

**DALY UNIT NO. 5**  
**WATERFLOOD EOR PROJECT**  
**ANNUAL REPORT FOR 2010**

**July 28, 2011**

**Tundra Oil and Gas Partnership**

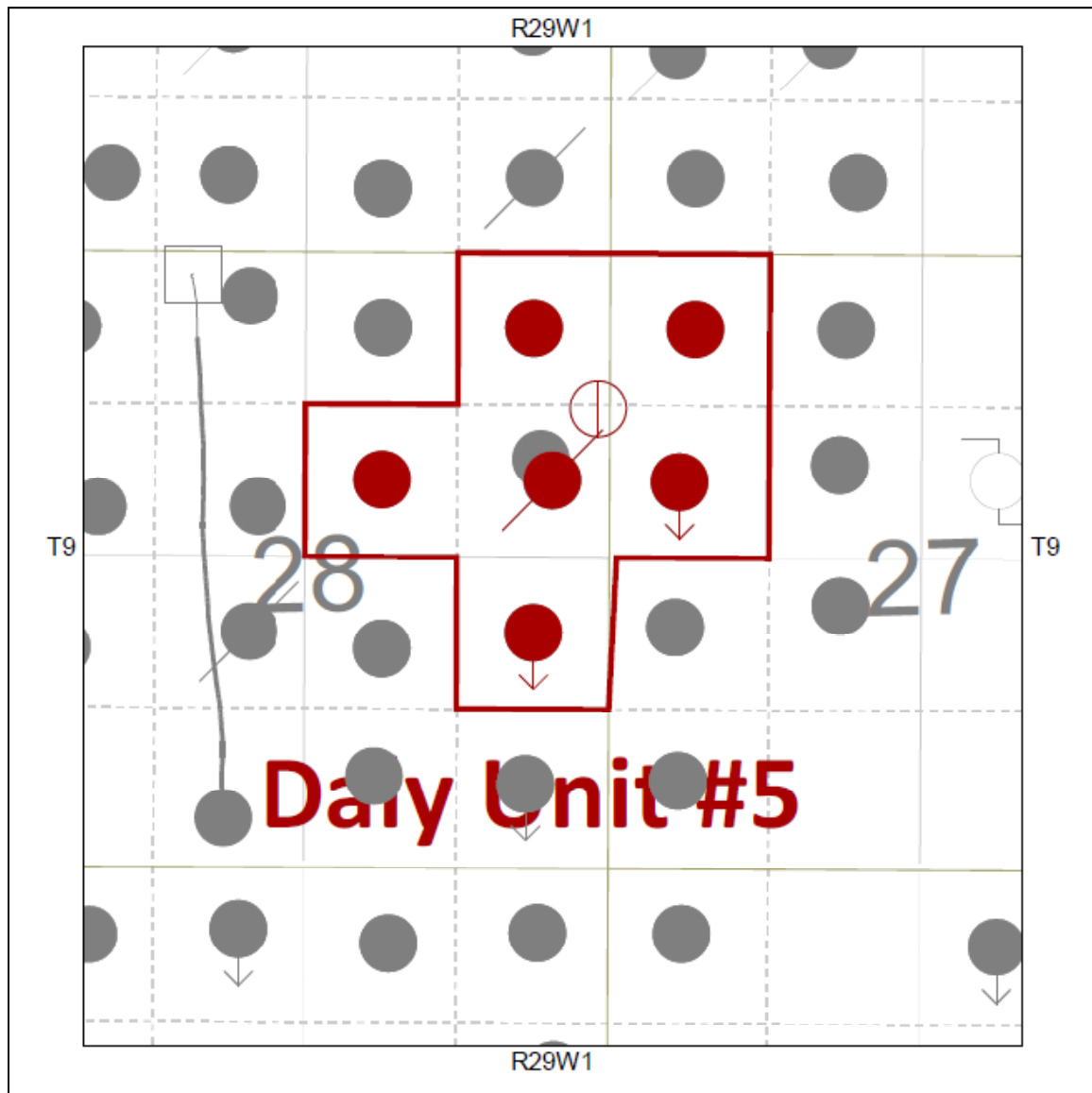
## Table of Contents

INTRODUCTION.....	3
DISCUSSION.....	4
Production History.....	4
Waterflood History.....	5
Waterflood EOR Operating Strategy and Performance .....	6
Water Source and Quality.....	6
Injection Wellhead Pressures .....	6
Reservoir Pressure .....	6
Well Servicing .....	6
Voidage Replacement .....	6
Waterflood Performance Discussion.....	<b>Error! Bookmark not defined.</b>
List of Appendices.....	7
Appendix A: Well List and Well Status	
Appendix B: Daly Unit No. 5 Injection Pattern Summary	
Appendix C: Injector Pattern Production/Injection Rates, Cumulatives and VRRs, Plots and Tables	

## INTRODUCTION

Daly Unit No. 5 Enhanced Oil Recovery (EOR) Waterflood Project was approved under Board Order No. PM 63 effective August 1st, 1990 with Tundra Oil and Gas Operator. The EOR project area, outlined in maroon the attached Figure 1, contains 7 wells over 6 LSDs in Township 9, Range 29W1. Well list and well status is available in Appendix A.

### Figure 1: Daly Unit No. 5 Area Outline



In accordance with Section 73 of the Manitoba Drilling and Production Regulation, Tundra submits the following 2010 Annual Progress Report for Daly Unit No. 5 as required by Board Order No PM 63.

## **DISCUSSION**

### **Production History**

For the wells included in Daly Unit No. 5, production started in July 1984 with 00/09-28-009-29W1/00. Oil production peaked at 17.8 m<sup>3</sup>/d in July of 1985. The water oil ratio (WOR) averaged 0.60 m<sup>3</sup>/m<sup>3</sup> over the last half of 2010. In December 2010, the Unit was producing 0.50 m<sup>3</sup>/d of oil and 0.42 m<sup>3</sup>/d of water. The oil production rate, injection rate, and WOR during each month for each injection pattern and for whole project are presented in Appendix C. The rates and WOR are presented in Figure 2.

**Figure 2: Daly Unit No. 5 Production/Injection Rates and WOR vs. Time**

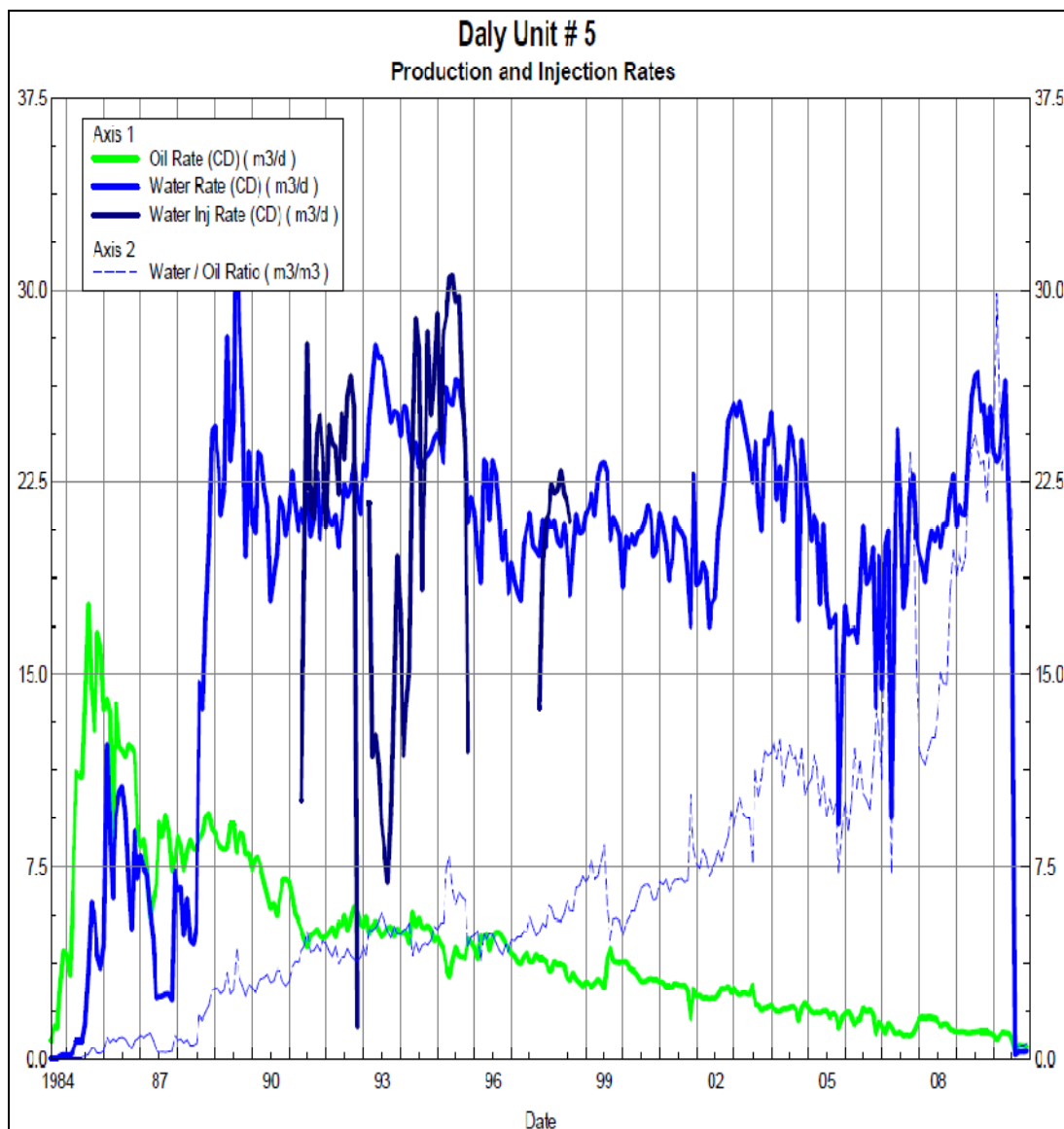
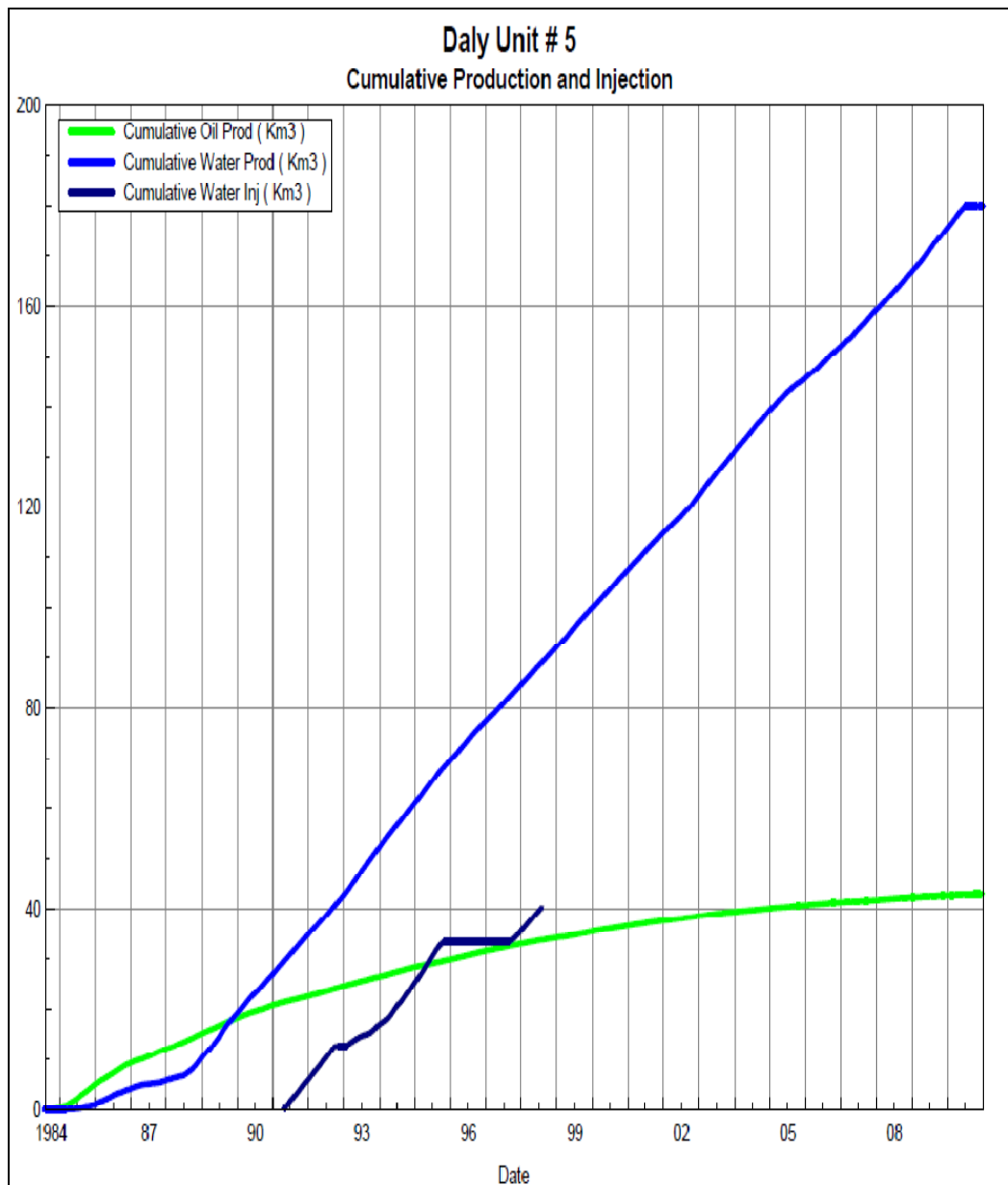


Figure 3 shows the cumulative production for Daly Unit No. 5 to the end of December 2010 as 42.9 E<sup>3</sup>m<sup>3</sup> of oil, and 180 E<sup>3</sup>m<sup>3</sup> of water. The cumulative water injected is over 40.2 E<sup>3</sup>m<sup>3</sup>. The cumulative volume of oil, and water produced and fluid injected for each

injection pattern and for the whole project for each injection well is presented in Appendix C.

**Figure 3: Daly Unit No. 5 Cumulative Oil, Water and Water Injected vs. Time**



### **Waterflood History**

As of December 2010 the Unit has no active vertical injector. Water was injected from February 1993 until July 1998.

## **Waterflood EOR Operating Strategy and Performance**

### **Water Source and Quality**

There is currently no injection in Daly unit No. 5.

### **Injection Wellhead Pressures**

No wellhead injection pressure is available for Daly Unit No. 5.

### **Reservoir Pressure**

No reservoir pressure measurements were taken at Daly Unit No. 5, in 2010.

### **Well Servicing**

No maintenance was required on the 7 wells in Daly Unit No. 5, in 2010.

### **Voidage Replacement**

Cumulative voidage for the Daly Unit No. 5 was 0.209 in December 2010. Calculation, plots and tables of the Voidage replacement ratio on a monthly and cumulative basis for each injection pattern and for the project area are presented in Appendix C.

### **Waterflood Performance Discussion**

The original oil-in-place of the area within the Unit is estimated at 430,000 m<sup>3</sup>. The current recovery factor is 10.0%, given cumulative oil production of 42,900 m<sup>3</sup>. The ultimate expected recoverable reserve based on decline analysis is 43,500 m<sup>3</sup> or an ultimate recovery factor of 10.1%.

The overall performance of this waterflood has been poor as indicated by the low recovery factor, and obvious lack of waterflood response in producers. The cumulative voidage of 0.209 supports that there has been insufficient water injection in the pool to provide good waterflood response.

The long term decline trends for oil and water are very stable and at a very low, nearly uneconomic, rate. The Unit will require the restarting of water injection in order to make this an effective waterflood. The evaluation of the waterflood potential of this Unit is tied to the general area the new facilities that have just been placed on line.

## **List of Appendices**

Appendix A: Well List and Well Status

Appendix B: Daly Unit No. 5 Injection Pattern Summary

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

## Appendix A

UWI	Well Status
100/12-27-009-29W1/00	Commingled
100/13-27-009-29W1/00	Capable of OIL Prod
100/08-28-009-29W1/00	Commingled
100/09-28-009-29W1/00	ABD Producer
102/09-28-009-29W1/00	Resumed COOP
100/10-28-009-29W1/00	Capable of OIL Prod
100/16-28-009-29W1/00	Capable of OIL Prod



Pattern Name	Injector Location (009-29W)	Injector Surf. Location (009-29W1)	Status	Supported Wells (010-29W1)	No. of Support ed Wells	Allocatio n 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
02/09-28-09-29 Injector	2/9/2028	Vertical Well	WTR Injection	08-28, 09-28, 10-28, 12-17, 13-27, 16-28	6	1	Jul 1984	Apr 1991	0.5	0.4	0.83	0.0	42.9	179.9	40.2	0.0	0.21

Appendix B

Oil Formation Vol. Factor : 1.06 m3/m3

## Completions Selected (7)

Oil Rate (CD) : 0.53 m3/d

Water Formation Vol Factor : 1.00 m3/m3

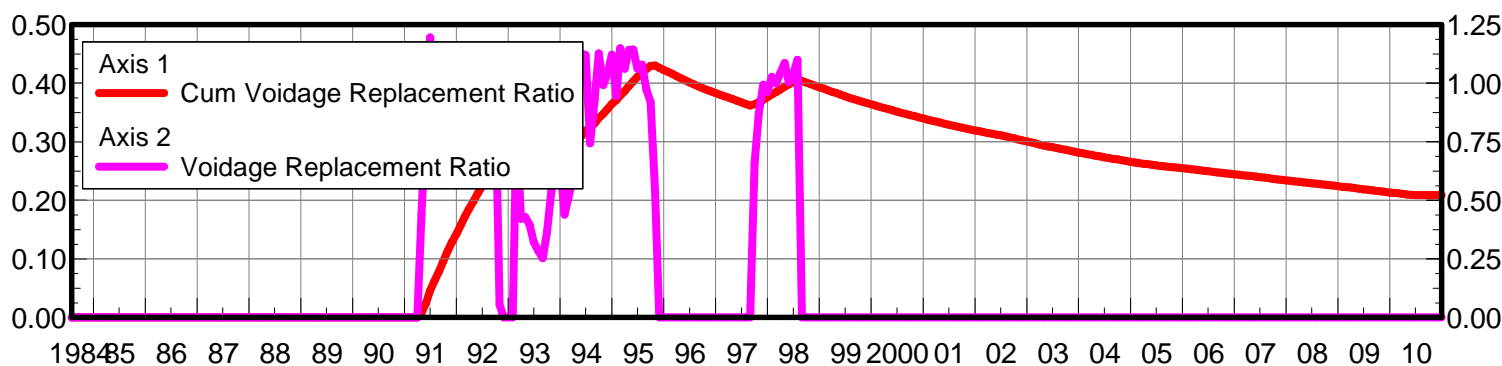
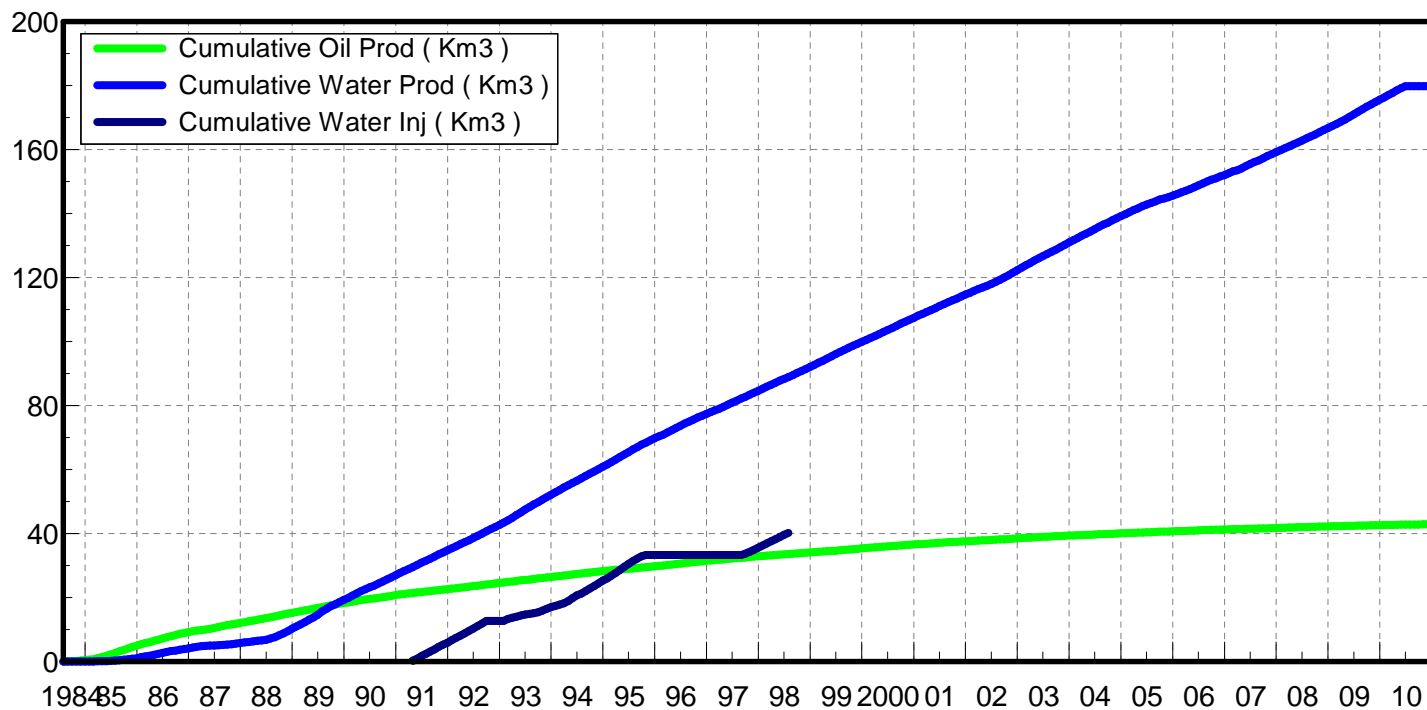
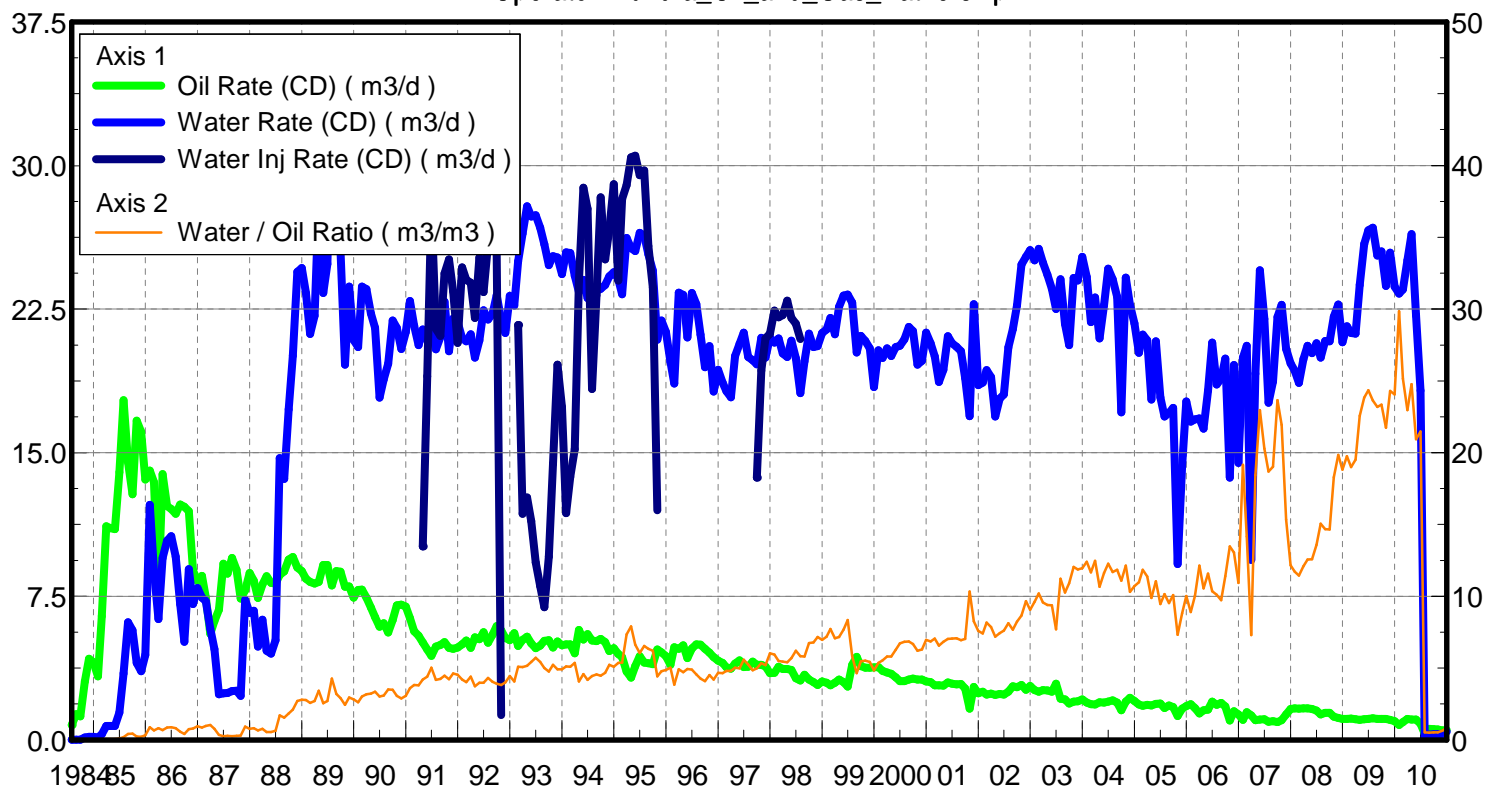
July 14, 2011

Water Rate (CD) : 19.41 m3/d

Water / Oil Ratio : 36.68 m3/m3

Operator: Tundra\_Oil\_and\_Gas\_Patnership

Water Inj Rate (CD) : 20.94 m3/d



Date

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 Km3	Cum Water Inj Km3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
7/31/1984	0.77	0.01	0.01		0.02	0.00	0.00	0.000	0.000
8/31/1984	1.34	0.01	0.00		0.07	0.00	0.00	0.000	0.000
9/30/1984	1.23	0.01	0.01		0.10	0.00	0.00	0.000	0.000
10/31/1984	3.05	0.13	0.04		0.20	0.00	0.00	0.000	0.000
11/30/1984	4.24	0.16	0.04		0.32	0.01	0.00	0.000	0.000
12/31/1984	4.05	0.16	0.04		0.45	0.01	0.00	0.000	0.000
1/31/1985	3.32	0.13	0.04		0.55	0.02	0.00	0.000	0.000
2/28/1985	6.46	0.29	0.04		0.73	0.03	0.00	0.000	0.000
3/31/1985	11.16	0.73	0.07		1.08	0.05	0.00	0.000	0.000
4/30/1985	11.05	0.73	0.07		1.41	0.07	0.00	0.000	0.000
5/31/1985	11.00	0.73	0.07		1.75	0.09	0.00	0.000	0.000
6/30/1985	13.98	1.43	0.10		2.17	0.14	0.00	0.000	0.000
7/31/1985	17.75	3.47	0.20		2.72	0.24	0.00	0.000	0.000
8/31/1985	14.50	6.15	0.42		3.17	0.43	0.00	0.000	0.000
9/30/1985	12.82	5.72	0.45		3.56	0.61	0.00	0.000	0.000
10/31/1985	16.68	4.02	0.24		4.07	0.73	0.00	0.000	0.000
11/30/1985	16.09	3.59	0.22		4.56	0.84	0.00	0.000	0.000
12/31/1985	13.60	4.44	0.33		4.98	0.98	0.00	0.000	0.000
1/31/1986	14.06	12.27	0.87		5.41	1.36	0.00	0.000	0.000
2/28/1986	13.46	8.84	0.66		5.79	1.60	0.00	0.000	0.000
3/31/1986	7.72	6.31	0.82		6.03	1.80	0.00	0.000	0.000
4/30/1986	13.88	9.50	0.68		6.45	2.09	0.00	0.000	0.000
5/31/1986	12.22	10.41	0.85		6.82	2.41	0.00	0.000	0.000
6/30/1986	12.07	10.64	0.88		7.19	2.73	0.00	0.000	0.000
7/31/1986	11.80	9.57	0.81		7.55	3.02	0.00	0.000	0.000
8/31/1986	12.29	7.08	0.58		7.93	3.24	0.00	0.000	0.000
9/30/1986	12.17	5.12	0.42		8.30	3.40	0.00	0.000	0.000
10/31/1986	11.95	8.92	0.75		8.67	3.67	0.00	0.000	0.000
11/30/1986	8.86	7.09	0.80		8.93	3.89	0.00	0.000	0.000
12/31/1986	8.29	7.93	0.96		9.19	4.13	0.00	0.000	0.000
1/31/1987	8.57	7.43	0.87		9.46	4.36	0.00	0.000	0.000
2/28/1987	7.44	7.24	0.97		9.67	4.56	0.00	0.000	0.000
3/31/1987	5.54	5.81	1.05		9.84	4.75	0.00	0.000	0.000
4/30/1987	6.22	4.74	0.76		10.02	4.89	0.00	0.000	0.000
5/31/1987	6.80	2.38	0.35		10.23	4.96	0.00	0.000	0.000
6/30/1987	9.21	2.44	0.26		10.51	5.03	0.00	0.000	0.000
7/31/1987	8.68	2.45	0.28		10.78	5.11	0.00	0.000	0.000
8/31/1987	9.50	2.55	0.27		11.07	5.19	0.00	0.000	0.000
9/30/1987	8.89	2.56	0.29		11.34	5.27	0.00	0.000	0.000
10/31/1987	7.39	2.30	0.31		11.57	5.34	0.00	0.000	0.000
11/30/1987	7.81	7.32	0.94		11.80	5.56	0.00	0.000	0.000
12/31/1987	8.72	6.63	0.76		12.07	5.76	0.00	0.000	0.000
1/31/1988	8.31	6.74	0.81		12.33	5.97	0.00	0.000	0.000
2/29/1988	7.41	4.88	0.66		12.55	6.11	0.00	0.000	0.000
3/31/1988	8.11	6.27	0.77		12.80	6.31	0.00	0.000	0.000
4/30/1988	8.55	4.66	0.55		13.06	6.45	0.00	0.000	0.000
5/31/1988	8.20	4.50	0.55		13.31	6.59	0.00	0.000	0.000
6/30/1988	8.17	5.21	0.64		13.55	6.74	0.00	0.000	0.000

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 Km3	Cum Water Inj Km3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
7/31/1988	8.62	14.71	1.71		13.82	7.20	0.00	0.000	0.000
8/31/1988	8.80	13.64	1.55		14.09	7.62	0.00	0.000	0.000
9/30/1988	9.42	17.26	1.83		14.38	8.14	0.00	0.000	0.000
10/31/1988	9.55	20.06	2.10		14.67	8.76	0.00	0.000	0.000
11/30/1988	9.01	24.44	2.71		14.94	9.49	0.00	0.000	0.000
12/31/1988	8.83	24.64	2.79		15.22	10.26	0.00	0.000	0.000
1/31/1989	8.42	23.34	2.77		15.48	10.98	0.00	0.000	0.000
2/28/1989	8.26	21.20	2.57		15.71	11.58	0.00	0.000	0.000
3/31/1989	8.17	22.15	2.71		15.96	12.26	0.00	0.000	0.000
4/30/1989	8.24	28.19	3.42		16.21	13.11	0.00	0.000	0.000
5/31/1989	9.14	23.34	2.55		16.49	13.83	0.00	0.000	0.000
6/30/1989	9.14	24.86	2.72		16.77	14.58	0.00	0.000	0.000
7/31/1989	8.06	34.46	4.28		17.02	15.65	0.00	0.000	0.000
8/31/1989	8.82	28.27	3.21		17.29	16.52	0.00	0.000	0.000
9/30/1989	8.79	25.52	2.90		17.55	17.29	0.00	0.000	0.000
10/31/1989	7.99	19.59	2.45		17.80	17.90	0.00	0.000	0.000
11/30/1989	8.01	23.68	2.96		18.04	18.61	0.00	0.000	0.000
12/31/1989	7.42	20.88	2.81		18.27	19.25	0.00	0.000	0.000
1/31/1990	7.83	20.52	2.62		18.52	19.89	0.00	0.000	0.000
2/28/1990	7.85	23.68	3.01		18.74	20.55	0.00	0.000	0.000
3/31/1990	7.43	23.54	3.17		18.97	21.28	0.00	0.000	0.000
4/30/1990	6.91	22.27	3.22		19.17	21.95	0.00	0.000	0.000
5/31/1990	6.41	21.52	3.36		19.37	22.62	0.00	0.000	0.000
6/30/1990	5.90	17.88	3.03		19.55	23.15	0.00	0.000	0.000
7/31/1990	6.09	18.84	3.09		19.74	23.74	0.00	0.000	0.000
8/31/1990	5.61	19.65	3.50		19.91	24.35	0.00	0.000	0.000
9/30/1990	6.27	21.90	3.50		20.10	25.00	0.00	0.000	0.000
10/31/1990	7.04	21.53	3.06		20.32	25.67	0.00	0.000	0.000
11/30/1990	7.06	20.42	2.89		20.53	26.28	0.00	0.000	0.000
12/31/1990	6.97	21.31	3.06		20.75	26.94	0.00	0.000	0.000
1/31/1991	6.36	22.92	3.60		20.94	27.65	0.00	0.000	0.000
2/28/1991	5.67	21.64	3.81		21.10	28.26	0.00	0.000	0.000
3/31/1991	5.44	20.62	3.79		21.27	28.90	0.00	0.000	0.000
4/30/1991	5.10	21.43	4.21	10.10	21.42	29.54	0.30	0.440	0.008
5/31/1991	4.73	20.85	4.41	18.99	21.57	30.19	0.89	0.853	0.024
6/30/1991	4.39	22.02	5.02	27.91	21.70	30.85	1.73	1.196	0.046
7/31/1991	4.87	20.39	4.19	21.47	21.85	31.48	2.39	0.983	0.063
8/31/1991	4.96	21.04	4.24	21.10	22.01	32.13	3.05	0.937	0.079
9/30/1991	5.11	22.89	4.48	24.37	22.16	32.82	3.78	0.998	0.096
10/31/1991	4.81	20.29	4.22	25.10	22.31	33.45	4.56	1.155	0.114
11/30/1991	4.76	22.01	4.63	23.43	22.45	34.11	5.26	1.000	0.129
12/31/1991	4.82	21.81	4.53	20.74	22.60	34.79	5.90	0.892	0.142
1/31/1992	4.99	20.99	4.21	24.68	22.75	35.44	6.67	1.098	0.158
2/29/1992	5.18	20.81	4.02	24.03	22.91	36.04	7.37	1.075	0.172
3/31/1992	4.81	21.19	4.41	23.87	23.05	36.70	8.11	1.055	0.186
4/30/1992	5.36	19.97	3.72	22.03	23.21	37.30	8.77	1.021	0.198
5/31/1992	5.25	20.86	3.97	25.19	23.38	37.94	9.55	1.123	0.212
6/30/1992	5.63	22.44	3.98	23.40	23.55	38.62	10.25	0.970	0.224

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 Km3	Cum Water Inj Km3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
7/31/1992	5.08	21.95	4.32	25.90	23.70	39.30	11.05	1.104	0.238
8/31/1992	5.50	22.26	4.05	26.61	23.87	39.99	11.88	1.113	0.252
9/30/1992	5.95	23.22	3.90	25.47	24.05	40.68	12.64	1.019	0.264
10/31/1992	5.73	21.95	3.83	1.29	24.23	41.36	12.68	0.055	0.261
11/30/1992	5.32	21.25	3.99		24.39	42.00	12.68	0.000	0.257
12/31/1992	5.21	23.20	4.45		24.55	42.72	12.68	0.000	0.253
1/31/1993	5.58	22.69	4.07		24.72	43.42	12.68	0.000	0.250
2/28/1993	4.91	24.99	5.09	21.68	24.86	44.12	13.29	0.819	0.258
3/31/1993	5.23	26.45	5.06	11.81	25.02	44.94	13.65	0.421	0.260
4/30/1993	5.39	27.87	5.17	12.67	25.19	45.78	14.03	0.430	0.263
5/31/1993	5.04	27.34	5.42	11.42	25.34	46.63	14.39	0.396	0.265
6/30/1993	4.79	27.40	5.72	9.27	25.49	47.45	14.67	0.321	0.266
7/31/1993	4.92	26.75	5.44	8.03	25.64	48.28	14.92	0.285	0.267
8/31/1993	5.17	25.88	5.01	6.94	25.80	49.08	15.13	0.253	0.266
9/30/1993	5.21	24.80	4.76	9.57	25.96	49.82	15.42	0.363	0.268
10/31/1993	4.83	25.26	5.24	14.42	26.10	50.61	15.86	0.540	0.272
11/30/1993	5.13	25.19	4.91	19.60	26.26	51.36	16.45	0.733	0.278
12/31/1993	4.94	24.33	4.92	17.39	26.41	52.12	16.99	0.674	0.283
1/31/1994	4.98	25.46	5.11	11.84	26.57	52.91	17.36	0.439	0.285
2/28/1994	4.99	25.43	5.10	13.75	26.71	53.62	17.74	0.511	0.288
3/31/1994	4.53	24.24	5.35	15.19	26.85	54.37	18.21	0.594	0.292
4/30/1994	5.75	23.39	4.07	23.97	27.02	55.07	18.93	0.954	0.300
5/31/1994	5.24	24.04	4.59	28.84	27.18	55.82	19.83	1.126	0.310
6/30/1994	5.52	23.08	4.18	27.73	27.35	56.51	20.66	1.121	0.319
7/31/1994	5.19	23.11	4.45	18.32	27.51	57.23	21.23	0.743	0.324
8/31/1994	5.15	23.44	4.55	23.23	27.67	57.95	21.95	0.930	0.331
9/30/1994	5.27	23.56	4.47	28.33	27.83	58.66	22.80	1.127	0.340
10/31/1994	5.10	23.76	4.66	25.10	27.98	59.40	23.58	0.992	0.348
11/30/1994	4.63	24.22	5.23	26.67	28.12	60.12	24.38	1.042	0.356
12/31/1994	4.79	24.43	5.10	29.03	28.27	60.88	25.28	1.123	0.365
1/31/1995	4.49	24.06	5.35	24.00	28.41	61.63	26.02	0.945	0.371
2/28/1995	4.33	23.27	5.38	28.25	28.53	62.28	26.81	1.150	0.379
3/31/1995	3.57	26.22	7.35	28.97	28.64	63.09	27.71	1.062	0.387
4/30/1995	3.25	25.68	7.89	30.43	28.74	63.86	28.62	1.142	0.395
5/31/1995	3.85	25.53	6.63	30.52	28.86	64.65	29.57	1.144	0.403
6/30/1995	4.38	26.48	6.05	29.50	28.99	65.45	30.45	1.062	0.411
7/31/1995	4.03	26.36	6.54	29.74	29.12	66.26	31.37	1.079	0.418
8/31/1995	4.01	25.37	6.33	25.81	29.24	67.05	32.17	0.971	0.424
9/30/1995	3.95	24.52	6.21	23.63	29.36	67.79	32.88	0.920	0.429
10/31/1995	4.72	20.91	4.43	12.00	29.50	68.43	33.26	0.538	0.430
11/30/1995	4.58	21.90	4.79		29.64	69.09	33.26	0.000	0.427
12/31/1995	4.37	21.31	4.88		29.78	69.75	33.26	0.000	0.423
1/31/1996	3.92	19.75	5.04		29.90	70.36	33.26	0.000	0.419
2/29/1996	4.84	18.61	3.84		30.04	70.90	33.26	0.000	0.416
3/31/1996	4.75	23.36	4.91		30.19	71.63	33.26	0.000	0.412
4/30/1996	4.94	23.24	4.71		30.33	72.32	33.26	0.000	0.409
5/31/1996	4.26	21.02	4.93		30.47	72.98	33.26	0.000	0.405
6/30/1996	4.77	23.34	4.89		30.61	73.68	33.26	0.000	0.401

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 Km3	Cum Water Inj Km3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
7/31/1996	4.99	22.76	4.56		30.76	74.38	33.26	0.000	0.398
8/31/1996	4.97	21.17	4.26		30.92	75.04	33.26	0.000	0.395
9/30/1996	4.76	19.46	4.09		31.06	75.62	33.26	0.000	0.392
10/31/1996	4.55	20.57	4.52		31.20	76.26	33.26	0.000	0.389
11/30/1996	4.33	18.20	4.20		31.33	76.81	33.26	0.000	0.386
12/31/1996	4.14	19.33	4.67		31.46	77.40	33.26	0.000	0.383
1/31/1997	4.02	18.65	4.64		31.59	77.98	33.26	0.000	0.380
2/28/1997	3.79	18.21	4.81		31.69	78.49	33.26	0.000	0.378
3/31/1997	3.73	17.89	4.80		31.81	79.05	33.26	0.000	0.375
4/30/1997	3.99	20.04	5.02		31.93	79.65	33.26	0.000	0.373
5/31/1997	4.15	20.68	4.98		32.06	80.29	33.26	0.000	0.370
6/30/1997	3.81	21.27	5.59		32.17	80.93	33.26	0.000	0.367
7/31/1997	3.81	20.00	5.25		32.29	81.55	33.26	0.000	0.365
8/31/1997	4.09	19.83	4.84		32.41	82.16	33.26	0.000	0.362
9/30/1997	3.93	19.61	4.99	13.70	32.53	82.75	33.67	0.659	0.364
10/31/1997	3.93	21.00	5.35	19.29	32.65	83.40	34.26	0.870	0.368
11/30/1997	3.83	19.96	5.21	20.97	32.77	84.00	34.89	0.993	0.372
12/31/1997	3.49	21.03	6.03	21.23	32.88	84.65	35.55	0.962	0.376
1/31/1998	3.50	20.76	5.94	22.42	32.99	85.30	36.25	1.028	0.381
2/28/1998	3.81	20.96	5.50	22.07	33.09	85.88	36.86	0.998	0.385
3/31/1998	3.70	20.18	5.46	22.19	33.21	86.51	37.55	1.042	0.389
4/30/1998	3.70	19.99	5.41	22.93	33.32	87.11	38.24	1.087	0.394
5/31/1998	3.65	20.85	5.71	22.03	33.43	87.75	38.92	1.004	0.398
6/30/1998	3.21	19.93	6.20	21.73	33.53	88.35	39.58	1.040	0.402
7/31/1998	3.11	18.11	5.83	20.94	33.62	88.91	40.22	1.100	0.406
8/31/1998	3.41	19.78	5.80		33.73	89.53	40.22	0.000	0.404
9/30/1998	3.15	21.22	6.74		33.82	90.16	40.22	0.000	0.401
10/31/1998	3.02	20.52	6.80		33.92	90.80	40.22	0.000	0.398
11/30/1998	2.87	20.57	7.18		34.00	91.42	40.22	0.000	0.396
12/31/1998	3.05	21.25	6.96		34.10	92.08	40.22	0.000	0.393
1/31/1999	2.98	21.44	7.18		34.19	92.74	40.22	0.000	0.391
2/28/1999	2.85	22.04	7.73		34.27	93.36	40.22	0.000	0.388
3/31/1999	2.99	21.19	7.09		34.36	94.01	40.22	0.000	0.386
4/30/1999	3.16	22.62	7.16		34.46	94.69	40.22	0.000	0.383
5/31/1999	3.02	23.20	7.68		34.55	95.41	40.22	0.000	0.380
6/30/1999	2.79	23.27	8.34		34.64	96.11	40.22	0.000	0.378
7/31/1999	3.92	22.84	5.82		34.76	96.82	40.22	0.000	0.375
8/31/1999	4.35	20.24	4.66		34.89	97.45	40.22	0.000	0.373
9/30/1999	3.85	21.10	5.48		35.01	98.08	40.22	0.000	0.371
10/31/1999	3.78	20.84	5.52		35.12	98.72	40.22	0.000	0.368
11/30/1999	3.77	20.45	5.43		35.24	99.34	40.22	0.000	0.366
12/31/1999	3.79	18.42	4.86		35.36	99.91	40.22	0.000	0.364
1/31/2000	3.80	20.36	5.35		35.47	100.54	40.22	0.000	0.362
2/29/2000	3.60	19.94	5.55		35.58	101.12	40.22	0.000	0.360
3/31/2000	3.53	20.45	5.80		35.69	101.75	40.22	0.000	0.358
4/30/2000	3.45	20.06	5.81		35.79	102.35	40.22	0.000	0.356
5/31/2000	3.27	20.52	6.27		35.89	102.99	40.22	0.000	0.354
6/30/2000	3.07	20.58	6.71		35.98	103.61	40.22	0.000	0.352

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 Km3	Cum Water Inj Km3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
7/31/2000	3.06	20.91	6.83		36.08	104.26	40.22	0.000	0.350
8/31/2000	3.15	21.57	6.86		36.18	104.93	40.22	0.000	0.348
9/30/2000	3.20	21.36	6.68		36.27	105.57	40.22	0.000	0.346
10/31/2000	3.15	19.60	6.22		36.37	106.17	40.22	0.000	0.344
11/30/2000	3.15	19.81	6.29		36.46	106.77	40.22	0.000	0.342
12/31/2000	3.05	21.26	6.96		36.56	107.43	40.22	0.000	0.340
1/31/2001	3.03	20.72	6.85		36.65	108.07	40.22	0.000	0.338
2/28/2001	2.84	20.04	7.05		36.73	108.63	40.22	0.000	0.336
3/31/2001	2.85	18.70	6.57		36.82	109.21	40.22	0.000	0.335
4/30/2001	2.83	19.33	6.84		36.91	109.79	40.22	0.000	0.333
5/31/2001	3.00	21.08	7.03		37.00	110.44	40.22	0.000	0.331
6/30/2001	2.94	20.72	7.05		37.09	111.06	40.22	0.000	0.329
7/31/2001	2.90	20.54	7.08		37.18	111.70	40.22	0.000	0.327
8/31/2001	2.92	20.30	6.94		37.27	112.33	40.22	0.000	0.326
9/30/2001	2.69	18.90	7.02		37.35	112.90	40.22	0.000	0.324
10/31/2001	1.64	16.91	10.32		37.40	113.42	40.22	0.000	0.323
11/30/2001	2.76	22.76	8.25		37.48	114.10	40.22	0.000	0.321
12/31/2001	2.44	18.53	7.60		37.56	114.68	40.22	0.000	0.319
1/31/2002	2.52	18.67	7.42		37.63	115.26	40.22	0.000	0.318
2/28/2002	2.37	19.32	8.16		37.70	115.80	40.22	0.000	0.317
3/31/2002	2.41	18.94	7.85		37.78	116.39	40.22	0.000	0.315
4/30/2002	2.35	16.89	7.19		37.85	116.89	40.22	0.000	0.314
5/31/2002	2.40	17.83	7.43		37.92	117.45	40.22	0.000	0.312
6/30/2002	2.37	18.04	7.62		37.99	117.99	40.22	0.000	0.311
7/31/2002	2.52	20.50	8.13		38.07	118.62	40.22	0.000	0.309
8/31/2002	2.80	21.46	7.67		38.16	119.29	40.22	0.000	0.308
9/30/2002	2.75	22.68	8.24		38.24	119.97	40.22	0.000	0.306
10/31/2002	2.87	24.82	8.66		38.33	120.74	40.22	0.000	0.304
11/30/2002	2.61	25.24	9.66		38.41	121.49	40.22	0.000	0.302
12/31/2002	2.82	25.57	9.07		38.49	122.29	40.22	0.000	0.301
1/31/2003	2.60	25.05	9.62		38.57	123.06	40.22	0.000	0.299
2/28/2003	2.51	25.65	10.20		38.65	123.78	40.22	0.000	0.297
3/31/2003	2.61	24.93	9.57		38.73	124.55	40.22	0.000	0.295
4/30/2003	2.59	24.30	9.39		38.80	125.28	40.22	0.000	0.294
5/31/2003	2.52	23.56	9.37		38.88	126.01	40.22	0.000	0.292
6/30/2003	2.93	22.51	7.69		38.97	126.69	40.22	0.000	0.291
7/31/2003	2.15	24.06	11.22		39.04	127.44	40.22	0.000	0.289
8/31/2003	2.12	21.73	10.27		39.10	128.11	40.22	0.000	0.288
9/30/2003	1.89	20.62	10.91		39.16	128.73	40.22	0.000	0.286
10/31/2003	2.00	24.14	12.05		39.22	129.48	40.22	0.000	0.285
11/30/2003	2.02	23.99	11.86		39.28	130.20	40.22	0.000	0.283
12/31/2003	2.11	25.23	11.96		39.35	130.98	40.22	0.000	0.282
1/31/2004	1.95	24.18	12.41		39.41	131.73	40.22	0.000	0.280
2/29/2004	1.87	21.83	11.68		39.46	132.36	40.22	0.000	0.279
3/31/2004	1.85	23.10	12.48		39.52	133.08	40.22	0.000	0.278
4/30/2004	1.97	20.97	10.66		39.58	133.71	40.22	0.000	0.276
5/31/2004	1.95	22.71	11.62		39.64	134.41	40.22	0.000	0.275
6/30/2004	2.01	24.61	12.26		39.70	135.15	40.22	0.000	0.274

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 Km3	Cum Water Inj Km3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
7/31/2004	2.06	24.07	11.69		39.76	135.89	40.22	0.000	0.272
8/31/2004	1.95	23.14	11.86		39.82	136.61	40.22	0.000	0.271
9/30/2004	1.54	17.11	11.09		39.87	137.12	40.22	0.000	0.270
10/31/2004	1.99	24.14	12.13		39.93	137.87	40.22	0.000	0.268
11/30/2004	2.20	22.72	10.31		40.00	138.55	40.22	0.000	0.267
12/31/2004	2.03	21.75	10.72		40.06	139.23	40.22	0.000	0.266
1/31/2005	1.84	20.22	10.98		40.12	139.86	40.22	0.000	0.265
2/28/2005	1.79	21.17	11.86		40.17	140.45	40.22	0.000	0.264
3/31/2005	1.83	20.87	11.39		40.22	141.10	40.22	0.000	0.263
4/30/2005	1.80	17.77	9.89		40.28	141.63	40.22	0.000	0.262
5/31/2005	1.88	20.83	11.05		40.34	142.27	40.22	0.000	0.261
6/30/2005	1.89	17.90	9.45		40.39	142.81	40.22	0.000	0.260
7/31/2005	1.66	16.89	10.15		40.44	143.33	40.22	0.000	0.259
8/31/2005	1.79	17.07	9.54		40.50	143.86	40.22	0.000	0.258
9/30/2005	1.72	17.35	10.09		40.55	144.38	40.22	0.000	0.257
10/31/2005	1.25	9.19	7.32		40.59	144.67	40.22	0.000	0.257
11/30/2005	1.62	14.31	8.81		40.64	145.10	40.22	0.000	0.256
12/31/2005	1.76	17.68	10.02		40.69	145.65	40.22	0.000	0.255
1/31/2006	1.86	16.62	8.91		40.75	146.16	40.22	0.000	0.254
2/28/2006	1.67	16.74	10.02		40.80	146.63	40.22	0.000	0.253
3/31/2006	1.38	16.79	12.14		40.84	147.15	40.22	0.000	0.252
4/30/2006	1.54	16.26	10.56		40.89	147.64	40.22	0.000	0.252
5/31/2006	1.57	18.24	11.59		40.94	148.20	40.22	0.000	0.251
6/30/2006	2.00	20.75	10.36		41.00	148.83	40.22	0.000	0.250
7/31/2006	1.84	18.57	10.12		41.05	149.40	40.22	0.000	0.249
8/31/2006	1.94	18.86	9.73		41.11	149.99	40.22	0.000	0.248
9/30/2006	1.75	19.92	11.40		41.17	150.58	40.22	0.000	0.247
10/31/2006	1.02	13.69	13.47		41.20	151.01	40.22	0.000	0.246
11/30/2006	1.50	19.59	13.06		41.24	151.60	40.22	0.000	0.245
12/31/2006	1.32	14.47	10.94		41.28	152.04	40.22	0.000	0.245
1/31/2007	1.04	19.97	19.16		41.32	152.66	40.22	0.000	0.244
2/28/2007	1.45	20.59	14.16		41.36	153.24	40.22	0.000	0.243
3/31/2007	1.29	9.41	7.31		41.40	153.53	40.22	0.000	0.242
4/30/2007	1.04	19.13	18.45		41.43	154.11	40.22	0.000	0.242
5/31/2007	1.07	24.52	22.97		41.46	154.87	40.22	0.000	0.240
6/30/2007	1.08	21.99	20.30		41.49	155.53	40.22	0.000	0.240
7/31/2007	0.94	17.61	18.70		41.52	156.07	40.22	0.000	0.239
8/31/2007	0.98	18.71	19.02		41.55	156.65	40.22	0.000	0.238
9/30/2007	0.93	22.09	23.66		41.58	157.31	40.22	0.000	0.237
10/31/2007	1.04	22.73	21.95		41.61	158.02	40.22	0.000	0.236
11/30/2007	1.33	20.42	15.36		41.65	158.63	40.22	0.000	0.235
12/31/2007	1.62	19.66	12.17		41.70	159.24	40.22	0.000	0.234
1/31/2008	1.65	19.27	11.72		41.75	159.84	40.22	0.000	0.233
2/29/2008	1.63	18.64	11.45		41.80	160.38	40.22	0.000	0.233
3/31/2008	1.65	19.88	12.09		41.85	161.00	40.22	0.000	0.232
4/30/2008	1.64	20.59	12.55		41.90	161.61	40.22	0.000	0.231
5/31/2008	1.61	20.21	12.58		41.95	162.24	40.22	0.000	0.230
6/30/2008	1.52	20.71	13.60		42.00	162.86	40.22	0.000	0.229



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 Km3	Cum Water Inj Km3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
7/31/2008	1.33	19.96	15.05		42.04	163.48	40.22	0.000	0.228
8/31/2008	1.42	20.84	14.68		42.08	164.13	40.22	0.000	0.228
9/30/2008	1.42	20.81	14.66		42.12	164.75	40.22	0.000	0.227
10/31/2008	1.21	22.11	18.28		42.16	165.44	40.22	0.000	0.226
11/30/2008	1.15	22.75	19.84		42.20	166.12	40.22	0.000	0.225
12/31/2008	1.10	20.77	18.83		42.23	166.76	40.22	0.000	0.224
1/31/2009	1.09	21.60	19.75		42.26	167.43	40.22	0.000	0.223
2/28/2009	1.12	21.25	19.01		42.30	168.03	40.22	0.000	0.223
3/31/2009	1.09	21.22	19.52		42.33	168.68	40.22	0.000	0.222
4/30/2009	1.05	23.77	22.56		42.36	169.40	40.22	0.000	0.221
5/31/2009	1.09	25.90	23.82		42.39	170.20	40.22	0.000	0.220
6/30/2009	1.09	26.61	24.34		42.43	171.00	40.22	0.000	0.219
7/31/2009	1.13	26.75	23.63		42.46	171.83	40.22	0.000	0.218
8/31/2009	1.09	25.29	23.20		42.50	172.61	40.22	0.000	0.217
9/30/2009	1.09	25.51	23.34		42.53	173.38	40.22	0.000	0.216
10/31/2009	1.09	23.71	21.74		42.56	174.11	40.22	0.000	0.215
11/30/2009	1.05	25.44	24.31		42.59	174.88	40.22	0.000	0.214
12/31/2009	0.98	23.68	24.07		42.62	175.61	40.22	0.000	0.214
1/31/2010	0.78	23.30	29.85		42.65	176.33	40.22	0.000	0.213
2/28/2010	0.94	23.52	25.14		42.67	176.99	40.22	0.000	0.212
3/31/2010	1.09	25.04	22.96		42.71	177.77	40.22	0.000	0.211
4/30/2010	1.07	26.42	24.77		42.74	178.56	40.22	0.000	0.210
5/31/2010	1.06	22.16	20.95		42.77	179.25	40.22	0.000	0.209
6/30/2010	0.85	18.24	21.46		42.80	179.79	40.22	0.000	0.209
7/31/2010	0.32	0.16	0.52		42.81	179.80	40.22	0.000	0.209
8/31/2010	0.57	0.28	0.50		42.83	179.81	40.22	0.000	0.209
9/30/2010	0.56	0.29	0.53		42.84	179.82	40.22	0.000	0.209
10/31/2010	0.55	0.29	0.53		42.86	179.83	40.22	0.000	0.209
11/30/2010	0.49	0.31	0.64		42.87	179.84	40.22	0.000	0.209
12/31/2010	0.50	0.42	0.83		42.89	179.85	40.22	0.000	0.209