

**SINCLAIR UNIT NO. 12
WATERFLOOD EOR PROJECT**

ANNUAL REPORT FOR 2016

May 30, 2017

Tundra Oil and Gas Partnership

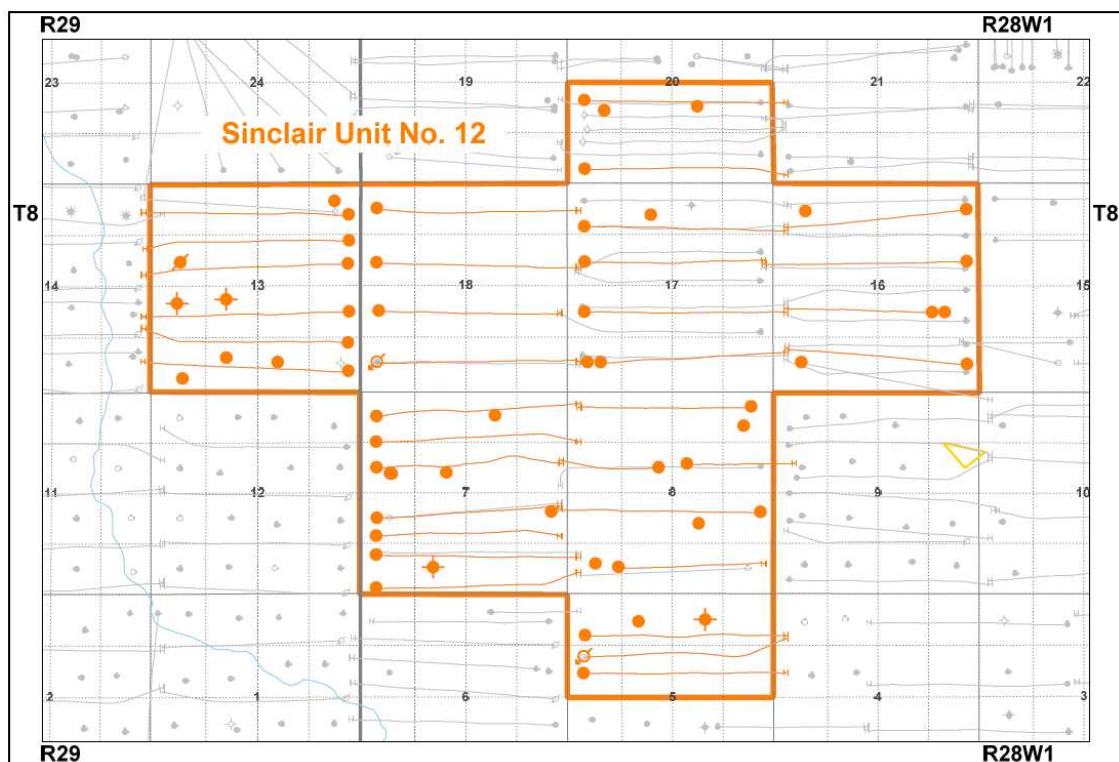
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INTRODUCTION

Sinclair Unit No. 12 Enhanced Oil Recovery (EOR) Waterflood Project was approved under Waterflood Order No. 44, effective February 1, 2015 with Tundra Oil and Gas (Tundra) as Operator. The EOR Unit area, outlined in orange, contains 57 producing wells and 2 injection wells in 112 LSDs in Township 8 Ranges 28 & 29 W1 as shown in the figure below. Well list and well status is available in Appendix A.

Figure 1: Sinclair Unit No. 12 Area Outline



In accordance with Section 73 of the Manitoba Drilling and Production Regulation, Tundra hereby submits the following 2016 Annual Progress Report for Sinclair Unit No. 12.

DISCUSSION

Production History

For the wells included in Sinclair Unit No. 12, production started in July 2004 with the 00/16-08-008-28W1 well. Average oil production peaked at 5.94 m³/d per well in February 2010. This production was coming from 43 wells and totaled 255.5 m³/d for the Unit. In December 2016, the Unit was producing 47.90 m³/d of oil and 86.66 m³/d of water and had an average WOR of 1.82 m³/m³ in 2016. Water injection commenced in

Sinclair Unit No. 12 in September 2015. The oil production rate, injection rate, and WOR for each injection pattern is presented in Appendix E. The rates and WOR are presented in Figure 2.

Figure 2: Sinclair Unit No. 12 Production/Injection Rates and WOR vs Time

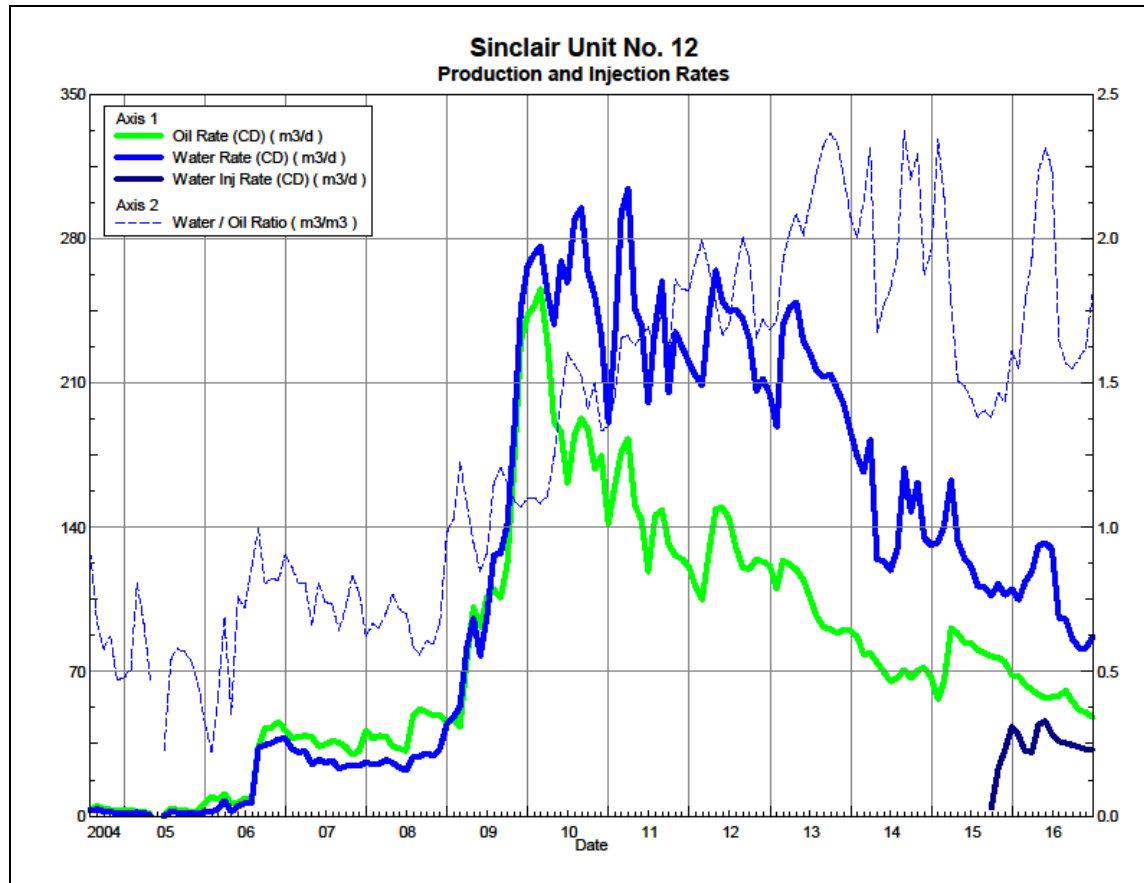
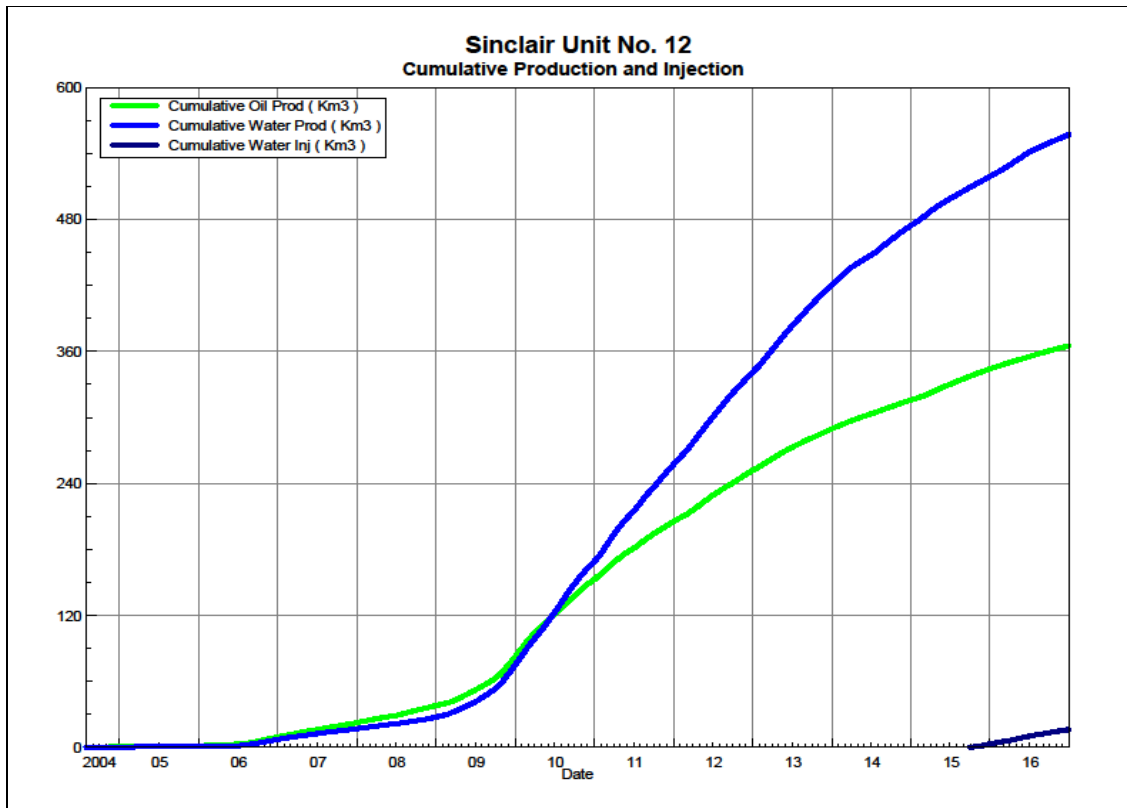


Figure 3 shows the cumulative production for Sinclair Unit No. 12 to the end of December 2016 as 365.15 e³m³ of oil, and 557.33 e³m³ of water, representing an 8.3% recovery factor of the OOIP. The cumulative water injected is 16.42 e³m³. The cumulative volume of oil, and water produced and fluid injected for each injection pattern is presented in Appendix E.

Figure 3: Sinclair Unit No. 12 Cumulative Oil, Water and Water Injected vs Time



Waterflood Development Plan

Sinclair Unit No. 12 Waterflood (WF) Development Plan

Twenty-three (23) horizontal wells are planned to be drilled in Sinclair Unit No. 12. The new water injection wells will be placed on injection after a pre-production period. No vertical wells are planned for conversion. In November 2014, four (4) proposed future injection wells (02/12-05, 02/05-07, 03/12-07-008-28W1 and 03/09-13-008-29W1) were drilled between existing horizontal/vertical producing wells, completing waterflood patterns with effective 20 acre spacing. In 2015, the 02/12-05 and 00/04-18-008-28W1 wells were converted to water injection. All of the horizontal wells are fracture stimulated to improve the injection rates. Water injection commenced in Sinclair Unit No. 12 in September 2015. As of December 2016, Sinclair Unit No. 12 had 2 injection patterns in place. In 2017, Tundra is planning to convert 5 more existing producers to injectors.

Production performance by injector pattern are summarized in Appendix B.

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 Operating Strategy and Performance

Water Source and Quality

The injection water for Sinclair Unit No. 12 was sourced from the 02/16-32-007-29W1 well (Lodgepole formation) until June 2016 when it was switched over to the newly recompleted source water well at 02/14-30-007-28W1 (Mannville formation). The water is treated at the 04-01-008-29W1 filtration plant where it is filtered to 0.1 microns and has scale inhibitor and biocide added. The injection water is then distributed to the injectors through the dedicated infrastructure system.

Injection Wellhead Pressures

Injection started in this Unit in September 2015. The average monthly wellhead injection pressure for each injection well is summarized in Appendix D. Since injection in this Unit is still in the early stages, the injector(s) are still building up to a target injection pressure of 6300 kPaa.

Reservoir Pressure

Where practical, Tundra is committed to collecting pressure data from newly drilled openhole injection wells. For Sinclair Unit No. 12, pressure data taken in 2015 from 5 locations is currently available (Appendix C). Pressures are corrected to a common datum of -450 m SS for comparison with other units in the area.

Well Servicing

The following table summarizes the well servicing performed within Sinclair Unit No. 12 during 2016:

Table 1: Sinclair Unit No. 12 Well Servicing

100.05-18-008-28W1.00	Pump Change	2/11/2016
100.07-20-008-28W1.00	Convert to Observation well	9/16/2016
100.13-05-008-28W1.00	Pump Change	2/5/2016
102.05-20-008-28W1.00	Pump Change	10/1/2016

Waterflood Performance Discussion

Twenty-three (23) horizontal wells are planned to be drilled in Sinclair Unit No. 12 for waterflood conversion. No vertical wells are planned for conversion. Water injection commenced in Sinclair Unit No. 12 in September 2015. As of December 2016, Sinclair Unit No. 12 waterflood area had 9 injection patterns in place, however, only 2 of these patterns are on active water injection. In 2017, Tundra is planning to convert 5 more existing producers to injectors.

Plots of the production and injection data along with the VRR information is presented in Appendix E for each of the injection patterns.

List of Appendices

Appendix A: Well Name and Well Status

Appendix B: Injection Pattern Summary

Appendix C: Reservoir Pressure Summary

Appendix D: Injection Pressure Summary

Appendix E: Injector Pattern Production/Injection Rates, Cumulative and VRR Plots for the following injectors:

102/12-05-008-28W1/0

103/04-07-008-28W1/0

102/05-07-008-28W1/0

103/12-07-008-28W1/0

100/09-16-008-28W1/0

100/12-17-008-28W1/0

100/04-18-008-28W1/0

103/01-13-008-29W1/0

103/09-13-008-29W1/0

Appendix A

<i>UWI</i>	<i>Surface Location</i>	<i>Type</i>	<i>Well Status</i>
100/12-05-008-28W1/0	100/12-04-008-28W1/0	Horizontal	Capable of OIL Prod
102/12-05-008-28W1/0	102/13-04-008-28W1/0	Horizontal	WTR Injection
100/13-05-008-28W1/0	100/13-04-008-28W1/0	Horizontal	Capable of OIL Prod
100/14-05-008-28W1/0	---	Vertical	Capable of OIL Prod
100/15-05-008-28W1/2	---	Vertical	Capable of OIL Prod
100/03-07-008-28W1/0	---	Vertical	Capable of OIL Prod
100/04-07-008-28W1/0	100/04-08-008-28W1/0	Horizontal	Capable of OIL Prod
103/04-07-008-28W1/0	103/04-08-008-28W1/0	Horizontal	Capable of OIL Prod
100/05-07-008-28W1/0	100/08-07-008-28W1/0	Horizontal	Capable of OIL Prod
102/05-07-008-28W1/0	102/08-07-008-28W1/0	Horizontal	Capable of OIL Prod
100/08-07-008-28W1/0	---	Vertical	Capable of OIL Prod
100/11-07-008-28W1/0	---	Vertical	Capable of OIL Prod
100/12-07-008-28W1/0	---	Vertical	Capable of OIL Prod
102/12-07-008-28W1/0	102/09-07-008-28W1/0	Horizontal	Capable of OIL Prod
103/12-07-008-28W1/0	103/13-08-008-28W1/0	Horizontal	Capable of OIL Prod
100/13-07-008-28W1/0	100/13-08-008-28W1/0	Horizontal	Capable of OIL Prod
100/15-07-008-28W1/0	---	Vertical	Capable of OIL Prod
100/04-08-008-28W1/0	---	Vertical	Capable of OIL Prod
102/04-08-008-28W1/0	102/01-08-008-28W1/0	Horizontal	Capable of OIL Prod
100/07-08-008-28W1/0	---	Vertical	Capable of OIL Prod
100/08-08-008-28W1/0	100/08-07-008-28W1/0	Horizontal	Capable of OIL Prod
100/10-08-008-28W1/0	100/12-09-008-28W1/0	Horizontal	Capable of OIL Prod
100/11-08-008-28W1/0	100/09-07-008-28W1/0	Horizontal	Capable of OIL Prod
100/16-08-008-28W1/0	---	Vertical	Capable of OIL Prod
102/16-08-008-28W1/0	102/13-08-008-28W1/0	Horizontal	Capable of OIL Prod
100/01-16-008-28W1/0	100/04-16-008-28W1/0	Horizontal	Capable of OIL Prod
100/04-16-008-28W1/0	---	Vertical	Capable of OIL Prod
100/08-16-008-28W1/0	---	Vertical	Capable of OIL Prod
102/08-16-008-28W1/0	102/05-16-008-28W1/0	Horizontal	Capable of OIL Prod
100/09-16-008-28W1/0	100/09-17-008-28W1/0	Horizontal	Capable of OIL Prod

<i>UWI</i>	<i>Surface Location</i>	<i>Type</i>	<i>Well Status</i>
100/13-16-008-28W1/0	---	Vertical	Capable of OIL Prod
100/16-16-008-28W1/0	100/13-16-008-28W1/0	Horizontal	Capable of OIL Prod
100/04-17-008-28W1/0	---	Vertical	Capable of OIL Prod
102/04-17-008-28W1/0	102/04-16-008-28W1/0	Horizontal	Capable of OIL Prod
100/05-17-008-28W1/0	100/05-16-008-28W1/0	Horizontal	Capable of OIL Prod
100/12-17-008-28W1/0	100/09-17-008-28W1/0	Horizontal	Capable of OIL Prod
100/13-17-008-28W1/0	100/13-16-008-28W1/0	Horizontal	Capable of OIL Prod
100/14-17-008-28W1/0	---	Vertical	Capable of OIL Prod
100/04-18-008-28W1/0	100/04-17-008-28W1/0	Horizontal	WTR Injection
100/05-18-008-28W1/0	100/08-18-008-28W1/0	Horizontal	Capable of OIL Prod
100/12-18-008-28W1/0	100/12-17-008-28W1/0	Horizontal	Capable of OIL Prod
100/13-18-008-28W1/0	100/13-17-008-28W1/0	Horizontal	Capable of OIL Prod
100/04-20-008-28W1/0	100/04-21-008-28W1/0	Horizontal	Capable of OIL Prod
100/05-20-008-28W1/0	---	Vertical	Capable of OIL Prod
102/05-20-008-28W1/0	102/05-21-008-28W1/0	Horizontal	Capable of OIL Prod
100/07-20-008-28W1/2	---	Vertical	Capable of OIL Prod
102/01-13-008-29W1/0	102/01-14-008-29W1/0	Horizontal	Capable of OIL Prod
103/01-13-008-29W1/0	103/08-14-008-29W1/0	Horizontal	Capable of OIL Prod
100/02-13-008-29W1/0	---	Vertical	Capable of OIL Prod
100/03-13-008-29W1/0	---	Vertical	Capable of OIL Prod
100/04-13-008-29W1/0	---	Vertical	Capable of OIL Prod
100/05-13-008-29W1/0	---	Vertical	Capable of OIL Prod
100/06-13-008-29W1/0	---	Vertical	Capable of OIL Prod
100/08-13-008-29W1/0	100/08-14-008-29W1/0	Horizontal	Capable of OIL Prod
102/09-13-008-29W1/0	102/09-14-008-29W1/0	Horizontal	Capable of OIL Prod
103/09-13-008-29W1/0	103/09-14-008-29W1/0	Horizontal	Capable of OIL Prod
100/12-13-008-29W1/0	---	Vertical	Capable of OIL Prod
100/16-13-008-29W1/0	---	Vertical	Capable of OIL Prod
102/16-13-008-29W1/0	102/16-14-008-29W1/0	Horizontal	Capable of OIL Prod
103/16-13-008-29W1/0	103/16-14-008-29W1/0	Horizontal	Drilled & Cased

Appendix B

Sinclair Unit No. 12 Injection Pattern Summary as of December 2016

Pattern Name	Injector BH Location (008-28W1)	Injector Surf. Location (008-28W1)	Status	No. of Supported Wells	Supported Wells (008-28W1)	Allocation Factor	Pattern Prod Start Month	Inj Start 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
02/12-05-008-28Inj	02/12-05	02/13-04	WTR Injection	4	12-05, 13-05 14-05, 15-05	0.5 0.25	Aug 2006	Dec 2015	0.37	4.10	11.11	9.58	10.77	12.16	4.70	2.129	0.198
03/04-07-008-28Inj	03/04-07	03/04-08	Capable of OIL Prod	4	03-07 04-07, 15-06, 16-06	0.7 0.5	Aug 2006	-	4.89	4.01	0.82	-	14.66	11.32	0.00	0.000	0.000
02/05-07-008-28Inj	02/05-07	02/08-07	Capable of OIL Prod	4	03-07 04-07, 05-07, 08-07	0.3 0.5	Aug 2006	-	3.12	5.05	1.62	-	15.10	24.04	0.00	0.000	0.000
03/12-07-008-28Inj	03/12-07	03/13-08	Capable of OIL Prod	5	11-07, 12-07 13-07 02/12-07, 15-07	0.3 0.5 1.0	Aug 2006	-	4.49	6.51	1.45	-	14.61	22.42	0.00	0.000	0.000
00/09-16-008-28Inj	00/09-16	00/09-17	Capable of OIL Prod	4	08-16, 02/08-16, 16-16 13-16	0.5 0.25	Nov 2006	-	1.45	2.40	1.65	-	20.77	25.91	0.00	0.000	0.000
00/12-17-008-28Inj	00/12-17	00/09-17	Capable of OIL Prod	3	05-17, 13-17 14-17	0.5 0.25	Aug 2006	-	1.89	2.09	1.11	-	25.04	25.33	0.00	0.000	0.000
00/04-18-008-28Inj	00/04-18	00/04-17	WTR Injection	3	15-07 13-07, 05-18	0.25 0.5	Aug 2006	Sep 2015	0.95	1.79	1.89	22.61	16.61	80.56	11.72	8.068	0.119
03/01-13-008-29Inj	03/01-13-008-29W1	03/04-18-008-29W1	Capable of OIL Prod	7	02-13, 03-13, 04-13 08-13, 02/01-13 05-13, 06-13	0.7 0.5 0.3	Dec 2005	-	5.24	5.32	1.02	-	17.68	19.30	0.00	0.000	0.000
03/09-13-008-29Inj	00/09-13-008-29W1	03/09-14-008-29W1	Capable of OIL Prod	4	02/09-13, 12-13, 02/16-13 16-13	0.5 0.3	Aug 2006	-	2.75	2.98	1.08	-	14.98	17.99	0.00	0.000	0.000

APPENDIX C

Sinclair Unit No. 12 - Pressure Summary

Location	Test Date	Final Pressure (kPaa)	MPP (mTVD)	KB	Datum Depth	Gradient	Pressure @ -450 masl
02/12-05-008-28W1/0	Dec 10 - Jan 31, 2015	1593.3	933.18	502.90	-450	8.25	1756
02/05-07-008-28W1/0	Nov 30, 2014 - Jan 31, 2015	4821.7	938.67	507.75	-450	8.25	4979
03/12-07-008-28W1/0	Dec 2 - Jan 20, 2015	5771.6	931.15	507.30	-450	8.25	5987
03/01-13-008-29W1/0	Jan 19 - Feb 11, 2015	3837.0	936.69	511.05	-450	8.25	4038
03/09-13-008-29W1/0	Nov 22, 2014 - Jan 7, 2015	4218.6	938.11	512.09	-450	8.25	4416

Appendix D

Average Monthly Injection Pressure (kPag)

Month	Injection Pressure	
	100/04-18	102/12-05
Jan-15	-	-
Feb-15	-	-
Mar-15	-	-
Apr-15	-	-
May-15	-	-
Jun-15	-	-
Jul-15	-	-
Aug-15	0	0
Sep-15	0	0
Oct-15	656	0
Nov-15	2832	52
Dec-15	2959	-17
Jan-16	2982	-78
Feb-16	3570	-35
Mar-16	3992	-18
Apr-16	3445	-57
May-16	4843	-66
Jun-16	4936	-70
Jul-16	4977	-92
Aug-16	4975	313
Sep-16	4974	-92
Oct-16	4971	-85
Nov-16	4977	-87
Dec-16	4972	-93

Appendix E

Rates and VRR Plots

Oil Formation Vol Factor : 1.07100 m3/m3

Water Formation Vol Factor : 1.00150 m3/m3

Water / Oil Ratio : 0.88 m3/m3

Pattern: 03/04-07-008-28Inj Set: SinclairUnit#12

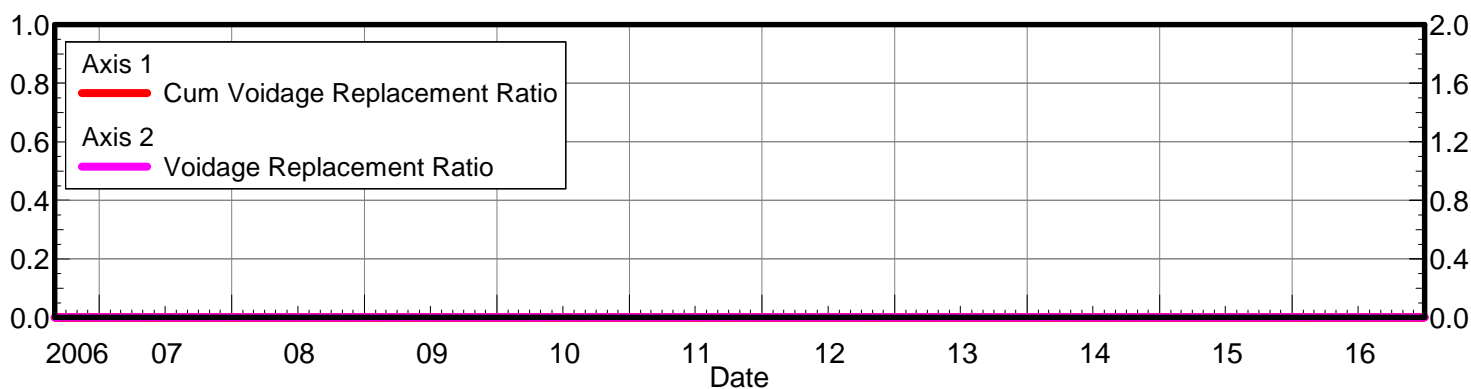
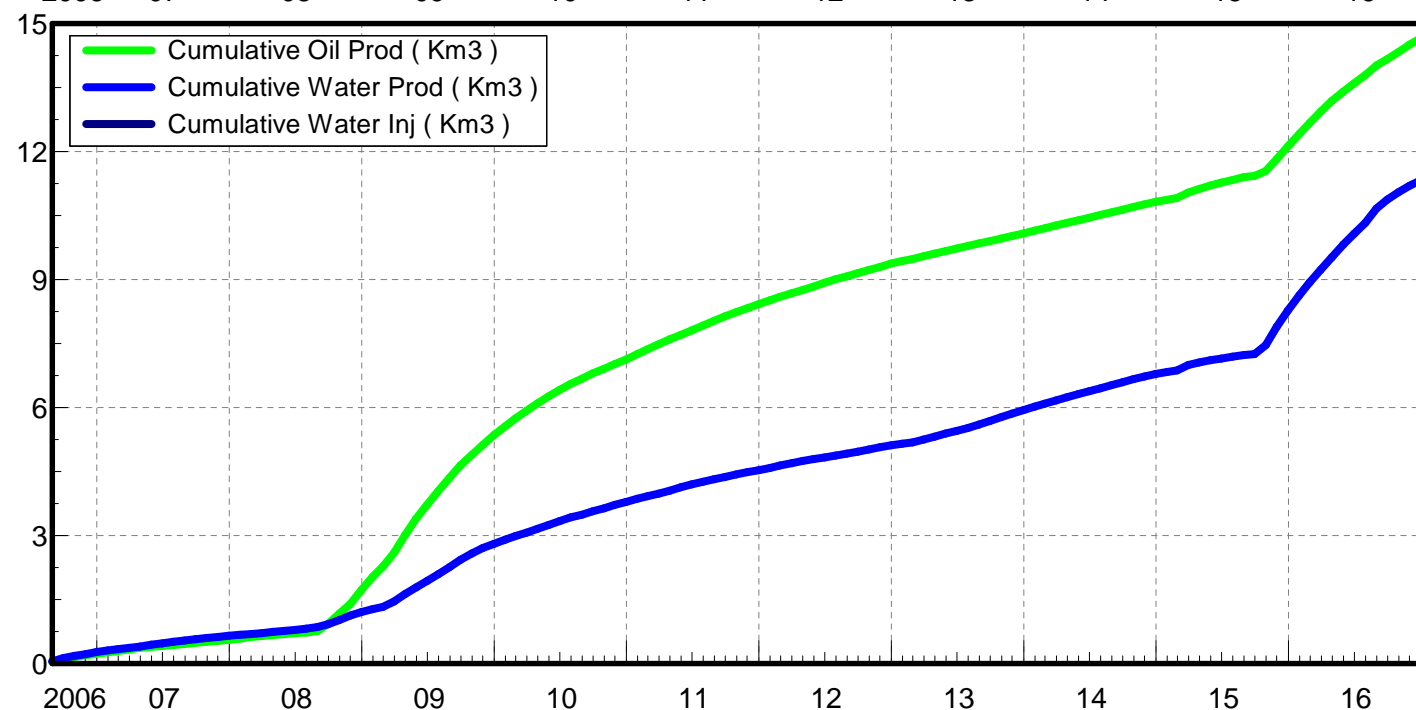
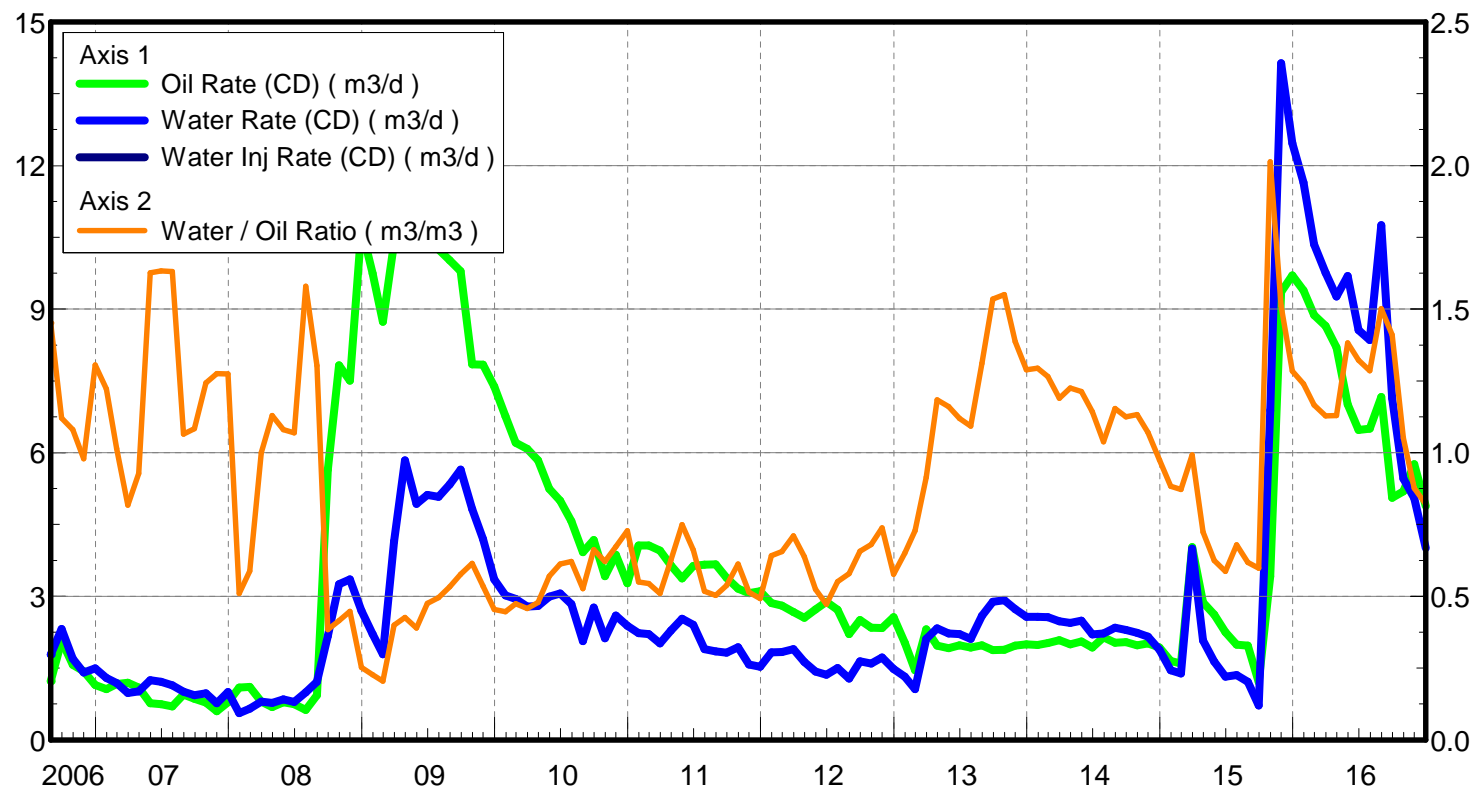
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Operator: TUNDRA_OIL_&_GAS_LIMITED

Oil Rate (CD) : 5.83 m3/d

Water Rate (CD) : 4.92 m3/d

Water Inj Rate (CD) : * m3/d



Oil Formation Vol Factor : 1.07100 m3/m3

Pattern: 02/05-07-008-28Inj Set: SinclairUnit#12

Water Formation Vol Factor : 1.00150 m3/m3

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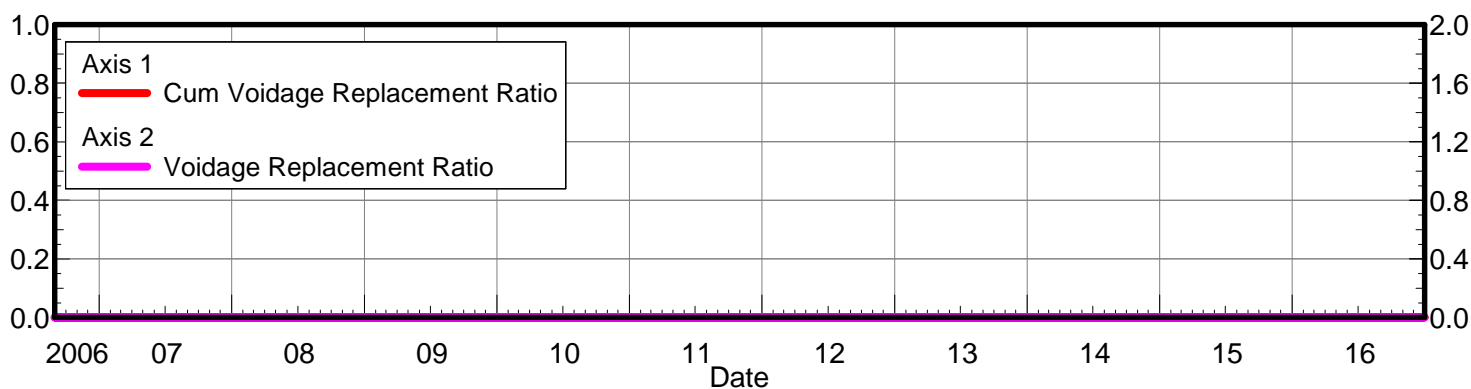
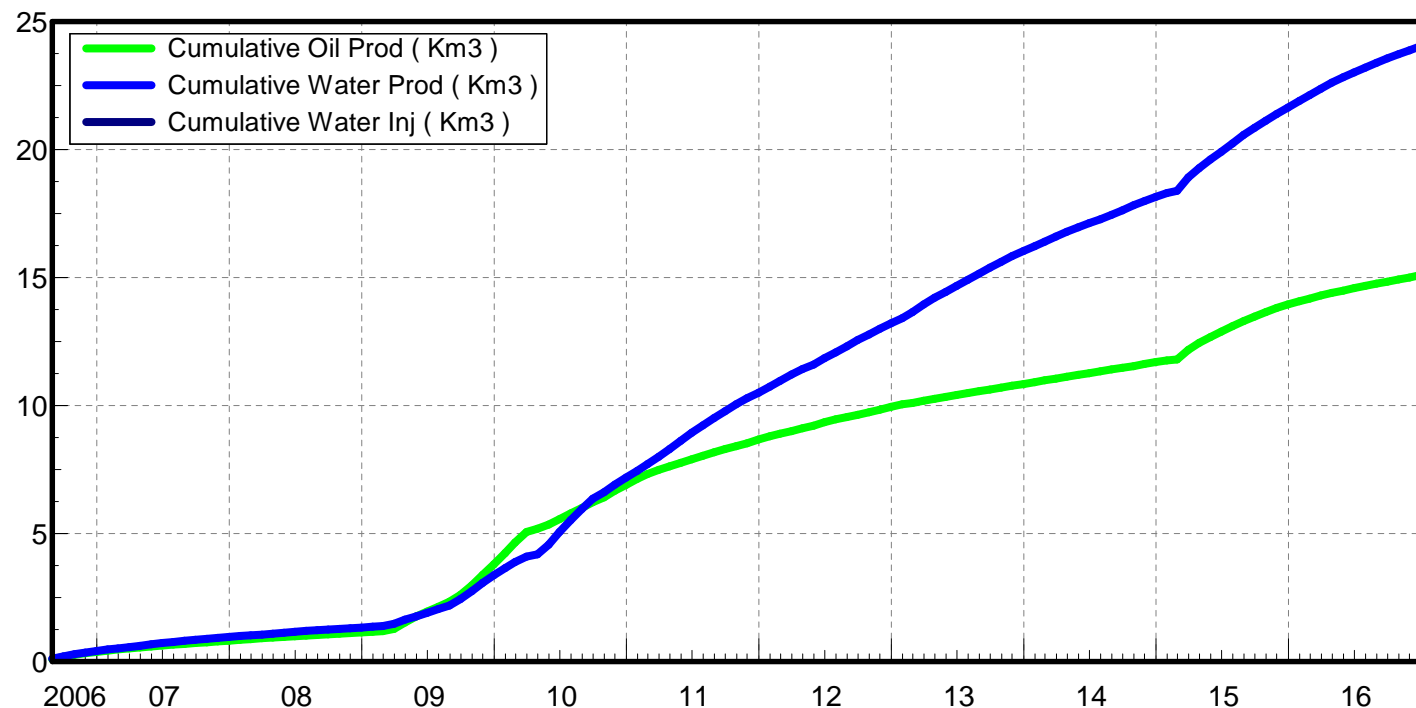
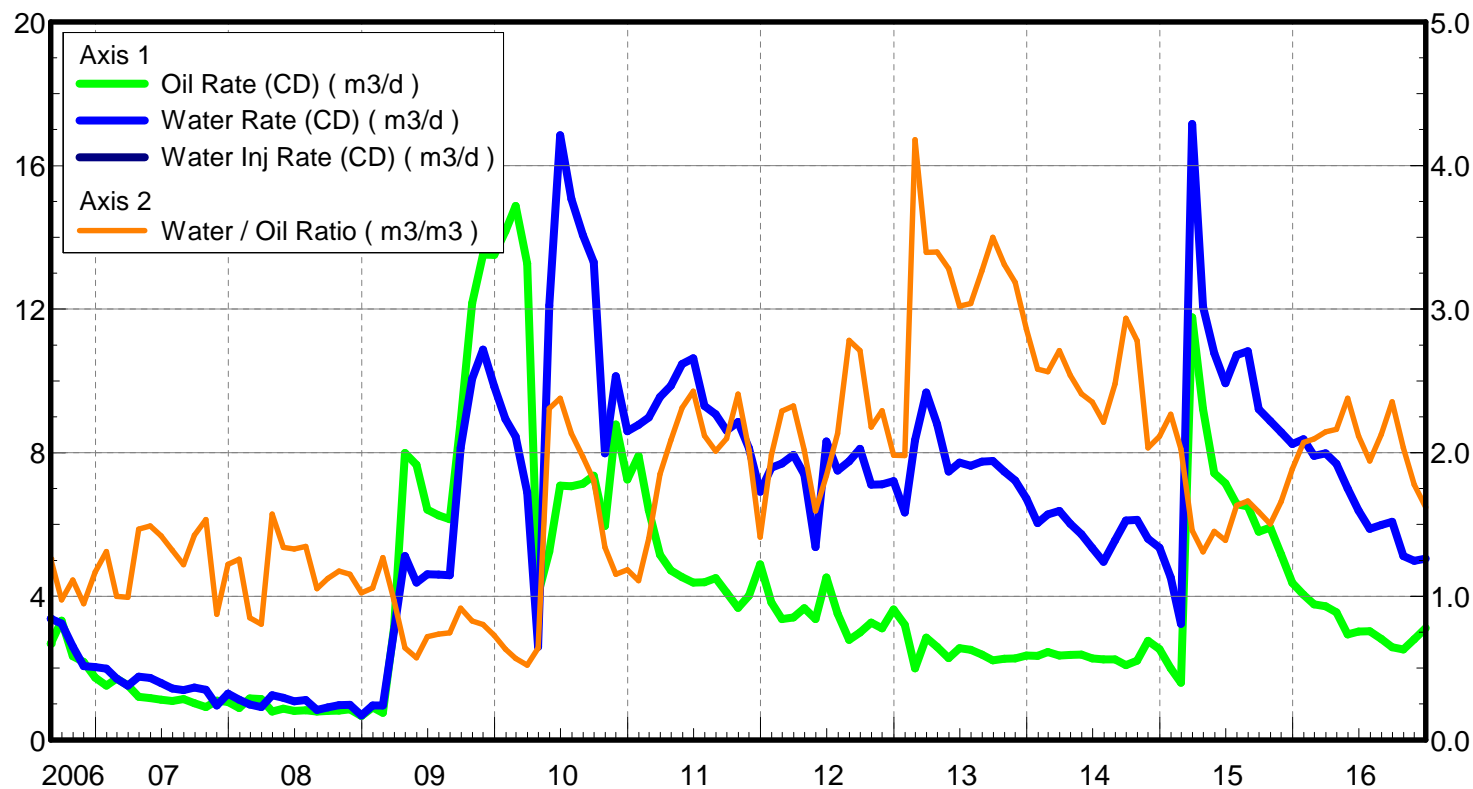
Water / Oil Ratio : 2.62 m3/m3

Operator: TUNDRA_OIL_ & GAS_LIMITED

Oil Rate (CD) : 2.36 m3/d

Water Rate (CD) : 3.62 m3/d

Water Inj Rate (CD) : * m3/d



Oil Formation Vol Factor : 1.07100 m3/m3

Pattern: 03/12-07-008-28Inj Set: SinclairUnit#12

Water Formation Vol Factor : 1.00150 m3/m3

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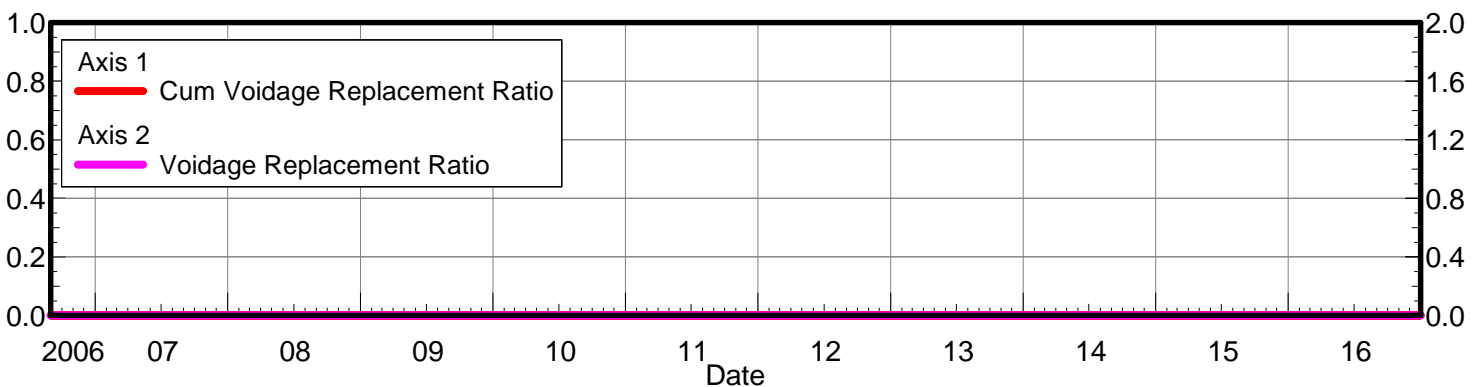
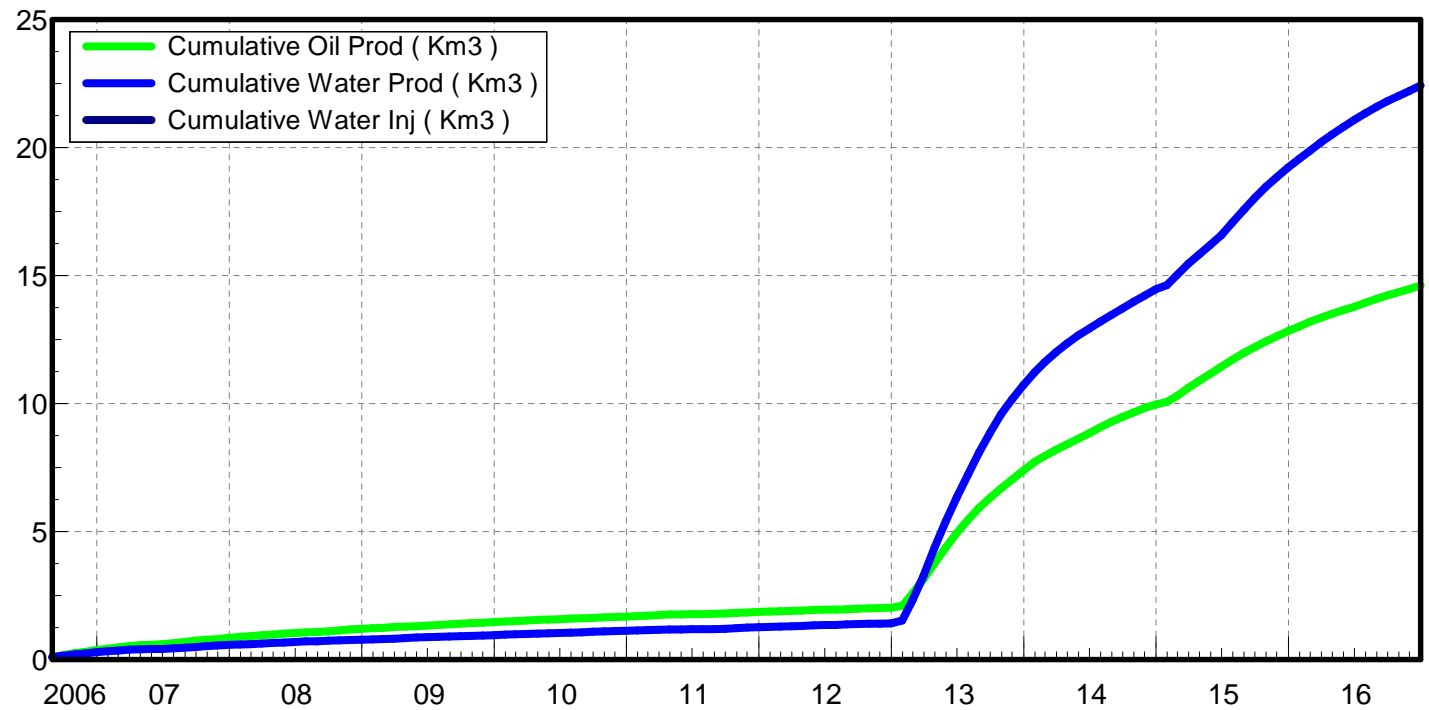
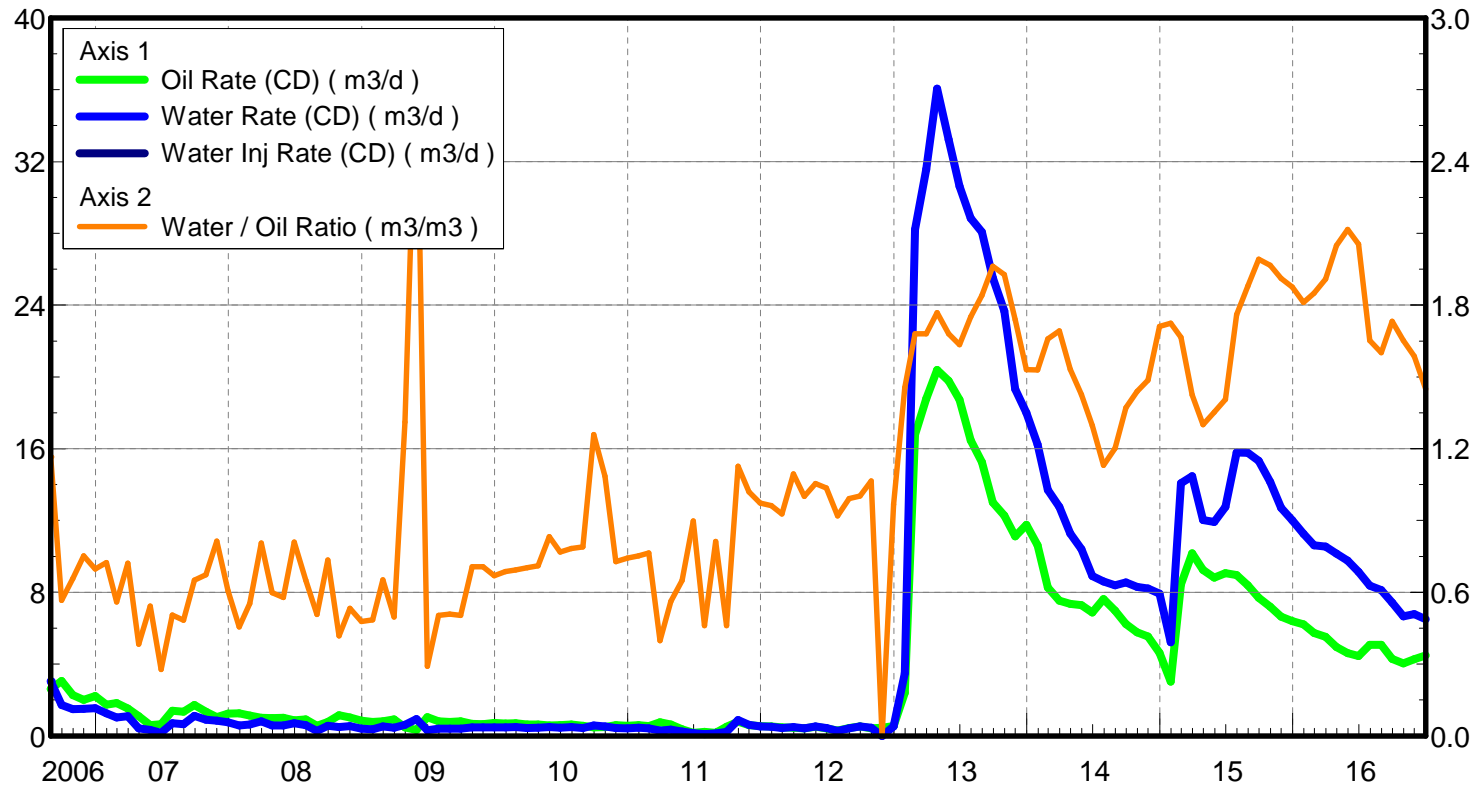
Water / Oil Ratio : 2.05 m3/m3

Operator: TUNDRA_OIL_&_GAS_LIMITED

Oil Rate (CD) : 3.84 m3/d

Water Rate (CD) : 6.56 m3/d

Water Inj Rate (CD) : * m3/d



Oil Formation Vol Factor : 1.07100 m3/m3

Pattern: 02/12-05-008-28Inj Set: SinclairUnit#12

Oil Rate (CD) : 0.33 m3/d

Water Formation Vol Factor : 1.00150 m3/m3

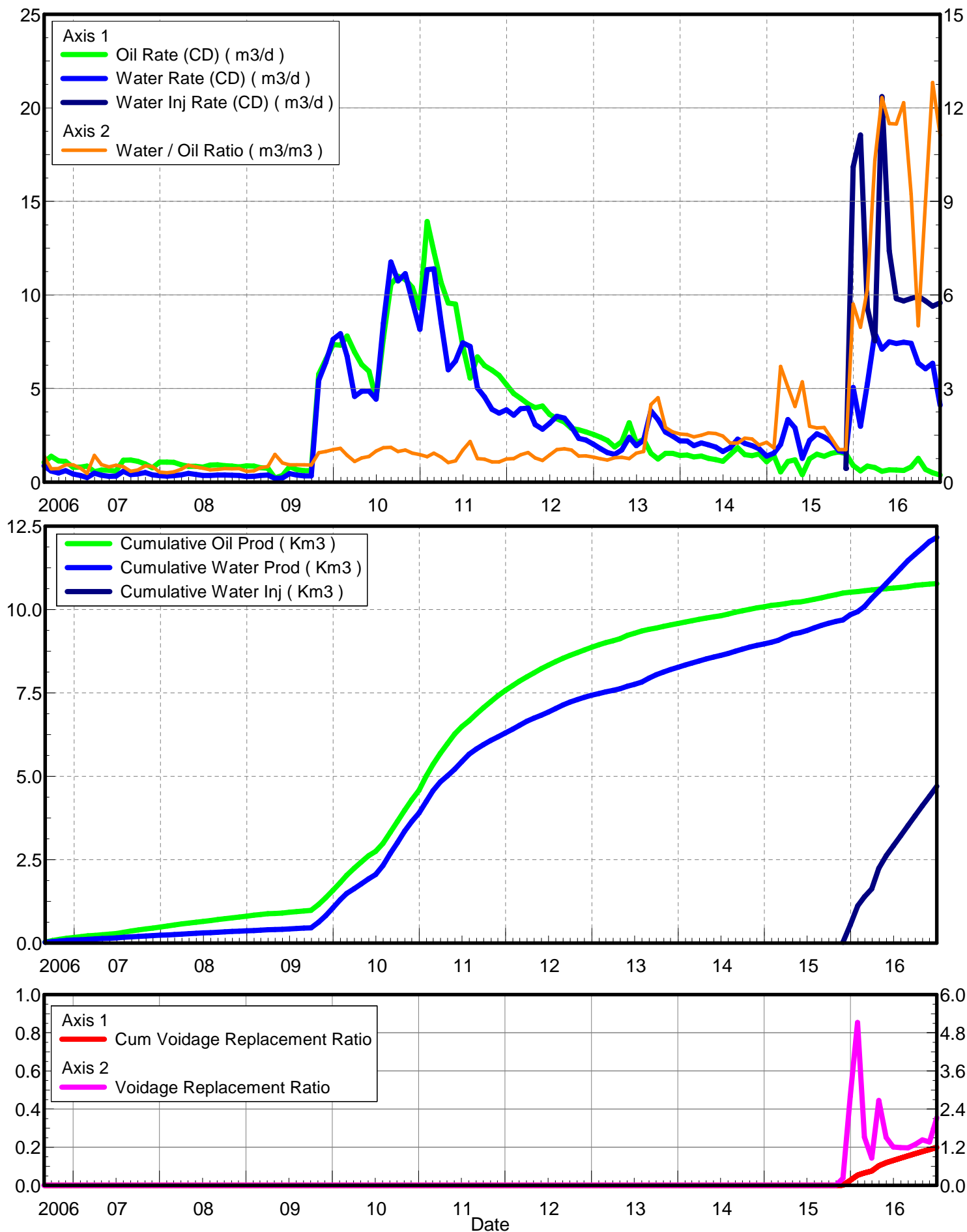
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Water Rate (CD) : 5.24 m3/d

Water / Oil Ratio : 19.58 m3/m3

Operator: TUNDRA_OIL_&_GAS_LIMITED

Water Inj Rate (CD) : 9.75 m3/d



Oil Formation Vol Factor : 1.07100 m3/m3

Pattern: 00/09-16-008-28Inj Set: SinclairUnit#12

Oil Rate (CD) : 0.42 m3/d

Water Formation Vol Factor : 1.00150 m3/m3

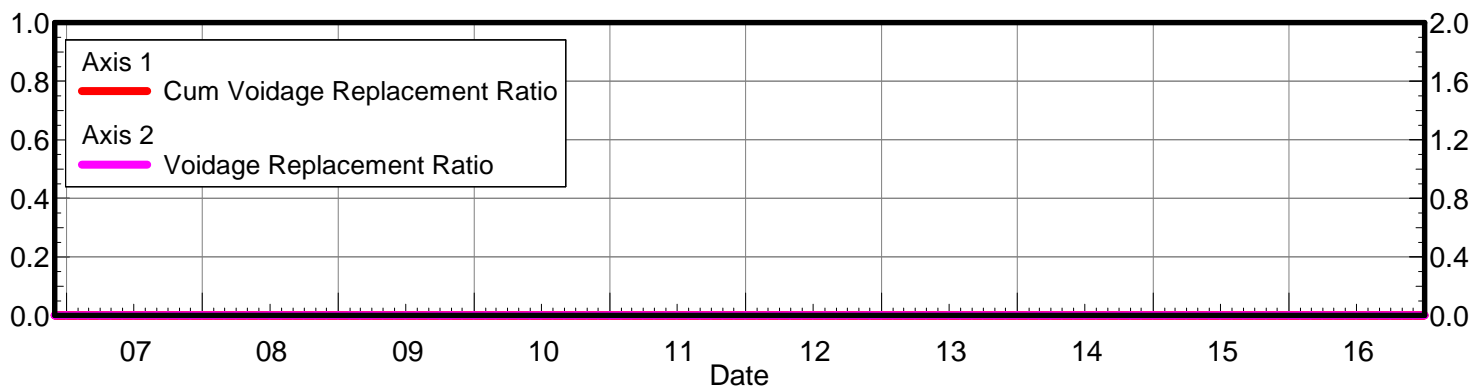
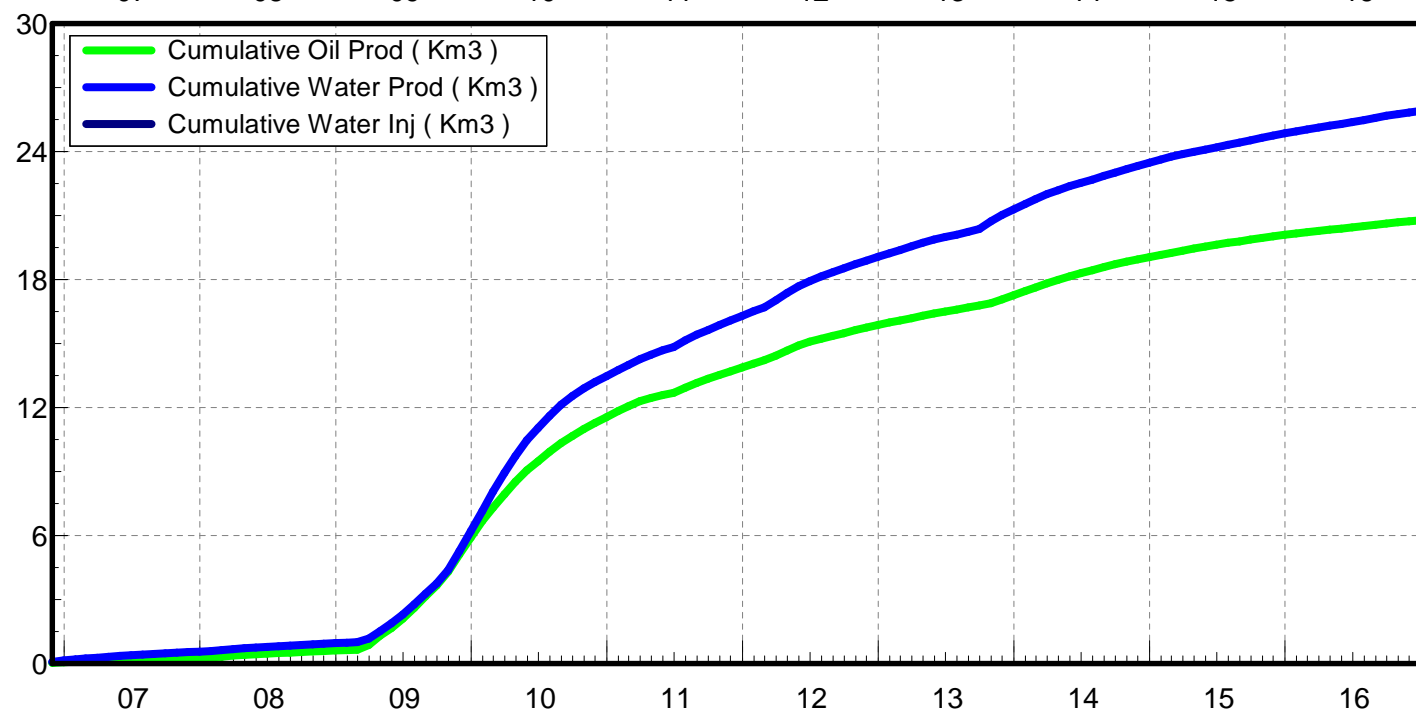
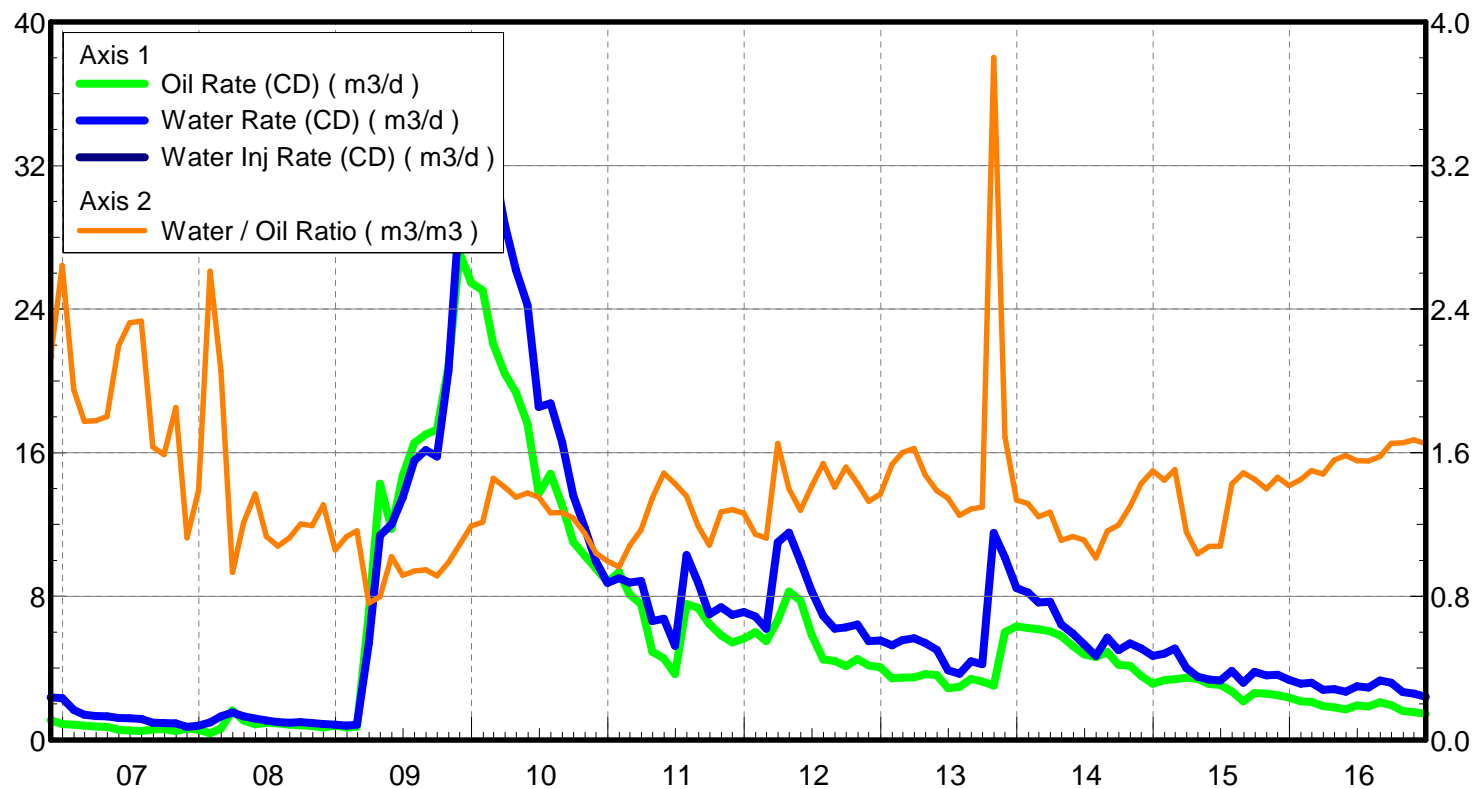
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Water Rate (CD) : 0.93 m3/d

Water / Oil Ratio : 1.76 m3/m3

Operator: TUNDRA_OIL_&_GAS_LIMITED

Water Inj Rate (CD) : 0.27 m3/d



Oil Formation Vol Factor : 1.07100 m3/m3

Pattern: 00/12-17-008-28Inj Set: SinclairUnit#12

Water Formation Vol Factor : 1.00150 m3/m3

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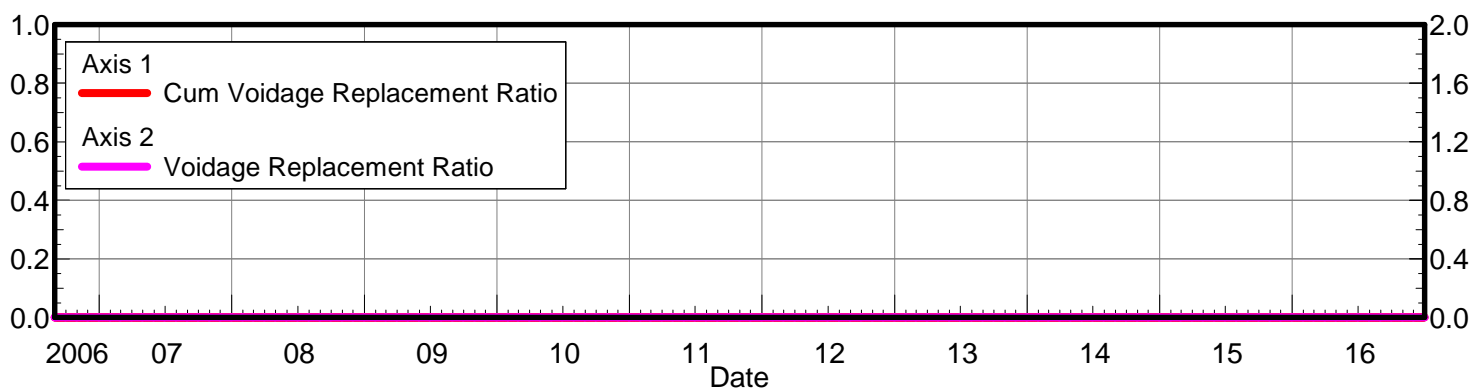
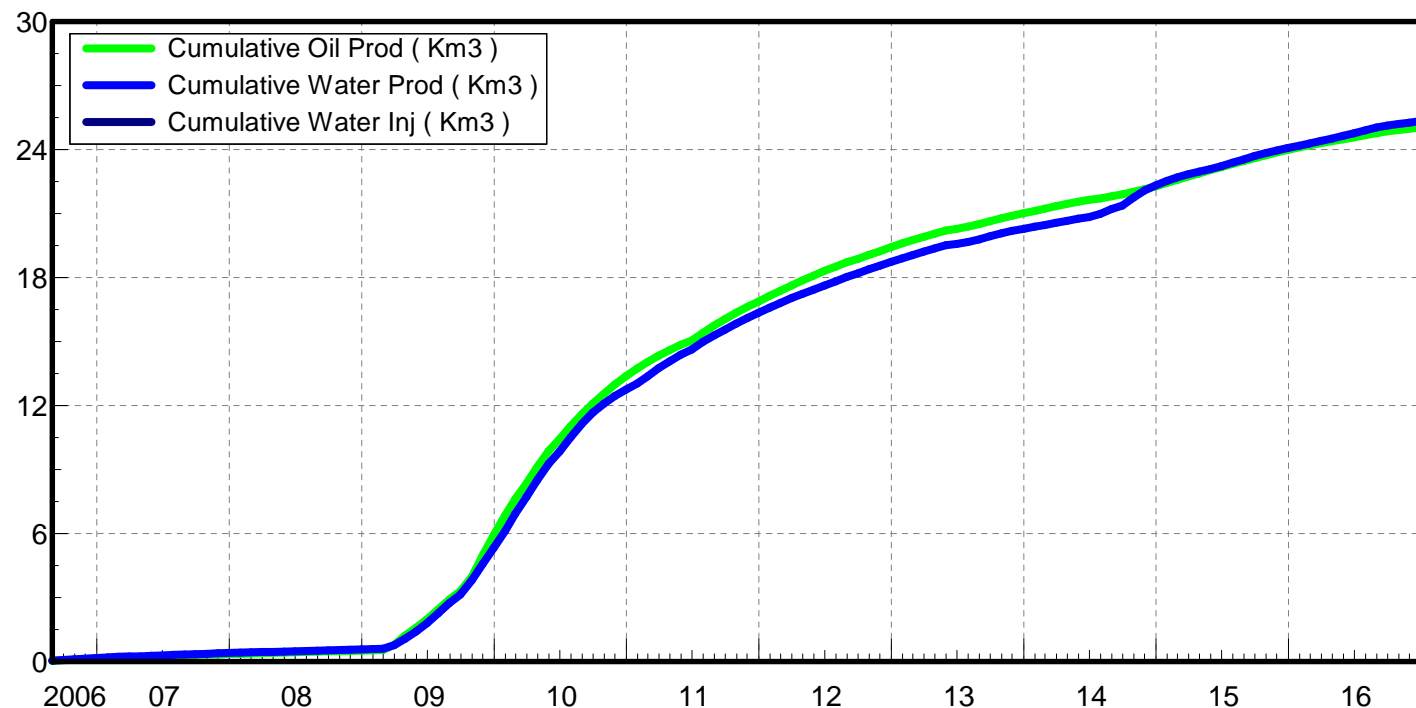
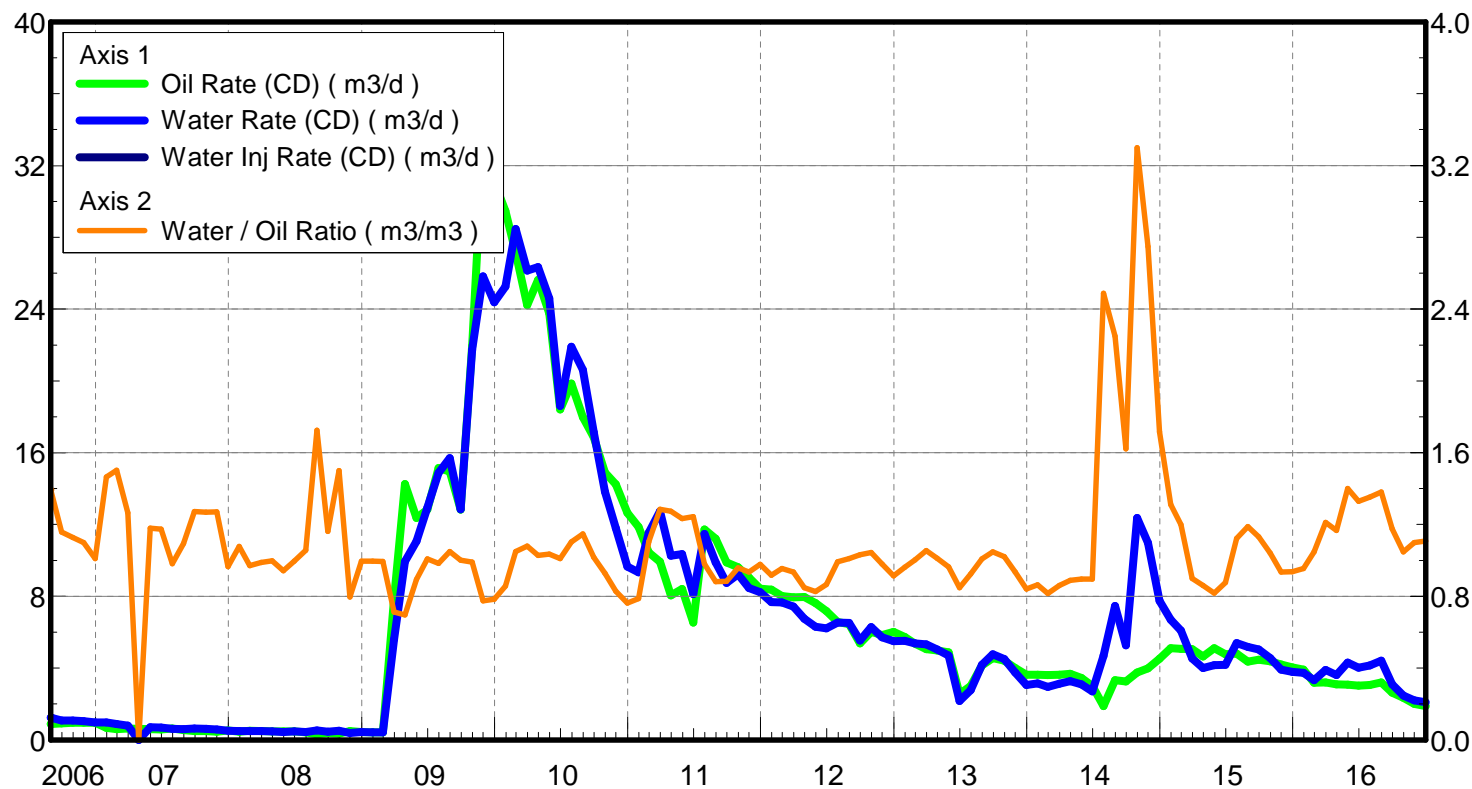
Water / Oil Ratio : 1.11 m3/m3

Operator: TUNDRA_OIL_&_GAS_LIMITED

Oil Rate (CD) : 1.69 m3/d

Water Rate (CD) : 1.85 m3/d

Water Inj Rate (CD) : 0.33 m3/d



Oil Formation Vol Factor : 1.07100 m3/m3

Pattern: 00/04-18-008-28Inj Set: SinclairUnit#12

Oil Rate (CD) : 0.81 m3/d

Water Formation Vol Factor : 1.00150 m3/m3

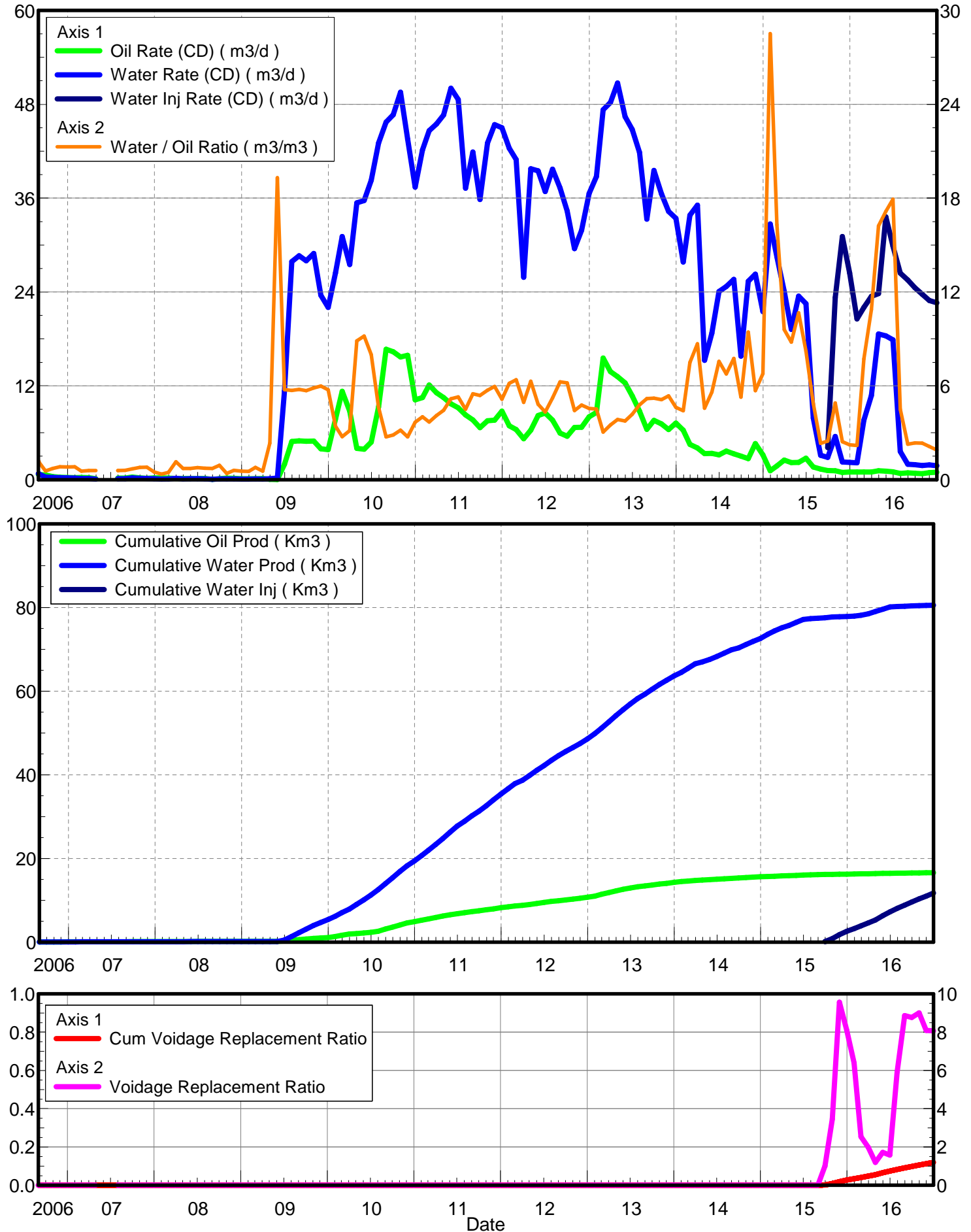
May 30, 2017

Water Rate (CD) : 31.68 m3/d

Water / Oil Ratio : 8.61 m3/m3

Operator: TUNDRA_OIL_&_GAS_LIMITED

Water Inj Rate (CD) : 21.75 m3/d



Oil Formation Vol Factor : 1.07100 m3/m3

Pattern: 03/01-13-008-29Inj Set: SinclairUnit#12

Water Formation Vol Factor : 1.00150 m3/m3

May 30, 2017

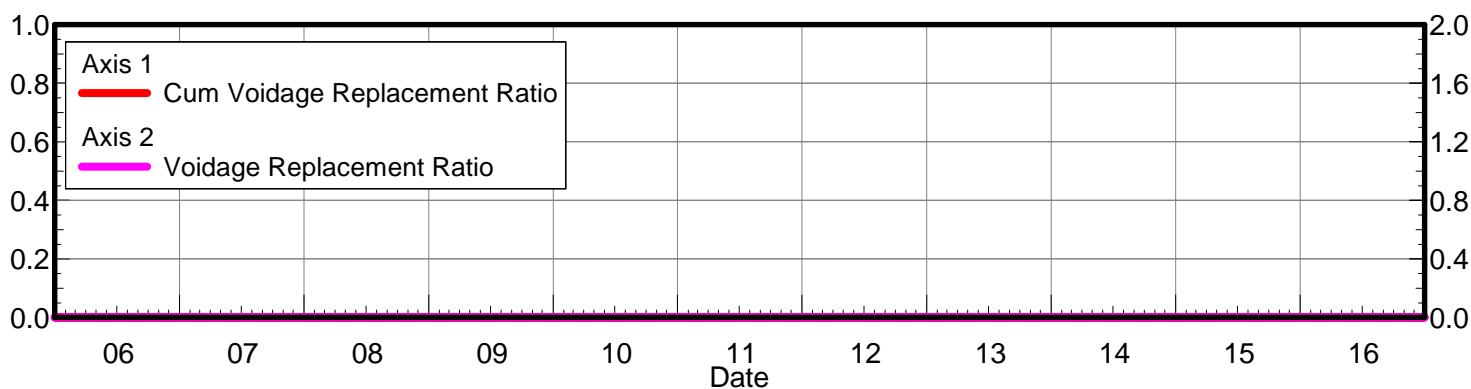
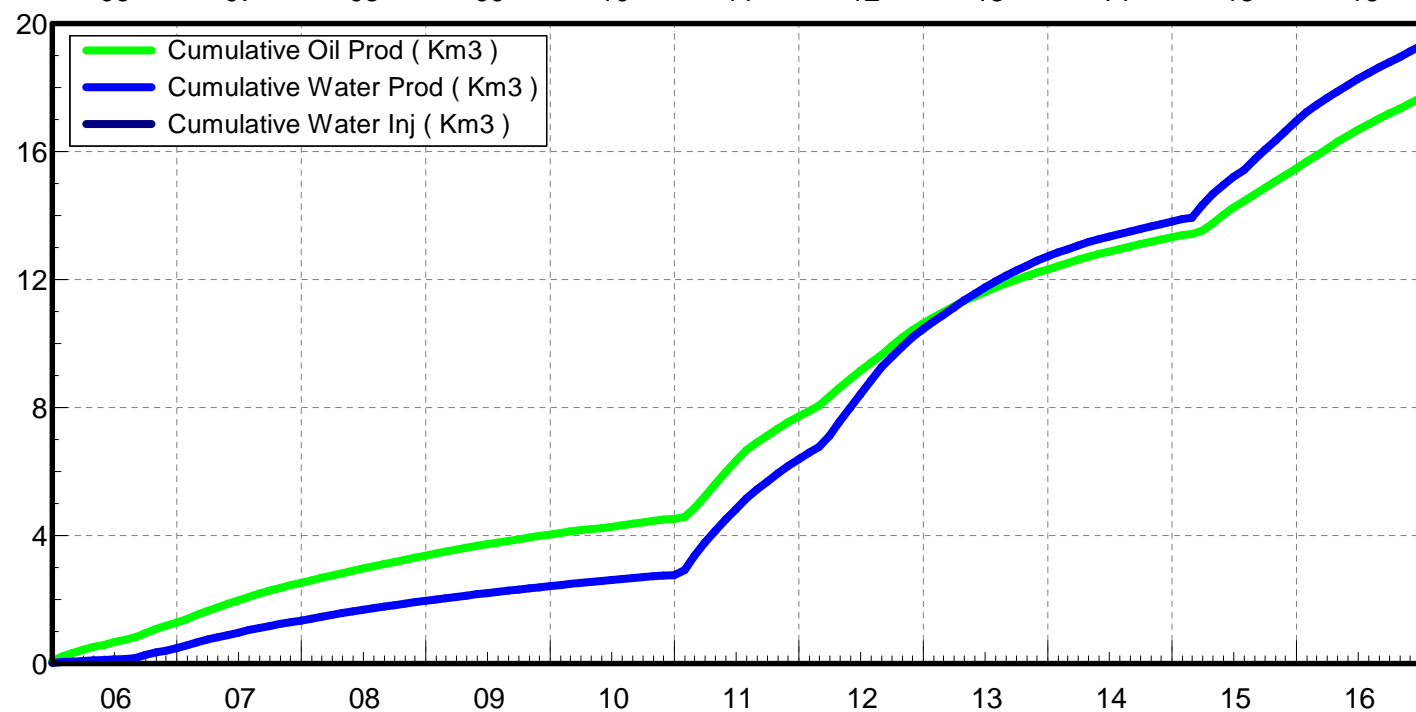
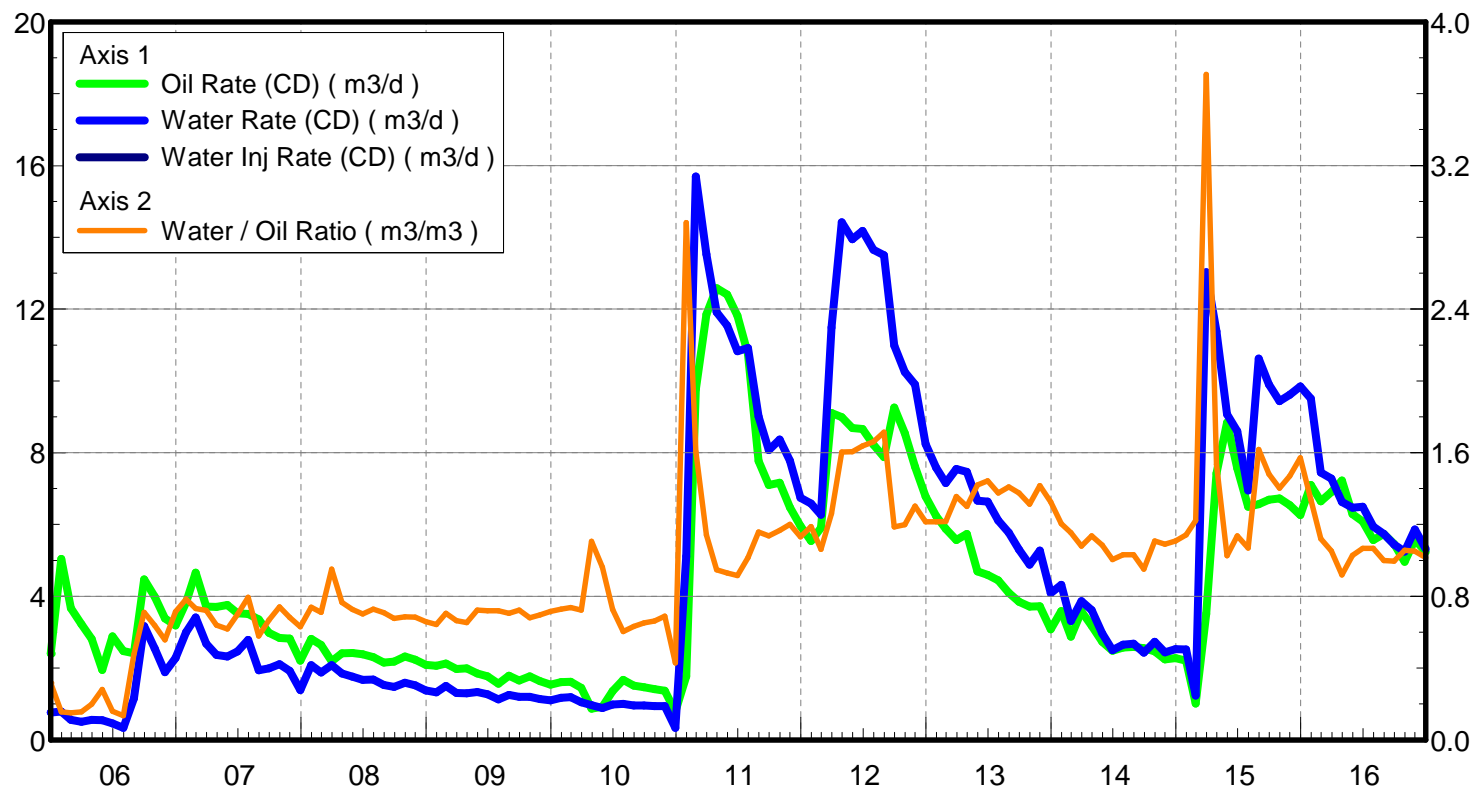
Water / Oil Ratio : 0.90 m3/m3

Operator: TUNDRA_OIL_ & GAS_LIMITED

Oil Rate (CD) : 4.72 m3/d

Water Rate (CD) : 5.05 m3/d

Water Inj Rate (CD) : * m3/d



Oil Formation Vol Factor : 1.07100 m3/m3

Pattern: 03/09-13-008-29Inj Set: SinclairUnit#12

Water Formation Vol Factor : 1.00150 m3/m3

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Water / Oil Ratio : 1.35 m3/m3

Operator: TUNDRA_OIL_&_GAS_LIMITED

Oil Rate (CD) : 3.39 m3/d

Water Rate (CD) : 4.25 m3/d

Water Inj Rate (CD) : * m3/d

