

BIRDTAIL UNIT NO. 2
WATERFLOOD EOR PROJECT

ANNUAL REPORT FOR 2016

May 3, 2017

Tundra Oil and Gas Partnership

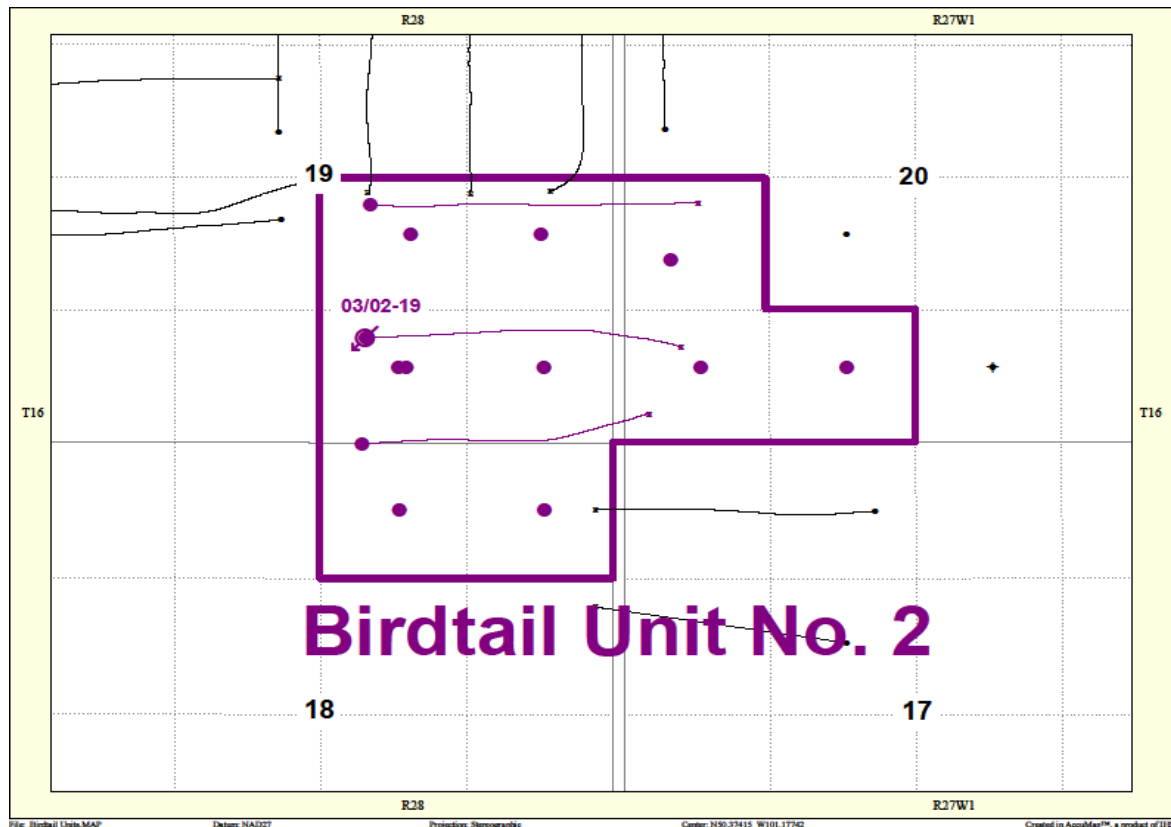
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INTRODUCTION

Birdtail Unit No. 2 Enhanced Oil Recovery (EOR) Waterflood Project was approved under Waterflood Order No. 8 effective December 1, 2000 with Progress Energy Production Partnership as Operator. Tundra acquired the unit from Progress Energy Production Partnership and become operator in October 2003. The EOR project area contains 13 wells in 9 LSDs in Township 16, Range 27 W1 as shown in the figure below. Well list and well status is available in Appendix A.

Figure 1: Birdtail Unit No. 2 Area Outline



In accordance with Section 73 of the Manitoba Drilling and Production Regulation, Tundra hereby submits the 2016 Annual Progress Report for Birdtail Unit No. 2 as required by Waterflood Order No. 8.

DISCUSSION

Production History

For the wells included in Birdtail Unit No. 2, production started January 1997 with 00/05-20-016-27W1/0 well. Oil production peaked at 11.8 m³/d in July 1998. The Unit was producing 3.74 m³/d of oil and 21.65 m³/d of water in December 2016 and had an average WOR of 5.70 m³/m³ in 2016. The oil production rate, injection rate, and WOR during each month for each injection pattern and for whole project are presented in Appendix D. The rates and WOR are plotted in Figure 2.

Figure 2: Birdtail Unit No. 2 Production/Injection Rates and WOR vs. Time

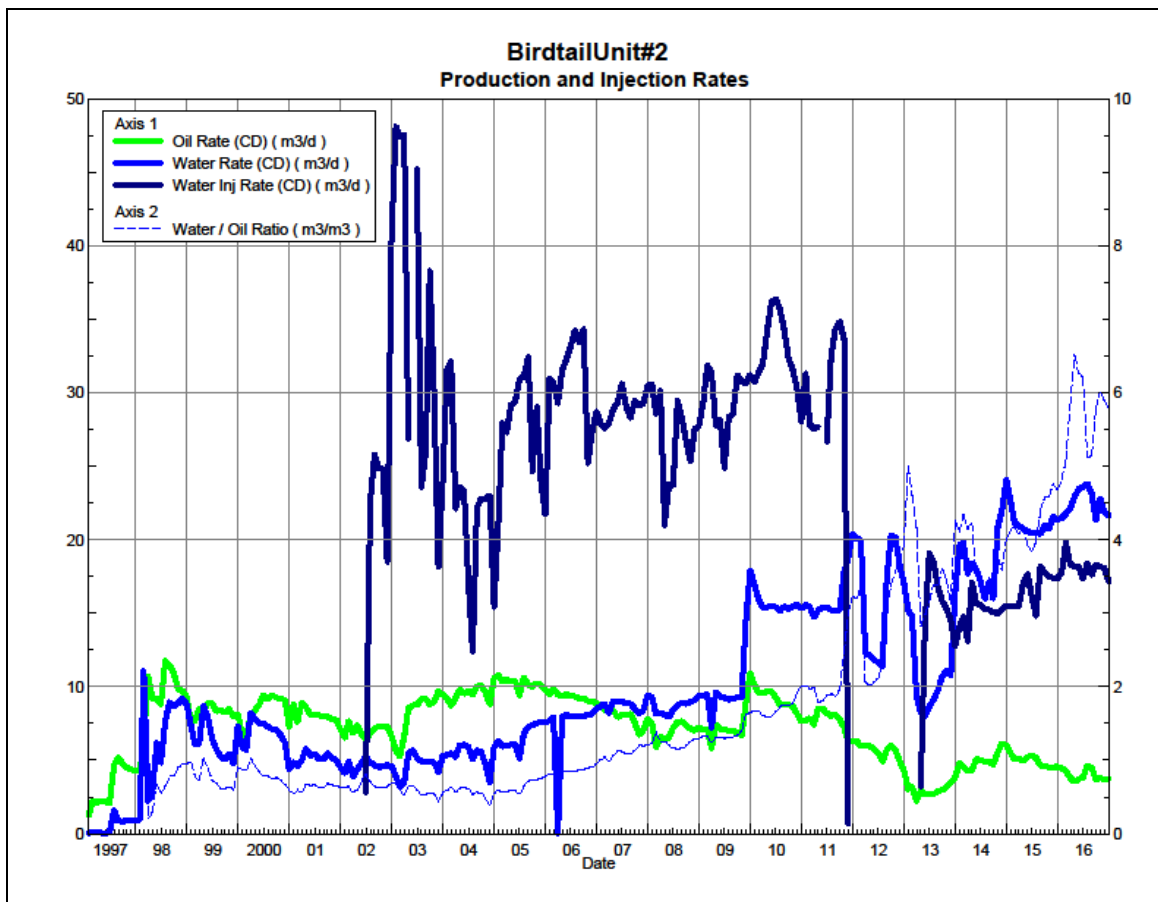
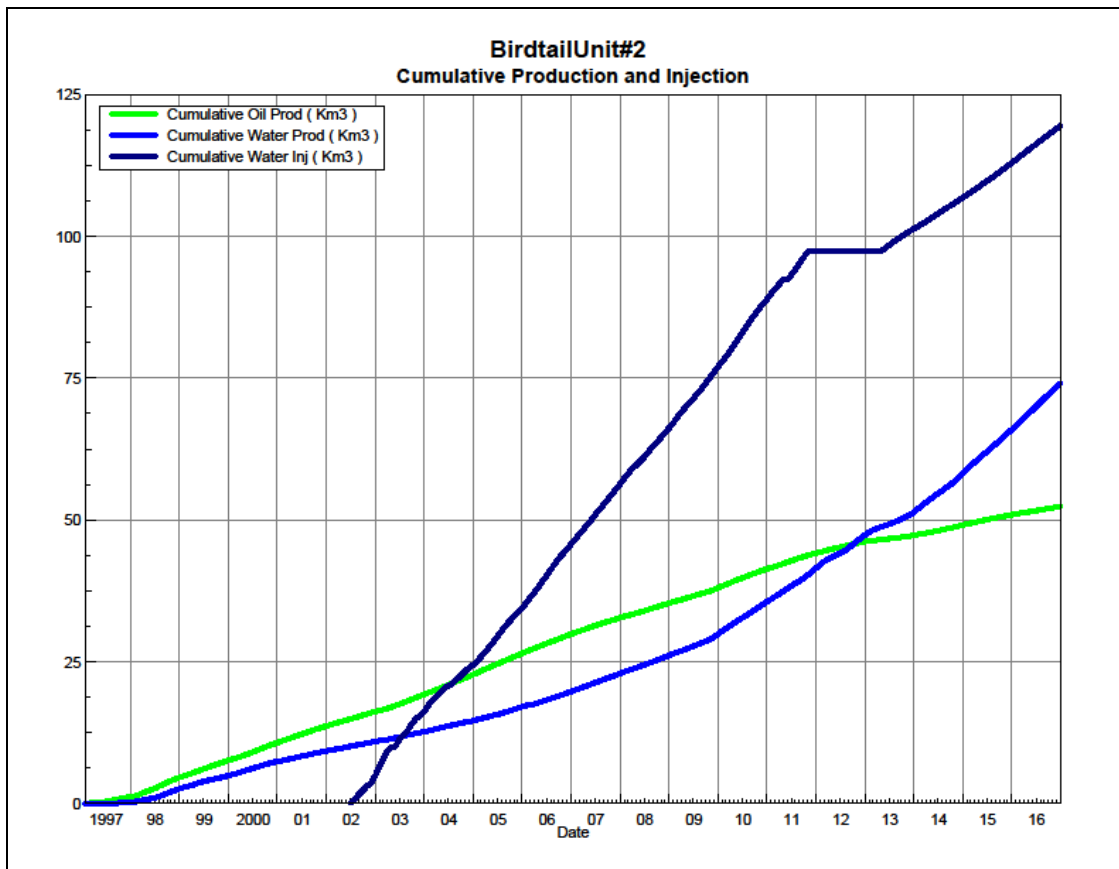


Figure 3 shows the cumulative production for Birdtail Unit No. 2 to the end of December 2016 as 52.3 e³m³ of oil, and 73.5 e³m³ of water. The cumulative water injected is 119.0 e³m³. The cumulative volume of oil, and water produced and fluid injected for each injection pattern and for the whole project for each injection well is presented in Appendix D.

Figure 3: Birdtail Unit No. 2 Cumulative Oil, Water and Water Injected vs. Time



Waterflood History

As of December 2016 the Unit had 1 active horizontal injector at 03/02-19-016-27W1/0. The vertical injectors at 02/02-19-016-27W1/0 (02/02-19) and 00/04-20-016-27W1/0 (00/04-20) were suspended in October 2011. Water injection started in June 2002. An overall summary for each injector pattern is presented in Appendix C.

Any future revisions to the waterflood development or surveillance plan would be based on new production or performance response data, technical studies, or observed reservoir behavior and reserves recovery interpretations.

Waterflood EOR Operations

Water Source and Quality

The injection water for Birdtail Unit No. 2 is sourced from the 00/02-19-016-27W/2 well (Lodgepole formation). The water is treated at the 09-05-16-27W1 battery where it is filtered to 0.50 microns and has scale inhibitor added.

Injection Wellhead Pressures

The monthly wellhead injection pressures for each injection well is summarized in Appendix B, and shows all injection pressure since 2003. The average injection pressure for the horizontal injector at 03/02-19-016-27W1/0 was 3909 kPag in 2016.

Reservoir Pressure

Where practical, Tundra is committed to collecting pressure data from newly drilled wells. For Birdtail Unit No. 2, pressure data taken in 2012 and 2013 from 4 locations is available (02/02-19, 03/02-19, 04/02-19 and 00/04-20). The reservoir pressures are 5266, 3990, 4646 and 5745 kPa(a), respectively.

Well Servicing

No maintenance was required on the 13 wells in Birdtail Unit No. 2 in 2016.

Voidage Replacement

Cumulative voidage for Birdtail Unit No. 2 was 0.932 in December 2016. This is reasonable considering that the wells within the unit have been producing for eighteen years. From 2002 until 2011, monthly voidage was significantly greater than 1, which is why the Birdtail Unit No. 2 had a cumulative VRR greater than 1. Calculation, plots and tables of the Voidage Replacement Ratio on a monthly and cumulative basis for each injection pattern are presented in Appendix D.

In consideration of the cumulative VRR in excess of 1, water injection was suspended in October 2011 in the vertical injectors. Injection in the Unit resumed in April 2013 with the conversion of the horizontal producer at 03/02-19-016-27W1/0 to injection.

Waterflood Performance Discussion

The original oil-in-place (OOIP) of 393 e^3m^3 with cumulative oil recovered to date of 52.4 e^3m^3 results in a recovery factor of 13.3%. The ultimate expected recoverable reserve based on decline analysis is 64.7 e^3m^3 or an ultimate recovery factor of 16.4%. The overall performance of this waterflood has been good as indicated by an expected recovery factor of 16.4% and increased or flattened oil production since water injection began in 2002.

The 03/02-19-016-27W1/0 (03/02-19) horizontal well was converted to a water injector in April 2013 after a short production period. The injection rates have been reasonably steady between 17-19 m^3/d and are starting to show some oil response on the offset vertical wells. Ultimately, it is expected that the 02/15-18 and 02/07-19-016-27W1/0 horizontal producers will benefit the most from the new 03/02-19 water injector. Tundra will continue to closely monitor the response of the reconfigured waterflood in this unit and make any appropriate changes as required to the injection targets and wells.

List of Appendices

Appendix A: Well Name and Well Status

Appendix B: Average Monthly Injection Pressure Summary

Appendix C: Injection Pattern Summary

Appendix D: Injector Pattern Production/Injection Rates, Cumulative and VRR Plot and
Table for the following injector:

03/02-19-016-27W1/0

Appendix A

UWI	Surface Location	Well Status
100/15-18-016-27W1/00		ABD Producer
102/15-18-016-27W1/00	104/04-20-016-27W1/00	Capable of OIL Prod
100/16-18-016-27W1/00		Capable of OIL Prod
100/01-19-016-27W1/00		Capable of OIL Prod
100/02-19-016-27W1/00		ABD Producer
102/02-19-016-27W1/00		ABD Injector
103/02-19-016-27W1/00	103/04-20-016-27W1/00	WTR Injection
100/07-19-016-27W1/00		Capable of OIL Prod
102/07-19-016-27W1/00	102/05-20-016-27W1/00	Capable of OIL Prod
100/08-19-016-27W1/00		Capable of OIL Prod
100/03-20-016-27W1/00		Capable of OIL Prod
100/04-20-016-27W1/00		WTR Injection
100/05-20-016-27W1/00		Capable of OIL Prod

Appendix B

Average Monthly Injection Pressure (kPag)

Injection Pressure			Injection Pressure			Injection Pressure			Injection Pressure			Injection Pressure				
Month	100/04-20	102/02-19	Month	100/04-20	102/02-19	Month	100/04-20	102/02-19	Month	100/04-20	102/02-19	103/02-19	Month	100/04-20	102/02-19	103/02-19
			Jan-06	8100	8200	Jan-09	8000	8100	Jan-12	-	-	-	Jan-15	-	-	3000
			Feb-06	8100	8200	Feb-09	8000	8100	Feb-12	-	-	-	Feb-15	-	-	3000
			Mar-06	8100	8200	Mar-09	8000	8100	Mar-12	-	-	-	Mar-15	-	-	2977
			Apr-06	8100	8200	Apr-09	8000	8100	Apr-12	-	-	-	Apr-15	-	-	3232
			May-06	8100	8200	May-09	8000	8100	May-12	-	-	-	May-15	-	-	3499
			Jun-06	8100	8200	Jun-09	8000	8100	Jun-12	-	-	-	Jun-15	-	-	3363
			Jul-06	8100	8200	Jul-09	8000	8100	Jul-12	-	-	-	Jul-15	-	-	2911
			Aug-06	8100	8200	Aug-09	7774	8100	Aug-12	-	-	-	Aug-15	-	-	3405
			Sep-06	8100	8200	Sep-09	8000	8100	Sep-12	-	-	-	Sep-15	-	-	3492
Oct-03	8400	8600	Oct-06	8055	8155	Oct-09	8000	7497	Oct-12	-	-	-	Oct-15	-	-	3499
Nov-03	8147	8220	Nov-06	7900	8050	Nov-09	8000	8100	Nov-12	-	-	-	Nov-15	-	-	3499
Dec-03	8310	8410	Dec-06	8000	8100	Dec-09	8000	6974	Dec-12	-	-	-	Dec-15	-	-	3499
Jan-04	8300	8400	Jan-07	8000	8100	Jan-10	8000	7084	Jan-13	-	-	-	Jan-16	-	-	3547
Feb-04	8300	8400	Feb-07	8000	8100	Feb-10	8000	8100	Feb-13	-	-	-	Feb-16	-	-	3999
Mar-04	8300	8400	Mar-07	8000	8100	Mar-10	8000	8100	Mar-13	-	-	-	Mar-16	-	-	3999
Apr-04	8240	8340	Apr-07	8000	8100	Apr-10	8000	8100	Apr-13	-	-	35	Apr-16	-	-	3999
May-04	8200	8300	May-07	8000	8100	May-10	8000	8100	May-13	-	-	736	May-16	-	-	3883
Jun-04	7390	7363	Jun-07	8000	8100	Jun-10	8000	8100	Jun-13	-	-	2346	Jun-16	-	-	3842
Jul-04	5732	5581	Jul-07	8000	8100	Jul-10	8000	8100	Jul-13	-	-	2938	Jul-16	-	-	3999
Aug-04	8200	8297	Aug-07	8000	6984	Aug-10	8000	8100	Aug-13	-	-	3000	Aug-16	-	-	3862
Sep-04	8200	8300	Sep-07	8000	8100	Sep-10	8000	8100	Sep-13	-	-	3000	Sep-16	-	-	3999
Oct-04	8200	8300	Oct-07	8000	8100	Oct-10	8000	8100	Oct-13	-	-	3000	Oct-16	-	-	4001
Nov-04	8200	8300	Nov-07	8000	8100	Nov-10	8020	7963	Nov-13	-	-	3040	Nov-16	-	-	4000
Dec-04	6997	6774	Dec-07	8000	8100	Dec-10	8003	7968	Dec-13	-	-	2614	Dec-16	-	-	3777
Jan-05	7013	7000	Jan-08	8000	8100	Jan-11	7900	7800	Jan-14	-	-	2977				
Feb-05	8000	8200	Feb-08	8000	8100	Feb-11	7882	7818	Feb-14	-	-	3012				
Mar-05	8000	8200	Mar-08	8000	8100	Mar-11	7594	7777	Mar-14	-	-	2610				
Apr-05	8000	8200	Apr-08	8000	8100	Apr-11	7743	7943	Apr-14	-	-	2989				
May-05	8035	8200	May-08	8000	8100	May-11	7761	7897	May-14	-	-	3000				
Jun-05	8100	8200	Jun-08	8000	8100	Jun-11	7057	7207	Jun-14	-	-	3001				
Jul-05	8100	8200	Jul-08	8000	8100	Jul-11	7800	7900	Jul-14	-	-	3019				
Aug-05	8100	8200	Aug-08	8000	8100	Aug-11	7800	7900	Aug-14	-	-	2999				
Sep-05	8203	8303	Sep-08	8000	8100	Sep-11	7800	7900	Sep-14	-	-	3001				
Oct-05	8300	8400	Oct-08	8000	8100	Oct-11	7129	7974	Oct-14	-	-	3000				
Nov-05	8300	8400	Nov-08	8000	8100	Nov-11	4347	4157	Nov-14	-	-	3000				
Dec-05	8197	8297	Dec-08	8000	8100	Dec-11	3542	2471	Dec-14	-	-	2999				

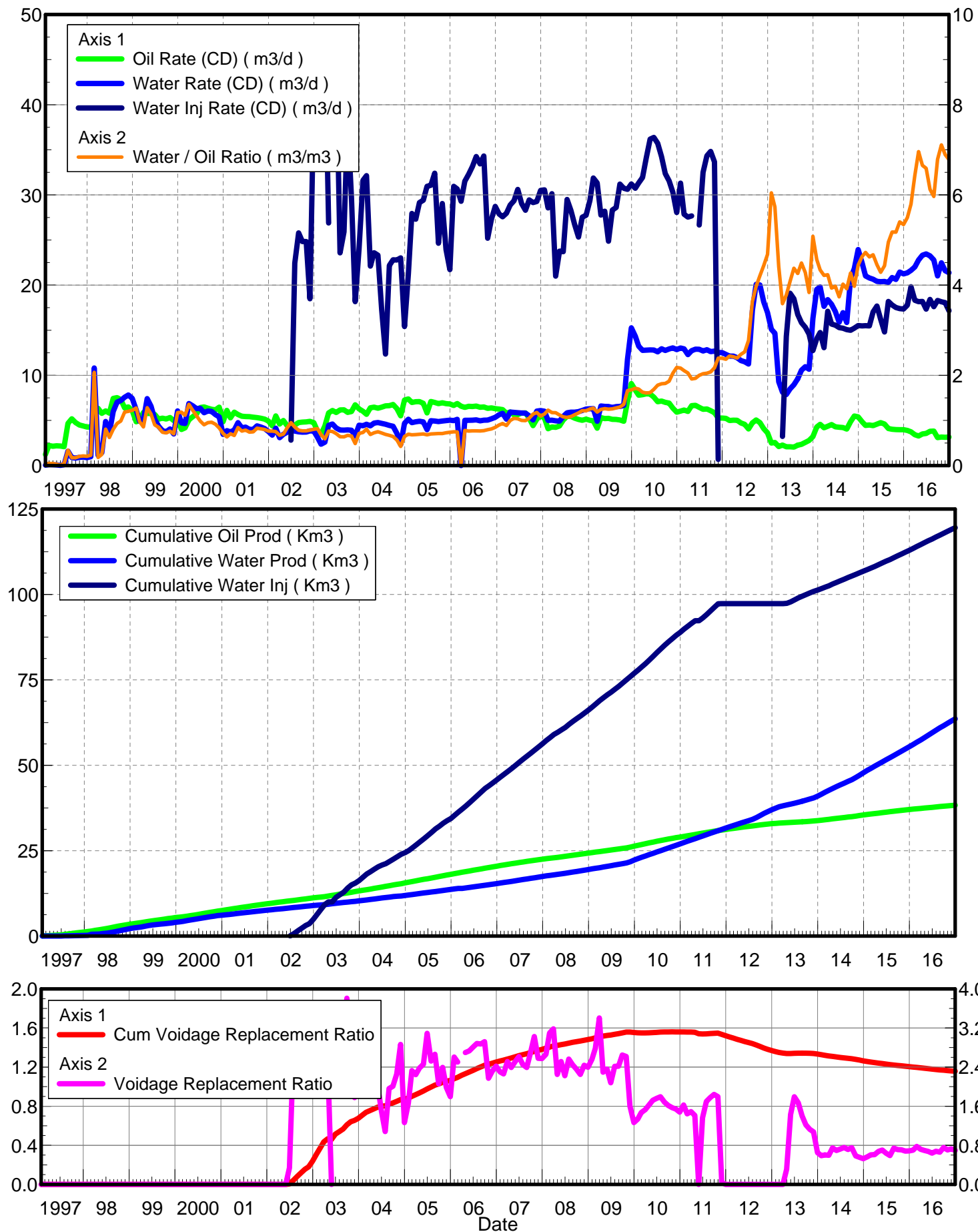
Appendix C

Birdtail Unit No.2 Pattern Summary as of December 2015

Pattern Name	Injector Location (016-27W1)	Injector Surf. Location (016-27W1)	Status	No. of Supported Wells	Supported Wells (016-27W1)	Allocation Factor	Pattern Prod Start Month	Inj Start Month	Inj End Month	Oil Rate (m³/d)	Water Rate (m³/d)	WOR (m³/m³)	Water Injection (m³/d)	Cum Oil (E³m³)	Cum Water (E³m³)	Cum Inj Water (E³m³)	Monthly VRR	Cum VRR
02/02-19-016-27W1 Injector	02/02-19	Vertical Well	WTR Injection	7	15-18, 02-19, 07-19	1	Jul 1997	Jun 2002	Oct 2011	-	-	-	-	-	-	-	-	-
					16-18, 01-19, 08-19, 02/07-19	0.5												
00/04-20-016-27W1 Injector	00/04-20	Vertical Well	WTR Injection	6	03-20, 05-20	1	Jan 1997	Jul 2002	Oct 2011	-	-	-	-	-	-	-	-	-
					16-18, 01-19, 08-19, 02/07-19	0.5												
03/02-19-016-27W1 Injector	03/02-19	03/04-20	WTR Injection	9	01-19, 02-19, 02/02-19, 07-19, 08-19, 02/15-18 (Surf Loc 04/04-20), 02/07-19 (Surf Loc 02/05-20), 04-20, 05-20	1	Jan 1997	Apr 2013	-	3.2	21.4	6.8	17.2	38.3	63.6	119.5	0.7	1.2

Appendix D
Rates and VRR
Plots and Tables

Oil Formation Vol Factor : 1.00150 m3/m3
 Water Formation Vol Factor : 1.00150 m3/m3
 Water / Oil Ratio : 6.24 m3/m3
 Pattern: 03/02-19-016-27Inj Set: BirdtailUnit#2
 May 03, 2017
 Operator: TUNDRA_OIL_&_GAS_LIMITED
 Oil Rate (CD) : 3.16 m3/d
 Water Rate (CD) : 19.74 m3/d
 Water Inj Rate (CD) : 18.19 m3/d



Production History

Pattern: 03/02-19-016-27Inj Set: BirdtailUnit#2

Date	Oil Rate (CD) m3/d	Water Rate (CD) m3/d	Water Oil Ratio m3/m3	Water Inj Rate (CD) m3/d	Cum Oil Prod Km3	Cum Water Prod Mm3	Cum Water Inj Km3	VRR	Cum VRR
1/31/1997	1.23	0.05	0.04		0.04	0.00	0.00	0.000	0.000
2/28/1997	2.22	0.10	0.05		0.10	0.00	0.00	0.000	0.000
3/31/1997	2.14	0.09	0.04		0.17	0.01	0.00	0.000	0.000
4/30/1997	2.19	0.06	0.03		0.23	0.01	0.00	0.000	0.000
5/31/1997	2.17	0.03	0.01		0.30	0.01	0.00	0.000	0.000
6/30/1997	2.09	0.09	0.04		0.36	0.01	0.00	0.000	0.000
7/31/1997	4.68	1.59	0.34		0.51	0.06	0.00	0.000	0.000
8/31/1997	5.18	0.89	0.17		0.67	0.09	0.00	0.000	0.000
9/30/1997	4.76	0.82	0.17		0.81	0.11	0.00	0.000	0.000
10/31/1997	4.50	0.91	0.20		0.95	0.14	0.00	0.000	0.000
11/30/1997	4.39	0.94	0.21		1.08	0.17	0.00	0.000	0.000
12/31/1997	4.26	0.87	0.20		1.21	0.20	0.00	0.000	0.000
1/31/1998	4.25	0.97	0.23		1.35	0.23	0.00	0.000	0.000
2/28/1998	5.24	10.81	2.07		1.49	0.53	0.00	0.000	0.000
3/31/1998	6.34	1.14	0.18		1.69	0.57	0.00	0.000	0.000
4/30/1998	5.78	1.42	0.25		1.86	0.61	0.00	0.000	0.000
5/31/1998	6.06	4.89	0.81		2.05	0.76	0.00	0.000	0.000
6/30/1998	5.81	3.61	0.62		2.22	0.87	0.00	0.000	0.000
7/31/1998	7.45	5.99	0.80		2.46	1.05	0.00	0.000	0.000
8/31/1998	7.53	7.03	0.93		2.69	1.27	0.00	0.000	0.000
9/30/1998	7.31	7.20	0.99		2.91	1.49	0.00	0.000	0.000
10/31/1998	6.39	7.57	1.19		3.11	1.72	0.00	0.000	0.000
11/30/1998	6.50	7.82	1.20		3.30	1.96	0.00	0.000	0.000
12/31/1998	6.10	7.45	1.22		3.49	2.19	0.00	0.000	0.000
1/31/1999	4.85	6.18	1.27		3.64	2.38	0.00	0.000	0.000
2/28/1999	5.06	4.91	0.97		3.78	2.52	0.00	0.000	0.000
3/31/1999	5.88	5.04	0.86		3.96	2.67	0.00	0.000	0.000
4/30/1999	5.78	7.42	1.28		4.14	2.90	0.00	0.000	0.000
5/31/1999	5.76	6.57	1.14		4.32	3.10	0.00	0.000	0.000
6/30/1999	5.67	5.12	0.90		4.49	3.25	0.00	0.000	0.000
7/31/1999	5.15	4.37	0.85		4.65	3.39	0.00	0.000	0.000
8/31/1999	5.25	3.87	0.74		4.81	3.51	0.00	0.000	0.000
9/30/1999	5.16	3.73	0.72		4.96	3.62	0.00	0.000	0.000
10/31/1999	5.32	4.05	0.76		5.13	3.75	0.00	0.000	0.000
11/30/1999	4.98	3.50	0.70		5.28	3.85	0.00	0.000	0.000
12/31/1999	5.16	6.06	1.17		5.44	4.04	0.00	0.000	0.000
1/31/2000	4.00	4.73	1.18		5.56	4.19	0.00	0.000	0.000
2/29/2000	4.18	4.66	1.11		5.68	4.32	0.00	0.000	0.000
3/31/2000	5.07	6.87	1.36		5.84	4.53	0.00	0.000	0.000
4/30/2000	5.40	6.63	1.23		6.00	4.73	0.00	0.000	0.000
5/31/2000	5.72	6.31	1.10		6.18	4.93	0.00	0.000	0.000
6/30/2000	6.42	6.34	0.99		6.37	5.12	0.00	0.000	0.000
7/31/2000	6.49	5.86	0.90		6.57	5.30	0.00	0.000	0.000
8/31/2000	6.36	6.05	0.95		6.77	5.49	0.00	0.000	0.000

Production History

Pattern: 03/02-19-016-27Inj Set: BirdtailUnit#2

Date	Oil Rate (CD) m3/d	Water Rate (CD) m3/d	Water Oil Ratio m3/m3	Water Inj Rate (CD) m3/d	Cum Oil Prod Km3	Cum Water Prod Mm3	Cum Water Inj Km3	VRR	Cum VRR
9/30/2000	6.23	5.99	0.96		6.96	5.67	0.00	0.000	0.000
10/31/2000	6.18	5.65	0.91		7.15	5.84	0.00	0.000	0.000
11/30/2000	6.47	5.40	0.83		7.34	6.00	0.00	0.000	0.000
12/31/2000	4.85	3.46	0.71		7.49	6.11	0.00	0.000	0.000
1/31/2001	6.11	3.87	0.63		7.68	6.23	0.00	0.000	0.000
2/28/2001	5.29	3.73	0.70		7.83	6.34	0.00	0.000	0.000
3/31/2001	5.92	3.94	0.67		8.01	6.46	0.00	0.000	0.000
4/30/2001	5.65	4.76	0.84		8.18	6.60	0.00	0.000	0.000
5/31/2001	5.46	4.17	0.76		8.35	6.73	0.00	0.000	0.000
6/30/2001	5.43	4.26	0.78		8.52	6.86	0.00	0.000	0.000
7/31/2001	5.42	4.01	0.74		8.68	6.98	0.00	0.000	0.000
8/31/2001	5.36	4.00	0.75		8.85	7.11	0.00	0.000	0.000
9/30/2001	5.31	4.40	0.83		9.01	7.24	0.00	0.000	0.000
10/31/2001	5.24	4.26	0.81		9.17	7.37	0.00	0.000	0.000
11/30/2001	5.14	4.11	0.80		9.33	7.49	0.00	0.000	0.000
12/31/2001	4.94	3.77	0.76		9.48	7.61	0.00	0.000	0.000
1/31/2002	4.40	3.36	0.76		9.62	7.71	0.00	0.000	0.000
2/28/2002	5.50	4.14	0.75		9.77	7.83	0.00	0.000	0.000
3/31/2002	4.60	3.09	0.67		9.91	7.93	0.00	0.000	0.000
4/30/2002	4.99	3.46	0.69		10.06	8.03	0.00	0.000	0.000
5/31/2002	4.41	3.69	0.84		10.20	8.14	0.00	0.000	0.000
6/30/2002	4.19	3.99	0.95	2.82	10.32	8.26	0.08	0.338	0.004
7/31/2002	4.48	3.82	0.85	22.44	10.46	8.38	0.78	2.654	0.041
8/31/2002	4.77	3.74	0.78	25.79	10.61	8.50	1.58	2.976	0.081
9/30/2002	4.82	3.70	0.77	24.83	10.76	8.61	2.32	2.860	0.118
10/31/2002	4.83	3.72	0.77	24.84	10.91	8.72	3.09	2.850	0.155
11/30/2002	4.90	3.85	0.79	18.49	11.05	8.84	3.65	2.075	0.180
12/31/2002	4.75	3.82	0.80	40.70	11.20	8.96	4.91	4.656	0.239
1/31/2003	3.80	3.10	0.82	48.11	11.32	9.05	6.40	6.847	0.308
2/28/2003	3.46	2.37	0.68	47.41	11.41	9.12	7.73	7.967	0.369
3/31/2003	4.39	2.59	0.59	47.50	11.55	9.20	9.20	6.661	0.435
4/30/2003	5.83	4.46	0.76	26.89	11.73	9.33	10.01	2.562	0.466
5/31/2003	6.10	4.61	0.75		11.91	9.48	10.01	0.000	0.459
6/30/2003	5.88	4.16	0.71	45.26	12.09	9.60	11.37	4.418	0.514
7/31/2003	6.17	3.94	0.64	23.57	12.28	9.72	12.10	2.284	0.539
8/31/2003	6.18	3.93	0.64	25.91	12.47	9.85	12.90	2.511	0.567
9/30/2003	5.90	3.95	0.67	38.30	12.65	9.96	14.05	3.811	0.610
10/31/2003	5.98	3.92	0.65	29.71	12.84	10.09	14.97	2.941	0.641
11/30/2003	6.73	3.28	0.49	18.17	13.04	10.18	15.52	1.775	0.656
12/31/2003	6.28	4.47	0.71	24.03	13.23	10.32	16.26	2.191	0.677
1/31/2004	6.01	4.41	0.73	31.62	13.42	10.46	17.24	2.975	0.708
2/29/2004	5.68	4.58	0.81	32.13	13.58	10.59	18.17	3.075	0.737
3/31/2004	6.41	4.40	0.69	22.11	13.78	10.73	18.86	2.004	0.755
4/30/2004	6.47	4.70	0.73	23.59	13.98	10.87	19.57	2.070	0.773

Production History

Pattern: 03/02-19-016-27Inj Set: BirdtailUnit#2

Date	Oil Rate (CD) m3/d	Water Rate (CD) m3/d	Water Oil Ratio m3/m3	Water Inj Rate (CD) m3/d	Cum Oil Prod Km3	Cum Water Prod Mm3	Cum Water Inj Km3	VRR	Cum VRR
5/31/2004	6.35	4.76	0.75	23.32	14.17	11.02	20.29	2.059	0.790
6/30/2004	6.47	4.67	0.72	17.28	14.37	11.16	20.81	1.522	0.800
7/31/2004	6.62	4.58	0.69	12.35	14.57	11.30	21.19	1.081	0.804
8/31/2004	6.64	4.45	0.67	22.18	14.78	11.44	21.88	1.961	0.819
9/30/2004	6.77	4.35	0.64	22.80	14.98	11.57	22.56	2.009	0.834
10/31/2004	6.31	3.56	0.56	22.79	15.18	11.68	23.27	2.259	0.850
11/30/2004	5.51	2.33	0.42	23.02	15.34	11.75	23.96	2.865	0.868
12/31/2004	7.26	4.69	0.65	15.41	15.57	11.89	24.44	1.264	0.873
1/31/2005	7.38	5.13	0.69	21.22	15.80	12.05	25.09	1.662	0.884
2/28/2005	7.00	4.76	0.68	27.94	15.99	12.19	25.88	2.329	0.901
3/31/2005	7.07	4.85	0.68	27.31	16.21	12.34	26.72	2.245	0.918
4/30/2005	7.09	4.91	0.69	29.16	16.42	12.48	27.60	2.381	0.936
5/31/2005	6.89	4.83	0.70	29.41	16.64	12.63	28.51	2.459	0.955
6/30/2005	5.83	3.98	0.68	30.95	16.81	12.75	29.44	3.092	0.977
7/31/2005	7.10	4.97	0.70	31.07	17.03	12.91	30.40	2.523	0.996
8/31/2005	6.99	4.93	0.71	32.41	17.25	13.06	31.41	2.664	1.016
9/30/2005	6.86	4.87	0.71	24.64	17.46	13.21	32.15	2.058	1.028
10/31/2005	6.95	4.94	0.71	29.05	17.67	13.36	33.05	2.395	1.045
11/30/2005	6.86	4.98	0.73	23.95	17.88	13.51	33.76	1.983	1.055
12/31/2005	6.83	5.03	0.74	21.72	18.09	13.66	34.44	1.796	1.064
1/31/2006	6.66	4.98	0.75	30.95	18.29	13.82	35.40	2.606	1.081
2/28/2006	6.88	5.13	0.75	30.65	18.49	13.96	36.26	2.504	1.096
3/31/2006	6.57	0.00	0.00	29.30	18.69	13.96	37.16	4.309	1.116
4/30/2006	6.45	5.01	0.78	31.52	18.88	14.11	38.11	2.699	1.133
5/31/2006	6.57	5.02	0.76	32.29	19.09	14.27	39.11	2.733	1.150
6/30/2006	6.54	5.03	0.77	33.14	19.28	14.42	40.10	2.810	1.167
7/31/2006	6.59	5.06	0.77	34.26	19.49	14.58	41.17	2.883	1.185
8/31/2006	6.46	4.95	0.77	33.44	19.69	14.73	42.20	2.874	1.203
9/30/2006	6.50	5.03	0.77	34.31	19.88	14.88	43.23	2.921	1.220
10/31/2006	6.34	5.05	0.80	25.20	20.08	15.04	44.01	2.172	1.229
11/30/2006	6.39	5.18	0.81	27.29	20.27	15.19	44.83	2.315	1.240
12/31/2006	6.31	5.35	0.85	28.73	20.47	15.36	45.72	2.421	1.252
1/31/2007	6.26	5.64	0.90	27.88	20.66	15.53	46.59	2.302	1.262
2/28/2007	6.20	5.78	0.93	27.58	20.84	15.69	47.36	2.261	1.272
3/31/2007	5.79	5.14	0.89	27.97	21.02	15.85	48.23	2.515	1.283
4/30/2007	5.93	5.93	1.00	28.88	21.19	16.03	49.09	2.393	1.294
5/31/2007	5.62	5.89	1.05	29.36	21.37	16.21	50.00	2.509	1.305
6/30/2007	5.65	5.86	1.04	30.61	21.54	16.39	50.92	2.615	1.317
7/31/2007	5.82	5.83	1.00	29.04	21.72	16.57	51.82	2.453	1.328
8/31/2007	5.83	5.80	1.00	28.30	21.90	16.75	52.70	2.391	1.338
9/30/2007	5.25	5.52	1.05	29.45	22.06	16.92	53.58	2.691	1.349
10/31/2007	4.43	5.05	1.14	29.15	22.19	17.07	54.49	3.027	1.361
11/30/2007	5.14	6.04	1.18	29.28	22.35	17.25	55.37	2.580	1.372
12/31/2007	5.56	6.09	1.10	30.50	22.52	17.44	56.31	2.577	1.382

Production History

Pattern: 03/02-19-016-27Inj Set: BirdtailUnit#2

Date	Oil Rate (CD) m3/d	Water Rate (CD) m3/d	Water Oil Ratio m3/m3	Water Inj Rate (CD) m3/d	Cum Oil Prod Km3	Cum Water Prod Mm3	Cum Water Inj Km3	VRR	Cum VRR
1/31/2008	5.28	6.03	1.14	30.56	22.68	17.63	57.26	2.661	1.393
2/29/2008	4.08	5.00	1.23	28.56	22.80	17.77	58.09	3.098	1.404
3/31/2008	4.29	5.03	1.17	30.14	22.93	17.93	59.02	3.183	1.417
4/30/2008	4.23	4.96	1.17	21.00	23.06	18.08	59.65	2.249	1.423
5/31/2008	4.38	4.92	1.12	23.77	23.20	18.23	60.39	2.514	1.430
6/30/2008	5.04	5.44	1.08	23.70	23.35	18.40	61.10	2.224	1.436
7/31/2008	5.47	5.84	1.07	29.50	23.52	18.58	62.01	2.565	1.446
8/31/2008	5.45	5.92	1.09	28.28	23.69	18.76	62.89	2.447	1.454
9/30/2008	5.25	5.91	1.13	26.72	23.84	18.94	63.69	2.356	1.461
10/31/2008	5.12	5.97	1.17	25.34	24.00	19.12	64.48	2.250	1.467
11/30/2008	5.02	6.10	1.22	27.53	24.15	19.31	65.30	2.438	1.475
12/31/2008	5.15	6.25	1.21	27.75	24.31	19.50	66.16	2.396	1.482
1/31/2009	5.02	6.29	1.25	29.39	24.47	19.69	67.07	2.560	1.490
2/28/2009	4.96	6.31	1.27	31.87	24.61	19.87	67.97	2.786	1.500
3/31/2009	4.14	4.91	1.19	31.33	24.74	20.02	68.94	3.407	1.512
4/30/2009	5.31	6.61	1.24	27.77	24.89	20.22	69.77	2.296	1.518
5/31/2009	5.20	6.56	1.26	28.19	25.06	20.42	70.64	2.361	1.524
6/30/2009	5.23	6.54	1.25	24.86	25.21	20.62	71.39	2.081	1.529
7/31/2009	5.12	6.43	1.26	28.33	25.37	20.82	72.27	2.416	1.536
8/31/2009	5.11	6.54	1.28	28.60	25.53	21.02	73.15	2.419	1.542
9/30/2009	5.06	6.56	1.30	31.20	25.68	21.22	74.09	2.647	1.551
10/31/2009	4.91	6.66	1.36	30.75	25.83	21.43	75.04	2.618	1.559
11/30/2009	7.09	11.78	1.66	30.62	26.05	21.78	75.96	1.602	1.559
12/31/2009	9.09	15.26	1.68	31.22	26.33	22.25	76.93	1.265	1.555
1/31/2010	8.37	14.35	1.71	30.74	26.59	22.70	77.88	1.336	1.552
2/28/2010	7.80	13.23	1.70	31.33	26.81	23.07	78.76	1.471	1.551
3/31/2010	7.85	12.77	1.63	31.94	27.05	23.46	79.75	1.529	1.550
4/30/2010	7.95	12.80	1.61	34.11	27.29	23.85	80.77	1.623	1.551
5/31/2010	7.93	12.82	1.62	36.19	27.53	24.25	81.90	1.722	1.553
6/30/2010	7.58	12.81	1.69	36.38	27.76	24.63	82.99	1.761	1.556
7/31/2010	7.07	12.61	1.78	35.72	27.98	25.02	84.09	1.793	1.558
8/31/2010	7.14	12.95	1.81	34.24	28.20	25.42	85.16	1.684	1.560
9/30/2010	7.01	12.76	1.82	32.36	28.41	25.80	86.13	1.617	1.561
10/31/2010	6.92	12.93	1.87	31.56	28.63	26.20	87.10	1.571	1.561
11/30/2010	6.37	13.04	2.05	30.29	28.82	26.60	88.01	1.543	1.560
12/31/2010	5.91	12.85	2.17	28.05	29.00	26.99	88.88	1.479	1.560
1/31/2011	6.03	13.03	2.16	31.31	29.19	27.40	89.85	1.625	1.560
2/28/2011	6.15	12.94	2.10	27.86	29.36	27.76	90.63	1.444	1.559
3/31/2011	5.99	12.30	2.05	27.54	29.55	28.14	91.49	1.489	1.559
4/30/2011	6.64	12.74	1.92	27.68	29.75	28.52	92.32	1.412	1.557
5/31/2011	6.67	12.90	1.93		29.95	28.92	92.32	0.000	1.541
6/30/2011	6.44	12.89	2.00	26.67	30.15	29.31	93.12	1.364	1.539
7/31/2011	6.24	12.70	2.04	32.50	30.34	29.70	94.13	1.697	1.541
8/31/2011	6.27	12.84	2.05	34.34	30.53	30.10	95.19	1.777	1.543

Production History

Pattern: 03/02-19-016-27Inj Set: BirdtailUnit#2

Date	Oil Rate (CD) m3/d	Water Rate (CD) m3/d	Water Oil Ratio m3/m3	Water Inj Rate (CD) m3/d	Cum Oil Prod Km3	Cum Water Prod Mm3	Cum Water Inj Km3	VRR	Cum VRR
9/30/2011	6.08	12.62	2.08	34.83	30.72	30.48	96.23	1.842	1.546
10/31/2011	5.86	12.69	2.17	33.66	30.90	30.87	97.28	1.796	1.548
11/30/2011	5.26	12.52	2.38	0.69	31.06	31.25	97.30	0.038	1.535
12/31/2011	5.26	12.53	2.38		31.22	31.64	97.30	0.000	1.522
1/31/2012	5.23	12.32	2.36		31.38	32.02	97.30	0.000	1.509
2/29/2012	4.99	12.13	2.43		31.52	32.37	97.30	0.000	1.497
3/31/2012	5.03	12.13	2.41		31.68	32.75	97.30	0.000	1.485
4/30/2012	5.01	11.95	2.38		31.83	33.11	97.30	0.000	1.474
5/31/2012	4.72	11.64	2.47		31.98	33.47	97.30	0.000	1.462
6/30/2012	4.56	11.50	2.52		32.11	33.81	97.30	0.000	1.452
7/31/2012	4.05	11.25	2.77		32.24	34.16	97.30	0.000	1.441
8/31/2012	4.73	17.20	3.64		32.39	34.70	97.30	0.000	1.427
9/30/2012	5.06	20.09	3.97		32.54	35.30	97.30	0.000	1.411
10/31/2012	4.75	20.02	4.21		32.69	35.92	97.30	0.000	1.395
11/30/2012	4.10	18.16	4.43		32.81	36.46	97.30	0.000	1.382
12/31/2012	3.62	16.95	4.68		32.92	36.99	97.30	0.000	1.370
1/31/2013	2.50	15.10	6.05		33.00	37.46	97.30	0.000	1.359
2/28/2013	2.56	14.66	5.73		33.07	37.87	97.30	0.000	1.350
3/31/2013	2.11	9.29	4.41		33.14	38.15	97.30	0.000	1.343
4/30/2013	2.27	8.13	3.59	3.23	33.20	38.40	97.40	0.309	1.339
5/31/2013	2.08	7.86	3.78	14.32	33.27	38.64	97.84	1.430	1.339
6/30/2013	2.08	8.50	4.08	19.10	33.33	38.90	98.41	1.793	1.341
7/31/2013	2.05	8.96	4.37	18.48	33.39	39.18	98.99	1.668	1.343
8/31/2013	2.26	9.62	4.26	16.74	33.46	39.47	99.50	1.400	1.343
9/30/2013	2.35	10.57	4.49	15.83	33.53	39.79	99.98	1.218	1.342
10/31/2013	2.56	10.95	4.28	15.32	33.61	40.13	100.46	1.126	1.341
11/30/2013	2.78	10.67	3.84	14.57	33.70	40.45	100.89	1.075	1.340
12/31/2013	3.21	16.30	5.08	12.74	33.80	40.96	101.29	0.650	1.334
1/31/2014	4.27	19.53	4.57	14.06	33.93	41.56	101.72	0.587	1.327
2/28/2014	4.56	19.80	4.34	14.75	34.06	42.12	102.14	0.602	1.321
3/31/2014	4.18	17.64	4.22	13.06	34.19	42.66	102.54	0.595	1.314
4/30/2014	4.35	18.40	4.23	17.10	34.32	43.21	103.05	0.747	1.309
5/31/2014	4.55	17.88	3.93	15.68	34.46	43.77	103.54	0.694	1.304
6/30/2014	4.30	17.08	3.97	15.57	34.59	44.28	104.01	0.723	1.299
7/31/2014	4.25	15.88	3.74	15.29	34.72	44.77	104.48	0.754	1.295
8/31/2014	4.21	16.95	4.02	15.23	34.85	45.30	104.95	0.715	1.290
9/30/2014	4.05	15.86	3.92	15.07	34.97	45.77	105.41	0.752	1.286
10/31/2014	4.86	20.74	4.27	15.00	35.12	46.42	105.87	0.582	1.280
11/30/2014	5.49	21.84	3.98	15.23	35.29	47.07	106.33	0.554	1.272
12/31/2014	5.39	23.95	4.44	15.52	35.45	47.81	106.81	0.526	1.264
1/31/2015	4.85	22.46	4.64	15.48	35.60	48.51	107.29	0.564	1.257
2/28/2015	4.45	21.02	4.72	15.50	35.73	49.10	107.72	0.605	1.252
3/31/2015	4.49	20.79	4.63	15.48	35.87	49.74	108.20	0.609	1.246
4/30/2015	4.42	20.65	4.67	17.03	36.00	50.36	108.71	0.675	1.241

Production History

Pattern: 03/02-19-016-27Inj Set: BirdtailUnit#2

Date	Oil Rate (CD) m3/d	Water Rate (CD) m3/d	Water Oil Ratio m3/m3	Water Inj Rate (CD) m3/d	Cum Oil Prod Km3	Cum Water Prod Mm3	Cum Water Inj Km3	VRR	Cum VRR
5/31/2015	4.58	20.42	4.45	17.68	36.14	51.00	109.26	0.703	1.236
6/30/2015	4.76	20.38	4.28	16.20	36.28	51.61	109.75	0.640	1.231
7/31/2015	4.61	20.40	4.43	14.81	36.43	52.24	110.21	0.588	1.226
8/31/2015	4.10	20.30	4.95	18.19	36.55	52.87	110.77	0.741	1.222
9/30/2015	4.03	20.85	5.18	17.80	36.68	53.49	111.30	0.712	1.217
10/31/2015	3.99	20.63	5.17	17.52	36.80	54.13	111.85	0.708	1.213
11/30/2015	3.97	21.45	5.40	17.40	36.92	54.78	112.37	0.681	1.209
12/31/2015	3.98	21.25	5.34	17.35	37.04	55.44	112.91	0.684	1.204
1/31/2016	3.89	21.37	5.50	17.77	37.16	56.10	113.46	0.700	1.200
2/29/2016	3.73	21.64	5.79	19.83	37.27	56.73	114.03	0.778	1.197
3/31/2016	3.42	22.01	6.43	18.32	37.38	57.41	114.60	0.717	1.193
4/30/2016	3.27	22.78	6.96	18.17	37.47	58.09	115.15	0.694	1.189
5/31/2016	3.50	23.32	6.66	18.19	37.58	58.81	115.71	0.675	1.184
6/30/2016	3.56	23.46	6.59	17.33	37.69	59.52	116.23	0.639	1.180
7/31/2016	3.80	23.25	6.12	18.42	37.81	60.24	116.80	0.678	1.176
8/31/2016	3.82	22.79	5.97	17.61	37.93	60.95	117.35	0.659	1.171
9/30/2016	3.10	21.02	6.79	18.30	38.02	61.58	117.90	0.755	1.168
10/31/2016	3.16	22.48	7.11	18.16	38.12	62.27	118.46	0.705	1.165
11/30/2016	3.13	21.60	6.89	18.07	38.21	62.92	119.00	0.727	1.162
12/31/2016	3.15	21.38	6.78	17.16	38.31	63.58	119.53	0.697	1.158