

Sinclair Unit No. 10

Waterflood Progress Report 2018

January 1st through December 31st 2018

Prepared for:

Manitoba Industry, Economic Development and Mines

Petroleum Branch

Prepared by:

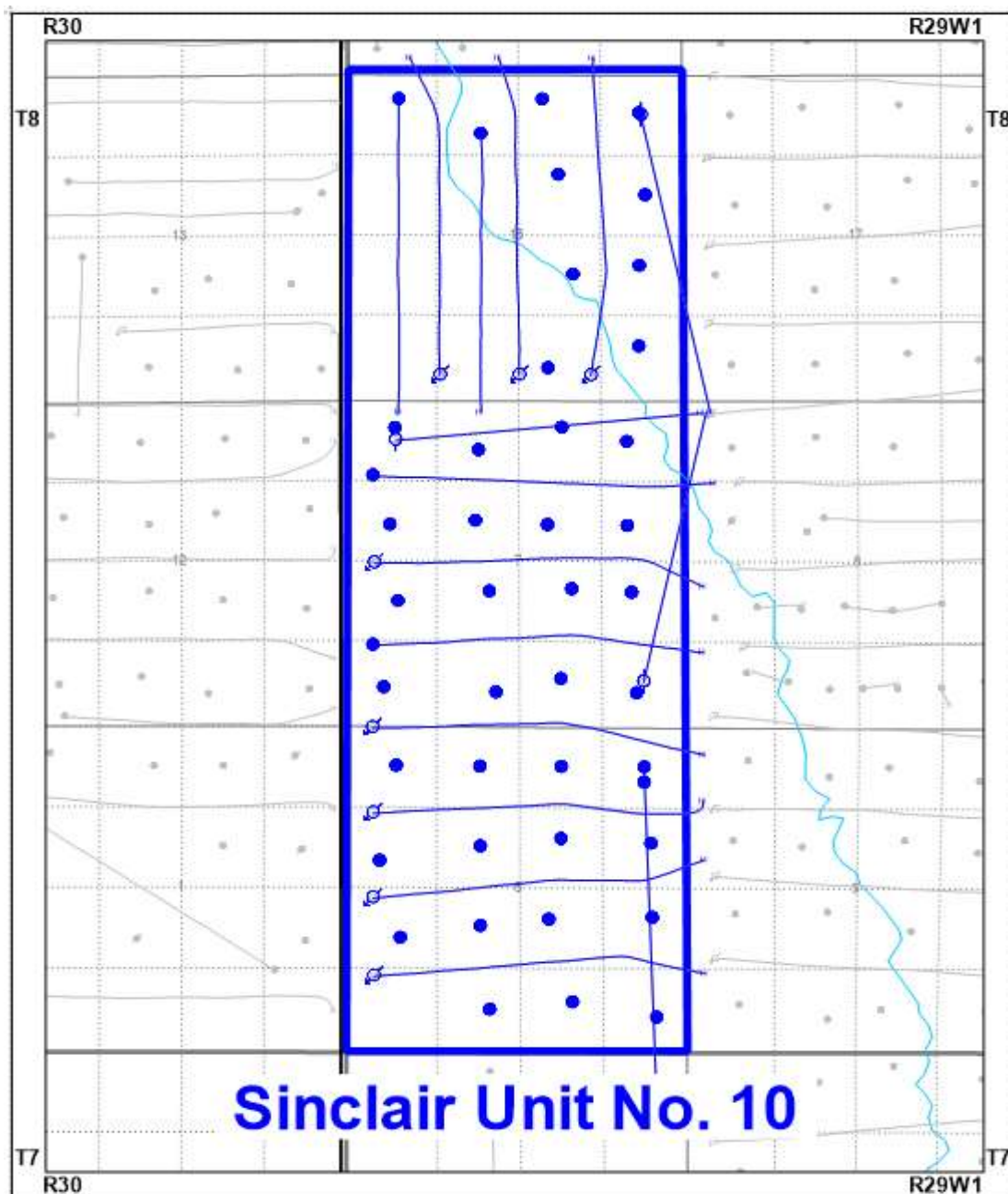
Tundra Oil and Gas

May 28, 2019

INTRODUCTION

Sinclair Unit No. 10 was approved on August 1, 2013 with Tundra Oil and Gas (Tundra) as Operator. The Unit area contains 44 producing wells, 8 injection wells and 3 wells waiting to be completed, in 48 LSDs in Township 8 Range 29 W1 as shown in the figure below.

Figure 1: Sinclair Unit No. 10 Area Outline



Sinclair Unit No.10

Tundra Oil and Gas (Tundra), as the operator of the Sinclair Unit No. 10 Enhanced Oil Recovery (EOR) project hereby submits the 2018 EOR report as per section 73 of the Drilling and Production Regulations.

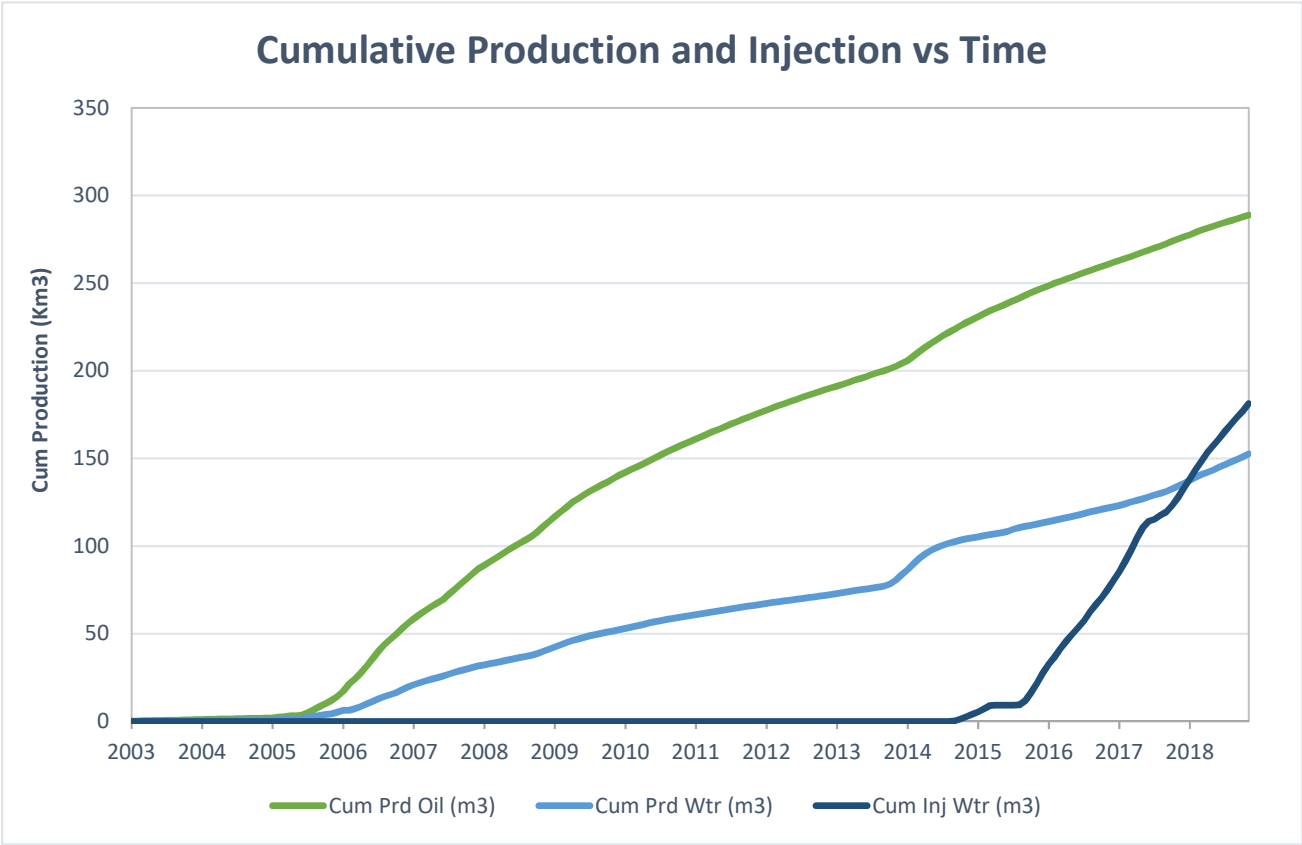
a) Monthly oil and water production rates, injection rate, GOR and WOR

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-2018	41.55	47.07	172.76	1.13	0
Feb-2018	41.97	62.15	184.31	1.48	0
Mar-2018	46.44	57.92	172.84	1.25	0
Apr-2018	41.81	47.35	159.26	1.13	0
May-2018	36.37	45.08	163.23	1.24	0
Jun-2018	35.54	43.65	130.23	1.23	0
Jul-2018	36.04	49.43	118.87	1.37	0
Aug-2018	33.87	48.62	145.90	1.44	0
Sep-2018	33.48	47.56	127.10	1.42	0
Oct-2018	33.57	46.50	125.90	1.39	0
Nov-2018	33.98	52.25	117.10	1.54	0
Dec-2018	35.29	54.74	140.52	1.55	0

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

2018 PRODUCTION	
Produced Oil (m ³)	13,676
Produced Gas (m ³)	0
Produced Water (m ³)	18,295
Fluid Injected (m ³)	53,412
CUMULATIVE PRODUCTION	
Produced Oil (m ³)	288,842
Produced Water (m ³)	152,677

Sinclair Unit No.10



c) Monthly wellhead injection pressure for each injection well

	00/03-18 Inj		00/04-06 Inj		02/02-18 Inj		02/03-18 Inj		02/05-06 Inj		02/05-07 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-2018	727.8	545	62.0	6025	653.1	-94	393.3	2982	421.0	5823	386.0	4977
Feb-2018	615.4	2683	57.0	5921	757.6	-94	339.7	3694	361.0	5837	471.0	5475
Mar-2018	559.2	2984	91.0	5921	1029.8	-94	438.4	4559	391.0	5836	498.0	5841
Apr-2018	477.7	2993	67.0	5961	835.7	-88	392.3	4718	287.0	5889	461.0	5882
May-2018	386.0	2993	67.0	6120	836.0	771	338.0	4979	388.0	6014	498.0	6045
Jun-2018	386.0	2783	62.0	5737	692.0	1002	284.0	4701	261.0	5740	366.0	5599
Jul-2018	0.0	2289	89.0	6069	582.0	2257	0.0	3730	433.0	6015	500.0	6003
Aug-2018	336.0	2711	71.0	6017	692.0	2561	0.0	2118	359.0	6007	305.0	6058
Sep-2018	384.0	2902	61.0	6075	614.0	2941	0.0	1233	316.0	6065	475.0	6065
Oct-2018	346.0	2898	134.0	6099	857.0	3775	0.0	-71	300.0	6031	394.0	5991
Nov-2018	301.0	2866	71.0	2116	723.0	4602	8.0	-96	247.0	5987	481.0	5995
Dec-2018	327.0	2948	149.0	110	687.0	4799	116.0	332	339.0	5991	412.0	5995
Total	4846.1		981.0		8959.2		2309.7		4103.0		5247.0	
Avg Inj P		2633		5181		1861		2740		5936		5827

	02/12-06 Inj		02/13-06 Inj		SU10	
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)
Jan-2018	441.0	5963	406.0	5748	3490.2	3917
Feb-2018	399.0	5873	403.0	5882	3403.7	4493
Mar-2018	376.0	5879	452.0	5876	3835.4	4561
Apr-2018	371.0	5917	282.0	5909	3173.7	4547
May-2018	345.0	6057	403.0	6056	3261.0	4899
Jun-2018	338.0	5742	271.0	5673	2660.0	4612
Jul-2018	404.0	6011	415.0	6026	2423.0	4973
Aug-2018	377.0	6027	272.0	5991	2412.0	4719
Sep-2018	426.0	6076	373.0	6049	2649.0	4799
Oct-2018	330.0	6036	341.0	6003	2702.0	4621
Nov-2018	313.0	6000	370.0	5957	2514.0	4340
Dec-2018	315.0	5998	329.0	5994	2674.0	4370
Total	4435.0		4317.0		35198.0	
Avg Inj P		5965		5930		4571

MONTH	Jan-2018	Feb-2018	Mar-2018	Apr-2018	May-2018	Jun-2018	Jul-2018	Aug-2018	Sep-2018	Oct-2018	Nov-2018	Dec-2018
Total m3	3490.2	3403.7	3835.4	3173.7	3261.0	2660.0	2423.0	2412.0	2649.0	2702.0	2514.0	2674.0
Daily (m³/d)	112.59	121.56	123.72	105.79	105.19	88.67	78.16	77.81	88.30	87.16	83.80	86.26

c) Monthly wellhead injection pressure for each injection well

2018 AVG. ANNUAL DAILY INJECTION =	96.58 m3/d
CUMULATIVE INJECTION TO Dec 31, 2017 =	127,947 m3
TOTAL 2018 ANNUAL INJECTION =	35,198 m3
CUMULATIVE INJECTION TO Dec 31, 2018 =	181,359 m3

d) Summary of the result of any survey of reservoir pressure conducted in 2018. N/A

e) Date and type of any well servicing.

Well	Service Description	Date
100.02-07-008-29W1.00	Pump Change/Acid Job	6/26/2018
100.04-06-008-29W1.00	WIW Cemented Liner Cleanout	11/8/2018
100.08-06-008-29W1.00	Pump Change/Acid Job	9/25/2018
100.08-07-008-29W1.00	Pump Change/Acid Job	6/27/2018
100.09-07-008-29W1.00	Pump Change/Acid Job	9/19/2018
102.01-06-008-29W1.00	Polish Rod Repair	9/25/2018
102.03-07-008-29W1.00	Cleanout to TD	6/23/2018
102.04-07-008-29W1.00	Bakken Open Hole Cleanout	11/10/2018

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-2018	1288.1	276.45	1459.3	135.84	5355.7	133.30	1.887	0.309
Feb-2018	1175.1	277.63	1740.3	137.58	5160.6	138.46	1.721	0.318
Mar-2018	1439.7	279.07	1795.4	139.38	5358.0	143.82	1.605	0.328
Apr-2018	1254.3	280.32	1420.5	140.80	4777.7	148.60	1.729	0.337
May-2018	1127.4	281.45	1397.5	142.20	5060.0	153.66	1.942	0.346
Jun-2018	1066.1	282.52	1309.6	143.50	3907.0	157.57	1.594	0.353
Jul-2018	1117.3	283.63	1532.4	145.04	3685.0	161.25	1.350	0.359
Aug-2018	1049.9	284.68	1507.3	146.54	4523.0	165.77	1.719	0.367
Sep-2018	1004.3	285.69	1426.7	147.97	3813.0	169.59	1.524	0.374
Oct-2018	1040.6	286.73	1441.4	149.41	3903.0	173.49	1.527	0.380
Nov-2018	1019.4	287.75	1567.4	150.98	3513.0	177.00	1.321	0.385
Dec-2018	1094.1	288.84	1696.9	152.68	4356.0	181.36	1.518	0.393

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

The injection water for Sinclair Unit No. 10 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>
102/01-06-008-29W1/0	Vertical	Producing	-
100/02-06-008-29W1/0	Vertical	Producing	-
100/03-06-008-29W1/0	Vertical	Producing	-
100/04-06-008-29W1/0	Horizontal	Injection	-
100/05-06-008-29W1/0	Vertical	Producing	-
102/05-06-008-29W1/0	Horizontal	Injection	-
100/06-06-008-29W1/0	Vertical	Producing	-
100/07-06-008-29W1/0	Vertical	Producing	-
100/08-06-008-29W1/0	Vertical	Producing	-
100/09-06-008-29W1/0	Vertical	Producing	-
100/10-06-008-29W1/0	Vertical	Producing	-
100/11-06-008-29W1/0	Vertical	Producing	-
100/12-06-008-29W1/0	Vertical	Producing	-
102/12-06-008-29W1/0	Horizontal	Injection	-
100/13-06-008-29W1/0	Vertical	Producing	-
102/13-06-008-29W1/0	Horizontal	Injection	-
100/14-06-008-29W1/0	Vertical	Producing	-
100/15-06-008-29W1/0	Vertical	Producing	-
100/16-06-008-29W1/0	Vertical	Producing	-
102/16-06-008-29W1/0	Horizontal	Producing	-
100/01-07-008-29W1/0	Vertical	Producing	-
102/01-07-008-29W1/0	Horizontal	Drilled & Cased	-
100/02-07-008-29W1/0	Vertical	Producing	-
102/03-07-008-29W1/0	Vertical	Producing	-
100/04-07-008-29W1/0	Vertical	Producing	-
102/04-07-008-29W1/0	Horizontal	Producing	-
100/05-07-008-29W1/0	Vertical	Producing	-
102/05-07-008-29W1/0	Horizontal	Injection	-
100/06-07-008-29W1/0	Vertical	Producing	-
100/07-07-008-29W1/0	Vertical	Producing	-
100/08-07-008-29W1/0	Vertical	Producing	-
100/09-07-008-29W1/0	Vertical	Producing	-
100/10-07-008-29W1/0	Vertical	Producing	-
100/11-07-008-29W1/0	Vertical	Producing	-
100/12-07-008-29W1/0	Vertical	Producing	-
100/13-07-008-29W1/0	Vertical	Producing	-
102/13-07-008-29W1/0	Horizontal	Producing	-
103/13-07-008-29W1/0	Horizontal	Drilled & Cased	-
100/14-07-008-29W1/0	Vertical	Producing	-
100/15-07-008-29W1/0	Vertical	Producing	-
100/16-07-008-29W1/0	Vertical	Producing	-
100/01-18-008-29W1/0	Vertical	Producing	-
100/02-18-008-29W1/0	Vertical	Producing	-
102/02-18-008-29W1/0	Horizontal	Injection	-
100/03-18-008-29W1/0	Horizontal	Injection	-

j) Well List

Sinclair Unit No.10 Well List

<i>UWI</i>	<i>Type</i>	<i>Status</i>	<i>Future Plans</i>
102/03-18-008-29W1/0	Horizontal	Injection	-
100/07-18-008-29W1/0	Vertical	Producing	-
100/08-18-008-29W1/0	Vertical	Producing	-
100/09-18-008-29W1/0	Vertical	Producing	-
100/10-18-008-29W1/0	Vertical	Producing	-
100/13-18-008-29W1/0	Horizontal	Producing	-
100/14-18-008-29W1/0	Horizontal	Producing	-
100/15-18-008-29W1/0	Vertical	Producing	-
100/16-18-008-29W1/0	Vertical	Producing	-
102/16-18-008-29W1/0	Horizontal	Drilled & Cased	-