

**Viriden Roselea Unit #2**  
**2012 Annual EOR Report**

## **Executive Summary**

In 2012 oil production in the Virden Roselea Unit #2 (VRU #2) was 19 m<sup>3</sup>/d (119 bbl/d) totaling 6.9 e<sup>3</sup>m<sup>3</sup> (43.4 mbbbl). Annual production was down 19% from 2011 to 2012. By the end of 2012 cumulative oil production from the VRU #2 was 1 136 e<sup>3</sup>m<sup>3</sup> (7.1 mmbbl). The original forecasted recovery was 270 e<sup>3</sup>m<sup>3</sup> (1.7 mmbbl) on primary recovery and 730 e<sup>3</sup>m<sup>3</sup> (4.6 mmbbl) total primary plus secondary recovery. It should be noted that the pool was expanded slightly after the original waterflood forecast was made, however the waterflood has made a tremendous increase to the ultimate oil recovery and has exceeded the original expectations.

In December 2012 there were 28 producing oil wells and 11 water injectors active in the unit. No development activity occurred in 2012.

The operatorship of VRU #2 was transferred to Corex Resources on December 19, 2012.

## Discussion

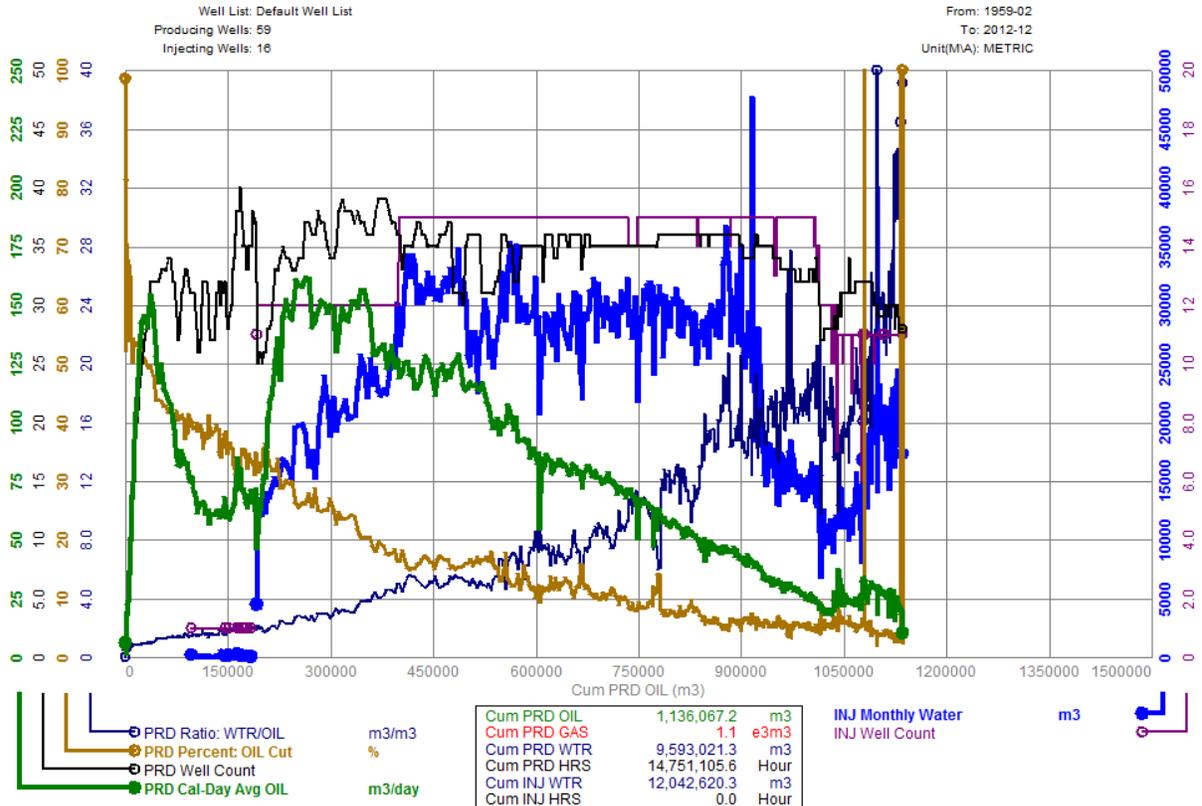
The VRU #2 has been under waterflood since 1966, 7 years after first production from the pool in 1959. Water injection increased the oil production rate from  $\sim 60 \text{ m}^3/\text{d}$  to  $\sim 150 \text{ m}^3/\text{d}$ , equivalent to peak production from the field. Expected ultimate oil recovery was increased by  $>4$  times by the waterflood.

There has been no development activity in VRU #2 in the last 10 years. From 1997-2002, four horizontal wells were drilled in the unit, all with poor results.

There have been no wells converted to injection since 1971. The water injection rate was  $675 \text{ m}^3/\text{d}$  in 2012 and the producing WOR was  $34 \text{ m}^3/\text{m}^3$ . The injected water at VRU #2 is not filtered or treated in any way.

In the composite rate – cumulative oil plot below, waterflood response is clearly demonstrated at a cumulative oil production of  $200 \text{ e}^3 \text{ m}^3$ .

Detailed production, injection, voidage tables and plots for the total unit and each injection pattern are at the end of this report.



## 2012 Reservoir Pressure Surveys

Unit	UWID	Licence	Test Date	Test Type	Shut-in Time (days)	Datum Pressure (kPaa)
VRU #2	100/13-06-11-25W1/00	2238	11/30/2012	AWS BU	7.2	6,158

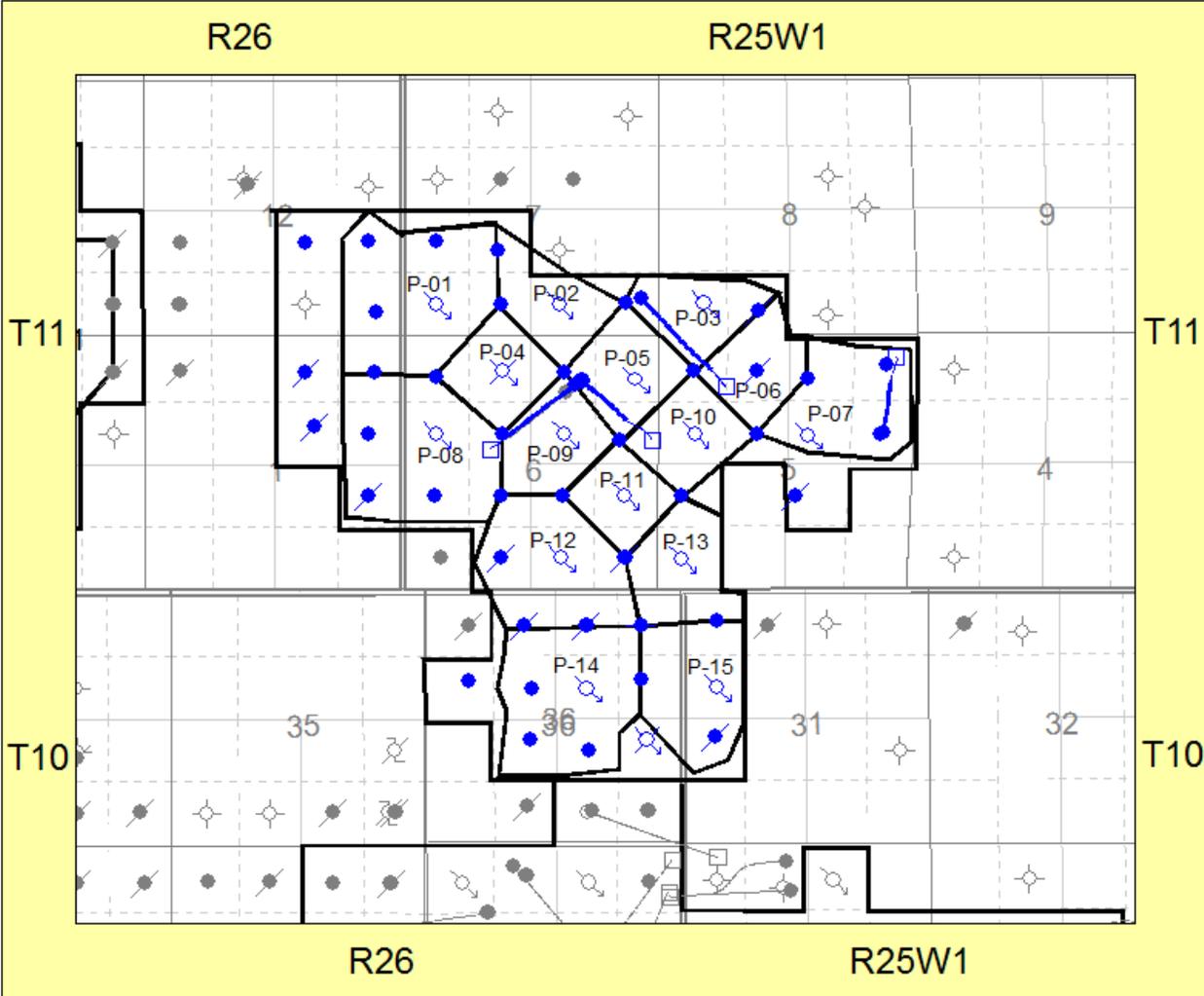
One reservoir pressure measurement was taken in 2012 and it is shown above. Pressures taken from 2010 and 2011 ranged from 8 459 kPaa to 11 218 kPaa which would suggest that the pressure taken in 2012 is in an area of the pool with lower than average pressure. As the VRR has been close to 1 over this time average pool pressure is expected to remain relatively stable over the past few years.

The VRR in 2012 was maintained at 0.98 when all facilities were on stream. The cumulative VRR at year end was 1.12. An oil formation volume factor of  $1.06 \text{ rm}^3/\text{sm}^3$  and a water formation volume factor of  $1.04 \text{ rm}^3/\text{sm}^3$  were used in the VRR calculations.

## 2012 Well Servicing

UWID	Licence	Operation	Date	OBJECTIVE
100/01-07-011-25W1/00	001814	Maintenance	11-APR-12	Suspension
100/02-06-011-25W1/00	001763	Maintenance	15-AUG-12	Annual annulus pressure test
100/10-06-011-25W1/00	001785	Maintenance	15-AUG-12	Annual annulus pressure test
100/12-05-011-25W1/00	001805	Maintenance	15-AUG-12	Annual annulus pressure test
100/10-05-011-25W1/00	002087	Maintenance	15-AUG-12	Annual annulus pressure test
100/04-05-011-25W1/00	001793	Maintenance	15-AUG-12	Annual annulus pressure test
100/08-06-011-25W1/00	001795	Maintenance	15-AUG-12	Annual annulus pressure test
100/10-36-010-26W1/00	001737	Maintenance	16-AUG-12	Annual annulus pressure test
100/12-06-011-25W1/00	002200	Maintenance	16-AUG-12	Annual annulus pressure test
100/04-07-011-25W1/00	001773	Maintenance	16-AUG-12	Annual annulus pressure test
100/02-07-011-25W1/00	001792	Maintenance	16-AUG-12	Annual annulus pressure test
100/04-07-011-25W1/00	001773	Maintenance	05-DEC-12	Replace failed tubing and packer

# Waterflood Pattern Map



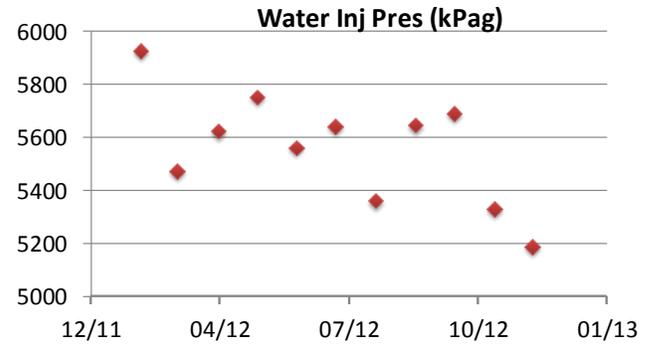
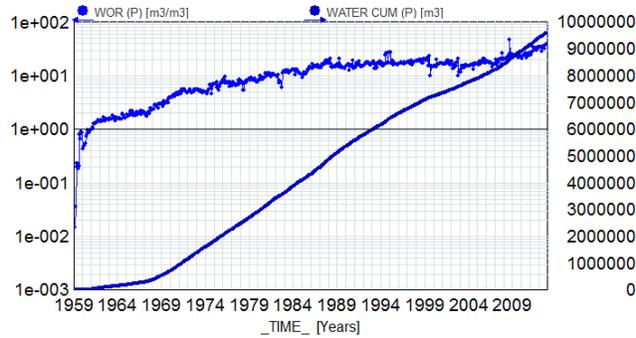
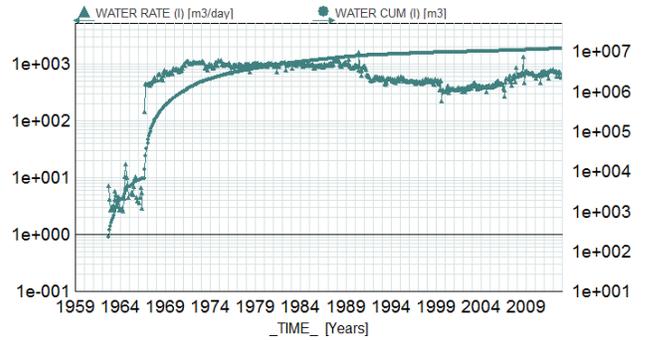
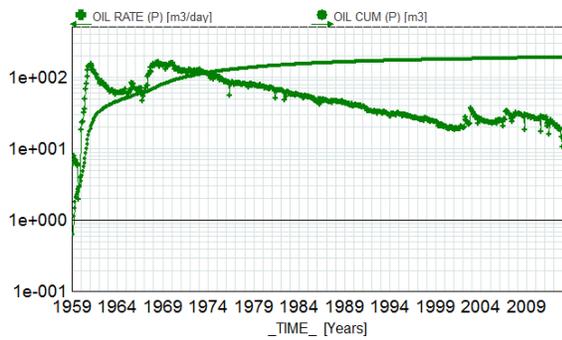
## Waterflood Patterns and Corresponding Injectors

Pattern	Injection Well
P-01	100/04-07-011-25W1/00
P-02	100/02-07-011-25W1/00
P-03	100/04-08-011-25W1/00
P-04	100/14-06-011-25W1/00
P-05	100/16-06-011-25W1/00
P-06	100/14-05-011-25W1/00
P-07	100/10-05-011-25W1/00
P-08	100/12-06-011-25W1/00
P-09	100/10-06-011-25W1/00
P-10	100/12-05-011-25W1/00
P-11	100/08-06-011-25W1/00
P-12	100/02-06-011-25W1/00
P-13	100/04-05-011-25W1/00
P-14	100/10-36-010-26W1/00
P-15	100/12-31-010-25W1/00

# Total for Virden Roselea Unit #2

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPa	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	680.3	21.95	22589.1	728.68	33.20	22695.0	732.10	5923	0.97	1.12
2/28/2012	577.9	20.64	19904.7	710.88	34.45	19964.0	713.00	5472	0.97	1.12
3/31/2012	662.4	21.37	22475.9	725.03	33.93	22543.0	727.19	5621	0.97	1.12
4/30/2012	642.3	21.41	18062.9	602.10	28.12	18117.0	603.90	5752	0.97	1.12
5/31/2012	646.5	20.85	22190.9	715.84	34.32	22257.0	717.97	5561	0.97	1.12
6/30/2012	573.4	19.11	0.0	0.00	0.00	20606.0	686.87	5640	35.06	1.12
7/31/2012	591.5	19.08	21572.1	695.87	36.47	21745.0	701.45	5359	0.98	1.12
8/31/2012	606.7	19.57	22002.7	709.76	36.27	22172.0	715.23	5643	0.98	1.12
9/30/2012	557.3	18.58	17802.8	593.43	31.94	17932.0	597.73	5688	0.98	1.12
10/31/2012	573.5	18.50	21003.1	677.52	36.62	21179.0	683.19	5328	0.98	1.12
11/30/2012	438.8	14.63	17170.2	572.34	39.13	17312.0	577.07	5184	0.98	1.12
12/31/2012	325.6	10.50						5171		

Cumulative Oil Produced (E3m <sup>3</sup> )	1136.07
Cumulative Water Produced (E3m <sup>3</sup> )	9593.02
Cumulative Water Injected (E3m <sup>3</sup> )	12042.62
Cumulative Voidage Replacement Ratio	1.12

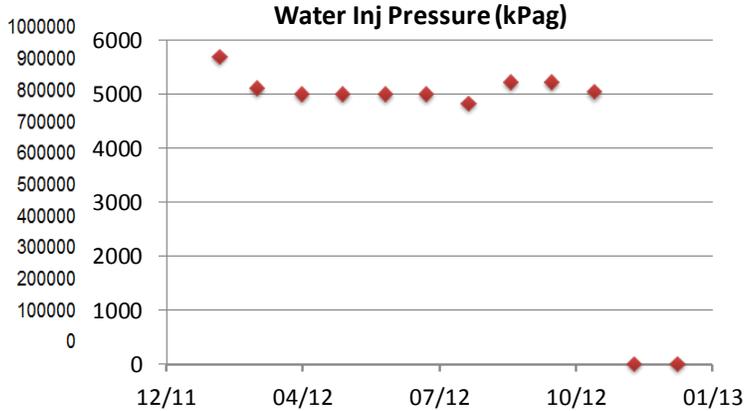
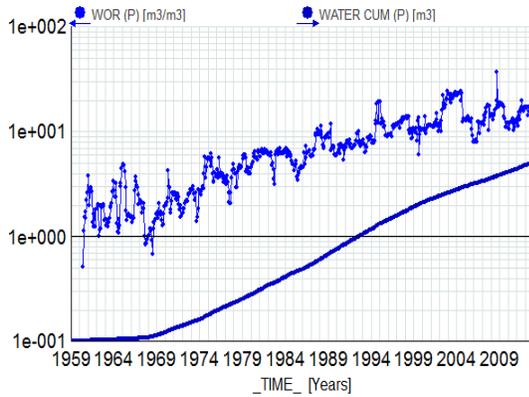
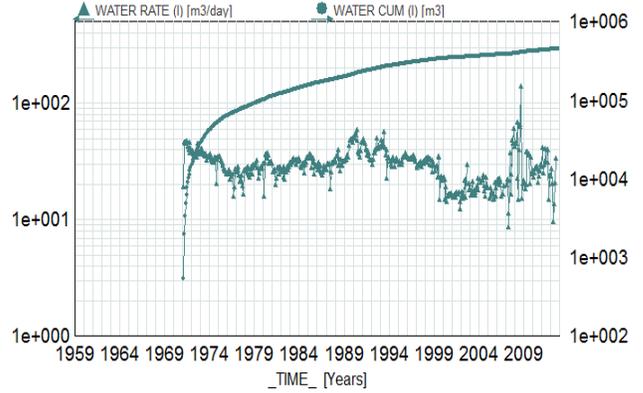
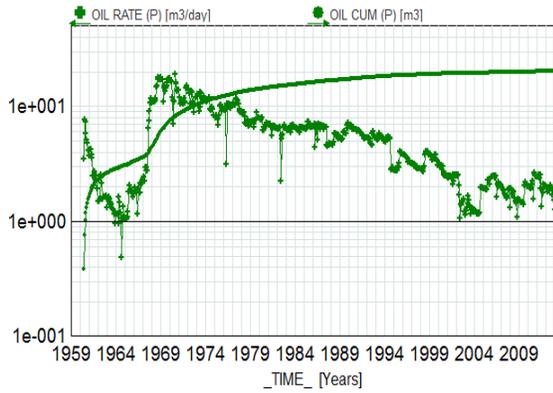


# Virден Roselea Unit No. 2

## Pattern P-01 - 00/04-07-011-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPg	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	60.0	1.94	1006.78	32.48	16.77	858.0	27.68	5681	13.95	0.67
2/28/2012	50.8	1.81	885.79	31.64	17.45	576.4	20.59	5097	11.08	0.67
3/31/2012	58.6	1.89	1002.83	32.35	17.11	301.0	9.71	5000	5.01	0.67
4/30/2012	56.7	1.89	808.60	26.95	14.26	414.0	13.80	5000	7.12	0.67
5/31/2012	57.1	1.84	988.15	31.88	17.31	425.0	13.71	5000	7.27	0.67
6/30/2012	61.3	2.04	0.00	0.00	0.00	634.0	21.13	4993	10.09	0.67
7/31/2012	61.6	1.99	967.42	31.21	15.70	1059.0	34.16	4813	16.77	0.67
8/31/2012	59.6	1.92	924.80	29.83	15.51	0.0	0.00	5200	0.00	0.67
9/30/2012	50.8	1.69	704.76	23.49	13.88	0.0	0.00	5200	0.00	0.67
10/31/2012	59.0	1.90	937.98	30.26	15.89	0.0	0.00	5032	0.00	0.67
11/30/2012	45.8	1.53	759.27	25.31	16.58	0.0	0.00	0	0.00	0.67
12/31/2012	39.1	1.26	0.00	0.00	0.00	0.0	0.00	0	0.00	0.67

Cumulative Oil Produced (E3m <sup>3</sup> )	103.68
Cumulative Water Produced (E3m <sup>3</sup> )	568.31
Cumulative Water Injected (E3m <sup>3</sup> )	451.33
Cumulative Voidage Replacement Ratio	0.67

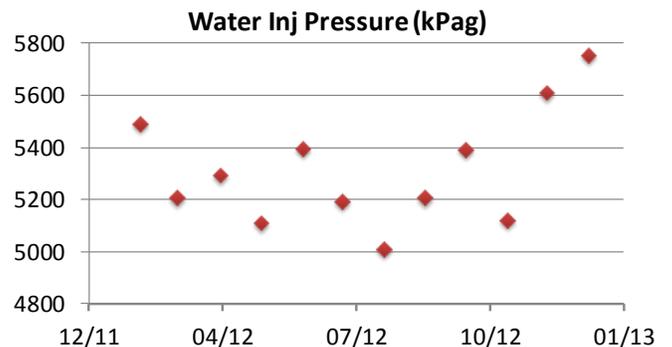
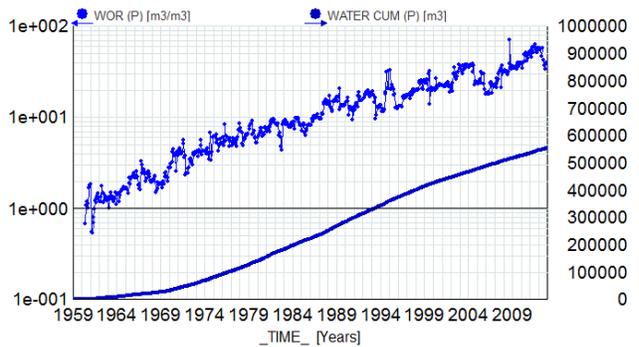
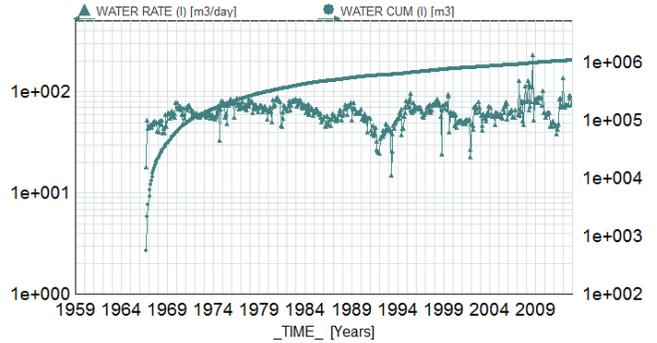
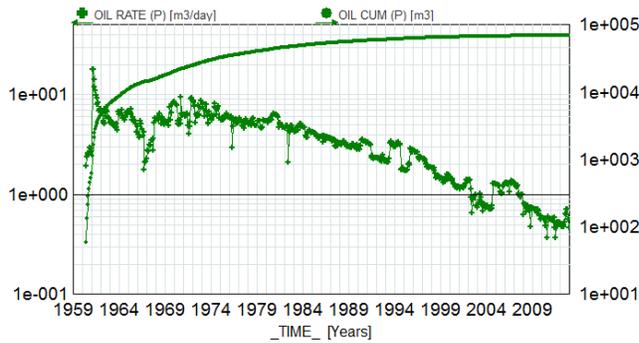


# Virден Roselea Unit No. 2

## Pattern P-02 - 00/02-07-011-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPg	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	15.6	0.50	864.59	27.89	55.30	2209.0	71.26	5490	2.51	1.68
2/28/2012	13.2	0.47	760.78	27.17	57.68	1994.8	71.24	5203	2.58	1.68
3/31/2012	15.3	0.49	861.44	27.79	56.42	2350.0	75.81	5294	2.68	1.68
4/30/2012	14.8	0.49	694.52	23.15	47.05	2220.0	74.00	5110	3.13	1.68
5/31/2012	14.8	0.48	848.57	27.37	57.26	2294.0	74.00	5394	2.66	1.68
6/30/2012	15.9	0.53	0.00	0.00	0.00	2220.0	74.00	5193	135.94	1.69
7/31/2012	19.8	0.64	847.65	27.34	42.83	2294.0	74.00	5006	2.64	1.69
8/31/2012	22.1	0.71	824.15	26.59	37.26	2729.0	88.03	5206	3.22	1.69
9/30/2012	19.0	0.63	648.04	21.60	34.14	2805.0	93.50	5390	4.20	1.69
10/31/2012	21.9	0.71	836.01	26.97	38.15	2801.0	90.35	5116	3.26	1.69
11/30/2012	16.8	0.56	673.66	22.46	40.13	2259.0	75.30	5607	3.27	1.70
12/31/2012	14.3	0.46	0.00	0.00	0.00	0.0	0.00	5752	0.00	1.70

Cumulative Oil Produced (E3m <sup>3</sup> )	70.25
Cumulative Water Produced (E3m <sup>3</sup> )	553.39
Cumulative Water Injected (E3m <sup>3</sup> )	1060.70
Cumulative Voidage Replacement Ratio	1.70

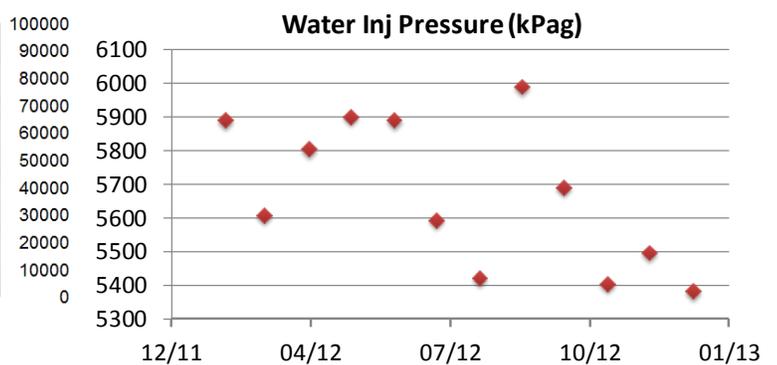
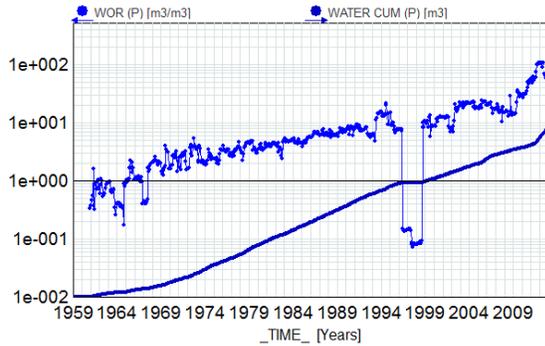
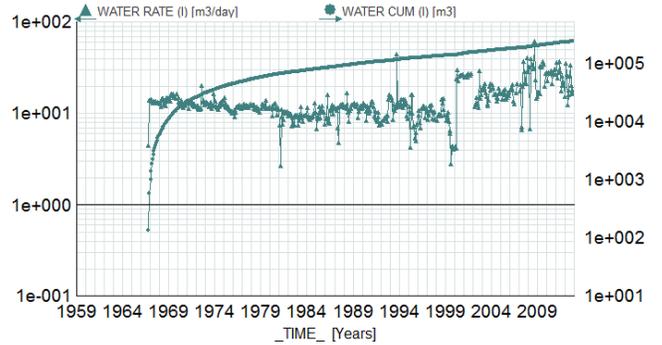
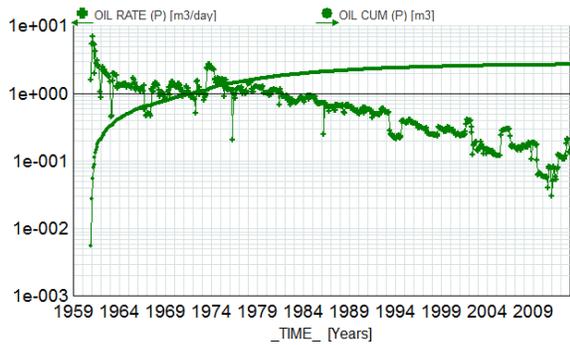


# Virден Roselea Unit No. 2

## Pattern P-03 - 00/14-08-011-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPg	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	3.6	0.11	368.23	11.88	103.73	1091.0	35.19	5890	2.93	3.12
2/28/2012	3.0	0.11	324.03	11.57	108.26	748.3	26.72	5607	2.29	3.12
3/31/2012	3.5	0.11	366.88	11.83	105.58	383.0	12.35	5803	1.03	3.11
4/30/2012	3.4	0.11	295.83	9.86	88.31	484.0	16.13	5900	1.62	3.10
5/31/2012	3.3	0.11	361.40	11.66	107.88	559.0	18.03	5890	1.53	3.09
6/30/2012	3.6	0.12	0.00	0.00	0.00	762.0	25.40	5593	206.53	3.10
7/31/2012	5.7	0.18	398.05	12.84	69.83	1059.0	34.16	5419	2.62	3.10
8/31/2012	6.4	0.21	412.35	13.30	64.18	630.0	20.32	5990	1.50	3.09
9/30/2012	6.4	0.21	372.90	12.43	58.04	494.0	16.47	5690	1.30	3.08
10/31/2012	6.4	0.21	418.30	13.49	65.62	565.0	18.23	5403	1.33	3.07
11/30/2012	4.1	0.14	283.15	9.44	69.06	508.0	16.93	5497	1.77	3.07
12/31/2012	4.1	0.13	0.00	0.00	0.00	0.0	0.00	5381	0.00	3.07

Cumulative Oil Produced (E3m <sup>3</sup> )	14.82
Cumulative Water Produced (E3m <sup>3</sup> )	61.52
Cumulative Water Injected (E3m <sup>3</sup> )	235.50
Cumulative Voidage Replacement Ratio	3.07

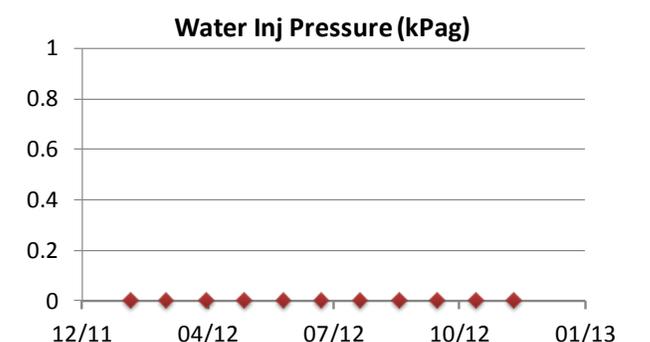
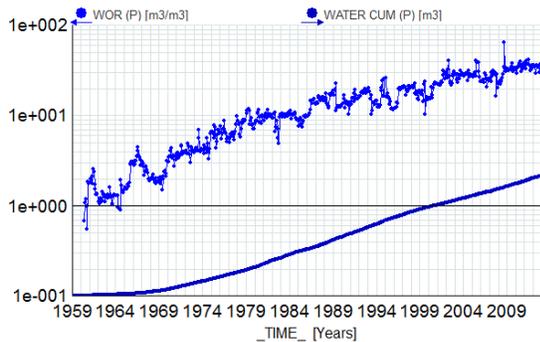
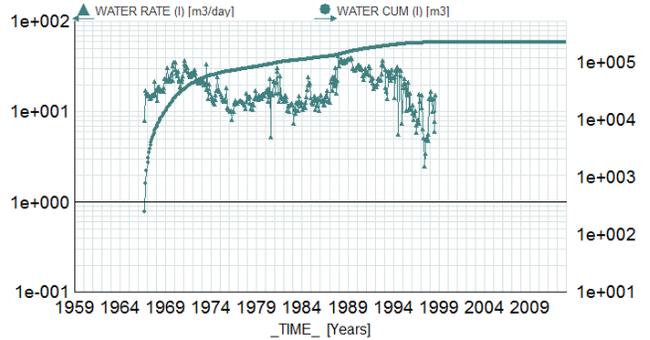
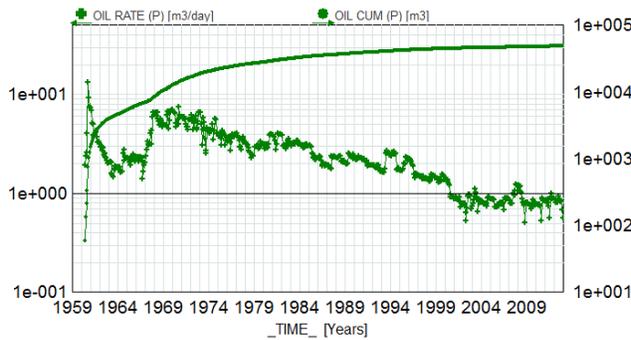


# Virден Roselea Unit No. 2

## Pattern P-04 - 00/14-06-011-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPg	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	26.7	0.86	933.39	30.11	34.94	0.0	0.00	--	0.00	0.45
2/28/2012	22.6	0.81	821.29	29.33	36.33	0.0	0.00	--	0.00	0.45
3/31/2012	26.1	0.84	929.96	30.00	35.63	0.0	0.00	--	0.00	0.45
4/30/2012	25.2	0.84	749.83	24.99	29.72	0.0	0.00	--	0.00	0.45
5/31/2012	25.0	0.81	912.45	29.43	36.45	0.0	0.00	--	0.00	0.45
6/30/2012	28.0	0.93	0.00	0.00	0.00	0.0	0.00	--	0.00	0.45
7/31/2012	27.2	0.88	936.29	30.20	34.43	0.0	0.00	--	0.00	0.45
8/31/2012	25.9	0.84	916.55	29.57	35.36	0.0	0.00	--	0.00	0.45
9/30/2012	24.7	0.82	738.93	24.63	29.97	0.0	0.00	--	0.00	0.45
10/31/2012	25.7	0.83	929.78	29.99	36.20	0.0	0.00	--	0.00	0.45
11/30/2012	20.3	0.68	752.67	25.09	37.07	0.0	0.00	--	0.00	0.45
12/31/2012	17.4	0.56	0.00	0.00	0.00	0.0	0.00	--	0.00	0.45

Cumulative Oil Produced (E3m <sup>3</sup> )	48.97
Cumulative Water Produced (E3m <sup>3</sup> )	444.13
Cumulative Water Injected (E3m <sup>3</sup> )	220.82
Cumulative Voidage Replacement Ratio	0.45

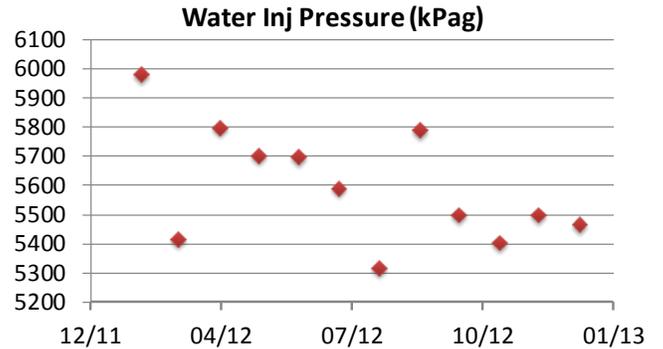
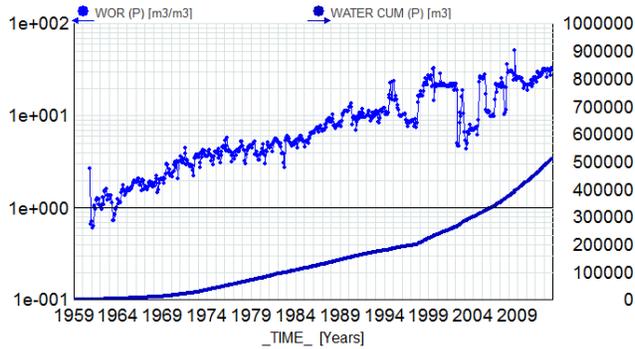
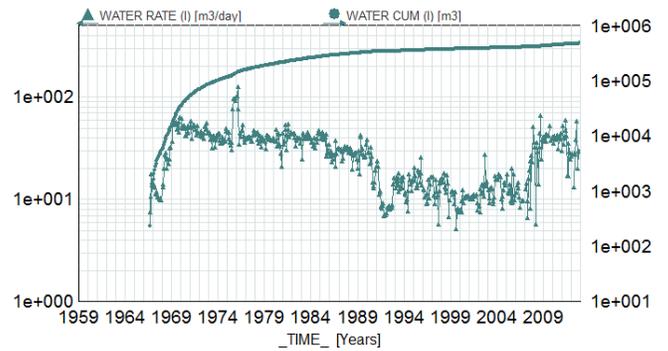
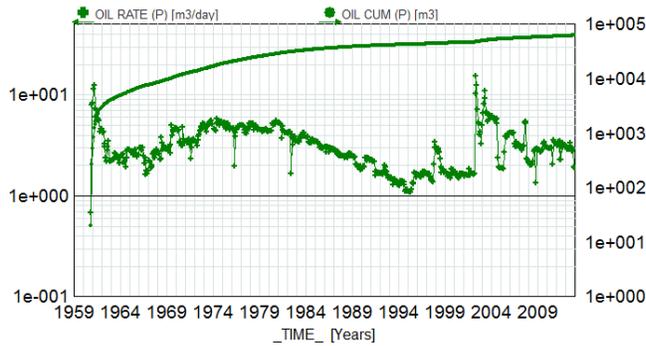


# Virден Roselea Unit No. 2

## Pattern P-05 - 00/16-06-011-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPg	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	94.7	3.06	2948.28	95.11	31.12	866.0	27.94	5981	0.28	0.86
2/28/2012	80.2	2.87	2594.49	92.66	32.34	0.0	0.00	5414	0.00	0.85
3/31/2012	92.6	2.99	2937.63	94.76	31.72	408.0	13.16	5797	0.13	0.85
4/30/2012	89.3	2.98	2368.63	78.95	26.52	870.0	29.00	5700	0.35	0.85
5/31/2012	89.9	2.90	2893.60	93.34	32.20	850.0	27.42	5697	0.28	0.84
6/30/2012	99.8	3.33	0.00	0.00	0.00	1146.0	38.20	5590	11.20	0.85
7/31/2012	90.1	2.91	2816.18	90.84	31.24	1804.0	58.19	5316	0.62	0.84
8/31/2012	86.5	2.79	2755.83	88.90	31.86	630.0	20.32	5790	0.22	0.84
9/30/2012	90.8	3.03	2485.45	82.85	27.37	602.0	20.07	5497	0.23	0.84
10/31/2012	89.6	2.89	2787.98	89.93	31.13	930.0	30.00	5403	0.32	0.84
11/30/2012	57.5	1.92	1904.20	63.47	33.10	876.0	29.20	5500	0.45	0.83
12/31/2012	58.4	1.88	0.00	0.00	0.00	0.0	0.00	5465	0.00	0.83

Cumulative Oil Produced (E3m <sup>3</sup> )	62.62
Cumulative Water Produced (E3m <sup>3</sup> )	510.00
Cumulative Water Injected (E3m <sup>3</sup> )	479.20
Cumulative Voidage Replacement Ratio	0.83

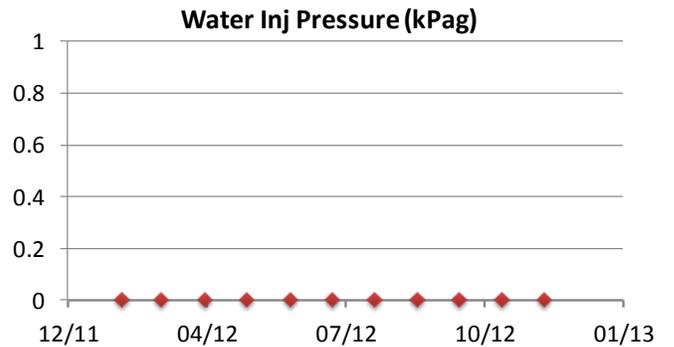
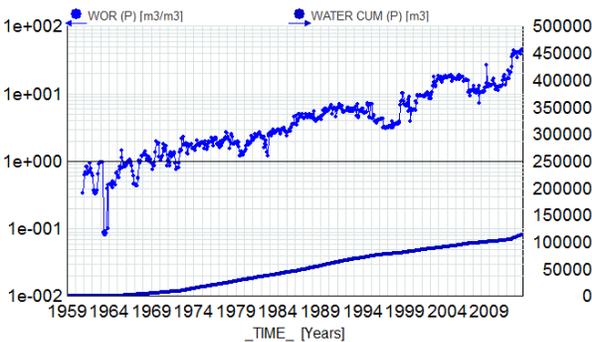
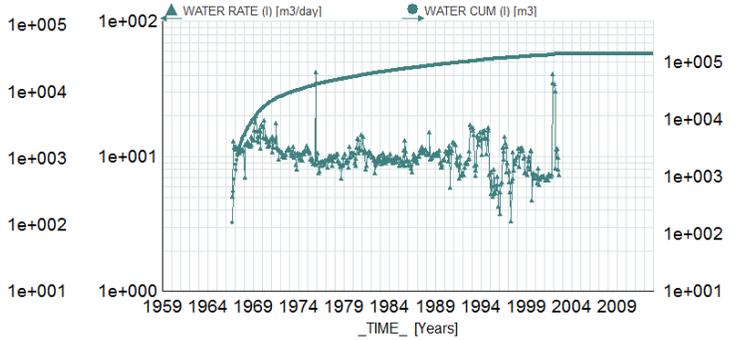
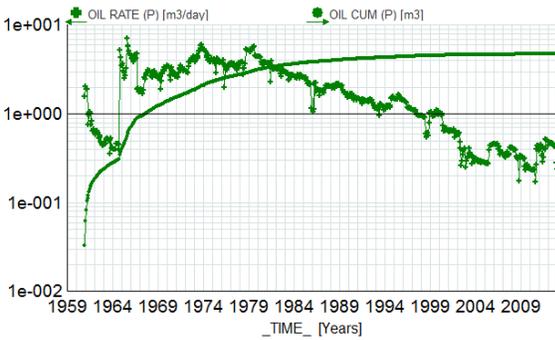


# Virден Roselea Unit No. 2

## Pattern P-06 - 00/14-05-011-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPg	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	15.1	0.49	605.79	19.54	40.17	0.0	0.00	--	0.00	0.93
2/28/2012	12.8	0.46	533.08	19.04	41.68	0.0	0.00	--	0.00	0.93
3/31/2012	14.6	0.47	598.37	19.30	41.06	0.0	0.00	--	0.00	0.93
4/30/2012	14.2	0.47	486.69	16.22	34.16	0.0	0.00	--	0.00	0.92
5/31/2012	14.3	0.46	594.65	19.18	41.45	0.0	0.00	--	0.00	0.92
6/30/2012	14.0	0.47	0.00	0.00	0.00	0.0	0.00	--	0.00	0.92
7/31/2012	13.8	0.44	570.41	18.40	41.39	0.0	0.00	--	0.00	0.91
8/31/2012	13.4	0.43	563.17	18.17	42.06	0.0	0.00	--	0.00	0.91
9/30/2012	13.1	0.44	501.66	16.72	38.33	0.0	0.00	--	0.00	0.91
10/31/2012	13.2	0.43	571.29	18.43	43.26	0.0	0.00	--	0.00	0.90
11/30/2012	8.5	0.28	386.67	12.89	45.59	0.0	0.00	--	0.00	0.90
12/31/2012	7.4	0.24	0.00	0.00	0.00	0.0	0.00	--	0.00	0.90

Cumulative Oil Produced (E3m <sup>3</sup> )	37.16
Cumulative Water Produced (E3m <sup>3</sup> )	113.78
Cumulative Water Injected (E3m <sup>3</sup> )	137.03
Cumulative Voidage Replacement Ratio	0.90

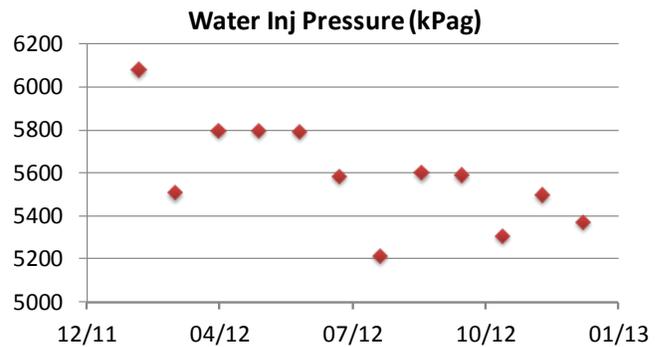
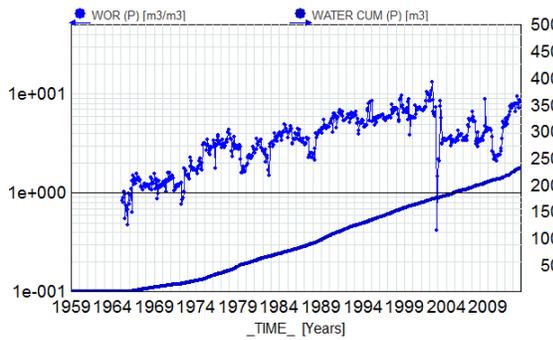
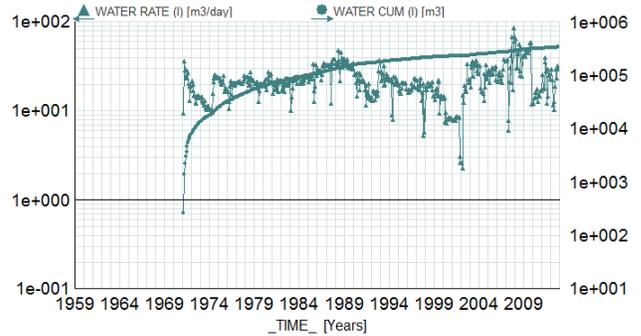
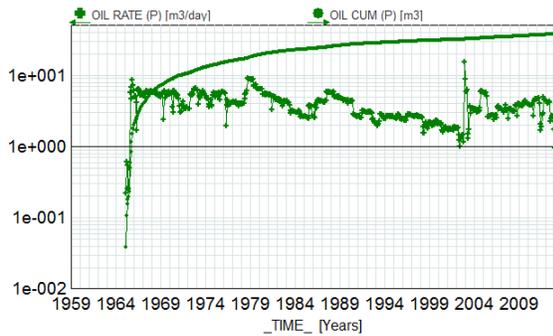


# Virден Roselea Unit No. 2

## Pattern P-07 - 00/10-05-011-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kP <sub>g</sub>	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	134.7	4.35	1043.16	33.65	7.74	918.0	29.61	6081	0.78	1.13
2/28/2012	114.6	4.09	920.54	32.88	8.04	627.6	22.41	5510	0.60	1.13
3/31/2012	129.1	4.16	1017.70	32.83	7.88	359.0	11.58	5800	0.31	1.13
4/30/2012	127.8	4.26	840.47	28.02	6.58	312.0	10.40	5800	0.32	1.12
5/31/2012	128.4	4.14	1026.95	33.13	8.00	394.0	12.71	5794	0.34	1.12
6/30/2012	68.0	2.27	0.00	0.00	0.00	570.0	19.00	5587	8.18	1.12
7/31/2012	77.6	2.50	742.56	23.95	9.57	907.0	29.26	5213	1.10	1.12
8/31/2012	82.3	2.65	657.72	21.22	8.00	950.0	30.65	5600	1.28	1.12
9/30/2012	82.0	2.73	587.36	19.58	7.17	709.0	23.63	5590	1.06	1.12
10/31/2012	81.3	2.62	667.19	21.52	8.20	1001.0	32.29	5306	1.33	1.12
11/30/2012	52.2	1.74	451.52	15.05	8.65	886.0	29.53	5497	1.75	1.12
12/31/2012	29.5	0.95	0.00	0.00	0.00	0.0	0.00	5374	0.00	1.12

Cumulative Oil Produced (E3m <sup>3</sup> )	68.69
Cumulative Water Produced (E3m <sup>3</sup> )	231.48
Cumulative Water Injected (E3m <sup>3</sup> )	339.09
Cumulative Voidage Replacement Ratio	1.12

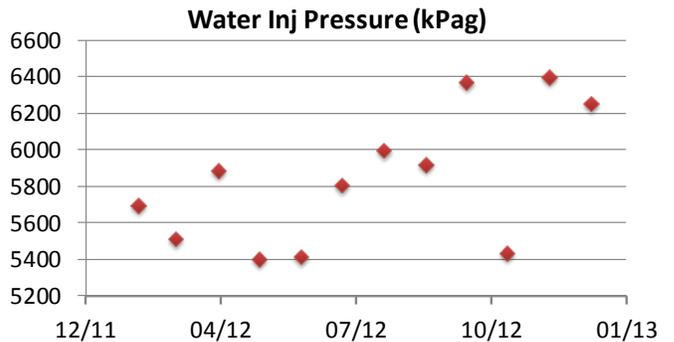
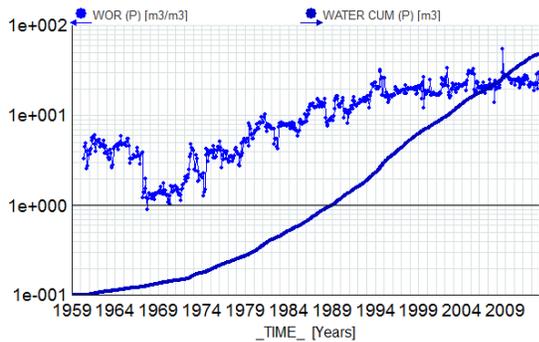
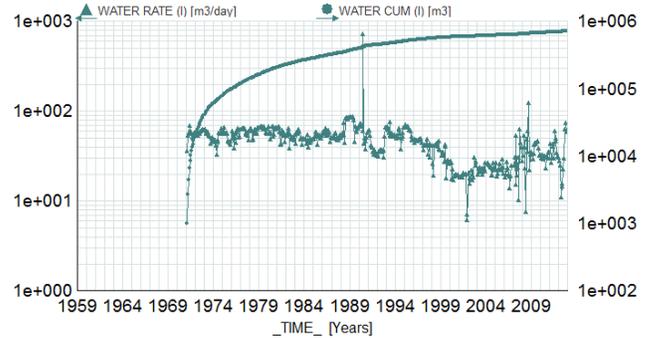
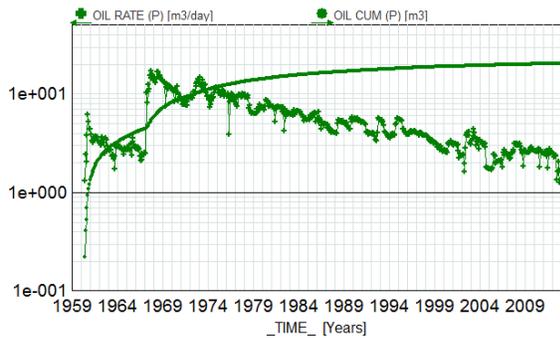


# Virден Roselea Unit No. 2

## Pattern P-08 - 00/12-06-011-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPg	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	75.6	2.44	1682.94	54.29	22.27	875.0	28.23	5694	0.50	0.72
2/28/2012	64.5	2.30	1487.68	53.13	23.08	703.9	25.14	5514	0.45	0.72
3/31/2012	73.3	2.36	1652.17	53.30	22.54	345.0	11.13	5884	0.20	0.71
4/30/2012	71.3	2.38	1346.23	44.87	18.88	476.0	15.87	5400	0.34	0.71
5/31/2012	71.7	2.31	1655.71	53.41	23.09	452.0	14.58	5413	0.26	0.71
6/30/2012	40.2	1.34	0.00	0.00	0.00	692.0	23.07	5807	16.79	0.71
7/31/2012	50.2	1.62	1091.81	35.22	21.74	945.0	30.48	5997	0.83	0.71
8/31/2012	63.7	2.06	1852.44	59.76	29.07	1974.0	63.68	5916	1.03	0.71
9/30/2012	49.7	1.66	1139.46	37.98	22.92	0.0	0.00	6367	0.00	0.71
10/30/2012	38.9	1.26	780.46	25.18	20.06	2331.0	75.19	5432	2.84	0.72
11/30/2012	49.9	1.66	1506.63	50.22	30.17	1781.0	59.37	6397	1.14	0.72
12/31/2012	42.4	1.37	0.00	0.00	0.00	0.0	0.00	6252	0.00	0.72

Cumulative Oil Produced (E3m <sup>3</sup> )	104.98
Cumulative Water Produced (E3m <sup>3</sup> )	895.56
Cumulative Water Injected (E3m <sup>3</sup> )	718.71
Cumulative Voidage Replacement Ratio	0.72

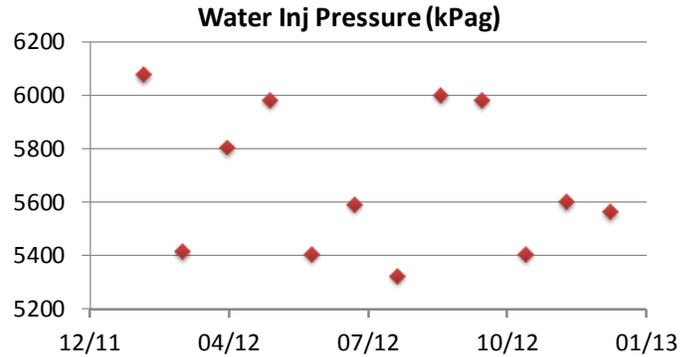
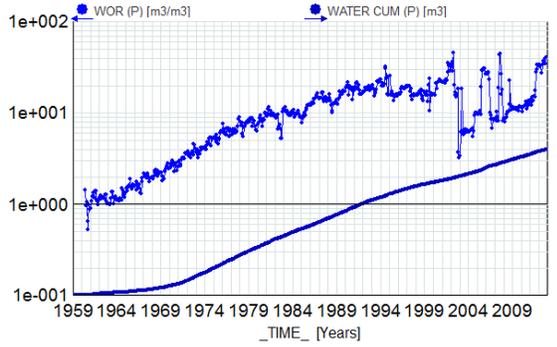
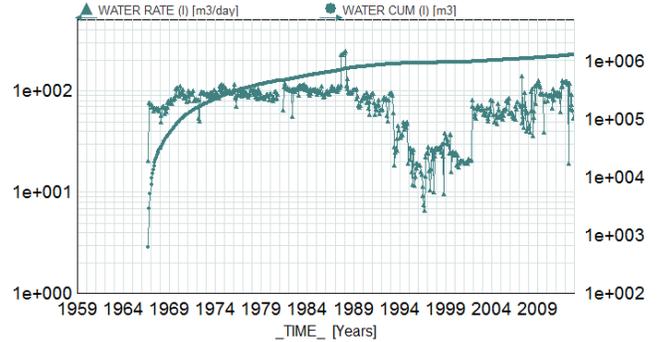
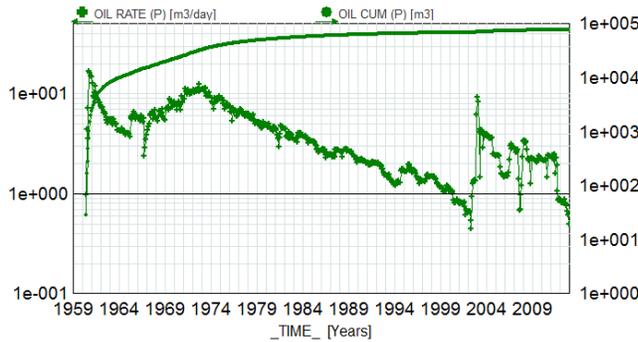


# Virден Roselea Unit No. 2

## Pattern P-09 - 00/10-06-011-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPg	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	26.2	0.84	854.16	27.55	32.62	3830.0	123.55	6077	4.35	2.04
2/28/2012	22.5	0.80	758.43	27.09	33.74	3459.4	123.55	5414	4.43	2.05
3/31/2012	25.9	0.84	858.79	27.70	33.16	3614.0	116.58	5806	4.08	2.05
4/30/2012	25.0	0.83	692.45	23.08	27.67	579.0	19.30	5980	0.81	2.05
5/31/2012	24.8	0.80	842.39	27.17	33.92	3698.0	119.29	5406	4.26	2.05
6/30/2012	26.5	0.88	0.00	0.00	0.00	3578.0	119.27	5590	131.57	2.06
7/31/2012	24.9	0.80	926.66	29.89	37.23	2069.0	66.74	5323	2.17	2.06
8/31/2012	24.3	0.78	929.11	29.97	38.31	2873.0	92.68	6000	3.01	2.06
9/30/2012	22.6	0.75	790.18	26.34	35.04	2206.0	73.53	5980	2.71	2.06
10/31/2012	20.8	0.67	837.60	27.02	40.36	2006.0	64.71	5406	2.34	2.06
11/30/2012	18.3	0.61	741.01	24.70	40.48	1618.0	53.93	5600	2.13	2.06
12/31/2012	15.5	0.50	0.00	0.00	0.00	0.0	0.00	5565	0.00	2.06

Cumulative Oil Produced (E3m <sup>3</sup> )	78.95
Cumulative Water Produced (E3m <sup>3</sup> )	534.23
Cumulative Water Injected (E3m <sup>3</sup> )	1266.84
Cumulative Voidage Replacement Ratio	2.06

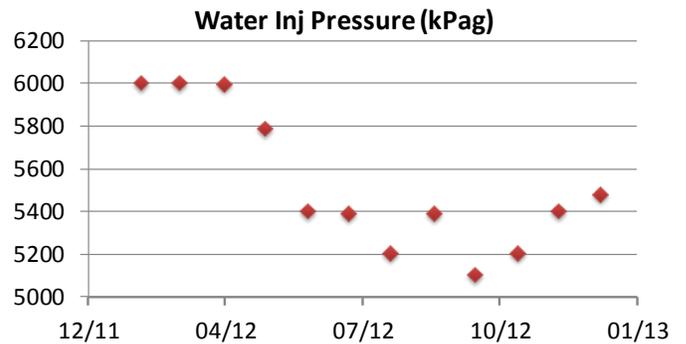
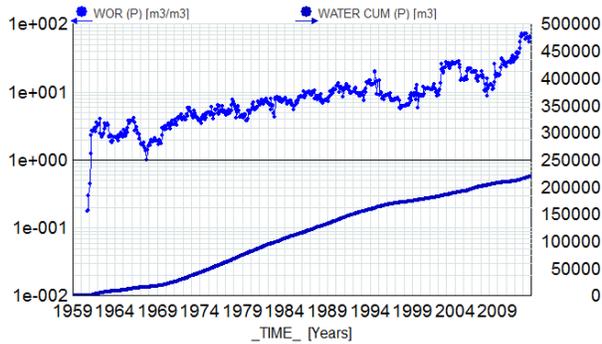
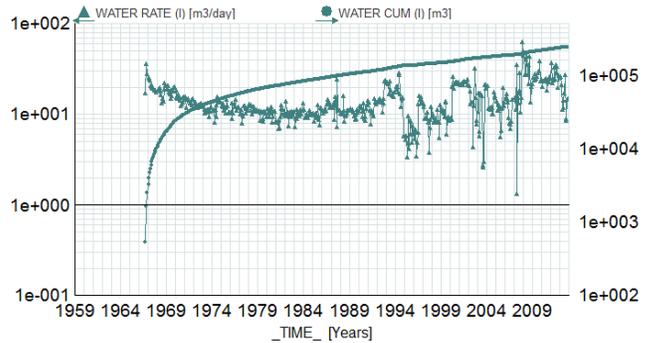
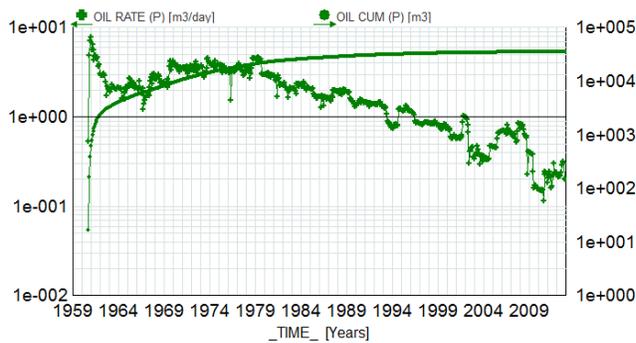


# Virден Roselea Unit No. 2

## Pattern P-10 - 00/12-05-011-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPg	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	7.0	0.23	493.80	15.93	70.08	823.0	26.55	6000	1.64	0.94
2/28/2012	6.0	0.21	434.50	15.52	72.62	602.5	21.52	6000	1.37	0.94
3/31/2012	6.9	0.22	491.95	15.87	71.25	349.0	11.26	5994	0.70	0.94
4/30/2012	6.7	0.22	396.69	13.22	59.38	357.0	11.90	5787	0.88	0.94
5/31/2012	6.7	0.22	484.64	15.63	72.55	443.0	14.29	5400	0.90	0.94
6/30/2012	7.2	0.24	0.00	0.00	0.00	519.0	17.30	5393	70.37	0.94
7/31/2012	8.9	0.29	557.92	18.00	62.95	849.0	27.39	5206	1.50	0.94
8/31/2012	9.5	0.31	579.82	18.70	61.11	267.0	8.61	5390	0.45	0.94
9/30/2012	9.5	0.32	524.38	17.48	55.26	269.0	8.97	5103	0.50	0.94
10/31/2012	9.4	0.30	588.16	18.97	62.54	459.0	14.81	5206	0.77	0.94
11/30/2012	6.0	0.20	398.13	13.27	66.01	448.0	14.93	5403	1.11	0.94
12/31/2012	6.1	0.20	0.00	0.00	0.00	0.0	0.00	5481	0.00	0.94

Cumulative Oil Produced (E3m <sup>3</sup> )	35.80
Cumulative Water Produced (E3m <sup>3</sup> )	220.12
Cumulative Water Injected (E3m <sup>3</sup> )	241.44
Cumulative Voidage Replacement Ratio	0.94

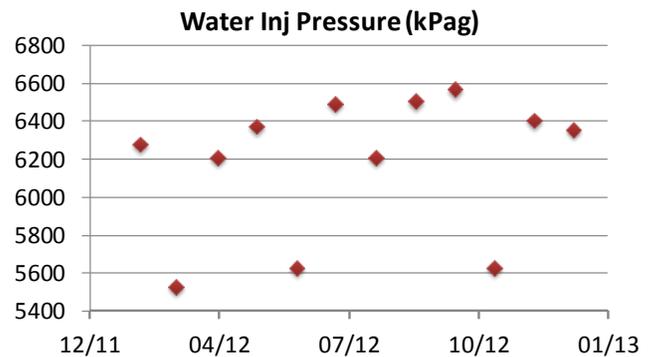
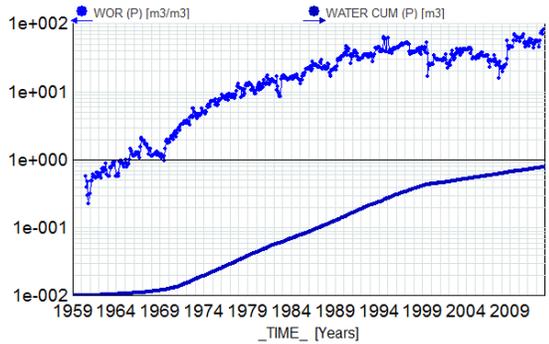
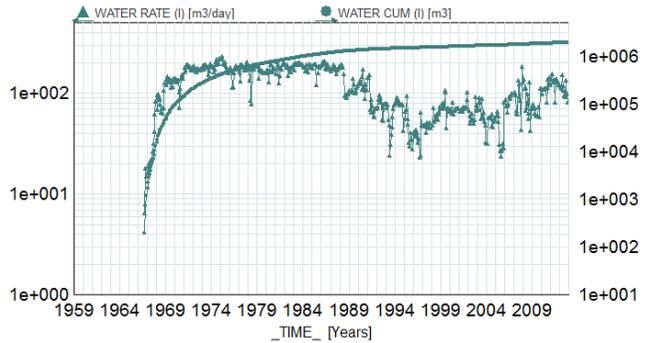
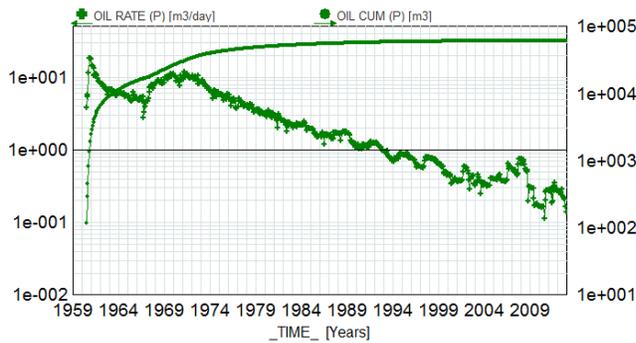


# Virден Roselea Unit No. 2

## Pattern P-11 - 00/08-06-011-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPg	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	8.3	0.27	449.82	14.51	54.03	3610.0	116.45	6274	7.88	3.63
2/28/2012	7.1	0.25	395.76	14.13	55.95	3155.3	112.69	5524	7.83	3.63
3/31/2012	8.1	0.26	448.12	14.46	55.15	4794.0	154.65	6206	10.50	3.63
4/30/2012	7.9	0.26	361.31	12.04	45.97	3232.0	107.73	6373	8.75	3.64
5/31/2012	7.9	0.25	441.46	14.24	55.94	3660.0	118.06	5629	8.14	3.64
6/30/2012	8.5	0.28	0.00	0.00	0.00	2818.0	93.93	6490	322.55	3.65
7/31/2012	7.1	0.23	506.03	16.32	71.34	2895.0	93.39	6210	5.64	3.65
8/31/2012	6.6	0.21	515.02	16.61	77.72	4208.0	135.74	6503	8.06	3.65
9/30/2012	6.6	0.22	465.73	15.52	70.28	3158.0	105.27	6567	6.68	3.66
10/31/2012	6.6	0.21	522.41	16.85	79.63	3037.0	97.97	5626	5.74	3.66
11/30/2012	5.0	0.17	402.50	13.42	80.58	2449.0	81.63	6400	6.01	3.66
12/31/2012	4.3	0.14	0.00	0.00	0.00	0.0	0.00	6355	0.00	3.66

Cumulative Oil Produced (E3m <sup>3</sup> )	62.37
Cumulative Water Produced (E3m <sup>3</sup> )	473.62
Cumulative Water Injected (E3m <sup>3</sup> )	1967.20
Cumulative Voidage Replacement Ratio	3.66

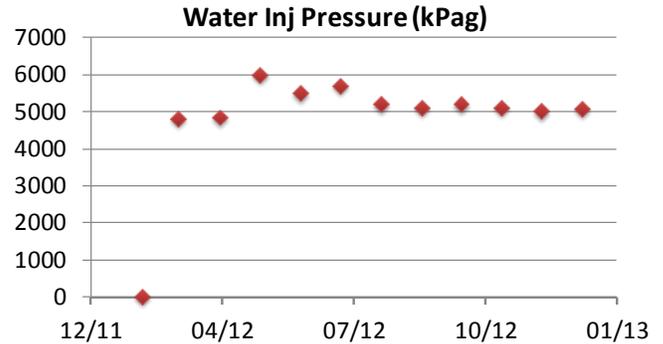
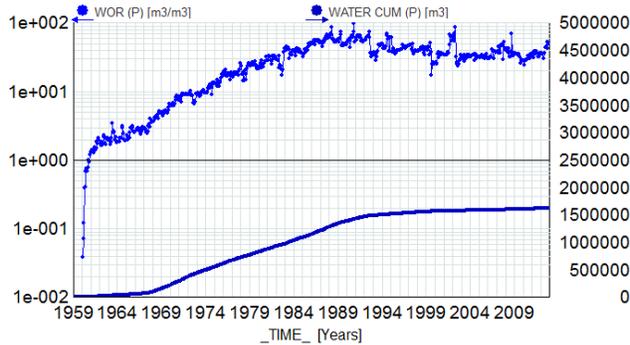
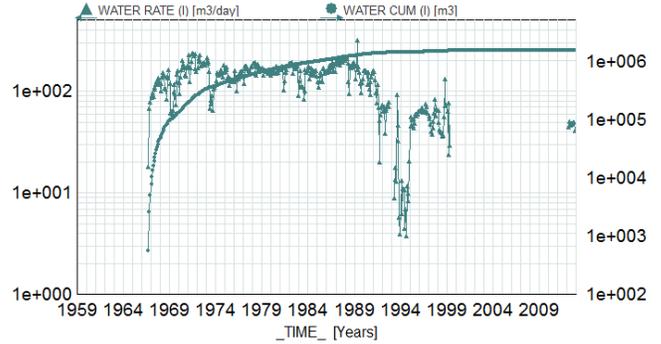
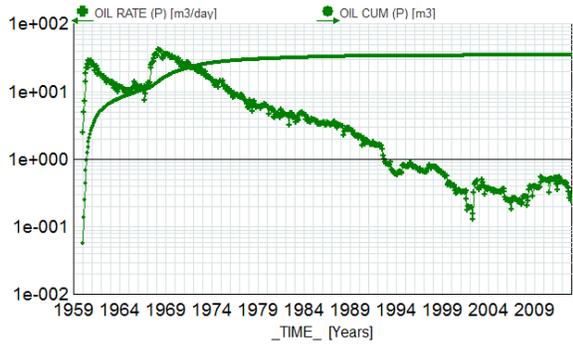


# Virден Roselea Unit No. 2

## Pattern P-12 - 00/02-06-011-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPg	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	14.1	0.45	499.10	16.10	35.43	0.0	0.00	--	0.00	0.85
2/28/2012	12.2	0.44	446.04	15.93	36.41	1260.0	45.00	4800	2.75	0.85
3/31/2012	14.1	0.46	505.09	16.29	35.77	1584.0	51.10	4839	3.05	0.85
4/30/2012	13.6	0.45	407.23	13.57	29.90	1397.0	46.57	5983	3.32	0.85
5/31/2012	13.7	0.44	497.54	16.05	36.35	1488.0	48.00	5506	2.91	0.85
6/30/2012	13.5	0.45	0.00	0.00	0.00	1440.0	48.00	5683	104.44	0.85
7/31/2012	12.1	0.39	533.53	17.21	44.14	1471.0	47.45	5197	2.69	0.86
8/31/2012	11.8	0.38	533.87	17.22	45.42	1532.0	49.42	5103	2.81	0.86
9/30/2012	10.0	0.33	432.73	14.42	43.17	1480.0	49.33	5197	3.34	0.86
10/31/2012	8.4	0.27	436.63	14.08	52.24	1529.0	49.32	5097	3.43	0.86
11/30/2012	8.9	0.30	436.40	14.55	49.27	1232.0	41.07	5003	2.77	0.86
12/31/2012	7.5	0.24	0.00	0.00	0.00	0.0	0.00	5081	0.00	0.86

Cumulative Oil Produced (E3m <sup>3</sup> )	143.99
Cumulative Water Produced (E3m <sup>3</sup> )	1625.57
Cumulative Water Injected (E3m <sup>3</sup> )	1520.84
Cumulative Voidage Replacement Ratio	0.86

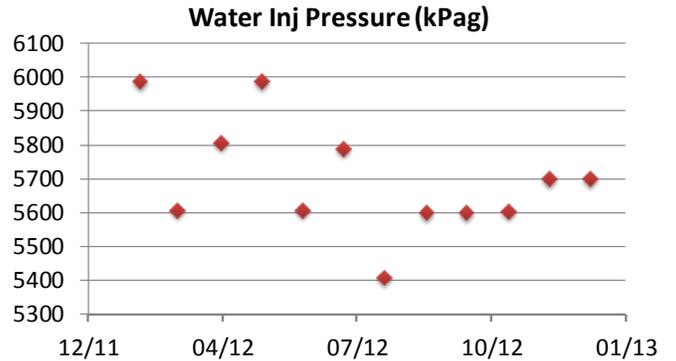
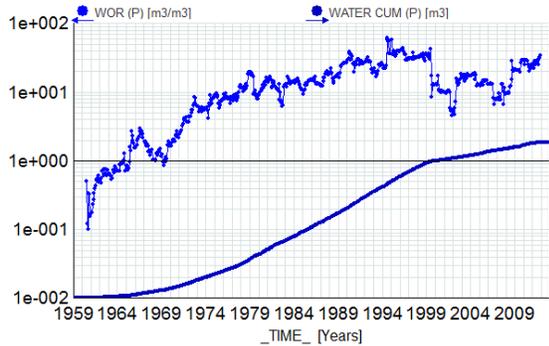
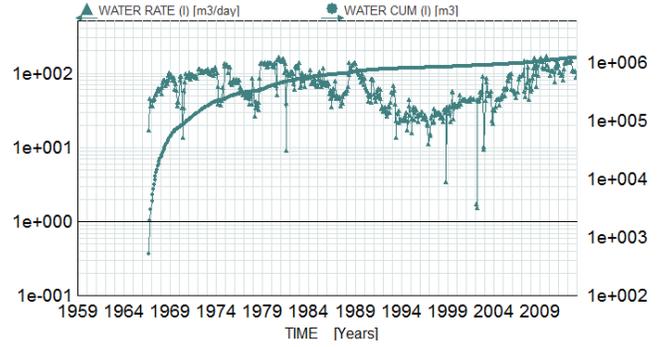
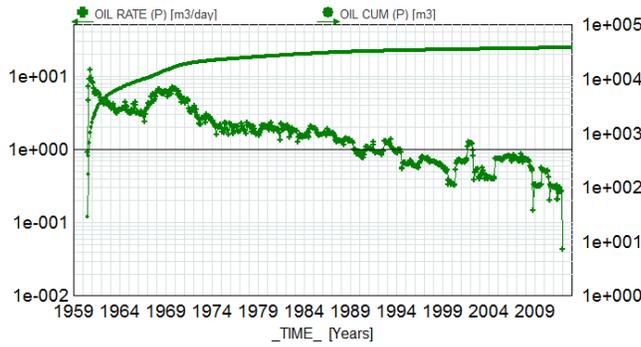


# Virден Roselea Unit No. 2

## Pattern P-13 - 00/04-05-011-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPa	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	0.0	0.00	0.00	0.00		4287.0	138.29	5987		3.61
2/28/2012	0.0	0.00	0.00	0.00		3871.7	138.28	5607		3.62
3/31/2012	0.0	0.00	0.00	0.00		4563.0	147.19	5806		3.64
4/30/2012	0.0	0.00	0.00	0.00		4415.0	147.17	5987		3.65
5/31/2012	0.0	0.00	0.00	0.00		4562.0	147.16	5606		3.66
6/30/2012	0.0	0.00	0.00	0.00		3207.0	106.90	5787		3.67
7/31/2012	0.0	0.00	0.00	0.00		3307.0	106.68	5406		3.68
8/31/2012	0.0	0.00	0.00	0.00		3249.0	104.81	5600		3.69
9/30/2012	0.0	0.00	0.00	0.00		3099.0	103.30	5600		3.70
10/31/2012	0.0	0.00	0.00	0.00		3305.0	106.61	5603		3.71
11/30/2012	0.0	0.00	0.00	0.00		2665.0	88.83	5700		3.72
12/31/2012	0.0	0.00	0.00	0.00		0.0	0.00	5700		3.72

Cumulative Oil Produced (E3m <sup>3</sup> )	37.77
Cumulative Water Produced (E3m <sup>3</sup> )	284.26
Cumulative Water Injected (E3m <sup>3</sup> )	1202.24
Cumulative Voidage Replacement Ratio	3.72

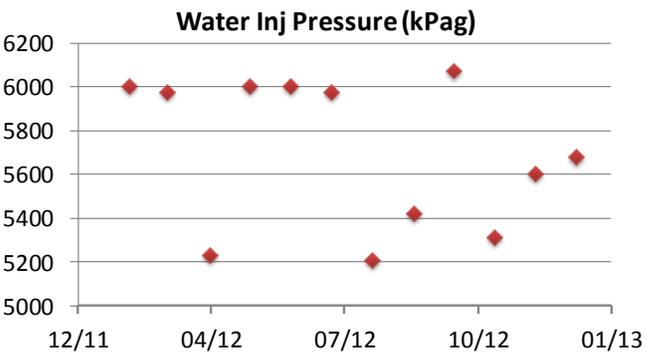
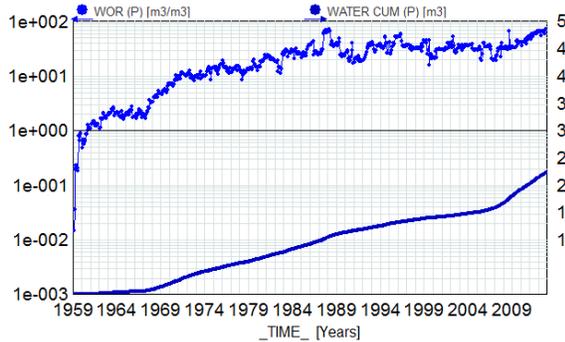
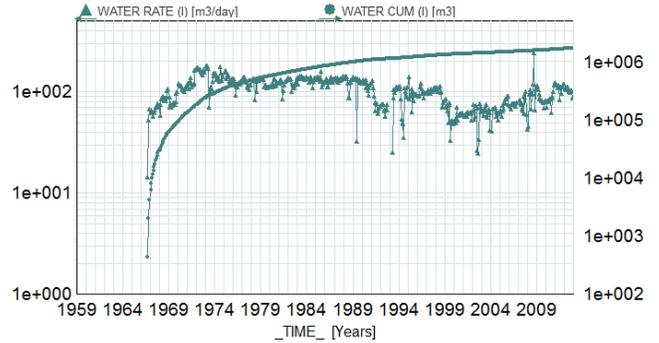
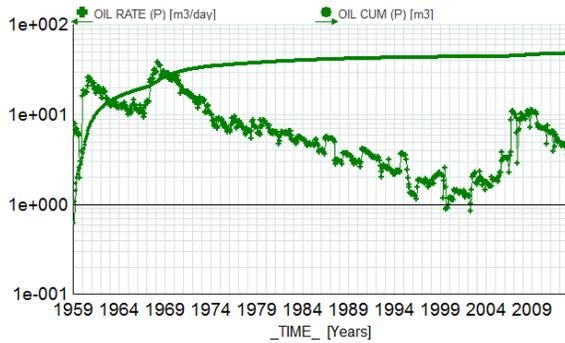


# Virден Roselea Unit No. 2

## Pattern P-14 - 00/10-36-010-26W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPg	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	150.4	4.85	9720.85	313.58	64.65	3328.0	107.35	6000	0.34	0.73
2/28/2012	127.4	4.55	8553.47	305.48	67.11	2964.1	105.86	5972	0.34	0.73
3/31/2012	146.9	4.74	9685.25	312.43	65.93	3493.0	112.68	5226	0.36	0.72
4/30/2012	140.8	4.69	7721.55	257.39	54.86	3361.0	112.03	6000	0.43	0.72
5/31/2012	142.7	4.60	9540.45	307.76	66.86	3432.0	110.71	6000	0.35	0.72
6/30/2012	140.9	4.70	0.00	0.00	0.00	3020.0	100.67	5973	20.91	0.72
7/31/2012	144.1	4.65	9637.90	310.90	66.88	3086.0	99.55	5206	0.32	0.72
8/31/2012	144.7	4.67	9516.20	306.97	65.77	3130.0	100.97	5423	0.32	0.72
9/30/2012	128.1	4.27	7554.20	251.81	58.99	3110.0	103.67	6073	0.40	0.72
10/31/2012	143.2	4.62	9653.15	311.39	67.43	3215.0	103.71	5310	0.33	0.72
11/30/2012	107.8	3.59	7639.35	254.65	70.90	2590.0	86.33	5603	0.33	0.72
12/31/2012	49.1	1.59	0.00	0.00	0.00	0.0	0.00	5677	0.00	0.72

Cumulative Oil Produced (E3m <sup>3</sup> )	159.76
Cumulative Water Produced (E3m <sup>3</sup> )	2225.39
Cumulative Water Injected (E3m <sup>3</sup> )	1711.06
Cumulative Voidage Replacement Ratio	0.72



# Virден Roselea Unit No. 2

## Pattern P-15 - 00/12-31-010-25W1/0

Date	Monthly Oil Prod sm <sup>3</sup>	Oil Rate (CD) sm <sup>3</sup> /d	Monthly Water Prod sm <sup>3</sup>	Water Rate (CD) sm <sup>3</sup> /d	Water Oil Ratio m <sup>3</sup> /m <sup>3</sup>	Monthly Water Inj sm <sup>3</sup>	Water Inj Rate (CD) sm <sup>3</sup> /d	Water Inj Pressure kPa	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
1/31/2012	10.9	0.35	555.35	17.91	51.18	0.0	0.00	--	0.00	0.96
2/28/2012	9.2	0.33	488.70	17.45	53.28	0.0	0.00	--	0.00	0.96
3/31/2012	10.6	0.34	553.35	17.85	52.20	0.0	0.00	--	0.00	0.95
4/30/2012	10.1	0.34	436.25	14.54	43.41	0.0	0.00	--	0.00	0.95
5/31/2012	10.3	0.33	545.05	17.58	52.92	0.0	0.00	--	0.00	0.95
6/30/2012	11.1	0.37	0.00	0.00	0.00	0.0	0.00	--	0.00	0.95
7/31/2012	13.6	0.44	551.70	17.80	40.57	0.0	0.00	--	0.00	0.95
8/31/2012	14.2	0.46	542.60	17.50	38.21	0.0	0.00	--	0.00	0.95
9/30/2012	14.3	0.48	490.70	16.36	34.44	0.0	0.00	--	0.00	0.95
10/31/2012	14.1	0.45	550.45	17.76	39.18	0.0	0.00	--	0.00	0.95
11/30/2012	10.8	0.36	443.55	14.79	41.26	0.0	0.00	--	0.00	0.95
12/31/2012	8.4	0.27	0.00	0.00	0.00	0.0	0.00	--	0.00	0.95

Cumulative Oil Produced (E3m <sup>3</sup> )	52.31
Cumulative Water Produced (E3m <sup>3</sup> )	457.22
Cumulative Water Injected (E3m <sup>3</sup> )	483.90
Cumulative Voidage Replacement Ratio	0.95

