



DOC20/490839-9; EF 14/25399 (SSD 9697)

Department of Planning, Industry and Environment  
via Major Projects Portal

Attention: Mandana Mazaheri

23 July 2020

**Bayswater Power Station Upgrade - (SSD 9697)- Environmental Impact Statement  
Review by the Environment Protection Authority**

I refer to your email to the Environment Protection Authority (EPA) received on 22 June 2020 seeking the EPA's advice in relation to the adequacy of the proponent's Environmental Impact Statement (EIS) for the proposed Bayswater Power Station Upgrade.

The proponent, AGL Macquarie, as a subsidiary of AGL Energy Limited (AGL), proposes to undertake a range of upgrades to the Bayswater Power Station aimed at improving the environmental performance of ash, salt and water management infrastructure and associated rehabilitation outcomes referred to as the Bayswater water and other associated operational works project (the Project). Bayswater Power station is located south-east of Muswellbrook in the Local Government Areas (LGA) of Muswellbrook and Singleton, in New South Wales (NSW).

The EPA has reviewed the EIS and has determined that it requires additional information to properly assess the proposal. The EPA's additional information requirements are provided at Attachment A to this letter.

If you require any further information regarding this matter, please contact Genevieve Lorang on 4908 6869 or by email to [hunter.region@epa.nsw.gov.au](mailto:hunter.region@epa.nsw.gov.au).

Yours sincerely

**JENNY LANGE**  
**A- Unit Head- Regulatory Operations**  
**Environment Protection Authority**

Encl: Attachment A- EPA Additional information required

## **ATTACHMENT A – EPA additional information requirements**

To properly assess the proposal the EPA requires the following:

### **Hydrogeology**

#### **1) Information on the existing impact of the Bayswater Ash Dam (BWAD) seepage on receiving groundwaters.**

The EIS and water modelling reports acknowledge and indicate that an estimated 8ML/d of seepage currently occurs from BWAD through the dam wall to shallow groundwater, inevitably discharging to the Pikes and Bayswater Creek catchments. Considering the volumes modelled, the existing containment ability of BWAD from underlying groundwaters is considered low. Further assessment of the existing impact of seepage to receiving groundwater quality is required.

The EIS states a groundwater monitoring program is already in place for the BWAD (AECOM, 2016a). Little discussion on groundwater observations monitoring seepage around the periphery of BWAD was presented in the EIS. The EIS does not use hydraulic and chemical evidence to demonstrate principle leakage is occurring through the dam wall, or that it is feasibly intercepted through the modelling report. Connectivity between shallow groundwater and deep groundwater across the area was not discussed, considering a regional groundwater deficit likely exists due to mining activity. Further work is required to indicate that direct seepage to underlying formations is not impacting on regional groundwater quality. The findings could be incorporated as supporting evidence in characterising existing impacts from BWAD.

The Bayswater Ash Dam Seepage South Investigation, required as part of Environment Protection Licence 779, is due for completion 30 November 2020. Detailed groundwater monitoring or preliminary findings from the investigation could be used to support the modelled findings.

#### **2) Information on the proposed upgrades to the BWAD seepage collection system, demonstrating an increase to the protection of receiving groundwaters.**

Further information is required to assess impacts to local and regional groundwaters from the additional hydraulic head within BWAD from the proposed augmentation as improved seepage interception measures were not included in the modelled results. Considering the additional hydraulic head from the augmentation will increase seepage, implemented seepage management measurements should demonstrate a similar increase or improvement in ability to intercept the increased rates of seepage. Demonstrated or revised modelling is required to show the groundwater protection measures demonstrate the impacts as negligible or adequately managed.

The lining of enlarged seepage management ponds is not discussed in the information provided on proposed seepage management upgrades. The proposed upgrades to seepage management are unlikely to account for the existing or increased modelled seepage. The level of environmental protection to groundwaters is unable to be adequately assessed.

#### **3) Information on the technical specifications of the BWAD augmentation, including the use of a liner, to prevent increased seepage to local and regional groundwaters.**

The proposed augmentation is to increase the existing BWAD footprint by approximately 167,000 m<sup>2</sup>. Details on a liner to prevent additional seepage ingress over the increased dam footprint is not presented in the EIS.

The EIS appears to evaluate additional impacts from the proposed augmentation to have negligible consequence due to seepage already occurring, this approach is not considered adequate to address the secretary's environmental assessment requirement to characterise the existing or additional impact to groundwater. Discussion regarding the impact to the regional groundwater environment receiving ongoing seepage is not sufficiently characterised. The reliance on modelling, with significant assumptions and uncertainty, poorly assesses the likely impact of the proposed augmentation on groundwater quality.

**4) Information on the post-closure and rehabilitation of the BWAD including any ongoing seepage management.**

The EIS does not discuss the rehabilitation or post closure of BWAD, including the requirement or longevity of upgraded seepage collection management systems post closure. To satisfactorily address the groundwater impacts for the life of the project post-closure management considerations are required.

### **Ravensthorpe Ash Line**

**5) Further information on the underground ash disposal and discharge of excess ash process water to mining voids and impact to groundwaters.**

The EIS describes the replacement of the Ravensthorpe Ash line for the transfer and disposal of ash from the Ravensthorpe Fly Ash Plant (Bayswater) to Ravensthorpe Void No. 3. No further details of the underground disposal or potential impacts to groundwaters from the disposal is discussed in the EIS or water modelling report.

The EIS also states, when conceptualising the sites water balance, excess process water is removed from the ash cycle directly into Void 4, presumably also at Ravensthorpe. No further details of the discharge or potential impacts to receiving groundwater are discussed in the EIS or water modelling report.

The impacts to regional groundwater quality from the discharges should could be discussed in conjunction with secondary leakage from the BWAD in the EIS.

### **Salt Cake Landfill**

**6) Information on the site design, technical specifications and liner compatibility of the proposed salt cake landfill.**

The salt cake landfill specifications conceptually meet the requirements of the *NSW EPA Environmental Guidelines Solid waste landfills, second edition, 2016* (the Landfill Guidelines). Detailed technical drawings are required to confirm compliance with the Landfill Guidelines including that the liner specifications are compatible with the brine leachate.

**7) An investigation of the feasibility of additional liner properties to meet the Aquifer Interference Policy quality minimum impact criteria.**

The EIS and its modelled findings indicate the landfill does not meet the *NSW Aquifer Interference Policy, DPI NOW, 2012 (AIP)* minimal impact consideration about groundwater quality. The proponent should investigate additional liner measures, above the minimum specified within the Landfill Guidelines, to ensure better compliance with AIP's minimal impact considerations for groundwater quality.

## **8) Preparation and submission of a detailed Groundwater Monitoring Plan for the proposed Salt Cake Landfill**

Further information on the groundwater monitoring of the Salt Cake Landfill is required to ensure its adequacy. A proposed groundwater monitoring program for the salt cake landfill, including trigger action response plans, is required to ensure leakage detection is adequate.

## **Surface Water**

### **9) A contemporary characterisation of surface water quality and assessment of potential water pollution risks from the existing development**

The current water quality impacts and risks to receiving waterways are not appropriately characterised. Limited surface water monitoring results are provided, largely from historical data that does not include information for key waterways potentially impacted by the existing development.

A report which describes the existing surface water quality at the premises and receiving waterways is required. This should:

- be based on sampling results representative of the current water quality under a range of operational and weather conditions
- include raw results and summary statistics for all pollutants potentially present at non-trivial levels, with the analytical suite based on a risk assessment of potential pollution sources
- include sampling sites at the coal handling plant sediment basin, ash dam, Lake Liddell and Plashett Reservoir and any discharges from these storages
- include appropriate sampling sites to detect potential impacts from the existing development on the receiving waterway, including
  - Pikes Creek between and downstream of the seepage collection dams
  - Bayswater Creek upstream and downstream of the confluence with Pikes Creek
  - Tinkers and Saltwater creeks
- compare pollutant levels to the appropriate guideline values for slightly to moderately disturbed ecosystems as recommended by the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (see 'Ecosystem protection level and guideline values' section below)
- identify potential sources of any pollutants detected at non-trivial levels including considering controlled discharges, managed overflows and groundwater mediated discharges such as seepage from the ash dam.

### **10) Information to demonstrate that all practical and reasonable options to avoid, minimise and mitigate water pollution impacts have been investigated and where feasible implemented.**

The potential impacts of the ash dam seepage from the current development are not well understood. The EIS does not adequately characterise seepage water quality or consider how this could impact on current surface water quality and under the proposal. An assessment of the potential water pollution impacts of the ash dam seepage is required and should include the following details of options considered and proposed to minimise seepage losses to the environment. Options considered should include, but are not limited to:

- source controls to avoid and minimise seepage, such as clean runoff diversions, groundwater interception bores and lining areas of high seepage

- measures to improve interception and return of seepage water including improvements to seepage collection drainage, collection pond sizing and lining, return pump capacity and pumping duration options.

The water balance modelling should include scenarios with these mitigation measures implemented to demonstrate their effectiveness.

A review of the seepage rates adopted in the water balance model as presented in Table 6.3 of Appendix E should be provided with justification why seepage rates would decrease with increasing ash dam volume.

### **11) An assessment of options considered to avoid or minimise managed overflows from the ash dam and mitigate the potential impacts of these overflows**

The EIS indicates that water will need to be removed from the ash dam to reduce the levels and avoid managed overflows and indicates that this could involve transferring ash water to Ravensworth Void 4 or to the brine concentrator plant. It is unclear what measures are proposed to be implemented. Clarification and further details are required, including consideration of all practical and reasonable measures.

The assessment of options considered to avoid or minimise managed overflows from the ash dam and mitigate the potential impacts of these overflows could include, but is not limited to:

- removing ash water from the ash dam for treatment and reuse
- increasing evaporation from the dam through, for example, mechanical barrel fans

### **12) Assessment of control discharge impacts from the ash dam**

It is unclear whether the applicant is proposing controlled discharges from the ash dam. Appendix E states, "Whilst the Bayswater EPL allows for discharge from the BWAD spillway, as a mitigation measure to avoid spills over the BWAD spillway, AGL Macquarie has committed to ensuring that adequate environmental freeboard is maintained throughout the life of the dam by setting operational target levels for the BWAD." The current environment protection licence includes a discharge point at the ash dam spillway (point 18), however, there are no discharge limits for this point.

The water pollution impact assessment should clarify if controlled discharges from the ash dam are proposed. If controlled discharges are proposed, a water pollution impact assessment is required to understand the potential impact of these discharges and to develop appropriate management measures to avoid, minimise and mitigate any non-trivial risks.

### **13) A water pollution impact assessment**

The EIS does not adequately characterise the quality, quantity, frequency and volume of the proposed discharges or assess the potential impacts of those discharges on the environment. A water pollution impact assessment prepared consistent with the national Water Quality Guidelines and NSW Government policy is required.

The EIS classifies the receiving waters as highly disturbed and compares pollutant levels to the guideline values for highly disturbed ecosystems. Consistent with the Australian and New Zealand Guidelines for Fresh and Marine Water Quality and NSW Government policy the appropriate level of protection adopted for the assessment is that for slightly to moderately disturbed ecosystems (see 'Ecosystem protection level and guideline values' section below).

The proponent should assess the potential impact of discharges on the environmental values of the receiving waterways, including any seepage, controlled discharges and managed overflows from the coal handling plant sediment basin and the ash dam. This assessment should be consistent with the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, and should include:

- a characterisation of the quality of the proposed discharges in terms of the concentrations and loads of all pollutants present at non-trivial levels, under typical and worst-case conditions – this should be based on monitoring data from the existing development
- an assessment of the impact of discharges on the environmental values of the receiving waterways with reference to the relevant guideline values for slightly to moderately disturbed ecosystems
- details of practical measures proposed to address residual impacts.

It is recommended that the relevant guideline values for slightly to moderately disturbed ecosystems are adopted when describing the existing condition of waterways and assessing the potential impact of the proposal. Consistent with the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, it is recommended that 95<sup>th</sup> percentile or maximum toxicant concentrations are compared to the relevant guideline values. Maximum toxicant concentrations should be compared to available acute toxicity data for relevant organisms (e.g. as detailed in toxicant technical briefs provided in the guidelines).

#### **14) Inclusion of daily time-step water balance modelling**

Daily time-step water balance modelling using an appropriate long-term observed rainfall dataset representing the range of conditions that occur at the site is required. The modelling should predict the frequency and volume of all discharges from the ash dam (including seepage, controlled discharges and managed overflows) under the existing scenario and the proposed scenario (with all proposed mitigation measures implemented). Sensitivity testing should be carried out to determine the effect of the proposed mitigation measures on discharge frequencies and volumes.

Daily time-step modelling of observed rainfall over a longer period representing the range of conditions at the site is appropriate to predict the likely frequency of spills from the ash dam over the life of the proposal. Several BOM stations exist in the vicinity of the premises.

#### **15) Details of the coal handling plant water management systems**

- i) A report that describes the measures proposed to minimise pollution from and mitigate impacts of discharges from the coal handling plant is required. The water balance modelling should be revised to reflect the proposed measures.
- ii) An assessment of the potential residual water quality impacts of discharges after these measures are implemented should be provided.

Substantial volumes of water discharge daily from the coal handling plant sediment basin. The EIS indicates that the proposal will involve upgrades to the coal handling plant water management system but predicts discharge volumes will remain unchanged. Details of the measures that will be implemented to minimise pollution and mitigate impacts to waterways from coal handling plant and an assessment of residual impacts are required.

#### **16) Details of measures to mitigate water pollution risks to waterways.**

The EIS states, “Where stockpiles are to be located in the floodplain, they would be located and sized to ensure no adverse impacts on flood behaviour.”

The EPA recommends that the applicant considers options to avoid locating stockpiles on the floodplain. If stockpiles are proposed to be located on the floodplain, the proponent should provide an assessment that includes details of measures that will be implemented to mitigate potential risks to waterways and an assessment of potential residual water pollution impacts, as part of the water pollution impact assessment in point 13 of this letter.

## **17) A report on Erosion and sediment controls**

A report that describes the proposed erosion and sediment controls including the design storm capacity of any proposed sediment basins. The applicant should also consider measures to avoid stormwater discharges (e.g. stormwater reuse) and minimise potential associated pollution (e.g. discharging stormwater to vegetated areas away from waterways).

If discharges to waters cannot be avoided, the proponent must assess the potential impact of proposed stormwater discharges on receiving waterways. The level of assessment should be commensurate with the risk.