

Sinclair Unit No. 18

Waterflood Progress Report 2017

January 1st through December 31st 2017

Prepared for:

Manitoba Industry, Economic Development and Mines

Petroleum Branch

Prepared by:

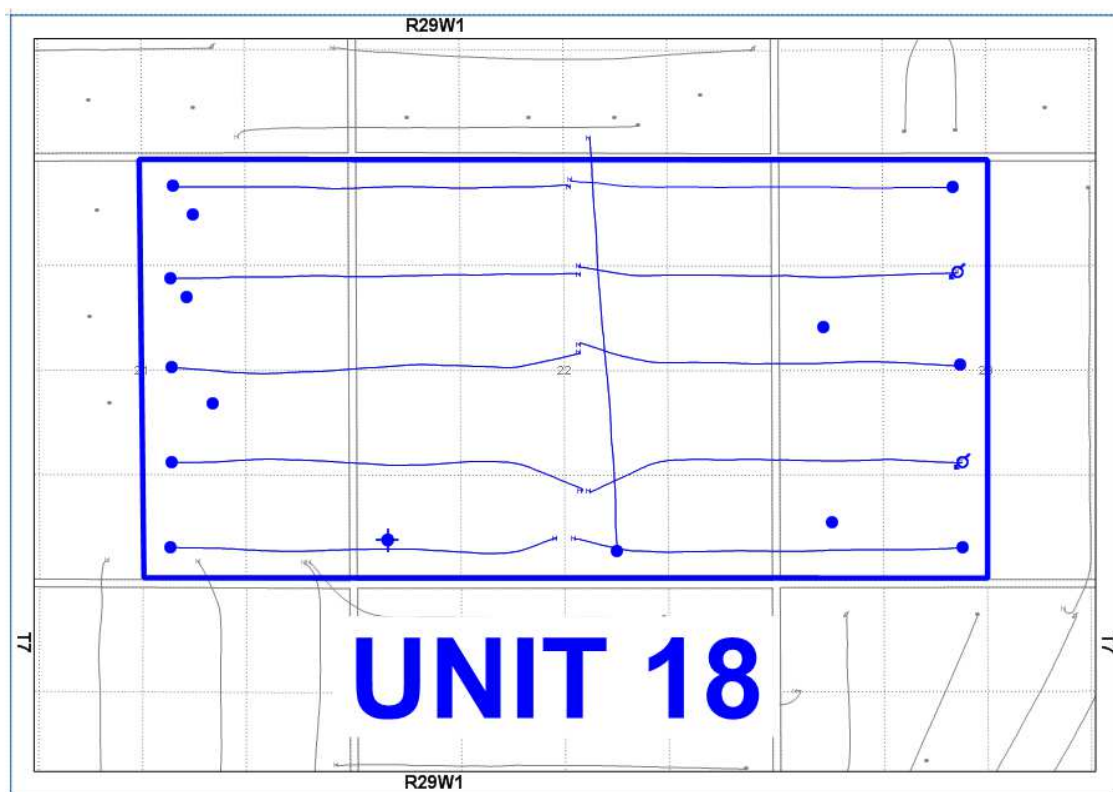
Tundra Oil and Gas

July 26, 2018

INTRODUCTION

Sinclair Unit No. 18 Enhanced Oil Recovery (EOR) Waterflood Project was approved under Waterflood Order No. 59 effective September 1, 2017 with Tundra Oil and Gas (Tundra) as Operator. The EOR project area contains 1 abandoned well, 14 producing wells and 2 horizontal injectors in 2 sections in Township 7, Range 29 W1 as shown in the figure below.

Figure 1: Sinclair Unit No. 18 Area Outline



Sinclair Unit No. 18

Tundra Oil and Gas (Tundra), as the operator of the Sinclair Unit No. 18 Enhanced Oil Recovery (EOR) project hereby submits the 2017 EOR report as per section 73 of the Drilling and Production Regulations.

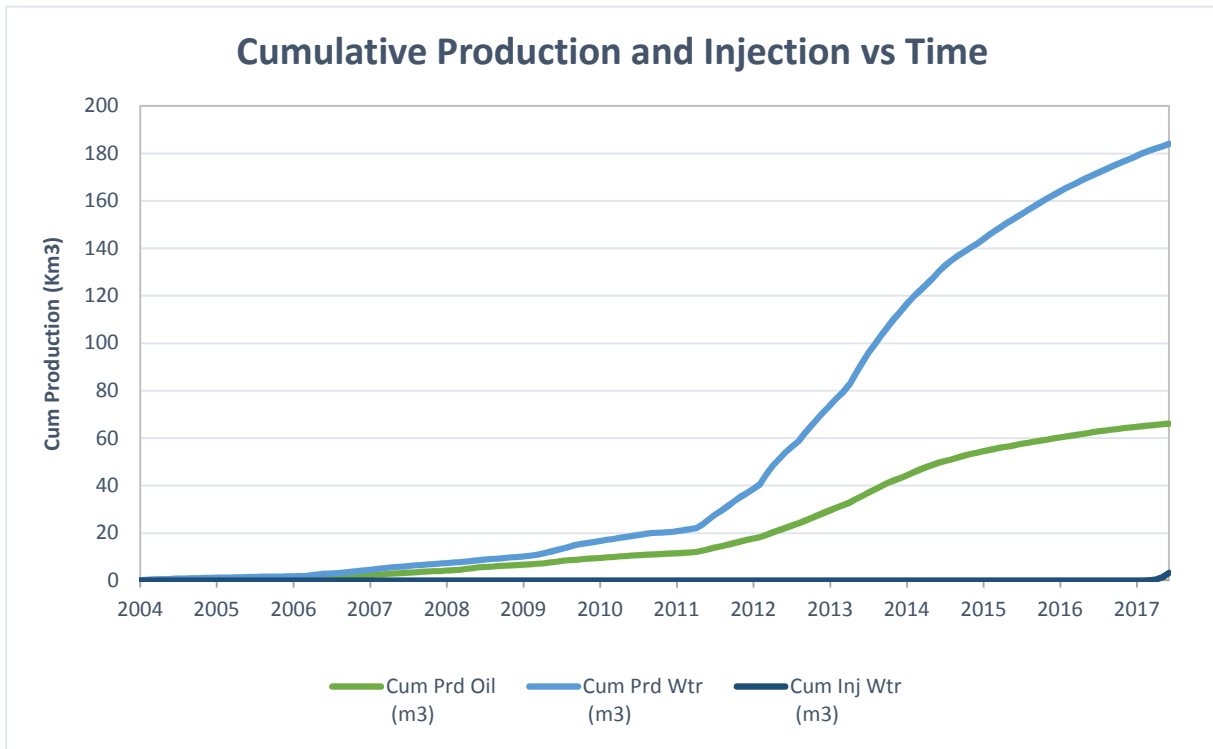
a) Monthly oil and water production rates, injection rate, GOR and WOR

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-2017	12.24	37.93	0.00	3.10	0
Feb-2017	13.21	42.23	0.00	3.20	0
Mar-2017	11.48	40.65	0.00	3.54	0
Apr-2017	10.94	41.46	0.00	3.79	0
May-2017	10.20	34.93	0.00	3.43	0
Jun-2017	11.15	34.23	0.00	3.07	0
Jul-2017	9.83	40.16	0.00	4.08	0
Aug-2017	8.76	38.78	0.00	4.43	0
Sep-2017	8.00	31.24	2.93	3.90	0
Oct-2017	8.77	30.46	9.58	3.47	0
Nov-2017	7.75	28.05	31.43	3.62	0
Dec-2017	7.48	34.74	60.19	4.64	0

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

2017 PRODUCTION	
Produced Oil (m ³)	3,637
Produced Gas (m ³)	0
Produced Water (m ³)	13,219
Fluid Injected (m ³)	3,194
CUMULATIVE PRODUCTION	
Produced Oil (m ³)	66,041
Produced Water (m ³)	184,010

Sinclair Unit No. 18



c) Monthly wellhead injection pressure for each injection well

	00/06-23 Inj		00/11-23 Inj		SU18	
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-2017	-	-	-	-	-	-
Feb-2017	-	-	-	-	-	-
Mar-2017	-	-	-	-	-	-
Apr-2017	-	-	-	-	-	-
May-2017	-	-	-	-	-	-
Jun-2017	-	-	-	-	-	-
Jul-2017	-	-	-	-	-	-
Aug-2017	-	-	-	-	-	-
Sep-2017	65.0	18	23.0	-69	88.0	-16
Oct-2017	189.0	-72	108.0	-20	297.0	-46
Nov-2017	546.0	-67	397.0	-22	943.0	-45
Dec-2017	1031.0	161	835.0	-96	1866.0	32
Total	1831.0		1363.0		3194.0	
Avg Inj P		10		-52		-19

MONTH	Jan-2017	Feb-2017	Mar-2017	Apr-2017	May-2017	Jun-2017	Jul-2017	Aug-2017	Sep-2017	Oct-2017	Nov-2017	Dec-2017
Total m3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88.0	297.0	943.0	1866.0
Daily (m³/d)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.93	9.58	31.43	60.19

2017 AVG. ANNUAL DAILY INJECTION = 8.68 m3/d
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CUMULATIVE INJECTION TO Dec 31, 2016 = 0 m3

TOTAL 2017 ANNUAL INJECTION = 3,194 m3
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CUMULATIVE INJECTION TO Dec 31, 2017 = 3,194 m3

d) Summary of the result of any survey of reservoir pressure conducted in 2017. N/A

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

Well	Service Description	Date
102.07-21-007-29W1.00	Replace polish rod/pump change	5/29/2017
102.10-21-007-29W1.00	Cemented Liner Clean Out	11/21/2017
103.10-21-007-29W1.00	Pump Change	6/19/2017
100.06-23-007-29W1.00	WIW Conversion	8/28/2017
100.11-23-007-29W1.00	WIW Conversion	9/1/2017

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-2017	379.3	62.78	1175.7	171.97	0.0	0.00	0.000	0.000
Feb-2017	369.9	63.15	1182.4	173.15	0.0	0.00	0.000	0.000
Mar-2017	355.8	63.51	1260.1	174.41	0.0	0.00	0.000	0.000
Apr-2017	328.1	63.84	1243.8	175.65	0.0	0.00	0.000	0.000
May-2017	316.1	64.15	1082.8	176.74	0.0	0.00	0.000	0.000
Jun-2017	334.5	64.49	1026.8	177.76	0.0	0.00	0.000	0.000
Jul-2017	304.8	64.79	1245	179.01	0.0	0.00	0.000	0.000
Aug-2017	271.6	65.07	1202.1	180.21	0.0	0.00	0.000	0.000
Sep-2017	240.0	65.31	937.1	181.15	88.0	0.09	0.074	0.000
Oct-2017	271.9	65.58	944.4	182.09	297.0	0.39	0.240	0.002
Nov-2017	232.6	65.81	841.6	182.93	943.0	1.33	0.865	0.005
Dec-2017	231.9	66.04	1076.9	184.01	1866.0	3.19	1.408	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. 18 is 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>
100/02-21-007-29W1/0	Horizontal	Producing	-
100/07-21-007-29W1/0	Vertical	Producing	-
102/07-21-007-29W1/0	Horizontal	Producing	WIW Conversion
100/10-21-007-29W1/0	Vertical	Producing	-
102/10-21-007-29W1/0	Horizontal	Producing	WIW Conversion
103/10-21-007-29W1/0	Horizontal	Producing	-
100/15-21-007-29W1/0	Vertical	Producing	-
102/15-21-007-29W1/0	Horizontal	Producing	-
100/02-22-007-29W1/0	Horizontal	Producing	-
100/04-22-007-29W1/0	Vertical	Abandoned Zone	-
100/03-23-007-29W1/0	Horizontal	Producing	-
100/04-23-007-29W1/0	Vertical	Producing	-
100/06-23-007-29W1/0	Horizontal	Injection	-
100/11-23-007-29W1/0	Horizontal	Injection	-
102/11-23-007-29W1/0	Horizontal	Producing	-
100/12-23-007-29W1/0	Vertical	Producing	-
100/14-23-007-29W1/0	Horizontal	Producing	-