Sinclair Unit No. 8

Waterflood Progress Report 2018

January 1st through December 31st 2018

Prepared for:

Manitoba Industry, Economic Development and Mines

Petroleum Branch

Prepared by:

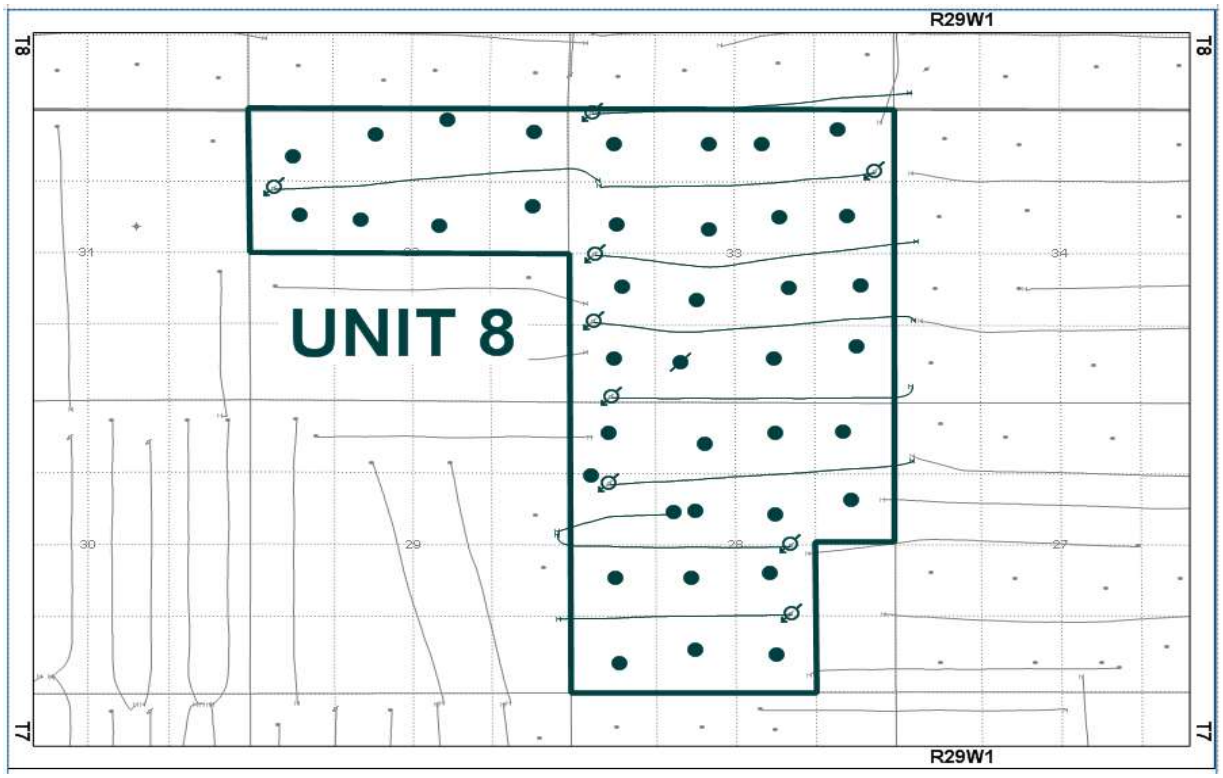
Tundra Oil and Gas

May 28, 2019

INTRODUCTION

Sinclair Unit No. 8 Enhanced Oil Recovery (EOR) Waterflood Project was approved under Waterflood Order No. 25 effective July 1, 2013 with Tundra Oil and Gas (Tundra) as Operator. The Unit area contains 38 vertical and 10 horizontal wells in 38 LSDs in Township 7 Range 29 W1 as shown in the figure below.

Figure 1: Sinclair Unit No. 8 Area Outline



Sinclair Unit No. 8

Tundra Oil and Gas (Tundra), as the operator of the Sinclair Unit No. 8 Enhanced Oil Recovery (EOR) project hereby submits the 2018 EOR report as per section 73 of the Drilling and Production Regulations.

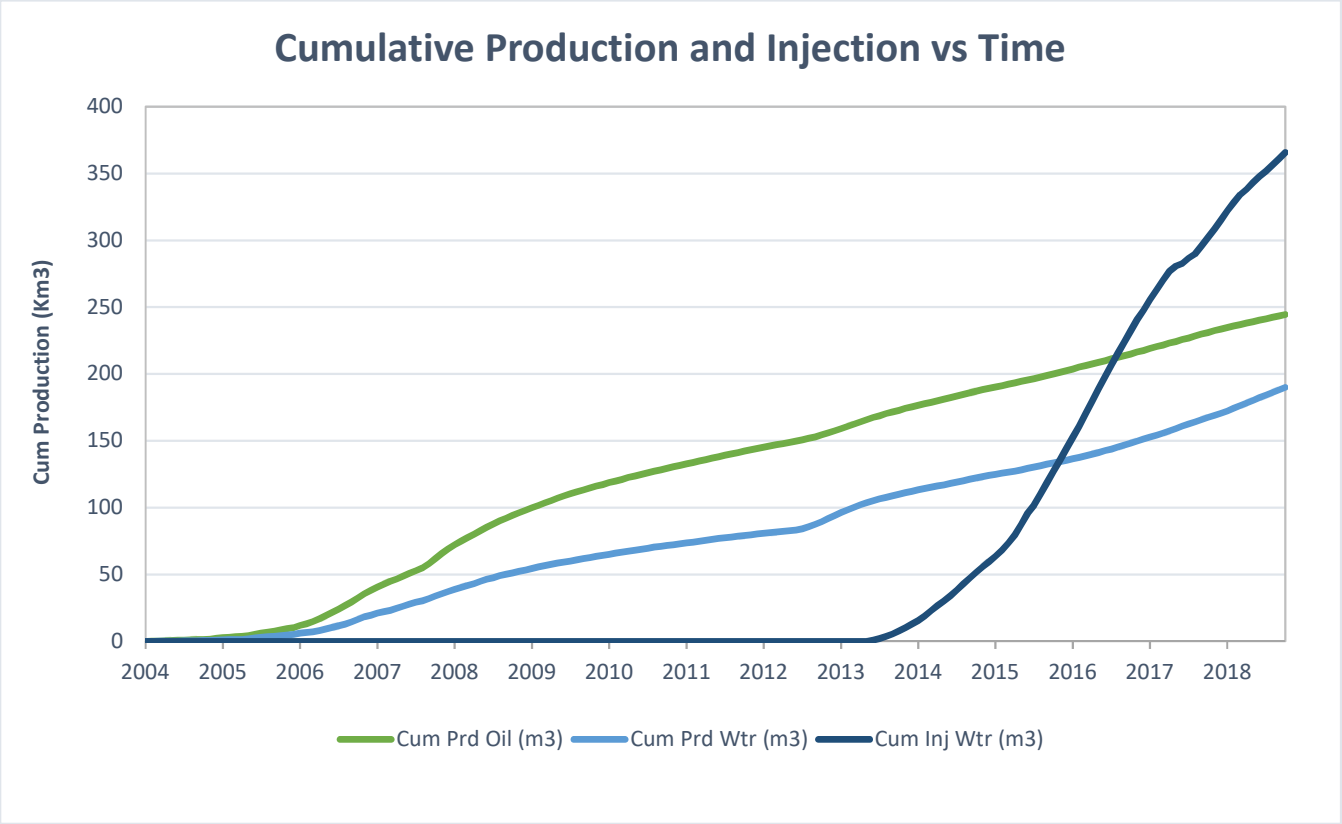
a) Monthly oil and water production rates, injection rate, GOR and WOR

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	43.54	52.22	212.32	1.20	0
Feb-2018	42.14	55.73	237.32	1.32	0
Mar-2018	40.35	57.84	227.77	1.43	0
Apr-2018	38.18	65.24	204.63	1.71	0
May-2018	34.20	62.50	184.81	1.83	0
Jun-2018	33.39	62.87	138.73	1.88	0
Jul-2018	33.68	66.91	157.10	1.99	0
Aug-2018	35.75	67.13	146.68	1.88	0
Sep-2018	35.99	64.97	139.57	1.81	0
Oct-2018	35.82	61.02	145.71	1.70	0
Nov-2018	36.44	61.49	154.00	1.69	0
Dec-2018	34.00	62.45	154.90	1.84	0

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

2018 PRODUCTION	
Produced Oil (m^3)	13,478
Produced Gas (m^3)	0
Produced Water (m^3)	22,529
Fluid Injected (m^3)	63,861
CUMULATIVE PRODUCTION	
Produced Oil (m^3)	244,518
Produced Water (m^3)	189,966

Sinclair Unit No. 8



c) Monthly wellhead injection pressure for each injection well

MONTH	02/04-33 Inj		02/05-33 Inj		02/07-28 Inj		02/12-28 Inj		02/12-32 Inj		02/13-33 Inj	
	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	354.0	5531	294.0	6033	317.0	4978	322.0	5852	731.0	6539	336.0	5392
Feb-2018	402.0	5908	291.0	6549	426.0	5579	460.0	6364	365.0	6545	287.0	6170
Mar-2018	313.0	6145	302.0	6566	506.0	6306	514.0	6563	310.0	6567	471.0	6560
Apr-2018	334.0	6190	244.0	6530	369.0	6462	327.0	6534	270.0	6472	389.0	6489
May-2018	344.0	6382	235.0	6451	327.0	6560	366.0	6570	356.0	6572	464.0	6566
Jun-2018	249.0	6145	67.0	5363	303.0	6381	246.0	6324	481.0	6439	359.0	6434
Jul-2018	337.0	6447	213.0	6101	335.0	6566	342.0	6540	99.0	6320	491.0	6543
Aug-2018	264.0	6232	14.0	4875	286.0	6565	253.0	6570	263.0	4309	278.0	6557
Sep-2018	311.0	6492	0.0	7242	326.0	6568	218.0	6537	208.0	4570	476.0	6500
Oct-2018	372.0	6492	0.0	7352	241.0	6539	281.0	6533	427.0	4756	360.0	6526
Nov-2018	260.0	6485	0.0	7242	213.0	6471	200.0	6477	484.0	5501	335.0	6447
Dec-2018	220.0	6319	0.0	7131	273.0	6569	258.0	6561	382.0	5822	243.0	6570
Total	3760.0		1660.0		3922.0		3787.0		4376.0		4489.0	
Avg Inj P		6231		6453		6295		6452		5868		6396

MONTH	02/16-33 Inj		03/05-33 Inj		03/07-28 Inj		SU8	
	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	533.0	6206	407.0	3614	209.0	6567	3503.0	5599
Feb-2018	595.0	6559	488.0	4992	154.0	6566	3468.0	6119
Mar-2018	554.0	6590	485.0	5548	197.0	6567	3652.0	6394
Apr-2018	407.0	6481	352.0	5695	186.0	6534	2878.0	6392
May-2018	136.0	6593	547.0	6350	203.0	6564	2978.0	6516
Jun-2018	94.0	6366	286.0	5830	208.0	6468	2293.0	6220
Jul-2018	87.0	6573	362.0	6268	170.0	6596	2436.0	6445
Aug-2018	89.0	6539	487.0	6563	176.0	6561	2110.0	6016
Sep-2018	59.0	6571	491.0	6565	212.0	6569	2301.0	6433
Oct-2018	188.0	6571	458.0	6444	154.0	6539	2481.0	6307
Nov-2018	395.0	6393	359.0	6434	114.0	6477	2360.0	6406
Dec-2018	265.0	6537	590.0	6569	237.0	6550	2468.0	6527
Total	3402.0		5312.0		2220.0		32928.0	
Avg Inj P		6498		5906		6547		6281

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	3503.0	3468.0	3652.0	2878.0	2978.0	2293.0	2436.0	2110.0	2301.0	2481.0	2360.0	2468.0
Daily (m^3/d)	113.00	123.86	117.81	95.93	96.06	76.43	78.58	68.06	76.70	80.03	78.67	79.61

c) Monthly wellhead injection pressure for each injection well

2018 AVG. ANNUAL DAILY INJECTION =	90.40 m3/d
CUMULATIVE INJECTION TO Dec 31, 2017 =	301,951 m3
TOTAL 2018 ANNUAL INJECTION =	32,928 m3
CUMULATIVE INJECTION TO Dec 31, 2018 =	365,812 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
100.03-28-007-29W1.00	Pump Change/Acid Job	7/31/2018
100.15-32-007-29W1.00	Rigless Acid	6/28/2018
100.16-28-007-29W1.00	Pump Change/Acid Job	1/30/2018
102.11-28-007-29W1.00	Rigless Acid	6/26/2018
102.12-32-007-29W1.00	Packer Repair	7/28/2018

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	1349.8	232.39	1618.7	169.06	6582.0	308.53	2.148	0.738
Feb-2018	1179.9	233.57	1560.3	170.62	6645.0	315.18	2.353	0.749
Mar-2018	1250.9	234.82	1793.1	172.41	7061.0	322.24	2.254	0.760
Apr-2018	1145.5	235.97	1957.3	174.37	6139.0	328.38	1.928	0.769
May-2018	1060.1	237.03	1937.4	176.30	5729.0	334.11	1.864	0.777
Jun-2018	1001.8	238.03	1886.2	178.19	4162.0	338.27	1.406	0.781
Jul-2018	1044.2	239.07	2074.1	180.26	4870.0	343.14	1.525	0.786
Aug-2018	1108.3	240.18	2080.9	182.34	4547.0	347.69	1.391	0.791
Sep-2018	1079.7	241.26	1949.1	184.29	4187.0	351.87	1.348	0.795
Oct-2018	1110.3	242.37	1891.7	186.19	4517.0	356.39	1.466	0.800
Nov-2018	1093.2	243.46	1844.8	188.03	4620.0	361.01	1.532	0.804
Dec-2018	1053.9	244.52	1935.8	189.97	4802.0	365.81	1.567	0.810

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

The injection water for Sinclair Unit No. 8 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

j) Well List

Sinclair Unit No. 8 Well List

UWI	*Type*	*Status*	*Future Plans*
102/02-28-007-29W1/0	Vertical	Producing	-
100/03-28-007-29W1/0	Vertical	Producing	-
100/04-28-007-29W1/0	Vertical	Producing	-
100/05-28-007-29W1/0	Vertical	Producing	-
100/06-28-007-29W1/0	Vertical	Producing	-
100/07-28-007-29W1/0	Vertical	Producing	-
102/07-28-007-29W1/0	Horizontal	Injection	-
103/07-28-007-29W1/0	Horizontal	Injection	-
100/09-28-007-29W1/0	Vertical	Producing	-
100/10-28-007-29W1/0	Vertical	Producing	-
100/11-28-007-29W1/0	Vertical	Producing	-
102/11-28-007-29W1/0	Horizontal	Producing	-
100/12-28-007-29W1/0	Vertical	Producing	-
102/12-28-007-29W1/0	Horizontal	Injection	-
100/13-28-007-29W1/0	Vertical	Producing	-
100/14-28-007-29W1/0	Vertical	Producing	-
100/15-28-007-29W1/0	Vertical	Producing	-
100/16-28-007-29W1/0	Vertical	Producing	-
100/09-32-007-29W1/0	Vertical	Producing	-
100/10-32-007-29W1/0	Vertical	Producing	-
100/11-32-007-29W1/0	Vertical	Producing	-
100/12-32-007-29W1/0	Vertical	Producing	-
102/12-32-007-29W1/0	Horizontal	Injection	-
100/13-32-007-29W1/0	Vertical	Producing	-
100/14-32-007-29W1/0	Vertical	Producing	-
100/15-32-007-29W1/0	Vertical	Producing	-
100/16-32-007-29W1/0	Vertical	Producing	-
100/01-33-007-29W1/0	Vertical	Producing	-
100/02-33-007-29W1/0	Vertical	Producing	-
100/03-33-007-29W1/0	Vertical	Suspended	-
100/04-33-007-29W1/0	Vertical	Producing	-
102/04-33-007-29W1/0	Horizontal	Injection	-
100/05-33-007-29W1/0	Vertical	Producing	-
102/05-33-007-29W1/0	Horizontal	Injection	-
103/05-33-007-29W1/0	Horizontal	Injection	-
100/06-33-007-29W1/0	Vertical	Producing	-
100/07-33-007-29W1/0	Vertical	Producing	-
100/08-33-007-29W1/0	Vertical	Producing	-
100/09-33-007-29W1/0	Vertical	Producing	-
100/10-33-007-29W1/0	Vertical	Producing	-
100/11-33-007-29W1/0	Vertical	Producing	-
100/12-33-007-29W1/0	Vertical	Producing	-
100/13-33-007-29W1/0	Vertical	Producing	-
102/13-33-007-29W1/0	Horizontal	Injection	-
100/14-33-007-29W1/0	Vertical	Producing	-

j) Well List

Sinclair Unit No. 8 Well List

UWI	*Type*	*Status*	*Future Plans*
100/15-33-007-29W1/0	Vertical	Producing	-
100/16-33-007-29W1/0	Vertical	Producing	-
102/16-33-007-29W1/0	Horizontal	Injection	-