


WASKADA UNIT NO. 19
Waterflood Progress Report 2020

Prepared for:
Manitoba Industry, Economic Development and Mines
Petroleum Branch

Prepared by:
 **TUNDRA OIL & GAS**

Date: 2021-08-26

Introduction

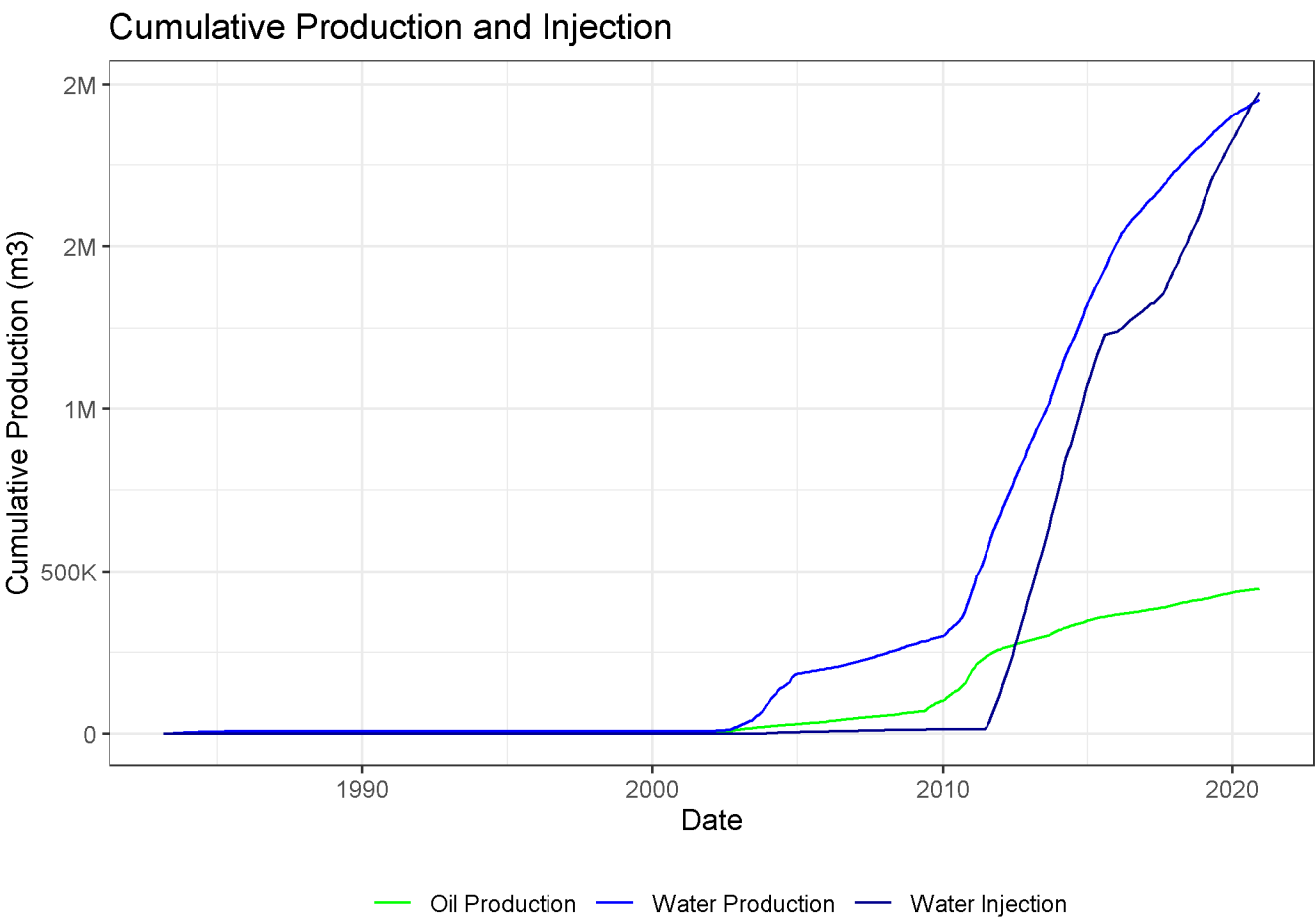
The Waskada Unit No. 19 pressure maintenance project commenced water injection into the Lower Amaranth A pool in accordance with Manitoba Energy and Mines Order No. PM 14, dated August 1, 2003. Waskada Unit No. 19 was acquired from EOG Resources Canada Inc. effective October 1, 2014 (closing date December 1, 2014) with Tundra Oil and Gas (Tundra) as the new operator. THE EOR project area contains wells over 36 LSDs in Township 1, Range 25W1. The Unit contains 85 wells. 28 producers, 23 injectors, and 34 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	50.11	209.02	457.97	4.17	0
FEB 2020	46.48	219.77	410.29	4.73	0
MAR 2020	42.30	105.70	441.08	2.50	0
APR 2020	38.62	173.28	477.64	4.49	0
MAY 2020	21.15	92.22	463.99	4.36	0
JUN 2020	30.69	131.72	469.68	4.29	0
JUL 2020	29.27	164.30	467.57	5.61	0
AUG 2020	29.69	174.10	458.28	5.86	0
SEP 2020	30.14	171.41	425.46	5.69	0
OCT 2020	28.24	142.85	400.39	5.06	0
NOV 2020	42.44	158.51	404.83	3.73	0
DEC 2020	47.74	170.22	398.94	3.57	0
Average	36.41	159.43	439.68		

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

Categories	m3
Oil Production	13,309
Water Production	58,233
Gas Production	0
Water Injection	160,962
Cumulative Oil	445,972
Cumulative Water	1,954,346
Cumulative Injection	1,975,324



Monthly Wellhead Pressure

All readings are in kPa

UWI	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Average
100.02-34-001-25W1.00	1,065	1,065	1,065										1,065
100.06-27-001-25W1.00	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
100.07-27-001-25W1.00	1,790	1,930	1,845	1,383	1,818	1,797	1,727	1,774	1,733	1,639	1,705	1,648	1,732
100.08-34-001-25W1.00	4,991	4,991	4,991	4,991	4,991	4,991	4,991	4,991	4,991	4,991			4,991
100.10-34-001-25W1.00	2,984	2,984	2,984	2,984	2,984	2,984	2,984	2,984	2,984	2,984			2,984
102.03-34-001-25W1.00	4,495	4,561	4,628	4,711	4,744	5,177	5,650	5,841	5,742	5,745	5,865	5,787	5,246
102.04-34-001-25W1.00	4,961	4,977	4,979	4,910	4,979	4,967	4,950	4,977	4,940	4,975	4,980	4,975	4,964
102.08-34-001-25W1.00	1,990	1,978	3,395	4,027	3,976	3,979	4,328	4,951	4,927	4,929	4,970	4,948	4,033
102.09-27-001-25W1.00	4,901	4,972	4,684	4,973	4,974	4,945	3,832	2,828	2,828	2,828	2,828	2,828	3,952
102.09-34-001-25W1.00	4,964	4,958	4,830	4,941	4,974	4,981	4,961	4,979	4,962	4,924	4,969	4,957	4,950
102.12-34-001-25W1.00	4,950	4,974	4,863	4,908	4,962	4,970	4,940	4,971	4,946	4,960	4,840	4,970	4,938
102.13-34-001-25W1.00	3,732	3,884	3,379	3,631	3,755	3,696	3,522	3,678	3,618	3,355	3,595	3,612	3,621
102.14-34-001-25W1.00	3,945	3,874	3,666	3,854	3,986	3,993	3,924	3,951	3,955	3,930	3,866	3,958	3,908
102.16-34-001-25W1.00	1,533	1,533	1,533	1,533	1,533	1,533	1,533	1,533	1,533	1,533	1,533	1,533	1,533
103.01-34-001-25W1.00	3,944	3,177	3,755	3,971	3,963	3,982	4,433	4,888	4,967	4,966	4,966	4,966	4,332
103.04-27-001-25W1.00	4,870	4,974	4,973	4,965	4,972	6,393	4,931	4,972	4,930	4,854	4,977	4,975	5,066
103.05-34-001-25W1.00	4,967	4,986	4,988	4,947	4,983	5,510	5,923	5,980	5,944	5,925	5,976	6,002	5,511
103.13-27-001-25W1.00	3,219	3,409	3,361	3,286	3,217	3,148	3,003	3,066	2,955	2,828	2,937	2,922	3,113
103.16-27-001-25W1.00			-80	-93	-93	-12	1,051	1,973	1,990	1,983	1,991	1,988	1,070
103.16-34-001-25W1.00	3,940	3,973	3,977	3,990	4,165	3,882	3,904	3,980	3,981	3,960	3,978	3,977	3,976
104.04-34-001-25W1.00	2,933	2,930	3,070	3,174	3,289	3,381	3,319	3,470	3,486	3,443	3,564	3,639	3,308
104.09-27-001-25W1.00	4,894	4,983	4,980	4,980	4,978	4,956	4,838	4,979	4,939	4,919	4,984	4,984	4,951
104.12-27-001-25W1.00	6,374	4,982	4,982	4,984	4,982	4,983	4,951	4,981	5,004	4,930	4,985	4,969	5,092

Monthly Injected Volumes

All Volumes are in m3

UWI	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
100.07-27-001-25W1.00	575	576	613	592	617	592	608	617	592	591	596	617	7,186
102.03-34-001-25W1.00	1,224	1,151	1,227	1,186	1,233	1,326	1,498	1,496	1,435	1,416	1,394	1,411	15,997
102.04-34-001-25W1.00	589	536	542	547	537	510	518	511	483	492	472	482	6,219
102.08-34-001-25W1.00	343	280	685	666	538	454	519	600	516	470	425	413	5,909
102.09-27-001-25W1.00	571	541	463	466	446	414	200						3,101
102.09-34-001-25W1.00	300	255	243	235	220	201	197	189	176	171	163	162	2,512
102.12-34-001-25W1.00	512	472	480	490	480	462	470	455	432	433	410	408	5,504
102.13-34-001-25W1.00	1,462	939	1,026	1,525	1,549	1,481	1,522	1,543	1,480	1,475	1,487	1,540	17,029
102.14-34-001-25W1.00	1,488	1,260	1,041	1,398	1,451	1,365	1,444	1,442	1,405	1,441	1,457	1,504	16,696
103.01-34-001-25W1.00	1,088	335	1,102	823	748	657	756	737	178				6,424
103.04-27-001-25W1.00	868	834	880	850	882	848	881	897	880	889	879	915	10,503
103.05-34-001-25W1.00	433	398	402	409	300	496	487	441	404	391	376	371	4,908
103.13-27-001-25W1.00	1,179	1,152	1,226	1,184	1,235	1,176	1,209	1,234	1,183	1,181	1,192	1,230	14,381
103.16-27-001-25W1.00			485	888	1,045	1,178	1,218	1,084	787	663	552	505	8,405
103.16-34-001-25W1.00	799	566	516	455	439	397	403	394	377	376	362	370	5,454
104.04-34-001-25W1.00	1,224	1,151	1,229	1,187	1,233	1,187	1,220	1,235	1,185	1,181	1,191	1,232	14,455
104.09-27-001-25W1.00	1,118	1,054	1,102	1,043	1,044	987	989	992	936	927	886	902	11,980
104.12-27-001-25W1.00	425	397	414	385	387	358	355	340	317	314	302	306	4,300
Grand Total	14,198	11,897	13,676	14,329	14,384	14,089	14,494	14,207	12,766	12,411	12,144	12,368	160,963

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	1,554	6,480	14,197	434,220	1,902,594	1,828,556	1.711	0.759
FEB 2020	1,348	6,374	11,898	435,568	1,908,968	1,840,454	1.496	0.761
MAR 2020	1,311	3,277	13,674	436,879	1,912,245	1,854,128	2.842	0.765
APR 2020	1,159	5,199	14,329	438,038	1,917,444	1,868,457	2.186	0.769
MAY 2020	656	2,858	14,384	438,694	1,920,302	1,882,841	3.967	0.774
JUN 2020	921	3,952	14,090	439,615	1,924,254	1,896,931	2.801	0.778
JUL 2020	907	5,092	14,495	440,522	1,929,346	1,911,426	2.356	0.782
AUG 2020	920	5,398	14,207	441,442	1,934,744	1,925,633	2.194	0.786
SEP 2020	905	5,142	12,764	442,347	1,939,886	1,938,397	2.058	0.789
OCT 2020	875	4,428	12,412	443,222	1,944,314	1,950,809	2.277	0.792
NOV 2020	1,274	4,756	12,145	444,496	1,949,070	1,962,954	1.944	0.795
DEC 2020	1,480	5,278	12,367	445,976	1,954,348	1,975,321	1.764	0.798

Workovers

UWI	Date	Description
102.05-27-001-25W1.00	2020-11-19	Pump Change & Acid
102.05-34-001-25W1.00	2020-11-18	Rigless Acid Stimulation
102.16-27-001-25W1.00	2020-11-25	Rigless Acid Stimulation
103.01-27-001-25W1.00	2020-10-21	Rigless Acid Stimulation
103.03-34-001-25W1.00	2020-10-21	Rigless Acid Stimulation
103.04-34-001-25W1.00	2020-11-04	Rigless Acid Stimulation
103.08-27-001-25W1.00	2020-11-25	Rigless Acid Stimulation
103.09-27-001-25W1.00	2020-11-02	Cleanout & Selective Acid
103.13-34-001-25W1.00	2020-11-05	Rigless Acid Stimulation
104.01-27-001-25W1.00	2020-10-21	Rigless Acid Stimulation
104.01-34-001-25W1.00	2020-11-17	Rigless Acid Stimulation
104.05-34-001-25W1.00	2020-10-22	Rigless Acid Stimulation
105.04-34-001-25W1.00	2020-11-17	Rigless Acid Stimulation

Well List

UWI	Type	Status
100.01-27-001-25W1.00	Vertical	Abandoned Zone
102.01-27-001-25W1.00	Horizontal	Producing
103.01-27-001-25W1.00	Horizontal	Producing
104.01-27-001-25W1.00	Horizontal	Producing
100.03-27-001-25W1.00	Vertical	Abandoned
100.04-27-001-25W1.00	Vertical	Abandoned
102.04-27-001-25W1.00	Horizontal	Producing
103.04-27-001-25W1.00	Horizontal	Injection
100.05-27-001-25W1.00	Vertical	Abandoned Zone
102.05-27-001-25W1.00	Horizontal	Producing
103.05-27-001-25W1.00	Horizontal	Abandoned Zone
104.05-27-001-25W1.00	Horizontal	Abandoned Zone
100.06-27-001-25W1.00	Vertical	Injection
100.07-27-001-25W1.00	Vertical	Injection
100.08-27-001-25W1.00	Vertical	Abandoned Zone
102.08-27-001-25W1.00	Horizontal	Abandoned Zone
103.08-27-001-25W1.00	Horizontal	Producing
104.08-27-001-25W1.00	Horizontal	Producing
100.09-27-001-25W1.00	Vertical	Abandoned
102.09-27-001-25W1.00	Horizontal	Injection
103.09-27-001-25W1.00	Horizontal	Producing
104.09-27-001-25W1.00	Horizontal	Injection
102.10-27-001-25W1.00	Vertical	Abandoned
100.11-27-001-25W1.00	Vertical	Abandoned Zone
100.12-27-001-25W1.00	Vertical	Abandoned
102.12-27-001-25W1.00	Horizontal	Producing
103.12-27-001-25W1.00	Horizontal	Producing
104.12-27-001-25W1.00	Horizontal	Injection
100.13-27-001-25W1.00	Vertical	Abandoned Zone
102.13-27-001-25W1.00	Horizontal	Producing
103.13-27-001-25W1.00	Horizontal	Injection
100.14-27-001-25W1.00	Vertical	Injection
102.14-27-001-25W1.00	Horizontal	Producing
100.15-27-001-25W1.00	Vertical	Abandoned Zone
100.16-27-001-25W1.00	Vertical	Producing
102.16-27-001-25W1.00	Horizontal	Producing
103.16-27-001-25W1.00	Horizontal	Injection
104.16-27-001-25W1.00	Horizontal	Producing
100.01-33-001-25W1.00	Vertical	Abandoned Zone
100.07-33-001-25W1.00	Vertical	Abandoned Zone
100.08-33-001-25W1.00	Vertical	Abandoned
100.01-34-001-25W1.00	Vertical	Abandoned
102.01-34-001-25W1.00	Horizontal	Abandoned Zone

UWI	Type	Status
103.01-34-001-25W1.00	Horizontal	Injection
104.01-34-001-25W1.00	Horizontal	Producing
100.02-34-001-25W1.00	Vertical	Injection
100.03-34-001-25W1.00	Vertical	Abandoned Zone
102.03-34-001-25W1.00	Horizontal	Injection
103.03-34-001-25W1.00	Horizontal	Producing
100.04-34-001-25W1.00	Vertical	Abandoned Zone
102.04-34-001-25W1.00	Horizontal	Injection
103.04-34-001-25W1.00	Horizontal	Producing
104.04-34-001-25W1.00	Horizontal	Injection
105.04-34-001-25W1.00	Horizontal	Producing
100.05-34-001-25W1.00	Vertical	Abandoned Zone
102.05-34-001-25W1.00	Horizontal	Producing
103.05-34-001-25W1.00	Horizontal	Injection
104.05-34-001-25W1.00	Horizontal	Producing
105.05-34-001-25W1.00	Horizontal	Producing
106.05-34-001-25W1.00	Horizontal	Suspended
107.05-34-001-25W1.00	Horizontal	Producing
100.06-34-001-25W1.00	Vertical	Abandoned Zone
100.07-34-001-25W1.00	Vertical	Producing
100.08-34-001-25W1.00	Vertical	Injection
102.08-34-001-25W1.00	Horizontal	Injection
103.08-34-001-25W1.00	Horizontal	Producing
100.09-34-001-25W1.00	Vertical	Producing
102.09-34-001-25W1.00	Horizontal	Injection
103.09-34-001-25W1.00	Horizontal	Producing
100.10-34-001-25W1.00	Vertical	Injection
100.11-34-001-25W1.00	Vertical	Abandoned Zone
100.12-34-001-25W1.00	Vertical	Abandoned Zone
102.12-34-001-25W1.00	Horizontal	Injection
103.12-34-001-25W1.00	Horizontal	Producing
104.12-34-001-25W1.00	Horizontal	Producing
100.13-34-001-25W1.00	Vertical	Abandoned Zone
102.13-34-001-25W1.00	Horizontal	Injection
103.13-34-001-25W1.00	Horizontal	Producing
100.14-34-001-25W1.00	Vertical	Abandoned Zone
102.14-34-001-25W1.00	Horizontal	Injection
100.15-34-001-25W1.00	Vertical	Producing
100.16-34-001-25W1.00	Vertical	Abandoned
102.16-34-001-25W1.00	Horizontal	Injection
103.16-34-001-25W1.00	Horizontal	Injection
104.16-34-001-25W1.00	Horizontal	Producing