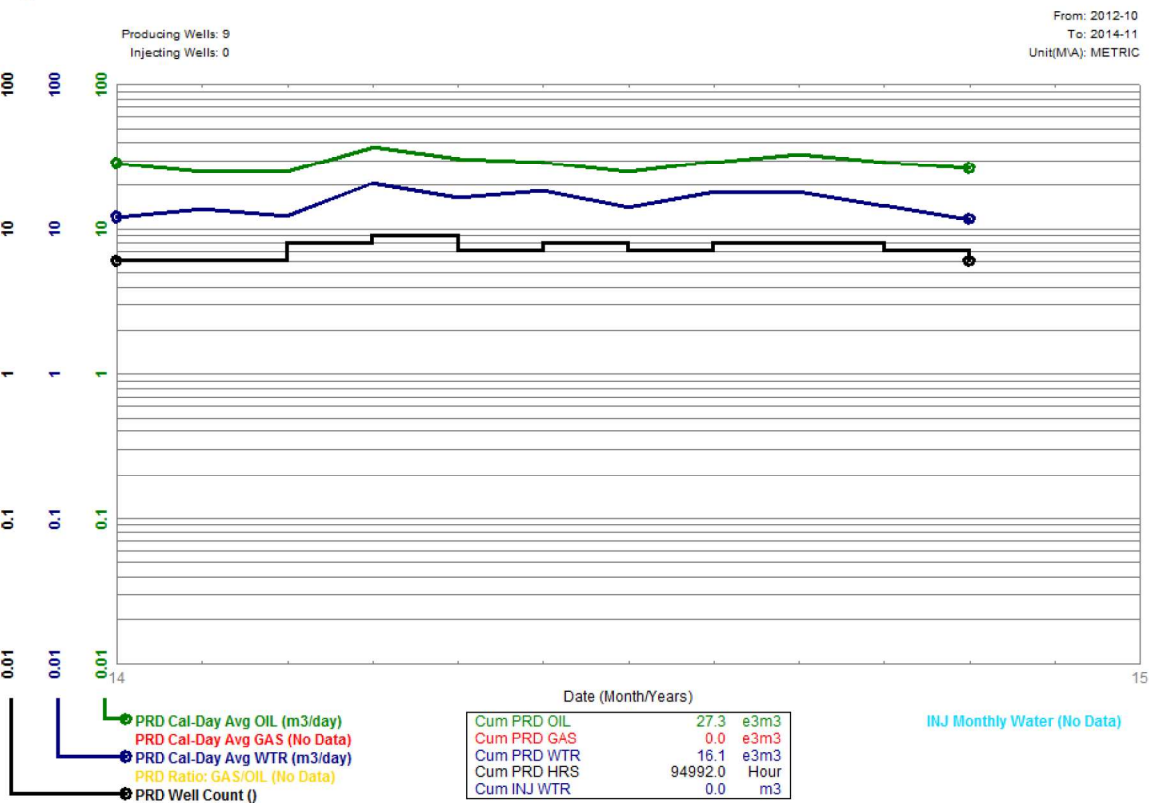


Figure 2: Rate vs Cum Production of EMU #4

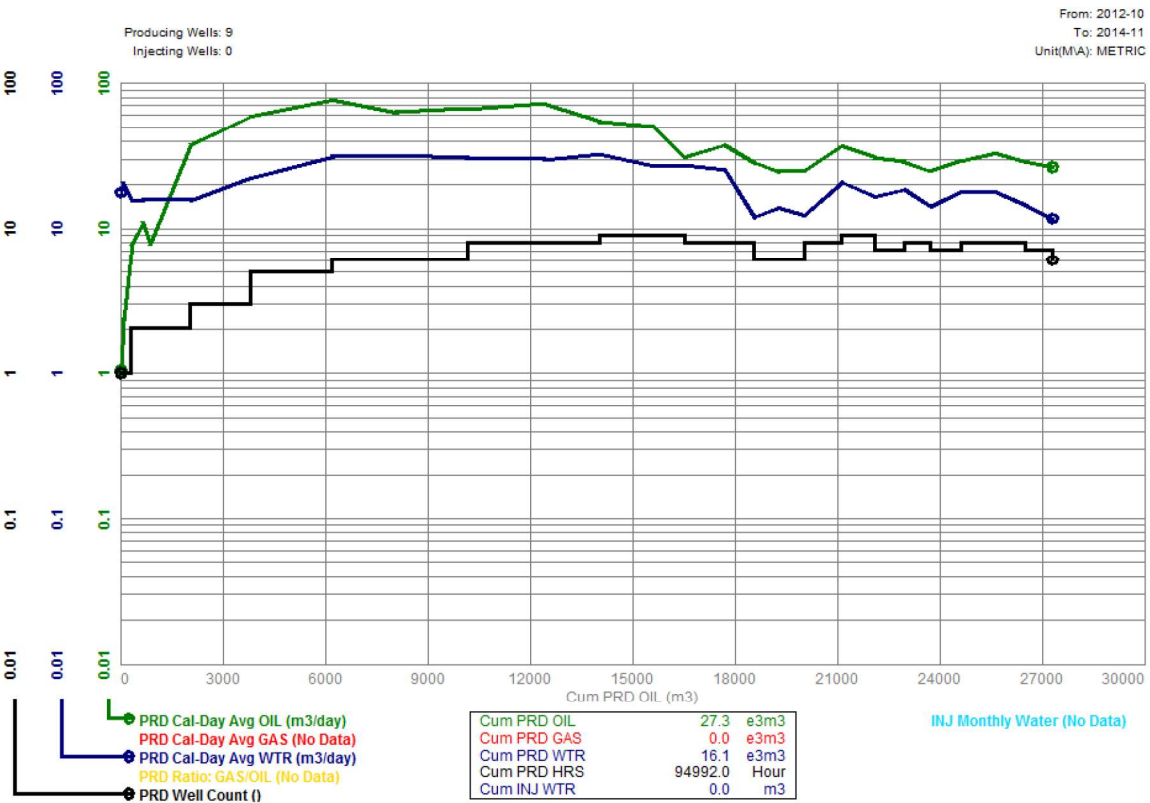
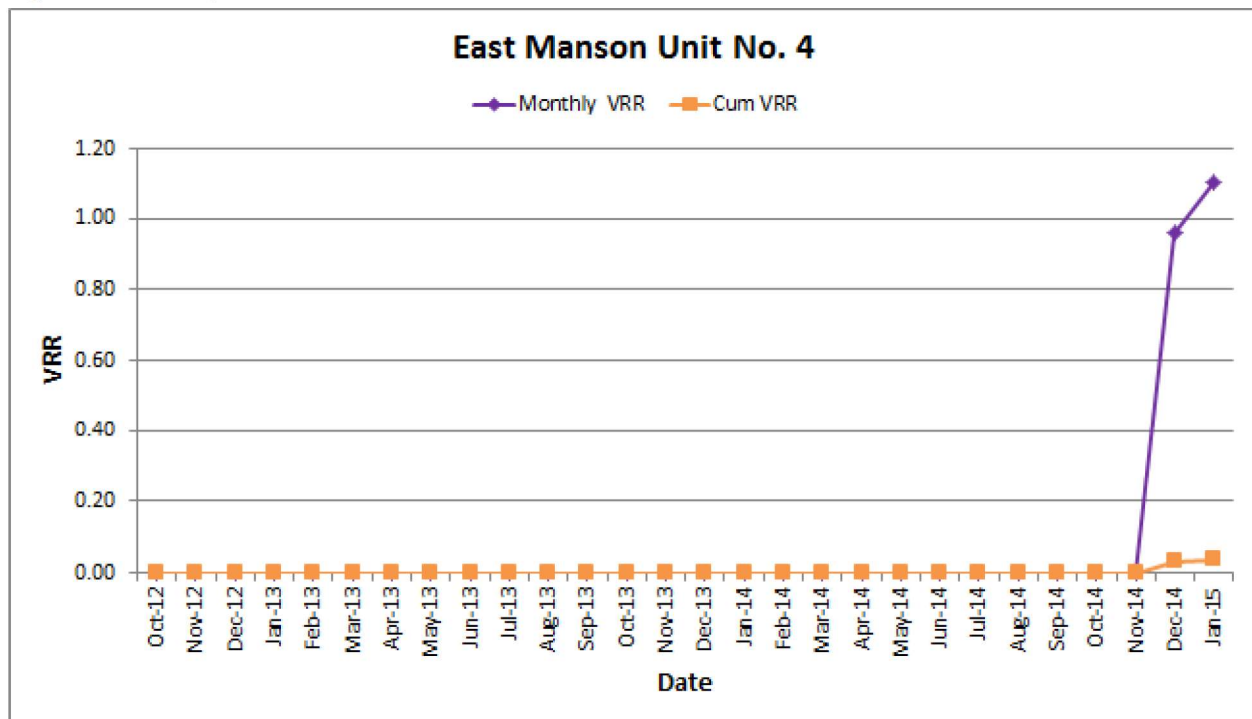


Figure 3: Injection Parameters

Month	Oil Rate (m3/d)	Gas Rate (m3/d)	Water Rate (m3/d)	Water Inj Rate (m3/d)	Water Inj Press (psi)	Cum Oil (m3)	Cum Gas (e3m3)	Cum Water (m3)	Cum Inj Water (m3)	GOR (m3/m3)	WOR (m3/m3)
Jan-14	28.4	0.0	12.0	0.0	-	18563.8	0.0	11321.0	0.0	0	0.42
Feb-14	24.6	0.0	13.8	0.0	-	19252.5	0.0	11708.2	0.0	0	0.56
Mar-14	24.9	0.0	12.3	0.0	-	20023.8	0.0	12090.5	0.0	0	0.50
Apr-14	36.9	0.0	20.7	0.0	-	21132.1	0.0	12711.9	0.0	0	0.56
May-14	30.8	0.0	16.6	0.0	-	22086.4	0.0	13225.1	0.0	0	0.54
Jun-14	28.8	0.0	18.5	0.0	-	22951.4	0.0	13779.8	0.0	0	0.64
Jul-14	24.8	0.0	14.2	0.0	-	23719.9	0.0	14219.7	0.0	0	0.57
Aug-14	29.2	0.0	18.0	0.0	-	24624.5	0.0	14776.2	0.0	0	0.62
Sep-14	32.9	0.0	17.9	0.0	-	25610.3	0.0	15312.0	0.0	0	0.54
Oct-14	28.9	0.0	14.4	0.0	-	26504.6	0.0	14226.2	0.0	0	0.50
Nov-14	26.4	0.0	11.7	0.0	-	27295.1	0.0	14569.8	0.0	0	0.44

Month	Days	Monthly Oil Prod (m3)	Monthly Gas Prod (Eam3)	Monthly H2O Prod (m3)	Monthly H2O Inj (m3)	Oil Prod (m3/d)	Gas Prod (Eam3/d)	H2O Prod (m3/d)	H2O Inj (m3/d)	Cum Oil (m3)	Cum Gas (Eam3)	Cum H2O (m3)	Cum H2O Inj (m3)	Prod Well Count	GOR (m3/m3)	H2OCut %	Voidage (m3/d)	Monthly VRR	Cum GOR (m3)	H2OCut %	Cum Void (m3)	Cum VRR
Oct-12	31	32.0	0	546.2	0	1	0	18	0	32	0	546	0	1	0	94.5%	18	0.00	0.0	94.5%	572.3	0.000
Nov-12	30	70.2	0	617.6	0	2	0	21	0	102	0	1164	0	1	0	89.8%	22	0.00	0.0	91.9%	1244.3	0.000
Dec-12	31	240.5	0	480.0	0	8	0	15	0	343	0	1644	0	2	0	66.6%	21	0.00	0.0	82.7%	1902.3	0.000
Jan-13	31	339.6	0	488.3	0	11	0	16	0	682	0	2132	0	2	0	59.0%	24	0.00	0.0	75.8%	2641.0	0.000
Feb-13	28	218.2	0	446.8	0	8	0	16	0	901	0	2579	0	2	0	67.2%	22	0.00	0.0	74.1%	3249.4	0.000
Mar-13	31	1171.0	0	485.7	0	38	0	16	0	2072	0	3065	0	3	0	29.3%	43	0.00	0.0	59.7%	4592.4	0.000
Apr-13	30	1753.8	0	664.4	0	58	0	22	0	3825	0	3729	0	5	0	27.5%	65	0.00	0.0	48.4%	6540.4	0.000
May-13	31	2393.4	0	968.0	0	77	0	31	0	6219	0	4697	0	6	0	28.8%	88	0.00	0.0	43.0%	9260.4	0.000
Jun-13	30	1885.0	0	963.0	0	63	0	32	0	8104	0	5660	0	6	0	33.8%	78	0.00	0.0	41.1%	11604.3	0.000
Jul-13	31	2061.7	0	950.8	0	67	0	31	0	10165	0	6611	0	8	0	31.6%	75	0.00	0.0	39.4%	14065.0	0.000
Aug-13	31	2247.6	0	925.6	0	73	0	30	0	12413	0	7536	0	8	0	29.2%	83	0.00	0.0	37.8%	16636.0	0.000
Sep-13	30	1631.2	0	970.9	0	54	0	32	0	14044	0	8507	0	9	0	37.3%	72	0.00	0.0	37.7%	18802.5	0.000
Oct-13	31	1558.1	0	837.6	0	50	0	27	0	15602	0	9345	0	9	0	35.0%	64	0.00	0.0	37.5%	20781.8	0.000
Nov-13	30	924.2	0	812.7	0	31	0	27	0	16527	0	10158	0	8	0	46.8%	50	0.00	0.0	38.1%	22773.3	0.000
Dec-13	31	1157.2	0	782.1	0	37	0	26	0	17684	0	10950	0	8	0	40.6%	53	0.00	0.0	38.2%	23914.1	0.000
Jan-14	31	880.1	0	371.3	0	28	0	12	0	18564	0	11321	0	6	0	29.7%	33	0.00	0.0	37.9%	24929.8	0.000
Feb-14	28	688.7	0	387.2	0	25	0	14	0	19253	0	11708	0	6	0	36.0%	32	0.00	0.0	37.8%	25821.7	0.000
Mar-14	31	771.3	0	382.3	0	25	0	12	0	20024	0	12091	0	8	0	33.1%	31	0.00	0.0	37.6%	26769.0	0.000
Apr-14	30	1108.3	0	621.4	0	37	0	21	0	21132	0	12712	0	9	0	35.9%	48	0.00	0.0	37.6%	28202.5	0.000
May-14	31	954.3	0	513.2	0	31	0	17	0	22086	0	13225	0	7	0	35.0%	35	0.00	0.0	37.5%	29415.0	0.000
Jun-14	30	865.0	0	554.7	0	29	0	18	0	22951	0	13780	0	8	0	39.1%	40	0.00	0.0	37.5%	30603.9	0.000
Jul-14	31	768.5	0	439.9	0	25	0	14	0	23720	0	14220	0	7	0	36.4%	32	0.00	0.0	37.5%	31607.1	0.000
Aug-14	31	904.6	0	556.5	0	29	0	18	0	24624	0	14776	0	8	0	38.1%	39	0.00	0.0	37.5%	32826.7	0.000
Sep-14	30	985.8	0	555.8	0	33	0	18	0	25610	0	15312	0	8	0	35.2%	42	0.00	0.0	37.4%	34084.8	0.000
Oct-14	31	894.4	0	446.4	0	29	0	14	0	26505	0	14226	0	7	0	33.3%	36	0.00	0.0	34.9%	35646.4	0.000
Nov-14	30	790.5	0	350.1	0	26	0	12	0	27395	0	14570	0	6	0	30.7%	31	0.00	0.0	34.8%	34568.8	0.000

Figure 4: Monthly and Cum VRR vs Time for EMU #4



## Discussion

In November/December 2014, Surge converted 1 well to injection (100/11-12) and injection commenced in December.

No production plots will be included for offsetting producers since public data is only current to November.

Initial response has been favorable, though, and Surge plans to convert 1 additional well to injection (100/05-12) in 2015.