

Virden Roselea Unit #1
2019 Annual EOR Report

Executive Summary

In 2019 oil production in Virden Roselea Unit #1 (VRU #1) was 62.4 m³/d (392 bbl/d) totaling 15.5 e³m³ (97.5 mmbbl). Annual production declined by 31.9% from 2018 to 2019, using yearly averages. Comparing December 2018 to December 2019 the production declined by 36%. By the end of 2019 cumulative oil production from the VRU #1 was 3,075 e³m³ (19.3 mmbbl). The original forecasted recovery was 845 e³m³ (5.3 mmbbl) on primary recovery and 2,300 e³m³ (14.4 mmbbl) total primary plus secondary recovery.

In December 2019 there were 52 producing oil wells and 8 water injectors active in the unit. In 2014, three horizontal Scallion wells were drilled in the unit and three horizontal Virden wells were also drilled. In 2015, only one well was drilled in the Virden formation. In 2016, two wells were drilled in the Virden formation and some existing Scallion horizontals were perforated in the Oolites. In 2017, three dual leg horizontal wells were drilled within the unit. In 2018, one Oolite dual leg well and one Scallion/Oolite dual leg well were drilled. In 2019 no wells were drilled in the unit, but two wells were converted to injection.

Discussion

The VRU #1 has been under waterflood since 1965, 11 years after initial production in 1954. Water injection increased the oil production rate from $\sim 125 \text{ m}^3/\text{d}$ (786 bbl/d) just prior to injection to $\sim 250 \text{ m}^3/\text{d}$ ($\sim 1,570 \text{ bbl/d}$), equivalent to peak production from the field. Expected ultimate oil recovery was increased by 2.5 – 3 times due to the waterflood. Due to this there are areas in the unit that have a higher recovery than what is seen in the other Roselea units, and overall, the unit has a higher recovery.

Horizontal drilling has offset the production decline over the last decade. In 2014, an additional three Scallion horizontals and three Virden horizontals were drilled in this unit with variable results. In 2015, one Virden horizontal was drilled and in 2016 another two Virden wells were drilled. In 2017, three dual leg horizontal wells were drilled. In 2018, one Oolite dual leg well and one Scallion/Oolite dual leg well were drilled. In 2019 no wells were drilled in the unit, but two wells were converted to injection.

In this unit it appears as if there may be a preferential orientation for fluid flow, as in large portions of the unit the wells offsetting injectors in the E-W direction were generally more successful than the adjacent producers to the North and South. The majority of the horizontals are aligned in an E-W orientation and the unit outline may support implementing an E-W line drive; technical work has yet to be conducted for full scale development. The water injection rate was $1,497 \text{ m}^3/\text{d}$ (9,415 bbl/d) in 2019 and the producing WOR was $33 \text{ m}^3/\text{m}^3$. The injected water at VRU #1 is not filtered or treated in any way.

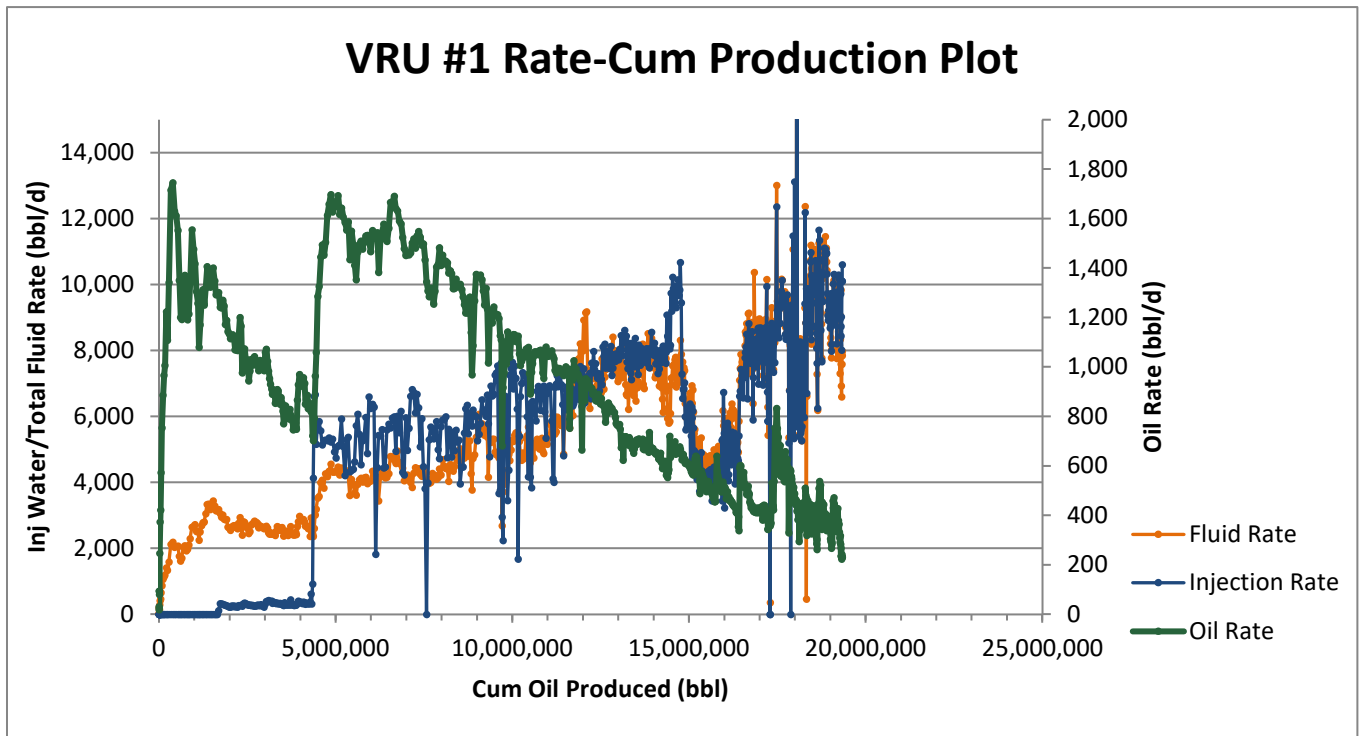
Significant events in 2019 are as follows:

- August 2019, deepen the 100/07-25-010-26W1/00 vertical injection well.
- August 2019, convert the 100/01-36-010-26W1/00 vertical well to injection.
- August 2019, convert the 100/02-36-010-26W1/00 vertical well to injection.

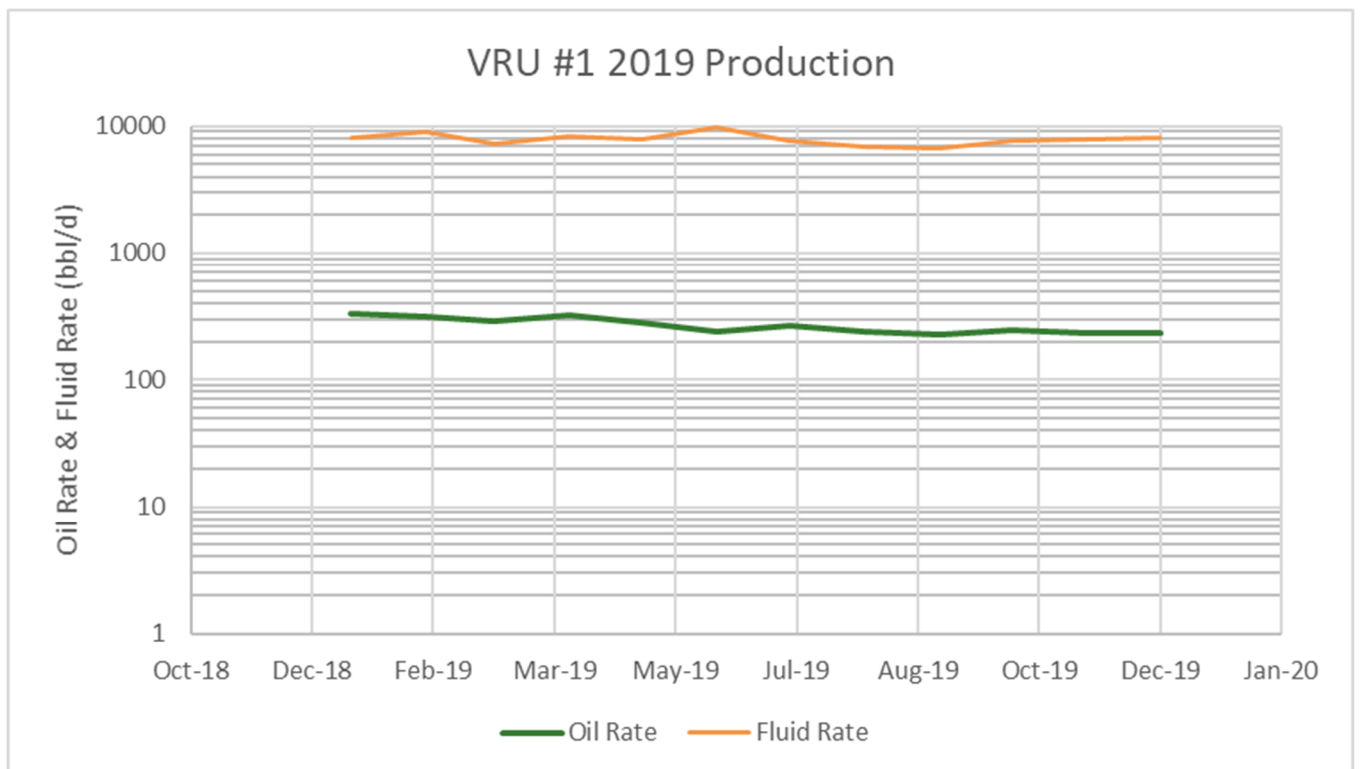
In the composite rate – cumulative oil plot below, waterflood response is clearly demonstrated at a cumulative oil production of $650 \text{ e}^3\text{m}^3$ (4 MMbbl).

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

VRU #1 – Rate vs Cumulative Oil Production



VRU #1 – Rate vs Time



2019 Reservoir Pressure Surveys

Unit	UWI	License	Test Type	Date of Pressure	Duration of SI (days)	Datum BHP (kPaa)
VRU #1	102/12-24-010-26W1/00	6816	AWS BU	2019-06-18	11	2,030
VRU #1	102/01-36-010-26W1/00	10715	AWS BU	2019-06-18	11	5,569

In 2019, two pressures were recorded within the unit, showing a large range in pressures. In 2018, two pressures were taken on new drilled open hole wells. In one, a higher pressure than expected was observed, due to historical injection in the area and the second pressure recorded makes sense given the historical production and drainage in the area. In 2017, twenty-two pressures were taken in the unit, giving an average reservoir pressure of 7,000 kPa. This is similar to previous years, where, in 2014, there were nine reservoir pressures recorded averaging 7,200 kPaa. As with most of the Virden units there is a large range in pressure. The initial reservoir pressure is estimated at 6,340 kPaa and the bubble point pressure as 1,273 kPaa. Many of the pressures recorded in 2017 seem to be reasonable and were taken on wells that had been shut in for a long period of time, and so are assumed to be stable. Only three pressures were recorded on newly drilled wells. There has been some effort to reduce injection in areas that have historically over injected, so the overall pressure in the unit may be declining due to this.

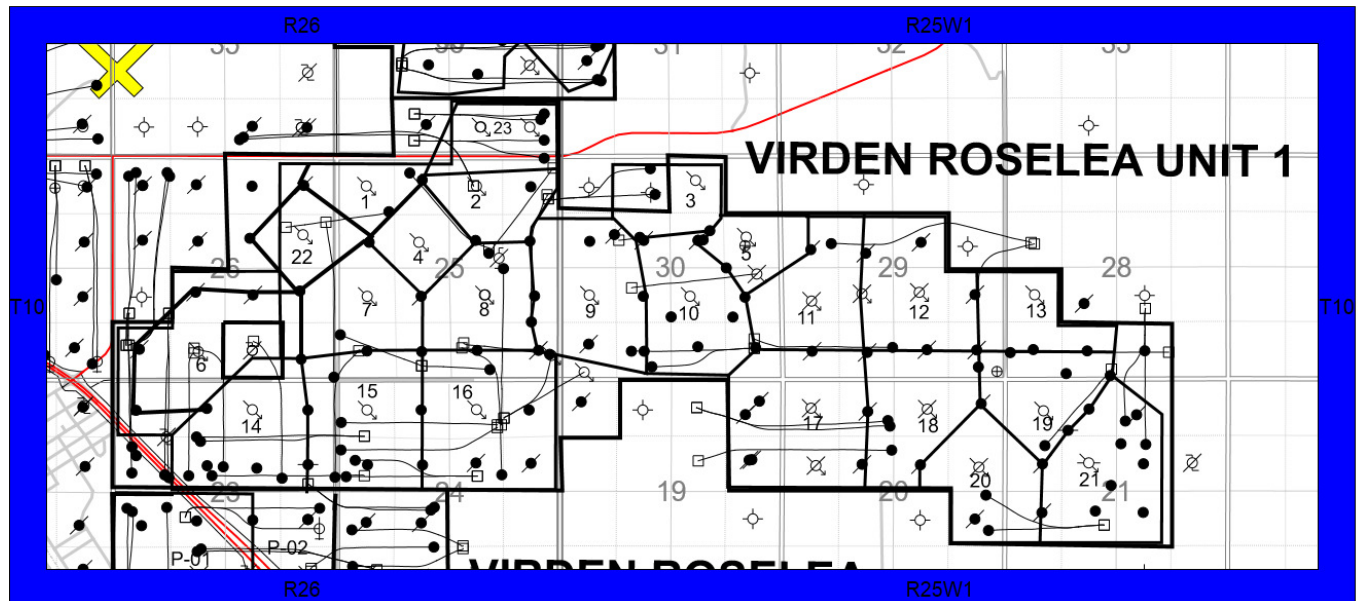
The voidage replacement ratio (VRR) in 2019 was above 1.00, and was 1.29 at the end of the year. The cumulative VRR at the end of 2018 was 0.97. An oil formation volume factor of 1.06 rm^3/sm^3 and a water formation volume factor of 1.04 rm^3/sm^3 were used in the VRR calculations.

The higher than initial reservoir pressure is inconsistent with the cumulative VRR of 0.97. The pressure inconsistency may be due to either the substantial over injection in some areas while others have under injected, or partial pressure support for the field from an aquifer on the west side of the unit. This water influx from the aquifer is not accounted for in the VRR calculation.

2019 Well Servicing

UWI	Unit	Licence	Start Date	Operation	Objective
PIPELINE REMOVAL 15-20-10-26	VRU#1	RM19VIR011	2019-11-01	Facilities	Major Surface R&M
102/14-20-010-25W1/00	VRU#1	10964	2019-06-19	Completion/Workover	Pump Repair
102/14-20-010-25W1/00	VRU#1	10964	2019-09-11	Completion/Workover	Pump Repair
100/07-25-010-26W1/00	VRU#1	000555	2019-08-20	Completion/Workover	Deepening
100/01-36-010-26W1/00	VRU#1	001536	2019-08-28	Completion/Workover	Injection Conversion
102/07-25-010-26W1/00	VRU#1	9932	2019-11-28	Completion/Workover	Pump Repair
104/08-30-010-25W1/00	VRU#1	005124	2019-08-07	Completion/Workover	Packer Repair
100/02-36-010-26W1/00	VRU#1	000795	2019-08-29	Completion/Workover	Injection Conversion
HEADER UPGRADE	VRU#1	FF19VIR002	2019-10-21	Facilities	Header Repair
INJECTION FLOWLINE	VRU#1	WF19VIR008	2019-10-08	Facilities	Injection Pipeline
LEAK DETECTION	VRU#1	FF19VIR004	2019-10-21	Facilities	Leak Detection Install
TURNAROUND	VRU#1	T19VIR003	2019-06-10	Facilities	Turnaround

VRU #1 Waterflood Pattern Map

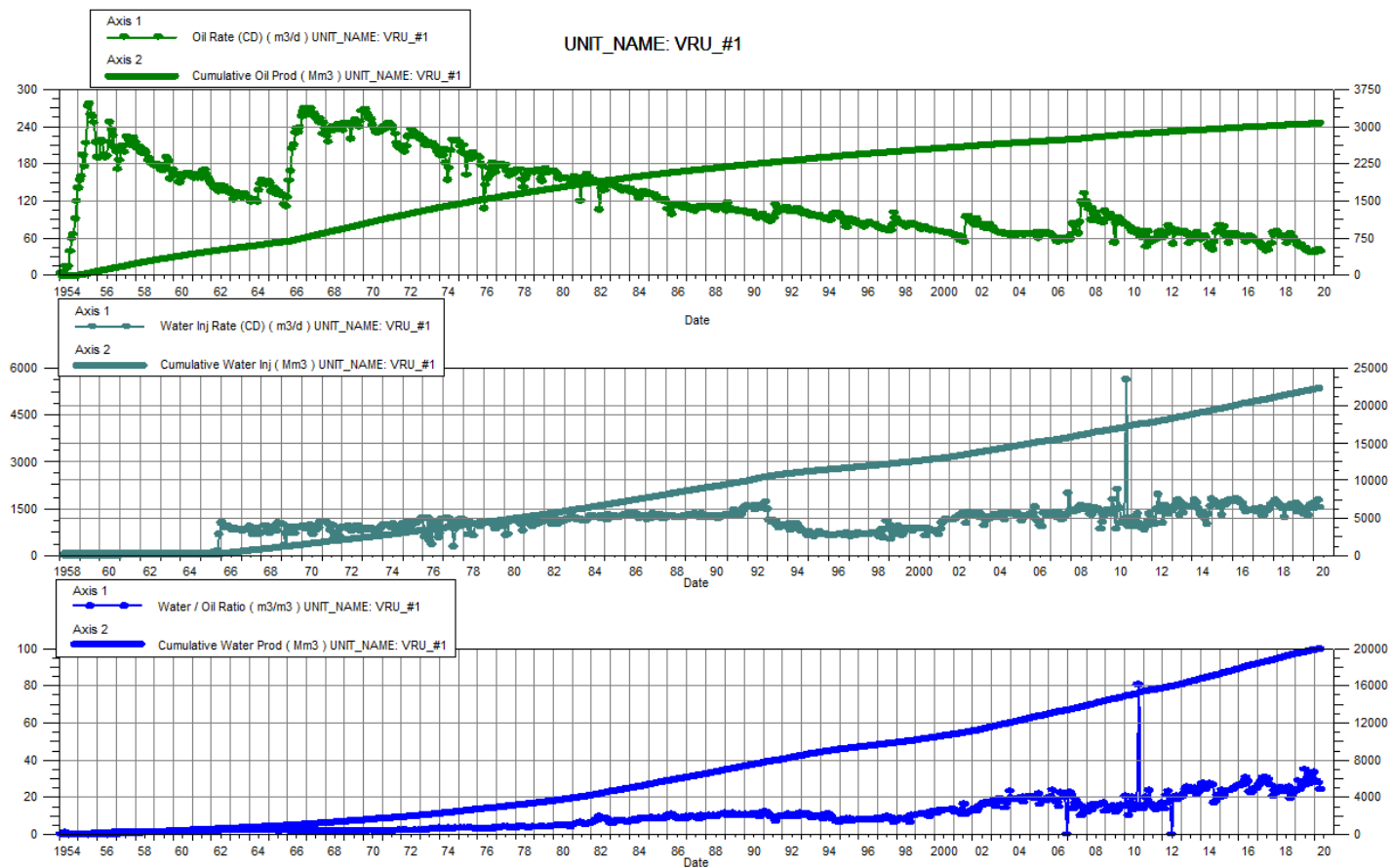


VRU #1 Waterflood Pattern Table

Pattern	Injection Well
P-01	100/13-25-010-26W1/00
P-02	100/15-25-010-26W1/00
P-03	100/15-30-010-25W1/00
P-04	100/11-25-010-26W1/00
P-05	100/09-30-010-25W1/00
P-06	100/03-26-010-26W1/00
P-07	100/05-25-010-26W1/00
P-08	100/07-25-010-26W1/00
P-09	100/05-30-010-25W1/00, 103/01-25-010-26W1/00
P-10	100/07-30-010-25W1/00, 104/08-30-010-25W1/00
P-11	100/05-29-010-25W1/00
P-12	100/06-29-010-25W1/00
P-12	100/07-29-010-25W1/00
P-13	100/05-28-010-25W1/00
P-14	100/15-23-010-26W1/00
P-15	100/13-24-010-26W1/00
P-16	100/15-24-010-26W1/00
P-16	103/01-25-010-26W1/00
P-19	100/13-21-010-25W1/00
P-21	100/11-21-010-25W1/00
P-22	100/09-26-010-26W1/00
P-23	100/01-36-010-26W1/00, 100/02-36-010-26W1/00

Total for VRU #1

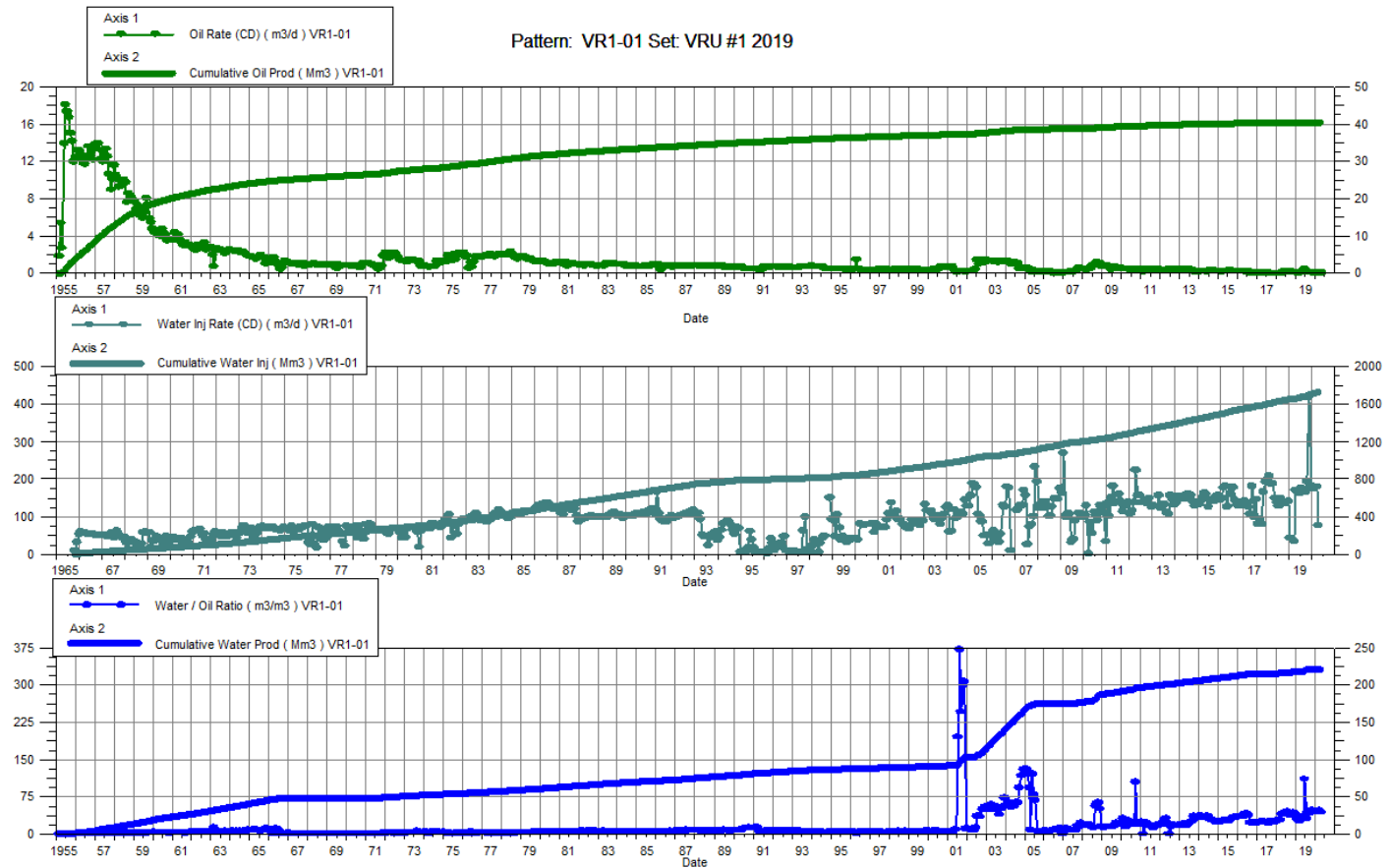
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	52.70	3058.20	1253.34	19440.18	1499.90	21788.56	23.78	1.15	0.97	5,068.80
2-28-2019	48.55	3059.56	1407.11	19479.58	1686.88	21835.79	28.98	1.16	0.97	5,068.80
3-31-2019	46.72	3061.01	1123.91	19514.42	1396.58	21879.09	24.06	1.19	0.97	5,068.80
4-30-2019	50.41	3062.52	1286.26	19553.01	1587.78	21926.72	25.51	1.19	0.97	5,068.80
5-31-2019	45.93	3063.94	1218.67	19590.79	1515.88	21973.71	26.53	1.20	0.97	5,068.80
6-30-2019	43.66	3065.25	1529.79	19636.68	1407.68	22015.94	35.04	0.89	0.97	5,068.80
7-31-2019	44.55	3066.63	1171.23	19672.99	1316.30	22056.75	26.29	1.08	0.97	5,068.80
8-31-2019	38.91	3067.84	1071.35	19706.20	1408.09	22100.40	27.53	1.27	0.97	5,068.80
9-30-2019	37.61	3068.97	1018.73	19736.76	1291.76	22139.15	27.09	1.22	0.97	5,068.80
10-31-2019	38.60	3070.17	1176.99	19773.25	1577.05	22188.04	30.49	1.30	0.97	5,068.80
11-30-2019	37.06	3071.28	1220.91	19809.87	1627.60	22236.87	32.94	1.29	0.97	5,068.80
12-31-2019	37.16	3072.43	1240.92	19848.34	1653.35	22288.12	33.39	1.29	0.97	5,097.19



VRU No. 1

Pattern P-01 - 00/13-25-010-26W1/0

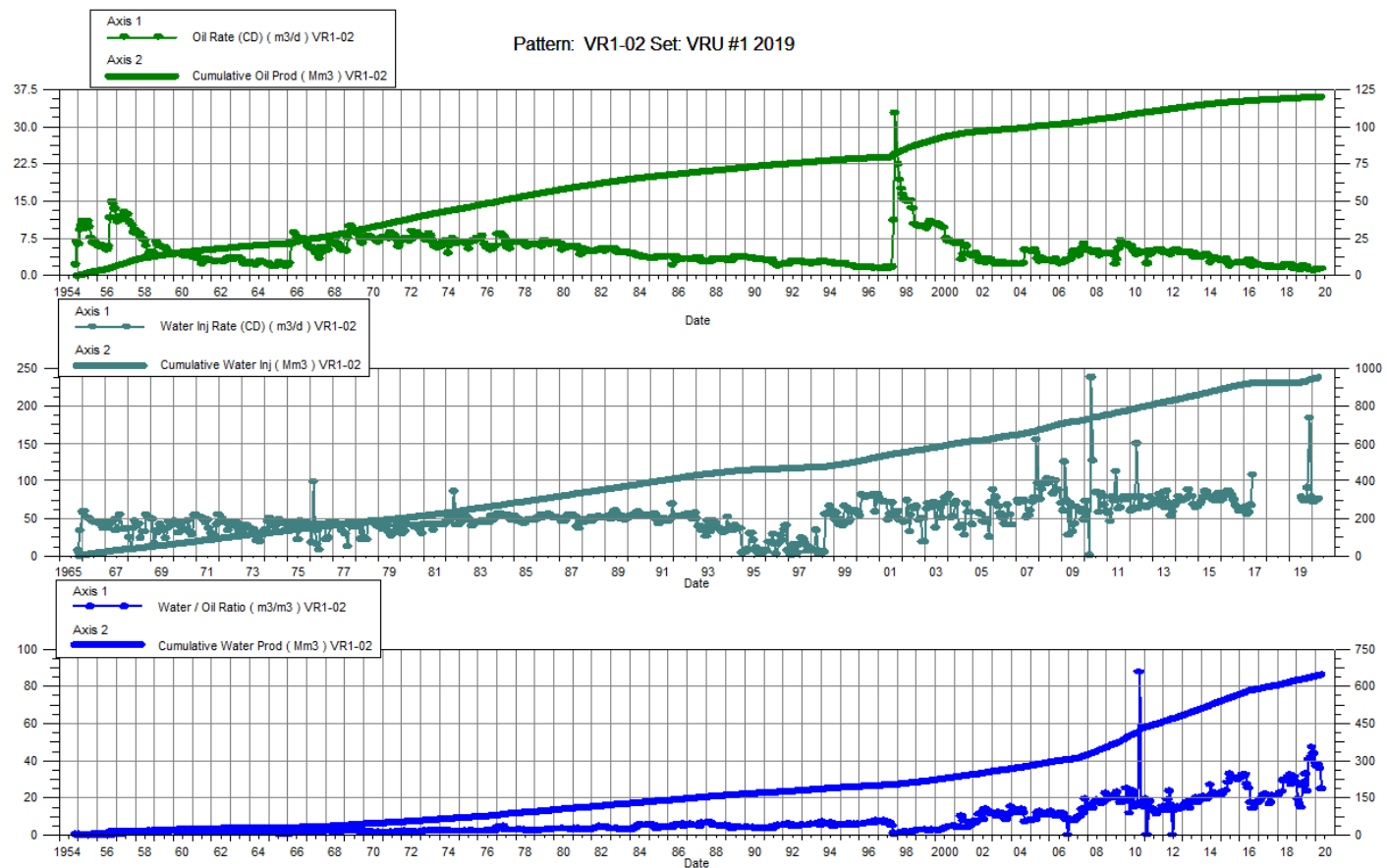
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1-31-2019	0.09	40.48	3.03	217.20	41.87	1658.41	32.21	13.39	6.42	4,950.00
2-28-2019	0.06	40.49	1.80	217.25		1658.41	27.96		6.42	4,950.00
3-31-2019	0.08	40.49	2.05	217.31	33.87	1659.46	25.54	15.91	6.42	4,950.00
4-30-2019	0.18	40.49	6.10	217.49	170.30	1664.56	33.57	27.12	6.43	4,950.00
5-31-2019	0.18	40.50	6.44	217.69	164.05	1669.65	36.13	24.79	6.45	4,950.00
6-30-2019	0.52	40.51	57.65	219.42	161.93	1674.51	110.01	2.78	6.42	4,950.00
7-31-2019	0.21	40.52	6.59	219.63	175.67	1679.95	30.98	25.80	6.44	4,950.00
8-31-2019	0.16	40.53	6.84	219.84	166.61	1685.12	43.23	23.81	6.45	4,950.00
9-30-2019	0.14	40.53	6.11	220.02	165.05	1690.07	42.32	26.38	6.47	4,950.00
10-31-2019	0.14	40.54	6.84	220.23	193.97	1696.08	47.49	27.75	6.49	4,950.00
11-30-2019	0.08	40.54	4.02	220.36	419.90	1708.68	47.43	102.15	6.53	4,950.00
12-31-2019	0.10	40.54	4.36	220.49	181.77	1714.32	45.60	40.81	6.55	4,950.00



VRU No. 1

Pattern P-02 - 00/15-25-010-26W1/0

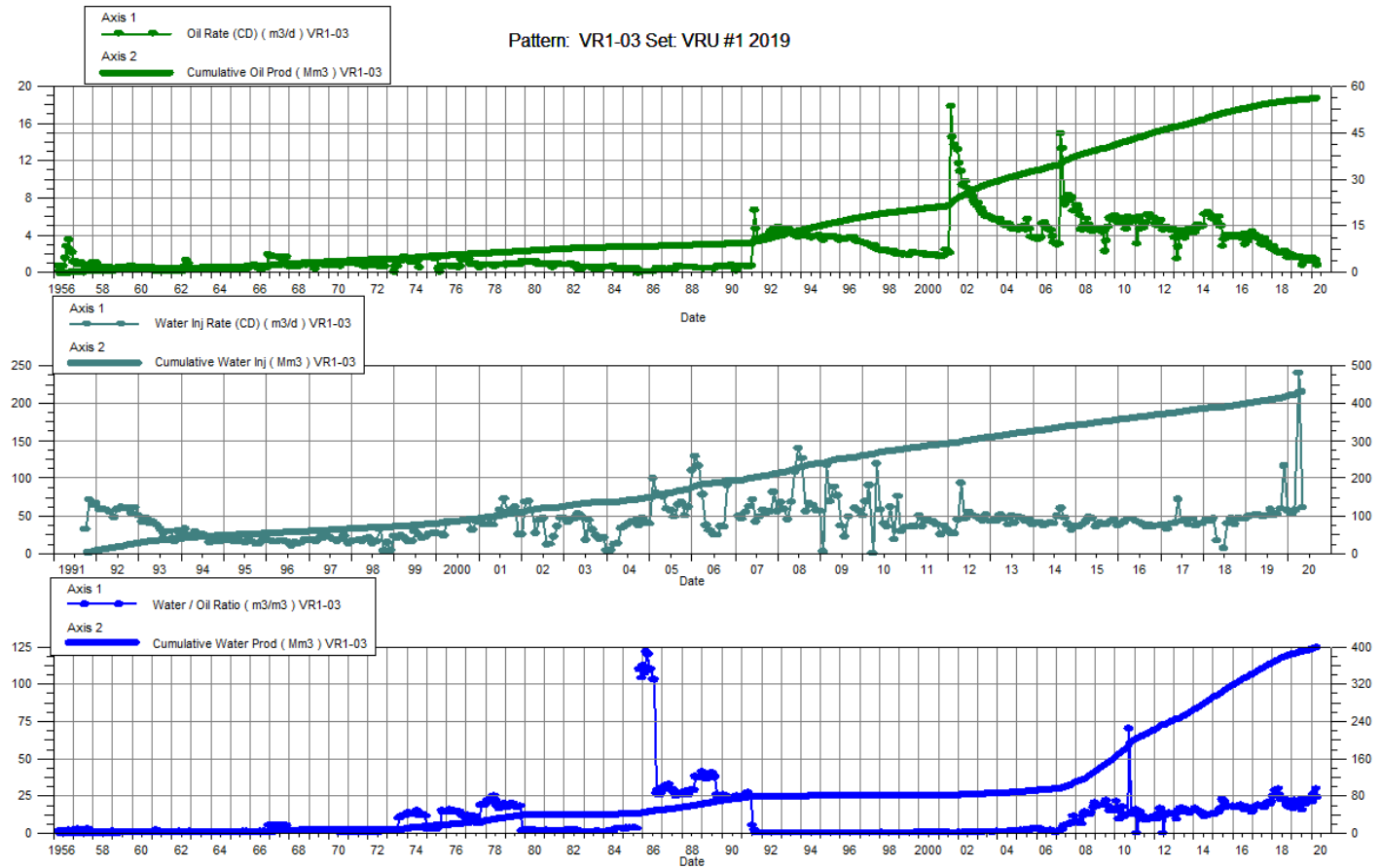
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	1.43	119.76	27.57	624.51		929.60	19.25		1.25	6,200.00
2-28-2019	1.20	119.80	19.79	625.07		929.60	16.54		1.24	6,200.00
3-31-2019	1.32	119.84	19.46	625.67		929.60	14.80		1.24	6,200.00
4-30-2019	2.01	119.90	53.11	627.26		929.60	26.37		1.24	6,200.00
5-31-2019	1.98	119.96	55.84	628.99		929.60	28.18		1.24	6,200.00
6-30-2019	1.68	120.01	55.07	630.65		929.60	32.86		1.24	6,200.00
7-31-2019	1.75	120.07	41.52	631.93	78.45	932.03	23.73	1.81	1.24	6,200.00
8-31-2019	1.24	120.10	50.03	633.48	72.82	934.29	40.39	1.42	1.24	6,200.00
9-30-2019	1.22	120.14	50.44	635.00	72.92	936.48	41.47	1.41	1.24	6,200.00
10-31-2019	1.28	120.18	60.27	636.87	90.73	939.29	47.05	1.47	1.24	6,200.00
11-30-2019	1.06	120.21	46.74	638.27	184.27	944.82	43.95	3.85	1.24	6,200.00
12-31-2019	1.24	120.25	48.20	639.76	78.26	947.25	38.77	1.58	1.24	6,909.68



VRU No. 1

Pattern P-03 - 00/15-30-010-25W1/0

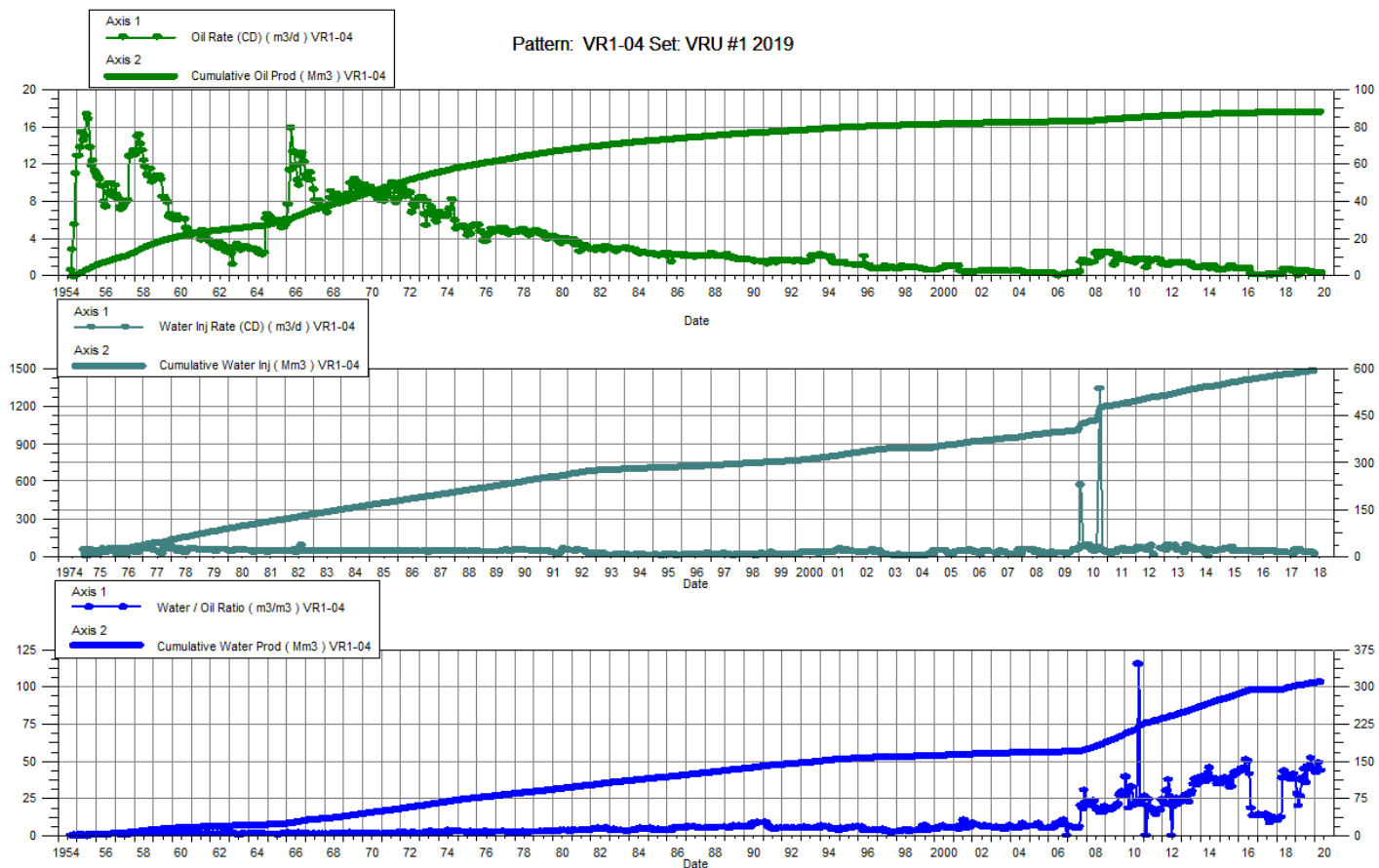
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1-31-2019	1.84	55.60	30.58	384.49	49.43	401.73	16.65	1.52	0.91	6,900.00
2-28-2019	1.66	55.65	37.13	385.53	50.03	403.13	22.32	1.29	0.91	6,900.00
3-31-2019	1.65	55.70	30.83	386.49	51.32	404.72	18.72	1.58	0.91	6,900.00
4-30-2019	1.73	55.75	30.52	387.40	50.84	406.25	17.66	1.58	0.92	6,900.00
5-31-2019	1.75	55.80	32.46	388.41	48.97	407.77	18.59	1.43	0.92	6,900.00
6-30-2019	1.55	55.85	34.88	389.46	50.22	409.27	22.51	1.38	0.92	6,900.00
7-31-2019	0.87	55.88	13.35	389.87	58.53	411.09	15.35	4.11	0.92	6,900.00
8-31-2019	1.24	55.91	25.41	390.66	50.75	412.66	20.49	1.90	0.92	6,900.00
9-30-2019	1.42	55.96	27.91	391.50	52.09	414.22	19.70	1.78	0.92	6,900.00
10-31-2019	1.57	56.01	34.81	392.58	59.47	416.07	22.13	1.63	0.93	6,900.00
11-30-2019	1.34	56.05	31.49	393.52	116.61	419.56	23.54	3.55	0.93	6,900.00
12-31-2019	1.28	56.09	27.69	394.38	57.23	421.34	21.63	1.97	0.93	6,900.00



VRU No. 1

Pattern P-04 - 00/11-25-010-26W1/0

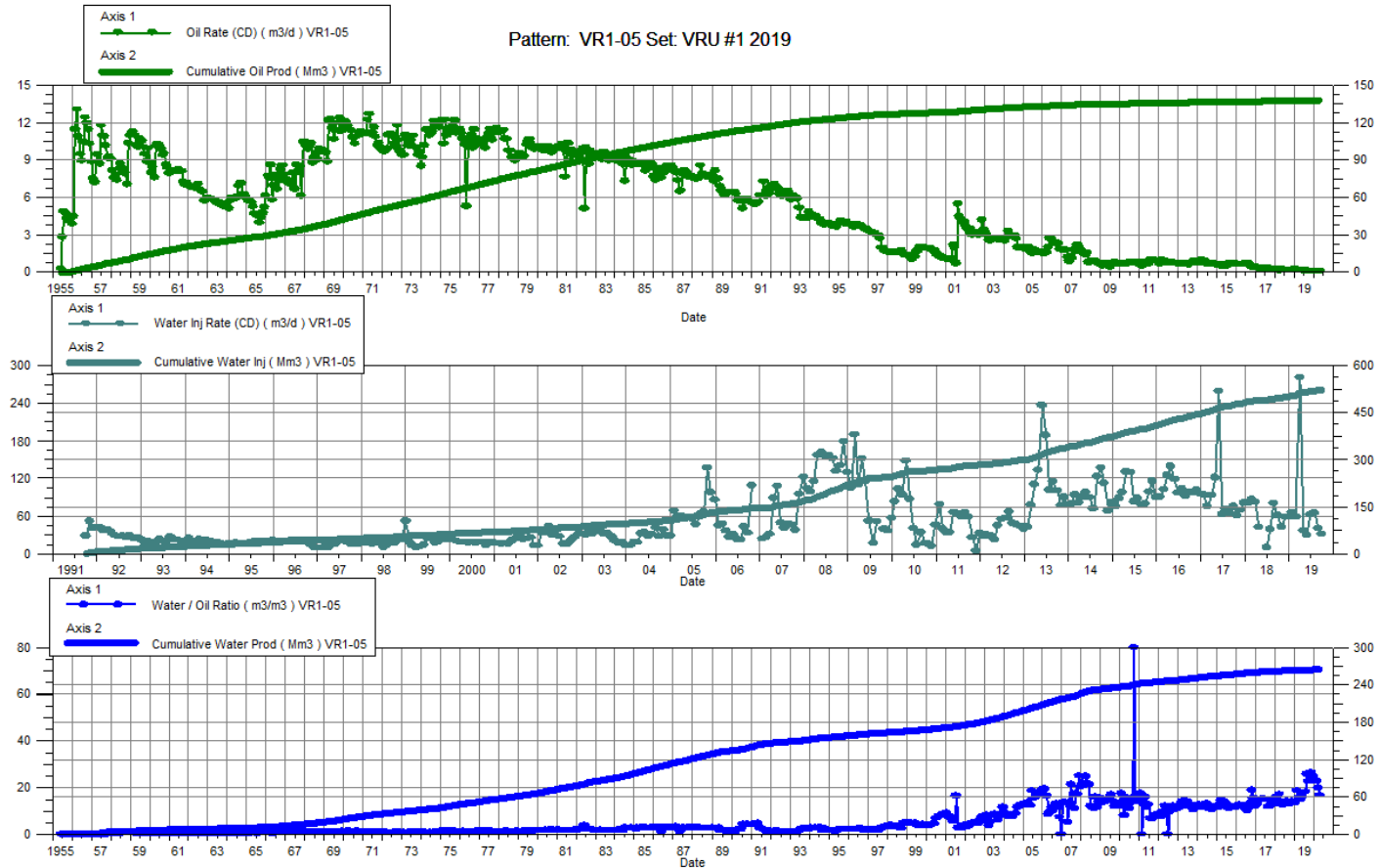
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1-31-2019	0.29	88.24	8.30	302.04		597.26	28.28		1.52	6,400.00
2-28-2019	0.10	88.24	1.98	302.10		597.26	19.85		1.52	6,400.00
3-31-2019	0.16	88.25	4.35	302.23		597.26	26.53		1.52	6,400.00
4-30-2019	0.61	88.27	22.61	302.91		597.26	36.99		1.52	6,400.00
5-31-2019	0.61	88.28	23.83	303.65		597.26	38.84		1.52	6,400.00
6-30-2019	0.56	88.30	25.07	304.40		597.26	44.99		1.51	6,400.00
7-31-2019	0.65	88.32	23.24	305.12		597.26	35.72		1.51	6,400.00
8-31-2019	0.54	88.34	25.34	305.91		597.26	46.77		1.51	6,400.00
9-30-2019	0.49	88.35	22.72	306.59		597.26	46.64		1.51	6,400.00
10-31-2019	0.49	88.37	25.39	307.37		597.26	52.02		1.50	6,400.00
11-30-2019	0.30	88.38	13.29	307.77		597.26	45.01		1.50	6,400.00
12-31-2019	0.34	88.39	15.00	308.24		597.26	43.72		1.50	6,400.00



VRU No. 1

Pattern P-05 - 00/09-30-010-25W1/0

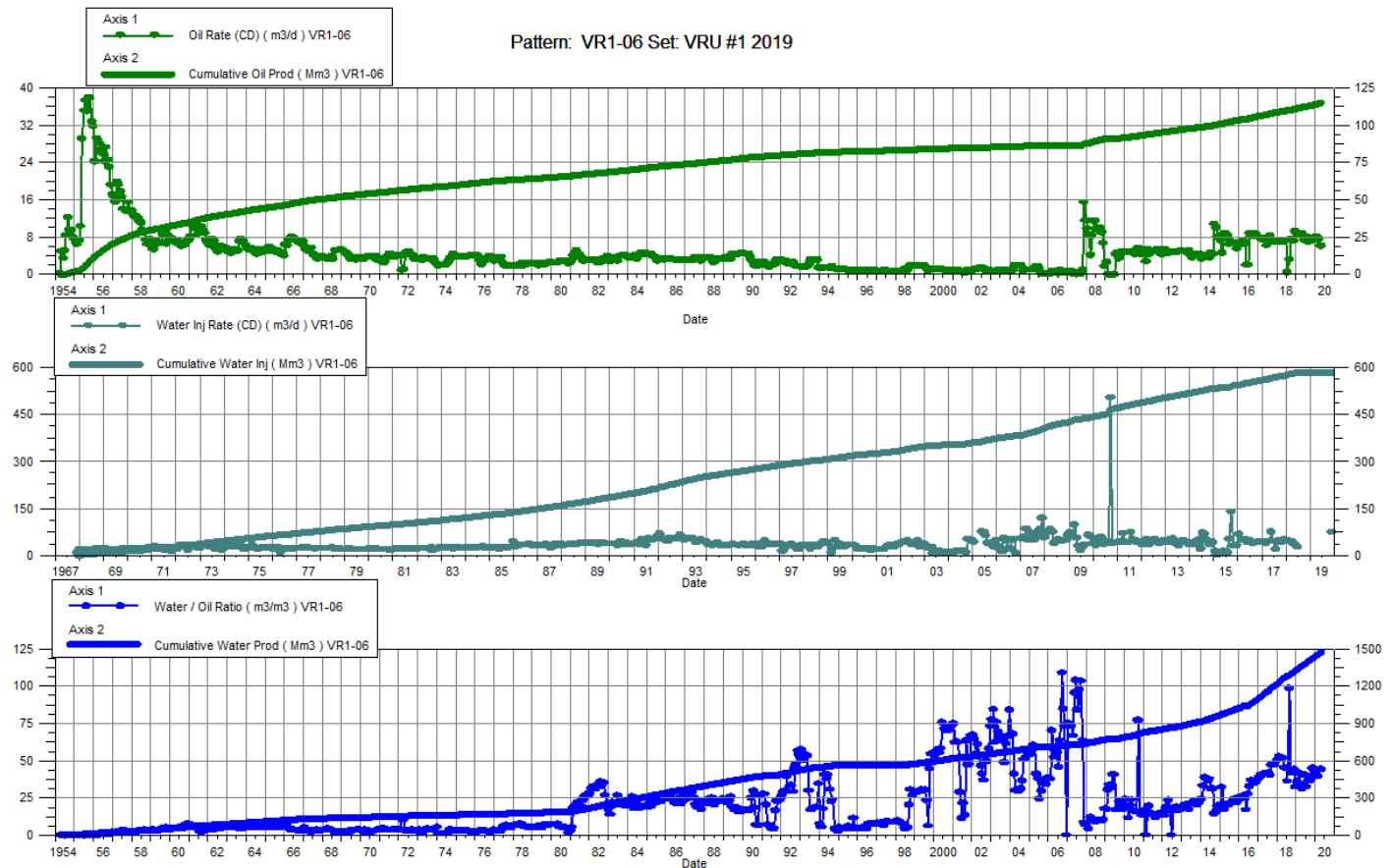
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	0.29	137.60	3.89	262.52	65.82	504.43	13.63	15.75	1.25	7,370.00
2-28-2019	0.23	137.60	4.37	262.64	58.58	506.07	18.71	12.71	1.26	7,370.00
3-31-2019	0.22	137.61	3.45	262.75	282.31	514.82	15.81	76.98	1.28	7,370.00
4-30-2019	0.23	137.62	3.42	262.85	36.12	515.90	15.00	9.89	1.28	7,370.00
5-31-2019	0.22	137.63	3.51	262.96	30.29	516.84	15.88	8.11	1.28	7,370.00
6-30-2019	0.18	137.63	3.13	263.05	61.98	518.70	17.71	18.73	1.29	7,370.00
7-31-2019	0.16	137.64	2.87	263.14	64.85	520.71	18.30	21.43	1.29	7,370.00
8-31-2019	0.12	137.64	3.09	263.24	40.30	521.96	25.77	12.56	1.29	7,370.00
9-30-2019	0.12	137.64	2.65	263.31	31.13	522.89	22.49	11.25	1.30	7,370.00
10-31-2019	0.12	137.65	3.05	263.41		522.89	24.99		1.30	7,370.00
11-30-2019	0.12	137.65	3.31	263.51		522.89	26.52		1.30	7,370.00
12-31-2019	0.13	137.65	3.17	263.61		522.89	24.76		1.30	7,370.00



VRU No. 1

Pattern P-06 - 00/03-26-010-26W1/0

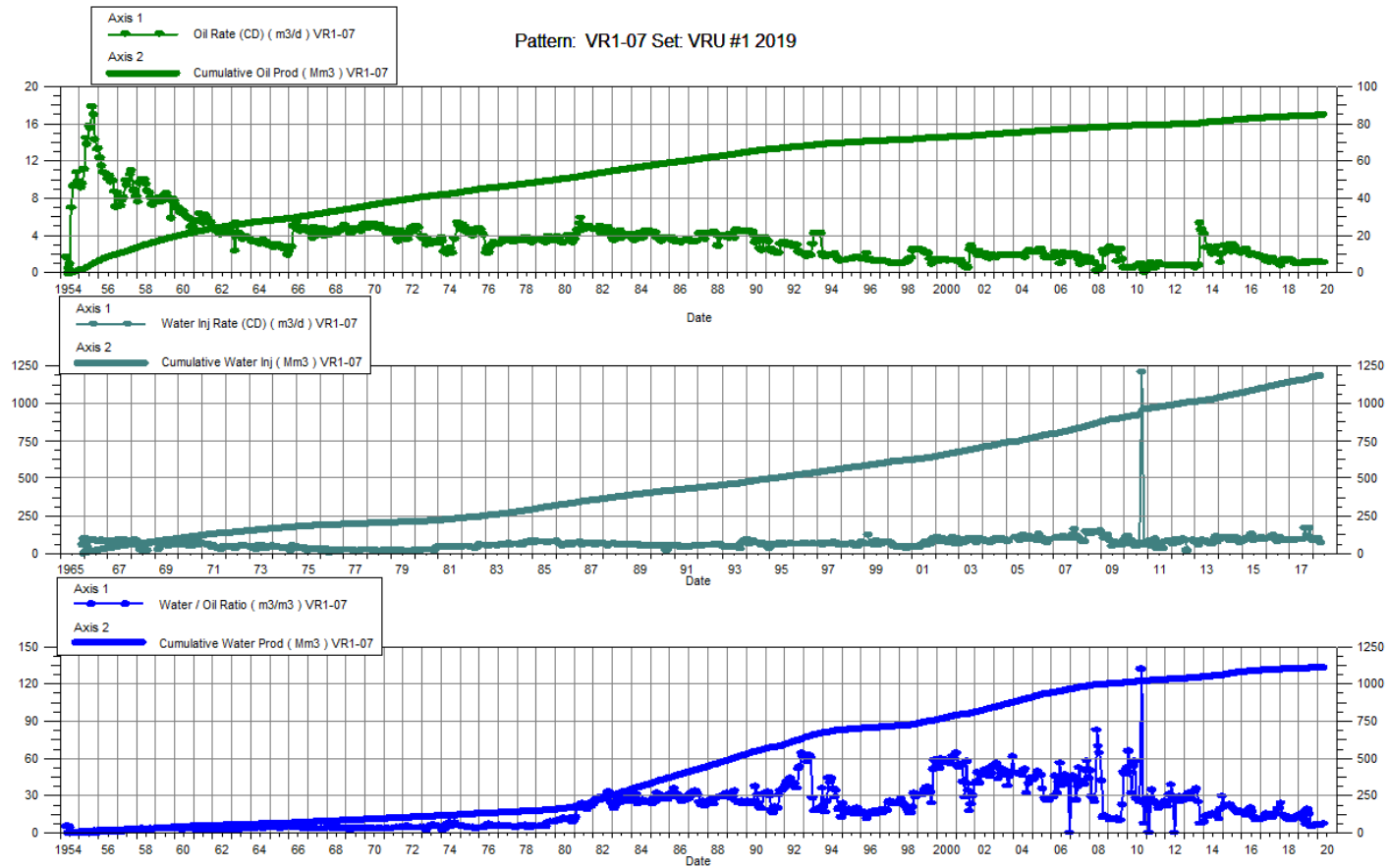
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	8.62	111.27	306.92	1333.27		585.09	35.60		0.40	4,850.00
2-28-2019	8.53	111.51	356.53	1343.25		585.09	41.81		0.40	4,850.00
3-31-2019	8.56	111.78	282.91	1352.02		585.09	33.06		0.40	4,850.00
4-30-2019	8.95	112.05	279.26	1360.40		585.09	31.20		0.40	4,850.00
5-31-2019	8.46	112.31	282.78	1369.17		585.09	33.41		0.39	4,850.00
6-30-2019	7.27	112.53	291.37	1377.91		585.09	40.08		0.39	4,850.00
7-31-2019	8.13	112.78	261.26	1386.01		585.09	32.14		0.39	4,850.00
8-31-2019	6.98	113.00	250.59	1393.77		585.09	35.91		0.39	4,850.00
9-30-2019	7.33	113.22	264.05	1401.70		585.09	36.04		0.39	4,850.00
10-31-2019	7.79	113.46	296.44	1410.89		585.09	38.07		0.38	4,850.00
11-30-2019	7.35	113.68	329.65	1420.78	72.09	587.25	44.83	0.21	0.38	4,850.00
12-31-2019	7.62	113.91	315.82	1430.57		587.25	41.47		0.38	4,850.00



VRU No. 1

Pattern P-07 - 00/05-25-010-26W1/0

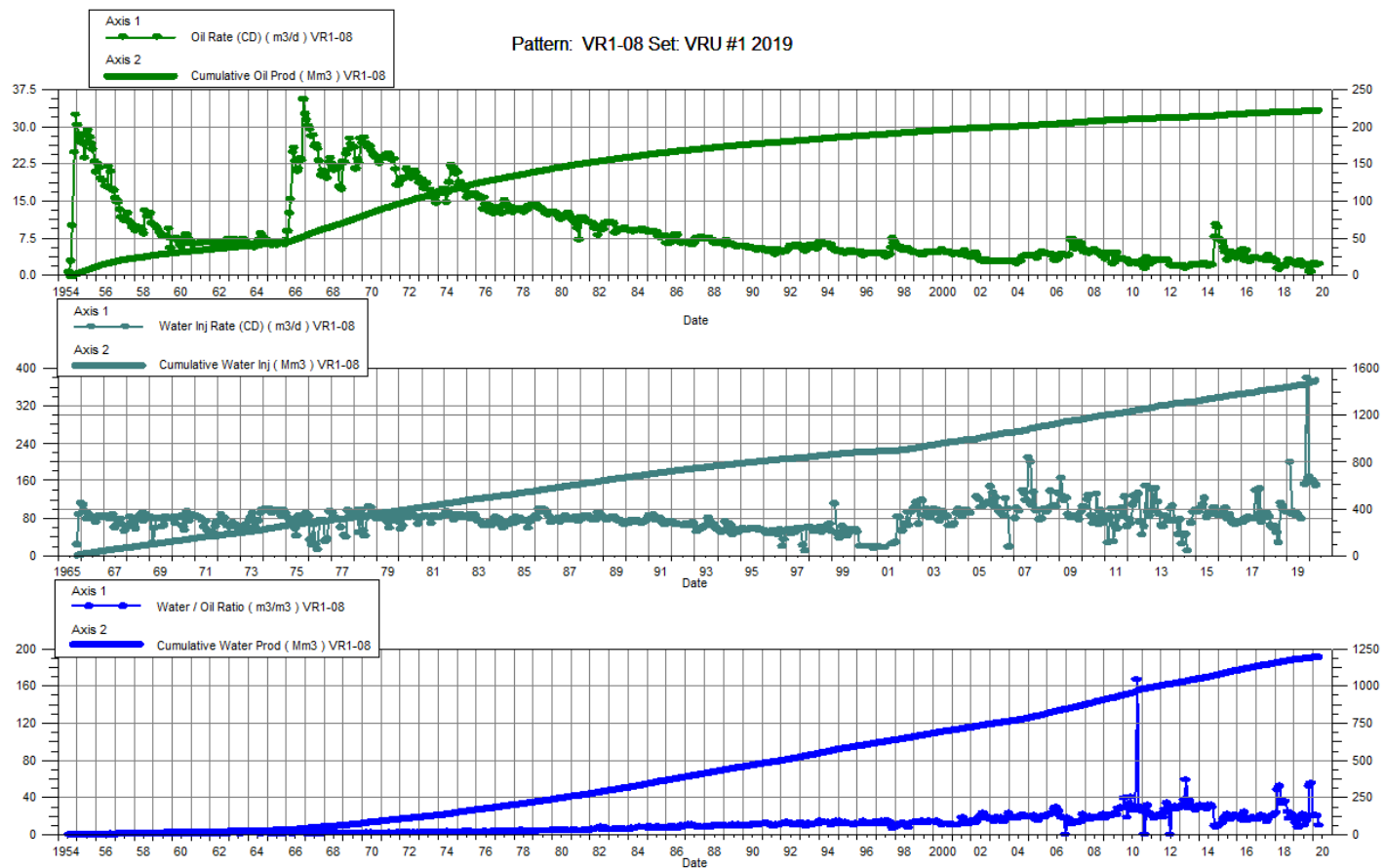
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	1.09	84.52	13.83	1103.28		1192.78	12.71		1.00	6,200.00
2-28-2019	1.05	84.55	16.18	1103.73		1192.78	15.45		1.00	6,200.00
3-31-2019	1.10	84.58	12.89	1104.13		1192.78	11.74		1.00	6,200.00
4-30-2019	1.24	84.62	12.50	1104.51		1192.78	10.12		1.00	6,200.00
5-31-2019	1.20	84.65	8.54	1104.77		1192.78	7.12		1.00	6,200.00
6-30-2019	1.03	84.69	19.43	1105.35		1192.78	18.77		1.00	6,200.00
7-31-2019	1.25	84.72	18.90	1105.94		1192.78	15.18		1.00	6,200.00
8-31-2019	1.25	84.76	6.66	1106.15		1192.78	5.35		1.00	6,200.00
9-30-2019	1.24	84.80	6.44	1106.34		1192.78	5.19		1.00	6,200.00
10-31-2019	1.23	84.84	7.33	1106.57		1192.78	5.95		1.00	6,200.00
11-30-2019	1.13	84.87	7.53	1106.79		1192.78	6.68		1.00	6,200.00
12-31-2019	1.16	84.91	7.22	1107.02		1192.78	6.20		1.00	6,200.00



VRU No. 1

Pattern P-08 - 00/07-25-010-26W1/0

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	2.52	221.09	32.31	1176.49		1444.25	12.82		1.03	7,000.00
2-28-2019	2.33	221.15	27.55	1177.26	200.00	1449.85	11.82	6.68	1.03	7,000.00
3-31-2019	2.38	221.23	20.21	1177.89	89.03	1452.61	8.50	3.93	1.04	7,000.00
4-30-2019	2.93	221.31	51.80	1179.44	93.00	1455.40	17.68	1.70	1.04	7,000.00
5-31-2019	2.81	221.40	52.67	1181.08	86.45	1458.08	18.74	1.56	1.04	7,000.00
6-30-2019	2.08	221.46	45.61	1182.44	88.37	1460.73	21.93	1.85	1.04	7,000.00
7-31-2019	2.28	221.53	23.19	1183.16		1460.73	10.19		1.04	7,000.00
8-31-2019	2.16	221.60	32.94	1184.18	79.42	1463.19	15.26	2.26	1.04	7,000.00
9-30-2019	2.23	221.67	41.05	1185.42		1463.19	18.42		1.04	7,000.00
10-31-2019	0.91	221.70	47.92	1186.90	152.57	1467.92	52.52	3.12	1.04	7,000.00
11-30-2019	0.83	221.72	45.90	1188.28	380.84	1479.35	55.15	8.15	1.05	7,000.00
12-31-2019	2.23	221.79	45.49	1189.69	168.35	1484.57	20.39	3.53	1.05	7,000.00

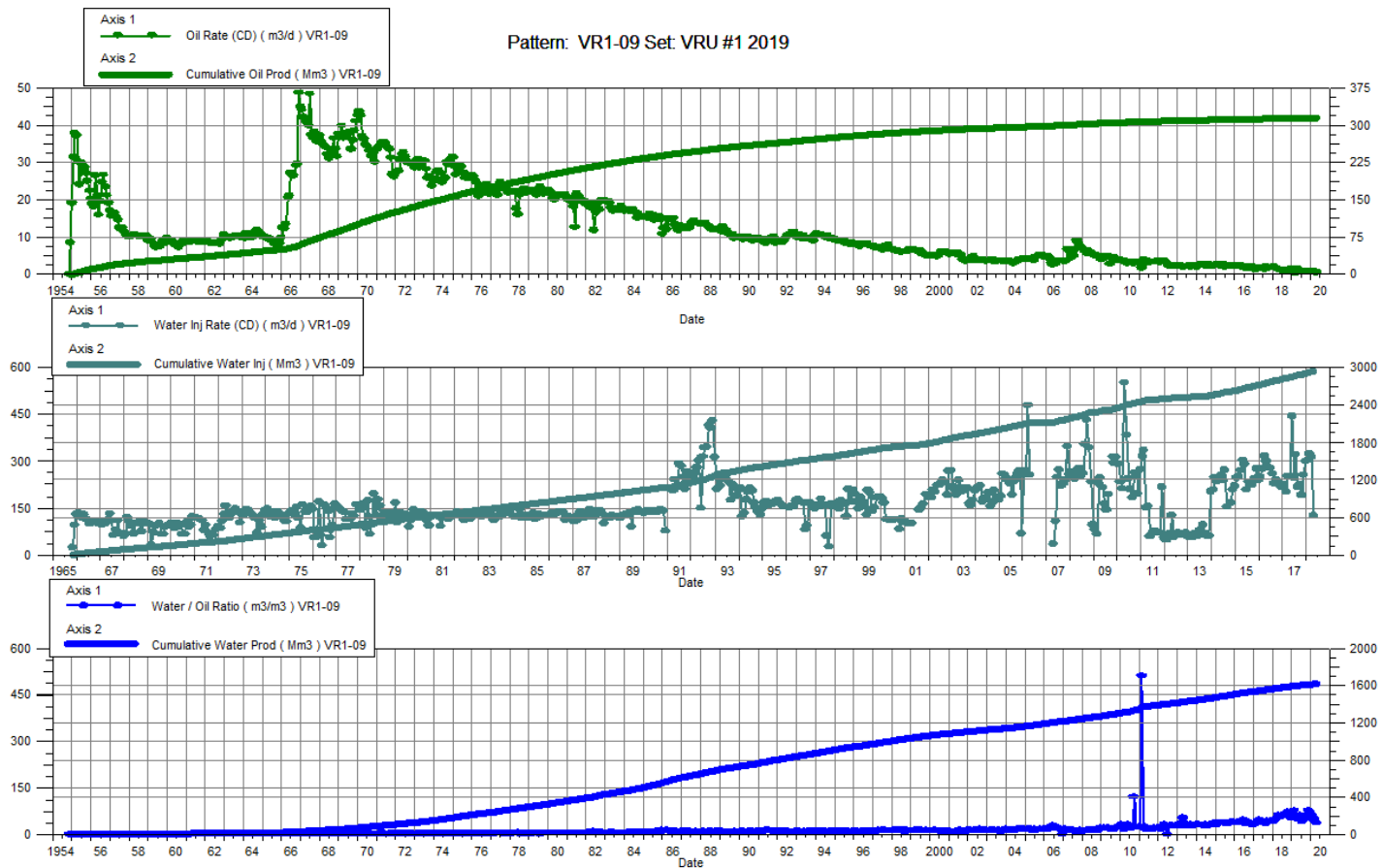


VRU No. 1

Pattern P-09 – 00/05-30-010-25W1/0

P-09 – 03/01-25-010-26W1/0

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	Water Inj Pressure kPa
1-31-2019	0.81	314.63	45.16	1589.48		2950.53	55.94		1.55	6,550.00	--
2-28-2019	0.47	314.65	37.20	1590.52		2950.53	78.45		1.54	6,550.00	--
3-31-2019	0.51	314.66	31.60	1591.50		2950.53	62.43		1.54	6,550.00	--
4-30-2019	1.59	314.71	79.67	1593.89		2950.53	50.04		1.54	6,550.00	--
5-31-2019	1.31	314.75	72.91	1596.15		2950.53	55.65		1.54	6,550.00	--
6-30-2019	0.98	314.78	60.65	1597.97		2950.53	62.07		1.54	6,550.00	--
7-31-2019	0.91	314.81	36.76	1599.11		2950.53	40.46		1.54	6,550.00	--
8-31-2019	0.91	314.84	46.69	1600.56		2950.53	51.21		1.54	6,550.00	--
9-30-2019	1.00	314.87	54.03	1602.18		2950.53	53.79		1.53	6,550.00	--
10-31-2019	1.05	314.90	66.88	1604.25		2950.53	63.83		1.53	6,550.00	--
11-30-2019	0.75	314.92	57.88	1605.99		2950.53	77.24		1.53	6,550.00	--
12-31-2019	0.74	314.95	52.16	1607.60		2950.53	70.50		1.53	6,550.00	--

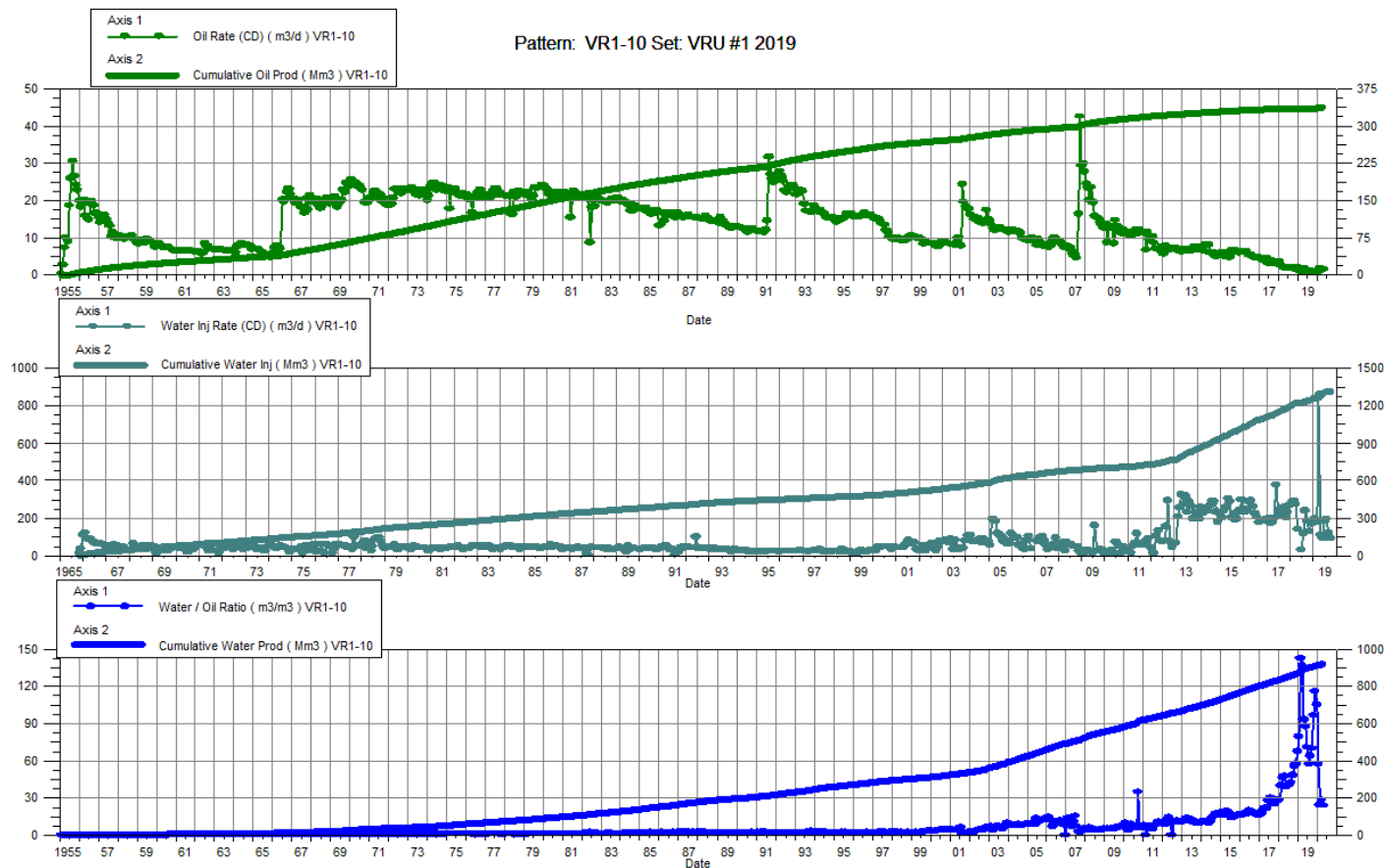


VRU No. 1

Pattern P-10 - 00/07-30-010-25W1/0

P-10 - 04/08-30-010-25W1/0

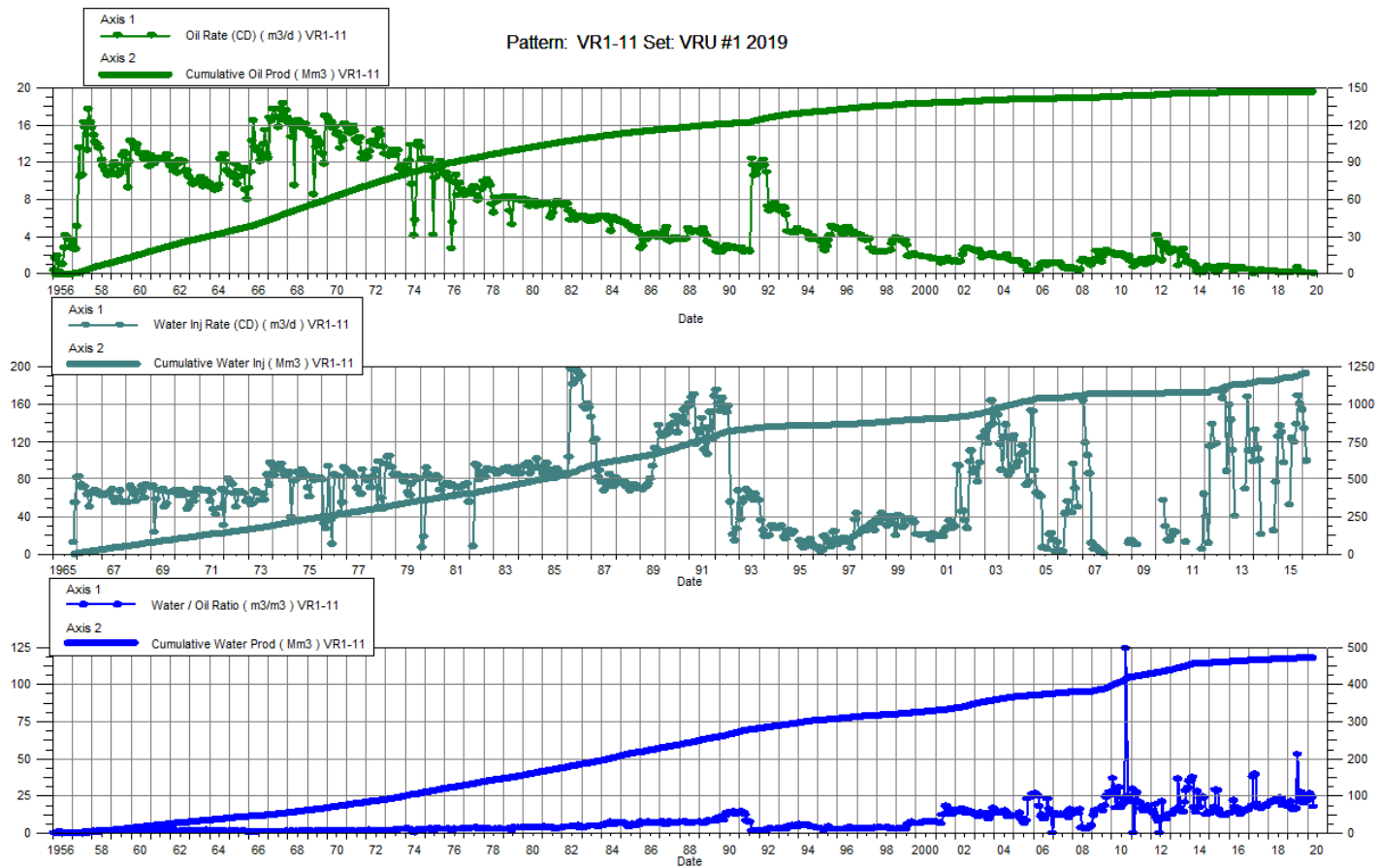
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa	Water Inj Pressure kPa
1-31-2019	1.81	336.30	143.86	873.75	197.45	1265.08	79.34	1.36	1.04	6,900.00	7,200.00
2-28-2019	1.24	336.34	176.02	878.68	175.73	1270.01	142.39	0.99	1.04	6,900.00	7,200.00
3-31-2019	1.13	336.37	153.94	883.45	846.94	1296.26	136.18	5.46	1.06	6,900.00	7,200.00
4-30-2019	1.81	336.43	168.16	888.49	108.36	1299.51	93.04	0.64	1.06	6,900.00	7,200.00
5-31-2019	1.57	336.48	137.50	892.76	90.88	1302.33	87.72	0.65	1.05	6,900.00	7,200.00
6-30-2019	1.24	336.51	88.08	895.40	185.93	1307.91	70.98	2.08	1.06	6,900.00	7,200.00
7-31-2019	1.38	336.56	79.12	897.85	194.54	1313.94	57.37	2.42	1.06	6,900.00	7,200.00
8-31-2019	1.23	336.60	79.11	900.30	120.90	1317.69	64.12	1.50	1.06	6,900.00	7,200.00
9-30-2019	1.05	336.63	73.18	902.50	93.39	1320.49	69.72	1.26	1.06	6,900.00	7,200.00
10-31-2019	0.94	336.66	90.68	905.31		1320.49	96.41		1.06	6,900.00	7,200.00
11-30-2019	0.79	336.68	90.99	908.04		1320.49	115.59		1.06	6,900.00	7,200.00
12-31-2019	0.81	336.71	85.50	910.69		1320.49	105.34		1.05	6,900.00	7,200.00



VRU No. 1

Pattern P-11 - 00/05-29-010-25W1/0

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	0.26	147.23	4.72	468.60		1215.47	18.07		1.97	6,800.00
2-28-2019	0.25	147.24	5.28	468.75		1215.47	21.00		1.96	6,800.00
3-31-2019	0.26	147.25	4.22	468.88		1215.47	16.14		1.96	6,800.00
4-30-2019	0.27	147.26	4.14	469.01		1215.47	15.30		1.96	6,800.00
5-31-2019	0.26	147.27	4.37	469.14		1215.47	16.52		1.96	6,800.00
6-30-2019	0.78	147.29	41.18	470.38		1215.47	52.81		1.96	6,800.00
7-31-2019	0.25	147.30	5.19	470.54		1215.47	21.03		1.96	6,800.00
8-31-2019	0.23	147.30	6.26	470.73		1215.47	27.59		1.96	6,800.00
9-30-2019	0.23	147.31	5.46	470.90		1215.47	24.18		1.96	6,800.00
10-31-2019	0.16	147.32	3.19	470.99		1215.47	19.86		1.96	6,800.00
11-30-2019	0.15	147.32	3.56	471.10		1215.47	23.52		1.96	6,800.00
12-31-2019	0.16	147.33	3.43	471.21		1215.47	21.92		1.96	6,800.00

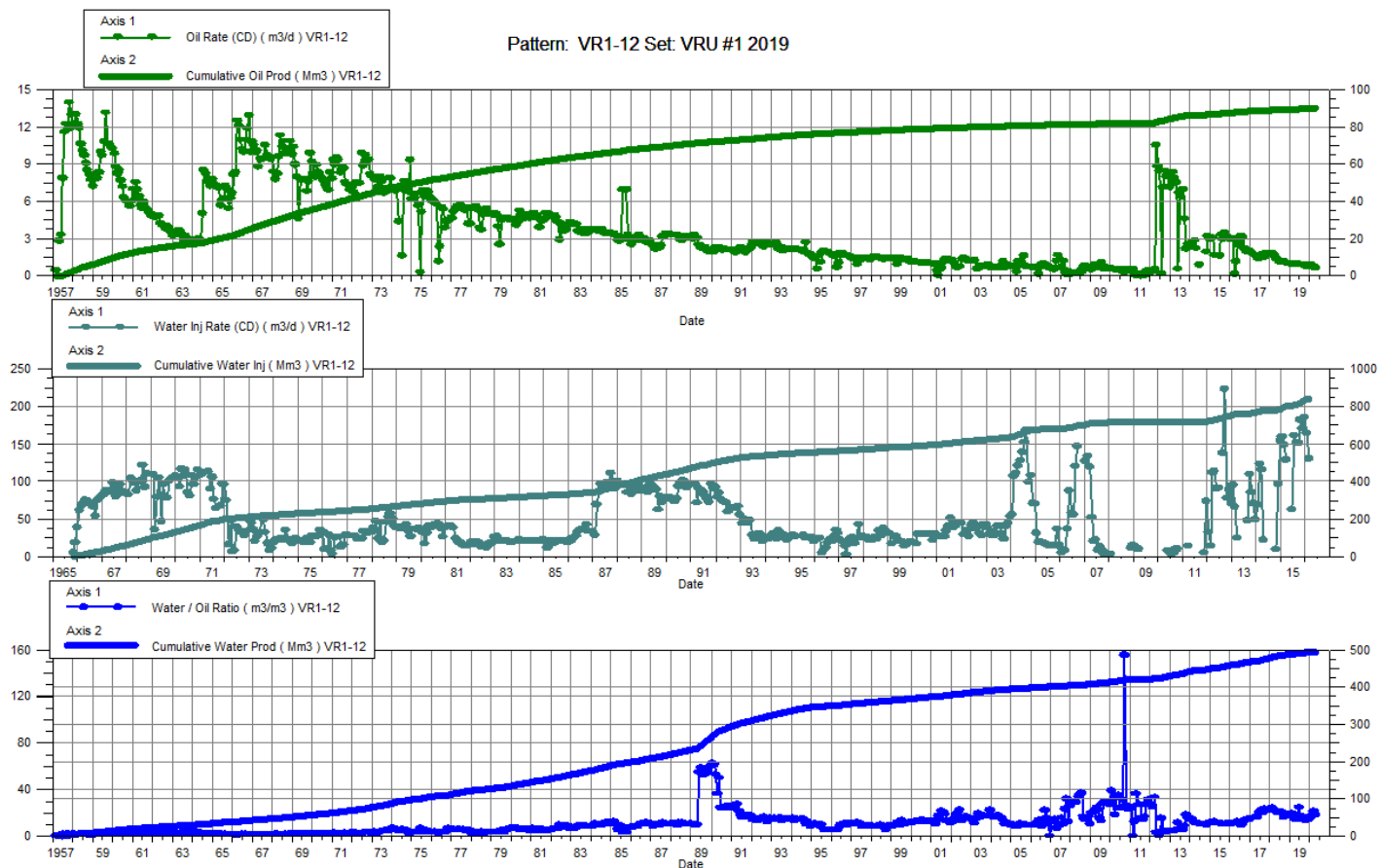


VRU No. 1

Pattern P-12 – 00/06-29-010-25W1/0

P-12 – 00/07-29-010-25W1/0

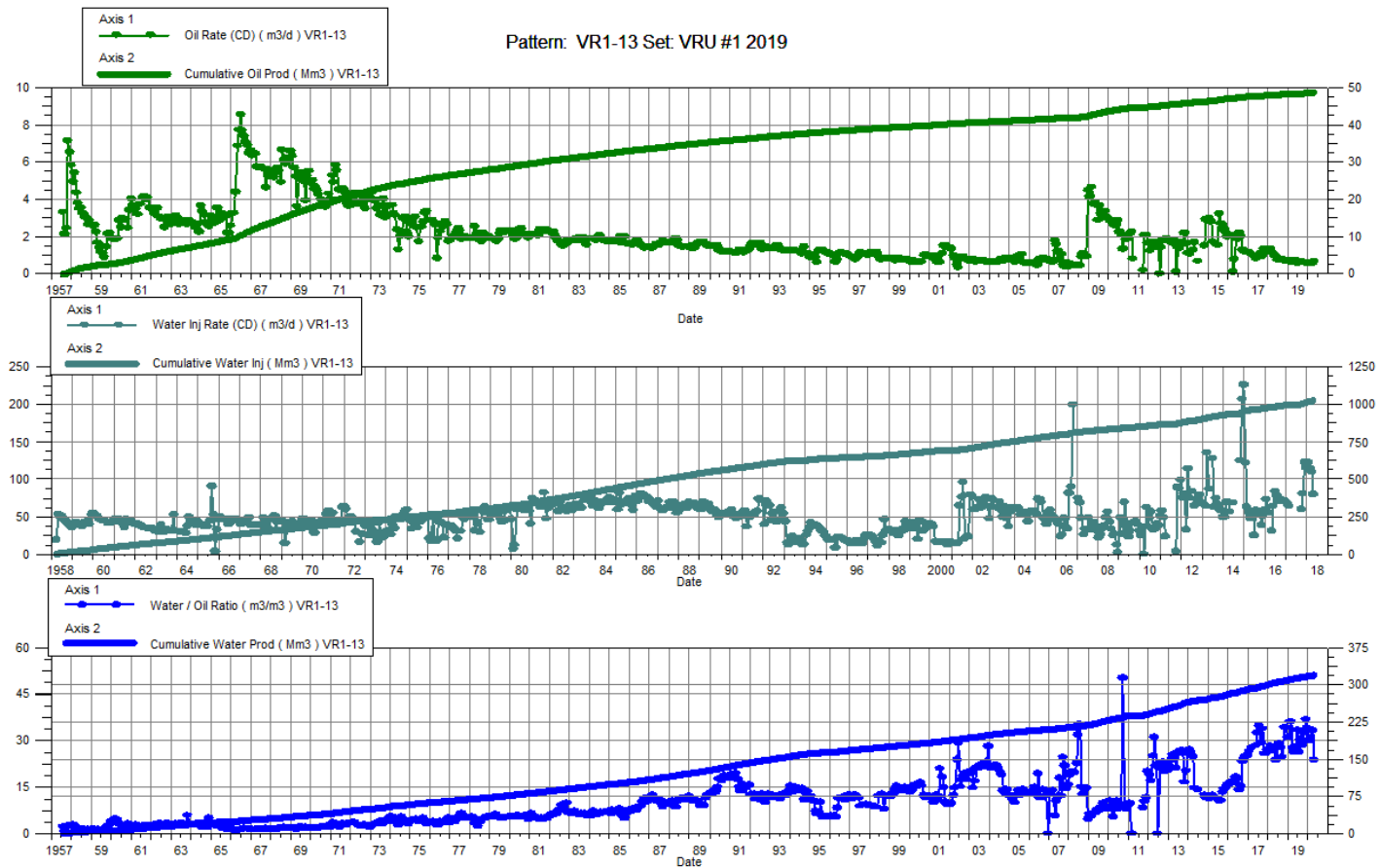
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa	Water Inj Pressure kPa
1-31-2019	0.97	89.62	16.27	487.04		844.13	16.76		1.46	6,800.00	6,800.00
2-28-2019	0.94	89.65	17.95	487.55		844.13	19.17		1.46	6,800.00	6,800.00
3-31-2019	0.97	89.68	14.39	487.99		844.13	14.76		1.46	6,800.00	6,800.00
4-30-2019	1.01	89.71	14.09	488.42		844.13	13.98		1.46	6,800.00	6,800.00
5-31-2019	0.99	89.74	14.68	488.87		844.13	14.80		1.46	6,800.00	6,800.00
6-30-2019	0.96	89.77	23.64	489.58		844.13	24.58		1.45	6,800.00	6,800.00
7-31-2019	0.97	89.80	13.55	490.00		844.13	13.97		1.45	6,800.00	6,800.00
8-31-2019	0.96	89.83	16.04	490.50		844.13	16.77		1.45	6,800.00	6,800.00
9-30-2019	0.94	89.86	14.36	490.93		844.13	15.30		1.45	6,800.00	6,800.00
10-31-2019	0.80	89.88	10.50	491.25		844.13	13.20		1.45	6,800.00	6,800.00
11-30-2019	0.76	89.91	11.82	491.61		844.13	15.57		1.45	6,800.00	6,800.00
12-31-2019	0.79	89.93	11.41	491.96		844.13	14.53		1.45	6,800.00	6,800.00



VRU No. 1

Pattern P-13 - 00/05-28-010-25W1/0

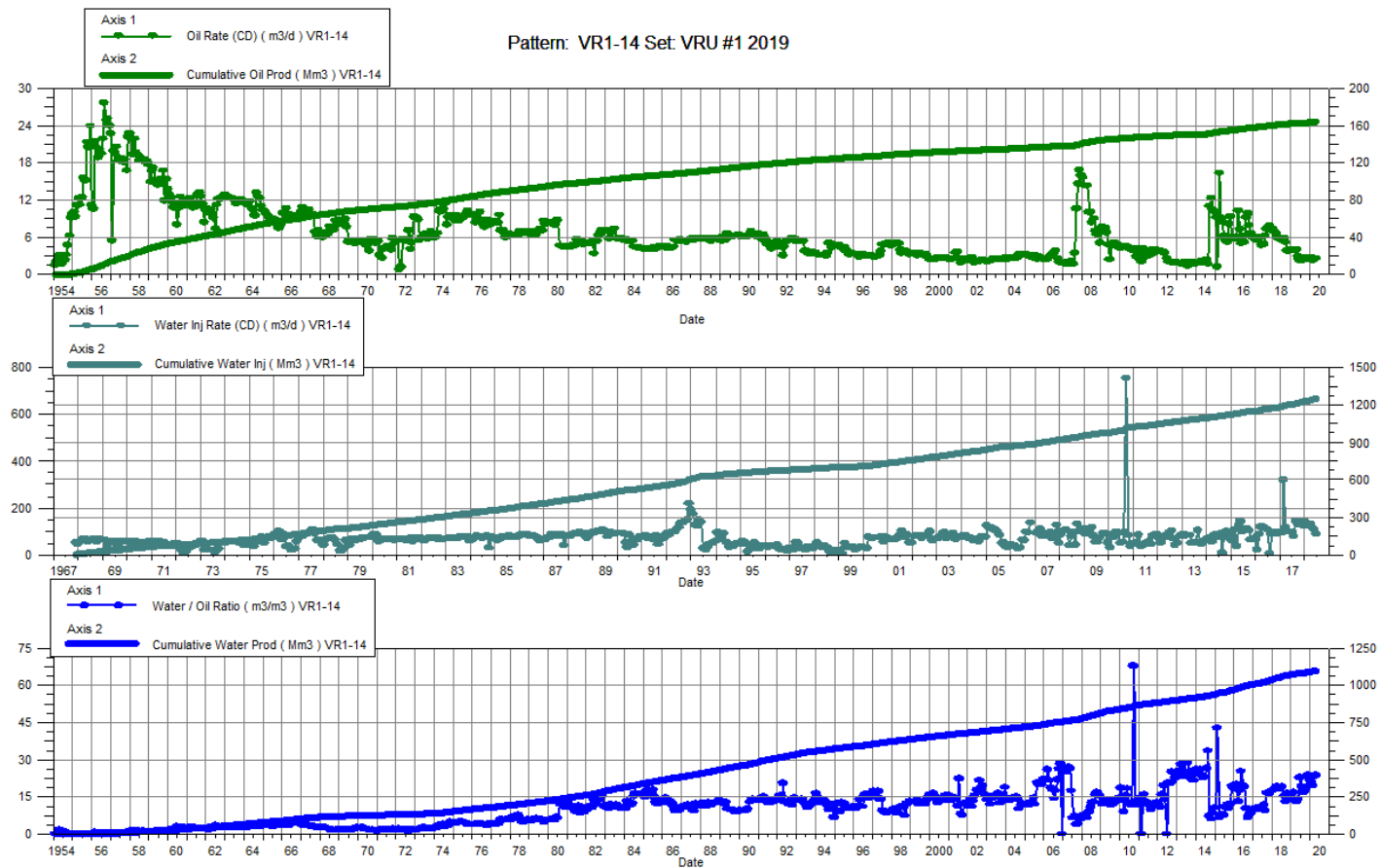
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	0.70	48.37	21.73	309.26		1027.52	31.26		2.87	5,600.00
2-28-2019	0.68	48.39	24.56	309.95		1027.52	36.01		2.86	5,600.00
3-31-2019	0.71	48.41	19.70	310.56		1027.52	27.61		2.86	5,600.00
4-30-2019	0.75	48.43	19.53	311.15		1027.52	26.15		2.85	5,600.00
5-31-2019	0.71	48.45	19.96	311.76		1027.52	27.97		2.85	5,600.00
6-30-2019	0.58	48.47	19.48	312.35		1027.52	33.36		2.84	5,600.00
7-31-2019	0.68	48.49	17.86	312.90		1027.52	26.24		2.84	5,600.00
8-31-2019	0.66	48.51	19.93	313.52		1027.52	30.24		2.83	5,600.00
9-30-2019	0.64	48.53	18.32	314.07		1027.52	28.51		2.83	5,600.00
10-31-2019	0.62	48.55	20.18	314.70		1027.52	32.34		2.82	5,600.00
11-30-2019	0.59	48.57	21.56	315.34		1027.52	36.70		2.82	5,600.00
12-31-2019	0.60	48.59	20.53	315.98		1027.52	33.99		2.81	5,600.00



VRU No. 1

Pattern P-14 - 00/15-23-010-26W1/0

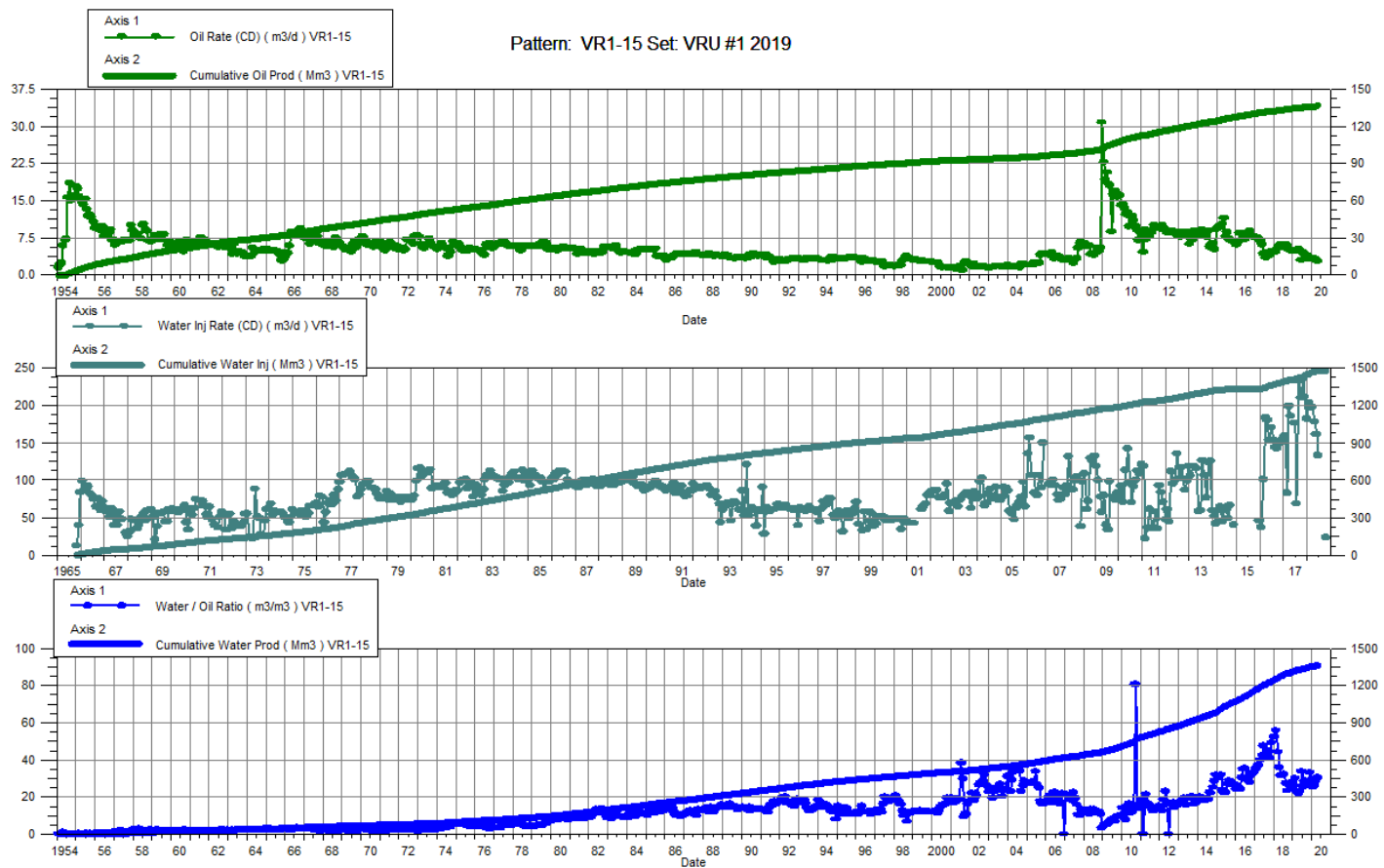
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	4.01	162.71	57.18	1070.14		1253.86	14.25		1.01	5,000.00
2-28-2019	3.93	162.82	65.89	1071.99		1253.86	16.77		1.01	5,000.00
3-31-2019	3.96	162.94	53.09	1073.63		1253.86	13.42		1.01	5,000.00
4-30-2019	4.12	163.07	52.99	1075.22		1253.86	12.86		1.01	5,000.00
5-31-2019	2.91	163.16	40.75	1076.49		1253.86	13.99		1.01	5,000.00
6-30-2019	2.37	163.23	53.80	1078.10		1253.86	22.69		1.01	5,000.00
7-31-2019	2.58	163.31	50.10	1079.65		1253.86	19.41		1.01	5,000.00
8-31-2019	2.41	163.38	40.17	1080.90		1253.86	16.65		1.01	5,000.00
9-30-2019	2.55	163.46	43.61	1082.21		1253.86	17.07		1.00	5,000.00
10-31-2019	2.77	163.54	50.29	1083.76		1253.86	18.14		1.00	5,000.00
11-30-2019	2.62	163.62	62.05	1085.63		1253.86	23.70		1.00	5,000.00
12-31-2019	2.56	163.70	55.54	1087.35		1253.86	21.67		1.00	5,000.00



VRU No. 1

Pattern P-15 - 00/13-24-010-26W1/0

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	4.96	134.72	127.51	1310.58		1484.97	25.72		1.03	5,000.00
2-28-2019	4.90	134.86	147.22	1314.70		1484.97	30.02		1.02	5,000.00
3-31-2019	5.11	135.02	118.03	1318.36		1484.97	23.08		1.02	5,000.00
4-30-2019	5.40	135.18	116.94	1321.87		1484.97	21.67		1.02	5,000.00
5-31-2019	5.00	135.34	113.84	1325.39		1484.97	22.78		1.02	5,000.00
6-30-2019	3.09	135.43	104.48	1328.53		1484.97	33.78		1.01	5,000.00
7-31-2019	4.50	135.57	115.47	1332.11		1484.97	25.64		1.01	5,000.00
8-31-2019	4.27	135.70	121.20	1335.87		1484.97	28.40		1.01	5,000.00
9-30-2019	4.02	135.82	104.42	1339.00		1484.97	25.98		1.01	5,000.00
10-31-2019	4.01	135.95	110.22	1342.42		1484.97	27.51		1.00	5,000.00
11-30-2019	3.47	136.05	115.14	1345.87		1484.97	33.20		1.00	5,000.00
12-31-2019	3.36	136.15	94.07	1348.79		1484.97	27.98		1.00	5,000.00

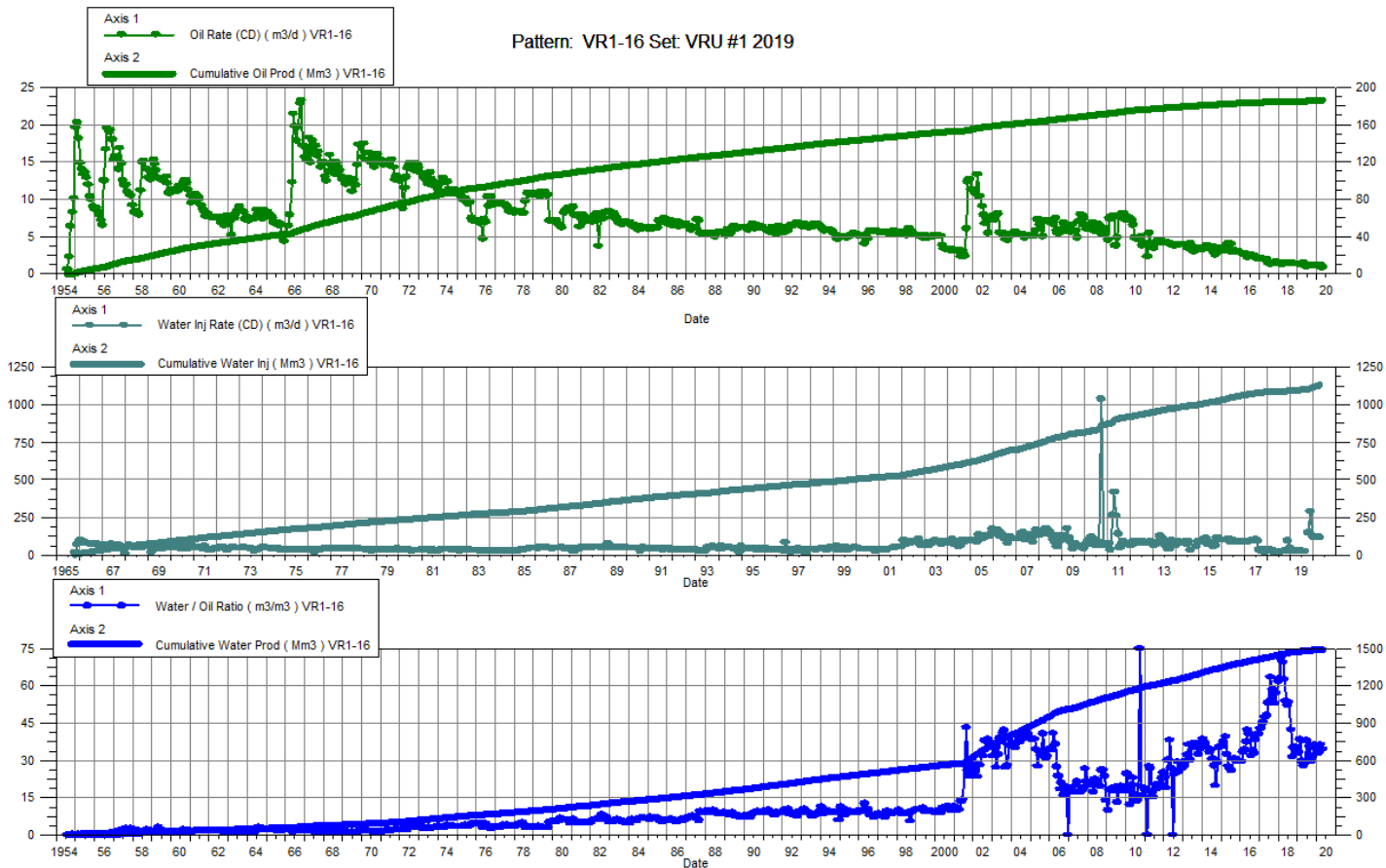


VRU No. 1

Pattern P-16 – 00/15-24-010-26W1/0

P-16 – 03/01-25-010-26W1/0

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	Water Inj Pressure kPa
1-31-2019	1.39	185.47	46.03	1471.92	23.39	1098.66	33.03	0.49	0.66	6,600.00	-
2-28-2019	1.38	185.51	53.12	1473.41	26.79	1099.41	38.40	0.49	0.66	6,600.00	-
3-31-2019	1.44	185.55	42.60	1474.73	25.81	1100.21	29.64	0.59	0.66	6,600.00	-
4-30-2019	1.51	185.60	42.24	1475.99	26.00	1100.99	27.94	0.59	0.66	6,600.00	-
5-31-2019	1.33	185.64	38.23	1477.18	25.52	1101.78	28.69	0.65	0.66	6,600.00	-
6-30-2019	0.96	185.67	36.35	1478.27	27.05	1102.59	37.84	0.73	0.66	6,600.00	-
7-31-2019	1.21	185.70	36.06	1479.39		1102.59	29.85		0.66	6,600.00	-
8-31-2019	1.15	185.74	40.65	1480.65	23.13	1103.31	35.46	0.55	0.66	6,600.00	-
9-30-2019	1.23	185.78	36.34	1481.74		1103.31	29.64		0.66	6,600.00	-
10-31-2019	1.26	185.82	39.57	1482.96	146.43	1107.85	31.28	3.58	0.66	6,600.00	-
11-30-2019	1.11	185.85	40.06	1484.17	290.43	1116.56	36.04	7.05	0.67	6,600.00	-
12-31-2019	1.18	185.89	40.59	1485.42	122.52	1120.36	34.38	2.93	0.67	6,600.00	-

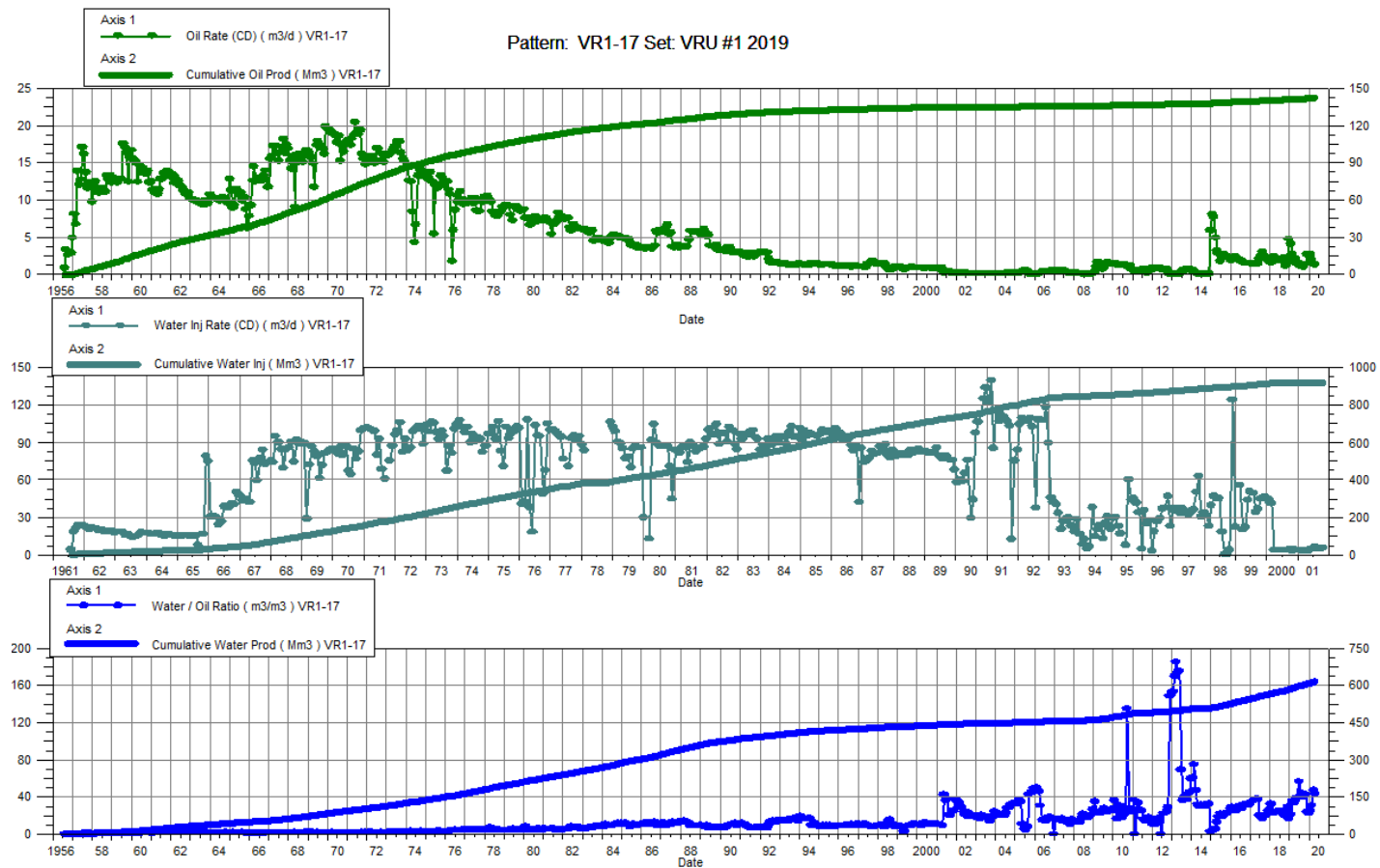


VRU No. 1

Pattern P-17 - 00/13-20-010-25W1/0 &

00/12-20-010-25W1/0

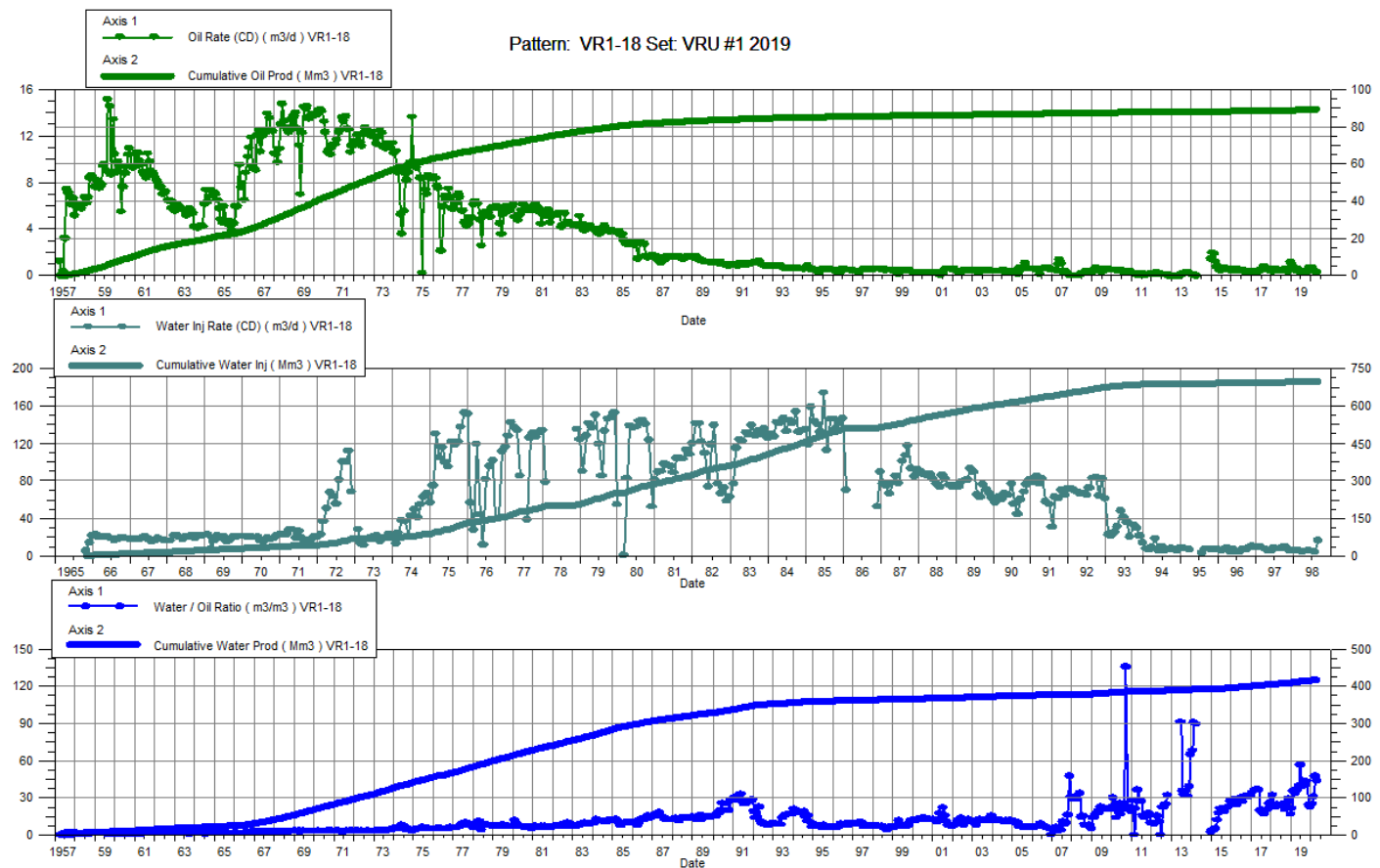
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	4.11	141.53	87.56	583.80		922.03	21.29		1.27	-
2-28-2019	2.75	141.61	98.12	586.55		922.03	35.70		1.26	-
3-31-2019	1.86	141.67	62.27	588.48		922.03	33.56		1.26	-
4-30-2019	2.22	141.74	79.57	590.86		922.03	35.91		1.25	-
5-31-2019	1.46	141.78	57.60	592.65		922.03	39.43		1.25	-
6-30-2019	1.59	141.83	89.36	595.33		922.03	56.20		1.25	-
7-31-2019	1.10	141.86	42.86	596.66		922.03	39.12		1.24	-
8-31-2019	1.40	141.91	61.03	598.55		922.03	43.48		1.24	-
9-30-2019	1.09	141.94	43.61	599.86		922.03	40.12		1.24	-
10-31-2019	1.46	141.98	63.26	601.82		922.03	43.31		1.24	-
11-30-2019	2.74	142.07	66.97	603.83		922.03	24.40		1.23	-
12-31-2019	2.83	142.15	64.60	605.83		922.03	22.82		1.23	-



VRU No. 1

Pattern P-18 - 00/15-20-010-25W1/0

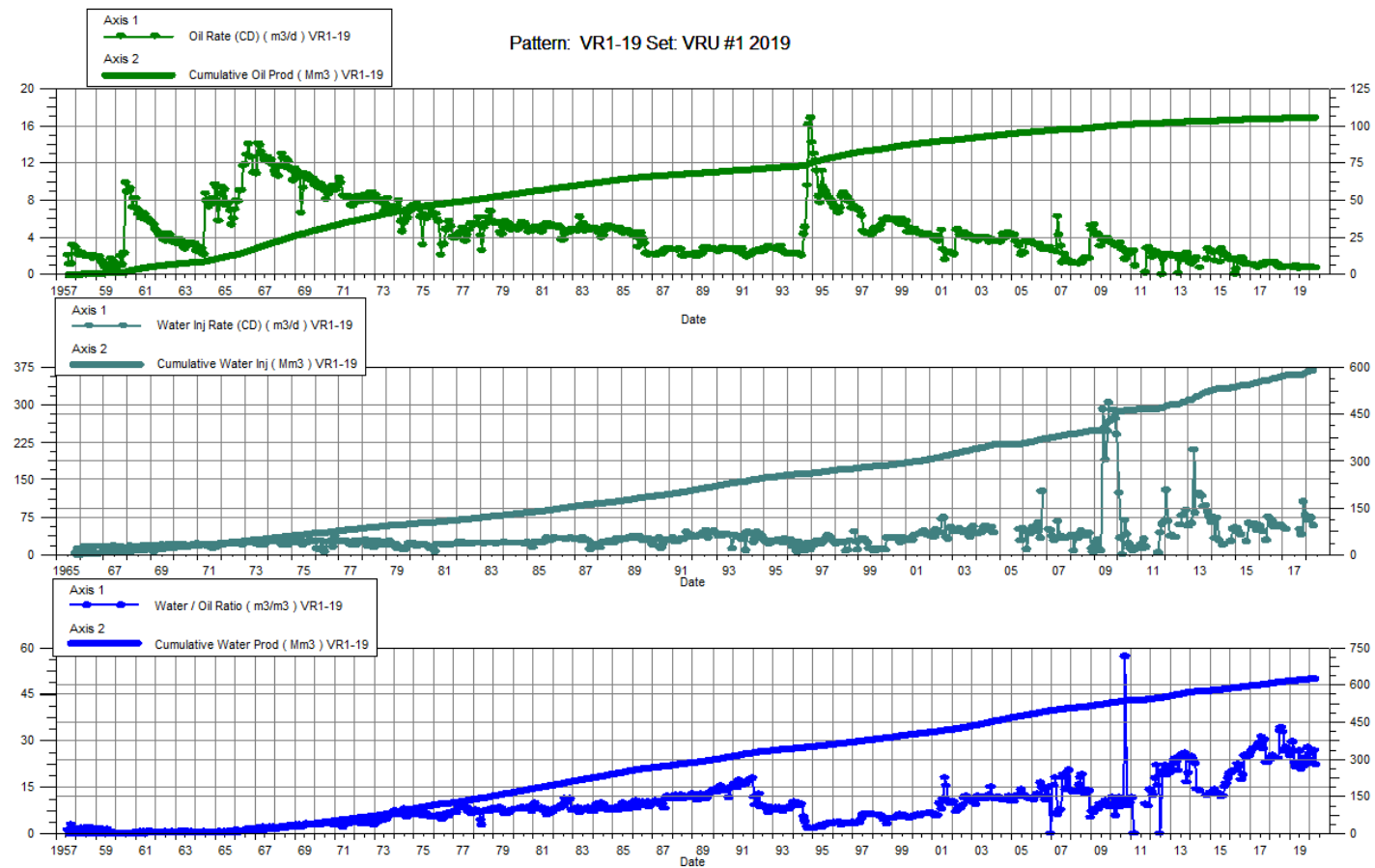
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	1.03	89.14	21.89	409.20		700.19	21.29		1.40	-
2-28-2019	0.69	89.16	24.53	409.89		700.19	35.70		1.40	-
3-31-2019	0.46	89.17	15.57	410.37		700.19	33.56		1.40	-
4-30-2019	0.55	89.19	19.89	410.97		700.19	35.91		1.40	-
5-31-2019	0.37	89.20	14.40	411.41		700.19	39.43		1.39	-
6-30-2019	0.39	89.21	21.79	412.07		700.19	56.60		1.39	-
7-31-2019	0.26	89.22	10.18	412.38		700.19	39.24		1.39	-
8-31-2019	0.34	89.23	14.56	412.84		700.19	43.25		1.39	-
9-30-2019	0.26	89.24	10.30	413.14		700.19	39.94		1.39	-
10-31-2019	0.37	89.25	15.82	413.63		700.19	43.31		1.39	-
11-30-2019	0.69	89.27	16.74	414.14		700.19	24.40		1.39	-
12-31-2019	0.71	89.29	16.15	414.64		700.19	22.82		1.39	-



VRU No. 1

Pattern P-19 - 00/13-21-010-25W1/0

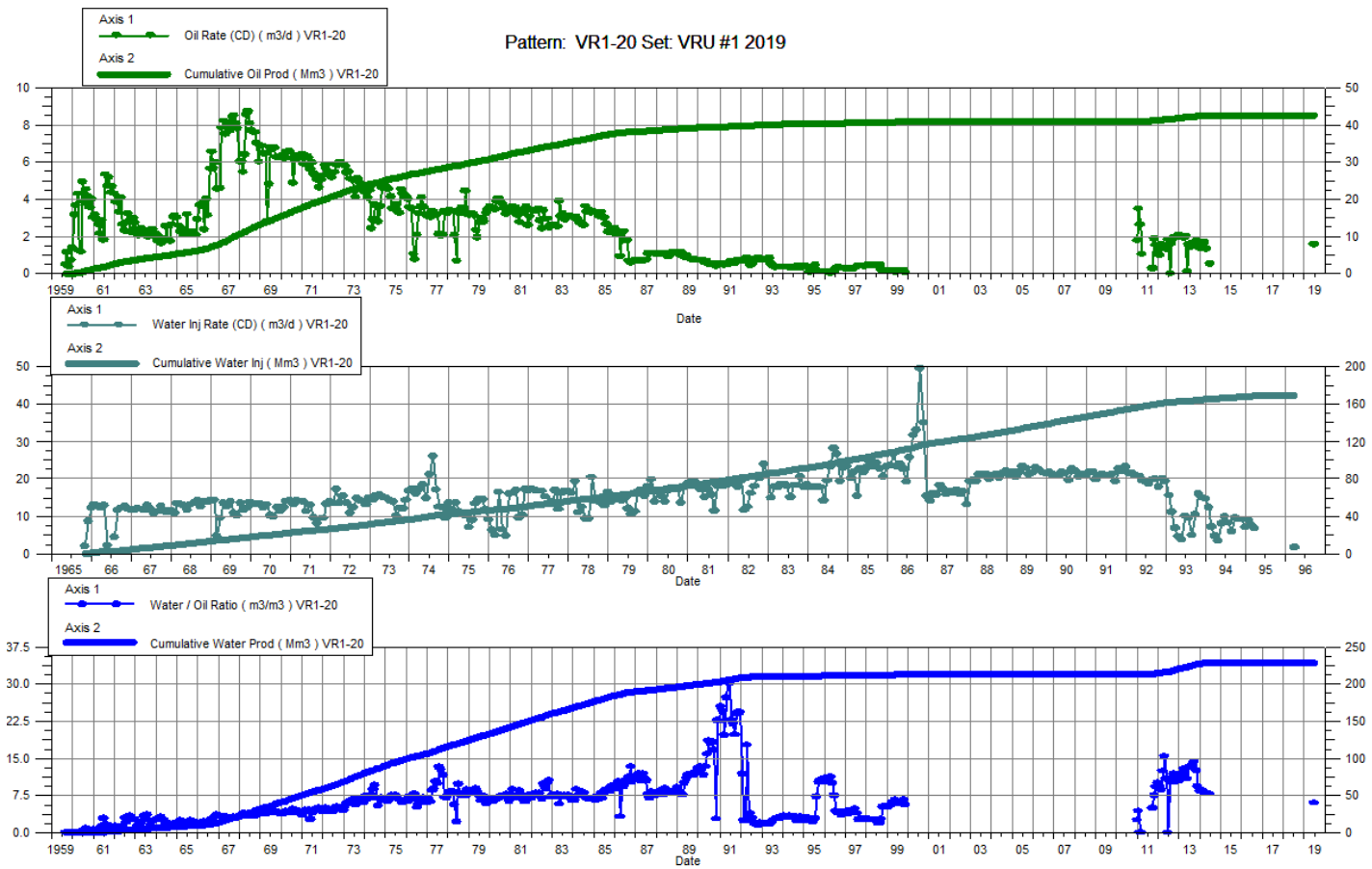
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	0.88	105.48	22.36	615.29		594.28	25.40		0.82	7,000.00
2-28-2019	0.86	105.50	25.26	616.00		594.28	29.53		0.82	7,000.00
3-31-2019	0.89	105.53	20.26	616.62		594.28	22.73		0.82	7,000.00
4-30-2019	0.94	105.56	20.08	617.23		594.28	21.41		0.82	7,000.00
5-31-2019	0.91	105.59	20.62	617.87		594.28	22.70		0.82	7,000.00
6-30-2019	0.74	105.61	19.71	618.46		594.28	26.62		0.82	7,000.00
7-31-2019	0.87	105.64	18.02	619.02		594.28	20.69		0.82	7,000.00
8-31-2019	0.85	105.66	19.98	619.64		594.28	23.47		0.82	7,000.00
9-30-2019	0.85	105.69	18.49	620.19		594.28	21.84		0.82	7,000.00
10-31-2019	0.86	105.71	20.93	620.84		594.28	24.42		0.82	7,000.00
11-30-2019	0.80	105.74	22.13	621.50		594.28	27.77		0.82	7,000.00
12-31-2019	0.82	105.76	21.08	622.16		594.28	25.66		0.81	7,000.00



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Pattern P-20 - 00/09-20-010-25W1/0

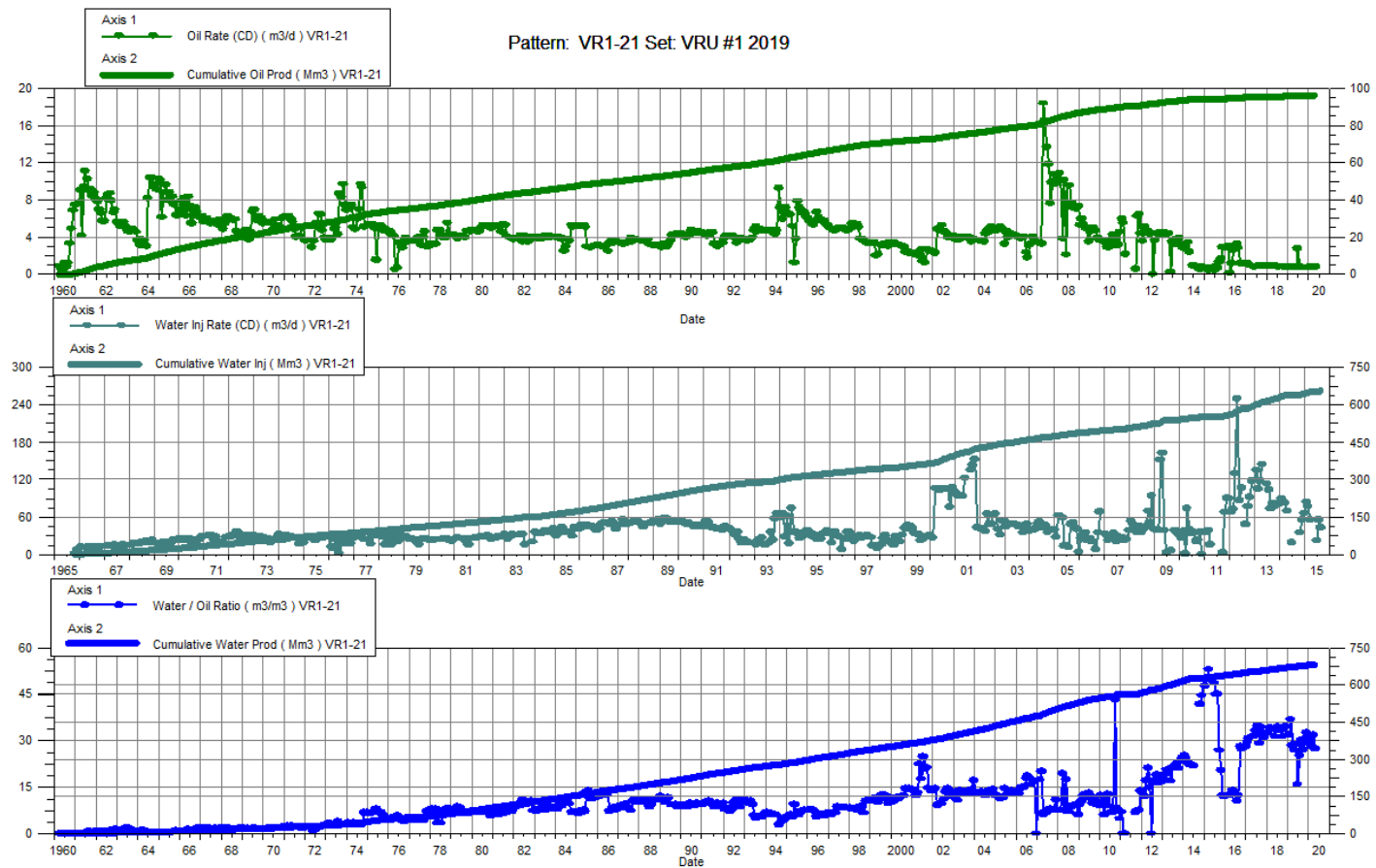
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019		42.70		228.19		169.20			0.62	-
2-28-2019		42.70		228.19		169.20			0.62	-
3-31-2019		42.70		228.19		169.20			0.62	-
4-30-2019		42.70		228.19		169.20			0.62	-
5-31-2019		42.70		228.19		169.20			0.62	-
6-30-2019	1.59	42.75	9.63	228.48		169.20	6.05		0.62	-
7-31-2019		42.75		228.48		169.20			0.62	-
8-31-2019		42.75		228.48		169.20			0.62	-
9-30-2019		42.75		228.48		169.20			0.62	-
10-31-2019		42.75		228.48		169.20			0.62	-
11-30-2019		42.75		228.48		169.20			0.62	-
12-31-2019		42.75		228.48		169.20			0.62	-



VRU No. 1

Pattern P-21 - 00/11-21-010-25W1/0

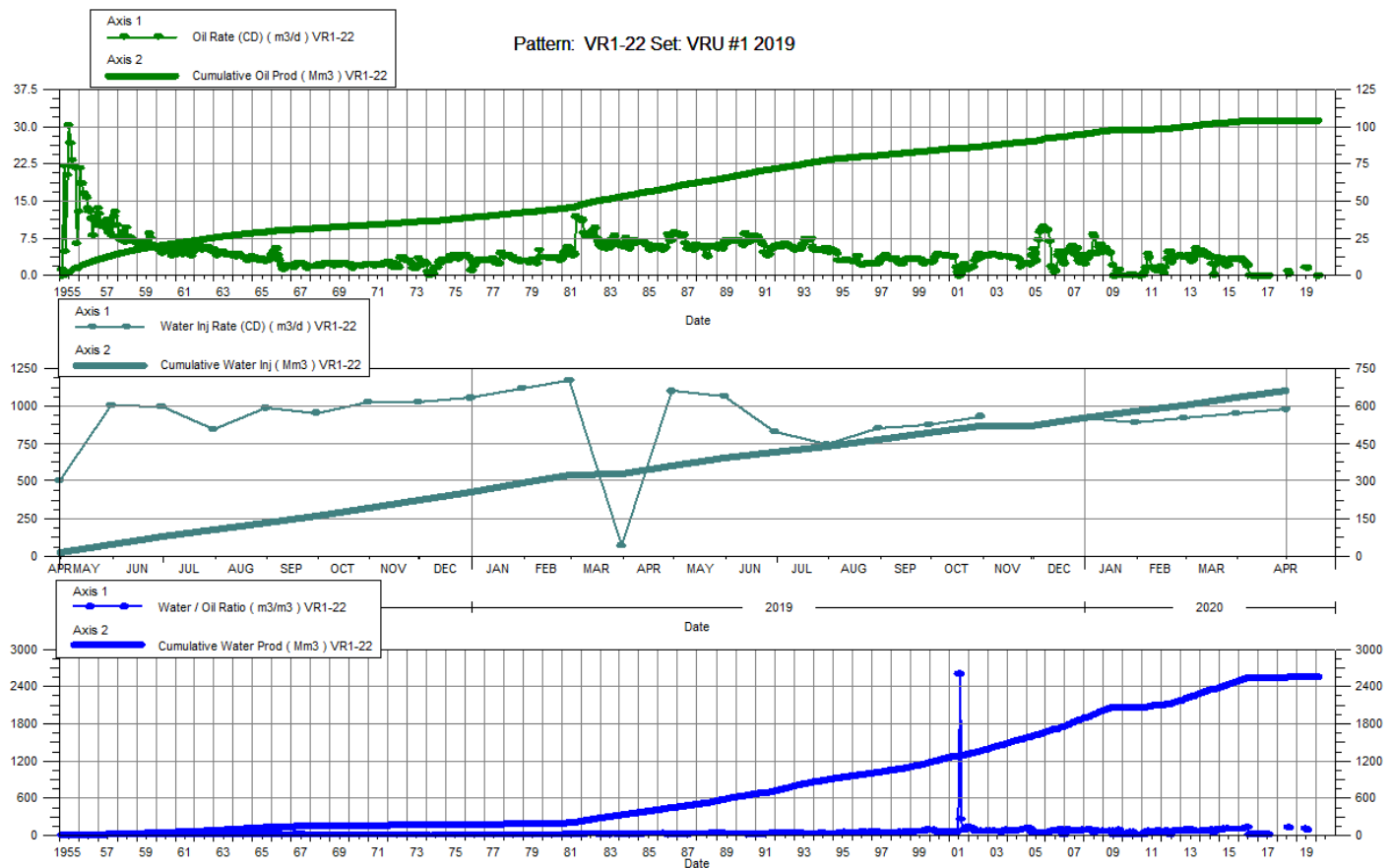
Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	0.82	95.96	26.08	669.15		656.98	31.89		0.86	5,000.00
2-28-2019	0.81	95.99	29.85	669.99		656.98	36.81		0.86	5,000.00
3-31-2019	0.84	96.01	23.93	670.73		656.98	28.42		0.86	5,000.00
4-30-2019	0.89	96.04	23.73	671.44		656.98	26.77		0.85	5,000.00
5-31-2019	0.84	96.06	24.12	672.19		656.98	28.65		0.85	5,000.00
6-30-2019	2.77	96.15	43.77	673.50		656.98	15.79		0.85	5,000.00
7-31-2019	0.87	96.17	21.85	674.18		656.98	25.22		0.85	5,000.00
8-31-2019	0.80	96.20	23.97	674.92		656.98	30.08		0.85	5,000.00
9-30-2019	0.79	96.22	21.20	675.56		656.98	26.95		0.85	5,000.00
10-31-2019	0.79	96.25	24.06	676.31		656.98	30.57		0.85	5,000.00
11-30-2019	0.78	96.27	25.34	677.07		656.98	32.56		0.85	5,000.00
12-31-2019	0.80	96.30	24.28	677.82		656.98	30.29		0.85	5,000.00



VRU No. 1

Pattern P-22 - 00/09-26-010-26W1/0

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		104.26		2546.52	1121.95	292.12			0.11	
2-28-2019		104.26		2546.52	1175.75	325.04			0.12	
3-31-2019		104.26		2546.52	67.29	327.12			0.12	
4-30-2019		104.26		2546.52	1103.15	360.22			0.14	-
5-31-2019		104.26		2546.52	1069.74	393.38			0.15	-
6-30-2019	1.65	104.31	192.70	2552.30	832.20	418.35	116.79	4.28	0.16	-
7-31-2019	1.53	104.36	139.06	2556.61	744.27	441.42	90.85	5.29	0.17	-
8-31-2019		104.36		2556.61	854.17	467.90			0.18	-
9-30-2019		104.36		2556.61	877.17	494.21			0.19	-
10-31-2019		104.36		2556.61	933.89	523.16			0.20	-
11-30-2019		104.36		2556.61		523.16			0.20	-
12-31-2019		104.36		2556.61	923.58	551.79			0.21	-



VRU No. 1

Pattern P-23 - 00/01-36-010-26W1/0

P-23 - 00/02-36-010-26W1/0

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	Water Inj Pressure kPa
1-31-2019	7.89	40.29	42.74	319.93		0.00	5.42		0.00	-	-
2-28-2019	7.74	40.51	49.26	321.31		0.00	6.37		0.00	-	-
3-31-2019	6.46	40.71	39.99	322.55		0.00	6.19		0.00	-	-
4-30-2019	4.74	40.85	39.13	323.72		0.00	8.26		0.00	-	-
5-31-2019	4.64	40.99	42.37	325.04		0.00	9.13		0.00	-	-
6-30-2019	3.59	41.10	39.53	326.22		0.00	11.01		0.00	-	-
7-31-2019	4.96	41.26	39.33	327.44		0.00	7.93		0.00	-	-
8-31-2019	4.29	41.39	36.14	328.56		0.00	8.43		0.00	-	-
9-30-2019	3.55	41.50	23.17	329.26		0.00	6.53		0.00	-	-
10-31-2019	4.37	41.63	32.73	330.27		0.00	7.48		0.00	-	-
11-30-2019	4.16	41.76	35.52	331.34	163.46	4.90	8.53	4.11	0.01	-	-
12-31-2019	1.95	41.82	120.05	335.06	121.65	8.67	61.52	1.00	0.02	-	-

