

WASKADA UNIT NO. 3 - PM 58

Waterflood Progress Report 2020

Prepared for:

Manitoba Industry, Economic Development and Mines

Petroleum Branch

Prepared by:



TUNDRA OIL & GAS

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Introduction

Waskada Unit No. 3 Enhanced Oil Recovery (EOR) Waterflood Project was approved under Board Order No. PM58 effective May 1984. The Unit area wells in 50 LSDs in Townships 1 & 2, Ranges 25 & 26 W1. The Unit contains 114 wells. 17 producers, 16 injectors, and 81 abandoned/suspended/other.

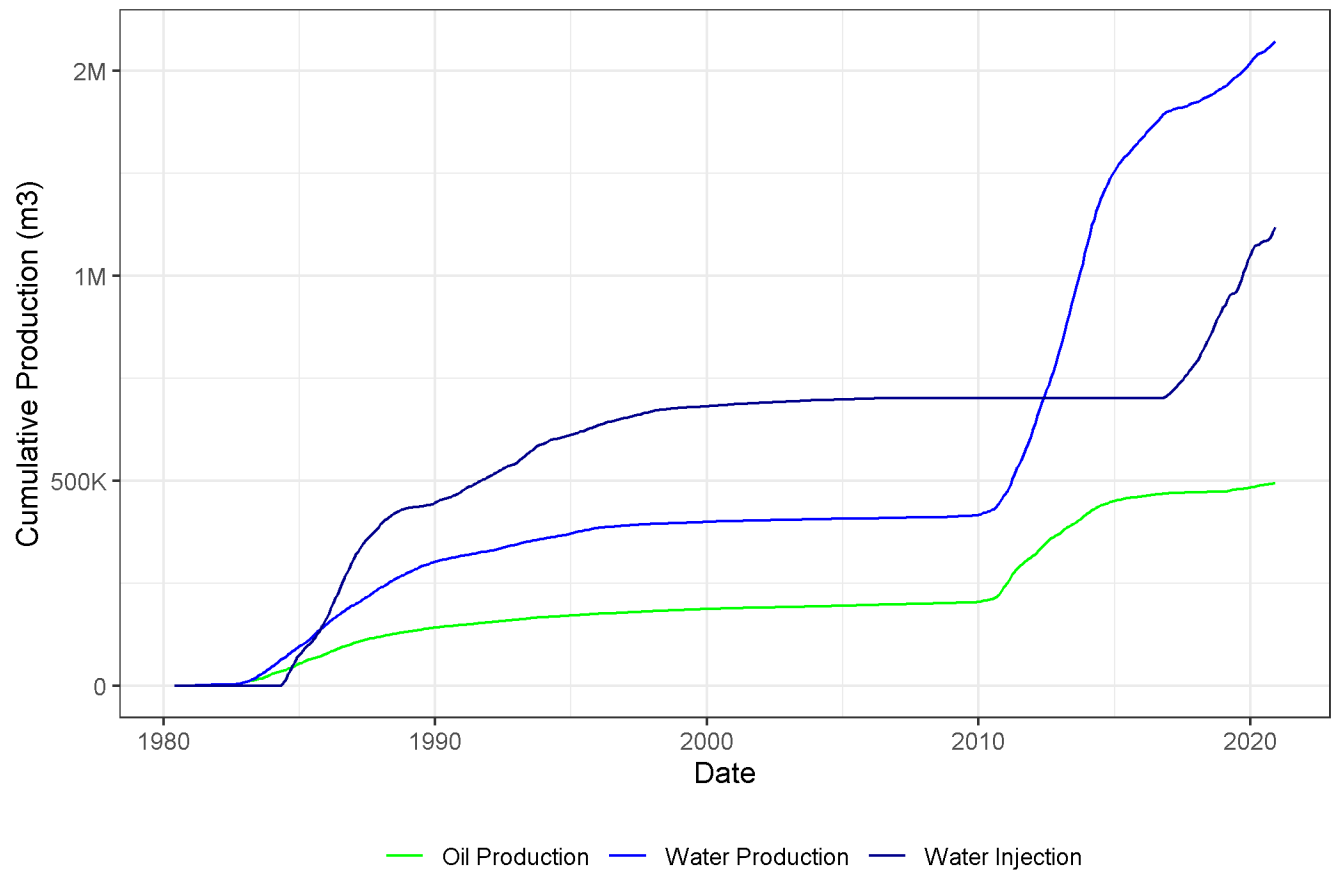
Monthly oil and water production rates, injection rate, GOR and WOR

MONTH	Cal Day Oil m3/d	Cal Day Water m3/d	Cal Day Injection m3/d	WOR	GOR
JAN 2020	41.48	233.70	450.21	5.63	0
FEB 2020	35.16	219.01	383.87	6.23	0
MAR 2020	38.53	220.46	365.40	5.72	0
APR 2020	39.21	212.76	85.23	5.43	0
MAY 2020	28.05	69.60	33.48	2.48	0
JUN 2020	25.92	85.30	141.51	3.29	0
JUL 2020	32.76	101.65	93.37	3.10	0
AUG 2020	33.48	141.79	48.38	4.24	0
SEP 2020	26.43	123.63	72.75	4.68	0
OCT 2020	24.22	173.37	265.94	7.16	0
NOV 2020	26.32	166.58	356.97	6.33	0
DEC 2020	27.30	171.49	404.10	6.28	0
Average	31.57	159.94	225.10		

Year summary of produced oil, gas, water and fluid injected

Categories	m3
Oil Production	11,556
Water Production	58,472
Gas Production	0
Water Injection	82,313
Cumulative Oil	494,314
Cumulative Water	1,570,677
Cumulative Injection	1,118,822

Cumulative Production and Injection



Monthly Wellhead Pressure

All readings are in kPa

UWI	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Average
102.04-36-001-26W1.00	3,783	3,787	2,917	766	208	208	208	208	208	208	822	2,604	1,327
102.05-31-001-25W1.00	1,988	1,989	2,026	1,712	1,657	1,271	675	687	687	86	650	2,563	1,333
102.08-05-002-25W1.00	2,820	2,676	1,457	638	1,151	2,740	2,984	2,620	3,135	3,246	3,476	3,575	2,543
102.08-36-001-26W1.00	2,985	2,986	1,878	539	192	322	532			-69	484	2,267	1,212
102.12-31-001-25W1.00	-92	-91	-91	-93	-93	-92	-91	-91	-91	-92	-91	-91	-92
102.14-36-001-26W1.00	2,443	2,972	3,028	2,974	2,973	2,973	2,973	2,973	2,973	2,973	2,973	2,973	2,933
102.16-36-001-26W1.00	491	771	1,149	1,419	1,425	1,032	-55	-86	-86	50	567	1,298	665
103.04-05-002-25W1.00	-10	-28	-22	-5	361	1,787	2,316	2,572	2,864	2,410	2,442	2,462	1,429
103.08-36-001-26W1.00	2,731	2,795	2,790	2,003	1,850	2,075	259	-49	-49	1,892	2,983	2,980	1,855
103.12-31-001-25W1.00	3,751	3,740	3,788	3,787	3,787	3,787	3,787	3,787	3,787	3,787	3,787	3,787	3,780
103.16-36-001-26W1.00	3,784	3,802	3,753	3,843	3,843	3,787	2,484	2,273	2,273	3,096	3,887	3,878	3,392
104.08-05-002-25W1.00								139	720	936	1,079	1,257	826
104.08-31-001-25W1.00	448	647	784	819	821	612	-89	-89	-89	-90	-72	-70	303
104.09-31-001-25W1.00	1,495	1,495	1,495	1,495	1,495	1,495	1,495	1,495	1,495	1,495	1,495	1,495	1,495
105.09-36-001-26W1.00	1,989	2,042	1,988	529	216	216	216	216	216	-19	-90	1,020	712
106.04-31-001-25W1.00	2,984	2,985	2,984	1,760	1,514	1,264	1,689	1,700	1,700	313	174	1,476	1,712

Monthly Injected Volumes

All Volumes are in m3

UWI	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
102.04-36-001-26W1.00	318	187	228	29							192	332	1,286
102.05-31-001-25W1.00	1,262	1,123	1,149	218		384	152			708	1,227	1,523	7,746
102.08-05-002-25W1.00	918	378	126	297	518	890	944	598	811	887	894	922	8,183
102.08-36-001-26W1.00	945	573	593	170		192	111			459	596	911	4,550
102.12-31-001-25W1.00	1,534	1,444	1,514	297		392	155			983	1,397	1,537	9,253
102.14-36-001-26W1.00	960	869	783	97									2,709
102.16-36-001-26W1.00	1,227	1,151	1,209	248		299	146			709	892	1,018	6,899
103.04-05-002-25W1.00	306	130	310	299	520	888	934	868	829	830	836	863	7,613
103.08-36-001-26W1.00	498	301	470	79		189	81			478	450	408	2,954
103.12-31-001-25W1.00	551	654	522	66									1,793
103.16-36-001-26W1.00	369	337	285	41		186	68			454	401	327	2,468
104.08-05-002-25W1.00								34	542	582	588	614	2,360
104.08-31-001-25W1.00	1,844	1,734	1,811	307		520	183			969	1,468	1,829	10,665
104.09-31-001-25W1.00	777												777
105.09-36-001-26W1.00	1,520	1,438	1,489	301						715	1,042	1,315	7,820
106.04-31-001-25W1.00	928	812	838	108		305	121			470	726	928	5,236
Grand Total	13,957	11,131	11,327	2,557	1,038	4,245	2,895	1,500	2,182	8,244	10,709	12,527	82,312

Voidage

All Volumes are in m3 Oil Formation Volume Factor (Rm3/Sm3) = 1.17								
MONTH	Oil	Water	Injection	Cumulative Oil	Cumulative Water	Cumulative Injection	VRR	Cumulative VRR
JAN 2020	1,286	7,244	13,957	484,040	1,519,443	1,050,465	1.595	0.504
FEB 2020	1,020	6,352	11,132	485,060	1,525,795	1,061,597	1.475	0.507
MAR 2020	1,194	6,834	11,327	486,254	1,532,629	1,072,924	1.376	0.511
APR 2020	1,176	6,383	2,557	487,430	1,539,012	1,075,481	0.330	0.510
MAY 2020	870	2,158	1,038	488,300	1,541,170	1,076,519	0.327	0.510
JUN 2020	778	2,559	4,245	489,078	1,543,729	1,080,764	1.224	0.511
JUL 2020	1,016	3,151	2,894	490,094	1,546,880	1,083,658	0.667	0.511
AUG 2020	1,038	4,395	1,500	491,132	1,551,275	1,085,158	0.267	0.510
SEP 2020	793	3,709	2,183	491,925	1,554,984	1,087,341	0.471	0.510
OCT 2020	751	5,374	8,244	492,676	1,560,358	1,095,585	1.318	0.513
NOV 2020	789	4,997	10,709	493,465	1,565,355	1,106,294	1.809	0.516
DEC 2020	846	5,316	12,527	494,311	1,570,671	1,118,821	1.987	0.521

Workovers

UWI	Date	Description
102.14-32-001-25W1.00	2020-12-01	Rigless Acid Stimulation
103.14-32-001-25W1.00	2020-12-07	Rigless Acid Stimulation

Well List

UWI	Type	Status
100.02-30-001-25W1.00	Vertical	Abandoned
102.02-30-001-25W1.00	Horizontal	Suspended
103.02-30-001-25W1.00	Horizontal	Abandoned Zone
102.04-30-001-25W1.00	Vertical	Abandoned
100.05-30-001-25W1.02	Vertical	Abandoned
102.05-30-001-25W1.00	Horizontal	Producing
103.05-30-001-25W1.00	Horizontal	Producing
104.05-30-001-25W1.00	Horizontal	Suspended
102.07-30-001-25W1.00	Vertical	Abandoned
100.08-30-001-25W1.02	Vertical	Abandoned
100.09-30-001-25W1.00	Vertical	Abandoned Zone
100.11-30-001-25W1.02	Vertical	Abandoned Zone
102.11-30-001-25W1.02	Vertical	Abandoned
102.12-30-001-25W1.00	Vertical	Abandoned
100.13-30-001-25W1.00	Vertical	Abandoned
102.13-30-001-25W1.00	Horizontal	Producing
103.13-30-001-25W1.00	Horizontal	Producing
104.13-30-001-25W1.00	Horizontal	Producing
100.14-30-001-25W1.00	Vertical	Abandoned
100.15-30-001-25W1.00	Vertical	Abandoned
100.16-30-001-25W1.00	Vertical	Abandoned
102.16-30-001-25W1.00	Horizontal	Producing
103.16-30-001-25W1.00	Horizontal	Producing
104.16-30-001-25W1.00	Horizontal	Producing
105.16-30-001-25W1.00	Horizontal	Producing
100.01-31-001-25W1.00	Vertical	Abandoned
102.01-31-001-25W1.00	Horizontal	Producing
100.02-31-001-25W1.00	Vertical	Abandoned
100.03-31-001-25W1.00	Vertical	Abandoned
102.04-31-001-25W1.00	Vertical	Abandoned
103.04-31-001-25W1.00	Horizontal	Producing
104.04-31-001-25W1.00	Horizontal	Producing
105.04-31-001-25W1.00	Horizontal	Producing
106.04-31-001-25W1.00	Horizontal	Injection
100.05-31-001-25W1.00	Vertical	Abandoned
102.05-31-001-25W1.00	Horizontal	Injection
103.05-31-001-25W1.00	Horizontal	Producing
100.06-31-001-25W1.00	Vertical	Abandoned
100.07-31-001-25W1.00	Vertical	Abandoned
100.08-31-001-25W1.00	Vertical	Abandoned
102.08-31-001-25W1.00	Horizontal	Producing
103.08-31-001-25W1.00	Horizontal	Producing
104.08-31-001-25W1.00	Horizontal	Injection

UWI	Type	Status
100.09-31-001-25W1.00	Vertical	Abandoned
102.09-31-001-25W1.00	Horizontal	Suspended
103.09-31-001-25W1.00	Horizontal	Producing
104.09-31-001-25W1.00	Horizontal	Injection
100.10-31-001-25W1.00	Vertical	Abandoned
100.11-31-001-25W1.00	Vertical	Abandoned
100.12-31-001-25W1.02	Vertical	Abandoned
102.12-31-001-25W1.00	Horizontal	Injection
103.12-31-001-25W1.00	Horizontal	Injection
104.12-31-001-25W1.00	Horizontal	Producing
100.13-31-001-25W1.00	Vertical	Abandoned
102.13-31-001-25W1.00	Horizontal	Producing
103.13-31-001-25W1.00	Horizontal	Producing
104.13-31-001-25W1.00	Horizontal	Suspended
100.14-31-001-25W1.00	Vertical	Abandoned
100.15-31-001-25W1.00	Vertical	Abandoned
100.16-31-001-25W1.00	Vertical	Abandoned
102.16-31-001-25W1.00	Horizontal	Suspended
103.16-31-001-25W1.00	Horizontal	Producing
104.16-31-001-25W1.00	Horizontal	Suspended
100.11-32-001-25W1.00	Vertical	Abandoned Zone
102.11-32-001-25W1.00	Horizontal	Producing
103.11-32-001-25W1.00	Horizontal	Producing
100.12-32-001-25W1.00	Vertical	Abandoned Zone
100.13-32-001-25W1.00	Vertical	Abandoned
102.13-32-001-25W1.00	Horizontal	Suspended
100.14-32-001-25W1.00	Vertical	Abandoned
102.14-32-001-25W1.00	Horizontal	Producing
103.14-32-001-25W1.00	Horizontal	Producing
104.01-36-001-26W1.00	Horizontal	Producing
100.04-36-001-26W1.00	Vertical	Abandoned
102.04-36-001-26W1.00	Horizontal	Injection
103.04-36-001-26W1.00	Horizontal	Producing
100.05-36-001-26W1.00	Vertical	Abandoned
100.06-36-001-26W1.00	Vertical	Abandoned Zone
100.07-36-001-26W1.00	Vertical	Abandoned
100.08-36-001-26W1.00	Vertical	Abandoned
102.08-36-001-26W1.00	Horizontal	Injection
103.08-36-001-26W1.00	Horizontal	Injection
104.08-36-001-26W1.00	Horizontal	Producing
100.09-36-001-26W1.02	Vertical	Abandoned
102.09-36-001-26W1.00	Horizontal	Producing
103.09-36-001-26W1.00	Horizontal	Suspended
104.09-36-001-26W1.00	Horizontal	Producing
105.09-36-001-26W1.00	Horizontal	Injection
100.10-36-001-26W1.00	Vertical	Abandoned Zone
100.11-36-001-26W1.00	Vertical	Abandoned Zone

UWI	Type	Status
100.13-36-001-26W1.00	Vertical	Abandoned
100.14-36-001-26W1.00	Vertical	Abandoned
102.14-36-001-26W1.00	Horizontal	Injection
103.14-36-001-26W1.00	Horizontal	Producing
100.15-36-001-26W1.00	Vertical	Abandoned
100.16-36-001-26W1.00	Vertical	Abandoned
102.16-36-001-26W1.00	Horizontal	Injection
103.16-36-001-26W1.00	Horizontal	Injection
104.16-36-001-26W1.00	Horizontal	Producing
100.01-05-002-25W1.00	Vertical	Abandoned Zone
102.01-05-002-25W1.00	Horizontal	Abandoned Zone
103.01-05-002-25W1.00	Horizontal	Suspended
104.01-05-002-25W1.00	Horizontal	Suspended
100.02-05-002-25W1.00	Vertical	Abandoned Zone
100.03-05-002-25W1.00	Vertical	Abandoned Zone
100.04-05-002-25W1.00	Vertical	Abandoned Zone
102.04-05-002-25W1.00	Horizontal	Producing
103.04-05-002-25W1.00	Horizontal	Injection
104.04-05-002-25W1.00	Horizontal	Producing
100.07-05-002-25W1.00	Vertical	Abandoned
100.08-05-002-25W1.00	Vertical	Abandoned Zone
102.08-05-002-25W1.00	Horizontal	Injection
103.08-05-002-25W1.00	Horizontal	Producing
104.08-05-002-25W1.00	Horizontal	Injection