

Sinclair Unit No. 13

Waterflood Progress Report 2018

January 1st through December 31st 2018

Prepared for:

Manitoba Industry, Economic Development and Mines

Petroleum Branch

Prepared by:

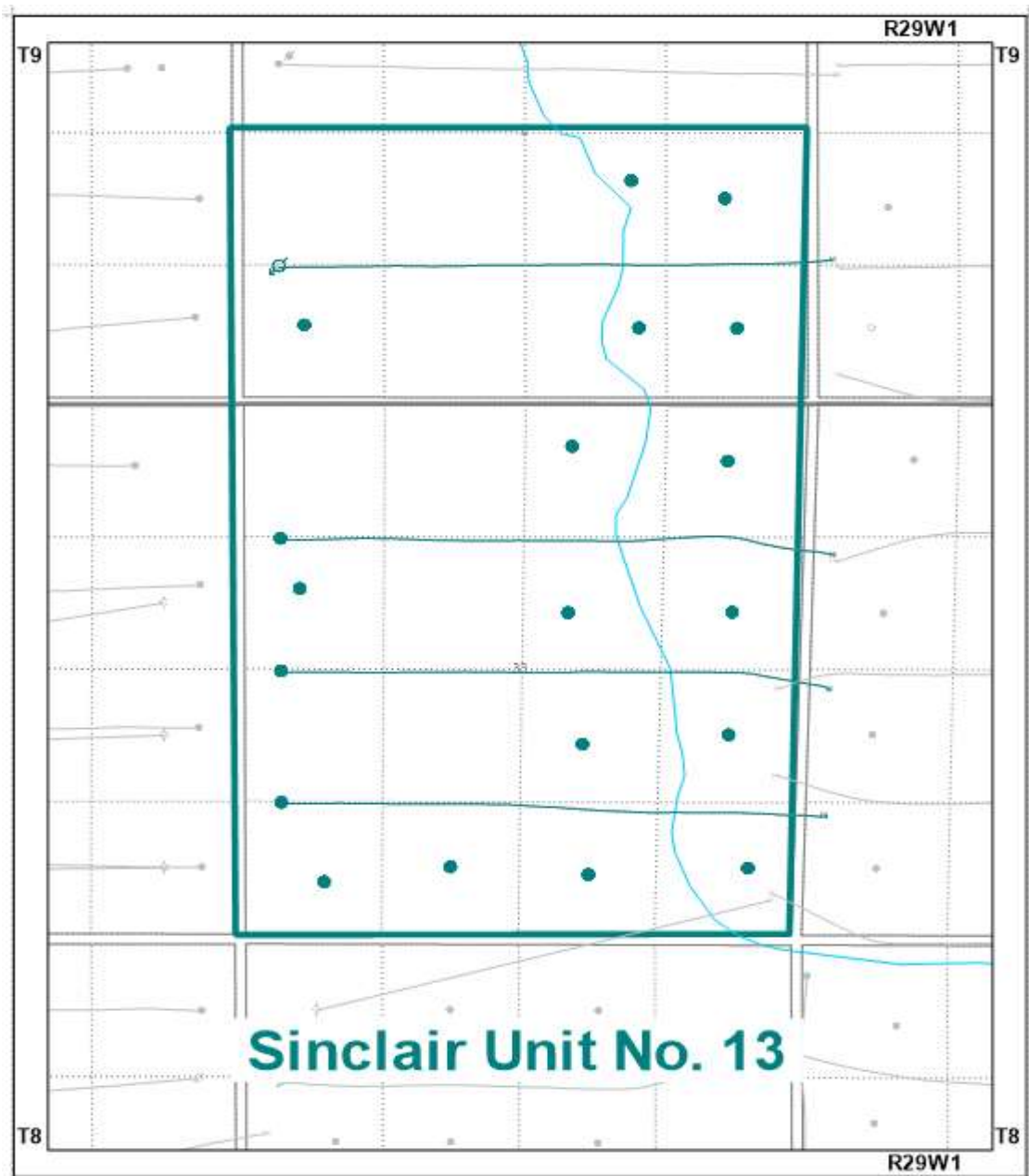
Tundra Oil and Gas

May 28, 2019

INTRODUCTION

Sinclair Unit No. 13 Enhanced Oil Recovery (EOR) Waterflood Project was approved on March 1, 2015 with Tundra Oil and Gas (Tundra) as Operator. The EOR Unit area, outlined in green, contains 16 producing vertical wells, 3 producing horizontal wells and 1 horizontal injection well, in 24 LSDs in Township 8 & 9 Range 29 W1 as shown in the figure below.

Figure 1: Sinclair Unit No. 13 Area Outline



Sinclair Unit No. 13

Tundra Oil and Gas (Tundra), as the operator of the Sinclair Unit No. 13 Enhanced Oil Recovery (EOR) project hereby submits the 2018 EOR report as per section 73 of the Drilling and Production Regulations.

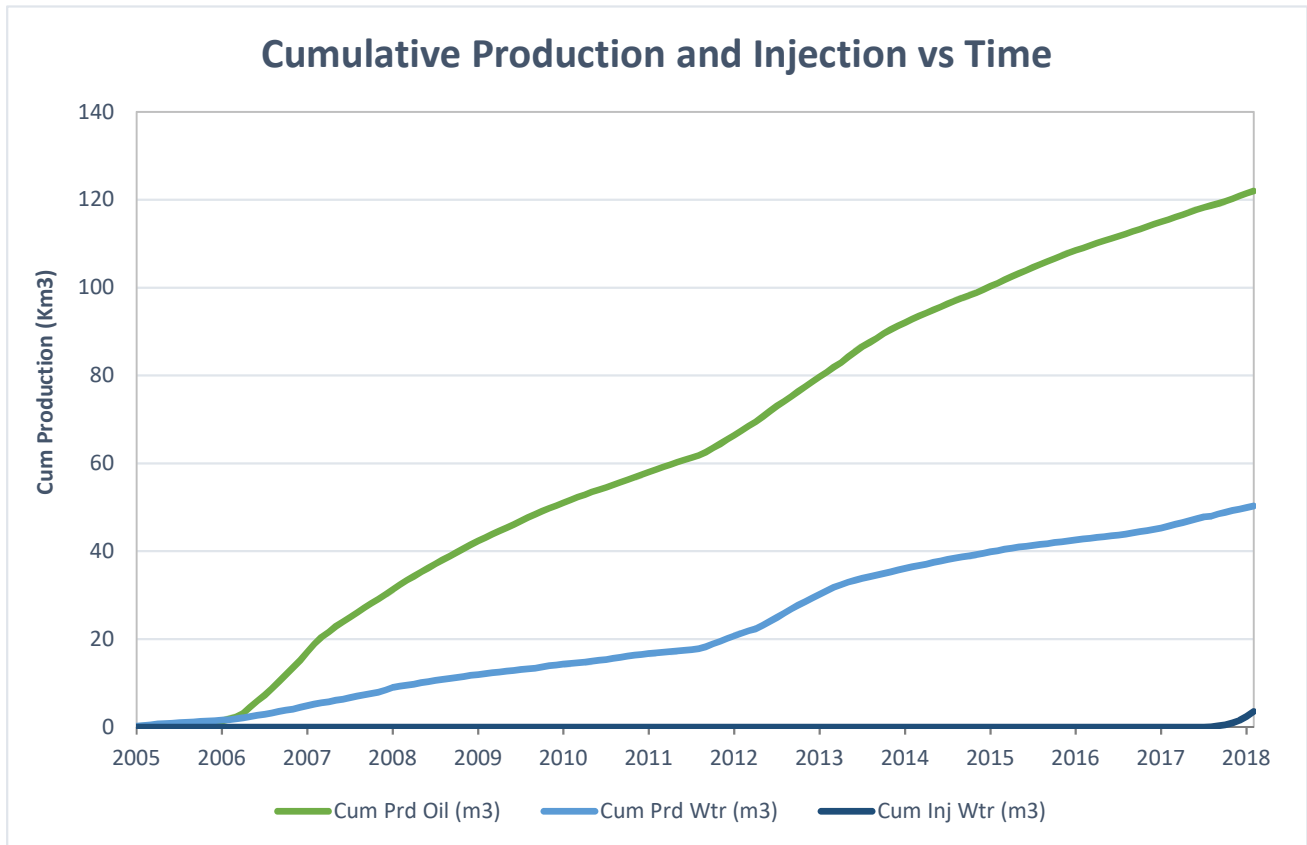
a) Monthly oil and water production rates, injection rate, GOR and WOR

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	18.88	13.29	0.00	0.70	0
Feb-2018	17.88	13.10	0.00	0.73	0
Mar-2018	19.49	13.88	0.00	0.71	0
Apr-2018	17.84	14.26	0.00	0.80	0
May-2018	17.24	14.05	0.00	0.82	0
Jun-2018	14.52	6.78	0.33	0.47	0
Jul-2018	13.80	14.76	6.89	1.07	0
Aug-2018	16.59	13.15	8.70	0.79	0
Sep-2018	19.68	12.77	14.08	0.65	0
Oct-2018	21.76	9.95	17.59	0.46	0
Nov-2018	17.78	12.34	30.58	0.69	0
Dec-2018	17.77	11.90	37.56	0.67	0

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

2018 PRODUCTION	
Produced Oil (m ³)	6,487
Produced Gas (m ³)	0
Produced Water (m ³)	4,572
Fluid Injected (m ³)	3,543
CUMULATIVE PRODUCTION	
Produced Oil (m ³)	121,974
Produced Water (m ³)	50,293

Sinclair Unit No. 13



c) Monthly wellhead injection pressure for each injection well

	02/04-04 Inj		SU13	
MONTH	Inj Water (m ³)	Avg Inj P (kPa)	Inj Water (m ³)	Avg Inj P (kPa)
Jan-2018	-	-	-	-
Feb-2018	-	-	-	-
Mar-2018	-	-	-	-
Apr-2018	-	-	-	-
May-2018	-	-	-	-
Jun-2018	10.0	-3	10.0	-3
Jul-2018	213.6	-69	213.6	-69
Aug-2018	269.8	-82	269.8	-82
Sep-2018	422.5	-57	422.5	-57
Oct-2018	545.3	5	545.3	5
Nov-2018	917.5	-13	917.5	-13
Dec-2018	1164.4	-52	1164.4	-52
Total	3543.1		3543.1	
Avg Inj P		-39		-39

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	0.0	0.0	0.0	0.0	0.0	10.0	213.6	269.8	422.5	545.3	917.5	1164.4
Daily (m³/d)	0.00	0.00	0.00	0.00	0.00	0.33	6.89	8.70	14.08	17.59	30.58	37.56

2018 AVG. ANNUAL DAILY INJECTION = 9.65 m3/d
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CUMULATIVE INJECTION TO Dec 31, 2017 = 0 m3

TOTAL 2018 ANNUAL INJECTION = 3,543 m3
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CUMULATIVE INJECTION TO Dec 31, 2018 = 3,543 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
100.03-33-008-29W1.00	Broken Polish Rod	9/14/2018
100.05-33-008-29W1.00	Cemented Liner Cleanout	6/24/2018
100.07-04-009-29W1.00	Pump Change/Acid Job	6/21/2018
102.04-04-009-29W1.00	WIW Conversion	6/12/2018

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	585.4	116.07	412	46.13	0.0	0.00	0.000	0.000
Feb-2018	500.6	116.57	366.9	46.50	0.0	0.00	0.000	0.000
Mar-2018	604.1	117.18	430.4	46.93	0.0	0.00	0.000	0.000
Apr-2018	535.3	117.71	427.9	47.36	0.0	0.00	0.000	0.000
May-2018	534.5	118.25	435.7	47.79	0.0	0.00	0.000	0.000
Jun-2018	435.5	118.68	203.4	48.00	10.0	0.01	0.015	0.000
Jul-2018	427.9	119.11	457.6	48.46	213.6	0.22	0.233	0.001
Aug-2018	514.4	119.62	407.5	48.86	269.8	0.49	0.282	0.003
Sep-2018	590.5	120.21	383	49.25	422.5	0.92	0.416	0.005
Oct-2018	674.5	120.89	308.5	49.55	545.3	1.46	0.529	0.008
Nov-2018	533.5	121.42	370.1	49.92	917.5	2.38	0.975	0.013
Dec-2018	550.9	121.97	369	50.29	1164.4	3.54	1.214	0.020

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

The injection water for Sinclair Unit No. 13 will be sourced from the 16-32-007-29W1 well (Lodgepole formation). The water is treated at the 03-04-007-29W1 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. 13 Well List

<i>UWI</i>	<i>Type</i>	<i>Status</i>	<i>Future Plans</i>
100/01-33-008-29W1/0	Vertical	Producing	-
100/02-33-008-29W1/0	Vertical	Producing	-
100/03-33-008-29W1/0	Vertical	Producing	-
100/04-33-008-29W1/0	Vertical	Producing	-
102/04-33-008-29W1/0	Horizontal	Producing	-
100/05-33-008-29W1/0	Horizontal	Producing	-
100/07-33-008-29W1/2	Vertical	Producing	-
100/08-33-008-29W1/0	Vertical	Producing	-
100/09-33-008-29W1/0	Vertical	Producing	-
100/10-33-008-29W1/2	Vertical	Producing	-
100/12-33-008-29W1/0	Vertical	Producing	-
102/12-33-008-29W1/0	Horizontal	Producing	-
100/15-33-008-29W1/2	Vertical	Producing	-
100/16-33-008-29W1/0	Vertical	Commingled	-
100/01-04-009-29W1/0	Vertical	Producing	-
100/02-04-009-29W1/0	Vertical	Producing	-
100/04-04-009-29W1/0	Vertical	Producing	-
102/04-04-009-29W1/0	Horizontal	Injection	-
100/07-04-009-29W1/0	Vertical	Producing	-
100/08-04-009-29W1/0	Vertical	Producing	-