

Waskada Lower Amaranth Unit No. 1

Waterflood Progress Report

January 1st – December 31st, 2013

PennWest

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Introduction:

The Waskada Lower Amaranth Unit No.1 pressure maintenance project commenced water injection into the Lower Amaranth designed and in accordance with Manitoba Energy and Mines Approval No. PM 58.

Please refer to Attachment 1 – Area Map.

PRESSURE MAINTENANCE: Governed by Board Order No. PM 58

Unit Information

UNITIZED ZONE: Lower Amaranth
Original Unit, January 1, 1983 Board Order – Voluntary
First Enlargement, July 1, 1983

POOL: Waskada Lower Amaranth A (03 29A)

This report documents the performance of the Waskada Lower Amaranth Unit No.1 pressure maintenance project for the period of January 1 to December 31, 2013. The Unit had 12 new drills and 1 month of injection from 1 well in 2013.

Please refer to Attachment 1A – Area Map of New Drills

Lower Amaranth Unit No. 1 is part of the main Waskada field. The Waskada field is situated on the northeast rim of the Williston Basin in southern Manitoba. It comprises a large portion of Township 1 and 2, Ranges 25 and 26 W1.

Geology

The Waskada Fields produce light density crude (approximately 36° API), predominantly from the Lower Amaranth formation. This is an interlaminated, shallow marine to subtidal succession of sandstones, siltstones, and shale progressively onlaps the Mississippian unconformity surface from basin center, up dip to the north and eastern basin limits in Saskatchewan and Manitoba. The fine grained reservoir rock has a complex reservoir characterization with 13 to 16 % porosity and permeability on the order of 0.5 to 15 md. The Lower Amaranth, the oldest Mesozoic unit, is a clastic red bed sequence lying directly on the Paleozoic erosional surface. It consists of a series of dolomitic siltstones and sandstones interbedded with argillaceous siltstones and shales. The section is usually subdivided into a lower sandy unit and an overlying shale unit. The lower sequence is the oil production zone. The bulk of pay is found in the laminated sandstone/siltstone facies.

The Lower Amaranth has been classified into four general lithological types:

1. Interbedded shale/siltstone/sandstone by grain size, color and texture
2. Siltstone – This lithology occurs in distinct intervals up to two or three metres in thickness. It is generally light green in color and dolomitic.
3. Laminated sandstone – This occurs in distinct sandy intervals with a wide range of grain sizes and primary sedimentary structures.
4. Massive sandstone – This lithology occurs in thin intervals and usually associated with the laminated sandstones facies. Beds are usually light grey to reddish grey in color and coarse to medium – grained.

Discussion

Production and Injection Performance

Board Order No. PM 58 provided for pressure maintenance operations in Waskada Lower Amaranth Unit No.1. From the startup of injection in February 1983, injection rates fluctuated to the same degree in each injector, making it difficult to link any production responses to any injector. The Unit includes 8 injection wells, at the end of 2013 none are currently active, and 34 active producers. Pressure maintenance by water injection ceased in January 2013. 12 wells were drilled in 2013, all horizontal, significantly adding to production.

Please refer to Attachment 2 – A Summary of the Unit Well List and History. Includes New Drills.

Please refer to Attachment 3 – A Production and Injection plot of the Unit.

Please refer to Attachment 3A – A Production plot of the New Drills.

Please refer to Attachment 4 – A Summary of Unit Annual Volumes and Rates.

Please refer to Attachment 5 – A Cumulative Production and Injection plot of the Unit.

Voidage Replacement Ratio Calculation:

The Cumulative VRR from production start reached a maximum of 1.17 in 1997 and has declined in the last 2 years to 0.9. The Cumulative VRR from injection start stabilized at 1.2 dropping in the last 2 years to 0.9. The decline in both Cumulative VRR's in the last 2 years is coincident with reduced Monthly VRR's in 2012, essentially no injection in 2013 and the startup of horizontal producers in 2013.

As well it is unknown how much injection water has been lost to the Mission Canyon Formation located just below the Amaranth Formation. It is expected that the injectors have experienced formation damage due to fines migration or clay swelling, injection water quality and compatibility with formation water, scale build up plus channeling problems.

Currently there are no active injector in this Unit and PennWest has no plans to reactivate at this time any of the old injectors.

Please refer to Attachment 6 – A Unit Voidage Replacement Ratio Plot.

Please refer to Attachment 7 – Individual Injection Well Performance Plots.

Pressure Surveys:

5 pressure surveys were conducted in 2013. Average pressures were in the range of 2700 to 3200 kPa. Initial reservoir pressure was approximately 8700 kPa with bubble point at about 4200 kPa.

Please refer to Attachment 1B - Area Map of 2013 Pressure Surveys with Values Posted.

Corrosion and Scale Prevention Program:

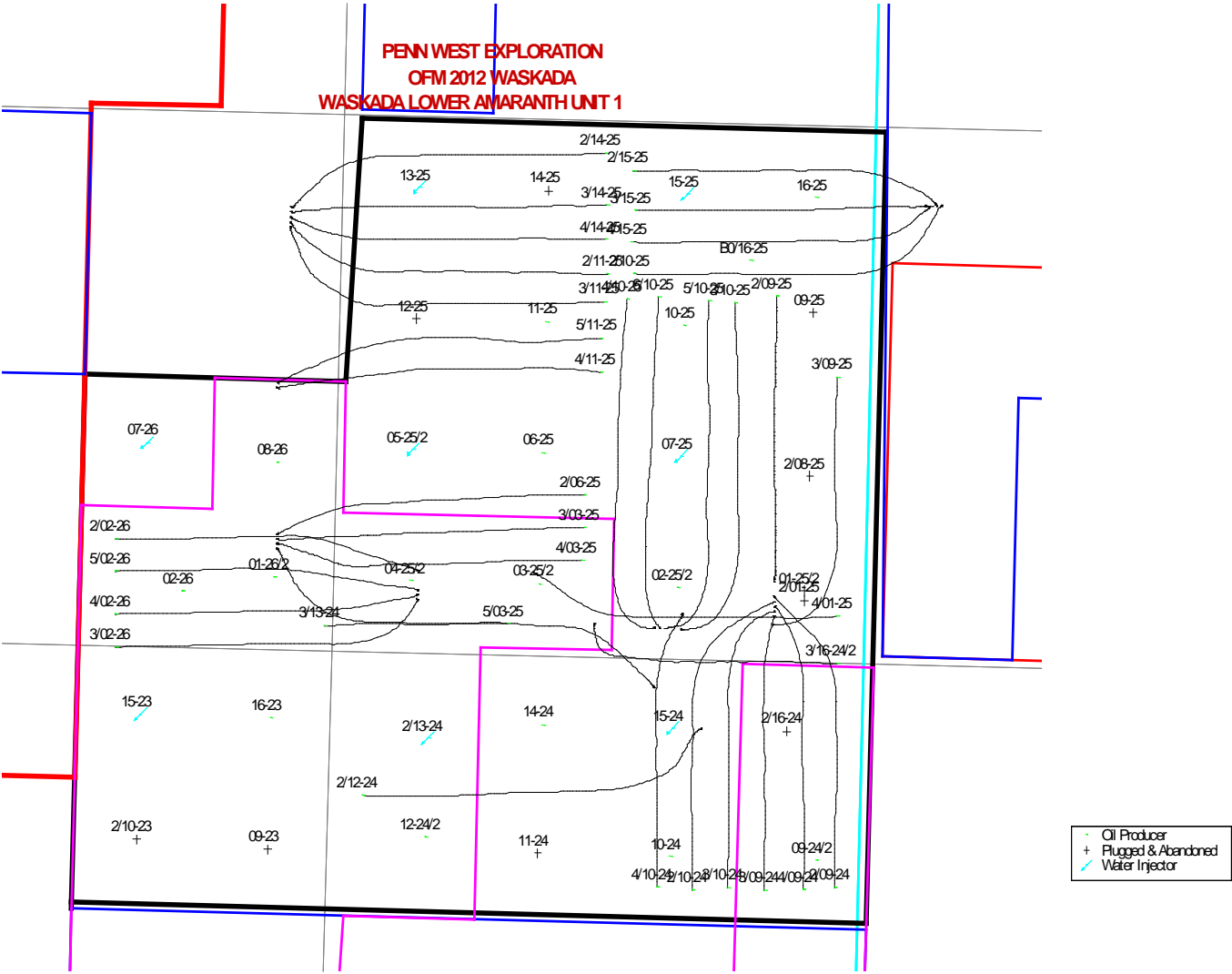
We currently inject ScalCor down all the new horizontal wells. PennWest will be installing cathodic protection on the wells. The new gathering system is Fibreglass and as such is not susceptible to corrosion.

Summary and Recommendations

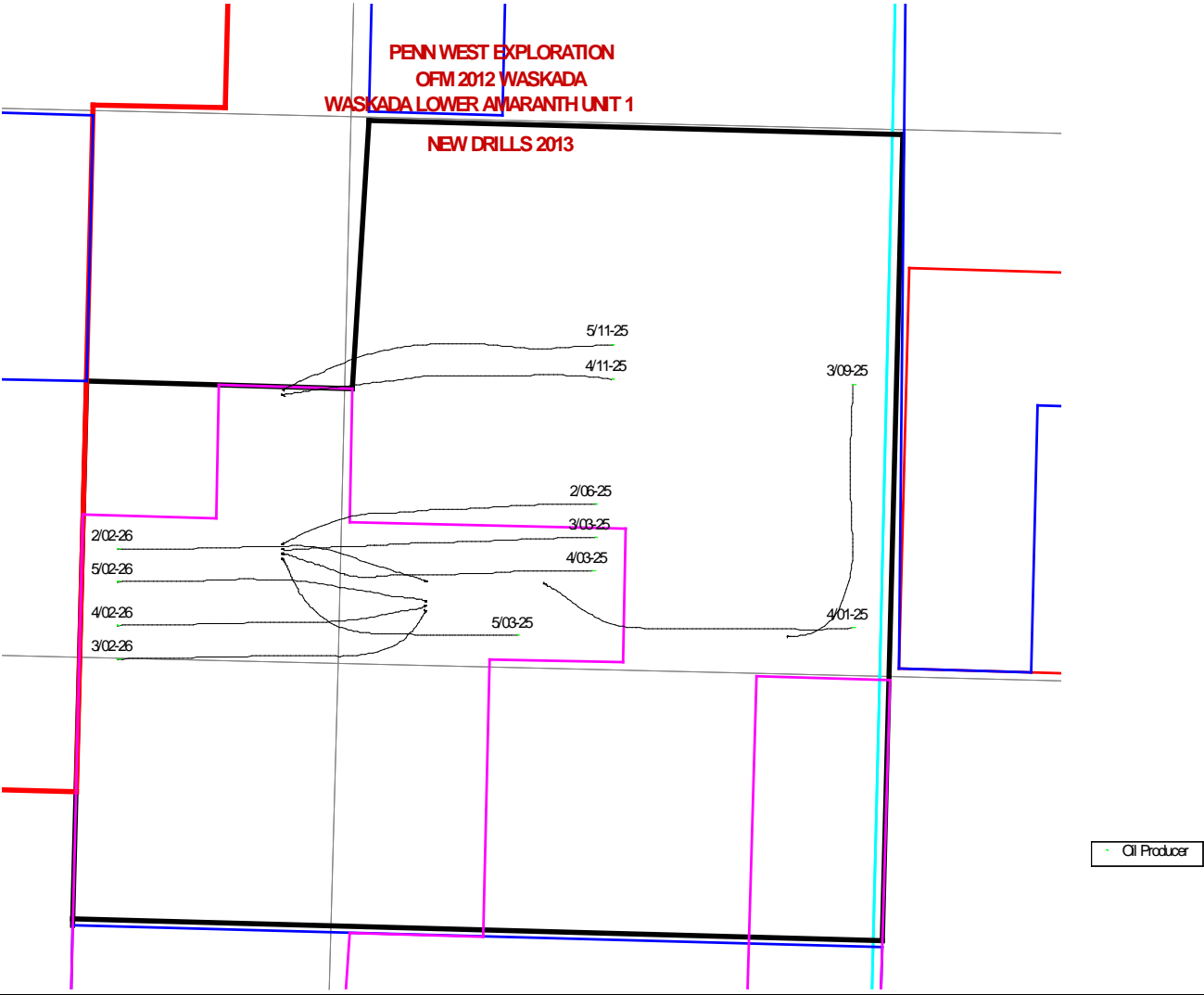
The behaviour of Waskada Unit 1 Lower Amaranth producers are indicated by good initial oil productivity, rapidly declining to low rates, with almost no discernible water flood response. It is also believed that fracture stimulation treatments, performed on these wells prior to initiation of water injection, “broke through” into the higher productivity Mississippian and that the majority of injected water to date has entered this zone. This is one of the major explanations for lack of waterflood response to date and the continued decline in oil productivities.

A horizontal producer and conversion of vertical producers to injector well pilot was contemplated for the Lower Amaranth targeting Unit 13 with results scalable to all Lower Amaranth Units. It is currently inactive pending evaluation of alternative schemes.

ATTACHMENT 1 – Area Map

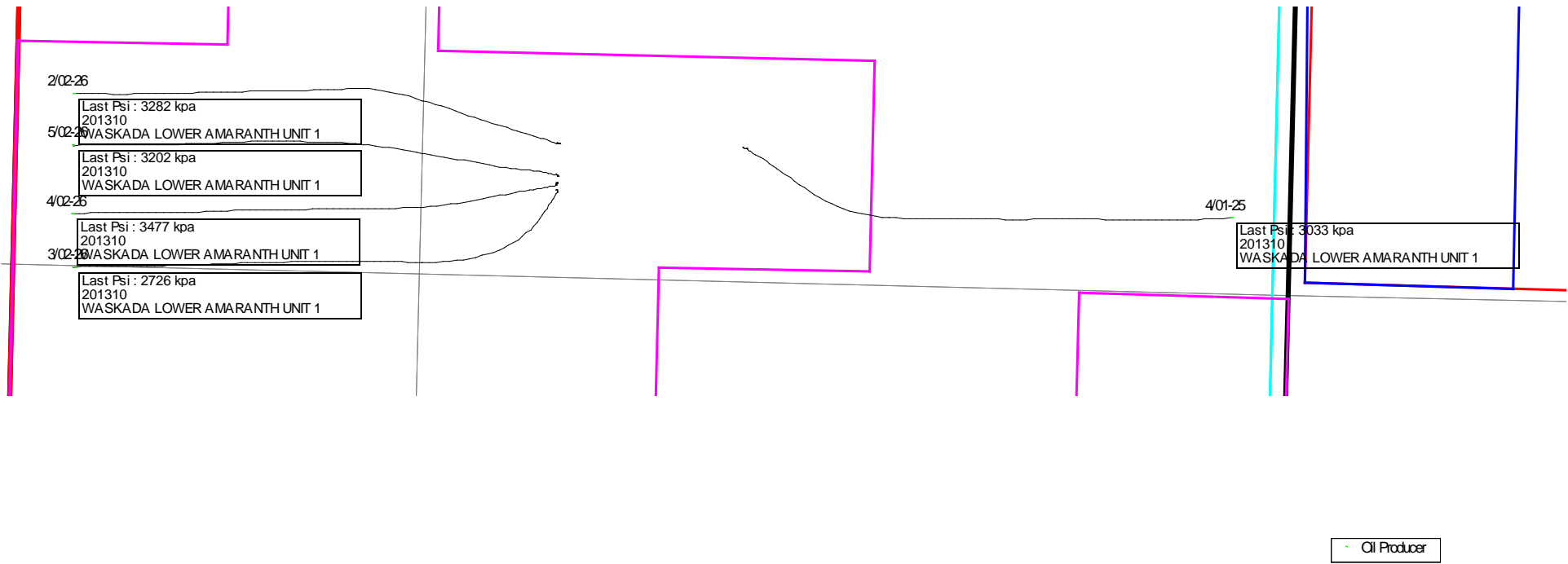


ATTACHMENT 1A – Area Map of New Drills



ATTACHMENT 1B – Area Map of 2013 Pressure Surveys with Values Posted

**PENN WEST EXPLORATION
OFM 2012 WASKADA
WASKADA LOWER AMARANTH UNIT 1
2013 Pressure Surveys**



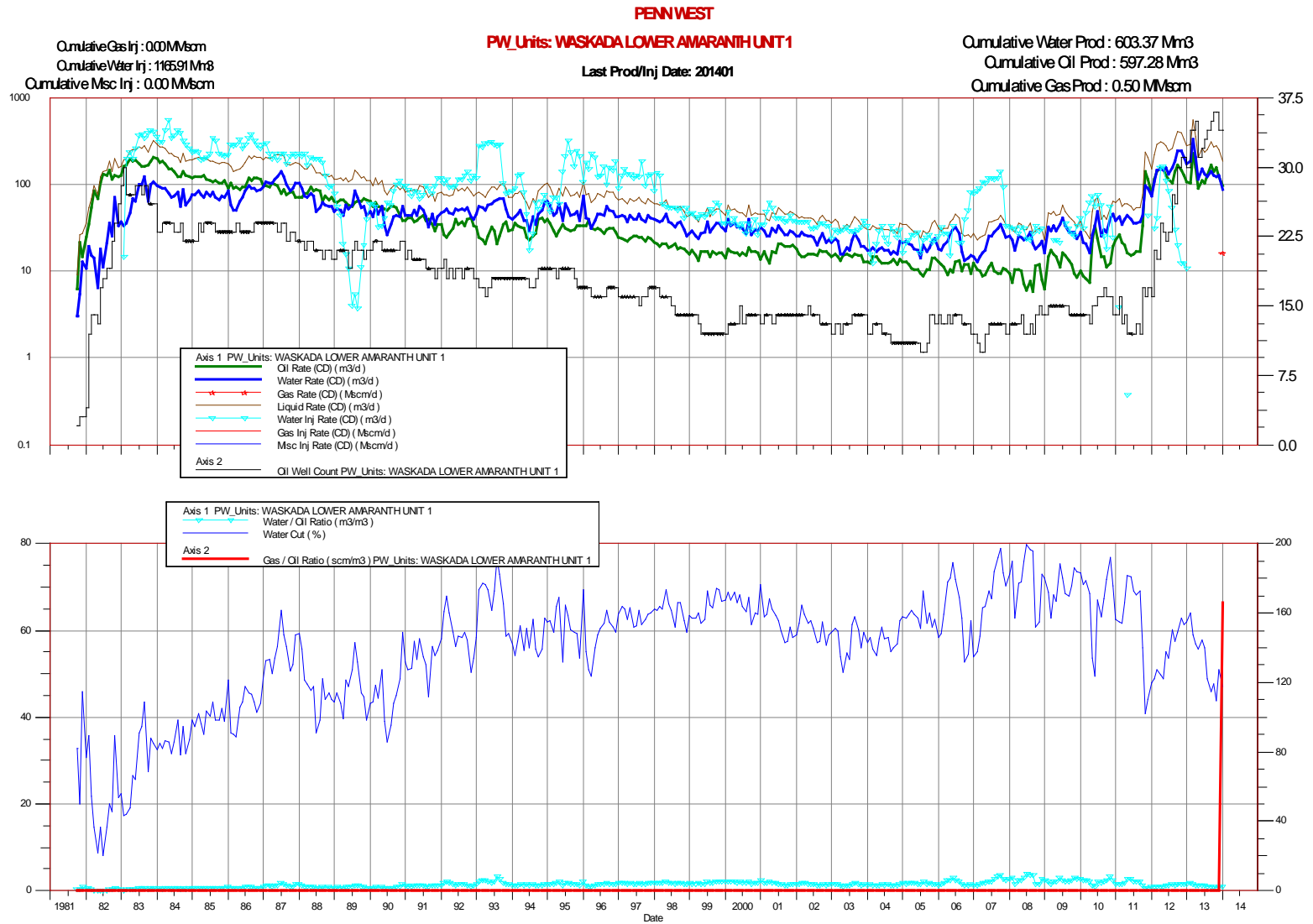
Attachment 2

Unit History: WASKADA LOWER AMARANTH UNIT 1

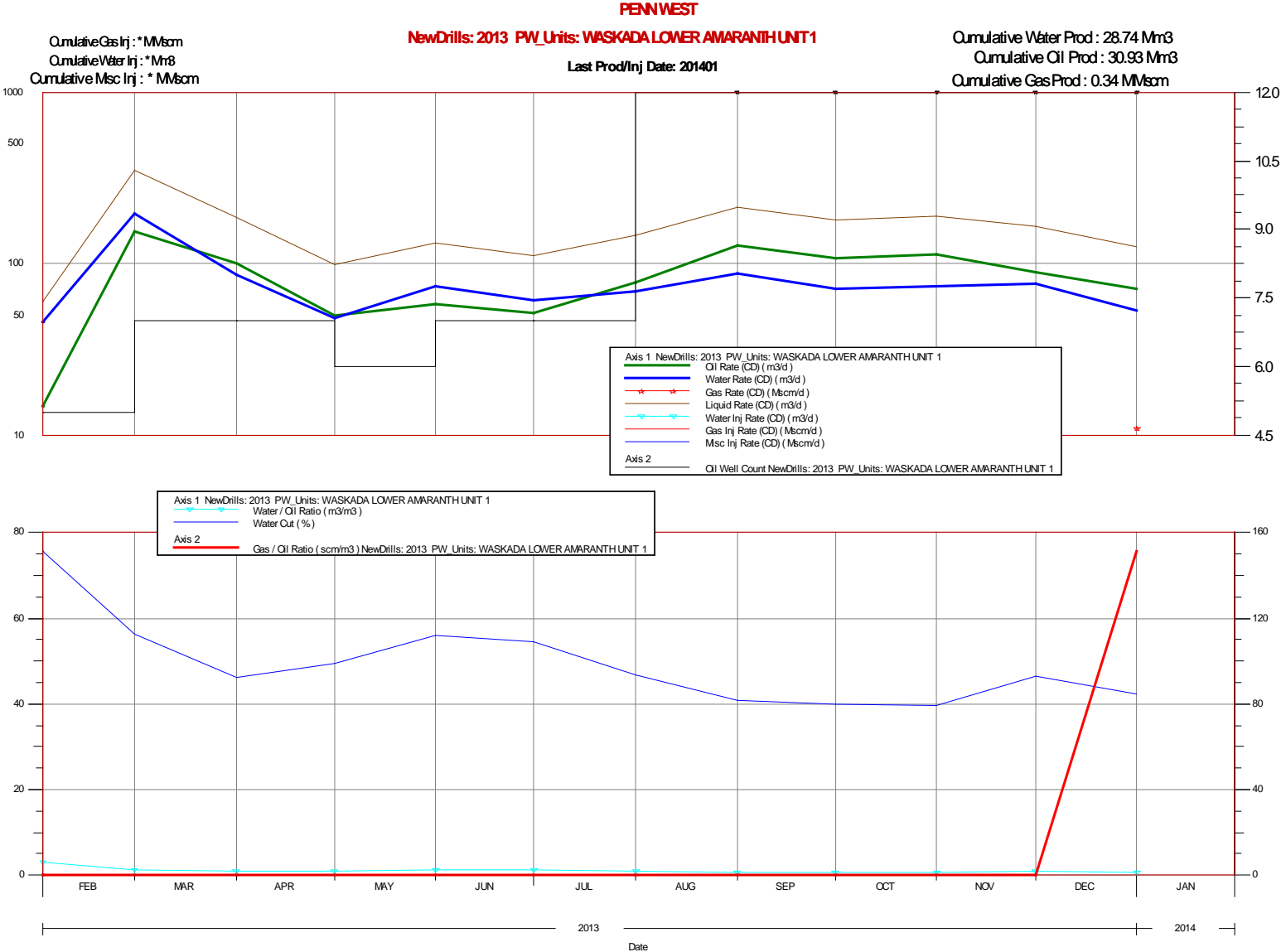
Well	Completion Date	OPERATOR	STATUS	New Drills	Kelly Bushing Elevation m	Total Depth m	First Production Date	Cum Oil Prod m3	Cum Water Prod m3	Last Production Date	First Injection Date	Cum Water Inj m3	Cum Gas Inj scm	Last Injection Date
02/02-26-001-26W1/0	2/12/2013	PENN_WEST	OIL	2013	470.8	1739	8/1/2013	2160.3	1423	12/1/2013		0	0	
02/06-25-001-26W1/0	1/10/2013	PENN_WEST	PTNL-OIL	2013	472.9	1751	2/1/2013	4115.6	6453.1	12/1/2013		0	0	
03/02-26-001-26W1/0	1/29/2013	PENN_WEST	OIL	2013	471	1751	8/1/2013	1860.4	1770	12/1/2013		0	0	
03/03-25-001-26W1/0	1/5/2013	PENN_WEST	PTNL-OIL	2013	472.6	1733	2/1/2013	2572.4	2693.3	12/1/2013		0	0	
03/09-25-001-26W1/0	1/15/2013	PENN_WEST	OIL	2013	471.6	1607	2/1/2013	3577	2950.1	12/1/2013		0	0	
04/01-25-001-26W1/0	3/4/2013	PENN_WEST	OIL	2013	472	1750	8/1/2013	558.6	277.3	12/1/2013		0	0	
04/02-26-001-26W1/0	2/4/2013	PENN_WEST	OIL	2013	470.8	1728	8/1/2013	1835.6	394.8	12/1/2013		0	0	
04/03-25-001-26W1/0	12/16/2012	PENN_WEST	PTNL-OIL	2013	472.6	1729	2/1/2013	4027.6	2217.7	12/1/2013		0	0	
04/11-25-001-26W1/0	2/9/2013	PENN_WEST	OIL	2013	469.7	1756	3/1/2013	2883.1	5234.2	12/1/2013		0	0	
05/02-26-001-26W1/0	2/7/2013	PENN_WEST	OIL	2013	470.9	1729	8/1/2013	1891.1	950.6	12/1/2013		0	0	
05/03-25-001-26W1/0	11/30/2012	PENN_WEST	PTNL-OIL	2013	473.3	1572	2/1/2013	1733.6	1116.7	12/1/2013		0	0	
05/11-25-001-26W1/0	2/5/2013	PENN_WEST	OIL	2013	469.7	1776	3/1/2013	1500.4	1623.3	12/1/2013		0	0	
00/01-25-001-26W1/2	7/6/1981	PENN_WEST	ABD-OIL	<N/A>	470.2	950	5/1/1990	0.2	394.7	11/1/1990		0	0	
00/01-26-001-26W1/2	9/18/1981	PENN_WEST	CMG-OIL	<N/A>	470.3	960	2/1/1982	32912.2	28723.6	5/1/2013		0	0	
00/02-25-001-26W1/2	8/26/1981	PENN_WEST	OIL	<N/A>	470.3	950	2/1/1983	31499.5	5694.8	12/1/2013		0	0	
00/02-26-001-26W1/0	11/21/1981	PENN_WEST	CMG-OIL	<N/A>	467.3	952	2/1/1982	26499.2	21948.7	2/1/2011		0	0	
00/03-25-001-26W1/2	7/19/1981	PENN_WEST	OIL	<N/A>	471.1	956	12/1/1982	30270.6	11743.9	1/1/2013		0	0	
00/04-25-001-26W1/2	8/21/1981	PENN_WEST	CMG-OIL	<N/A>	470.8	963	11/1/1982	30711.8	5178.8	2/1/2013		0	0	
00/05-25-001-26W1/2	8/31/1981	PENN_WEST	WTR-INJ	<N/A>	471.1	953	10/1/1981	3740.7	517.4	2/1/1983	2/1/1983	344455	0	9/1/2012
00/06-25-001-26W1/0	1/23/1982	PENN_WEST	OIL	<N/A>	471.4	936	2/1/1982	45231.6	66048.1	12/1/2012		0	0	
00/07-25-001-26W1/0	3/6/1982	PENN_WEST	WTR-INJ	<N/A>	469.9	937	6/1/1982	1959.5	608.2	2/1/1983	2/1/1983	151191	0	5/1/2012
00/07-26-001-26W1/0	7/11/1982	PENN_WEST	WTR-INJ	<N/A>	467.8	950	10/1/1982	2446.4	306.1	12/1/1983	1/1/1984	140303.7	0	1/1/2013
00/08-26-001-26W1/0	11/2/1981	PENN_WEST	OIL	<N/A>	469.6	948	1/1/1982	37114.1	45497.2	4/1/2013		0	0	
00/09-23-001-26W1/0	7/6/1982	PENN_WEST	ABD-OIL	<N/A>	470.1	953	8/1/1982	10673.1	32946	12/1/1990		0	0	
00/09-24-001-26W1/2	12/3/1981	PENN_WEST	OIL	<N/A>	473	944	1/1/1983	13547.4	18352.6	8/1/2011		0	0	
00/09-25-001-26W1/0	1/10/1982	PENN_WEST	ABD-OIL	<N/A>	471.3	934	2/1/1982	4928.1	6496	2/1/1991		0	0	
00/10-24-001-26W1/0	2/11/1982	PENN_WEST	OIL	<N/A>	470.3	935	3/1/1982	5135.9	1650.1	11/1/2012		0	0	
00/10-25-001-26W1/0	5/19/1982	PENN_WEST	OIL	<N/A>	473.1	938	6/1/1982	22201	10329.1	7/1/2013		0	0	
00/11-24-001-26W1/0	2/17/1982	PENN_WEST	ABD-OIL	<N/A>	469.8	935	3/1/1982	5111.4	740.5	10/1/1995		0	0	
00/11-25-001-26W1/0	5/24/1982	PENN_WEST	OIL	<N/A>	472.4	940	6/1/1982	22676	23918	11/1/2011		0	0	
00/12-24-001-26W1/2	11/6/1981	PENN_WEST	CMG-OIL	<N/A>	468.1	952	2/1/1983	24642.8	23212.5	5/1/2008		0	0	
00/12-25-001-26W1/0	5/30/1982	PENN_WEST	ABD-OIL	<N/A>	471	946	6/1/1982	16862.2	39232.8	3/1/1992		0	0	
00/13-25-001-26W1/0	8/4/1982	PENN_WEST	WTR-INJ	<N/A>	469	960.1	10/1/1982	343.6	241.8	12/1/1983	12/1/1983	66694.8	0	12/1/2007

00/14-24-001-26W1/0	11/16/1981	PENN_WEST	OIL	<N/A>	469.3	951	2/1/1982	14322	10382.2	4/1/2012		0	0	
00/14-25-001-26W1/0	8/9/1982	OMEGA_HYDROC	ABD-OIL	<N/A>	471.1	936	12/1/1982	439.4	252.4	8/1/1989		0	0	
00/15-23-001-26W1/0	1/29/1982	PENN_WEST	WTR-INJ	<N/A>	467.5	941	2/1/1982	2958.1	789.6	9/1/1983	10/1/1983	169248.1	0	5/1/2004
00/15-24-001-26W1/0	10/2/1981	PENN_WEST	WTR-INJ	<N/A>	470.5	963	10/1/1981	3402.6	431.2	2/1/1983	2/1/1983	129998.4	0	11/1/2006
00/15-25-001-26W1/0	8/12/1982	PENN_WEST	WTR-INJ	<N/A>	471.2	948	11/1/1982	467.2	136.2	9/1/1983	12/1/1983	38585.7	0	10/1/2012
00/16-23-001-26W1/0	9/24/1981	PENN_WEST	OIL	<N/A>	468.8	965	11/1/1981	49579.8	44886.7	11/1/2013		0	0	
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02/01-25-001-26W1/0	9/14/1982	PENN_WEST	ABD-OIL	<N/A>	471.7	947	1/1/1983	3356.5	15964	12/1/1990		0	0	
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02/09-24-001-26W1/0	11/28/2011	PENN_WEST	OIL	<N/A>	471.4	1729	2/1/2012	4738.6	5171	12/1/2013		0	0	
02/09-25-001-26W1/0	9/26/1994	PENN_WEST	PMP-OIL	<N/A>	470.9	1703	10/1/1994	9621.4	21035.1	12/1/2013		0	0	
02/10-23-001-26W1/0	6/2/1983	PENN_WEST	ABD-OIL	<N/A>	469.8	948	6/1/1983	8664.8	16439.8	11/1/1992		0	0	
02/10-24-001-26W1/0	11/22/2011	PENN_WEST	OIL	<N/A>	471.5	1758	2/1/2012	4320.2	5772.4	12/1/2013		0	0	
02/10-25-001-26W1/0	6/30/2012	PENN_WEST	OIL	<N/A>	472.3	1796	10/1/2012	986.5	3772.1	12/1/2013		0	0	
02/11-25-001-26W1/0	2/18/2011	PENN_WEST	OIL	<N/A>	470.2	1775	10/1/2011	5909.1	3923.5	12/1/2013		0	0	
02/12-24-001-26W1/0	1/14/2010	PENN_WEST	OIL	<N/A>	472.5	1850	5/1/2010	2676.4	2025.7	12/1/2013		0	0	
02/13-24-001-26W1/0	9/16/1982	PENN_WEST	WTR-INJ	<N/A>	470.1	951		0	0		2/1/1983	125434.2	0	11/1/2006
02/14-25-001-26W1/0	3/12/2011	PENN_WEST	OIL	<N/A>	470.4	1777	10/1/2011	2548.8	2235.1	11/1/2013		0	0	
02/15-25-001-26W1/0	3/3/2012	PENN_WEST	OIL	<N/A>	472.3	1738	10/1/2012	1237.1	2780.7	12/1/2013		0	0	
02/16-24-001-26W1/0	2/6/1982	PENN_WEST	ABD-OIL	<N/A>	472.3	956	2/1/1982	12749.4	18033.7	5/1/2002		0	0	
03/09-24-001-26W1/0	11/5/2011	PENN_WEST	OIL	<N/A>	471.6	1636	2/1/2012	3983.1	3591.2	12/1/2013		0	0	
03/10-24-001-26W1/0	11/10/2011	PENN_WEST	OIL	<N/A>	471.4	1666	2/1/2012	4358.7	2784.6	12/1/2013		0	0	
03/10-25-001-26W1/0	1/28/2012	PENN_WEST	OIL	<N/A>	471.3	1847	4/1/2012	3540	2780.2	12/1/2013		0	0	
03/11-25-001-26W1/0	2/11/2011	PENN_WEST	OIL	<N/A>	470.2	1817	10/1/2011	5418.6	7497.9	12/1/2013		0	0	
03/13-24-001-26W1/0	1/20/2010	PENN_WEST	OIL	<N/A>	472.2	1852	5/1/2010	5580.2	6207.4	12/1/2013		0	0	
03/14-25-001-26W1/0	3/5/2011	PENN_WEST	OIL	<N/A>	470.4	1740	10/1/2011	2593	3536.3	12/1/2013		0	0	
03/15-25-001-26W1/0	2/21/2012	PENN_WEST	OIL	<N/A>	472.4	1700	10/1/2012	2184.6	4522.9	12/1/2013		0	0	
03/16-24-001-26W1/2	9/4/2010	PENN_WEST	OIL	<N/A>	472.1	1562	11/1/2010	7987.3	13886.8	12/1/2013		0	0	
04/09-24-001-26W1/0	11/16/2011	PENN_WEST	OIL	<N/A>	472.2	1666	2/1/2012	4620.5	3109	12/1/2013		0	0	
04/10-24-001-26W1/0	1/19/2012	PENN_WEST	OIL	<N/A>	471.4	1648	4/1/2012	3279.9	3718.5	12/1/2013		0	0	
04/10-25-001-26W1/0	7/10/2012	PENN_WEST	OIL	<N/A>	471.3	1836	8/1/2012	4508.5	6799.6	12/1/2013		0	0	
04/14-25-001-26W1/0	2/25/2011	PENN_WEST	OIL	<N/A>	470.5	1745	10/1/2011	3170	1700.4	7/1/2013		0	0	
04/15-25-001-26W1/0	2/24/2012	PENN_WEST	OIL	<N/A>	472.3	1727	10/1/2012	1619.8	3008.5	12/1/2013		0	0	
05/10-25-001-26W1/0	2/5/2012	PENN_WEST	OIL	<N/A>	471.2	1827	8/1/2012	1905.7	1844.9	12/1/2013		0	0	
06/10-25-001-26W1/0	7/5/2012	PENN_WEST	OIL	<N/A>	471.3	1814	8/1/2012	3601.3	7273.2	12/1/2013		0	0	
80/16-25-001-26W1/0	10/27/1997	PENN_WEST	OIL	<N/A>	473.6	929	11/1/1997	1261.3	206.3	8/1/2012		0	0	

ATTACHMENT 3 – Unit Production and Injection Plot



ATTACHMENT 3A – New Drills Production Plot



ATTACHMENT 4 – Unit Annual Volumes and Rates

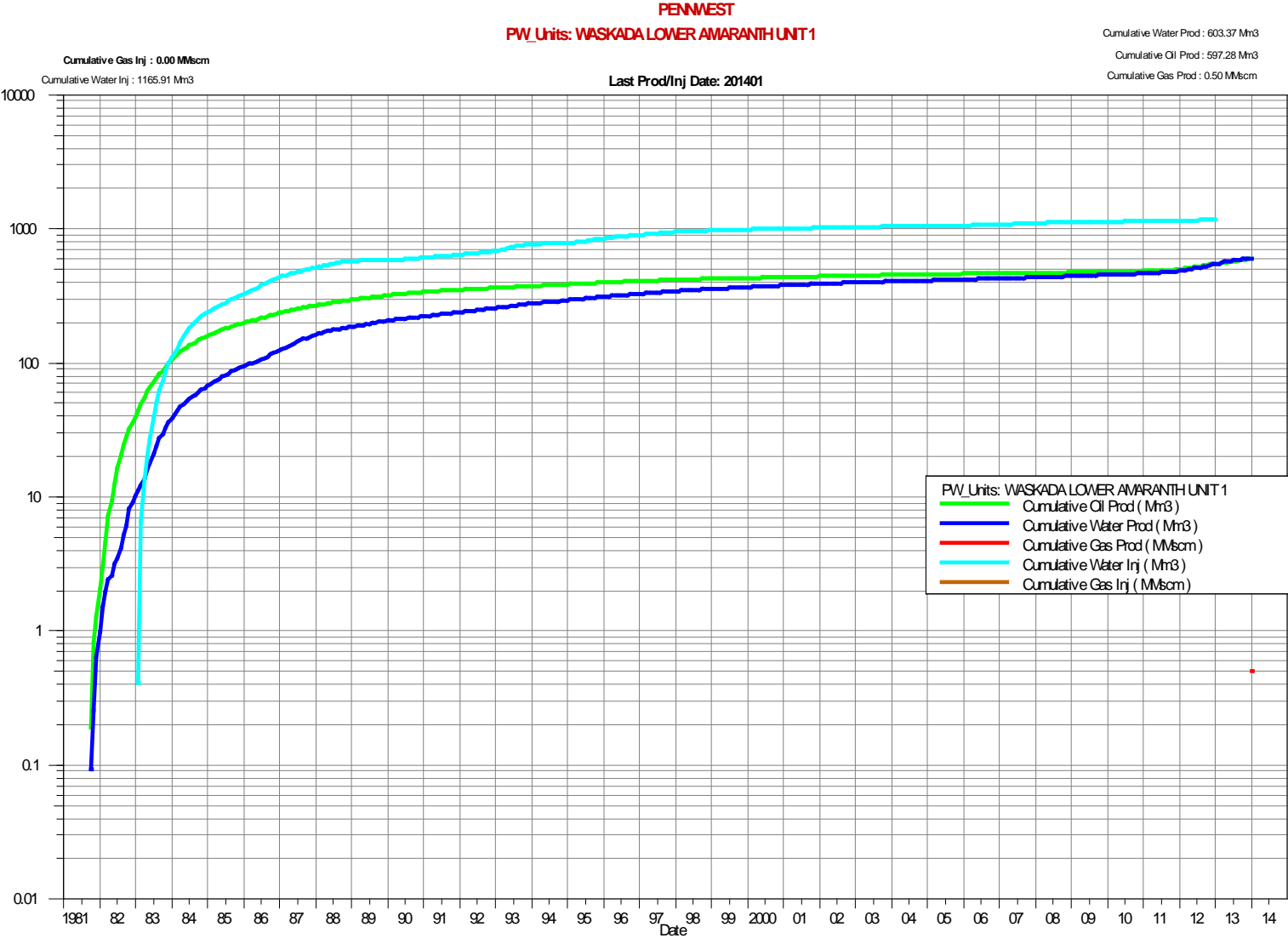
PW_Units: WASKADA LOWER AMARANTH UNIT 1

Rates and Volume History

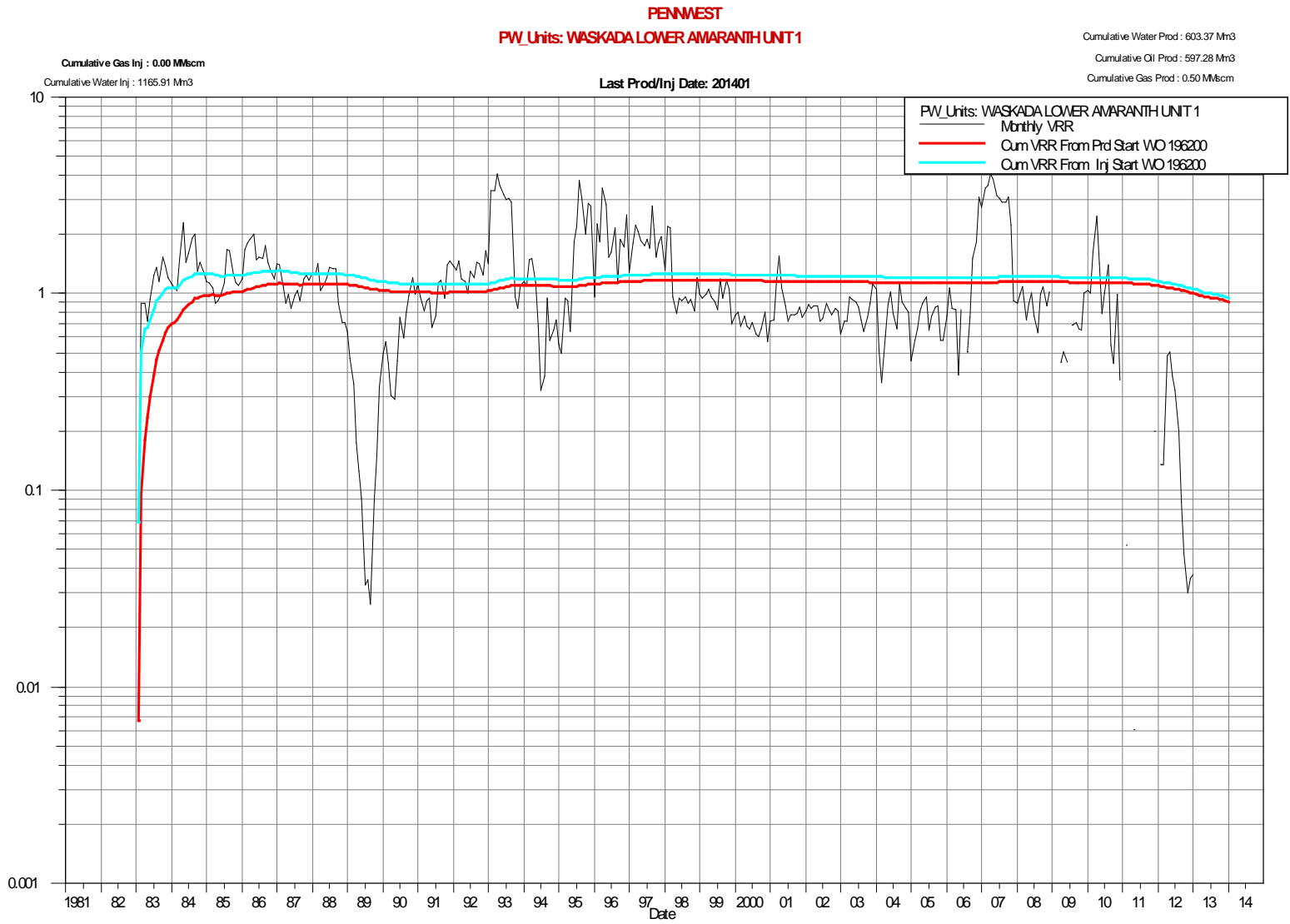
	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
	Oil	Oil	Water	Water	Water	Water	Gas	Gas Inj
	Prod	Rate	Prod	Rate	Inj	Inj	Inj	Rate
Date	m3	m3/d	m3	m3/d	m3	m3/d	Mscm	Mscm/d
1/1/1981	1292.9	3.54	647.2	1.77				
1/1/1982	34588.9	94.76	8564.2	23.46				
1/1/1983	63455.2	173.85	26800.8	73.43	98755	270.56	0	0
1/1/1984	55294.5	151.08	28616.9	78.19	132955	363.27	0	0
1/1/1985	41786.9	114.48	27554.8	75.49	86897	238.07	0	0
1/1/1986	37496.3	102.73	28006.2	76.73	107802	295.35	0	0
1/1/1987	32268.4	88.41	39340	107.78	82230	225.29	0	0
1/1/1988	28003.1	76.51	25126.1	68.65	64867	177.23	0	0
1/1/1989	23116.6	63.33	20406.2	55.91	9366	25.66	0	0
1/1/1990	19472.3	53.35	15999.6	43.83	24156	66.18	0	0
1/1/1991	13901.5	38.09	16049.7	43.97	31802	87.13	0	0
1/1/1992	12341.8	33.72	17728.7	48.44	41247	112.7	0	0
1/1/1993	10180.2	27.89	20905.4	57.28	81517	223.33	0	0
1/1/1994	11592.4	31.76	15872.9	43.49	26062	71.4	0	0
1/1/1995	11593.3	31.76	18339.5	50.25	56183	153.92	0	0
1/1/1996	11489.3	31.39	16991.8	46.43	57114	156.05	0	0
1/1/1997	8730.5	23.92	15107.5	41.39	46833	128.31	0	0
1/1/1998	7119.8	19.51	13147.4	36.02	24871	68.14	0	0
1/1/1999	5829	15.97	11052.6	30.28	17130	46.93	0	0
1/1/2000	5997.5	16.39	11739.7	32.08	12856	35.12	0	0
1/1/2001	6356.2	17.41	10507.9	28.79	15584	42.7	0	0
1/1/2002	5845.5	16.02	9015.9	24.7	12815	35.11	0	0

1/1/2003	5398.9	14.79	7475.8	20.48	10947	29.99	0	0
1/1/2004	4779.2	13.06	6511.1	17.79	9381	25.63	0	0
1/1/2005	4145.9	11.36	7148.9	19.59	8353	22.88	0	0
1/1/2006	4094.1	11.22	7752	21.24	11382	31.18	0	0
1/1/2007	3775.3	10.34	8307.6	22.76	36593	100.26	0	0
1/1/2008	3226.5	8.82	8271.4	22.6	10750	29.37	0	0
1/1/2009	4690.3	12.85	10886.6	29.83	6697	18.35	0	0
1/1/2010	5691.9	15.59	11077.8	30.35	17244	47.24	0	0
1/1/2011	14013.7	38.39	17601.6	48.22	1465	4.01	0	0
1/1/2012	47697.2	130.32	59593.2	162.82	21723	59.35	0	0
1/1/2013	49005.7	134.26	58551.8	160.42	336	0.92	0	0
	-----		-----		-----			
	594270.8		600698.8		1165911			Sum

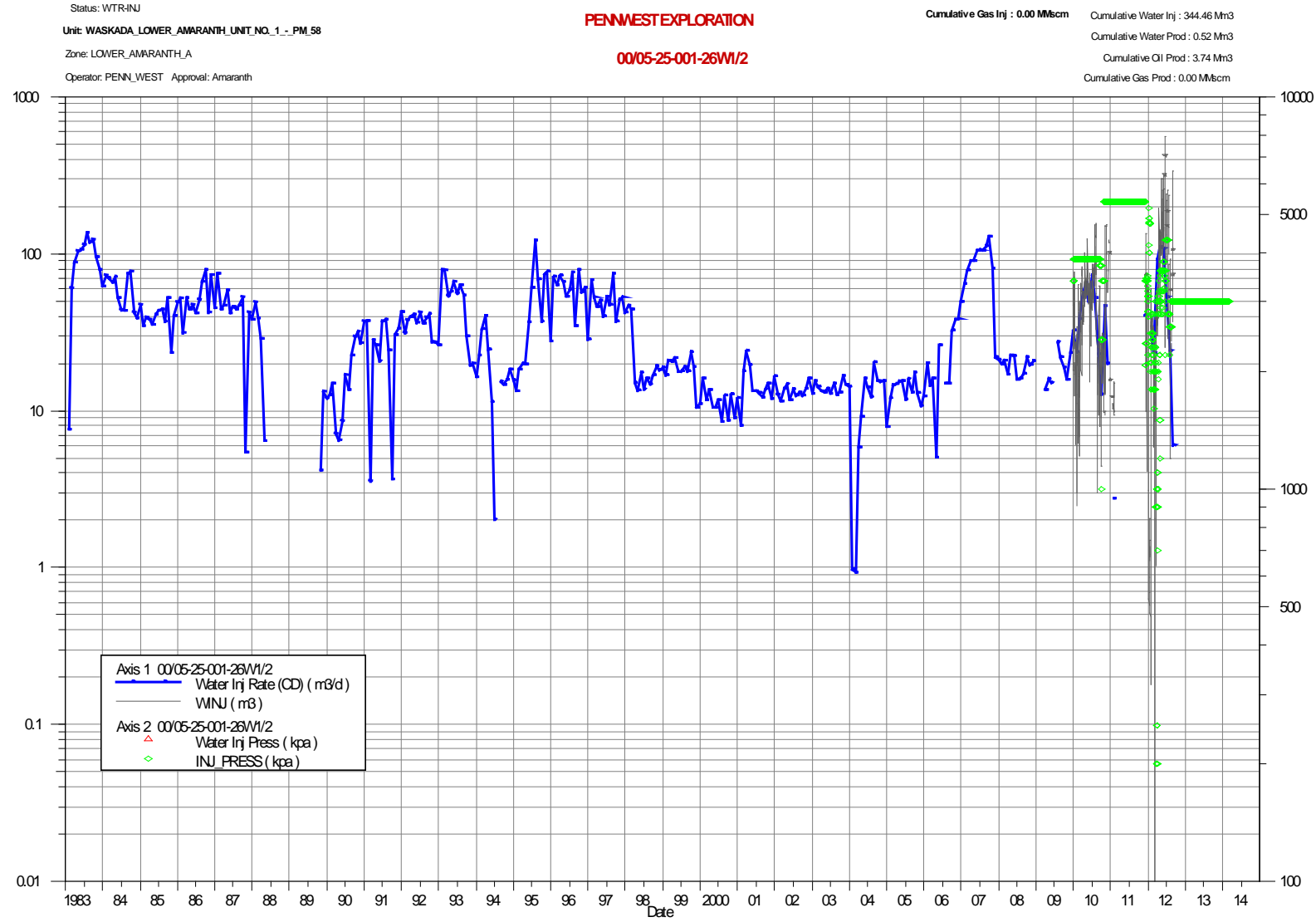
ATTACHMENT 5 – Unit Cumulative Production and Injection Plot



ATTACHMENT 6 – Unit Voidage Replacement Ratio Plot



ATTACHMENT 7 – Individual Injection Well Performance Plots (8 Wells)



Status: WTR-INJ

Unit: WASKADA_LOWER_AMARANTH_UNIT_NO.1_-_PM_58

Zone: LOWER_AMARANTH_A

Operator: PENN_WEST Approval: Amaranth

PENNWEST EXPLORATION

00/07-25-001-26W1/0

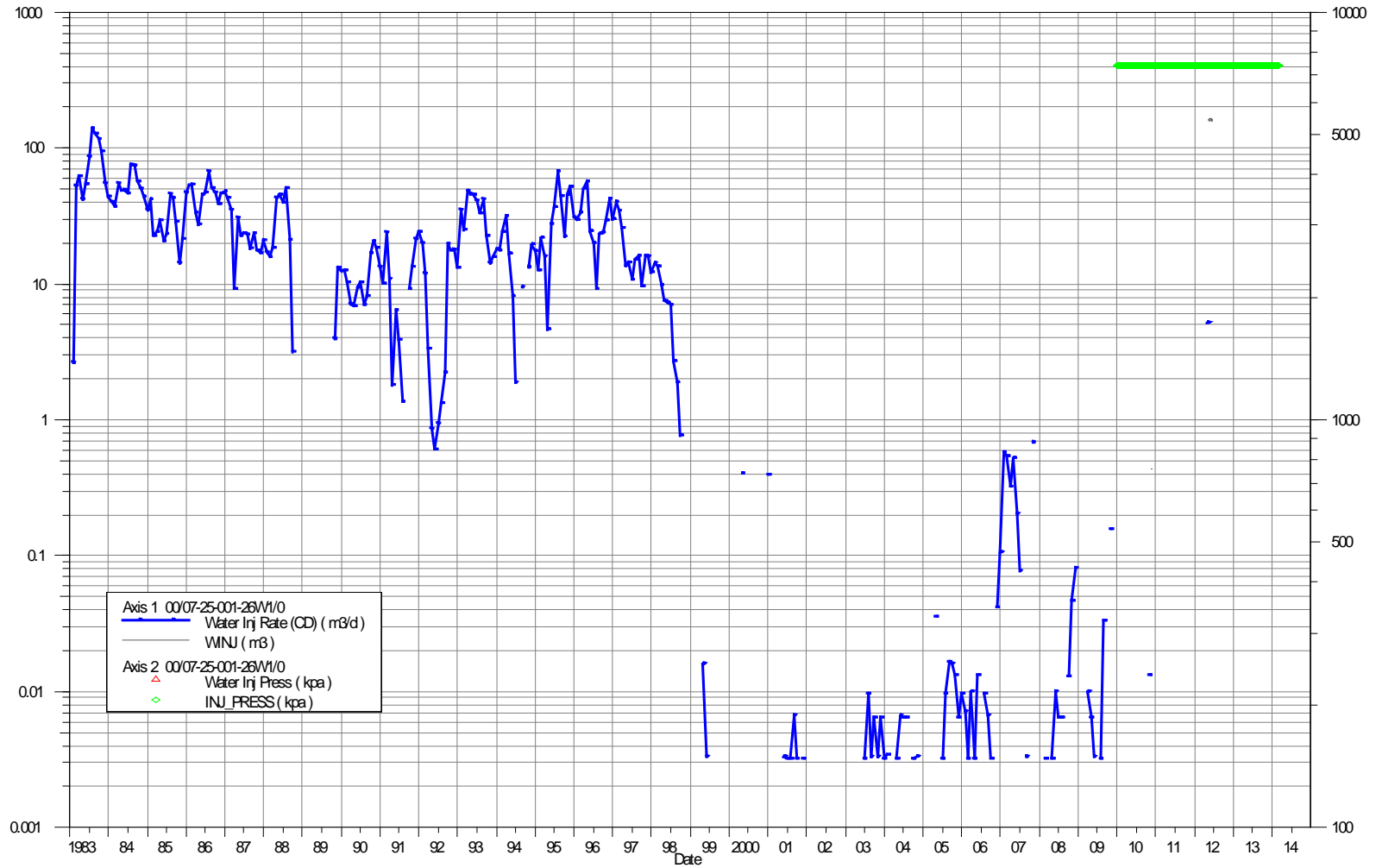
Cumulative Gas Inj : 0.00 MMscm

Cumulative Water Inj : 151.19 Mm3

Cumulative Water Prod : 0.61 Mm3

Cumulative Oil Prod : 1.96 Mm3

Cumulative Gas Prod : 0.00 MMscm



Status: WTR-INJ

Unit: WASKADA_LOWER_AMARANTH_UNIT_NO.1_-_PM_58

Zone: LOWER_AMARANTH_A

Operator: PENN_WEST Approval: Amaranth

PENNWEST EXPLORATION

00/07-26-001-26W1/0

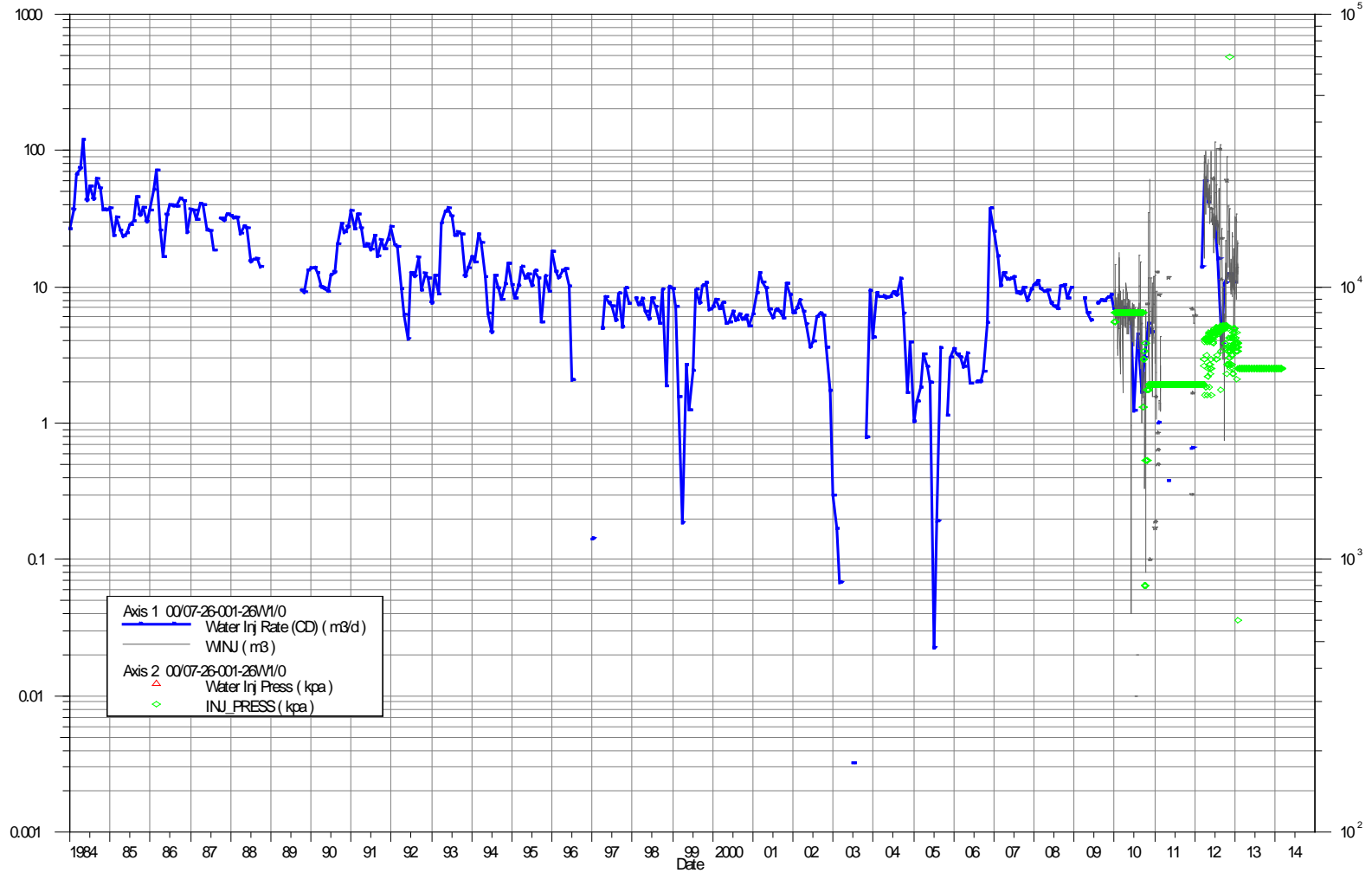
Cumulative Gas Inj : 0.00 MMscm

Cumulative Water Inj : 140.30 Mm3

Cumulative Water Prod : 0.31 Mm3

Cumulative Oil Prod : 2.45 Mm3

Cumulative Gas Prod : 0.00 MMscm



Status: WTR-INJ

Unit: WASKADA_LOWER_AMARANTH_UNIT_NO.1_-_PM_58

Zone: LOWER_AMARANTH_A

Operator: PENN_WEST Approval: Amaranth

PENNWEST EXPLORATION

00/13-25-001-26W1/0

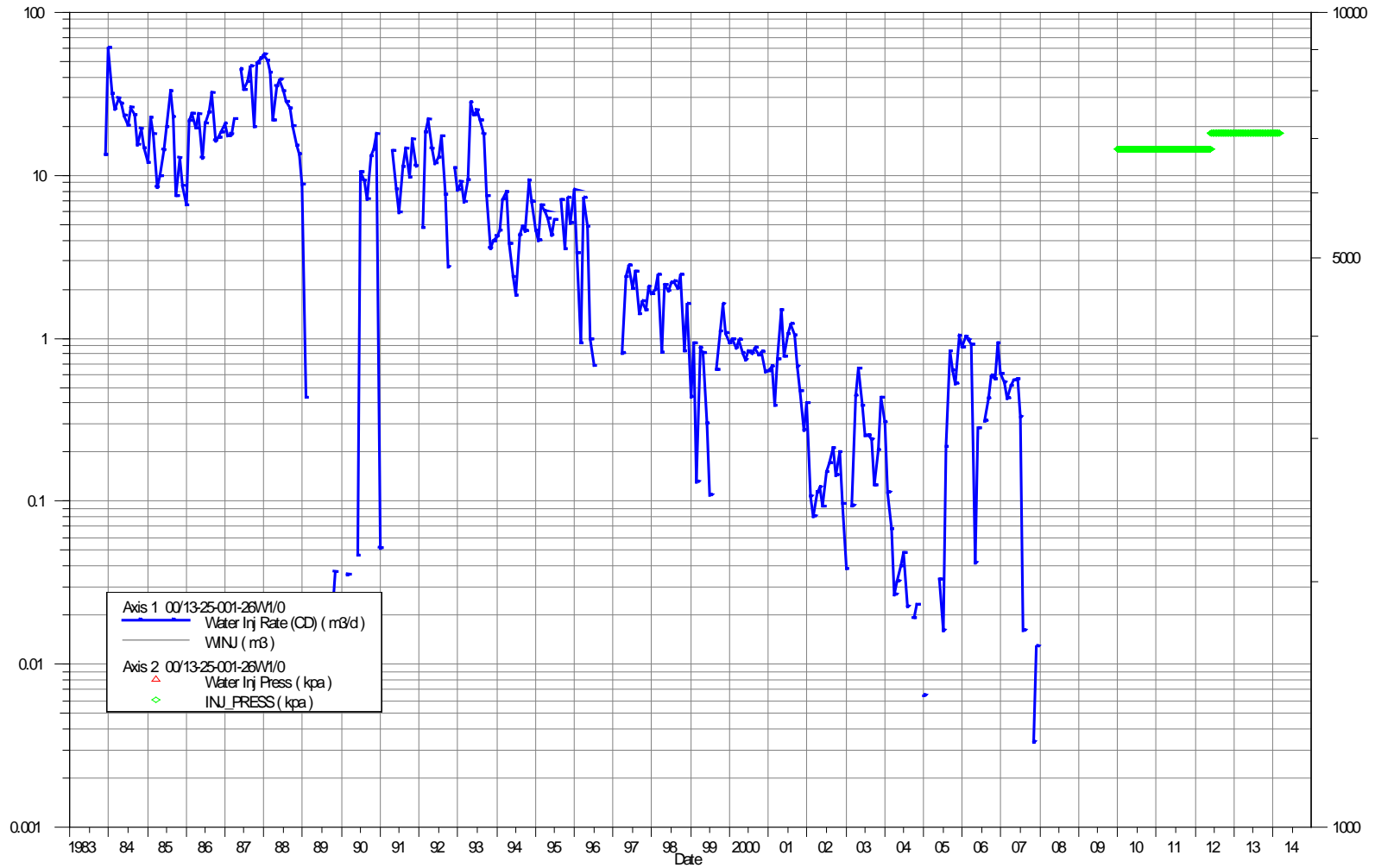
Cumulative Gas Inj : 0.00 MMscm

Cumulative Water Inj : 66.69 Mm3

Cumulative Water Prod : 0.24 Mm3

Cumulative Oil Prod : 0.34 Mm3

Cumulative Gas Prod : 0.00 MMscm



Status: WTR-INJ

Unit: WASKADA_LOWER_AMARANTH_UNIT_NO.1_-_PM.58

Zone: LOWER_AMARANTH_A

Operator: PENN_WEST Approval: Amaranth

PENNWEST EXPLORATION

00/15-23-001-26W1/0

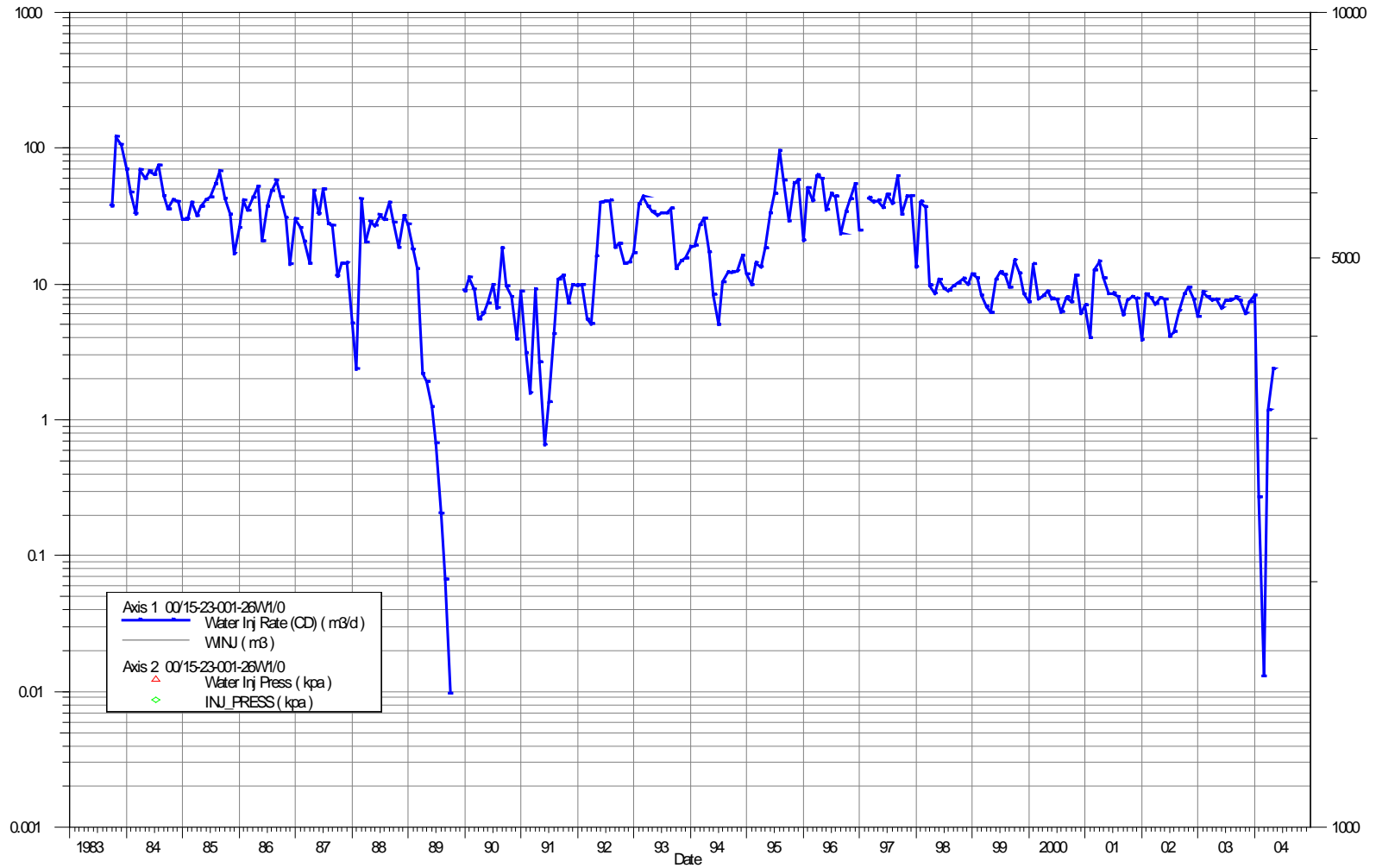
Cumulative Gas Inj : 0.00 MMscm

Cumulative Water Inj : 169.25 Mm3

Cumulative Water Prod : 0.79 Mm3

Cumulative Oil Prod : 2.96 Mm3

Cumulative Gas Prod : 0.00 MMscm



Status: WTR-INJ

Unit: WASKADA_LOWER_AMARANTH_UNIT_NO.1_-_PM_58

Zone: LOWER_AMARANTH_A

Operator: PENN_WEST Approval: Amaranth

PENNWEST EXPLORATION

00/15-24-001-26W1/0

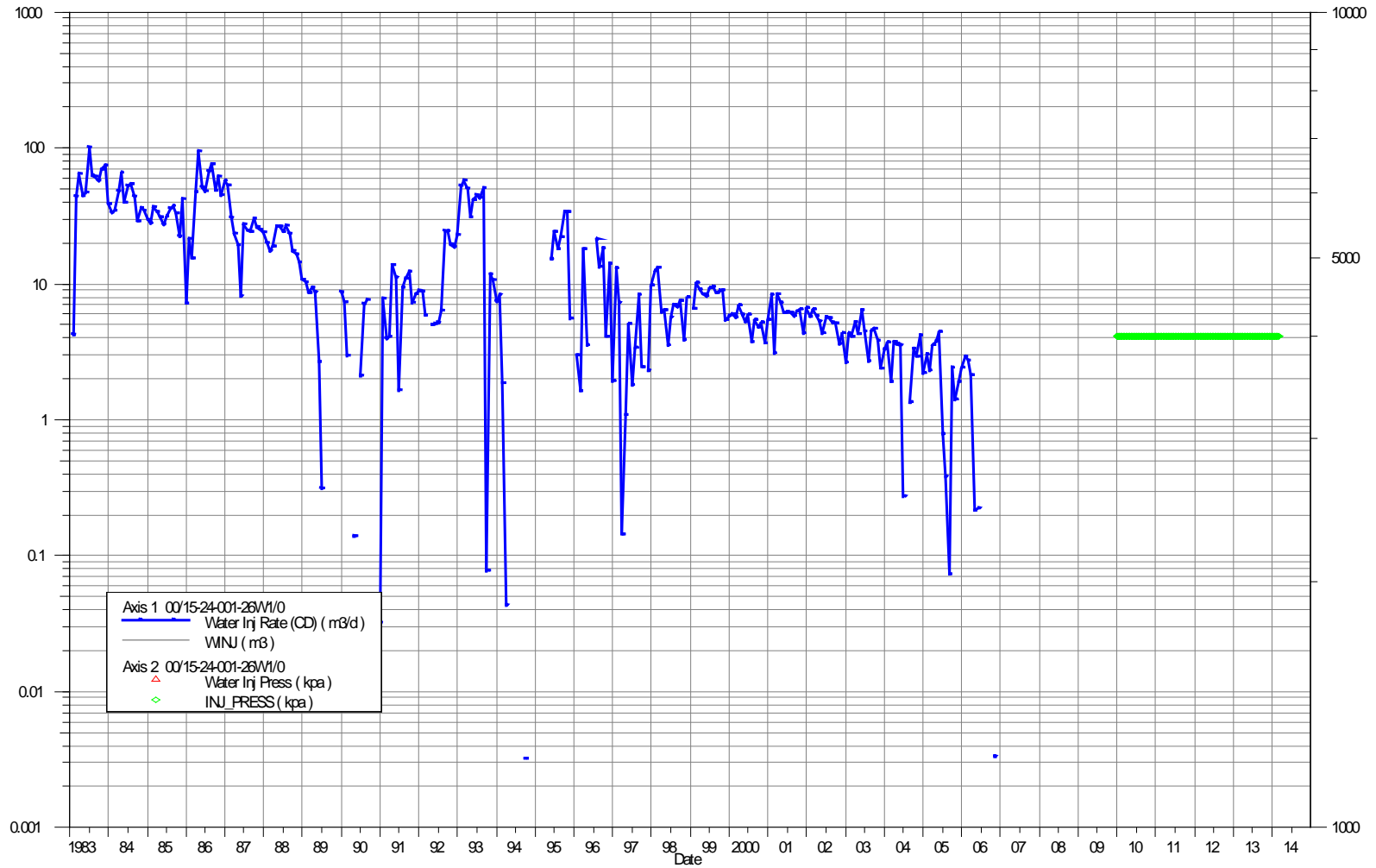
Cumulative Gas Inj : 0.00 MMscm

Cumulative Water Inj : 130.00 Mm3

Cumulative Water Prod : 0.43 Mm3

Cumulative Oil Prod : 3.40 Mm3

Cumulative Gas Prod : 0.00 MMscm



Status: WTR-INJ

Unit: WASKADA_LOWER_AMARANTH_UNIT_NO_1_-_PM_58

Zone: LOWER_AMARANTH_A

Operator: PENN_WEST Approval: Amaranth

PENNWEST EXPLORATION

00/15-25-001-26W1/0

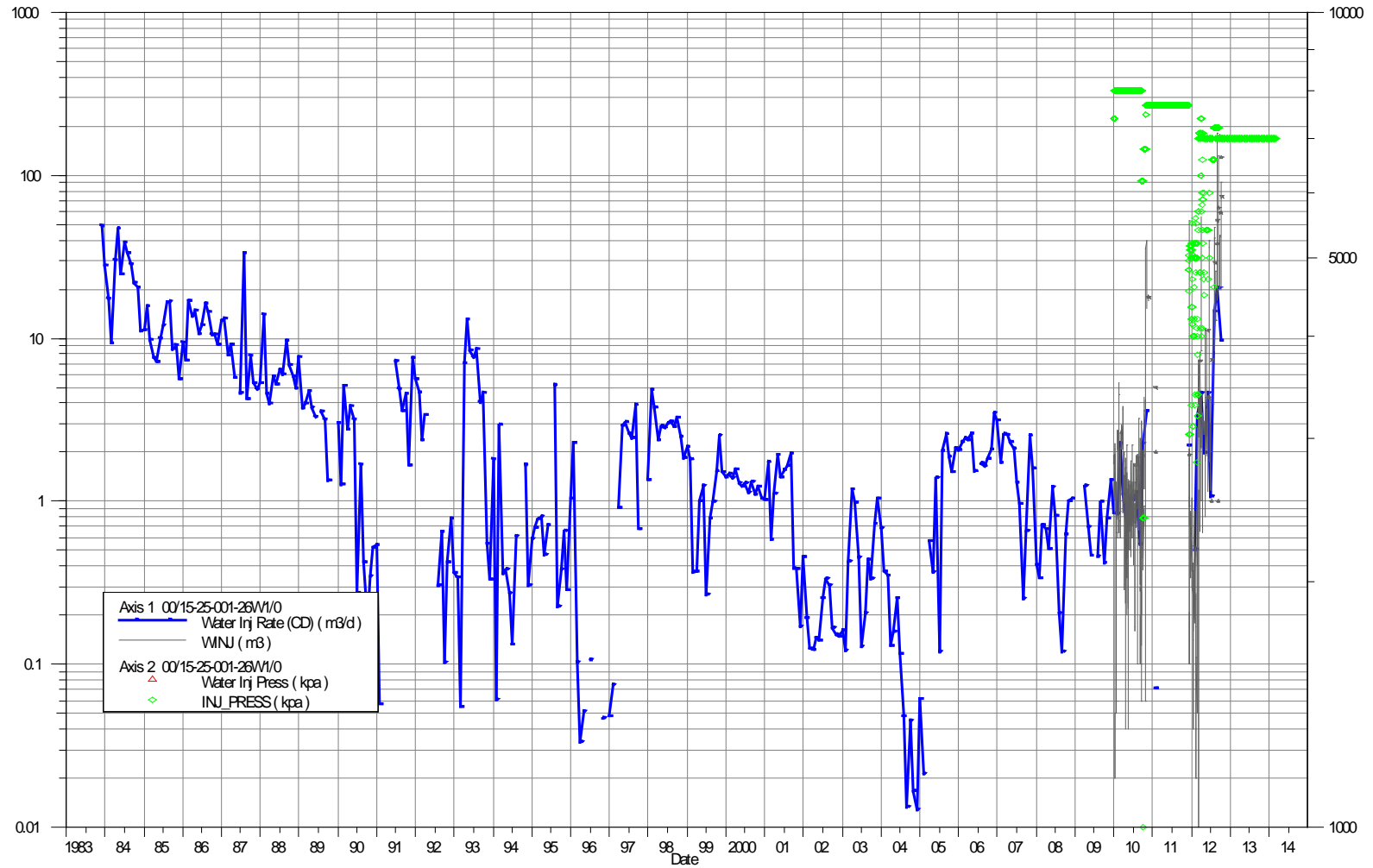
Cumulative Gas Inj : 0.00 MMscm

Cumulative Water Inj : 38.59 Mm3

Cumulative Water Prod : 0.14 Mm3

Cumulative OI Prod : 0.47 Mm3

Cumulative Gas Prod : 0.00 MMscm



Status: WTR-INJ

Unit: WASKADA_LOWER_AMARANTH_UNIT_NO.1_-_PM.58

Zone: LOWER_AMARANTH_A

Operator: PENN_WEST Approval: Amaranth

PENNWEST EXPLORATION

02/13-24-001-26W1/0

Cumulative Gas Inj : 0.00 MMscm

Cumulative Water Inj : 125.43 Mm3

Cumulative Water Prod : * Mm3

Cumulative Oil Prod : * Mm3

Cumulative Gas Prod : * MMscm

