

# Alcoa Groundwater Pumping Test

## COMMUNITY UPDATE JUNE 2022

**This update provides a status of groundwater levels for key monitoring bores, including total extraction rates, as part of the Alcoa 12-month groundwater pumping test of the Upper Eastern View Formation (UEVF) aquifer.**

**The groundwater pumping test commenced on 13 May 2021. Stage one of the test was completed on 8 December 2021.**

### In summary:

- This report covers the period between **31 May to 29 June 2022**.
- No water was extracted during this period and total rainfall was 36.2mm.
- As at 20 June 2022, the water level was RL -17.28m which represents 15.9% of the proposed full volume of the waterbody. (Relative level, or RL, is the water level in metres below sea level.)
- No water has been extracted since 8 December 2021, the groundwater level in the lower part of the UEVF has returned to its pre-test level. Refer to Graph 1.
- There is no change to groundwater behaviour in the upper part of the UEVF aquifer which is gradually increasing (refer Graph 2), or the unconfined shallow Demons Bluff Group (DBG) and Perched Water Table (PWT) aquifers which are responding to natural climate variations (refer Graph 3).
- Specialist consultants continue to collate, analyse and validate the data collected during stage one to determine if there is a sustainable pumping rate. Analysis of the data so far has not identified any adverse impact on the Anglesea River.
- The data is also being used in parallel to update the Anglesea Groundwater Model (in conjunction with Barwon Water) which is being independently reviewed by a Technical Review Panel established by the Department of Environment Land Water and Planning (DELWP).
- Further information about the 12-month groundwater pumping test can be found on the [Alcoa website](#).

### Background

The groundwater pumping test is being undertaken in two stages:

- Stage one - an initial six-month period to establish various aquifer parameters, update the groundwater model and determine a sustainable extraction rate to support a further licence amendment.
- Stage two - an additional six-month period to provide additional confidence to the community, and further validation of the updated groundwater model and input to the associated risk assessment.

As planned, on 8 December 2021 the test reached a significant milestone, with stage one successfully completed.

The test has run in accordance with the licence, and we are pleased with the progress to date.

A total of 671.9ML was extracted during stage one, representing approximately 44% of the licensed volume.

Specialist consultants are now collating, analysing and validating the data collected during stage one to determine a sustainable pumping rate.

Throughout stage one, monthly reviews were conducted with the Co-regulator Technical Working Group (inclusive of Alcoa, Southern Rural Water, DELWP, EPA Victoria, Earth Resources Regulation, Barwon Water and Corangamite Catchment Management Authority).

The data will also facilitate the calibration of the updated 'Anglesea Groundwater Model' being developed in close conjunction with Barwon Water. The model is being independently peer reviewed by a Technical Review Panel established by DELWP and will further inform any proposed long-term licence amendment.

The commencement of stage two of the pumping test will be subject to the technical analysis and independent peer review of the outcomes of stage one of the test, together with approval from Southern Rural Water.

Further information and updates are posted on [www.alcoa.com.au/anglesea](http://www.alcoa.com.au/anglesea).

### **Water Monitoring Plan**

The 12-month groundwater pumping test commenced on 13 May 2021 and is underpinned by a comprehensive water monitoring plan approved by Southern Rural Water. The plan will ensure the groundwater extraction is not threatening groundwater dependent ecosystems that may connect to the aquifer underlying and surrounding the mine, or adversely impact any other users.

Water extraction rates, groundwater levels and quality, and the waterbody level are closely monitored by a specialist consultant. Results are reported monthly to the co-regulator technical working group (inclusive of Alcoa, Southern Rural Water, Department Environment Land Water and Planning, EPA Victoria, Earth Resources Regulation, Barwon Water and CCMA) for review, and an update is published for the community.

A total of 1,500ML is permitted to be extracted during the pumping test, with a maximum daily extraction limit of 5.18ML.

To monitor groundwater levels and quality during the pumping test, 28 bores have been selected with 12 of those also nominated as trigger bores. The location of the trigger and other monitoring bores are shown in Figure 1 below.

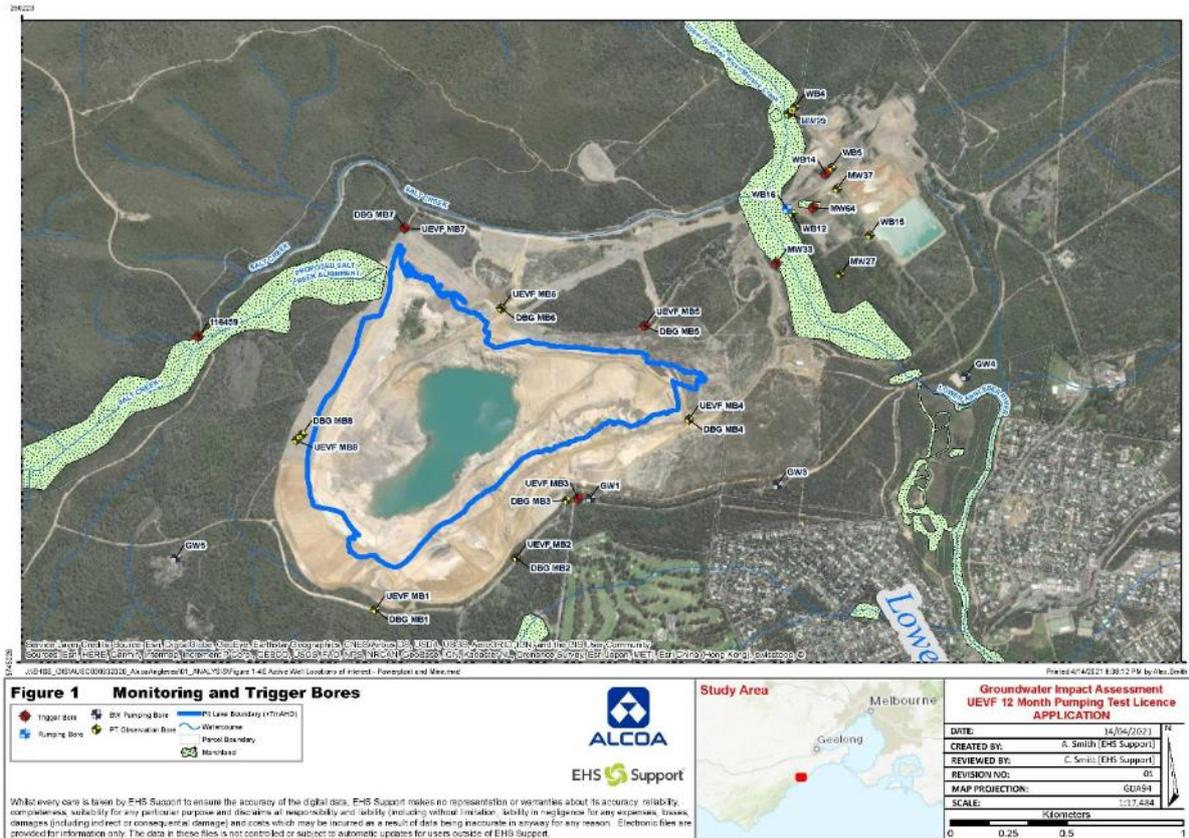


Figure 1: Trigger and other monitoring bore locations.

Each of the trigger bores has defined water level and/or water quality thresholds, known as triggers, and defined response actions if a trigger is met. The triggers and responses, known as trigger rules, were developed in consultation with a specialist consultant and Southern Rural Water.

Each trigger has been set at a conservatively low level to ensure we are alerted early, and, if necessary, able to act quickly during the pumping test to prevent damage to groundwater dependent ecosystems. In total there are five separate trigger rules, with these applying in various combinations to the 12 trigger bores. Each trigger rule has different responses ranging from additional monitoring to reducing the pumping rate.

Data from key Barwon Water monitoring bores in the vicinity is also included in the water monitoring plan for analysis. This data is provided by Barwon Water.

## Extraction rates

Month	Volume extracted (ML)	Maximum daily volume extracted (ML)	Total volume extracted to date (ML)
<b>May 2021 (from 13/5)</b>	53.6 ML	3.45ML	53.6 ML
<b>June 2021</b>	118.3ML	4.32ML	171.9ML
<b>July 2021</b>	132.6ML	4.32ML	304.5ML
<b>August 2021</b>	105.1ML	4.32ML	409.6ML
<b>September 2021</b>	61.5ML*	3.45ML	471.1ML
<b>October 2021</b>	74.0ML*	3.45ML	569.0ML
<b>November 2021</b>	101.1ML	3.45ML	645.2ML
<b>December 2021</b>	26.7ML	3.45ML	671.9ML
<b>January 2022</b>	0ML	0ML	671.9ML
<b>February 2022</b>	0ML	0ML	671.9ML
<b>March 2022</b>	0ML	0ML	671.9ML
<b>April 2022</b>	0ML	0ML	671.9ML
<b>May 2022</b>	0ML	0ML	671.9ML
<b>June 2022</b>	0ML	0ML	671.9ML

Note: SRW License allows a maximum daily limit of 5.18ML, and total extracted volume limit of 1500ML.

\*Due to equipment reliability issue, a lower volume was extracted.

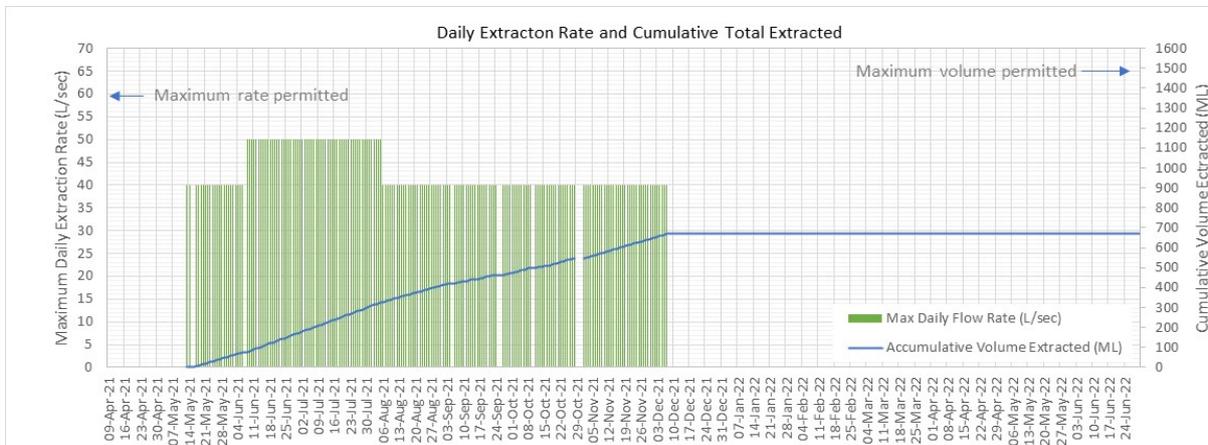


Figure 2: Daily extraction rate and cumulative total extracted.

## Waterbody level

Date	Waterbody level RL (m)	Monthly Rainfall (mm)	Waterbody % Full
26 April 2021	-20.93m	N/A	10.3%
24 May 2021	-20.42m	163.2mm	11.1%
21 June 2021	-19.93m	65.8mm	11.8%
19 July 2021	-19.41m	84.6mm	12.5%
30 Aug 2021	-18.64m	29.6mm	13.7%
27 Sept 2021	-18.46m	57.4mm	14.0%
25 Oct 2021	-18.06m	103mm	14.6%
22 Nov 2021	-17.72m	39.6mm	15.2%
8 Dec 2021	-17.62m	1.8mm	15.4%
17 Jan 2022	-17.87m	33.0mm	15.2%
21 Feb 2022	-17.46m	132.0mm	15.6%
21 Mar 2022	-17.40m	63.7mm	15.7%
26 April 2022	-17.41m	23mm	15.7%
23 May 2022	-17.39m	18.2mm	15.7%
20 June 2022	-17.28m	36.2mm	15.9%

Note: Total estimated volume of the water body is 17,200ML (17.2GL) at RL 5.5m (subject to future bathymetry surveys).

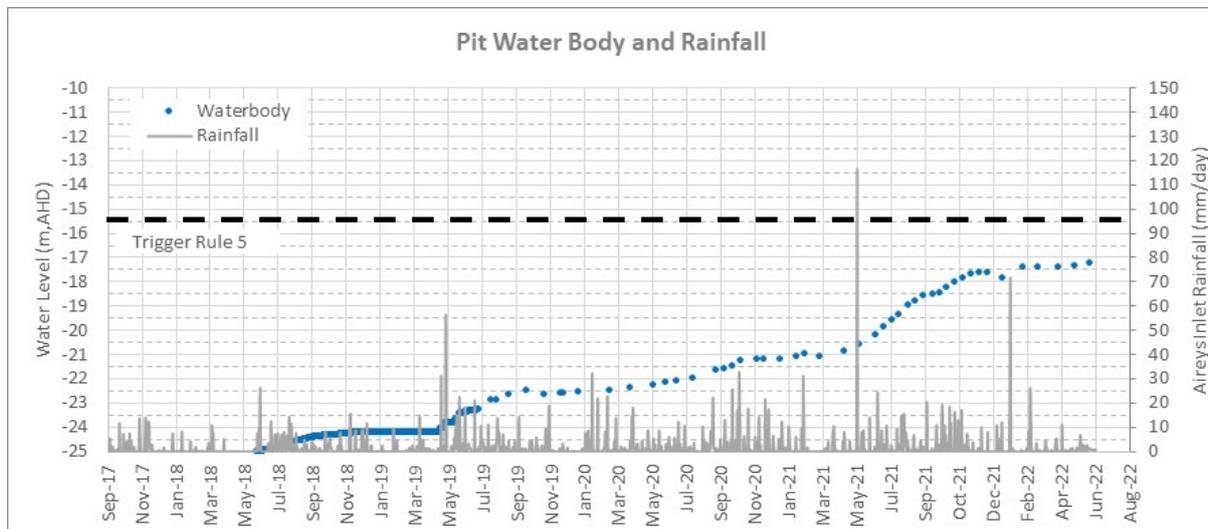


Figure 3: Pit waterbody level and rainfall

## Groundwater level monitoring and trigger status

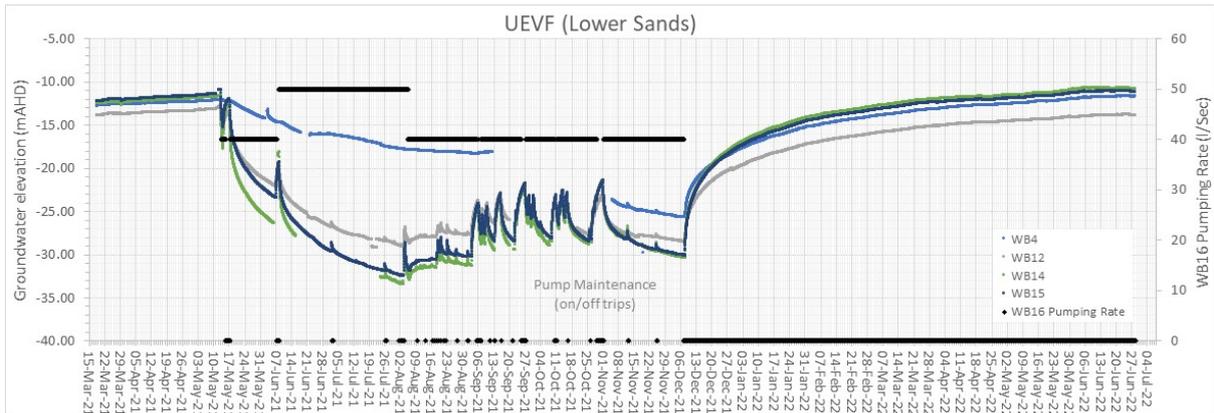
Although Alcoa did not pump during this reporting period, we continue to monitor the bores monthly.

Bore	Overall status	Action / Comment
<b>UEVF WB14</b>	No trigger reached	Continue to monitor
<b>UEVF SOB 116459</b>	No trigger reached	Continue to monitor
<b>UEVF MB3</b>	No trigger reached	Continue to monitor
<b>UEVF MB5</b>	No trigger reached	Continue to monitor
<b>UEVF MB7</b>	No trigger reached	Continue to monitor
<b>UEVF MB8</b>	No trigger reached	Continue to monitor
<b>DBG MB3</b>	No trigger reached	Continue to monitor
<b>DBG MB5</b>	No trigger reached	Continue to monitor
<b>DBG MB7</b>	No trigger reached	Continue to monitor
<b>DBG MB8</b>	No trigger reached	Continue to monitor
<b>PWT MW33</b>	No trigger reached	Continue to monitor
<b>PWT MW64</b>	No trigger reached	Continue to monitor

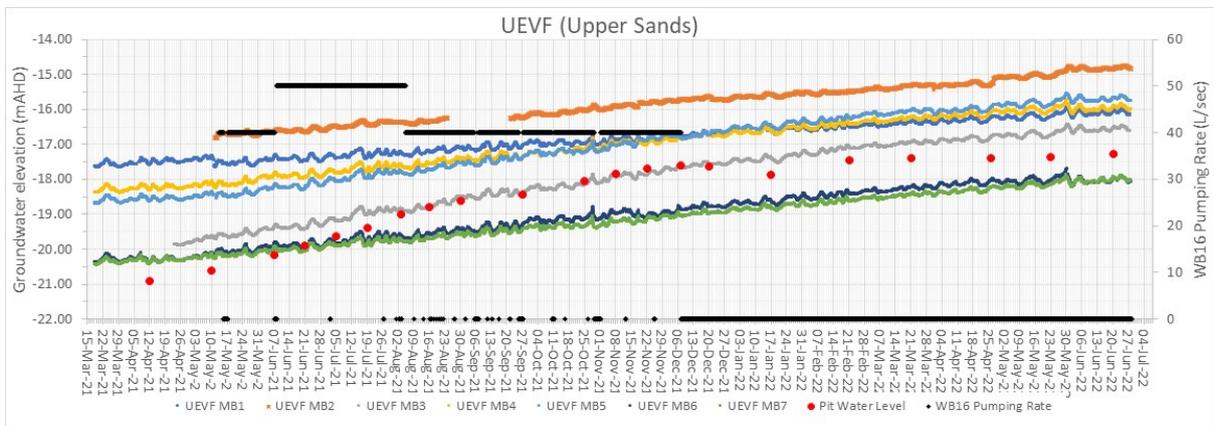
## Current Key Data

Below (page 7) are graphical representations of some of the key data since stage one of the pumping test concluded on 8 December 2021.

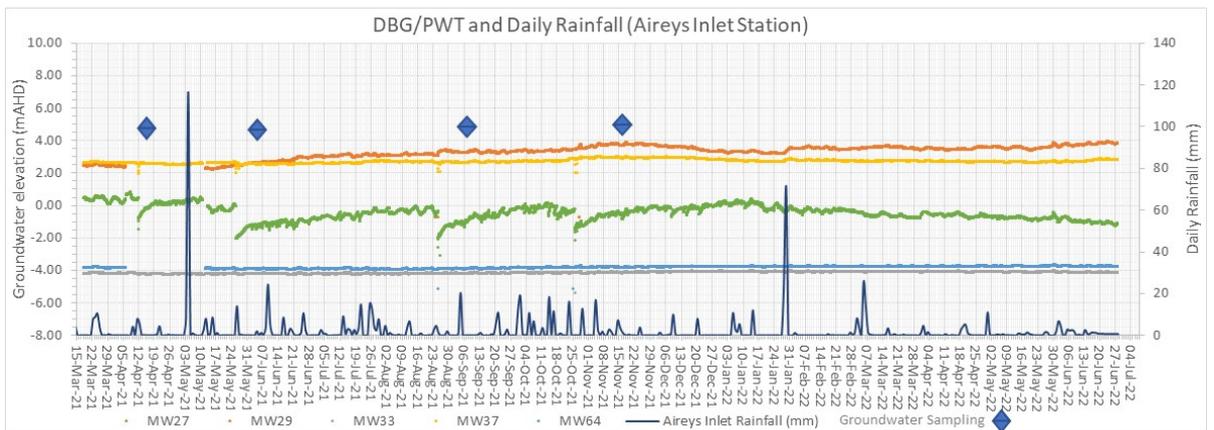
- Graph 1 shows that the groundwater levels in the lower part of the UEVF (180 metres to 250 metres below the surface) have recovered as expected and analysis of the data is being undertaken to derive aquifer parameters for input into the updated numerical model.
- Graph 2 shows that groundwater levels in the upper part of the UEVF aquifer, located at depths varying between 40 metres and 140 metres below the surface, show no impact of pumping test and continue to gradually increase in pressure.
- Graph 3 importantly shows the shallowest aquifers, Demons Bluff Formation (DBF) and Perched Water Table (PWT), located 5 metres to 50 metres below the surface and closest to the Anglesea River system, are responding only to natural climate variations and have shown no impact as a result of the pumping test.



Graph 1: Groundwater level (pressure) trends for the lower part of the UEVF aquifer (approximately 200m depth) show declines as modelled.



Graph 2: Groundwater level (pressure) trends for the upper part of the UEVF aquifer (approximately 40m to 140m depth) show no impact of pumping.



Graph 3: Groundwater level trends in the DBG / PWT aquifer (approximately 5m to 50m depth) shows response only to natural climate variations and no impact of pumping.

## Barwon Water Anglesea borefield monitoring data

*Update provided by Barwon Water*

The Anglesea borefield is one of a number of water sources that can supplement the existing Greater Geelong water supply system for Barwon Water. Access to groundwater from the Lower Eastern View Formation (LEVF) is governed by a bulk entitlement, issued by the Victorian Government.

Barwon Water commenced a groundwater pumping test at the end of January to inform a review of its bulk entitlement and associated environmental monitoring program. This will run for six months, with strict environmental protection controls in place.

During operation, Barwon Water reports monthly on the status against the threshold level for two key bores. They have recommenced these monthly updates for the duration of the pumping test. The Anglesea borefield groundwater level trigger was not reached during this reporting period.

For more information on the Anglesea borefield and the monthly updates please see the [Barwon Water website](#).