

Assessment of EPBC Act-Ramsar Listed Matters for projects

Suggested information for inclusion in the advice to DPIE

Newcastle Power Station Project (SSI 9837) EPBC Bilateral Assessment (EPBC 2019/8425) – BCD Assessment

11 December 2020

All section, table, figure and appendix references in document (below) refer to sections, tables, figures and appendices in the Amendment Report Biodiversity Development Assessment Report (Amendment Report BDAR).

1. Identifying MNES

(a) **Confirm** whether all the EPBC Act-Ramsar Listed Matters that occur on the project site, or in the vicinity are identified in the EIS. Note which issues have not been identified.

The Hunter Estuary Wetlands, a Ramsar listed wetlands, are located to the south and east of the Development Site. The Kooragang (Ash Island) component is closest to the development site and is located about 2.5 kilometres south of the Development Site at its closest point, whilst the Fullerton Cove section, which is considered important migratory shorebird habitat is approximately 5 kilometres south-east.

The Proposal was declared a controlled action on 15 August 2019 under section 75 of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). This was due to potential construction or operational impacts of the Proposal on a Ramsar wetland, due to its proximity to the Kooragang component of the Hunter Estuary Wetland approximately 2.7 km south and south-east of the Newcastle Power Station site. As a result, under item 3 of the Environmental Assessment Requirements (EARs), the Department of Environment and Energy (now the Department of Agriculture, Water and the Environment (DAWE)) considered that the proposed action has the potential to significantly impact:

- the physico-chemical status of the Hunter Estuary Wetlands Ramsar site; and
- the habitat or lifecycle of native species dependent on the Hunter Estuary Wetlands Ramsar site.

RAMSAR WETLANDS - BIODIVERSITY

An assessment of the likelihood that habitat or lifecycle of native species dependent on the Hunter Estuary Wetlands Ramsar site has been undertaken and a decision as to whether a significant impact is likely has been made by the proponent in Appendix 6 of the Amendment Report Biodiversity Development Assessment Report (BDAR). This Appendix provides details on the extent of the impacts of the proposed action on: (i) habitat, such as saltmarsh and mangroves or native species such as Green and Golden Bell Frog or Migratory Shorebirds, that are dependent on the Hunter Estuary Wetlands Ramsar site, which could be impacted indirectly if water quality (through both groundwater and surface water contamination); and (ii) wetland species that are indirectly impacted as a result of noise during construction or the ongoing operation of the power plant.

A description of the controls and measures that will be put in place to manage impacts from the proposed action of the habitat and lifecycles of the native species dependent on the Ramsar site has also been provided.

Appendix 6 notes that the wetlands have been listed because they meet three of the Ramsar criteria (Brereton and Taylor-Wood, 2010: *Ecological Character Description of the Kooragang Component of the Hunter Estuary Wetlands Ramsar Site*):

- *Criterion 2:* Kooragang component has records of one wetland bird species (Australasian bittern *Botaurus poiciloptilus*) listed as Endangered under the EPBC Act and a frog species (Green and golden bell frog *Litoria aurea*) listed as vulnerable under the EPBC Act and IUCN red list;

DOC20/967134 – Newcastle Power Station Project EPBC Bilateral Assessment - BCD Assessment

- *Criterion 4:* Kooragang component is an important foraging and roosting site for migratory shorebirds and supports waterbirds at critical stages in their life cycles including breeding, migration stop-over, roosting and drought refuge; and
- *Criterion 6:* the Kooragang component regularly supports >1% of the East Asian Australasian Flyway population of Eastern Curlew (*Numenius madagascariensis*) and more than 1% of the Australian population of Red-necked Avocet (*Recurvirostra novaehollandiae*).

Impacts to these three Criterion are identified and discussed in detail in Appendix 6. Specifically, Appendix 6, provides detailed discussion on the impacts to:

- Australasian bittern – which is considered to be a breeding resident in the Hunter Estuary as there are extensive areas of habitat available and it has been recorded in all months. Marginal habitat was identified within the Study Area, notably very small areas of freshwater wetland which were dry at time of survey. Impacts were considered to be low;
- Green and golden bell frog – breeding populations have been recorded in ponds on Kooragang Island (although there is no recent information on green and golden bell frog breeding events within the Ramsar site). Marginal habitat was identified on the Study Area, due to the small areas of freshwater wetland, but targeted searches undertaken in March 2019 did not detect the species, thus impacts are considered unlikely;
- Migratory shorebirds (providing important foraging and roosting sites) and waterbirds (provides support at critical stages in their life cycles including breeding, migration stop-over, roosting and drought refuge), specifically detailing the Eastern curlew (regularly supports >1% of the East Asian Australasian Flyway population) and the red-necked avocet (regularly supports more than 1% of the Australian population). At the time of listing, a maximum of 6800 migratory waders were recorded within the Hunter Estuary Wetlands, which includes 112 species of water birds and 45 species of migratory birds listed under international agreements. It is noted that the Fullerton Cove area within the Kooragang component has been identified as the most important foraging area for the majority of the migratory shorebirds in the Hunter Estuary; with the Stockton Sandspit and the Kooragang Dykes noted as important roosting and foraging areas for migratory shorebirds.

Appendix 2 of the Amendment Report BDAR identifies a variety of migratory shorebirds either known from the Hunter Estuary Wetlands or have potential habitat on the Study Area, namely: bar-tailed godwit, black-faced monarch, black-tailed godwit, broad-billed sandpiper, cattle egret, common greenshank, common sandpiper, curlew sandpiper, double-banded plover, Eastern curlew, Eastern osprey, glossy ibis, greater sand plover, grey plover, grey-tailed tattler, Latham's snipe, lesser sand plover, little curlew, little stint, little tern, marsh sandpiper, oriental cuckoo, Pacific golden plover, pectoral sandpiper, pin-tailed snipe, red knot, red-necked stint, ruddy turnstone, ruff, rufous fantail, satin flycatcher, sharp-tailed sandpiper, speckled monarch, Swinhoe's snipe, Terek sandpiper, whimbrel, white-bellied sea-eagle, white-throated needletail and yellow wagtail; concluding no likely life cycle impacts due to lack of habitat within Study Area or targeted searches (e.g. Latham's snipe) did not detect the species; and

- the Estuary Stingray (*Dasyatis fluviorum*), which is also listed as Vulnerable on the IUCN Red List (Version 2009.1) and has been recorded from the Hunter Estuary, where it inhabits mangroves that fringe the river and estuarine habitat.

Appendix 6 also notes that Hunter Estuary Wetlands contain large extents of *Sarcocornia* coastal saltmarsh and mangroves which supports and provides habitat to migratory shorebirds, along with patches of intertidal mudflats which provide foraging habitat for these migratory shorebirds. Migratory shorebirds are present for up to eight months of the year between September and April in the Hunter Estuary Ramsar. Additionally, the hydrology (tidal regime and freshwater inflows) of the wetlands are a major influence on the distribution and extent of these saltmarsh and mangroves, which provides habitat to the migratory shorebirds. Impacts to these components of the Ramsar wetland are discussed in detail in Appendix 6. The Proposal does not involve the removal of mangrove or coastal saltmarsh vegetation.

BCD considers that Appendix 6 of the Amendment Report BDAR has adequately identified and described the Ramsar listed biodiversity matters.

RAMSAR WETLANDS – HYDROLOGICAL AND PHYSICO CHEMICAL STATUS

The Department of Environment and Energy (now DAWE) considered that the proposed action has the potential to significantly impact:

- The Physico chemical status of the Hunter Estuary Wetlands Ramsar Site during construction and operation. Notably, (i) Groundwater may be intersected during construction of the transmission line and gas pipeline due to it being located within close proximity to the surface. This 'could lead to groundwater contamination which would need to be managed accordingly; and (ii) During operation, discharges from the power station may include stormwater, processed water and solid and liquid wastes; and (iii) It is possible Acid Sulphate Soils (ASS) will be encountered, as the site is currently classified as class 2, class 3, and class 4 on the ASS probability map in the Port Stephens Local Environmental Plan 2013. There is the potential for ASS to impact the water quality of the Hunter Estuary Wetlands Ramsar site if the ASS are not managed appropriately.

An assessment of the likelihood of hydrological change or contamination during construction or operation has been carried out in Appendix 6 of the Amendment Report BDAR. This Appendix provides details on the extent of the impacts of the proposed action on: (i) Possibility that the action will result in substantial and measurable change in the hydrological regime of the wetland through a change in volume, timing, duration of ground and surface water to and within the wetland; and (ii) Possibility that the action will result in a substantial and measurable change in the water quality of the wetland – for example, a substantial change in the level of salinity, pollutants, or nutrients in the wetland, or water temperature which may adversely impact on biodiversity, ecological integrity, social amenity or human health.

- Appendix 6 notes that the nearest boundary of the Hunter Wetland is situated approx. 2.5 kilometres to the south of the proposed Development Site. Further, no works are proposed within the boundary of the wetland or near the boundary of the wetland. No direct impacts during construction or operation are expected.
- The Amendment Report BDAR states that it is not proposed to extract any groundwater for construction or operational use. Due to the low permeability of the clay dominated alluvial soils, it is not expected that shallow excavations would encounter significant inflow or create an enduring impact on regional groundwater level.
- The gas pipeline is likely to be installed below the water table but no significant adverse impact on the flow of shallow groundwater is expected.
- Changes to surface water and hydrology as a result of changes in stormwater runoff discharge patterns is expected to be minor. This includes as a result of changes in stormwater behaviour due to changes in impervious surfaces (about 30% of the Newcastle Power Station area). Given the relative size of the development footprint compared to the total catchment area of the Hunter River (around 22,000 kilometres²), it is expected that there would be negligible impact on the hydraulic behaviour of the Hunter River and associated wetlands. In addition, flood modelling indicates that the development would not have any effect on the pattern of flood flows or on flood levels or on flood velocity outside the property area.
- Based on the surface and groundwater assessment work completed for the Proposal, impacts on the hydrological regime of the wetland is therefore considered unlikely.

The likelihood of water quality impacts on the Hunter Estuary Wetlands through the construction and operation of the proposed development is considered to be minor given the distance of the proposed development from the wetlands provided that the recommended avoidance, mitigation and management measures are implemented. Studies undertaken during for the Proposal indicate that:

- Potential impacts to storm water can be managed by installation of a system of drains and water retention systems. Stormwater can then be passed through a bioretention system to slowly filter stormwater runoff. The assessment concluded that operational stormwater discharges from the bioretention system was likely to be of a superior quality compared to the existing background conditions.
- Impacts to hydrology of the area are expected to be minimal and therefore impacts to salinity are considered unlikely.

- Groundwater in the area of the Proposal flows to the north-northwest towards the Hunter River. Groundwater in the Proposal area is therefore not expected to flow towards the Kooragang component of the wetlands of the Nature Reserve (including Fullerton Cove or the Hunter Estuary Wetlands).
- Care should be taken not to dewater shallow groundwater where possible, to prevent oxidation of ASS that may be encountered in shallow excavations. The likelihood of an impact on the Kooragang wetland is minor given the distance (greater than 2.5 kilometres) and provided that the recommended avoidance, mitigation, and management measures are implemented.
- Land contamination risks for the Proposal are not considered to be significant and can be avoided, mitigated and managed during construction and operation of the Proposal by implementation of appropriate mitigation measures.
- Preventing surface water contamination is considered the key to preventing impacts to groundwater. The risk of impacts during both construction and operation, such as a hydrocarbon spill, will be mitigated by measures specified in an Operation Environmental Management Plan and Construction Environmental Management Plan. The proposed stormwater management system will also act as a secondary defence system to capture any potential run-off from site
- Any potential impacts on groundwater systems can be mitigated by implementing several specified management plans and operational procedures. By implementing these plans a Neutral or Beneficial Effect (NorBE) on the receiving groundwater quality can be demonstrated.
- The potential for the Proposal to generate exceedances of air quality standards is low and manageable through effective operation of the proposed emission controls.
- Additionally, a review of potential cumulative impacts identified that there is a low potential for the Proposal to collectively generate localised exceedances of air quality standards (when considered in-conjunction with Tomago Aluminium Smelter, the key emission source in the area).
- No substantial impacts to physico-chemical status of the wetland are therefore expected.

BCD considers that the proponent has provided an adequate assessment in Appendix 6 of the Amendment Report BDAR on the potential for hydrological change within the wetland during construction and operation of the proposed development. BCD concurs that these impacts are unlikely.

BCD also considers that the proponent has provided an adequate assessment in Appendix 6 of the Amendment Report BDAR on the potential for physico-chemical change within the wetland during construction and operation of the proposed development. BCD concurs that these impacts are unlikely as long as the recommended avoidance, mitigation and management measures are implemented.

(b) In the circumstance where there are EPBC Act-listed species that are not addressed by the BAM (i.e. migratory species) **comment** on whether these species have been assessed in accordance with the SEARs and provide references to where the assessment information is detailed in the EIS.

The Protected Matters Search (as detailed in Table of the Appendix 2 of the Amendment Report BDAR) identified a number of potential migratory species for the Study Area: - bar-tailed godwit, black-faced monarch, black-tailed godwit, broad-billed sandpiper, cattle egret, common greenshank, common sandpiper, curlew sandpiper, double-banded plover, eastern curlew, eastern osprey, glossy ibis, greater sand plover, grey plover, grey-tailed tattler, Latham's snipe, lesser sand plover, little curlew, little stint, little tern, marsh sandpiper, oriental cuckoo, Pacific golden plover, pectoral sandpiper, pin-tailed snipe, red knot, red-necked stint, ruddy turnstone, ruff, rufous fantail, satin flycatcher, sharp-tailed sandpiper, speckled monarch, Swinhoe's snipe, terek sandpiper, whimbrel, white-bellied sea-eagle, white-throated needletail and yellow wagtail; as listed under the EPBC Act.

The EIS / Amendment Report BDAR concluded for most species that there was no likely life cycle impacts due to lack of habitat within Study Area or there were no local records. Where there was minimal habitat (e.g. eastern curlew, Latham's Snipe, Little curlew and rufous fantail), targeted searches did not detect the species.

(c) **Verify** that the proponent has expressed a statement about the potential impact i.e. likely significant, low risk of impact, not occurring, for each listed threatened species and community protected by the EPBC Act referred to in 1(a). Note which species and/or communities have not been addressed in this manner.

BCD considers that the proponent has provided an adequate statement on the potential impact of the Proposal in Appendix 6 of the Amendment Report BDAR, which includes addressing potential impacts to faunal species (e.g. green and golden bell frog) and significant vegetation types (e.g. coastal saltmarsh) that provide important wetland habitat.

Appendix 6 of the Amendment Report BDAR states *'The project has been assessed against the significant impact criteria for impacts to the wetland and those species potentially utilising the wetland and potentially affected by the proposal. With implementation of the controls identified in the EIS, it is expected that there will be no measurable residual impact from the construction or operation of the Proposal on the local or regional groundwater aquifers with regards to quantities or quality'*. The assessment concludes that the project is unlikely to have a significant impact on the wetland and the species utilising the wetland.

(d) **Identify** where further information from the proponent is critical to the assessment of MNES particularly in relation to mapping Table 1 (A), analysis of impacts Table 1 (F) and Table 2 (F), avoidance, mitigation and offsetting, and 6.

Further information was sought during the BAM assessment on Ramsar (i.e. exhibition of the EIS), with respect to:

- BCD requests further information on discharge volumes/frequencies and management of operational water storages

These matters were adequately addressed in the Response to Submissions (RTS) and the Amendment Report BDAR.

2. Assessment of the relevant impacts

All EPBC Act-listed Ramsar matters that the Commonwealth consider would be significantly impacted (as noted in the referral documentation) should be assessed and offset. These are referred to as relevant impacts.

(a) **Verify** [by ticking the following boxes]:

- ✓ the nature and extent of all the relevant impacts has been described
- ✓ measures to avoid and mitigate have been described
- X an appropriate offset for any residual adverse significant impact has been determined. **Not applicable.**

RAMSAR WETLANDS - BIODIVERSITY

Appendix 6 of the Amendment Report BDAR provides an assessment of potential biodiversity impacts to the character of the listed Ramsar wetland (Hunter Wetland Estuary).

Impacts to specific native fauna species such as Green and Golden Bell Frog are addressed above in Section 1(a) and correspond to the broad assessment provided in Appendix 2 of the Amendment Report BDAR; whilst Migratory Shorebirds are assessed under 'Migratory Fauna Impacts' in Appendix 6:

- *Possibility that the action will substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species*

Considered unlikely. Construction - the action does not include works that will occur within the boundary of the wetlands: all works are located about 2.5 kilometres to the northwest of the Ramsar boundary at its closest point. No important habitat will therefore be cleared as part of the Proposal and no impact to fire regimes or nutrient cycles is expected. Studies for the Proposal have also indicated that there will be no impact to hydrological cycles.

While some vegetation clearance will occur, areas of ground disturbance will be focused in areas that have been previously disturbed on the north side of an existing industrial area. These are not connected to habitat in the wetland area and no fragmentation of habitat associated with the wetland will occur. The MNES assessment undertaken by the proponent considers it highly unlikely that the Proposal will result in permanent or major impacts to important habitat for a migratory species.

- *Possibility that the action will result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species*

Considered unlikely. The proposed development site is located 2.5 kilometres from the boundary of the wetland and is of sufficient distance from the wetland such that impacts are unlikely. The risk of introduction or dispersal of an invasive species or disease will be managed through prevention and control measures implemented under a Construction Environment Management Plan for the Proposal. These measures will ensure soil and seed material is not transferred and will be applied on site during construction and operation.

Weed infestations within the construction footprint are to be identified and mapped prior to construction and standard hygiene processes will include inspections of equipment prior to arrival on site. Appropriate wash down facilities will be available to clean vehicles and equipment prior to arrival on-site and prior to departure. Given the proposed mitigation measures, the MNES assessment undertaken by the proponent considers it unlikely that the Proposal will result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.

- *Possibility that the action will seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species*

Considered unlikely. The Proponent's assessment notes that the location of the activity means that it is considered extremely unlikely that the activity will seriously disrupt the lifecycle of an ecologically significant proportion of the population of a migratory species. The proposed Development Site is located at least 2.5 kilometres from the wetland at its closest point and about 5 kilometres from Fullerton Cove which is considered to be the most important foraging area for the majority of the migratory shorebirds in the Hunter Estuary (Herbert 2007). Proposals may potentially impact upon water birds using the wetlands through noise from haul trucks during construction and from potential increased traffic. However, during construction, it is proposed that oversized or heavy items would be transported along the Pacific Highway and Old Punt Road thereby avoiding impacts that may arise from use of Tomago Road. Noise minimisation practices will be included in the CEMP in accordance with Biodiversity and Conservation Division (BCD) recommendations.

Noise levels during operation are expected to be no more than (similar or less than) levels from other industrial premises in the area, as stated in Appendix 6. The distance and the existing industrial operations between the Ramsar site and the Proposal would mean the Proposal would not be audible from the Ramsar site during construction or operation. The MNES assessment undertaken by the proponent considers it unlikely that the Proposal will seriously disrupt the lifecycle of a migratory species utilising the wetlands.

There could also be impacts on migratory species through effects on migration due to plume rise from the turbines. Species flying to the Hunter Ramsar Wetland to forage have the potential to be impacted upon due to the plume of hot exhaust gas vented from the stack. Worst case scenario (based on the gas turbine option and constant operation), the plume could reach a height of 882 metres and a radial distance of just over 150 metres. While the plume might reach a substantial height in an area where birds will be flying lower to the ground as they approach the wetland, the radial distance of the plume is not modelled to be substantial, in the context of the landscape; approximately 150 metres wide (maximum distance) while the wetland is approximately 12 kilometre wide. As such, the proportion of air space that the plume will impact upon is not considered substantial in the broader context, as per Appendix 6.

Outcomes of the overall assessment on biodiversity and nature of the wetland are summarised in the Table (not numbered) in Appendix 6:

- *Possibility that the action will result in areas of the wetland being destroyed or substantially modified*

Impact unlikely due to the proposed Development Site being located 2.5 kilometres from the boundary of the wetland. Therefore, no works will occur within the boundary or near the boundary of the wetlands; nor will there be any direct impacts on the wetland during construction or operation.

- *Possibility that the action will result in the habitat or lifecycle of native species, including invertebrate fauna and fish species, dependent upon the wetland being seriously affected*

Unlikely due to the proposed Development Site being located 2.5 kilometres from the boundary of the wetland. Therefore, no works will occur within the boundary or near the boundary of the wetlands; nor will there be any direct impacts on the wetland during construction or operation. Furthermore, no direct impacts on the habitat or lifecycle of native species during construction or operation is therefore expected. Potential indirect impacts on habitat or life cycle of native species dependent upon the wetland are considered to largely fall into two areas:

- Hydrology – There is expected to be negligible impact on the hydraulic behaviour of the Hunter River and associated wetlands as a result of the Proposal. Impacts to surface water during both construction and operation can be controlled by implementation of a bioretention system to reduce any potential contaminants. Groundwater flow in the vicinity of the Proposal is generally north-northwest towards the Hunter River. Groundwater in the Proposal area is therefore not expected to flow towards the Kooragang component of the wetlands. Any potential impacts on groundwater systems beneath the site can be mitigated by implementing several specified management plans and operational procedures. By implementing these plans a Neutral or Beneficial Effect (NorBE) on the receiving groundwater quality can be demonstrated. There are therefore expected to be no significant impacts to habitat of native species dependent upon the wetland.
- Noise – The Proposal may potentially impact upon water birds using the wetlands through noise from haul trucks during construction and from potential increased traffic. However, during construction, it is proposed that oversized or heavy items would be transported along the Pacific Highway and Old Punt Road thereby avoiding impacts that may arise from use of Tomago Road. Noise minimisation practices will be included in the Construction Environmental Management Plan (CEMP) in accordance with the Department of Planning, Industry and Environment (DPIE) recommendations. Noise at the site during construction is not expected to impact species utilising the wetlands due to the distance from the site as well as the intervening developments. These are expected to act as buffers sufficient to attenuate levels to a level that is minor or insignificant in comparison to ambient levels. Noise levels during operation are therefore expected to be no more than (similar or less than) levels from other industrial premises in the area. The distance and the existing industrial operations between the Ramsar site and the Proposal would mean the Proposal would not be audible from the Ramsar site during construction or operation. The habitat or lifecycle of native species dependent upon the wetland is therefore not expected to be seriously affected.

- *Possibility that the action will result in a substantial and measurable change in the water quality of the wetland (for example, biodiversity, ecological integrity)*

The likelihood of impact on the Hunter Estuary Wetlands is considered to be minor given the distance and provided that the recommended avoidance, mitigation and management measures are implemented. Studies undertaken during for the Proposal indicate that:

- Potential impacts to storm water can be managed by installation of a system of drains and water retention systems. Stormwater can then be passed through a bioretention system to slowly filter stormwater runoff. The assessment concluded that operational stormwater discharges from the bioretention system was likely to be of a superior quality compared to the existing background conditions.
- Groundwater in the area of the Proposal flows to the north-northwest towards the Hunter River. Groundwater in the Proposal area is therefore not expected to flow towards the Kooragang component of the wetlands of the National Park (Hunter Wetlands), (including Fullerton Cove or the Hunter Estuary Wetlands).
- Preventing surface water contamination is considered the key to preventing impacts to groundwater. The risk of impacts during both construction and operation, such as a hydrocarbon spill, will be mitigated

by measures specified in an Operation Environmental Management Plan and Construction Environment Management Plan. The proposed stormwater management system will also act as a secondary defence system to capture any potential run-off from site.

- Any potential impacts on groundwater systems can be mitigated by implementing several specified management plans and operational procedures. By implementing these plans a Neutral or Beneficial Effect (NorBE) on the receiving groundwater quality can be demonstrated.
- *Possibility that the action will result in an invasive species that is harmful to the ecological character of the wetland being established (or an existing invasive species being spread) in the wetland*

Appendix 6 states that the proposed Development Site is located 2.5 kilometres from the boundary of the wetland and is of sufficient distance from the wetland such that impacts are unlikely. The risk of introduction or dispersal of an invasive species or disease will be managed through prevention and control measures implemented under a Construction Environment Management Plan for the Proposal. These measures will ensure soil and seed material is not transferred and will be applied on site during construction and operation. Weed infestations within the construction footprint are to be identified and mapped prior to construction and standard hygiene processes will include inspections of equipment prior to arrival on site. Appropriate wash down facilities will be available to clean vehicles and equipment prior to arrival on-site and prior to departure. Given the proposed mitigation measures, it is therefore considered unlikely that the Proposal will result in the introduction or dispersal of an invasive species.

BCD concurs with the above assessment. Appendix 6 to the Amendment Report BDAR concludes that the Proposal is unlikely to have a significant impact on the wetland or the species that use it.

Mitigation Measures

The impact assessment has been used to help identify control and mitigation measures to be implemented during Proposal construction and operation so as to avoid or mitigate impacts. These controls and measures will be identified and detailed in Construction Environment Management Plan, specifically in: Soil and Water Management Plan, Groundwater Management Plan, Flood Preparedness Plan and Operation Environmental Management Plan.

Specific mitigation measures are described in Appendix 6 under 'Mitigation Measures and Residual Impacts':

- Scheduling construction works to avoid wet seasons and heavy rainfall, where possible.
- Minimization of the area of exposed and unstable ground surface during construction.
- Locating stockpiles, sediment basins, bunds and vehicle wash-downs away from drainage lines.
- Installation of sediment controls including sediment traps, contour berms and energy dissipaters.
- Locating cleared vegetation at high points away from watercourses with upgradient water diverted to avoid entering stockpile.
- Stormwater capture strategy including construction of sediment basins to manage stormwater runoff during construction and operation. Modelling to determine requirements during both the construction and operation phase has noted the similarity in size and location requirements for both phases allowing for re-use or modification of proposed basins from the construction phase into permanent basins. The basins will be constructed and operated in compliance with Erosion Control Association Australasia (Best Practice Erosion and Sediment Control - 2008) and Landcom (Managing Urban Stormwater: Soils and Construction Volume 1. 4th Edition - 2004) guidelines.
- Establishing dirty water drains to direct site runoff to the sediment retention basin system.
- Steps to minimize groundwater dewatering (potentially oxidizing unoxidized Acid Sulphate Soils (ASS)).
- Acid sulfate management plan including protocol to minimize the disturbance and exposure of ASS and an emergency protocol where acidic runoff is generated.
- Procedure to minimize risk of drilling waste (in the form of drilling fluids and hydraulic stimulation fluids) contaminating watercourses during drilling, completion, hydraulic stimulation and workover activities. Use of dedicated refuelling areas and spill controls together with appropriate fuel liquid and storage and handling in accordance with Australian Standards.
- Inclusion of contingency approaches in all plans in the unlikely event of an incident. This includes fuel spill protocols including provision of spill kits and training of personnel.

RAMSAR WETLANDS – HYDROLOGICAL AND PHYSICO CHEMICAL STATUS

- *Possibility that the action will result in a substantial and measurable change in the hydrological regime of the wetland, for example, a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland*

Appendix 6 notes that the nearest boundary of the Hunter Wetland is situated approx. 2.5kilometres to the SW of the proposed Development Site.

The Amendment Report BDAR states that It is not proposed to extract any groundwater for construction or operational use. Due to the low permeability of the clay dominated alluvial soils, it is not expected that shallow excavations would encounter significant inflow or create an enduring impact on regional groundwater level.

The gas pipeline is likely to be installed below the water table but no significant adverse impact on the flow of shallow groundwater is expected.

Changes to surface water and hydrology as a result of changes in stormwater runoff discharge patterns is expected to be minor. This includes as a result of changes in stormwater behaviour due to changes in impervious surfaces (about 30% of the Newcastle Power Station area). Given the relative size of the development footprint compared to the total catchment area of the Hunter River (around 22,000 km²), it is expected that there would be negligible impact on the hydraulic behaviour of the Hunter River and associated wetlands. In addition, flood modelling indicates that the development would not have any effect on the pattern of flood flows or on flood levels or on flood velocity outside the property area.

BCD concurs with the above assessment concluding that impacts on the hydrological regime of the wetland are considered unlikely.

(b) **Note** if information in relation to any of these boxes has not been provided for any relevant EPBC Act-listed species and communities.

BCD considers that the 'Assessment of MNES' in the Amendment Report BDAR is adequate with respect to Ramsar wetland matters.

(c) There may be listed threatened species and communities for which the proponent will claim that the impact will be **not** significant in accordance with the *EPBC Act Significant Impact Guidelines*. Please **provide** advice for cases where BCD disagrees with this finding.

Not applicable. BCD is satisfied with the assessment of MNES provided the Amendment Report BDAR.

(d) Provide references to where specific lists or tables are detailed in the EIS

RAMSAR WETLANDS - BIODIVERSITY

EIS

- Appendix D – Biodiversity Development Assessment Report
- Table 1.5.3 Supplementary SEARs - Supplementary Environmental Assessment (*Notes: Impacts to Ramsar Wetlands – 'The physico-chemical status of the Hunter Estuary Wetlands Ramsar site' and 'The habitat or lifecycle of native species dependent on the Hunter Estuary Wetlands Ramsar site')
- Table 2.3.2 Wastewater disposal options – summary of impact to Ramsar wetlands
- Table 8.2.1 Risk and residual risk assessment – summary to Ramsar wetlands

Appendix D (to EIS) – Biodiversity Development Assessment Report

- Appendix 6 – EPBC Assessment

- Table 1 – Landscape Features of the Development Site (*lists Ramsar wetland)
- Figure 16 – Location of Hunter Estuary Wetland (Kooragang component)

Appendix 6 of Amendment Report Biodiversity Development Assessment Report – EPBC Assessment (Ramsar wetland)

- Table (not numbered) – Scope of Assessment – pg. 2
- Table (not numbered) – Nature and extent of likely impact (Ramsar listed wetland) – pg. 8-12
- Table (not numbered) – Migratory fauna species – pg. 13-14

RAMSAR WETLANDS – HYDROLOGICAL AND PHYSICO CHEMICAL STATUS

EIS

- Appendix D – Biodiversity Development Assessment Report
- Table 1.5.3 Supplementary SEARs - Supplementary Environmental Assessment (*Notes: Impacts to Ramsar Wetlands – 'impacts of the groundwater and surface water contamination on the Hunter Estuary Wetlands Ramsar site and include an analysis of how effective each of the controls will be to make sure the ecological character of the Hunter Estuary Wetlands Ramsar site is maintained'.)
- Table 2.3.2 Wastewater disposal options – summary of impact to Ramsar wetlands
- Table 8.2.1 Risk and residual risk assessment – summary to Ramsar wetlands

Appendix D (to EIS) – Biodiversity Development Assessment Report

- Appendix 6 – EPBC Assessment
- Table 1 – Landscape Features of the Development Site (*lists Ramsar wetland)
- Figure 16 – Location of Hunter Estuary Wetland (Kooragang component)

Appendix 6 of Amendment Report Biodiversity Development Assessment Report – EPBC Assessment (Ramsar wetland)

- Table (not numbered) – Scope of Assessment – pg. 2
 - Table (not numbered) – Project Assessments – Pg. 5
 - Project Assessments – pg. 6-8
 - Table (not numbered) – Nature and Extent of Likely Impact – pg. 8-12
-

DOC20/967134 – Newcastle Power Station Project EPBC Bilateral Assessment - BCD Assessment

Table 1 Impact Summary Relevant EPBC Act – listed Ecological Communities (refer to section 3)

A	B	C	D	E		F	G
EPBC Act -listed EEC	Y/N	PCTs	Y/N/co mment	Ha	Credits	Comment	Relevant page numbers in the EIS
Not applicable							

- (A) **List** the relevant EPBC Act listed ecological communities that will be significantly impacted in accordance with the referral documentation.
- (B) **Verify** that there is evidence in the EIS that listed EEC and species habitat has been mapped in accordance with relevant listing guidelines (Yes/No).
Proponents are required by the SEARs to ensure that EPBC-listed communities are mapped in accordance with EPBC Act listing criteria. It is important that any derived native grassland components of an EPBC listed EEC are included in the mapping of native vegetation extent.
- (C) **List** the Plant Community Types (PCTs) associated with the ecological communities in accordance with Chapter 5 of the BAM.
- (D) **Confirm** that the identification of PCTs has been correct (Yes/No) and comment if not correct.
- (E) **Record** the area of impact (ha) and credits required.
- (F) **Comment** on the analysis of the impacts in relation to the nature and extent of the impact and whether or not the EIS includes an analysis of the direct and indirect impacts to the EEC. Note whether further information might be required.
- (G) **Cite** relevant page numbers for details provided the EIS and Appendices for each EEC.

Table 2 Impact Summary Relevant EPBC Act – listed Species (refer to section 4)

A	B	C	D	E		F	G
Threatened species (listed under the EPBC Act)	Credit Type (SC/EC)	Record PCTs associated with ecosystem credits	Y/N/Comment	Hectares (total species habitat)	Credits (total species habitat)	Comment	Relevant page numbers in the EIS and Appendices
Not applicable.							

- (A) **List** the relevant threatened species that will be significantly impacted in accordance with the referral documentation.
- (B) **Record** whether the relevant threatened species is classified as “species credit species” of ecosystem credit species for the purposes of the BAM.
- (C) **List** the PCTs associated with the ecosystem credit species.
- (D) **Verify** that the habitat polygons for MNES have been mapped appropriately representing the foraging and/or breeding habitat for the species that will be impacted by the development.
- (E) **Record** the area of impact (ha) and credits required. For impacts associated with ecosystem credit species identify the total credit requirements associated with the cleared PCTs identified as habitat for the species.
- (F) **Comment** on the adequacy of the analysis of the impacts in relation to the nature and extent of the impact and whether or not the EIS includes an analysis of the direct and indirect impacts to the species. Note if further information is required.
- (G) **Cite** relevant page numbers for details provided in the EIS and Appendices for each threatened species.

3. Avoid, mitigate and offset

Comment on whether or not the EIS identifies measures to avoid and minimise impacts on the relevant EPBC Act-listed threatened species and communities. Section 8 of the BAM requires that proponents detail these efforts and commitments in the EIS. Identify gaps in the discussion on measures to avoid and minimise impacts on Commonwealth matters. Provide references to sections and page numbers in the EIS.

RAMSAR WETLANDS – BIODIVERSITY AND HYDROLOGICAL AND PHYSICO CHEMICAL STATUS

EIS

Section 6.2.4 of the EIS (page 92) identifies measures to avoid and minimise impacts to biodiversity in general (not just Ramsar listed matters). The EIS and Appendix 6 of the Amendment Report BDAR conclude the Proposal is unlikely to have a significant impact on the wetland or the species that use it.

A number of potential sites within the Tomago area were investigated for the development of the Proposal. The potential sites were assessed against environmental, infrastructure, economic, engineering, stakeholder, and land use constraints and opportunities. The Proposal area was selected because it was best suited against the criteria for a power station and its ancillary infrastructure needs, while minimising the potential for environmental and social impacts.

The EIS states (page 92) that *'AGL has worked with ecological specialists to select areas for development within the Proposal area that would minimise biodiversity impacts. This includes locating the proposed electrical transmission corridor and gas pipeline in areas that have been previously disturbed and are predominantly cleared, or which contain lower quality native vegetation. Additionally, the selection of horizontal directional drilling (HDD) for part of the storage pipeline would minimise impacts to the ephemeral drainage line within the Proposal area'*.

Apart from avoid and minimise, the Proposal will also incorporate many mitigation measures to reduce adverse impacts to biodiversity. Table 6.2.7 (Avoidance, mitigation and management - Biodiversity) details measures to mitigate and manage the following potential impacts:

- Implementation of a Biodiversity Management Plan would be prepared as part of the Construction Environmental Management Plan and implemented throughout construction. The Plan would include, but not be limited to:
 - Plans showing areas to be cleared and areas to be protected, including exclusion zones, appropriate signage, protected habitat features and revegetation areas, vehicle and equipment parking areas, and stockpile areas
 - Site inductions
 - Location of threatened biodiversity
 - Pre-clearing survey requirements
 - Vegetation clearing procedures
 - Procedures for unexpected threatened species finds and fauna handling
 - Protocols to manage weeds and pathogens including a plan of management for the control of weeds, according to requirements under the NSW *Biosecurity Act 2015*
 - Protocols for soil and seed material to minimise transfer between sites
 - Restriction of public access and associated impacts from domestic pets, waste dumping and damage to adjoining vegetation should be enforced pre, during and post construction
 - Reduction in lighting levels at access road to avoid any adverse effects upon the essential behavioural patterns of light-sensitive fauna, in accordance with AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting
 - Noise management practices
 - Dust control measures
- Detailed design would consider areas identified in the Biodiversity Development Assessment Report (BDAR) that host threatened species and communities and limits the intrusion of the Proposal into those areas.

- Limit removal of trees to that required within the development footprint and reinstate logs and rocks, which are removed for pipeline construction, along the right of ways or relocate them to appropriate nearby habitats.
 - A pre-clearing protocol would be implemented during clearing works, as follows:
 - Pre-clearance surveys would be undertaken to determine if any inhabiting fauna are present, and
 - A suitably qualified and trained fauna handler would be present during hollow-bearing tree clearing to rescue and relocate displaced fauna
 - Appropriate exclusion fencing around trees and woodland that are to be retained within the development footprint would be erected, considering allowance for tree protection zones in accordance with the Australian Standards
- Koala traffic signs would be installed along the access route from Old Punt Road.
- Any fencing required around proposed easements (not including fencing erected for safety of operation purposes) would have a koala-friendly design, with a 20 centimetre gap at the bottom to allow the movement of koalas and other terrestrial fauna.
- A Biodiversity Offset Strategy would be prepared for the Proposal.
- Weed infestations within the construction footprint would be identified and mapped prior to construction.
- Appropriate wheel wash and hygiene procedures would be implemented to limit construction plant and vehicles spreading weed seeds, vegetation debris and loose soil to and from the Proposal area.
- Weed controls would be monitored regularly to promote the rehabilitation of revegetated areas within the Proposal area. Supplementary active revegetation would be undertaken as required.
- Open sections of trenches would be monitored as required for trapped animals such as small ground dwelling mammals.

Appendix E – Amendment Report BDAR

Section 5 of the Amendment Report BDAR specifically addresses the avoid and minimise aspects of the Proposal that are relevant to biodiversity in general, which would include MNES. It details the measures as identified in the EIS and outlined above. It also notes that the 'Do nothing Option' was not considered a feasible option, and therefore avoid and minimise measures were applied to the Proposal during the following phases / issues: - site selection and design, alternative technologies, assessment of prescribed impacts, and indirect impacts.

Appendix 6 of the Amendment Report BDAR details mitigation measures under Section – 'Mitigation of impacts and residual impacts', which have been previously detailed in Section 2(a) of this assessment.

Comment on the adequacy and feasibility of measures to avoid and minimise impacts. Identify inadequacies where further efforts could be made to avoid and minimise impacts on Commonwealth matters. Provide references to sections and page numbers in the EIS that discuss avoidance and mitigation measures relevant to EPBC Act-Ramsar listed wetland.

See discussion above for comments on avoid and minimise measures, and details of mitigation. BCD did not identify any inadequacies where further efforts could be made to avoid and minimise.

4. Offsetting

(a) **Verify** [by ticking the following boxes] that the offsets proposed to address impacts to EPBC-listed threatened species and communities are in accordance with the requirements under the EPBC Act.

☒ An appropriate offset for any residual adverse significant impact has been determined.

☒ Proposed offsets for EECs provide a like for like outcome i.e. proponents have identified PCTs attributed to the specific threatened ecological community being impacted.

☒ Proposed offsets have been determined using the BAM

If offsets have not been determined in accordance with the BAM, Planning is required to discuss the proposed approach with the Commonwealth as soon as possible.

Not applicable.

5. Comment on whether the information and data relied upon for the assessment have been appropriately referenced in the EIS. Comment on the validity of the sources of information and robustness of the evidence.

The information and data used in the assessment has been appropriately referenced, and the sources of information are valid.

DOC20/967134 – Newcastle Power Station Project EPBC Bilateral Assessment - BCD Assessment

Table 3 Summary of Offset Requirements

A	B	C	D	E	F
Threatened species or EEC (listed under the EPBC Act)	Credits required as calculated by the BAM	Credits generated from offsets in remnant vegetation	Credits generated from offsets proposed by other means	Comment on the proposed offsets.	Relevant page numbers in the EIS and Appendices
Not applicable.					

- (A) **List** the relevant threatened species or ecological community included in the proposed offset package (these are the listed species and communities that will be significantly impacted in accordance with the *EPBC Act Significant Impact Guidelines 1.1.*). Identify any relevant species or ecological communities which have not been included in the proposed offset package.
- (B) **List** the total credit requirement identified by the BAM for impacted listed threatened species and ecological community. For EECs and ecosystem credit species this is the sum of the credits generated by PCTs associated.
- (C) **Identify** the total number of required credits which are proposed to be retired through conserving and managing remnant / mature vegetation.
- (D) **Identify** the number of credits proposed to be met through other methods allowable under the BAM, such as rehabilitation of impacted areas or regrowth vegetation.
- (E) **Comment** on the adequacy of the proposed offset in meeting requirements of the BAM and the EPBC Act. In particular is there a reasonable argument for a shortfall in credits required for MNES and/or non-compliance with like-for like? Are the offsets proposed by means other than protection of remnant vegetation adequate?
- (F) **Reference** the relevant page numbers from the EIS and Appendices for each threatened species and community.