

**Virden Roselea Unit #2**  
**2019 Annual EOR Report**

## Executive Summary

In 2019 oil production in Virden Roselea Unit #2 (VRU #2) averaged 40 m<sup>3</sup>/d (251.6 bbl/d) totaling 14.6 e<sup>3</sup>m<sup>3</sup> (91.8 mmbbl). Annual production declined by 12.6% from 2018 to 2019, using yearly averages. Comparing December 2018 to December 2019 the unit had a decline of 26.5%. By the end of 2019 cumulative oil production from the VRU #2 was 1,246 e<sup>3</sup>m<sup>3</sup> (7.8 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. That said, the unit is still at a low recovery and there is still potential to improve the performance and gain incremental reserves.

In December 2019 there were 37 producing oil wells and 8 water injectors active in the unit. In 2019, one dual leg horizontal well was drilled.

## Discussion

The VRU #2 has been under waterflood since 1966, seven years after first production from the pool in 1959. Water injection increased the oil production rate from  $\sim 60 \text{ m}^3/\text{d}$  ( $\sim 377 \text{ bbl/d}$ ) to  $\sim 150 \text{ m}^3/\text{d}$  ( $944 \text{ bbl/d}$ ), equivalent to peak production from the field. Expected ultimate oil recovery was increased by more than four times by the waterflood.

Prior to the operatorship transferring to Corex Resources very little additional development had taken place in the unit. From 1997- 2002, four horizontal wells were drilled in the unit, all with poor results. In 2013, a very successful Virden well was drilled in the unit. 2014 was very active: six horizontal wells, a disposal well, and a vertical producer were drilled and 5 vertical recompletes in the Whitewater formation were executed successfully. In 2015, one well in the Virden formation was drilled. In 2015, a poor producer, 103/16-05-011-25W1/00 was converted to injection. Currently, the pattern is being monitored for response, and some response has been seen. This is the first well to have been converted to injection since 1971. At the end of 2016 all of the old pipelines in the unit had been replaced, allowing for us to effectively set injection targets. The unit is mainly laid out in 5-spot patterns; however, there are some areas in the unit that have seen little to no waterflood support, mainly on the west side of the unit. There is the possibility of completing the remaining 5-spot patterns, but it was deemed more efficient to implement a horizontal-horizontal waterflood after drilling infill wells. This unit has a low recovery factor and has poor sweep efficiency. Changing the established patterns should help to recover incremental reserves, as at this point in time, there is a lot of water cycling. The water injection rate was  $826 \text{ m}^3/\text{d}$  ( $5,198 \text{ bbl/d}$ ) in 2019 and the producing WOR was  $29.6 \text{ m}^3/\text{m}^3$ . The injected water at VRU #2 is not filtered or treated in any way.

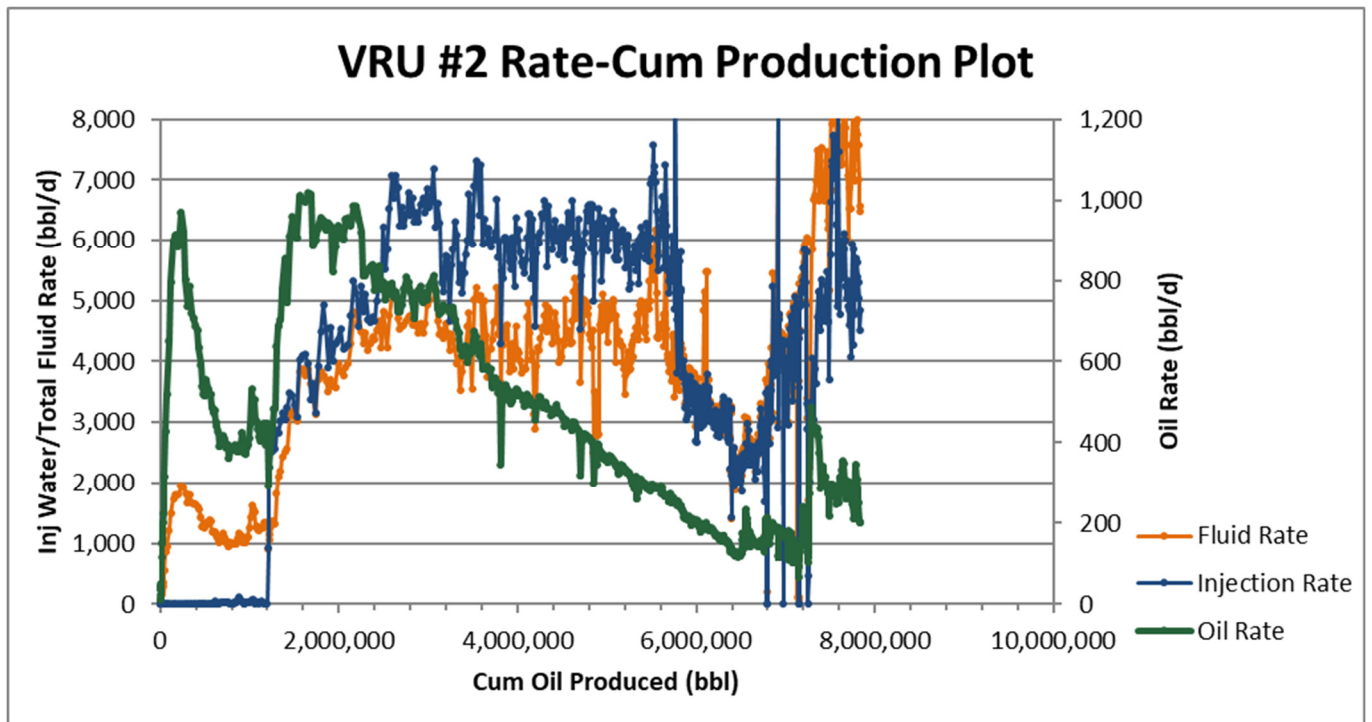
Significant events in 2019 are as follows:

- March 2018, abandon the 100/04-05-011-25W1/00 vertical injection well.
- March 2018, deepen the 100/02-06-011-25W1/00 vertical injection well.
- April 2019, perform a water shutoff on 102/05-31-010-25W1/00 with a polymer squeeze.
- July 2019, suspend the 100/02-07-011-25W1/00 vertical well.
- November 2019, drill the 103/05-31-010-25W1/00 horizontal well in the Oolites and Scallion.

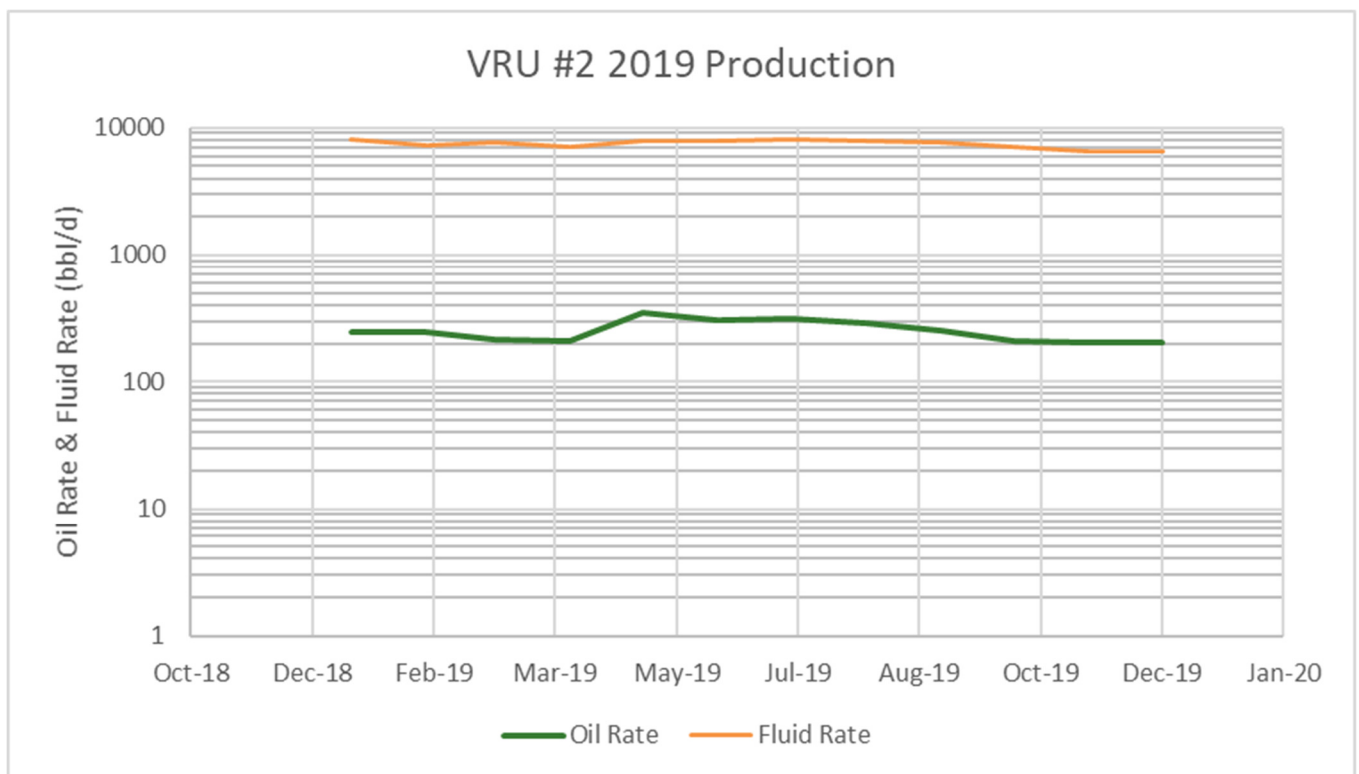
In the composite rate – cumulative oil plot below, waterflood response is clearly demonstrated at a cumulative oil production of  $200 \text{ e}^3\text{m}^3$  (1.25 MMbbl).

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

## VRU #2 – Rate vs Cum Oil Production



## VRU #2 – Rate vs Time



## 2019 Reservoir Pressure Surveys

Unit	UWI	License	Test Type	Date of Pressure	Duration of SI (days)	Datum BHP (kPaa)
VRU #2	103/05-31-010-25W1/00	11308	BH BU	2019-12-03	10	6,758

In 2019, one pressure was recorded on a newly drilled well that is in an area that gave a pressure near initial reservoir pressure, if slightly higher. In 2018, seven pressures were taken. The average of this pressure survey is around 4,900 kPa, however, it is unlikely that this is representative of the average unit pressure. Past surveys have consistently indicated that the unit is over pressured. Although, it must be said that the pressure is often very variable depending on the area. Some injection wells have been shut-in to reduce the pressure in the unit, and the disposal well has allowed Corex to attempt to balance the flood by setting injection targets, lowering the overall pressure of the pool. Therefore, a reduction in pressure may be plausible within the unit. The pool is still over pressured as vertical wells even far away from injection have high pressure and suspended wells can hold fluid to surface for years. It is hoped that the high pressure will help improve production in the new producers. We may also need to reconsider the previous notion that a significant portion of the injected water has gone out of zone. The water still may have gone out of zone, resulting in poor sweep efficiency and the overall low recovery in the unit, but it did not appear to entirely leave the system and has therefore pressured up the unit. Pressures on newly drilled wells outside of the unit boundary are over pressured, indicating that the over injection in some areas has abnormally over pressured non-unit reservoir.

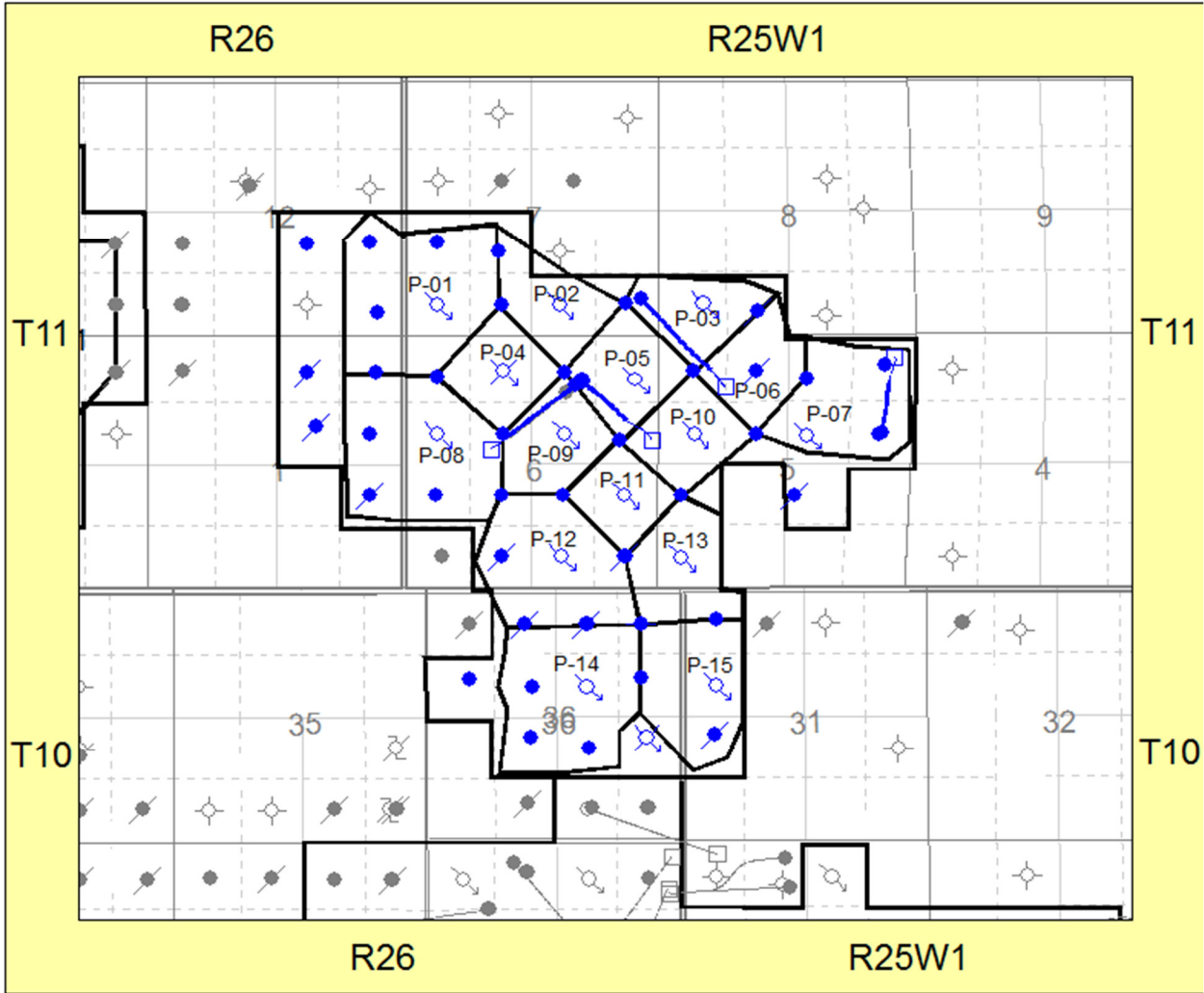
Pressures taken from 2010 and 2011 ranged from 6,000 kPaa to 11,218 kPaa. The pressures for VRU #2 taken over the years are very variable resulting in a large array of pressures and uncertainty in the average pool pressure. As the pressures vary with area, and possibly by formation, it is unlikely we will be able to record consistent pressures.

The VRR in 2019 averaged 0.70. Currently, the disposal well is taking large volumes of water, enabling us to balance the flood in other areas. It is hoped that the ability to balance the patterns will result in improved sweep efficiency. The cumulative VRR at year end dropped slightly to 1.04, this number is misleading, as while the cumulative VRR within the unit is close to 1.0 there is a large discrepancy based on a pattern basis, with some patterns being significantly over or under injected in. 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.

## 2019 Well Servicing

UWI	Unit	Licence	Start Date	Operation	Objective
102/03-07-011-25W1/00	VRU#2	10677	2019-05-21	Completion/Workover	Pump Repair
100/15-06-011-25W1/00	VRU#2	001797	2019-11-26	Completion/Workover	Pump Repair
103/05-31-010-25W1/00	VRU#2	11308	2019-11-17	Drilling	Drilling - original
103/05-31-010-25W1/00	VRU#2	11308	2019-12-03	Completion/Workover	Initial Completion
102/12-06-011-25W1/00	VRU#2	10292	2019-05-03	Completion/Workover	Pump Repair
100/04-05-011-25W1/00	VRU#2	001793	2019-03-14	Abandon	Abandon Well
100/04-05-011-25W1/00	VRU#2	001793	2019-09-01	Facilities	Reclamation
TURNAROUND	VRU#2	T19VIR004	2019-07-08	Facilities	Turnaround
100/02-07-011-25W1/00	VRU#2	001792	2019-07-08	Completion/Workover	Suspension
100/02-06-011-25W1/00	VRU#2	001763	2019-03-18	Completion/Workover	Deepening
CATHODIC	VRU#2	RM19VIR009	2019-09-02	Facilities	Cathodic
103/09-05-011-25W1/00	VRU#2	10026	2019-11-12	Completion/Workover	Suspension
100/11-36-010-26W1/00	VRU#2	001764	2019-05-01	Completion/Workover	Pump Repair
102/05-31-010-25W1/00	VRU#2	10966	2019-04-15	Completion/Workover	Water Shut Off
102/05-31-010-25W1/00	VRU#2	10966	2019-06-03	Completion/Workover	Pump Repair
102/05-31-010-25W1/00	VRU#2	10966	2019-11-30	Completion/Workover	Water Shut Off

# Waterflood Pattern Map



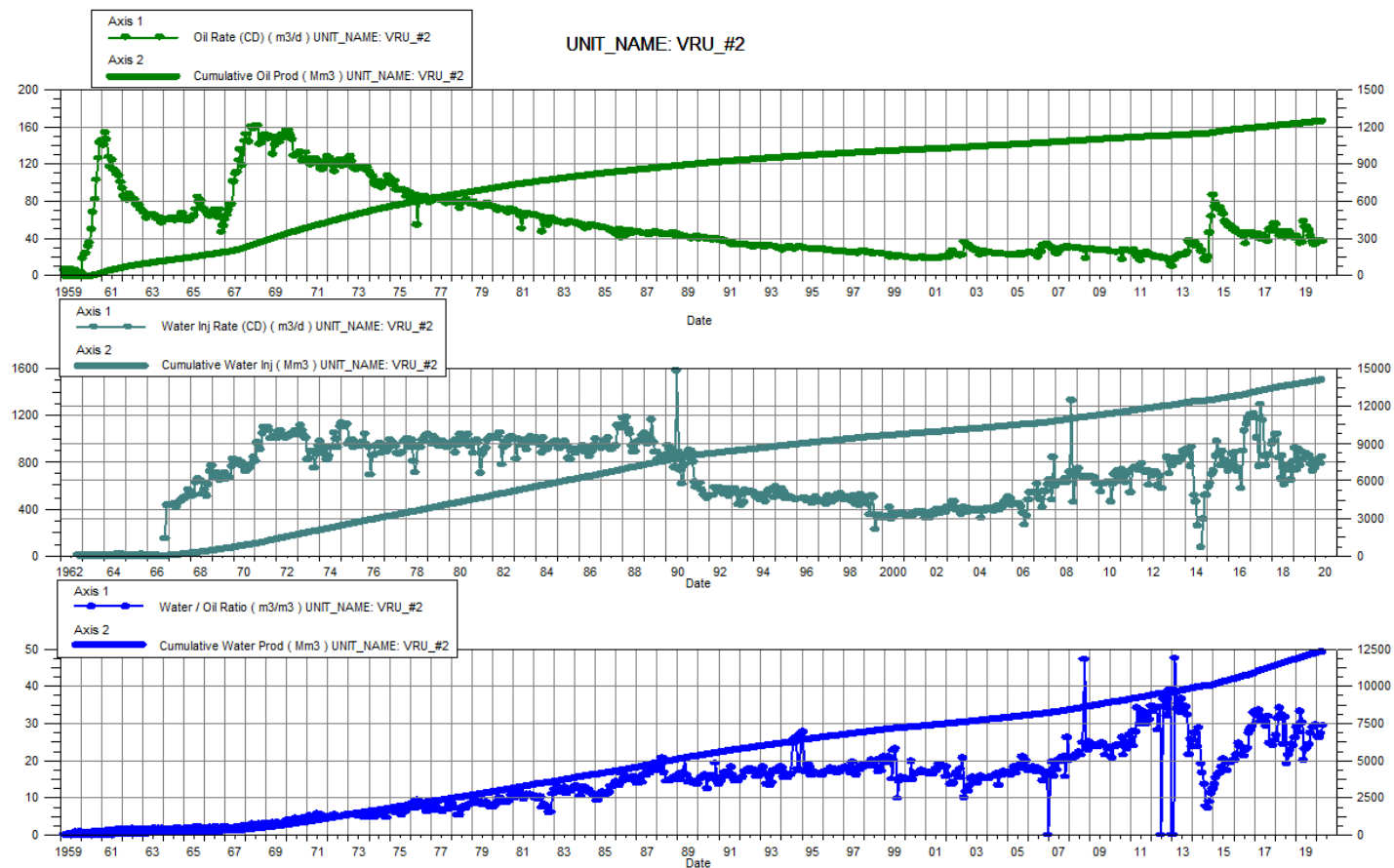


## Waterflood Patterns and Corresponding Injectors

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, 103/16-05-011-25W1/00
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

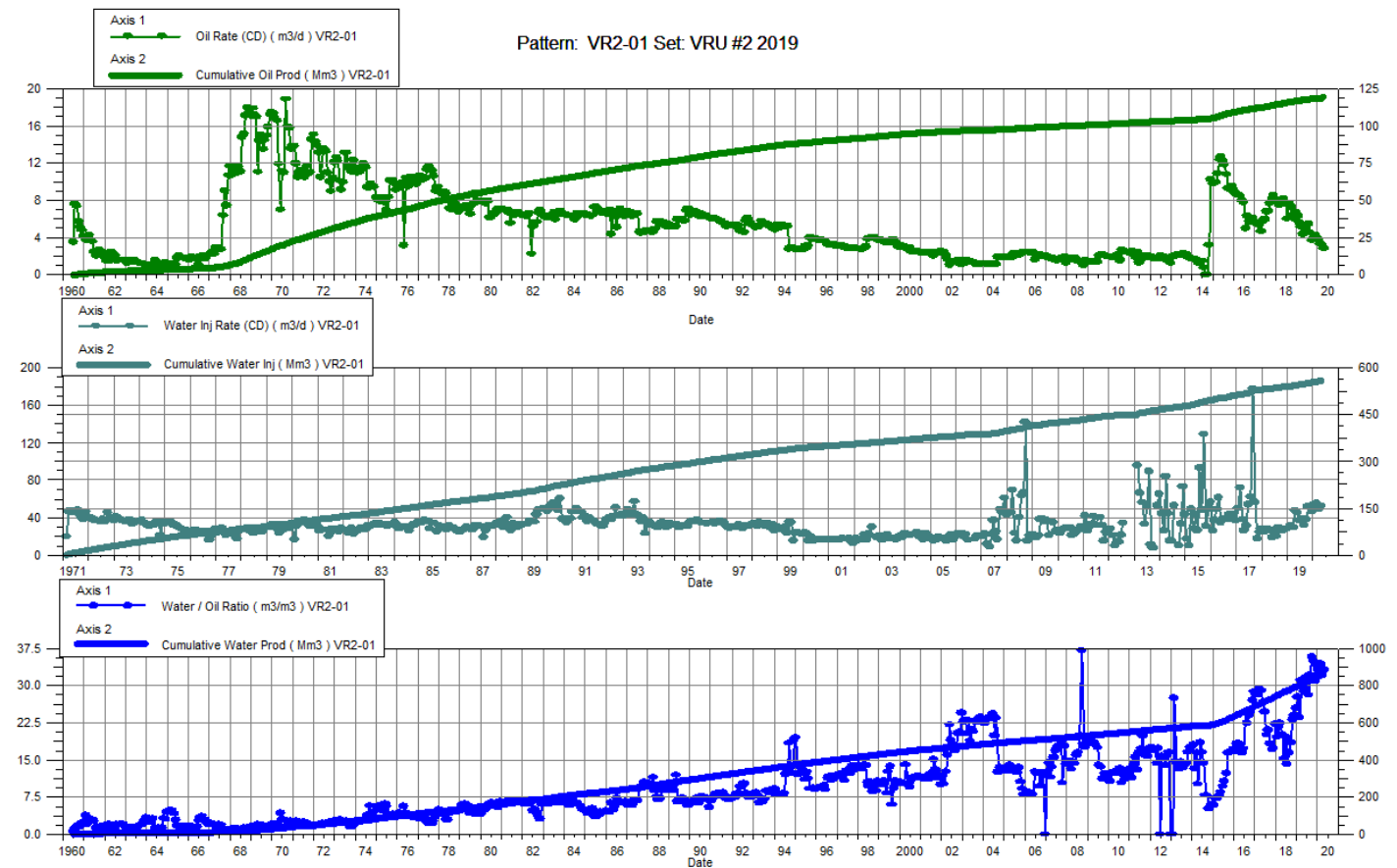
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	42.5	1232.83	1230.9	11851.56	924.13	13809.2	28.94	0.73	1.05	4,275.00
2-28-2019	39.9	1233.94	1099.9	11882.36	738.21	13829.9	27.59	0.65	1.05	4,275.00
3-31-2019	35.3	1235.04	1175.6	11918.80	912.48	13858.2	33.27	0.75	1.05	4,275.00
4-30-2019	35.7	1236.11	1074.9	11951.05	768.53	13881.2	30.12	0.69	1.05	4,275.00
5-31-2019	58.8	1237.93	1182.3	11987.70	888.06	13908.8	20.10	0.72	1.05	4,275.00
6-30-2019	52.2	1239.50	1207.3	12023.92	828.40	13933.6	23.14	0.66	1.05	4,275.00
7-31-2019	52.3	1241.12	1216.6	12061.63	877.00	13960.8	23.26	0.69	1.05	4,275.00
8-31-2019	48.5	1242.62	1184.6	12098.36	841.39	13986.9	24.43	0.68	1.05	4,275.00
9-30-2019	42.4	1243.89	1162.9	12133.24	854.49	14012.5	27.43	0.71	1.05	4,275.00
10-31-2019	37.4	1245.05	1075.5	12166.58	783.96	14036.8	28.79	0.70	1.05	4,275.00
11-30-2019	34.1	1246.08	995.7	12196.45	728.20	14058.7	29.18	0.71	1.04	4,275.00
12-31-2019	34.2	1247.14	1010.6	12227.78	754.32	14082.1	29.59	0.72	1.04	4,275.00



# Viriden Roselea Unit No. 2

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

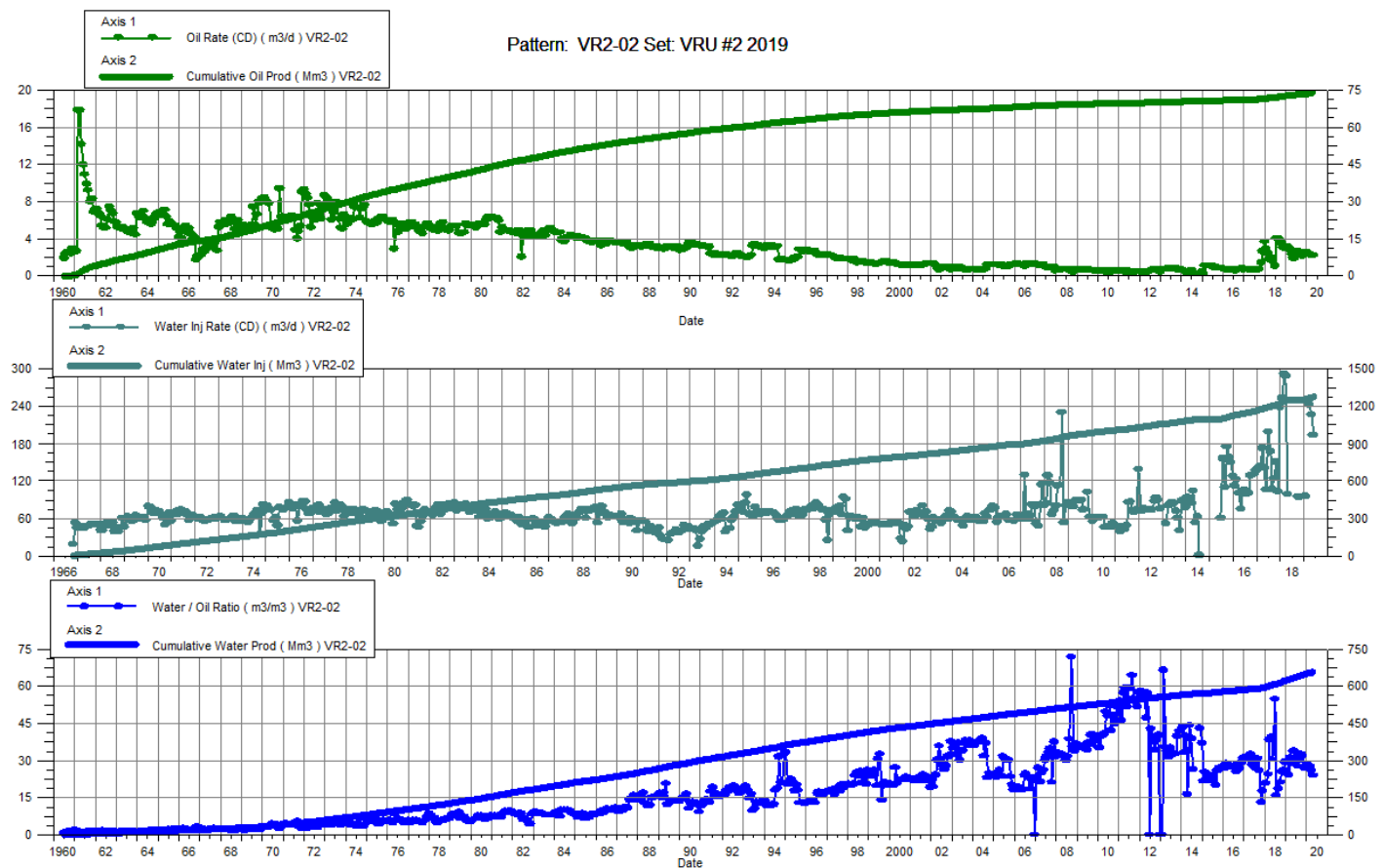
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	6.3	117.21	175.28	797.55	29.13	542.9	27.63	0.16	0.59	3,700.00
2-28-2019	5.6	117.37	132.73	801.27	31.25	543.75	23.55	0.23	0.59	3,700.00
3-31-2019	5.2	117.53	160.03	806.23	29.06	544.65	30.97	0.18	0.59	3,700.00
4-30-2019	4.4	117.66	133.02	810.22	47.70	546.08	30.49	0.35	0.59	3,700.00
5-31-2019	5.2	117.82	150.50	814.88	44.82	547.47	28.71	0.29	0.59	3,700.00
6-30-2019	4.7	117.96	150.31	819.39	36.97	548.58	31.71	0.24	0.58	3,700.00
7-31-2019	5.5	118.13	153.19	824.14	38.87	549.79	28.02	0.25	0.58	3,700.00
8-31-2019	4.6	118.27	145.93	828.67	32.10	550.78	32.11	0.21	0.58	3,700.00
9-30-2019	3.7	118.39	133.62	832.68	38.47	551.94	35.68	0.28	0.58	3,700.00
10-31-2019	3.9	118.51	137.40	836.93	51.58	553.5	35.01	0.37	0.58	3,700.00
11-30-2019	4.4	118.64	134.26	840.96		553.53	30.88		0.58	3,700.00
12-31-2019	4.0	118.76	134.92	845.14	46.84	555.0	33.99	0.34	0.57	3,700.00



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

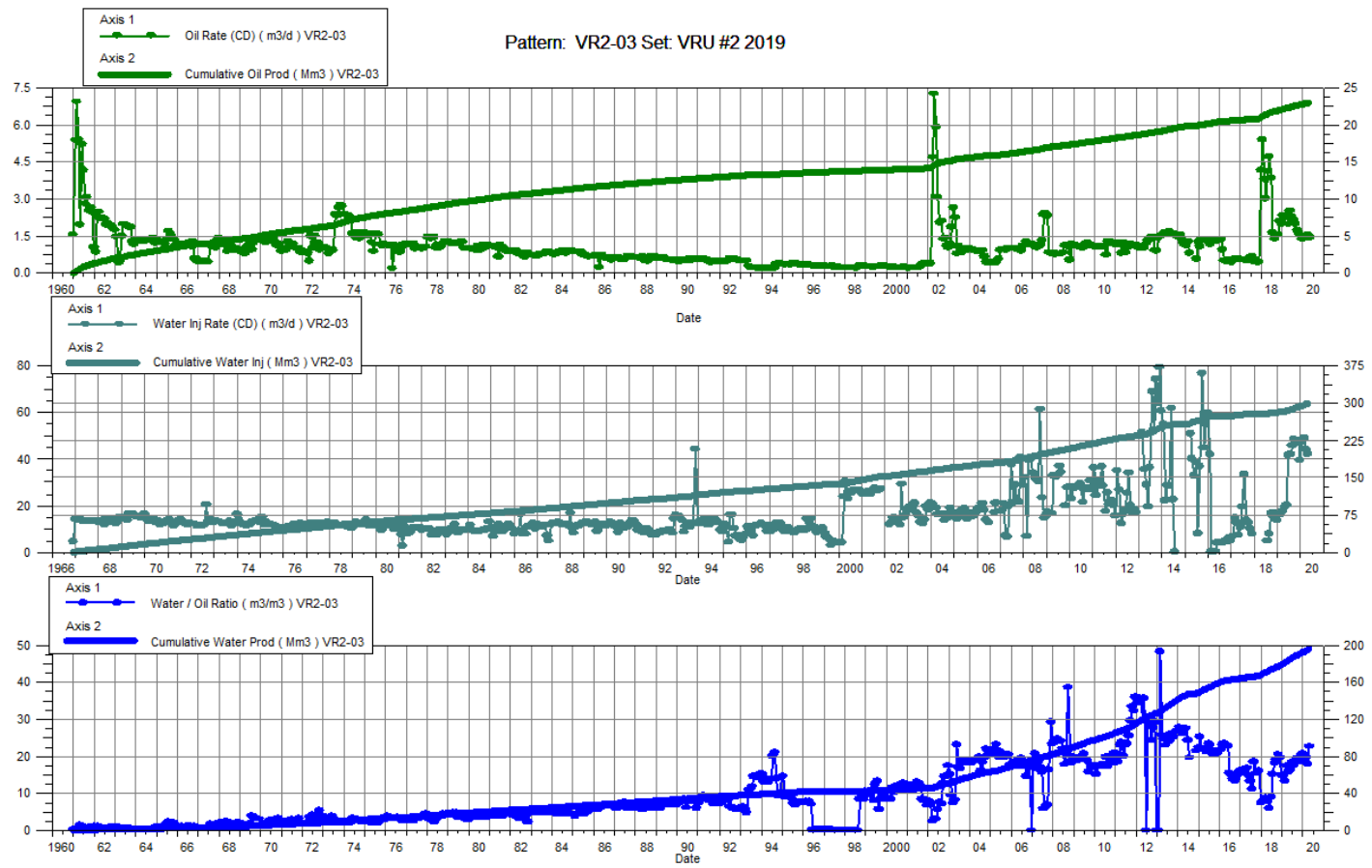
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	3.25	72.85	97.31	623.53	95.58	1261.41	29.95	0.95	1.81	6,300.00
2-28-2019	3.06	72.93	74.00	625.61		1261.41	24.21		1.80	6,300.00
3-31-2019	2.79	73.02	87.42	628.32	242.74	1268.94	31.34	2.69	1.81	6,300.00
4-30-2019	2.36	73.09	67.19	630.33	227.33	1275.76	28.43	3.27	1.81	6,300.00
5-31-2019	1.93	73.15	65.39	632.36	194.36	1281.78	33.79	2.89	1.81	6,300.00
6-30-2019	2.57	73.23	80.12	634.76		1281.78	31.21		1.81	6,300.00
7-31-2019	2.74	73.31	75.79	637.11		1281.78	27.62		1.80	6,300.00
8-31-2019	2.61	73.39	78.15	639.53		1281.78	29.91		1.79	6,300.00
9-30-2019	2.36	73.46	77.10	641.85		1281.78	32.71		1.79	6,300.00
10-31-2019	2.14	73.53	68.16	643.96		1281.78	31.82		1.78	6,300.00
11-30-2019	2.47	73.60	65.72	645.93		1281.78	26.61		1.78	6,300.00
12-31-2019	2.57	73.68	69.35	648.08		1281.78	26.96		1.77	6,300.00



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## Pattern P-03 - 00/04-08-011-25W1/0

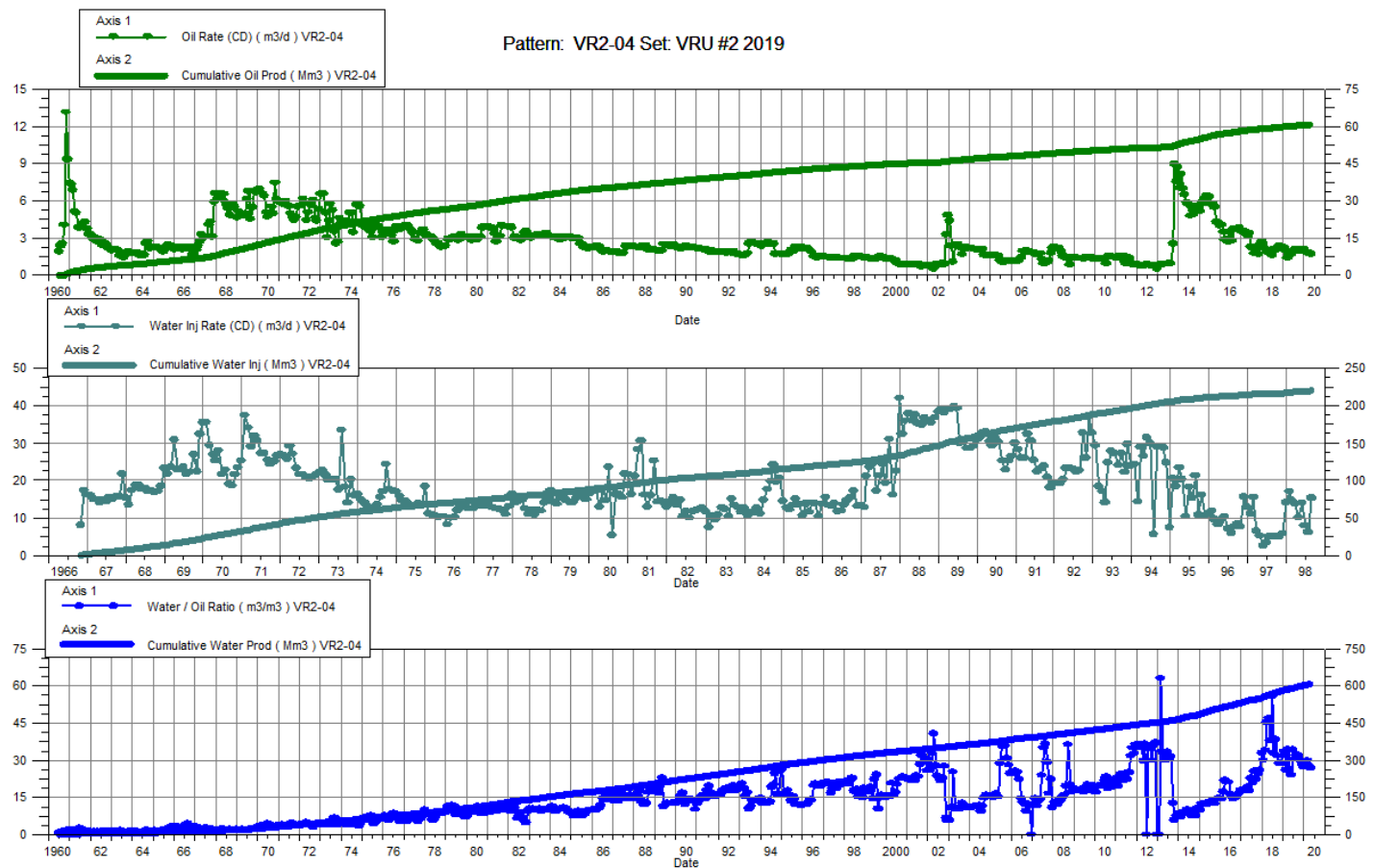
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	2.32	22.17	34.05	180.08	16.16	282.89	14.67	0.44	1.40	6,000.00
2-28-2019	2.25	22.23	30.28	180.93	16.29	283.35	13.44	0.50	1.39	6,000.00
3-31-2019	2.30	22.30	40.23	182.17	17.81	283.90	17.47	0.42	1.39	6,000.00
4-30-2019	2.00	22.36	31.47	183.12	19.37	284.48	15.77	0.58	1.38	6,000.00
5-31-2019	2.55	22.44	41.45	184.40	20.32	285.11	16.28	0.46	1.38	6,000.00
6-30-2019	2.31	22.51	42.43	185.68	41.80	286.37	18.35	0.93	1.37	6,000.00
7-31-2019	2.18	22.58	38.47	186.87	42.10	287.67	17.63	1.03	1.37	6,000.00
8-31-2019	2.01	22.64	37.22	188.02	45.84	289.09	18.51	1.17	1.37	6,000.00
9-30-2019	1.76	22.69	34.26	189.05	48.53	290.55	19.47	1.35	1.37	6,000.00
10-31-2019	1.65	22.74	31.16	190.02	48.42	292.05	18.86	1.47	1.37	6,000.00
11-30-2019	1.53	22.79	28.15	190.86	46.73	293.45	18.34	1.57	1.37	6,000.00
12-31-2019	1.39	22.83	28.87	191.76	39.48	294.67	20.73	1.30	1.37	6,000.00



# Viriden Roselea Unit No. 2

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

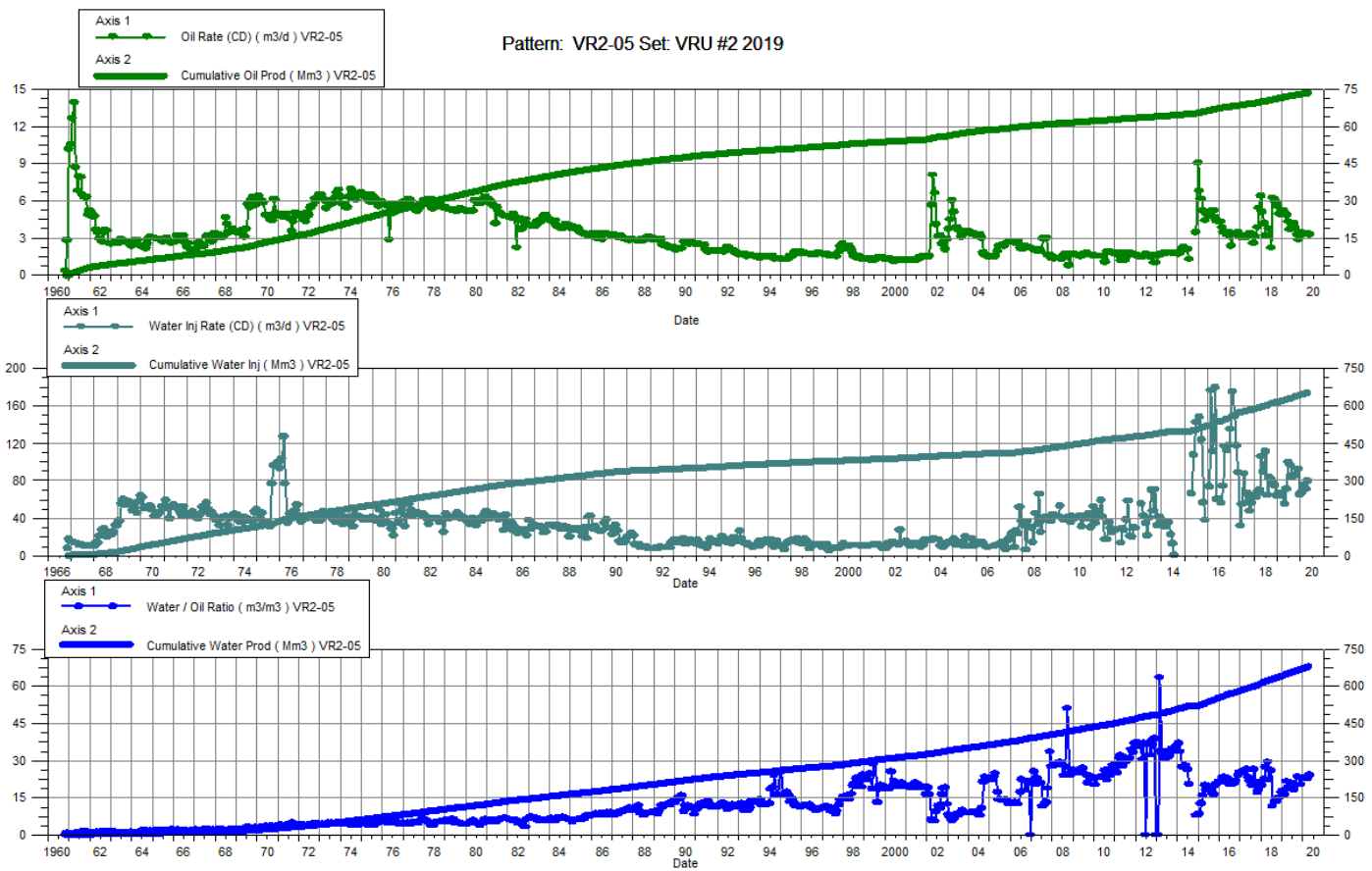
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	2.19	60.02	73.42	581.24		220.82	33.59		0.34	--
2-28-2019	2.03	60.08	52.69	582.72		220.82	25.97		0.34	--
3-31-2019	1.43	60.12	48.78	584.23		220.82	34.22		0.34	--
4-30-2019	1.69	60.17	45.37	585.59		220.82	26.77		0.34	--
5-31-2019	1.67	60.22	39.88	586.83		220.82	23.86		0.34	--
6-30-2019	1.86	60.28	63.51	588.73		220.82	34.13		0.34	--
7-31-2019	2.16	60.35	65.40	590.76		220.82	30.30		0.34	--
8-31-2019	2.16	60.41	69.22	592.91		220.82	32.00		0.34	--
9-30-2019	2.11	60.48	67.41	594.93		220.82	32.01		0.34	--
10-31-2019	1.97	60.54	59.62	596.78		220.82	30.24		0.34	--
11-30-2019	1.95	60.60	54.65	598.42		220.82	28.02		0.33	--
12-31-2019	2.08	60.66	56.25	600.16		220.82	27.08		0.33	--



# Virden Roselea Unit No. 2

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

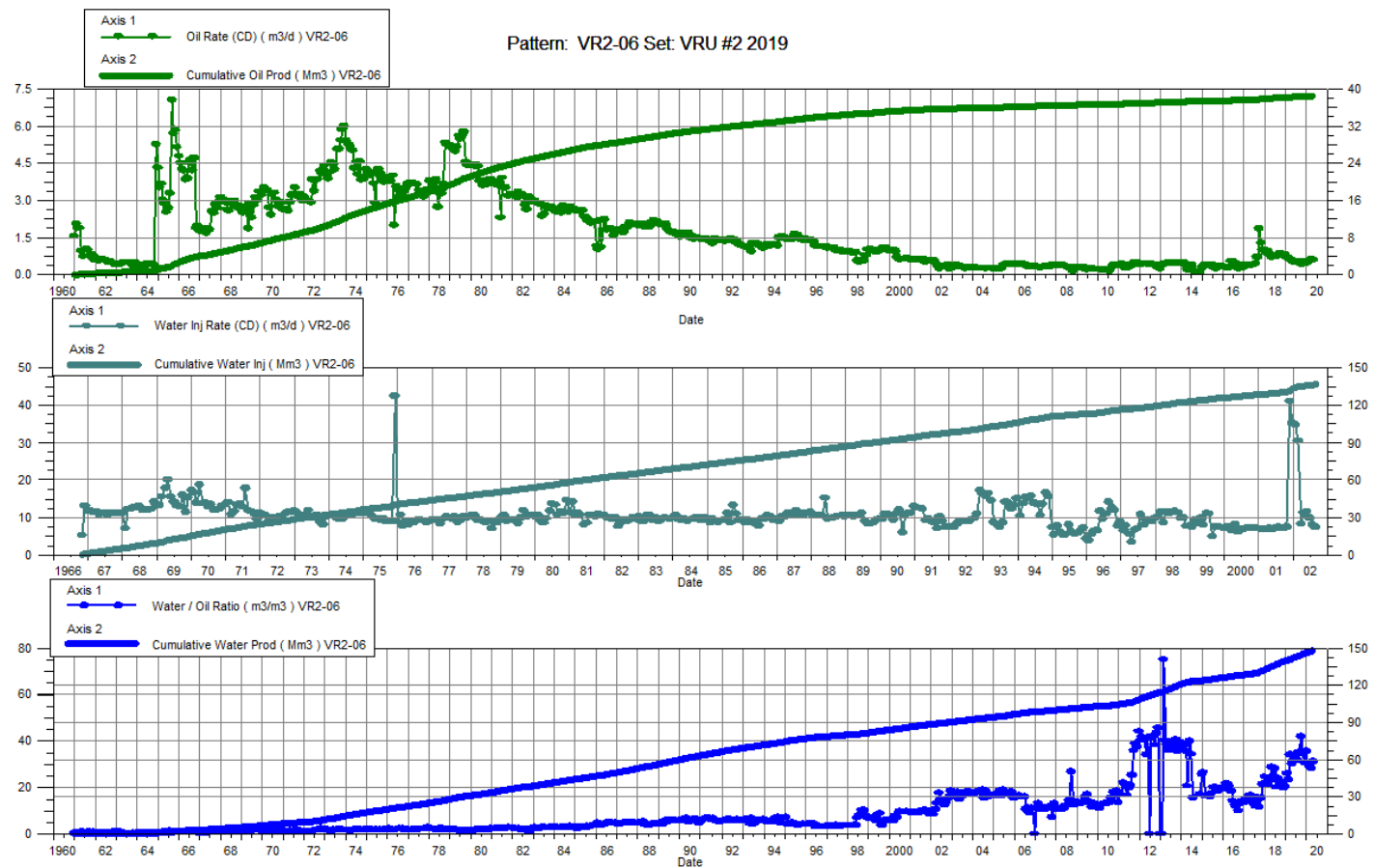
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	5.21	71.90	93.45	643.21	64.55	620.05	17.93	0.65	0.87	4,800.00
2-28-2019	5.05	72.04	83.26	645.55	66.96	621.93	16.48	0.76	0.87	4,800.00
3-31-2019	4.87	72.19	105.55	648.82	63.10	623.88	21.67	0.57	0.86	4,800.00
4-30-2019	4.33	72.32	82.27	651.29	55.50	625.55	19.00	0.64	0.86	4,800.00
5-31-2019	3.71	72.44	78.64	653.72	71.15	627.76	21.22	0.86	0.86	4,800.00
6-30-2019	4.13	72.56	75.78	656.00	99.90	630.75	18.35	1.25	0.86	4,800.00
7-31-2019	4.24	72.69	76.60	658.37	96.61	633.75	18.09	1.19	0.87	4,800.00
8-31-2019	3.88	72.81	78.30	660.80	83.94	636.35	20.15	1.02	0.87	4,800.00
9-30-2019	3.27	72.91	76.84	663.10	86.15	638.93	23.50	1.08	0.87	4,800.00
10-31-2019	2.89	73.00	67.44	665.19	86.02	641.60	23.33	1.22	0.87	4,800.00
11-30-2019	3.47	73.10	70.40	667.31	92.83	644.38	20.32	1.26	0.87	4,800.00
12-31-2019	3.31	73.21	75.07	669.63	65.03	646.40	22.70	0.83	0.87	4,800.00



## Virden Roselea Unit No. 2

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

Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	0.70	38.30	18.25	139.83		137.03	25.94		0.77	--
2-28-2019	0.67	38.31	15.66	140.27		137.03	23.22		0.76	--
3-31-2019	0.60	38.33	20.57	140.91		137.03	34.05		0.76	--
4-30-2019	0.58	38.35	17.68	141.44		137.03	30.29		0.76	--
5-31-2019	0.53	38.37	16.87	141.96		137.03	31.69		0.76	--
6-30-2019	0.53	38.38	18.40	142.51		137.03	34.41		0.75	--
7-31-2019	0.55	38.40	17.51	143.05		137.03	31.67		0.75	--
8-31-2019	0.52	38.42	18.27	143.62		137.03	34.94		0.75	--
9-30-2019	0.44	38.43	18.48	144.18		137.03	41.90		0.75	--
10-31-2019	0.48	38.45	16.47	144.69		137.03	34.55		0.75	--
11-30-2019	0.53	38.46	16.46	145.18		137.03	30.79		0.74	--
12-31-2019	0.48	38.48	17.00	145.71		137.03	35.48		0.74	--



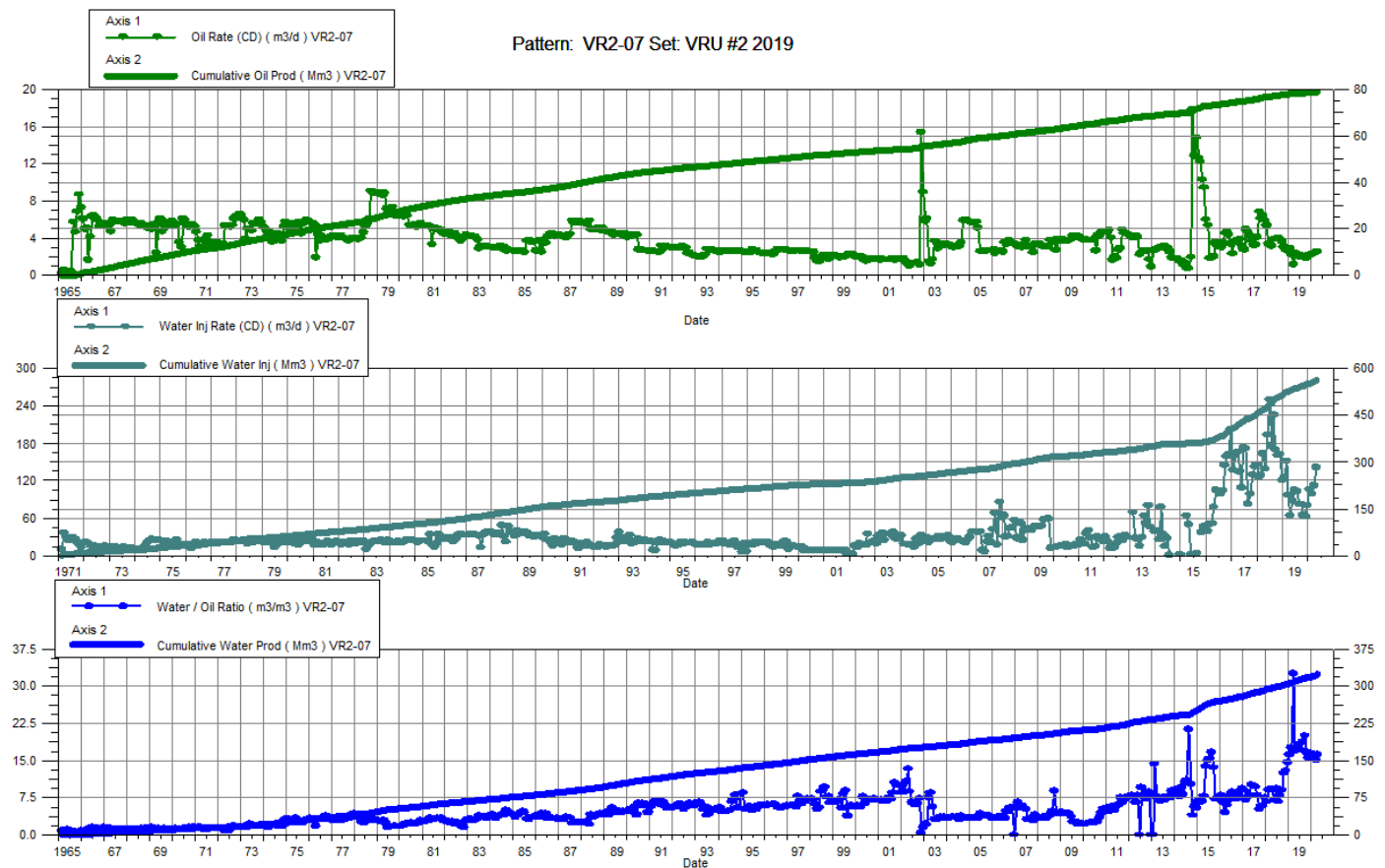


# Viriden Roselea Unit No. 2

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

## 03/16-05-011-25W1/0

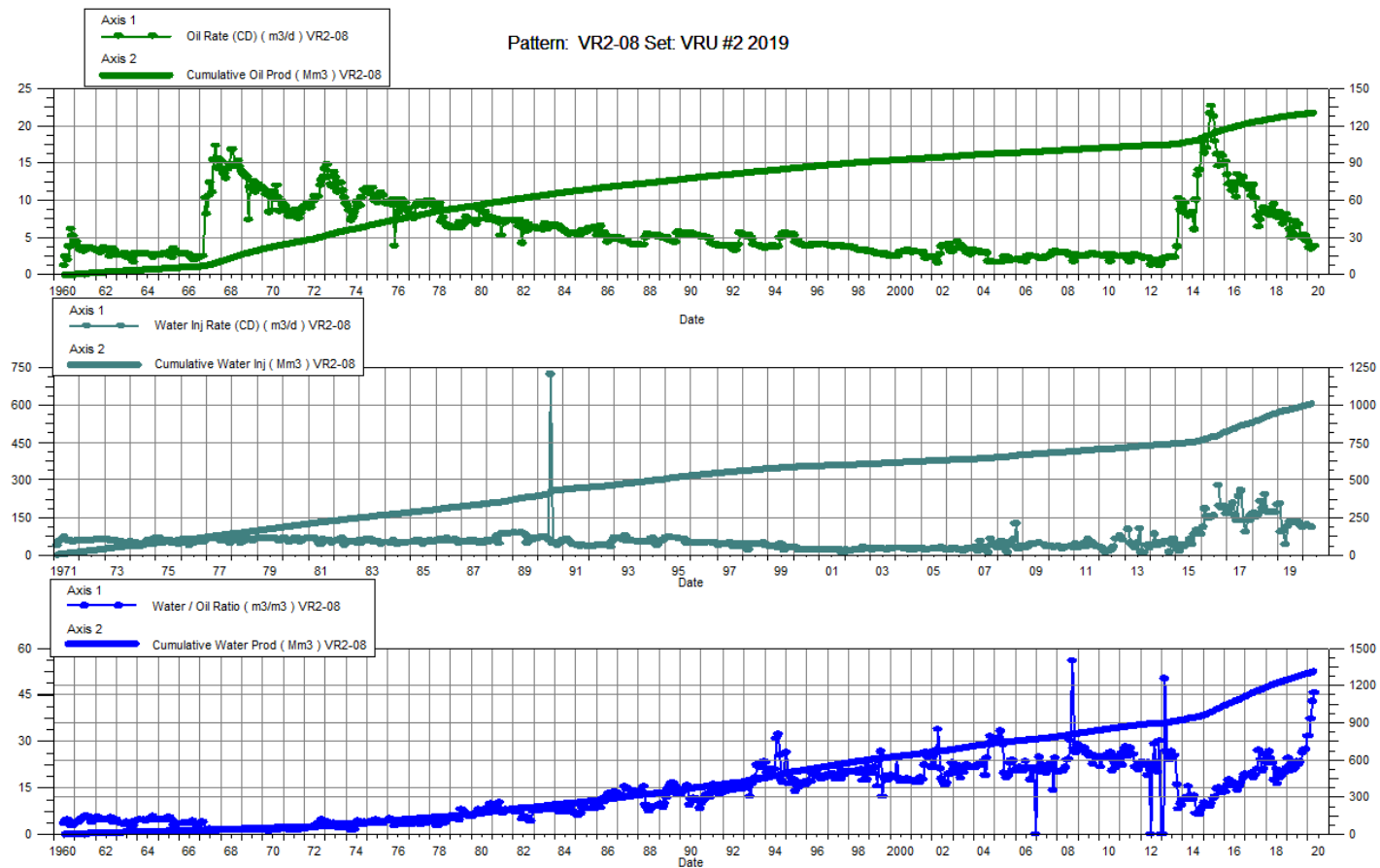
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa	Water Inj Pressure kPa
1-31-2019	2.91	78.14	47.05	305.25	125.45	521.92	16.16	2.51	1.36	5,600.00	3,800.00
2-28-2019	2.33	78.21	40.98	306.40	151.82	526.17	17.57	3.50	1.36	5,600.00	3,800.00
3-31-2019	1.24	78.25	40.18	307.65	96.68	529.17	32.49	2.33	1.37	5,600.00	3,800.00
4-30-2019	2.46	78.32	41.21	308.88	64.03	531.09	16.77	1.47	1.37	5,600.00	3,800.00
5-31-2019	2.33	78.39	40.06	310.12	88.95	533.85	17.19	2.10	1.37	5,600.00	3,800.00
6-30-2019	1.98	78.45	36.07	311.21	105.07	537.00	18.24	2.76	1.37	5,600.00	3,800.00
7-31-2019	2.23	78.52	38.21	312.39	103.23	540.20	17.10	2.55	1.38	5,600.00	3,800.00
8-31-2019	2.05	78.59	38.36	313.58	82.42	542.76	18.72	2.04	1.38	5,600.00	3,800.00
9-30-2019	1.91	78.64	38.32	314.73	81.83	545.21	20.02	2.03	1.38	5,600.00	3,800.00
10-31-2019	1.89	78.70	31.32	315.70	64.42	547.21	16.60	1.94	1.38	5,600.00	3,800.00
11-30-2019	2.25	78.77	34.97	316.75	62.53	549.08	15.54	1.68	1.38	5,600.00	3,800.00
12-31-2019	2.20	78.84	36.39	317.88	80.68	551.59	16.54	2.09	1.39	5,600.00	3,800.00



# Viriden Roselea Unit No. 2

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

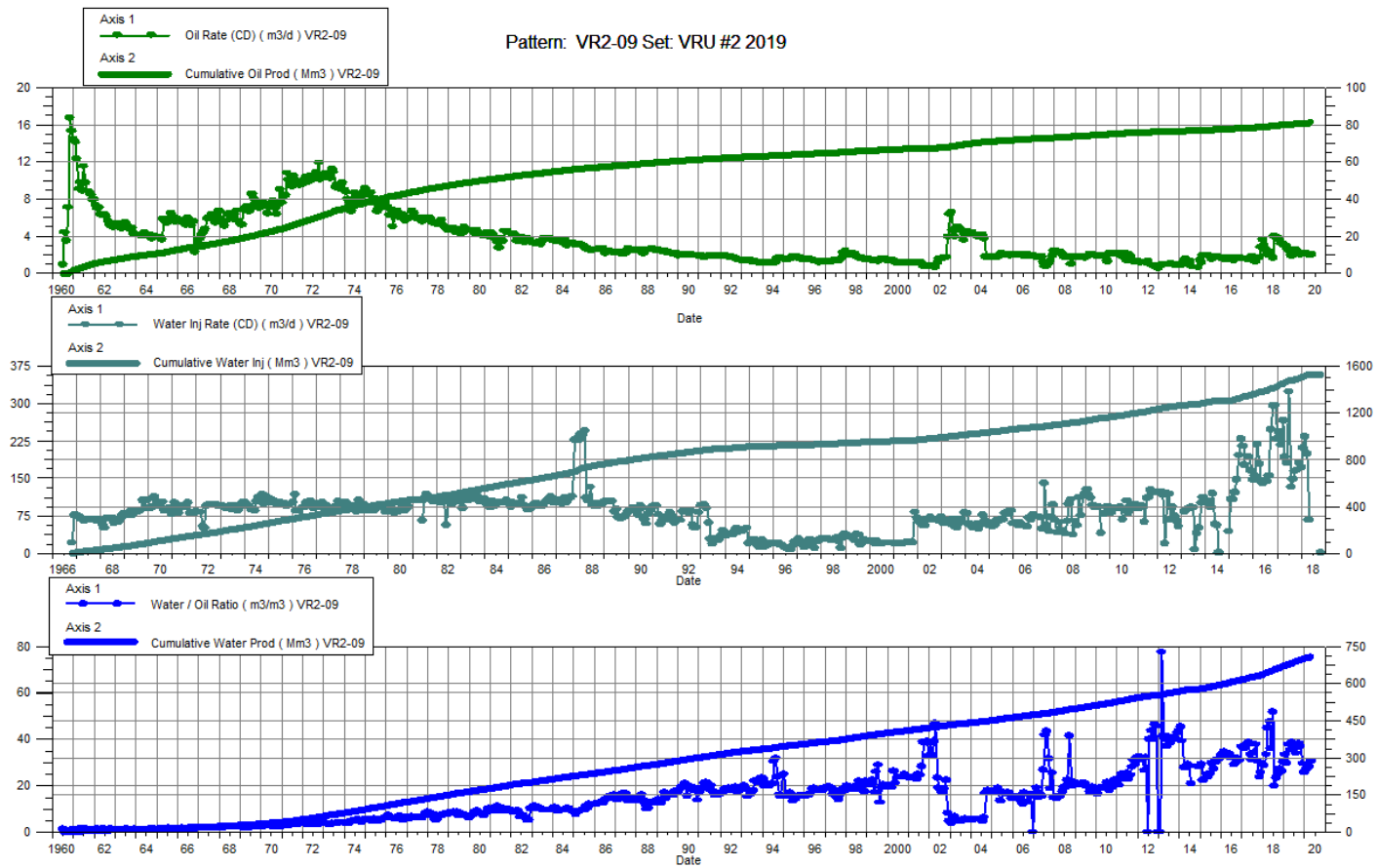
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	7.42	128.34	180.72	1249.28	204.39	960.72	24.37	1.09	0.70	6,600.00
2-28-2019	6.12	128.52	125.30	1252.78	91.29	963.27	20.49	0.69	0.70	6,600.00
3-31-2019	5.07	128.67	114.77	1256.34	96.84	966.27	22.65	0.81	0.70	6,600.00
4-30-2019	5.46	128.84	112.29	1259.71	40.40	967.49	20.57	0.34	0.70	6,600.00
5-31-2019	7.21	129.06	153.44	1264.47	114.54	971.04	21.29	0.71	0.70	6,600.00
6-30-2019	6.55	129.26	153.12	1269.06	132.90	975.02	23.36	0.83	0.70	6,600.00
7-31-2019	6.81	129.47	152.45	1273.79	129.06	979.03	22.39	0.81	0.70	6,600.00
8-31-2019	5.22	129.63	121.54	1277.55	127.61	982.98	23.28	1.01	0.70	6,600.00
9-30-2019	4.95	129.78	129.87	1281.45	128.53	986.84	26.25	0.95	0.70	6,600.00
10-31-2019	5.36	129.94	146.28	1285.99	129.09	990.84	27.28	0.85	0.70	6,600.00
11-30-2019	5.25	130.10	144.11	1290.31	118.93	994.41	27.45	0.80	0.70	6,600.00
12-31-2019	4.51	130.24	142.93	1294.74	110.32	997.83	31.68	0.75	0.70	6,600.00



# Viriden Roselea Unit No. 2

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

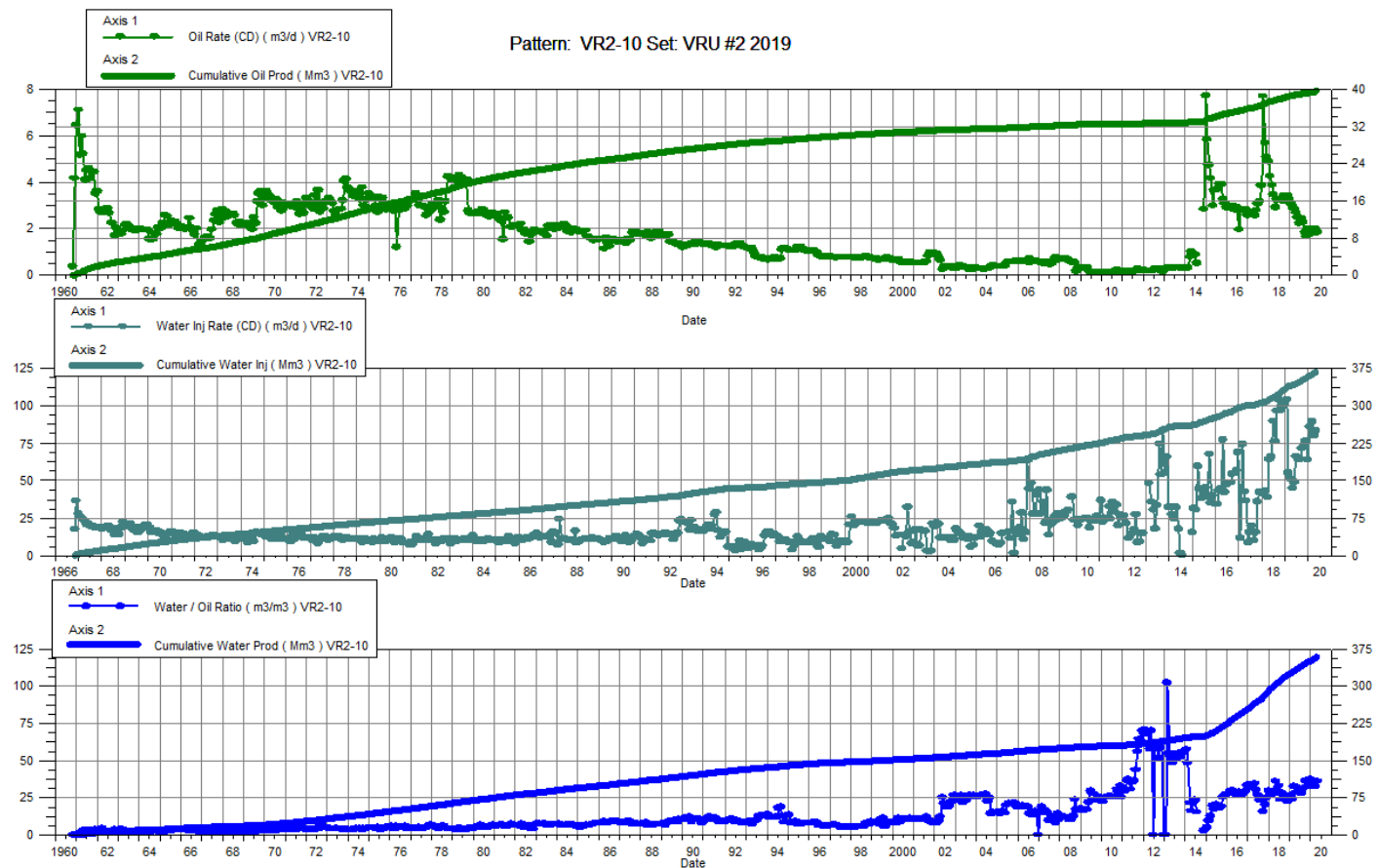
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	2.97	80.22	98.65	671.47		1530.94	33.25		2.03	5,000.00
2-28-2019	2.90	80.30	86.31	673.89		1530.94	29.72		2.03	5,000.00
3-31-2019	2.57	80.38	96.98	676.90		1530.94	37.66		2.02	5,000.00
4-30-2019	2.36	80.45	83.27	679.39		1530.94	35.30		2.01	5,000.00
5-31-2019	1.92	80.51	73.80	681.68		1530.94	38.41		2.01	5,000.00
6-30-2019	2.35	80.58	87.48	684.31		1530.94	37.17		2.00	5,000.00
7-31-2019	2.56	80.66	86.61	686.99		1530.94	33.82		1.99	5,000.00
8-31-2019	2.46	80.74	89.09	689.75		1530.94	36.17		1.98	5,000.00
9-30-2019	2.25	80.81	86.01	692.33		1530.94	38.29		1.98	5,000.00
10-31-2019	2.06	80.87	76.39	694.70		1530.94	37.04		1.97	5,000.00
11-30-2019	2.20	80.94	64.81	696.65		1530.94	29.45		1.97	5,000.00
12-31-2019	2.25	81.01	57.24	698.42		1530.94	25.46		1.96	5,000.00



# Viriden Roselea Unit No. 2

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

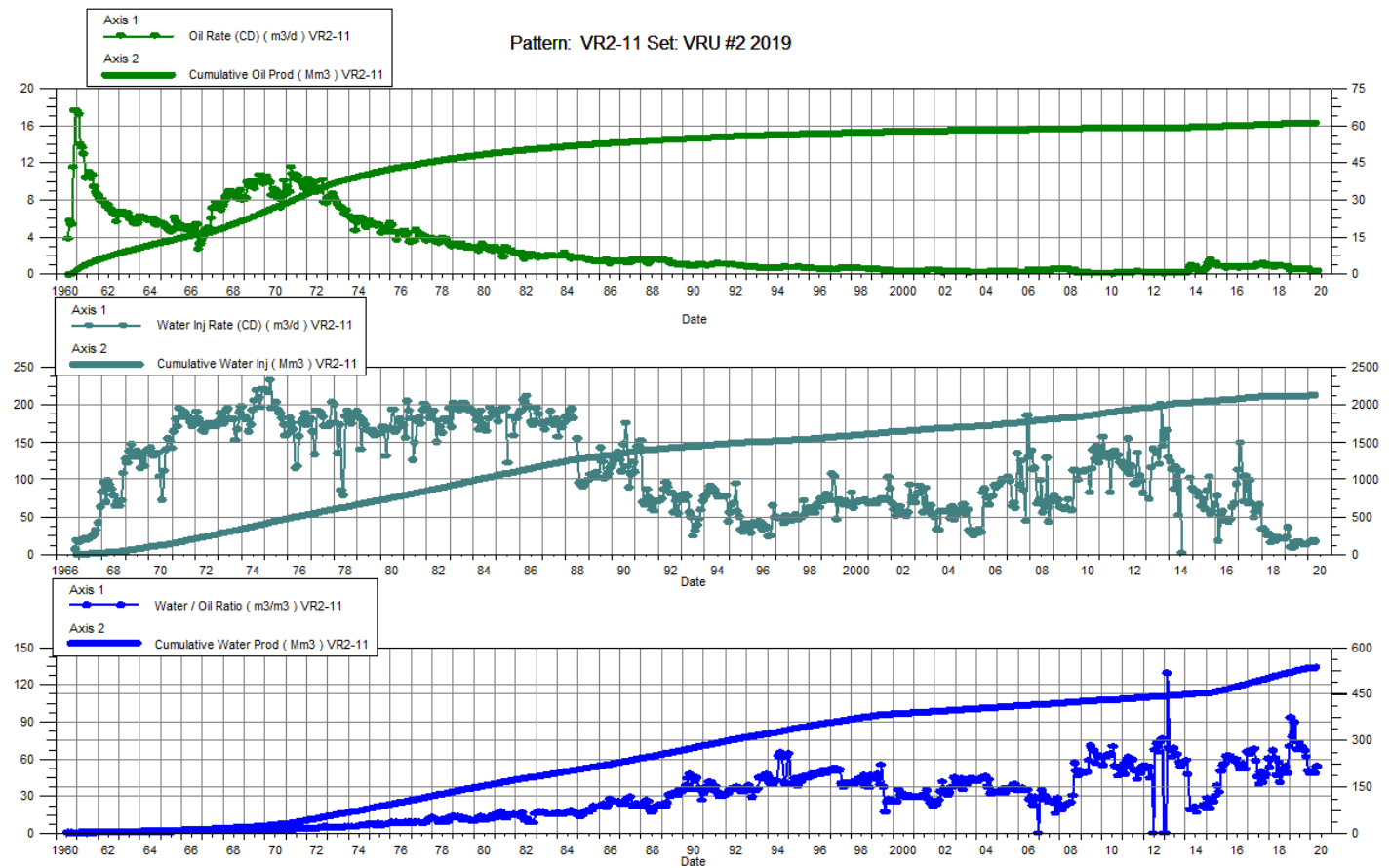
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	3.07	38.61	81.92	326.15	104.26	338.51	26.65	1.23	0.93	3,800.00
2-28-2019	2.98	38.70	71.28	328.15	55.29	340.06	23.92	0.74	0.93	3,800.00
3-31-2019	2.85	38.78	93.10	331.03	51.32	341.65	32.64	0.54	0.92	3,800.00
4-30-2019	2.71	38.87	76.89	333.34	44.83	342.99	28.33	0.56	0.92	3,800.00
5-31-2019	2.49	38.94	71.75	335.56	49.00	344.51	28.77	0.66	0.92	3,800.00
6-30-2019	2.25	39.01	69.68	337.65	66.23	346.50	30.90	0.92	0.92	3,800.00
7-31-2019	2.47	39.09	68.22	339.77	64.35	348.49	27.60	0.91	0.92	3,800.00
8-31-2019	2.29	39.16	70.70	341.96	64.48	350.49	30.92	0.88	0.92	3,800.00
9-30-2019	1.85	39.21	66.34	343.95	71.80	352.65	35.93	1.05	0.92	3,800.00
10-31-2019	1.69	39.27	61.93	345.87	72.77	354.90	36.62	1.14	0.92	3,800.00
11-30-2019	2.01	39.33	64.86	347.82	76.53	357.20	32.21	1.14	0.92	3,800.00
12-31-2019	1.80	39.38	67.35	349.90	64.03	359.18	37.37	0.93	0.92	3,800.00



# Viriden Roselea Unit No. 2

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

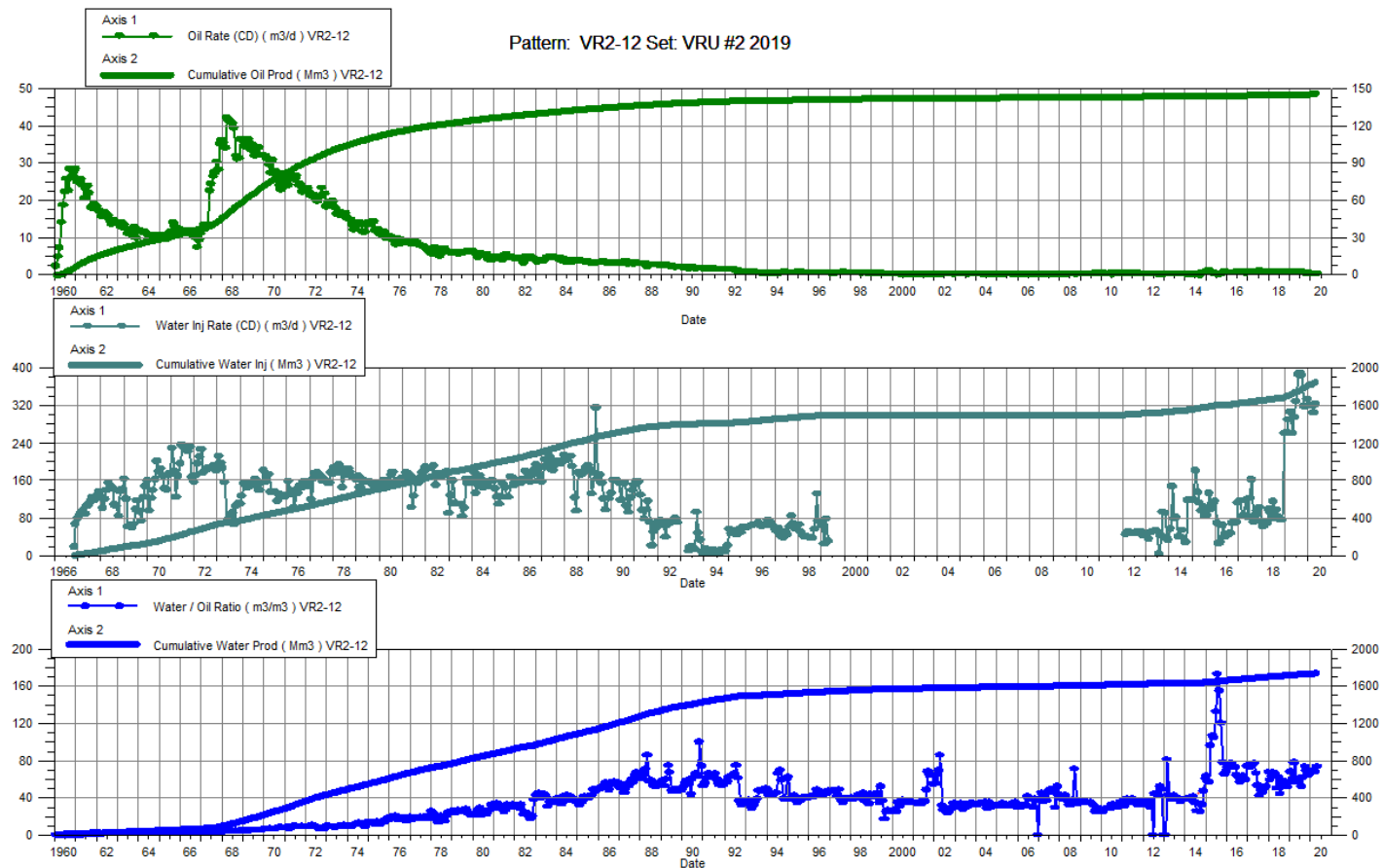
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	0.49	61.03	45.84	519.54	22.65	2123.58	93.31	0.49	3.65	4,200.00
2-28-2019	0.51	61.05	39.97	520.66	35.25	2124.57	77.83	0.87	3.65	4,200.00
3-31-2019	0.57	61.07	51.31	522.25	8.74	2124.84	89.78	0.17	3.64	4,200.00
4-30-2019	0.60	61.08	44.15	523.57	7.70	2125.07	73.57	0.17	3.63	4,200.00
5-31-2019	0.64	61.10	43.21	524.91	9.43	2125.36	67.42	0.22	3.62	4,200.00
6-30-2019	0.57	61.12	41.03	526.14	15.50	2125.82	72.40	0.37	3.61	4,200.00
7-31-2019	0.59	61.14	40.06	527.38	16.19	2126.33	68.13	0.40	3.61	4,200.00
8-31-2019	0.58	61.16	40.70	528.65	15.77	2126.82	69.61	0.38	3.60	4,200.00
9-30-2019	0.59	61.17	39.03	529.82	14.04	2127.24	66.56	0.35	3.59	4,200.00
10-31-2019	0.59	61.19	36.21	530.94	12.61	2127.63	61.79	0.34	3.59	4,200.00
11-30-2019	0.57	61.21	28.64	531.80	12.57	2128.00	50.11	0.43	3.58	4,200.00
12-31-2019	0.40	61.22	19.16	532.39	13.58	2128.43	47.85	0.69	3.58	4,200.00



# Viriden Roselea Unit No. 2

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

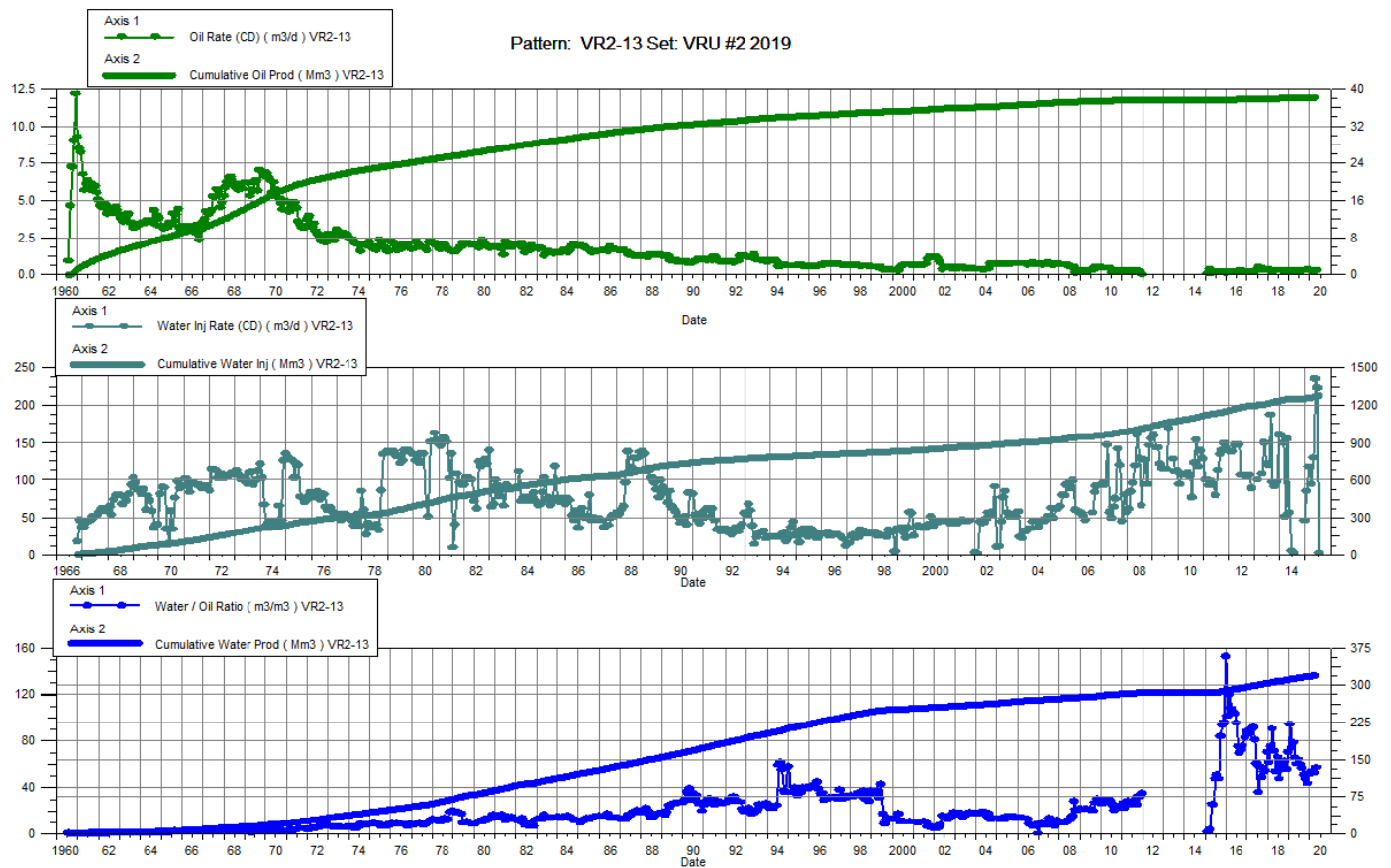
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	0.82	145.45	56.12	1715.36	261.97	1706.10	68.04	4.60	0.92	5,400.00
2-28-2019	0.81	145.47	48.85	1716.72	290.07	1714.23	60.12	5.84	0.92	5,400.00
3-31-2019	0.68	145.49	53.20	1718.37	306.19	1723.72	77.80	5.68	0.92	5,400.00
4-30-2019	0.85	145.51	47.86	1719.81	261.67	1731.57	56.59	5.37	0.93	5,400.00
5-31-2019	0.81	145.54	46.53	1721.25	295.50	1740.73	57.74	6.24	0.93	5,400.00
6-30-2019	0.79	145.56	47.49	1722.68	330.03	1750.63	60.49	6.83	0.94	5,400.00
7-31-2019	0.87	145.59	45.44	1724.08	386.58	1762.61	52.12	8.34	0.94	5,400.00
8-31-2019	0.77	145.61	46.93	1725.54	389.23	1774.68	61.33	8.16	0.95	5,400.00
9-30-2019	0.65	145.63	47.35	1726.96	385.13	1786.23	73.36	8.02	0.95	5,400.00
10-31-2019	0.63	145.65	43.87	1728.32	319.05	1796.12	69.55	7.17	0.96	5,400.00
11-30-2019	0.56	145.67	35.75	1729.39	318.07	1805.67	63.80	8.76	0.96	5,400.00
12-31-2019	0.39	145.68	26.16	1730.20	334.35	1816.03	66.35	12.59	0.97	5,400.00



# Viriden Roselea Unit No. 2

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

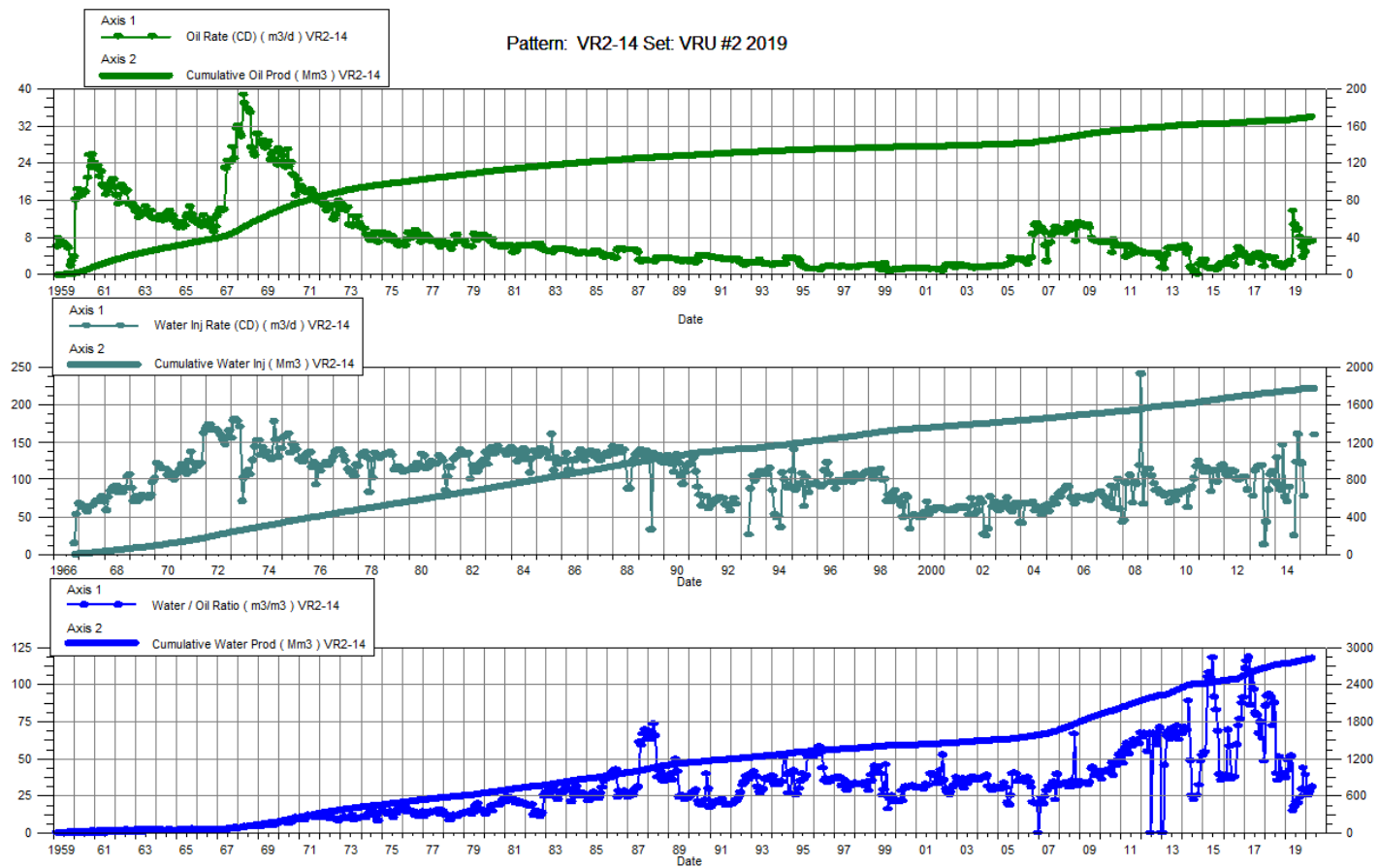
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	0.2	38.16	21.29	311.12		1285.3	93.9		3.67	3,800.00
2-28-2019	0.3	38.17	18.68	311.64		1285.3	73.4		3.67	3,800.00
3-31-2019	0.3	38.18	24.04	312.38		1285.3	78.5		3.66	3,800.00
4-30-2019	0.3	38.19	20.53	313.00		1285.3	65.4		3.65	3,800.00
5-31-2019	0.3	38.20	20.03	313.62		1285.3	60.0		3.65	3,800.00
6-30-2019	0.3	38.21	17.31	314.14		1285.3	63.7		3.64	3,800.00
7-31-2019	0.3	38.22	17.10	314.67		1285.3	59.2		3.64	3,800.00
8-31-2019	0.3	38.23	17.35	315.21		1285.3	56.7		3.63	3,800.00
9-30-2019	0.3	38.24	17.02	315.72		1285.3	50.6		3.62	3,800.00
10-31-2019	0.3	38.25	15.78	316.21		1285.3	47.1		3.62	3,800.00
11-30-2019	0.4	38.26	15.72	316.68		1285.3	43.3		3.61	3,800.00
12-31-2019	0.3	38.27	16.52	317.19		1285.3	51.8		3.61	3,800.00



# Virden Roselea Unit No. 2

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

Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	2.22	167.13	82.91	2735.61		1786.49	37.33		0.62	3,000.00
2-28-2019	2.44	167.20	119.70	2738.96		1786.49	49.11		0.61	3,000.00
3-31-2019	2.24	167.27	95.05	2741.90		1786.49	42.35		0.61	3,000.00
4-30-2019	3.05	167.36	157.97	2746.64		1786.49	51.85		0.61	3,000.00
5-31-2019	13.73	167.79	205.70	2753.02		1786.49	14.98		0.61	3,000.00
6-30-2019	10.70	168.11	191.68	2758.77		1786.49	17.91		0.61	3,000.00
7-31-2019	9.68	168.41	204.65	2765.11		1786.49	21.14		0.61	3,000.00
8-31-2019	9.79	168.71	197.10	2771.23		1786.49	20.14		0.61	3,000.00
9-30-2019	8.10	168.95	194.46	2777.06		1786.49	24.01		0.61	3,000.00
10-31-2019	6.06	169.14	178.71	2782.60		1786.49	29.49		0.61	3,000.00
11-30-2019	3.90	169.26	169.69	2787.69		1786.49	43.55		0.60	3,000.00
12-31-2019	4.93	169.41	193.38	2793.68		1786.49	39.25		0.60	3,000.00





# Virden Roselea Unit No. 2

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

Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	0.34	53.18	6.83	480.37		483.90	20.37		0.91	--
2-28-2019	0.58	53.20	53.18	481.86		483.90	92.20		0.90	--
3-31-2019	0.33	53.21	7.41	482.09		483.90	22.65		0.90	--
4-30-2019	0.31	53.22	5.86	482.27		483.90	18.80		0.90	--
5-31-2019	11.34	53.57	29.93	483.19		483.90	2.64		0.90	--
6-30-2019	8.39	53.82	21.64	483.84		483.90	2.58		0.90	--
7-31-2019	7.08	54.04	30.61	484.79		483.90	4.32		0.90	--
8-31-2019	6.89	54.25	29.63	485.71		483.90	4.30		0.89	--
9-30-2019	5.76	54.43	30.30	486.62		483.90	5.26		0.89	--
10-31-2019	3.73	54.54	26.29	487.43		483.90	7.05		0.89	--
11-30-2019	1.15	54.58	19.29	488.01		483.90	16.75		0.89	--
12-31-2019	2.46	54.65	38.01	489.19		483.90	15.46		0.89	--

