

Sinclair Unit No. 7

Waterflood Progress Report 2019

January 1st through December 31st 2019

Prepared for:

Manitoba Industry, Economic Development and Mines

Petroleum Branch

Prepared by:

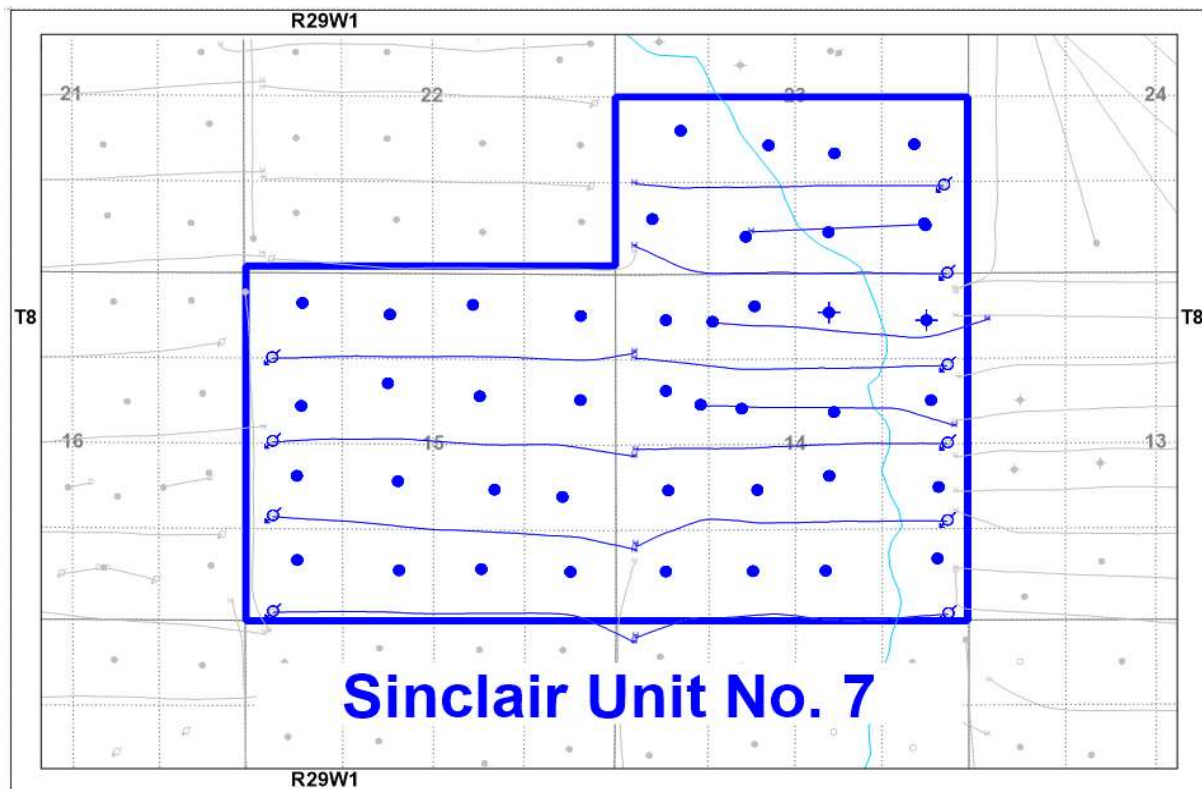
Tundra Oil and Gas

June 8, 2020

INTRODUCTION

Sinclair Unit No. 7 Enhanced Oil Recovery (EOR) Waterflood was approved under Waterflood Order No. 26 effective July 1, 2013 with Tundra Oil and Gas (Tundra) as operator. The Unit area contains 41 producing wells, 2 abandoned wells and 10 injection wells in 2.5 sections in Township 8 Range 29 W1 as shown in the figure below.

Figure 1: Sinclair Unit No. 7 Area Outline



Sinclair Unit No. 7

Tundra Oil and Gas (Tundra), as the operator of the Sinclair Unit No. 7 Enhanced Oil Recovery (EOR) project hereby submits the 2019 EOR report as per section 73 of the Drilling and Production Regulations.

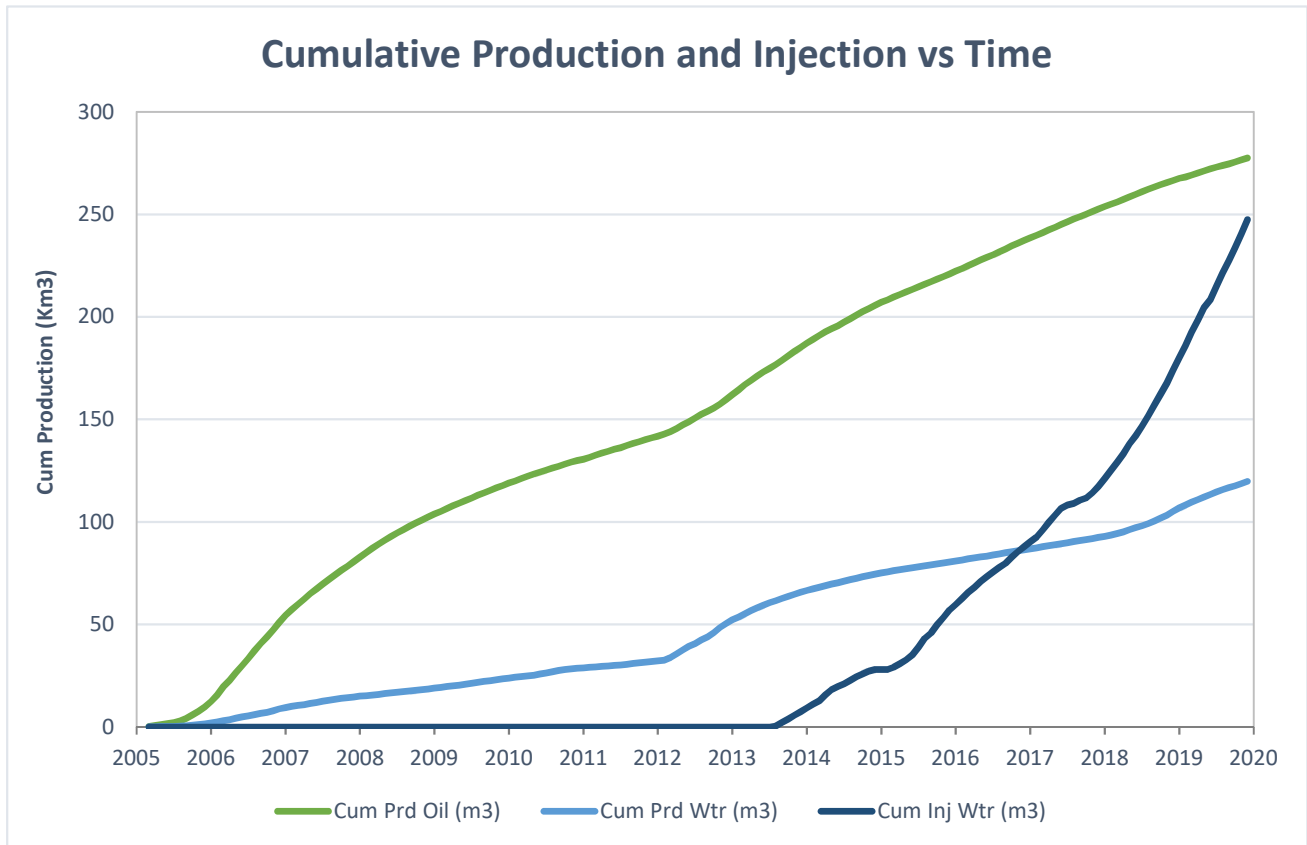
a) Monthly oil and water production rates, injection rate, GOR and WOR

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	32.96	55.94	200.74	1.70	0
Feb-2019	25.52	50.08	202.68	1.96	0
Mar-2019	31.25	44.64	213.06	1.43	0
Apr-2019	31.43	44.01	200.47	1.40	0
May-2019	30.59	40.36	195.23	1.32	0
Jun-2019	31.38	40.75	131.13	1.30	0
Jul-2019	30.23	38.68	207.90	1.28	0
Aug-2019	27.81	34.90	208.84	1.25	0
Sep-2019	27.96	33.25	203.90	1.19	0
Oct-2019	27.63	28.52	199.29	1.03	0
Nov-2019	31.92	34.38	229.13	1.08	0
Dec-2019	33.47	36.66	221.29	1.10	0

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

2019 PRODUCTION	
Produced Oil (m ³)	11,028
Produced Gas (m ³)	0
Produced Water (m ³)	14,645
Fluid Injected (m ³)	73,451
CUMULATIVE PRODUCTION	
Produced Oil (m ³)	277,545
Produced Water (m ³)	119,779

Sinclair Unit No. 7



c) Monthly wellhead injection pressure for each injection well

	02/16-14 Inj		02/09-14 Inj		02/01-23 Inj		02/05-15 Inj		03/05-15 Inj		03/01-14 Inj	
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)	Inj Water (m ³)	Avg Inj P (kPa)	Inj Water (m ³)	Avg Inj P (kPa)
Jan-2019	697.0	6554	357.0	6562	763.0	6557	1225.0	1781	808.0	-91	140.0	5315
Feb-2019	624.0	6565	321.0	6570	671.0	6565	1107.0	2410	832.0	-92	123.0	6479
Mar-2019	662.0	6306	346.0	6556	673.0	6580	1145.0	2868	1094.0	-77	123.0	6461
Apr-2019	617.0	6374	307.0	6439	550.0	6458	907.0	2770	1086.0	-89	105.0	6458
May-2019	598.0	5806	270.0	6037	499.0	6160	1048.0	3068	1105.0	-83	91.0	6015
Jun-2019	368.0	4516	205.0	5786	312.0	5583	683.0	3265	703.0	-90	62.0	4997
Jul-2019	659.0	6400	388.0	6453	542.0	6552	943.0	3485	1175.0	-90	128.0	6318
Aug-2019	686.0	6461	346.0	6456	504.0	6556	987.0	3798	1208.0	-92	126.0	6409
Sep-2019	662.0	6548	344.0	6569	447.0	6570	849.0	4084	1185.0	44	131.0	6534
Oct-2019	671.0	6420	336.0	6518	413.0	6467	874.0	4106	1219.0	618	117.0	6447
Nov-2019	640.0	6563	312.0	6569	449.0	6525	1136.0	5150	1188.0	1273	112.0	6539
Dec-2019	657.0	6566	304.0	6568	465.0	6572	1057.0	5466	1241.0	1827	113.0	6569
Total	7541.0		3836.0		6288.0		11961.0		12844.0		1371.0	
Avg Inj P		6257		6424		6429		3521		255		6212

	03/08-14 Inj		02/08-14 Inj		04/12-15 Inj		02/04-15 Inj		SU7	
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)	Inj Water (m ³)	Avg Inj P (kPa)
Jan-2019	465.0	6557	538.0	6547	1230.0	468	0.0	0	6223.0	4472
Feb-2019	411.0	6561	490.0	6562	1091.0	1360	5.0	8	5675.0	4738
Mar-2019	441.0	6563	525.0	6548	1169.0	2073	427.0	-15	6605.0	4386
Apr-2019	383.0	6454	465.0	6418	1040.0	2810	554.0	-90	6014.0	4400
May-2019	321.0	6022	396.0	5943	1029.0	2951	695.0	-75	6052.0	4185
Jun-2019	241.0	5784	280.0	5696	642.0	2948	438.0	-80	3934.0	3840
Jul-2019	482.0	6461	546.0	6401	845.0	3191	737.0	-80	6445.0	4509
Aug-2019	435.0	6446	509.0	6395	819.0	3374	854.0	-90	6474.0	4571
Sep-2019	413.0	6574	497.0	6565	704.0	3485	885.0	-89	6117.0	4688
Oct-2019	395.0	6528	476.0	6511	726.0	3627	951.0	-90	6178.0	4715
Nov-2019	384.0	6592	463.0	6559	1165.0	4941	1025.0	-91	6874.0	5062
Dec-2019	389.0	6566	466.0	6520	1106.0	5345	1062.0	-91	6860.0	5191
Total	4760.0		5651.0		11566.0		7633.0		73451.0	
Avg Inj P		6426		6389		3048		-65		

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	6223.0	5675.0	6605.0	6014.0	6052.0	3934.0	6445.0	6474.0	6117.0	6178.0	6874.0	6860.0
Daily (m³/d)	200.74	202.68	213.06	200.47	195.23	131.13	207.90	208.84	203.90	199.29	229.13	221.29

c) Monthly wellhead injection pressure for each injection well

2019 AVG. ANNUAL DAILY INJECTION =	201.14 m3/d
CUMULATIVE INJECTION TO Dec 31, 2018 =	174,004 m3
TOTAL 2019 ANNUAL INJECTION =	73,451 m3
CUMULATIVE INJECTION TO Dec 31, 2019 =	247,455 m3

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
100.05-23-008-29W1.00	Pump Change	8/23/2019
100.05-23-008-29W1.00	Scale Squeeze	9/18/2019
100.06-23-008-29W1.00	Pump Change	10/31/2019
100.13-14-008-29W1.00	Pump Change	12/12/2019
100.14-14-008-29W1.00	Pump Change & Acid Job	7/19/2019
100.14-14-008-29W1.00	Scale Squeeze	8/22/2019
102.04-15-008-29W1.00	WIW Conversion	2/15/2019
102.12-14-008-29W1.00	Rod Failure / Pump Change	11/1/2019

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	1021.8	267.54	1734.2	106.87	6223.0	180.23	2.200	0.458
Feb-2019	714.5	268.25	1402.1	108.27	5675.0	185.90	2.618	0.470
Mar-2019	968.9	269.22	1383.9	109.65	6605.0	192.51	2.728	0.484
Apr-2019	942.9	270.17	1320.4	110.98	6014.0	198.52	2.581	0.496
May-2019	948.4	271.11	1251.1	112.23	6052.0	204.57	2.670	0.508
Jun-2019	941.4	272.06	1222.5	113.45	3934.0	208.51	1.764	0.515
Jul-2019	937.0	272.99	1199.1	114.65	6445.0	214.95	2.926	0.528
Aug-2019	862.1	273.85	1081.8	115.73	6474.0	221.43	3.229	0.541
Sep-2019	838.9	274.69	997.4	116.73	6117.0	227.54	3.227	0.554
Oct-2019	856.5	275.55	884	117.61	6178.0	233.72	3.430	0.566
Nov-2019	957.6	276.51	1031.4	118.64	6874.0	240.59	3.342	0.580
Dec-2019	1037.5	277.55	1136.6	119.78	6860.0	247.45	3.052	0.593

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

The injection water for Sinclair Unit No. 7 will be sourced from the 16-32-007-29W1 well (Lodgepole formation). The water is treated at the 03-04-008-29W1 battery where it is filtered to 0.5 microns and has scale inhibitor 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>
100/01-14-008-29W1/0	Vertical	Producing	-
103/01-14-008-29W1/0	Horizontal	Injection	-
100/02-14-008-29W1/0	Vertical	Producing	-
100/03-14-008-29W1/0	Vertical	Producing	-
100/04-14-008-29W1/0	Vertical	Producing	-
100/05-14-008-29W1/0	Vertical	Producing	-
100/06-14-008-29W1/0	Vertical	Producing	-
100/07-14-008-29W1/0	Vertical	Producing	-
100/08-14-008-29W1/0	Vertical	Producing	-
102/08-14-008-29W1/0	Horizontal	Injection	-
103/08-14-008-29W1/0	Horizontal	Injection	-
100/09-14-008-29W1/0	Vertical	Producing	-
102/09-14-008-29W1/0	Horizontal	Injection	-
100/10-14-008-29W1/0	Vertical	Producing	-
100/11-14-008-29W1/0	Vertical	Producing	-
100/12-14-008-29W1/0	Vertical	Producing	-
102/12-14-008-29W1/0	Horizontal	Producing	-
100/13-14-008-29W1/0	Vertical	Producing	-
100/14-14-008-29W1/0	Vertical	Producing	-
102/14-14-008-29W1/0	Horizontal	Producing	-
100/15-14-008-29W1/0	Vertical	Abandoned	-
100/16-14-008-29W1/0	Vertical	Abandoned	-
102/16-14-008-29W1/0	Horizontal	Injection	-
100/01-15-008-29W1/0	Vertical	Producing	-
100/02-15-008-29W1/0	Vertical	Producing	-
100/03-15-008-29W1/0	Vertical	Producing	-
100/04-15-008-29W1/0	Vertical	Producing	-
102/04-15-008-29W1/0	Horizontal	Injection	-
100/05-15-008-29W1/0	Vertical	Producing	-
102/05-15-008-29W1/0	Horizontal	Injection	-
103/05-15-008-29W1/0	Horizontal	Injection	-
100/06-15-008-29W1/0	Vertical	Producing	-
100/07-15-008-29W1/0	Vertical	Producing	-
100/08-15-008-29W1/0	Vertical	Producing	-
100/09-15-008-29W1/0	Vertical	Producing	-
100/10-15-008-29W1/0	Vertical	Producing	-
100/11-15-008-29W1/0	Vertical	Producing	-
102/12-15-008-29W1/0	Vertical	Producing	-
104/12-15-008-29W1/0	Horizontal	Injection	-
100/13-15-008-29W1/0	Vertical	Producing	-
100/14-15-008-29W1/0	Vertical	Producing	-
100/15-15-008-29W1/0	Vertical	Producing	-
100/16-15-008-29W1/0	Vertical	Producing	-
100/01-23-008-29W1/0	Vertical	Producing	-
102/01-23-008-29W1/0	Horizontal	Injection	-

j) Well List**Sinclair Unit No. 7 Well List**

<i>UWI</i>	<i>Type</i>	<i>Status</i>	<i>Future Plans</i>
103/01-23-008-29W1/0	Horizontal	Producing	-
100/02-23-008-29W1/0	Vertical	Producing	-
100/03-23-008-29W1/0	Vertical	Producing	-
100/04-23-008-29W1/0	Vertical	Producing	-
100/05-23-008-29W1/0	Vertical	Producing	-
100/06-23-008-29W1/0	Vertical	Producing	-
100/07-23-008-29W1/0	Vertical	Producing	-
100/08-23-008-29W1/0	Vertical	Producing	-