

Sinclair Unit No. 19

Waterflood Progress Report 2019

January 1st through December 31st 2019

Prepared for:

Manitoba Industry, Economic Development and Mines

Petroleum Branch

Prepared by:

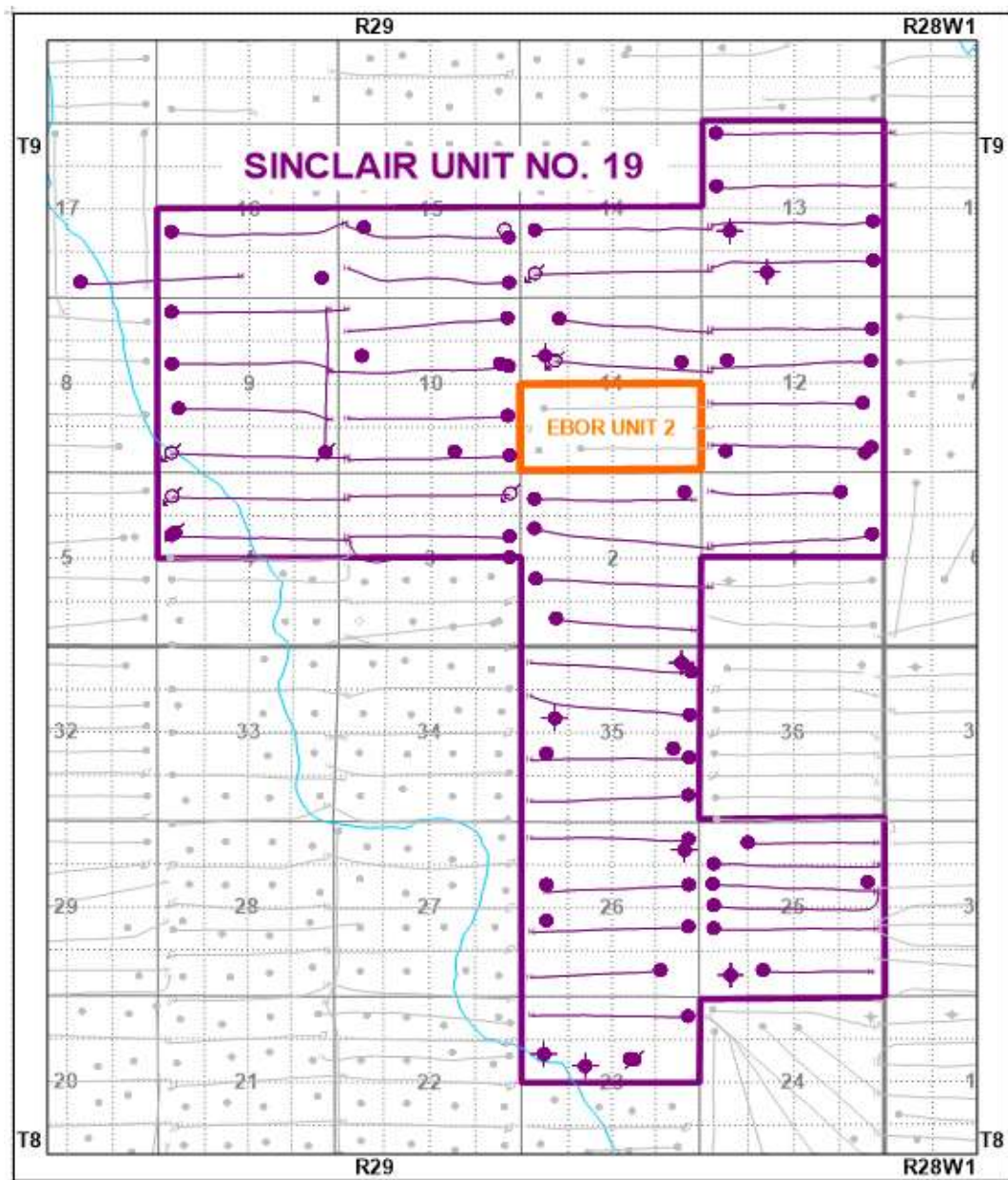
Tundra Oil and Gas

June 10, 2020

INTRODUCTION

Sinclair Unit No. 19 Enhanced Oil Recovery (EOR) Waterflood Project was approved on October 1, 2017 with Tundra Oil and Gas (Tundra) as Operator. The EOR Unit area, outlined in purple, contains 83 wells (12 abandoned/suspended wells, 17 producing vertical wells, 51 producing horizontal wells and 3 injection wells) in 192 LSDs in Townships 8 & 9 Range 29 W1 as shown in the figure below.

Figure 1: Sinclair Unit No. 19 Area Outline



Sinclair Unit No. 19

Tundra Oil and Gas (Tundra), as the operator of the Sinclair Unit No. 19 Enhanced Oil Recovery (EOR) project hereby submits the 2019 EOR report as per section 73 of the Drilling and Production Regulations.

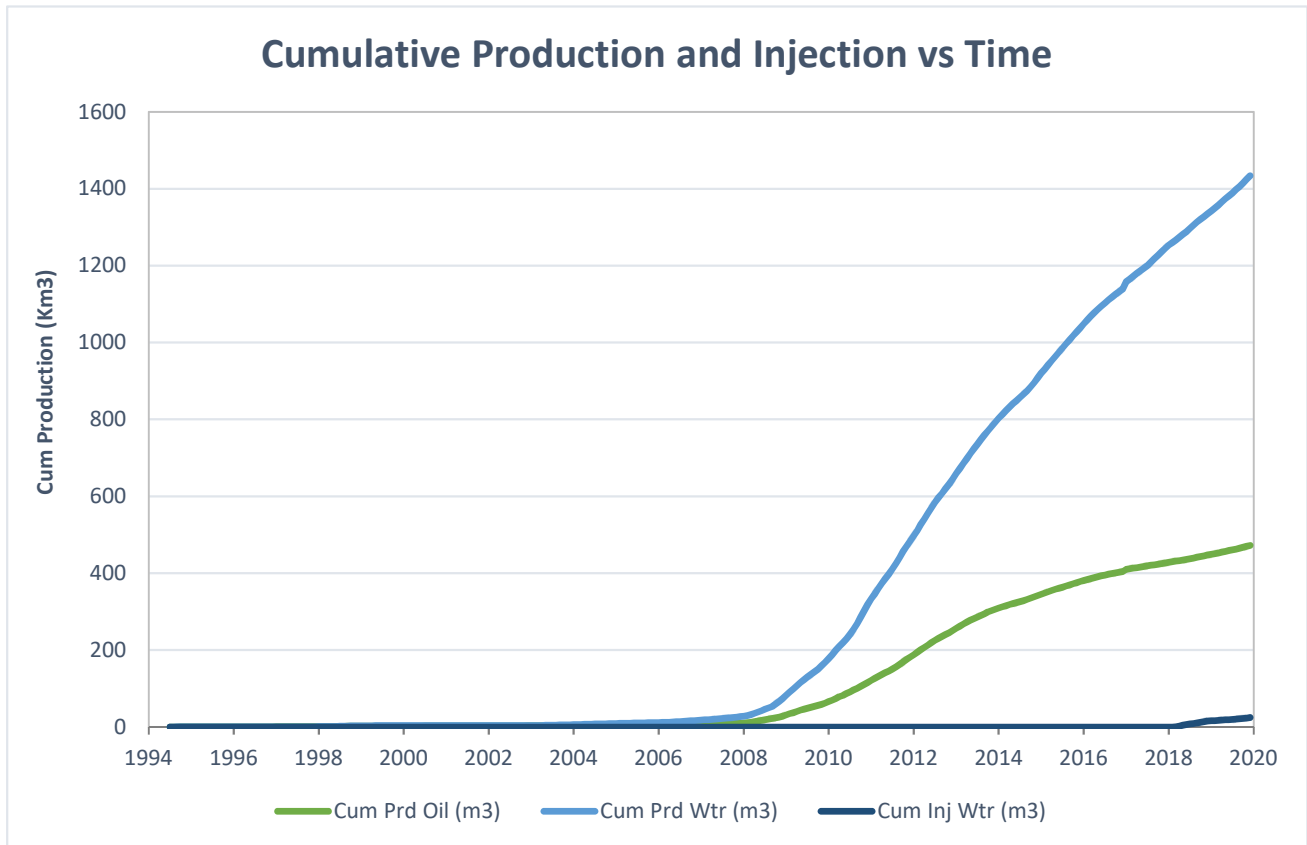
a) Monthly oil and water production rates, injection rate, GOR and WOR

MONTH	Cal Dly Oil m ³ /day	Cal Dly Wtr m ³ /day	Cal Inj Wtr m ³ /day	WOR m ³ /m ³	GOR m ³ /m ³
Jan-2019	58.83	245.81	22.89	4.18	0
Feb-2019	59.39	241.86	18.91	4.07	0
Mar-2019	64.67	251.58	22.36	3.89	0
Apr-2019	72.14	273.93	17.11	3.80	0
May-2019	70.60	261.51	26.61	3.70	0
Jun-2019	62.41	255.62	16.75	4.10	0
Jul-2019	57.21	261.55	14.81	4.57	0
Aug-2019	61.60	269.46	20.77	4.37	0
Sep-2019	72.11	256.94	27.97	3.56	0
Oct-2019	80.17	303.59	30.55	3.79	0
Nov-2019	88.76	320.03	37.93	3.61	0
Dec-2019	81.30	303.38	52.24	3.73	0

b) Cumulative volume of oil, gas and water produced and fluid injected

2019 PRODUCTION	
Produced Oil (m ³)	25,232
Produced Gas (m ³)	0
Produced Water (m ³)	98,771
Fluid Injected (m ³)	9,420
CUMULATIVE PRODUCTION	
Produced Oil (m ³)	472,327
Produced Water (m ³)	1,433,809

Sinclair Unit No. 19



c) Monthly wellhead injection pressure for each injection well

	00/16-03 Inj		00/13-04 Inj		00/04-14 Inj		SU19	
MONTH	Inj Water (m ³)	Avg Inj P (kPa)	Inj Water (m ³)	Avg Inj P (kPa)	Inj Water (m ³)	Avg Inj P (kPa)	Inj Water (m ³)	Avg Inj P (kPa)
Jan-2019	0.0	63	709.7	5475	0.0	0	709.7	2769
Feb-2019	2.4	-93	527.1	5466	0.0	0	529.5	2686
Mar-2019	207.1	133	486.1	5468	0.0	0	693.2	2800
Apr-2019	106.5	-59	406.7	5414	0.0	0	513.2	2678
May-2019	414.9	1827	409.9	7375	0.0	0	824.8	4601
Jun-2019	251.4	2013	251.2	5160	0.0	0	502.6	3586
Jul-2019	70.5	1979	388.5	5980	0.0	0	459.0	3979
Aug-2019	365.7	2275	278.2	5711	0.0	0	643.9	3993
Sep-2019	581.7	4567	257.4	4985	0.0	0	839.1	4776
Oct-2019	540.5	5168	368.5	6084	38.3	401	947.3	4900
Nov-2019	621.9	6103	371.7	6566	144.4	204	1138.0	4291
Dec-2019	715.3	6133	333.5	6567	570.7	-94	1619.5	4202
Total	3877.9		4788.5		753.4		9419.8	
Avg Inj P		2509		5854		42		3772

MONTH	Jan-2019	Feb-2019	Mar-2019	Apr-2019	May-2019	Jun-2019	Jul-2019	Aug-2019	Sep-2019	Oct-2019	Nov-2019	Dec-2019
Total m3	709.7	529.5	693.2	513.2	824.8	502.6	459.0	643.9	839.1	947.3	1138.0	1619.5
Daily (m³/d)	22.89	18.91	22.36	17.11	26.61	16.75	14.81	20.77	27.97	30.56	37.93	52.24

2019 AVG. ANNUAL DAILY INJECTION = 25.74 m3/d

CUMULATIVE INJECTION TO Dec 31, 2018 = 15,185 m3
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TOTAL 2019 ANNUAL INJECTION = 9,420 m3
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CUMULATIVE INJECTION TO Dec 31, 2019 = 24,604 m3
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d) Summary of the result of any survey of reservoir pressure conducted in 2019. N/A

e) **Date and type of any well servicing.**

Well	Service Description	Date
100.01-35-008-29W1.00	Pump Change	2/13/2019
100.05-35-008-29W1.00	Rod Repair	12/16/2019
100.01-15-009-29W1.00	Pump Change	12/19/2019
100.04-14-009-29W1.00	WIW Conversion	9/10/2019
100.05-16-009-29W1.00	Pump Change	12/20/2019
100.09-03-009-29W1.00	Cemented Liner Clean Out	6/24/2019
100.09-10-009-29W1.00	C-Suspension Tool Install	7/17/2019
100.09-11-009-29W1.00	Pump Change	8/29/2019
100.13-02-009-29W1.00	BHP Change	6/27/2019
100.16-03-009-29W1.00	WiW Packer Repair	8/8/2019
100.16-10-009-29W1.00	Casing Leak Repair	9/17/2019
102.12-04-009-29W1.00	Cemented Liner Clean Out	7/17/2019
102.13-09-009-29W1.00	Pump Change	1/21/2019
102.16-13-009-29W1.00	Pump Change	10/12/2019

f) **Calculations of voidage replacement ratio on a monthly and cumulative basis**

VOIDAGE CALCULATIONS

OIL FORMATION VOLUME FACTOR (Rm3/Sm3) = 1.071

MONTH	Mth Oil Prod (m3)	Cum Oil Prod (Km3)	Mth Water Prod (m3)	Cum Water Prod (Km3)	Mth Water Inj (m3)	Cum Water Inj (Km3)	VRR	Cum VRR
Jan-2019	1823.8	448.92	7620.2	1342.66	709.7	15.89	0.074	0.009
Feb-2019	1662.8	450.58	6772.1	1349.43	529.5	16.42	0.062	0.009
Mar-2019	2004.9	452.59	7798.9	1357.23	693.2	17.12	0.070	0.009
Apr-2019	2164.3	454.75	8217.8	1365.45	513.2	17.63	0.049	0.010
May-2019	2188.6	456.94	8106.8	1373.55	824.8	18.46	0.079	0.010
Jun-2019	1872.2	458.81	7668.7	1381.22	502.6	18.96	0.052	0.010
Jul-2019	1773.6	460.59	8108	1389.33	459.0	19.42	0.046	0.010
Aug-2019	1909.5	462.50	8353.4	1397.68	643.9	20.06	0.062	0.011
Sep-2019	2163.4	464.66	7708.1	1405.39	839.1	20.90	0.084	0.011
Oct-2019	2485.3	467.14	9411.2	1414.80	947.0	21.85	0.078	0.011
Nov-2019	2662.9	469.81	9601	1424.40	1138.0	22.98	0.091	0.012
Dec-2019	2520.4	472.33	9404.8	1433.81	1619.5	24.60	0.134	0.013

g) **An outline of the method used for quality control and treatment of the injected fluid**

The injection water for Sinclair Unit No. 19 is sourced from the 02/14-30-007-28W1 well (Mannville formation). The water is treated at the 04-01-008-29W1 filtration plant where it is filtered to 0.1 microns and has scale inhibitor and biocide added. The injection water is then distributed to the injectors through the dedicated infrastructure system.

h) **A report of any unusual performance problems and remedial measures taken or being considered. N/A**

i) **Any other information necessary to evaluate the project**

<i>UWI</i>	<i>Type</i>	<i>Status</i>	<i>Future Plans</i>
100/09-23-008-29W1/0	Vertical	Producing	-
100/10-23-008-29W1/0	Vertical	Suspended	-
100/11-23-008-29W1/0	Vertical	Abandoned Zone	-
100/12-23-008-29W1/0	Vertical	Abandoned Zone	-
100/16-23-008-29W1/0	Horizontal	Producing	-
100/03-25-008-29W1/0	Horizontal	Producing	-
100/04-25-008-29W1/0	Vertical	Abandoned Zone	-
100/05-25-008-29W1/0	Horizontal	Producing	-
100/09-25-008-29W1/0	Vertical	Producing	-
100/12-25-008-29W1/0	Horizontal	Producing	-
102/12-25-008-29W1/0	Horizontal	Producing	-
100/13-25-008-29W1/0	Horizontal	Producing	-
103/13-25-008-29W1/0	Horizontal	Producing	-
100/01-26-008-29W1/0	Horizontal	Producing	-
100/05-26-008-29W1/0	Vertical	Producing	-
100/08-26-008-29W1/0	Horizontal	Producing	-
100/09-26-008-29W1/0	Horizontal	Producing	-
100/12-26-008-29W1/0	Vertical	Producing	-
100/16-26-008-29W1/0	Vertical	Abandoned Zone	-
102/16-26-008-29W1/0	Horizontal	Producing	-
100/01-35-008-29W1/0	Horizontal	Producing	-
100/05-35-008-29W1/0	Vertical	Producing	-
100/08-35-008-29W1/0	Vertical	Producing	-
102/08-35-008-29W1/0	Horizontal	Producing	-
100/09-35-008-29W1/0	Horizontal	Producing	-
100/12-35-008-29W1/0	Vertical	Abandoned Zone	-
100/16-35-008-29W1/3	Vertical	Abandoned Zone	-
102/16-35-008-29W1/0	Horizontal	Producing	-
100/09-01-009-29W1/0	Horizontal	Producing	-
100/16-01-009-29W1/0	Horizontal	Producing	-
100/04-02-009-29W1/0	Horizontal	Producing	-
100/05-02-009-29W1/0	Horizontal	Producing	-
100/12-02-009-29W1/0	Horizontal	Producing	-
100/13-02-009-29W1/0	Horizontal	Producing	-
100/16-02-009-29W1/0	Vertical	Producing	-
100/09-03-009-29W1/0	Horizontal	Producing	-
102/09-03-009-29W1/0	Horizontal	Producing	-
100/16-03-009-29W1/0	Horizontal	Injection	-
100/12-04-009-29W1/0	Vertical	Suspended	-
102/12-04-009-29W1/0	Horizontal	Producing	-
100/13-04-009-29W1/0	Horizontal	Injection	-
100/01-09-009-29W1/0	Horizontal	Suspended	-
100/04-09-009-29W1/0	Horizontal	Producing	WIW Conversion
100/05-09-009-29W1/0	Horizontal	Producing	-
100/12-09-009-29W1/0	Horizontal	Producing	-

j) Well List

Sinclair Unit No. 19 Well List

<i>UWI</i>	<i>Type</i>	<i>Status</i>	<i>Future Plans</i>
102/13-09-009-29W1/0	Horizontal	Producing	-
100/01-10-009-29W1/0	Horizontal	Producing	-
100/02-10-009-29W1/0	Vertical	Producing	-
100/08-10-009-29W1/0	Horizontal	Producing	-
100/09-10-009-29W1/0	Vertical	Producing	-
102/09-10-009-29W1/0	Horizontal	Producing	-
104/09-10-009-29W1/0	Horizontal	Producing	-
100/12-10-009-29W1/0	Vertical	Producing	-
100/16-10-009-29W1/0	Horizontal	Producing	-
103/16-10-009-29W1/0	Horizontal	Producing	-
100/09-11-009-29W1/0	Vertical	Producing	-
100/12-11-009-29W1/0	Vertical	Abandoned Zone	-
102/12-11-009-29W1/0	Horizontal	Producing	WIW Conversion
100/13-11-009-29W1/0	Horizontal	Producing	-
100/01-12-009-29W1/0	Vertical	Producing	-
102/01-12-009-29W1/0	Horizontal	Producing	-
100/04-12-009-29W1/0	Vertical	Producing	-
100/08-12-009-29W1/0	Horizontal	Producing	-
100/09-12-009-29W1/0	Horizontal	Producing	-
100/12-12-009-29W1/0	Vertical	Producing	-
100/16-12-009-29W1/0	Horizontal	Producing	-
102/01-13-009-29W1/0	Horizontal	Producing	-
100/03-13-009-29W1/2	Vertical	Abandoned Zone	-
100/05-13-009-29W1/0	Vertical	Abandoned Zone	-
100/08-13-009-29W1/0	Horizontal	Producing	-
100/12-13-009-29W1/0	Horizontal	Producing	-
100/13-13-009-29W1/0	Horizontal	Producing	-
102/16-13-009-29W1/0	Horizontal	Producing	-
100/04-14-009-29W1/0	Horizontal	Injection	-
100/05-14-009-29W1/0	Horizontal	Producing	-
100/01-15-009-29W1/0	Horizontal	Producing	-
104/01-15-009-29W1/0	Horizontal	Producing	-
100/05-15-009-29W1/2	Vertical	Pumping	-
100/08-15-009-29W1/2	Vertical	Producing	-
102/08-15-009-29W1/0	Horizontal	Producing	-
100/01-16-009-29W1/2	Vertical	Commingled	-
100/05-16-009-29W1/0	Horizontal	Producing	-
100/02-17-009-29W1/0	Horizontal	Producing	-