

**North Pierson Unit 2  
Waterflood EOR Project**

**2017 Annual Report**

**March 1, 2018  
Crescent Point Energy Corporation**

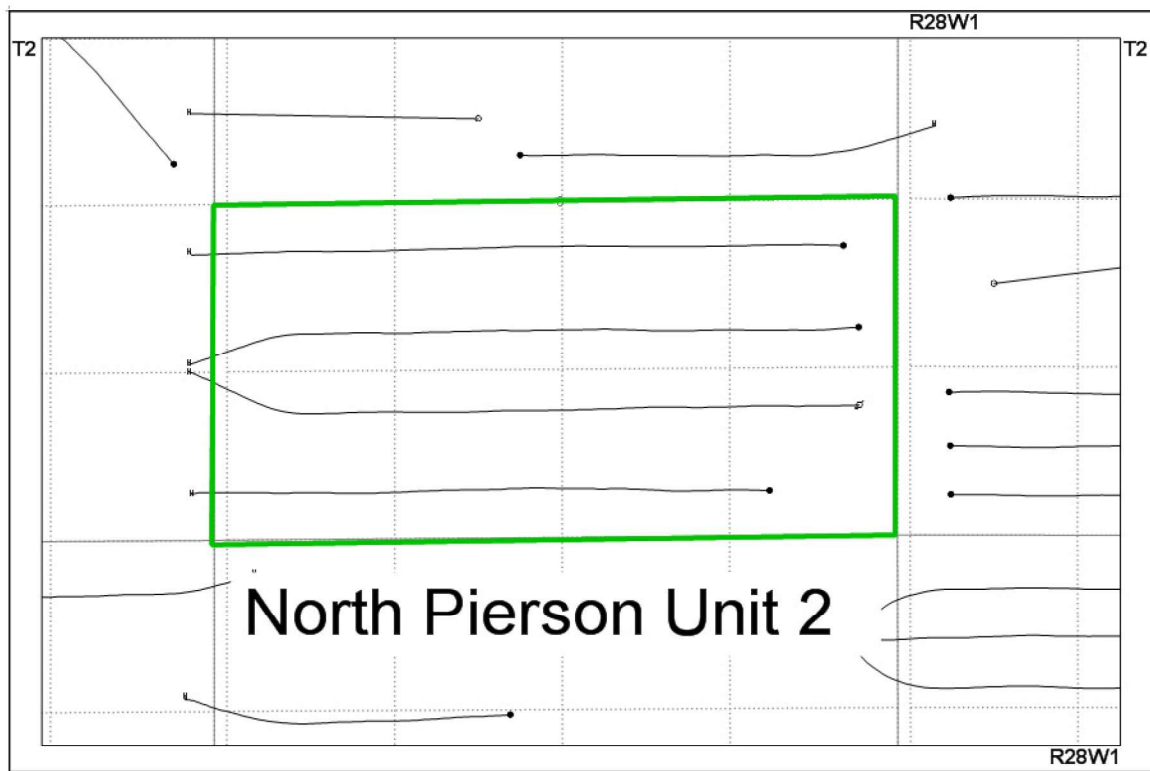
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## Introduction

North Pierson Unit 2 (NPU2) was approved on May 7, 2014. NPU2 includes 2 horizontal producing wells, 1 water injection well and 1 non-producing horizontal well located in S/2 8-2-28 as shown in the figure below.

### Figure 1: North Pierson Unit 2 Area Outline



Crescent Point Energy (CPG), in accordance with Section 73 of the Manitoba Drilling and Production Regulation, hereby submits the 2017 Annual Progress Report for NPU2.

## Production History

The first well that was drilled was 00/01-08-002-28W1/0 and was placed on production May 2010. In 2012, 3 more wells were drilled and brought on production. Production peaked in August 2012 at 31.6 m<sup>3</sup>/d (198.6 bbl/d) with a 50% watercut. Production in December 2017 was 2.3 m<sup>3</sup>/d (14.7 bbl/d) with a 67.4% watercut. The oil production rate, injection rate, and WOR during each month for the whole project are presented in Appendix C. The rate and WOR are plotted in Figure 2.

**Figure 2: North Pierson Unit 2 Production**

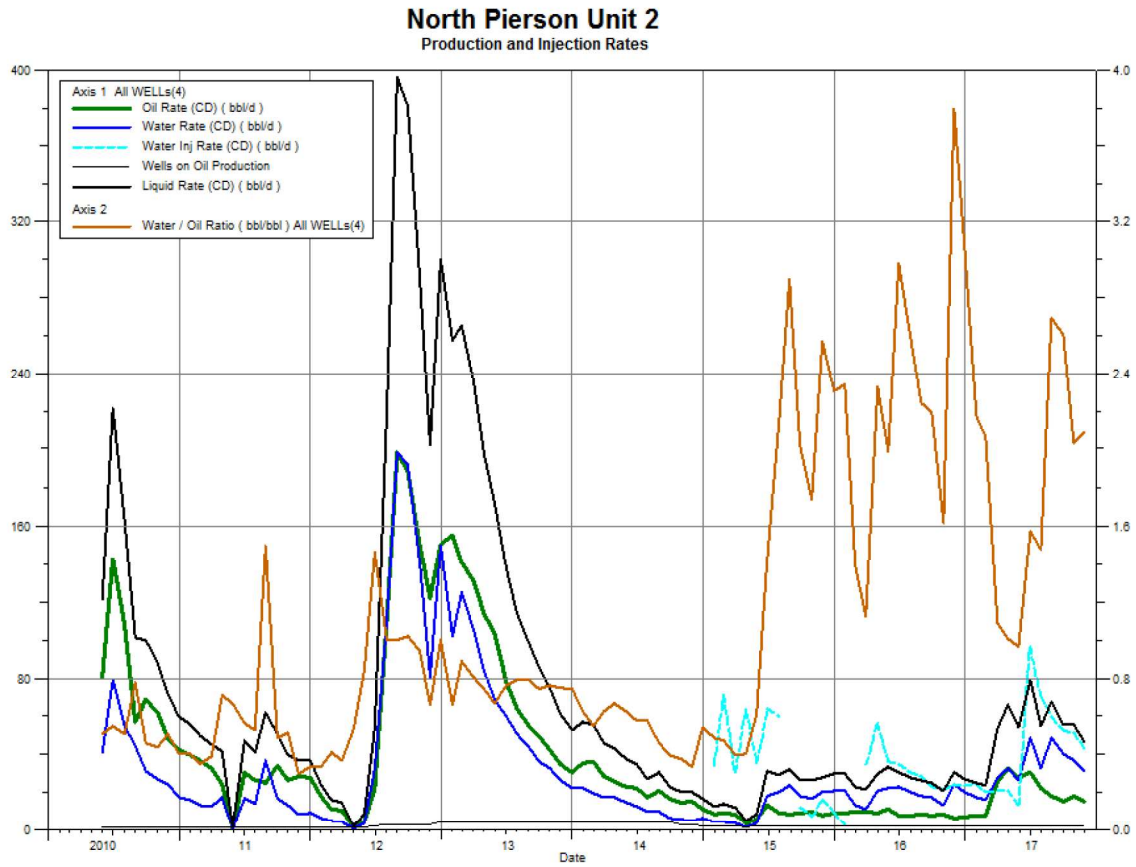
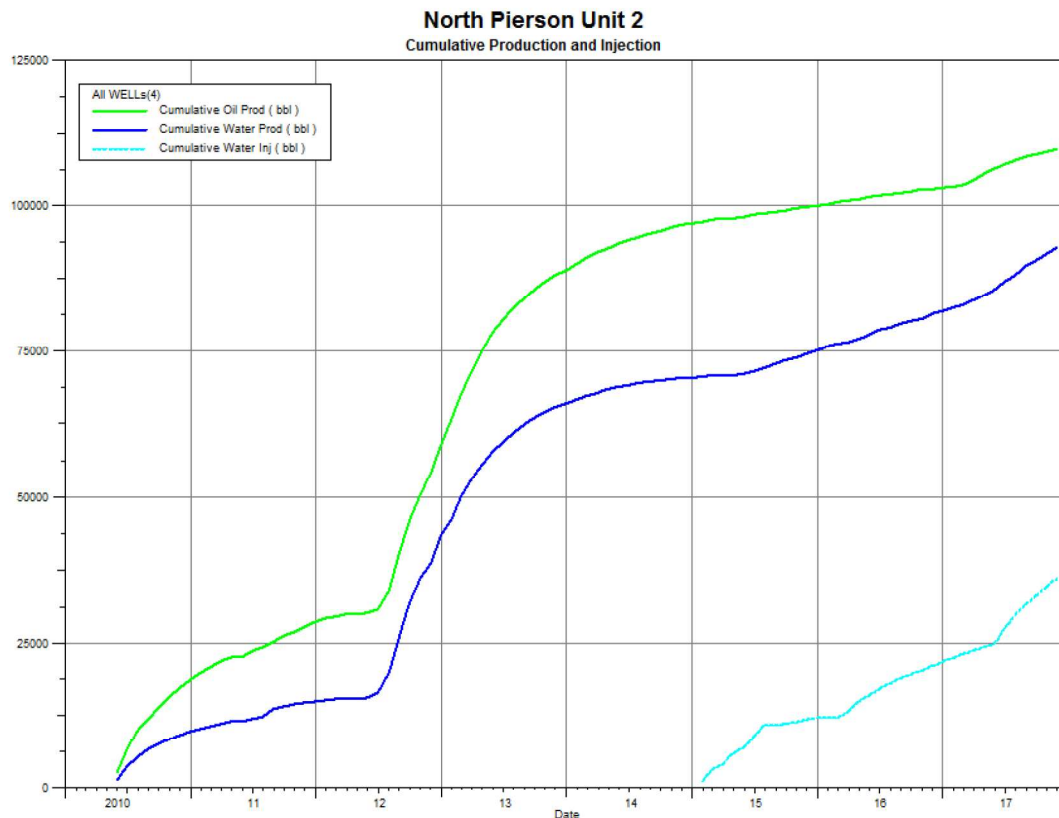


Figure 3 shows the cumulative production for NPU2 to the end of November 2017 is 17.5  $\text{e}^3\text{m}^3$  (109.9 mbbbl) of oil and 14.8  $\text{e}^3\text{m}^3$  (92.9 mbbbl) of water, which represents a cumulative recovery factor to date of 15.2%. The cumulative volume of oil, water produced, and fluid injected for the whole project are presented in Appendix C.

**Figure 3: North Pierson Unit 2 Cumulative Production and Water Injected**



## Waterflood History

Water injection started in January 2015. As of December 2017, the Unit has 1 active horizontal injection well at 00/01-08-002-28W1/0. A summary of the injector is presented in Appendix C.

## Waterflood Operating Strategy

### Water Source and Quality

The injection water for NPU2 will be produced water from the 9-32-1-28 battery where it is treated with scale inhibitor, filtered through 1.0 micron filter socks and distributed to the injection system.

### Injection Wellhead Pressures

The maximum allowable wellhead injection pressure in NPU2 is 4700 kPa. The monthly wellhead injection pressures for each injection well are summarized in Appendix B, showing pressures since January 2017.

### Reservoir Pressure

No pressure surveys were taken in 2017.

### Well Servicing

**Table 2: North Pierson Unit 2 2017 Well Servicing**

UWI	Well Service	Date
00/01-08-002-28W1/0	Tubing Repair	7/28/2017
02/01-08-002-28W1/0	Acid Treatment	5/29/2017
02/08-08-002-28W1/0	Pump Repair	3/11/2017
02/08-08-002-28W1/0	Acid Treatment	3/15/2017

### **Voidage Replacement**

Cumulative voidage for North Pierson Unit 2 was 0.139 in November 2016 and continues to climb steadily with a monthly voidage of about 0.789. Calculations, plots and tables of the Voidage Replacement Ratio on a monthly and cumulative basis for each the whole project area is presented in Appendix C.

### **Waterflood Performance**

The original oil-in-place (OOIP) of 115.0 e<sup>3</sup>m<sup>3</sup> with cumulative oil recovered to date of 17.5 e<sup>3</sup>m<sup>3</sup> results in a recovery factor of 15.2%. At this time, the ultimate recovery factor has not yet been determined.

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## **List of Appendices**

Appendix A: Well Name and Status

Appendix B: Average Monthly Injection Pressures

Appendix C: Injector Pattern Production/Injection Rates, Cumulative VRRs,  
Plots and Tables

## Appendix A

UWI	Surface Location	Well Status
00/01-08-002-28W1/0	00/01-07-002-28W1/0	Producing
02/01-08-002-28W1/0	02/01-07-002-28W1/0	Injecting
00/08-08-002-28W1/0	00/08-07-002-28W1/0	Non-producing
02/08-08-002-28W1/0	02/07-08-02-28W1/1	Producing

## Appendix B

### Average Monthly Injection Pressures

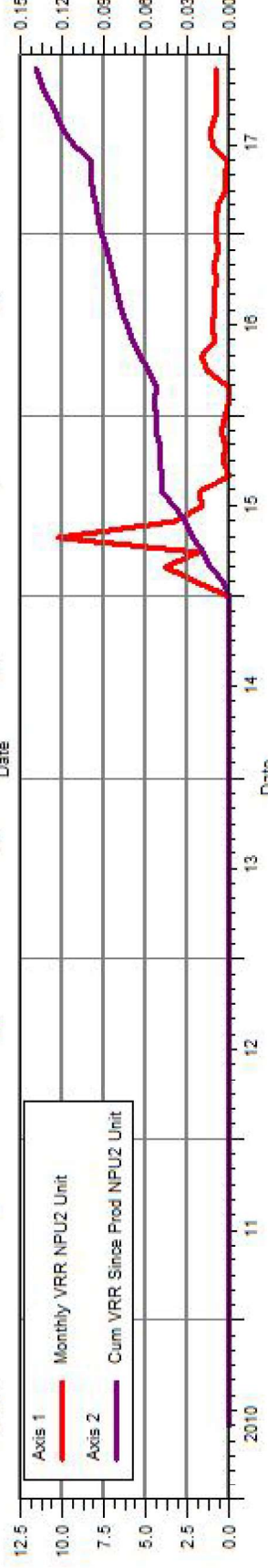
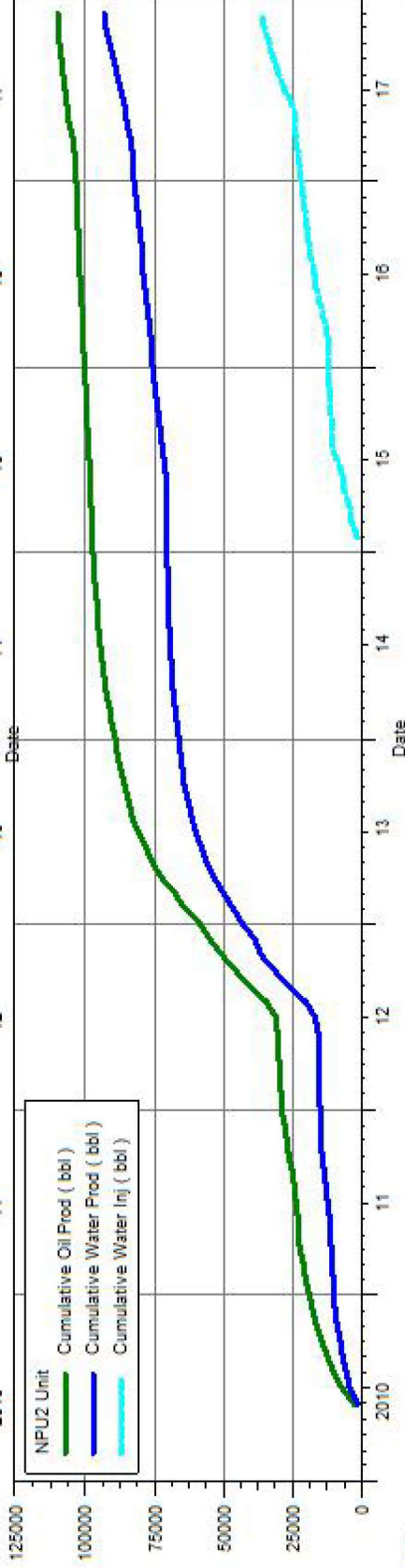
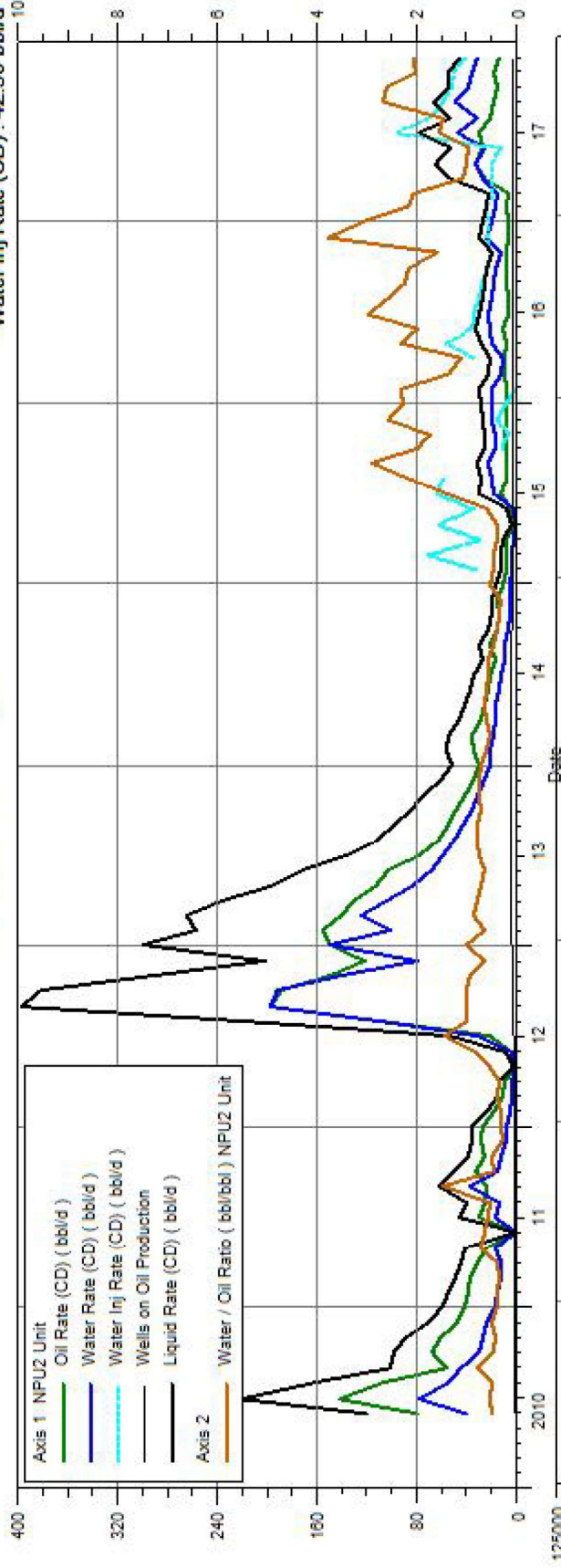
Month	Injection Pressure
	02/01-08-002-28W1/0
Jan-16	1,723.69
Feb-16	1,723.69
Mar-16	1,925.81
Apr-16	2,100.00
May-16	2,100.00
Jun-16	1,896.00
Jul-16	1,896.00
Aug-16	1,896.00
Sep-16	1,896.00
Oct-16	1,896.00
Nov-16	1,896.00
Dec-16	1,896.00

**Appendix C**  
**Rates and WRR**  
**Plots and Tables**

# North Pierson Unit 2

Ptn: 02/01-08-002-28W1/0 Inj

Oil Rate (CD) : 14.97 bbl/d  
Water Rate (CD) : 31.26 bbl/d  
Water Inj Rate (CD) : 42.56 bbl/d



Date	Oil Rate (CD)	Water Rate (CD)	Water Inj Rate (CD)	Cum Oil Prod	Cum Water Prod	Cum Water Inj	Water Cut	Monthly VRR	Cum VRR Since Prod
	bbl/d	bbl/d	bbl/d	Mbbl	Mbbl	Mbbl	%		
5/31/2010	80.61	40.54		2.5	1.26	0	33.46	0	0
6/30/2010	143.11	78.73		6.79	3.62	0	35.49	0	0
7/31/2010	107.6	54.7		10.13	5.31	0	33.7	0	0
8/31/2010	56.85	44.23		11.89	6.69	0	43.76	0	0
9/30/2010	68.41	31.09		13.94	7.62	0	31.25	0	0
10/31/2010	61.5	26.78		15.85	8.45	0	30.34	0	0
11/30/2010	47.53	23.88		17.27	9.16	0	33.44	0	0
12/31/2010	42.16	17.06		18.58	9.69	0	28.81	0	0
1/31/2011	39.59	15.83		19.81	10.18	0	28.56	0	0
2/28/2011	37.02	12.83		20.85	10.54	0	25.73	0	0
3/31/2011	32.42	12.62		21.85	10.93	0	28.02	0	0
4/30/2011	24.47	17.26		22.58	11.45	0	41.36	0	0
5/31/2011	0.85	0.57		22.61	11.47	0	40	0	0
6/30/2011	30.11	16.86		23.51	11.98	0	35.89	0	0
7/31/2011	26.54	14.04		24.34	12.41	0	34.6	0	0
8/31/2011	24.75	37.03		25.1	13.56	0	59.93	0	0
9/30/2011	33.94	16.37		26.12	14.05	0	32.54	0	0
10/31/2011	26.09	13.37		26.93	14.46	0	33.88	0	0
11/30/2011	28.3	8.39		27.78	14.72	0	22.86	0	0
12/31/2011	27.39	9.13		28.63	15	0	25	0	0
1/31/2012	18.26	6.09		29.2	15.19	0	25	0	0
2/29/2012	11.34	4.6		29.52	15.32	0	28.84	0	0
3/31/2012	10.63	3.88		29.85	15.44	0	26.71	0	0
4/30/2012	1.3	0.69		29.89	15.46	0	34.74	0	0
5/31/2012	4.3	3.61		30.03	15.57	0	45.64	0	0
6/30/2012	22.04	32.25		30.69	16.54	0	59.41	0	0
7/31/2012	108.89	109.04		34.06	19.92	0	50.03	0	0
8/31/2012	198.53	198.35		40.22	26.07	0	49.98	0	0
9/30/2012	188.8	192.28		45.88	31.84	0	50.46	0	0
10/31/2012	150.27	141.34		50.54	36.22	0	48.47	0	0
11/30/2012	122	80.51		54.2	38.64	0	39.76	0	0
12/31/2012	150.18	150.04		58.86	43.29	0	49.98	0	0
1/31/2013	155.5	102.1		63.68	46.45	0	39.63	0	0
2/28/2013	140.73	124.74		67.62	49.94	0	46.99	0	0
3/31/2013	131.34	105.2		71.69	53.21	0	44.48	0	0
4/30/2013	113.61	84.12		75.1	55.73	0	42.54	0	0
5/31/2013	103.52	68.56		78.31	57.85	0	39.84	0	0
6/30/2013	77.8	59.25		80.64	59.63	0	43.23	0	0
7/31/2013	63.53	50.38		82.61	61.19	0	44.23	0	0
8/31/2013	54.78	43.42		84.31	62.54	0	44.21	0	0
9/30/2013	49.04	36.21		85.78	63.63	0	42.47	0	0
10/31/2013	42.55	32.32		87.1	64.63	0	43.17	0	0
11/30/2013	34.82	26.06		88.14	65.41	0	42.8	0	0
12/31/2013	30.23	22.32		89.08	66.1	0	42.47	0	0
1/31/2014	35.16	21.87		90.17	66.78	0	38.35	0	0
2/28/2014	35.69	19.41		91.17	67.32	0	35.22	0	0
3/31/2014	28.32	17.57		92.05	67.87	0	38.28	0	0
4/30/2014	25.62	16.96		92.82	68.38	0	39.83	0	0
5/31/2014	22.95	14.26		93.53	68.82	0	38.33	0	0

6/30/2014	21.97	12.56		94.19	69.2	0	36.37	0	0
7/31/2014	16.98	9.8		94.71	69.5	0	36.59	0	0
8/31/2014	20.94	9.58		95.36	69.8	0	31.38	0	0
9/30/2014	16.37	6.5		95.85	69.99	0	28.41	0	0
10/31/2014	14.77	5.48		96.31	70.16	0	27.05	0	0
11/30/2014	15.22	5.09		96.77	70.31	0	25.08	0	0
12/31/2014	10.75	5.84		97.1	70.5	0	35.21	0	0
1/31/2015	8.58	4.16	33.9	97.37	70.62	1.05	32.64	1.977	0.005
2/28/2015	9.21	4.34	70.9	97.63	70.75	3.04	32.01	3.879	0.014
3/31/2015	8.44	3.31	30.11	97.89	70.85	3.97	28.15	1.872	0.018
4/30/2015	3.23	1.3	63.04	97.98	70.89	5.86	28.7	10.191	0.027
5/31/2015	5.13	3.12	35.16	98.14	70.98	6.95	37.84	3.228	0.032
6/30/2015	12.83	18.24	63.49	98.53	71.53	8.86	58.7	1.686	0.04
7/31/2015	9.25	19.82	59.83	98.81	72.15	10.71	68.18	1.769	0.048
8/31/2015	8.08	23.41		99.07	72.87	10.71	74.36	0	0.048
9/30/2015	8.76	17.65	12.01	99.33	73.4	11.07	66.83	0.389	0.049
10/31/2015	9.66	16.78	6.55	99.63	73.92	11.27	63.47	0.209	0.05
11/30/2015	7.82	20.13	15.77	99.86	74.53	11.75	72.02	0.493	0.052
12/31/2015	8.95	20.63	9.23	100.14	75.17	12.03	69.75	0.27	0.053
1/31/2016	8.93	20.9	2.48	100.42	75.81	12.11	70.07	0.072	0.053
2/29/2016	9.52	13.23		100.69	76.2	12.11	58.15	0	0.053
3/31/2016	9.98	11.18	34.57	101	76.54	13.18	52.83	1.315	0.057
4/30/2016	8.89	20.74	56.08	101.27	77.17	14.86	69.99	1.64	0.065
5/31/2016	11.14	22.16	36.32	101.61	77.85	15.99	66.54	0.931	0.069
6/30/2016	7.67	22.85	34.68	101.84	78.54	17.03	74.86	1.006	0.073
7/31/2016	7.79	20.21	30.64	102.09	79.16	17.98	72.17	0.957	0.077
8/31/2016	8.06	18.08	28.08	102.34	79.72	18.85	69.18	0.928	0.08
9/30/2016	7.84	17.21	23.08	102.57	80.24	19.54	68.7	0.794	0.083
10/31/2016	7.91	12.78	21.45	102.82	80.64	20.21	61.76	0.866	0.086
11/30/2016	6.35	24.13	23.86	103.01	81.36	20.92	79.16	0.707	0.088
12/31/2016	6.63	20.33	23.6	103.21	81.99	21.66	75.4	0.777	0.091
1/31/2017	7.81	16.98	24.17	103.45	82.52	22.4	68.49	0.839	0.094
2/28/2017	7.64	15.79	19.93	103.67	82.96	22.96	67.4	0.728	0.096
3/31/2017	25.38	27.61	20.51	104.45	83.82	23.6	52.11	0.311	0.098
4/30/2017	32.73	32.81	20.8	105.44	84.8	24.22	50.06	0.253	0.099
5/31/2017	27.55	26.52	12.9	106.29	85.62	24.62	49.04	0.189	0.1
6/30/2017	30.69	48.37	96.65	107.21	87.07	27.52	61.18	1.019	0.11
7/31/2017	21.99	32.42	70.32	107.89	88.08	29.7	59.58	1.07	0.118
8/31/2017	18.08	48.8	59.23	108.45	89.59	31.54	72.97	0.778	0.124
9/30/2017	15.26	39.81	52.33	108.91	90.79	33.11	72.29	0.832	0.13
10/31/2017	18.16	36.91	51.01	109.47	91.93	34.69	67.02	0.792	0.135
11/30/2017	14.97	31.26	42.56	109.92	92.87	35.97	67.62	0.789	0.139