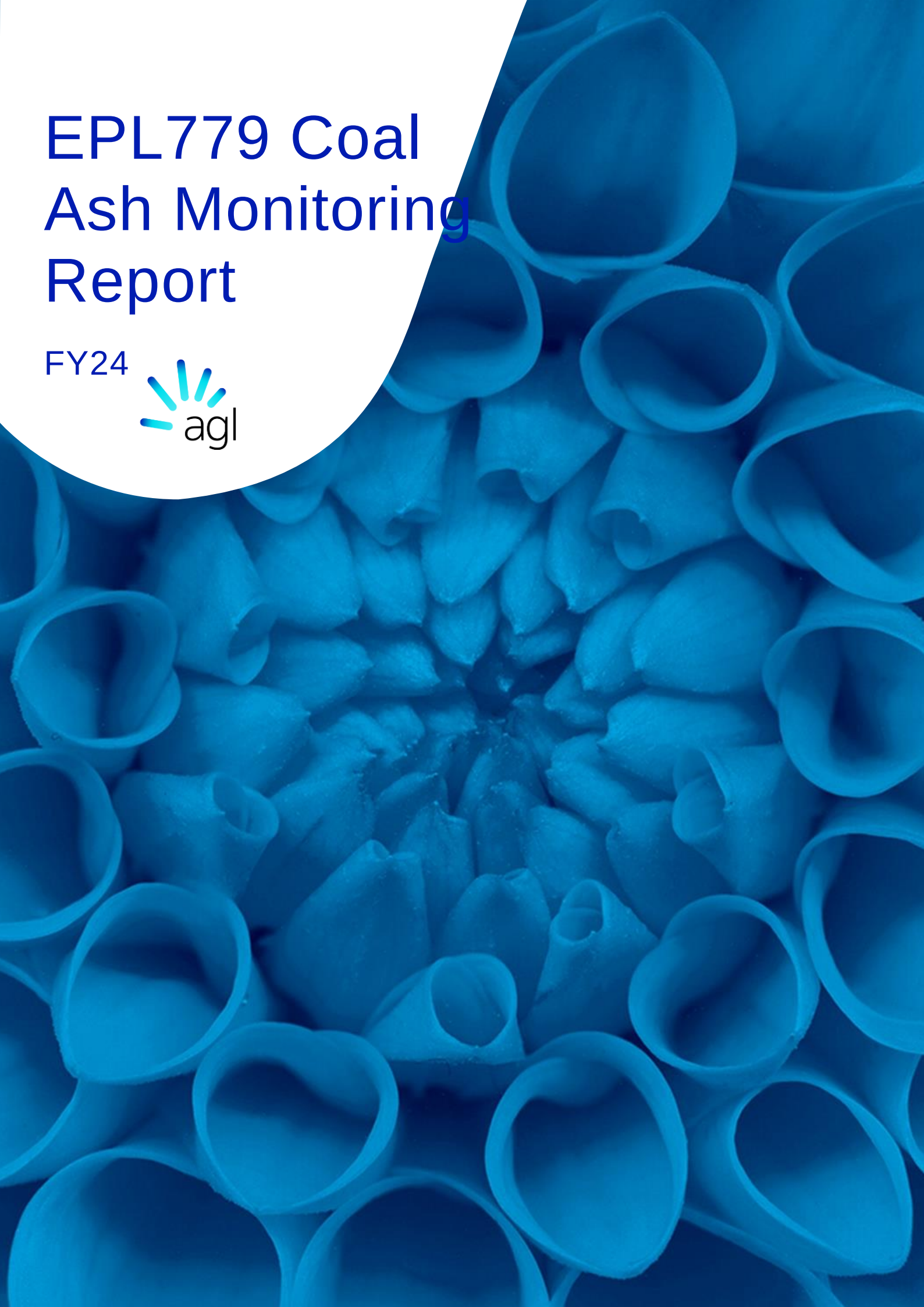
EPL779 Coal Ash Monitoring Report

FY24



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1. Introduction

AGL Macquarie (AGLM) holds Environment Protection Licence 779 (the EPL) for Bayswater Power Station. The EPL includes a requirement for the preparation of an Annual Coal Ash Monitoring Report.

This report has been prepared to meet the requirements of R4.6 of the EPL for the reporting period 1 July 2023 to 30 June 2024. The report will be uploaded to a relevant page linked to the AGLM website (https://www.agl.com.au/about-agl/operations/agl-in-the-hunter) and provided to the EPA via info@epa.nsw.gov.au by 31 October following the end of the reporting period.

The requirements of this report and the section where each requirement is addressed is presented in Table 1.

Table 1: Report Requirements and Sections Where Requirements are Addressed

Report Requirement	Relevant Section
M10.4 For each licence reporting period, the licensee must monitor and record the following details regarding generation, deposition, storage, transport and reuse of coal ash generated at the premises:	This report
a) Quantity of coal used for electricity generation at the premises;	Section 2.1
b) Quantity of bottom ash; and quantity of fly ash, generated at the premises and the grade of fly ash produced (if the grade is known);	Section 2.2
c) Quantity of bottom ash; and quantity of fly ash, deposited, and/or stored at the premises with a description of how it is stored and the processes for managing the storage;	Section 2.3 Section 2.4 Table 3
d) Quantity of bottom ash; and quantity of fly ash, transported from the premises together with identification of the destination; and	Section 2.5 Table 3
e) Management measures used for coal ash repositories on the premises to maintain the viability of ash reuse, including identification of any other material being stored concurrently with newly deposited coal ash.	Section 2.7Table 3
Quantities are to be reported in tonnes.	Throughout this report
Note: The collection and reporting of information required by the above condition does not come into effect until three months after the issued date of this licence version to allow the licensee to put in place the relevant systems required to meet the condition.	Section 1
R4.6 The licensee must prepare an Annual Coal Ash Monitoring Report that details information required under condition M10.4 in respect of generation, deposition, storage, transport and reuse of coal ash generated at the premises for each Annual Return reporting period.	Section 1 This report
R4.7	Section 1

Report Requirement	Relevant Section
By no later than 31 October of each year, the licensee must make the Annual Coal Ash Monitoring Report required by condition R4.6 publicly and prominently available on its website.	
R4.8 By no later 31 October each year, the licensee must send a copy of the Annual Coal Ash Monitoring Report required by condition R4.6 to the EPA at info@epa.nsw.gov.au	Section 1

2. Report

2.1. Quantity of Coal Used for Electricity Generation

During the reporting period, Bayswater Power Station consumed 6.95 million tonnes (Mt) of coal for electricity generation.

2.2. Ash Generation

The total quantity of ash generated during the reporting period includes both fly ash and bottom ash:

Ash generation sorted by category is detailed in Table 2.

Table 2: Ash Generation During the Reporting Period

Ash Category	Quantity (MT)
Bottom ash	0.26
Fly ash	1.73
Total ash produced	**1.99**

2.3. Ash Deposition

Ash produced at Bayswater Power Station is deposited and stored in both the Bayswater Ash Dam (BWAD) and Ravensworth Void 5 (RWV5). Bottom ash is only stored within the Bayswater Ash Dam whereas Fly Ash is stored primarily in RWV5. If the RWV5 ash deposition infrastructure is unavailable for any reason, fly ash is diverted to the BWAD.

The following quantities of ash were deposited in the Bayswater Ash Dam (BWAD) and Void 5 during the reporting period:

Bottom Ash:

- 0.18 Mt deposited hydraulically at Bayswater Ash Dam (BWAD)
- 0.075 Mt deposited mechanically at Void 5

Fly Ash:

- 0.22 Mt deposited hydraulically at BWAD
- 1.3 Mt deposited hydraulically at Void 5

2.3.1. Bayswater Ash Dam

The BWAD is located to the East of the Bayswater Power Station and is owned and operated by AGLM. The BWAD is formed in Pikes Gully and is confined by a Main Embankment along the eastern boundary, a Saddle Dam Embankment along the north-western corner of the site, a coal conveyor embankment along the western boundary and natural topography along the southern side of the site as illustrated in Figure 1.

Figure 1 BWAD Site Plan (November 202 Google Earth Image)

The furnace ash including economiser grits are collected and crushed, then mixed with ash return water to create a suspension (slurry) and pumped to the north-western side of the dam. The bottom ash and fly ash is transported from the ash plant via above ground basalt lined pipes to a disperser located on a high point within the ash reservoir.

BWAD receives bottom ash as a lean mix slurry at up to 30% solids content. When fly ash is diverted to the BWAD, the percentage of solids varies from 0% to 40% based on the number of collection vessels diverted. The ash disposal system at BWAD comprises a closed water cycle of pumps and pipes to convey ash slurry to the dam. The decant water is either lost through evaporation and seepage or returned to the power station for reuse in conveying ash.

The current ash placement includes dispersing ash from the western extents of the Fall-Back Strategy cells, beaching towards the decanting locations in the east of each cell. Deposition locations have been prescribed along the western wall for AGLM to migrate south once the deposition reaches the design ash level. The deposition locations however can be moved as required based on the observations of the ongoing deposition.

A revised Ash Management Plan is currently being developed. The revised ash management plan comprises separate management areas for bottom ash and fly ash.

Bottom Ash

Bottom ash is deposited into a dedicated channel in Stage 2 cell on the northern side of the dam, adjacent to the saddle dam. The extraction of bottom ash is managed in this channel which include baffles to slow down the flow of the ash whilst encouraging the settlement of solids before passing through the decant structures into the decant pond. Three decant structures were installed at the end of the channel as the final step of removing ash from the water flowing into the decant pond.

Fly Ash

Fly ash will be deposited into four cells constructed in stage 2 and stage 3. The deposition, drying and harvesting of ash will be rotated in the four cells throughout the operations. Two deposition points will be installed in each fly ash cell with one on the A-line and the other one on the B-line. The fly ash management process will follow the sequence below:

i. Deposition of fly-ash in first cell until when the capacity is exhausted or up to the recommended levels in the cell. To retain ash in the cells and decant water with very low TDS, the decant structures will be progressively raised.

ii. When deposition in the first cell has been stopped it will be moved into the second cell and will continue until capacity is exhausted or up to the recommended levels in the cell. During this time, ash deposited in the first cell will be dried through some form of mud farming activities involving amphibious excavators and low ground pressure dozers. This process will involve extensive testing of the material to ensure safety of people and plant working in the cell. When it is deemed safe to commence extraction of dry ash from the cell, Moxies and Dozers will be used to move the ash from the cell to the dry stacking area ready for haulage to the rehabilitation areas.

iii. When the second cell has reached capacity, deposition will be moved to the third cell and controlled drying and extraction process as highlighted in step 2 will commence in the second cell.

iv. Finally, deposition will be moved to the fourth cell and drying, and extraction of ash will commence in the third cell. This rotation will be repeated throughout the remaining years of the Power Station.

In future an ash haulage contractor will be engaged to manage the deposition, drying and harvesting of both bottom and fly ash into the cells.

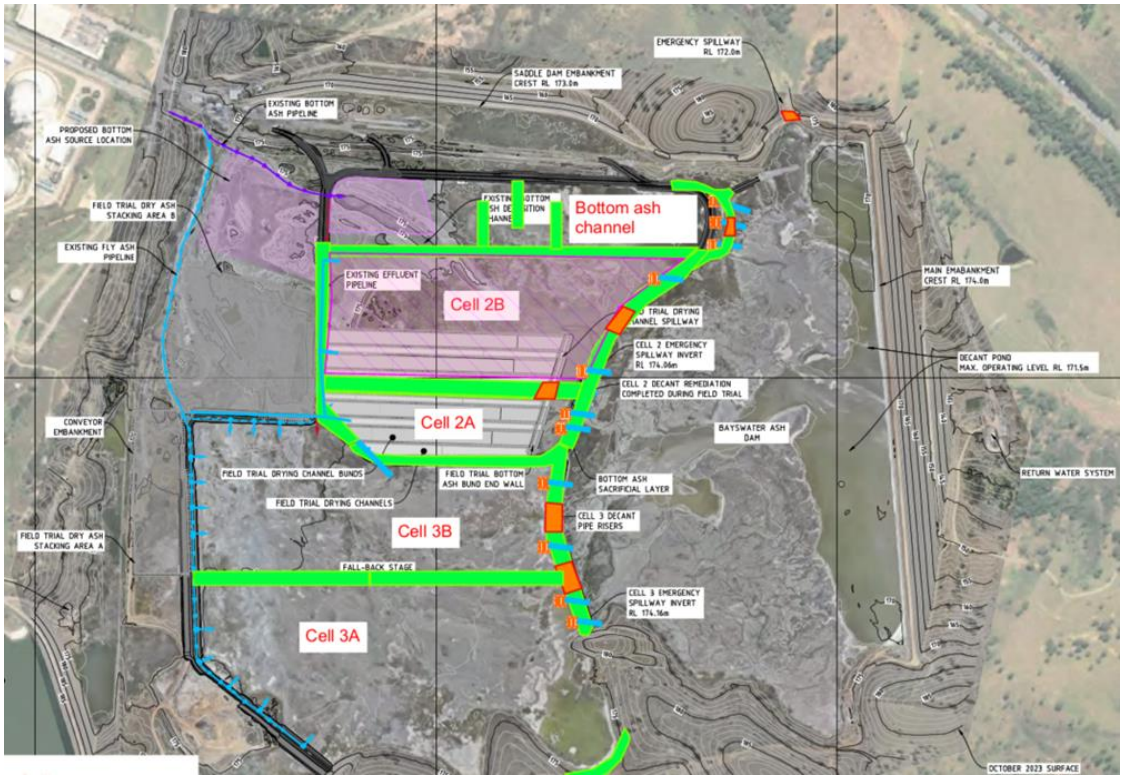

Figure 2 Proposed BWAD ash management cells

2.3.2. Ravensworth Void 5

The Ravensworth south-eastern ramp (Void 5 east) and final void (Void 5 north) are collectively known as Void 5. Both are located entirely within the Macquarie Generation Subdivision share of the Ravensworth South area, which is flanked on the south by land belonging to the Narama Open Cut, and in the west by land occupied by Ravensworth West Mine and Ravensworth Underground Mine (RUM).

The Ravensworth area is situated in the upper Hunter Valley, approximately halfway between the towns of Singleton and Muswellbrook adjacent to the New England Highway as shown in Figure 1

Figure 3 Aerial image showing the general arrangement of RWV5

The fly ash is transported by pipeline from Bayswater Power Station to RWV5.The system that transports fly ash from Bayswater Power Station to Ravensworth Void 5 (RWV5) conveys the ash from the station to silos located adjacent to Bayswater Ash Dam using a pneumatic extraction system with dry compressed air as the transport medium. From the silos, the fly ash is mixed with water to form a dense phase concentration of around 60 to 65 % solids by weight. This slurry is subsequently pumped 12.2 km through steel pipelines to the Ravensworth Void 5 (RWV5) emplacement area.

The ash emplacement strategy involves 2 distinct stages.

Stage 1 comprised the emplacement of fly ash into each of the Void Arms up to full supply level (RL101 m). Both arms were fully utilised during Stage 1 ashing operations, by discharging from the northern and eastern extents of the northern and eastern arms respectively. Ash was prevented from entering the return water pond by constructing a series of low-level embankments, using an upstream raising methodology. Ash emplacement was cycled between the two Arms in the Void, such that one Arm was active, while the other one drying and, construction of the next low-level embankment was occurring in the other Arm.

Stage 2 comprises the emplacement of fly ash in the remaining Void. Fly ash is currently being discharged from the southern and western void ridges to form a beach that pushes the decant pond in a north-easterly direction to the inside corner of the Void. A series of sumps were constructed, following up the access road on the eastern side of the Northern Arm, as the ash level raises. These sumps are required to retain the ash beach to provide a clean pond for the return water pump. As the ash level rises, the return water pump will be raised up in level, to each successive sump.

2.4. Ash Storage

Ash storage is completed in the areas below.

As described in Section 2.3 ash is stored in Bayswater Ash Dam and Ravensworth Void 5.

2.5. Ash Transport

The following quantities of ash were transported offsite for reuse by external vendors during the reporting period:

- **Bottom Ash**: 2.3 kilotons (kt) sold to offsite vendors.
- **Fly Ash**: 61.52 kt sold to offsite vendors.

2.6. Coal Ash Statistics

Statistics for coal deposition, storage and transport are shown in Table 3.

Table 3: Coal Ash Statistics

Ash Category	Quantity (MT)
Ash Deposition	
Bayswater Ash Dam	
Bottom Ash	0.18
Fly Ash	0.22
Ravensworth Void 5	
Bottom Ash	0.075
Fly Ash	1.3

2.7. Management Measures

AGL Macquarie has implemented several management measures to ensure the proper handling, storage, and reuse of ash:

- **Ash Storage and Deposition**: Ash is stored in the Bayswater Ash Dam (BWAD) and Void 5 through both hydraulic and mechanical methods. No mixing of fly ash and bottom ash occurred during the FY24 reporting period to maintain the viability of ash reuse.
- **Ash Reuse**: AGL Macquarie continues to promote the beneficial reuse of ash by selling fly ash and bottom ash to external vendors.
- **Monitoring and Compliance**: Regular monitoring and testing is conducted to ensure compliance with EPL 779 conditions and to facilitate the reuse and safe disposal of ash in an environmentally responsible manner.