NSW GOVERNMENT
Department of Planning

MAJOR PROJECT ASSESSMENT:
Upgrade of the Bayswater Power Station Water Pumping Station, Muswellbrook

Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

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EXECUTIVE SUMMARY

Macquarie Generation (the Proponent) operates both the Bayswater and Liddell Power Stations which together provide 40% of the State's electricity supply. The Proponent proposes to upgrade its water pumping station at the Hunter River by installing an additional pumping station, effectively increasing pumping capacity from 450 megalitres per day to 1,200 megalitres per day. Associated infrastructure to convey the water from the river to nearby Plashett Dam would also be required.

The purpose of the project is to secure water supply to the power stations in light of new water reforms which require the power stations extract more of their annual water requirements from periods of high river flow such as during flood. It must be noted that this project does not represent an increase in annual water extraction from the Hunter River, rather, it represents a change to when and how the same volume is extracted.

The proposed project is subject to Part 3A of the *Environmental Planning and Assessment Act 1979* and requires the approval of the Minister for Planning.

The site is located approximately two kilometres north of Jerry's Plains on the Hunter River and adjacent land between the river and Plashett Dam and includes the following lots: Lot 91 DP 234544, Lot 1 DP 616024 and Lot 110 DP 625973. The new pumping station would be located on the northern bank of the river, on a disturbed section adjacent to the existing pumping station.

The capital cost of the proposed water pumping station is estimated at $50 million. Approximately 30 people would be employed during construction. Once operational, the station would operate automatically, independent of human involvement. If approved, construction would take approximately eighteen months.

The potential environmental planning implications of the project are few given the remote location of the project. However, concern was raised regarding the impact that the project may have on the local platypus population; endangered River-Flat Eucalypt community; and the effects on downstream river flows during high flow periods. After thorough consideration and consultation with DEC and DNR, a number of measures were proposed which serve to enhance the measures proposed in the Statement of Commitments and submissions report. The Department is satisfied that if undertaken, the adverse environmental impacts of the project would be negligible and that considerable local environmental benefit is possible.

On balance, the Department considers that the proposed Bayswater Water Pumping Station Upgrade is a project that would be of benefit to the State of New South Wales because it secures the operation of two of the State's power stations which are responsible for meeting a significant portion of the State's electricity demand. Overall, the proposed Bayswater Power Station Water Treatment Plant upgrade project could be approved subject to the effective implementation of the Proponent's Statement of Commitments and the Department's recommended Conditions of Approval.

CONTENTS

1. BACKGROUND

1.1 Location

Macquarie Generation (the Proponent) proposes to upgrade its water pumping station on the Hunter River at the Bayswater Power Station located between Singleton and Muswellbrook in the Upper Hunter region of New South Wales (refer to Figure 1). The site is located on the Hunter River and adjacent land between the river and Plashett Dam and includes the following lots: Lot 91 DP 234544, Lot 1 DP 616024 and Lot 110 DP 625973.

Figure 1: Site Location (reproduced from the Proponent's Environmental Assessment)

1.2 Existing Site

The site is located on the Hunter River in the Upper Hunter Valley approximately two kilometres north of Jerry's Plains or around 20 kilometres south of Muswellbrook. The new pumping station would be located on the northern bank of the river, on a disturbed section of river bank adjacent to the existing pumping station.

The land upon which both the pumping station and associated pipeline is proposed is owned by the Proponent. It is zoned Zone 1(a) (Rural Zone) in the *Singleton Local Environment Plan 1996.* The project is an innominate permissible use in the zone.

1.3 Surrounding Land Use

The land immediately surrounding the site consists of predominantly cleared land with some fragments of riparian vegetation along the river bank. The existing pumping station lies immediately adjacent to the south of the site. Land proposed for the pipeline generally consists of cleared land primarily used for cattle grazing with some scattered trees and native forest throughout. Land on the southern side of the river is primarily used for pastoral purposes.

Within the broader area, Plashett Dam lies several kilometres to the north of the proposed pumping station site. The Bayswater Pumping Station lies approximately ten kilometres to the north east and a Coal & Allied mining operation lies approximately four kilometres to the east. The nearest residential dwelling is located approximately 1.1 kilometres to south east of the existing pumping station. As mentioned, Jerry's Plains lies two kilometres to the north.

2. PROPOSED DEVELOPMENT

2.1 Project Description

Coal-fired power stations use water as part of their power station cooling process. Water for the Bayswater and Liddell Power Stations is sourced from the Hunter River, a river body which has a regulated water management system which governs water extraction from the river. The Bayswater Pumping Station upgrade would see the water extraction capacity of the power station increase from its existing 450 megalitre (ML) capacity per day to 1200 ML capacity per day, consistent with its licence issued under the regulated water system. It must be noted that this does not represent an increase to the amount of water extracted annually – rather, it represents a change to the *way* it is extracted. This is given further explanation in section 2.2.

The proposal consists of the construction and operation of a new low pressure pump station capable of extracting up to 800 ML per day. It would operate in conjunction with the existing pumping station. The proposed pumping station would consist of up to 20 pumps that could be switched on and off depending on the pumping rate desired. This would be determined by a gauging system located at Jerry's Plains, which would automatically trigger the operation of each pump depending on the measured volume of flow at Jerry's Plains. The pumps would not activate unless the flow at the gauging station exceeded 1,500 megalitres per day for a period of 12 hours.

An aboveground pipeline would be constructed to convey water extracted by the pumping station 3.5 kilometres to the Plashett Dam where it would enter the dam via a proposed discharge outlet. The discharge outlet would be specifically designed to minimise scouring or damaging of the dam embankment whilst permitting discharge over a range of possible dam water levels. The water would then be transferred for use in the Bayswater and Liddell power stations using existing infrastructure.

Some minor upgrade works to the electricity infrastructure connecting to the existing pumping station would also be required to ensure sufficient electricity supply for the new pumping station.

2.2 Project Need

Government water reforms implemented in the Hunter Valley in 2004 have changed the way that water from the Hunter River is managed. In particular, this has changed the way that power stations such as Bayswater and Liddell can extract water. Under the new reforms, these power stations would be required to extract more of their water during high flow events such as after heavy rain or during floods, rather than during lower flow periods as has been historical practice. High flow events are relatively infrequent and typically of short duration. Therefore, increased pumping capacity is required to ensure that the same volume of water can be extracted over these periods as was extracted prior to the implementation of the new water reforms.

This water supply is critical to the operation of the Bayswater and Liddell Power Stations, and as approximately 40 % of the State's demand for electricity is met by their operation alone, the Proponent asserts that it is vital to NSW that their water supply be secured.

3. STATUTORY CONTEXT

3.1 Major Project

The project is declared to be a Major Project under *State Environmental Planning Policy (Major Projects) 2005* because it is development for the purpose of an electricity generation facility for coal fired generation that has a capital investment value of more than $30 million (clause 24(a)). The project will therefore be assessed and determined by the Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979*.

3.2 Permissibility

The site for the proposed pumping station is located within land currently owned and used by the Proponent for the purposes of water extraction. The land upon which the pumping station is proposed is zoned 1(a) Rural Zone in the *Singleton Local Environmental Plan 1996* (Singleton LEP). The proposed pumping station is an innominate permissible use in the zone and is consistent with the zone's objectives – to provide for the proper and co-ordinated use of rivers and water catchment areas.

3.3 Minister's Approval Power

The application and environmental assessment was placed on public exhibition from Friday 16 February to Tuesday 20 March 2006 and submissions invited in accordance with Section 75H of the Act. The Department has met all its legal obligations so that the Minister can make a determination about the project.

It is also noted that the Environmental Assessment submitted in support of the subject application adequately addresses the Director-General's requirements.

3.4 Nature of the Recommended Approval

An instrument of project approval has been created. This instrument grants full project approval to the project and details conditions that establish stringent environmental standards, mitigation measures, environmental controls and monitoring requirements for the pumping station.

4. CONSULTATION AND ISSUES RAISED

4.1 Submissions

The Department received three submissions on the project: from the Department of Environment and Conservation (DEC); the Department of Natural Resources (DNR); and a single public submission. Neither the DEC nor DNR objected to the proposal, however each agency did identify key issues for further consideration. The submission received from the public explicitly objected to the proposal. Each submission is summarised below. Consideration of the issues identified in submissions and assessment of the environmental impacts of this proposal are provided in section 5 of this report.

Department of Environment and Conservation (DEC)

- the new pump facility and associated construction activities must be must be relocated and confined to the heavily disturbed section of bed immediately adjacent to the existing pumping station so as to avoid adverse impacts on the River-Flat Eucalyptus Community and the platypus population;
- the potential capture and temporary relocation of the platypus population to a suitable environment prior to the commencement of the next nesting season is likely to be difficult without resulting in platypus mortality or trauma;
- if approval is granted, it is recommended that all biodiversity-related mitigation measures specified in the Statement of Commitments and listed in the Environmental Assessment be undertaken;
- all pump station construction works that may impact on the local platypus population must be undertaken during the period of mid-March to mid-September inclusive unless it can be demonstrated that the temporary removal of platypus will not result in adverse impacts to platypus individuals; and
- a long-term management plan and monitoring program targeting the conservation and management of the local platypus population and the River-Flat Eucalypt Forest must be prepared in consultation with DEC prior to the commencement of site works.

Department of Natural Resources (DNR)

- the flow duration curve in the Environmental Assessment should be replotted with a 0-3000 megalitre per day y-axis to show the impact of higher flow rate at relatively low flow rates. Most of the impact will be below 2000-3000 megalitres per day;
- details of automatic operation should be provided, including step up and step down pumping rates;
- the Environmental Assessment does not include an assessment of the potential impact of accessing regulated flows at a higher rate than currently possible. This may result in impacts on the bed and bank stability of the upstream reaches of the Hunter River and could adversely affect riparian vegetation;
- the intention to use the additional capacity for extracting supplementary flows only may need to be reflected in operational procedures for the new pumps; and
- while not required under Part 3A, DNR suggests the Proponent obtain a work approval under the *Water Management Act 2000* for the purposes of operating in the regulated river system operated by State Water.

Submission from the Public

- inadequate justification for the project has been given when significant water saving gains could be achieved through a higher level of water recycling and other efficiency improvements;
- the implementation of the pumping station would reduce the need to use alternative water supplies to the Hunter river. The alternative sources: Glenbawn Dam; Glennies Creek Dam; and treated effluent from municipal sewerage plants is preferable to increased extraction from the Hunter River;
- the threefold increase in water extraction during the river's flood periods will significantly damage the Hunter river's aquatic ecosystems, riparian vegetation and the soil structure of surrounding lands. It will also exacerbate the occurrence of land degradation due to sedimentation;
- the nationally and internationally significant Hexham Swamp and Kooragang Island wetlands would be damaged due to the enhanced extraction because their health is dependent on high flows; and
- the quality of water runoff from the pump station into the nearby Plashett Dam will be diminished, causing further damage to aquatic vegetation and species biodiversity.

4.2 Submissions Report

On review of the issues identified in submissions, the Department required the Proponent to prepare a Submissions Report to address each of the issues raised in those submissions. As part of this process, the Proponent reviewed each submission and made specific comment in relation to each issue identified.

Some minor changes to the Statement of Commitments were made to more thoroughly address issues raised, specifically in relation to the River-Flat Eucalypt Community and the local platypus population. Commitment was also made by the Proponent to adopt the water management recommendations made by DNR. The revised Statement of Commitments is attached to this report as Appendix C.

5. ASSESSMENT OF ENVIRONMENTAL IMPACTS

After consideration of the Environmental Assessment, submissions and Submissions Report, the Department has identified the following key environmental issues associated with the proposal:

- ecology impacts; and
- water cycle management;

All other issues are considered to be minor and have been addressed as part of the Proponent's Statement of Commitments.

5.1 Ecology Impacts

Issues

The main issue raised regarding ecology impacts was the potential adverse impact of construction work on the local platypus population and the River-Flat Eucalypt community, both of which had been identified as being located within the vicinity of the proposed works.

These two species had been identified as part of the Ecological Impact Assessment undertaken by the Proponent to determine the potential effect of the project on local flora and fauna (including fish species and migratory fauna). Impacts associated with sedimentation, river bank loss/ damage, changes to river flow regimes and the clearance of approximately 8.75 hectares of vegetation were stated to have been investigated. The study also stated that specific consideration had been given to threatened and endangered species as listed on the NSW *Threatened Species Conservation Act 1995* (TSC Act) and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EP&BC Act).

The study concluded that the two main ecological issues associated with the project were the occurrence of the River-Flat Eucalypt Forest, an endangered ecological community under the TSC Act, and known platypus habitat within the proposed pumping station site. Subsequently, it was recommended that the proposed site be relocated such that it was restricted to the disturbed section of river bank immediately adjacent to the existing pumping station, so as to avoid the River-Flat Eucalypt community and to reduce the likelihood of adversely impact on potential platypus habitat. Further recommendations were also made such as restricting the commencement of construction to periods outside of the known platypus breeding season and the use of defined, platypus-sensitive construction work practices. The implementation of a management plan for monitoring and ensuring the long-term River-Flat Eucalypt community and platypus health was also recommended by the study.

While acknowledging that the proposed clearance of 8.75 hectares of vegetation would result in the removal of forage and shelter/ nesting habitat, the study asserted that through appropriate vegetation management natural regeneration would compensate for its loss. The study further stated that the land to be cleared was predominantly grassland formed by historic clearing practices. Importantly, the study asserted den and nest resources could be maintained through the retention of hollow-bearing trees through careful pipeline design. The creation of habitat fragmentation through the 25-metre wide pipeline easement was acknowledged, however it was argued that threatened fauna groups (Squirrel Glider, some bird and microchiropteran bat species) known to be using the study area would be capable of crossing this barrier and that natural regeneration would further serve to reduce fragmentation effects over time. Based on this information, the study concluded that the project would be unlikely to significantly impact these species.

Consideration

The Department and DEC are generally satisfied with the Proponent's ecological assessment and concur with the Proponent's assessment that the two main ecological issues affecting the proposal regard the River-Flat Eucalypt community and the local platypus population.

Essentially, these issues arise from the positioning of the proposed pumping station on undisturbed river bank which is populated by a River-Flat Eucalypt community. Relocating the pumping station to the heavily disturbed section of river bank adjacent to the exiting pumping station effectively eliminates the need to disturb the River-Flat Eucalypt community and reduces the likelihood of affecting existing/ potential resting or nesting burrows used

by the local platypus population observed in the area. This position is supported by the DEC and has been reflected in the recommended conditions which limit the proposed station and associated construction activities to the heavily disturbed area. To safeguard against disturbance beyond this area, the recommended conditions also require the Proponent establish fencing around the adjacent undisturbed riverbank and the River-Flat Eucalypt community prior to construction thereby physically prohibiting their disturbance. The fencing works would be removed upon completion of the construction works and the disturbed areas would be rehabilitated as part of a broader rehabilitation scheme that would be undertaken by the Proponent.

The Department has also included conditions which would require the preparation of a comprehensive Construction Management Plan. Importantly, this Plan would set out detailed work practices for the sensitive and careful disturbance of the disturbed river bank so that in the event that platypuses are discovered, they would be able to escape to the river unharmed. The Plan would also include detailed site specific area maps which would clearly differentiate between construction areas and areas prohibiting disturbance.

Finally, the Department, on advice from the DEC, has included conditions which would limit the period within which construction could commence to the period outside of the platypus breeding season. The Proponent's assessment concluded that if construction occurred within the breeding season, then it would be likely that newborns would be lost through potential nesting burrow damage or through abandonment. Hence, this condition safeguards against any adverse impacts on the breeding cycle and newborn platypuses.

The Department and DEC are of the opinion that provided all of these measures can be undertaken, the potential adverse impacts of the project on the River-Flat Eucalypt community and the local platypus population would be minimal during the construction period. Equally important however is the broader long-term impact of the project on both of these groups. Consequently, the Department has recommended conditions that require the Proponent to implement a comprehensive Ecology Management Plan. This Plan would require impacts be regularly monitored and, when required, the implementation of positive initiatives to ensure that each population is proactively conserved over the longer-term.

Ultimately, the Department is of the opinion that while some disturbance of the local environment is likely (albeit minimal) the overall effect of the project would be one of considerable local environmental benefit. The introduction of proactive monitoring programs should ensure the long-term future of the local platypus population and the endangered River-Flat Eucalypt community. Similarly, through the introduction of other initiatives, such as a rehabilitation scheme for disturbed areas, the ecological value of the local area is likely to be notably improved.

5.2 Water Cycle Management

Issues

Two central issues were identified in relation to water cycle management as it relates to this project. Both DNR and the one public submission stated concern regarding the effect of the project on Hunter River flow during periods of high flow. Secondly, the public submission raised a more strategic concern in relation to water supply alternatives and water demand as it relates to the specific needs of the Bayswater and Liddell power stations. Importantly, any consideration of water cycle management as it relates to this project must be viewed in the context of the project representing a change to the way water is extracted. It does not represent or seek a change to the annual volume extracted.

The Proponent utilised DNR modelling to compare the impact on overall daily downstream flow volumes for both the existing pumping station with the proposed pumping station. Consideration was given to a broad range of potential flow volumes and the assessment concluded that there would be negligible change during high-flow events between that proposed by the project and that presently experienced due to the existing pumping station.

Consideration

The Department is satisfied with the flow assessment undertaken by the Proponent and supports the Proponent's conclusion that negligible change in flow is predicted to occur during high flow periods. In reaching this conclusion, the Department highlights that consideration has been given to the beneficial effects of high flow events and their importance to the Hunter River and nearby wetland biodiversity. It is acknowledged that high flow events such as floods can serve as migration and reproduction "triggers" for river and waterway dependent

ecology. Similarly, the assertion in the public submission that these events have further beneficial effects on reducing river algae and salinity levels is noted. However, on the basis of the information provided in the assessment there appears to be little evidence that permitting extraction to the proposed capacity during these events would result in any change to the river flow levels beyond that currently experienced under the existing pumping regime. Therefore, the Department is of the opinion that no adverse impacts as a result of higher extraction capacity during high flow events would be observed.

Concern was also raised in the public submission regarding water supply and water demand for the Bayswater and Liddell power stations. Specifically, the submission asserted that insufficient consideration had been given to alternative sources, and that significant opportunities existed for improving the efficient use of water across both power station plants.

In relation to water supply alternatives, the Department concurs with the broader principle of the public submission, that is, that alternative water sources should be investigated by the Proponent. This is a view shared by the Proponent, which outlined in its Environmental Assessment a number of longer-term options that are under on-going consideration. The Department supports this course of action because alternatives, such as the piping of treated municipal effluent to the plants, are medium to long-term options and less suitable for meeting the immediate requirements of the recently introduced NSW water reforms. In this context then, the proposal to increase the high flow pumping capacity is adequately justified. As has already been noted, the capacity increase is predicted to have a negligible impact on river flow levels during such events.

With regards to potential opportunities for improving the efficient use of water at both the Liddell and Bayswater plants, the Department highlights that significant water efficiency programs are currently underway at both plants. The recently approved $80 million Bayswater Water Treatment Plant upgrade is a recent example of the Proponent's commitment to maximise the use of the water in the power station system. The Water Treatment Plant upgrade project was implemented to maximise the water re-use capability of saline water sourced from Lake Liddell. This project forms part of a broader program of world's best practice initiatives being undertaken by the Proponent to maximise water efficiency at both of its plants.

6. CONCLUSION AND RECOMMENDATIONS

The Department has assessed the EA, Statement of Commitments and submissions on the proposal, and the submissions report and is satisfied that the impacts of the proposal can be mitigated and/or managed to ensure an acceptable level of environmental performance.

The project is effectively changing the way water is extracted from the Hunter River for the Bayswater and Liddell Power Stations. Under the new NSW water reforms, the Proponent is required to extract more of its annual water needs from the river during high flow events such as floods. This does not represent a change in the amount of water extracted over a given year, rather, it represents a change to when and how this water is extracted.

Environmental measures have been outlined which seek to address the main environmental issues, that is, impacts on the local platypus population; endangered River-Flat Eucalypt community; and the effects on downstream river flows during high flow periods. Provided these and the measures proposed in the Statement of Commitments and submissions report are undertaken, the adverse environmental impacts of the project are believed to be negligible.

The Department is of the opinion that the project would be of benefit to the State of New South Wales because it secures the operation of two of the State's power stations which are responsible for meeting 40 % of the State's electricity demand.

Overall, the proposed Bayswater Water Pumping Station Upgrade project could be approved subject to the effective implementation of the Proponent's Statement of Commitments and the Department's recommended conditions of approval.

APPENDIX A – RECOMMENDED CONDITIONS OF APPROVAL

APPENDIX B – STATEMENT OF COMMITMENTS

APPENDIX C – RESPONSE TO SUBMISSIONS

APPENDIX D – ENVIRONMENTAL ASSESSMENT