Mt Piper Power Station
Ash Placement Project

ENVIRONMENTAL ASSESSMENT

EXECUTIVE SUMMARY

August 2010

Executive Summary

The Proponent

Delta Electricity (Delta) is a New South Wales State-Owned Corporation whose purpose is primarily to maintain and operate facilities for the generation and supply of electricity into the National Electricity Market (NEM).

Delta owns and operates Mt Piper Power Station, located approximately 17 km north-west of Lithgow (refer to **Figure 1**). The station currently comprises two coal-fired generating units, each of which is operating at 700 MW.

In 1990 Lithgow City Council granted Delta Electricity consent for ash placement in the former Western Main open cut mine void adjacent to the power station. This area is known as Area 1 and employs dry ash placement. Currently, approximately 780,000 m^3 of ash is placed in Area 1 annually.

Based on the planned operation of the Mt Piper Power Station, the present ash placement area is expected to reach capacity in five to six years – i.e. by around 2015, well before the power station reaches the end of its economic life. Accordingly, there is a need to obtain development consent for ash placement beyond that time.

This Environmental Assessment (EA) report has been prepared to support Delta Electricity's application for relevant approvals for the construction and operation of four sites which represent the Mt Piper Ash Placement. It addresses the requirements for the preparation of an Environmental Assessment for the project, issued by the Director General of Planning.

Strategic Justification

Need for the Project

Ash removal, placement and storage are critical to the long-term ongoing operation of the existing Mt Piper Power Station. Delta Electricity actively pursues reuse of ash from Mt Piper Power Station and has strong commercial, operational and environmental incentives to do so. The current ash storage facility is nearing maximum capacity and alternative sites are necessary for the power station to maintain its role as a low cost, reliable and essential supplier of electricity to NSW consumers.

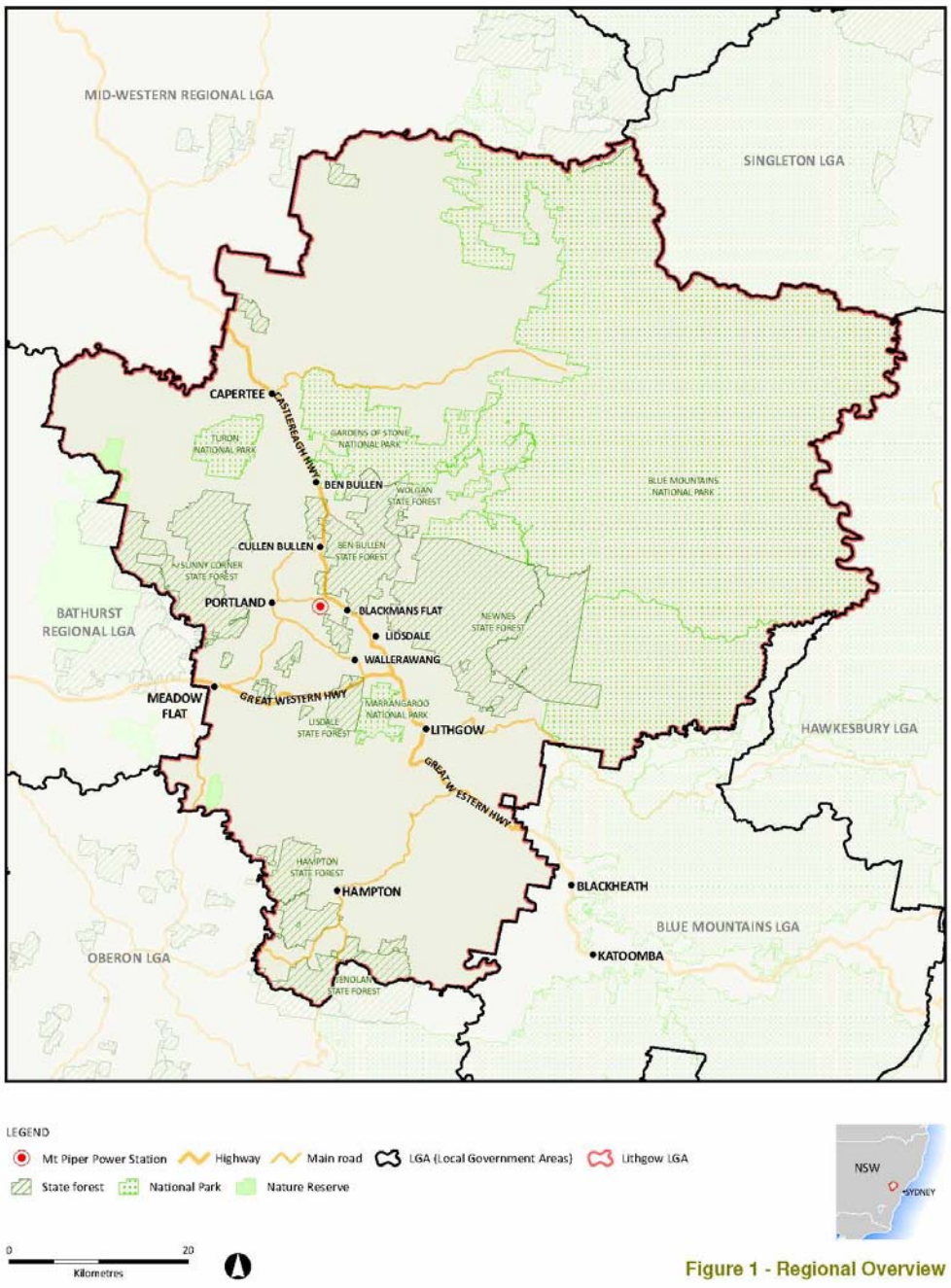


Figure 1 - Regional Overview

By the end of 2009 approximately 10.1 million tonnes of ash from Mt Piper 1 & 2 had been placed in the present ash placement area, Area No. 1. Under planned operations, the approved ash storage area is expected to reach capacity by around 2015, well before the existing power station reaches the end of its economic life. Accordingly, there is a need to undertake planning activities and obtain approvals to enable the continued placement of ash once the existing ash placement area reaches capacity. The selection of additional ash placement areas is required to maintain the operation of the Mt Piper Power Station Units 1 and 2 and to provide for the operation of the proposed Mt Piper Extension should it be constructed as a coal fired plant.

In January 2010 Delta obtained concept approval (Application 09_0119) for the development of 2,000MW of new generating capacity at the Mt Piper site (known as Mt Piper Extension). This new capacity would be either coal fired or gas turbines and if it were to proceed as a coal-fired plant there would be a need for further ash placement areas.

The Mt Piper Extension development site has been made available for sale to the private sector as part of the NSW Government's Energy Reform Strategy. Should the buyer seek project approval to build a coal-fired power station then there would be additional demand for ash storage facilities that is best met by use of the same ash storage sites as those sought for Mt Piper Units 1 and 2. Accordingly, this environmental assessment also provides for ash storage requirements of Mt Piper Extension should it be coal fired.

Alternatives Considered

Delta currently is able to provide about 200,000 tonnes per year from Mt Piper Power Station for reuse in the cement industry. Ash from power generation activities can be beneficially reused for cement making or horticultural purposes, soil stabilisation, engineered fill and road bases, aggregates and polymers and zeolite production, subject to the quality of the ash produced. Delta continues to seek opportunities for reuse of the ash produced.

In 2006 Delta undertook a feasibility and site selection study in which potential ash placement sites were selected to be assessed and evaluated. In total, 25 potential ash placement sites were identified in the surrounding area located up to 13km from the power station. The study also allowed for consideration of potential expansion of the generating capacity of Mt Piper. Ash placement schemes were considered for the current generation capacity of Units 1 and 2 and also the addition of a further 2000 MW of coal fired generation capacity. The volume of storage required and the probable area available at each of the alternatives indicated the need for multiple storage sites.

Throughout the process a number of assumptions and observations were noted including:

- The sites closer to the power station were ranked more highly due to proximity and therefore minimising the need of transporting ash across, or on public roads and the added benefit of a reduction in transportation costs;
- Many of the sites further from the power station site had smaller storage capacities as they were generally on smaller sites;
- Backfilling of underground workings was generally not considered practical due to the limited available space and excessive placement costs, and possible groundwater contamination/ environmental issues;
- It was assumed there would be minimal environmental disturbance at areas with prior disturbance by open cut mining.

Based on the recommendations of that feasibility study, Delta selected four sites (as shown in **Figure 2**) within the defined investigation areas, these being Lamberts North, Lamberts South, Neubecks Creek and Ivanhoe No. 4, for further consideration. The feasibility and site selection study found that, compared with the other options, the four preferred sites would:

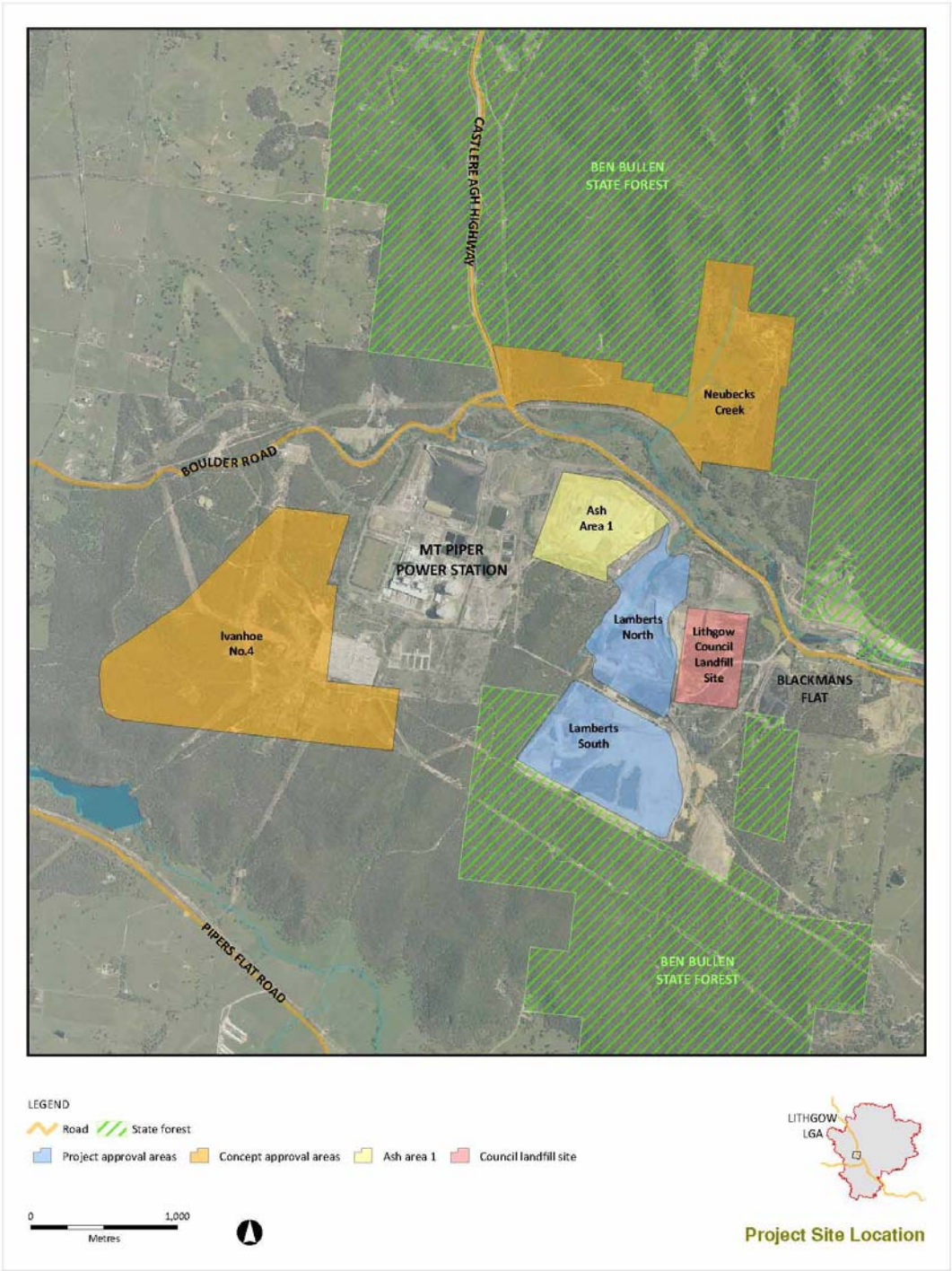
- Optimise the economic costs and benefits;
- Enable the placement of ash within land owned by Delta Electricity or Centennial Coal;
- Enable the ash to be placed in areas that are either currently subject to open cut mining or intended for coal extraction;
- Enable the ash to be transported via conveyor or private haul roads and minimise the requirement to utilise public roads; and
- Minimise undesirable environmental and social impacts in already developed areas.

Overview of the Proposal

A full description of the proposal is provided in detail in Chapter 3– Project Description.

In brief, Delta is seeking Concept Approval and Project Approval for two of the proposed placement sites Lamberts North and Lamberts South and Concept Approval for the future development of Neubecks Creek and Ivanhoe No.4. Lamberts North and Lamberts South are currently being mined for coal and Project Approval is being sought for these sites to allow for their development for ash placement from around 2015.

The ash storage available at Lamberts North and Lamberts South is sufficient to provide for the existing Mt Piper Power Station Units 1 and 2 until about 2042-2045, which is the effective life of the plant.



- **Figure 2 – Site Location**

A proposal to extend the generation capacity at the power station site by the construction of an additional 2000MW of gas or coal fired generation capacity was considered by the Department of Planning under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Concept approval under Section 75O of the EP&A Act was issued for the new power station, called Mt Piper Extension, on 12 January 2010.

If the Mt Piper Extension project proceeds as a coal-fired plant, there would be a reduction in the life of Lamberts North and Lamberts South sites and they would effectively be filled by about 2026.

Concept approval only is being sought for Neubecks Creek and Ivanhoe No 4 as it is necessary to provide an approval process for ash storage should Mt Piper Extension proceed as a coal fired plant. Should Mt Piper Extension proceed with the coal fired option, project approval for the use of Neubecks Creek and Ivanhoe No 4 as ash storage areas would be required before 2026 to provide sufficient ash placement capacity for both plants.

The objectives of the proposal are therefore:

- To provide suitable ash placement areas to ensure the ongoing operation of the existing power station site beyond 2015, in order to maintain the existing level of power supply in NSW;
- To provide sufficient storage areas for ash from the proposed Mt Piper Extension power station should it be coal fired; and
- To minimise and manage any environmental or social impacts which may result from the construction and operation of the proposed ash placement areas.

Approval Process

The proposal has been declared a Major Project and is subject to assessment under the provisions of Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Under Part 3A of the EP&A Act Delta is seeking Concept Approval and Project Approval for the proposed placement sites at Lamberts North and Lamberts South and Concept Approval for the future development of Neubecks Creek and Ivanhoe No.4. An Environmental Assessment Report and a draft Statement of Commitments has been prepared and submitted to the Department of Planning for public exhibition.

The responses received during the exhibition are addressed by the proponent and the project and the responses are assessed by the Department of Planning. The Minister for Planning is the approval authority for the project.

Environmental Assessment of Key Issues

Air Quality

Computer-based dust dispersion modelling was undertaken for the Lamberts North and South dust placement areas and used to assess the impacts of the proposal, while a qualitative assessment for odour and ash contaminants, and for the proposed Ivanhoe No. 4 and Neubecks Creek sites was undertaken.

Meteorological data from the Mt Piper Power Station site were combined with estimated dust emissions from proposed activities to predict off-site total suspended particulates (TSP), particulate matter less than 10 microns (PM_{10}) and deposited dust levels.

An additional scenario was also developed which took into account ash requiring placement from the proposed Mt Piper Extension Project.

The results from the assessment indicated that the project, even without mitigation, is unlikely to cause exceedances of annual PM_{10}, TSP and dust deposition criteria at nearest sensitive receptor locations. It is possible that the maximum 24-hour average PM_{10} criteria may be exceeded from time to time although it is unlikely that the project will be the cause of such exceedances. It was noted that the probability of the project causing an exceedance of 50 $\mu g/m^3$ increases, with increasing background levels. Since the maximum 24-hour average model results represented the "worst-day" at each location in terms of potential impacts from the project, and that the probability of maximum project impacts occurring at the same time as maximum background levels would be very low.

The assessment was based on a worst case operation, in which no controls have been put in place to reduce onsite dust emissions. It is intended that existing dust control measures used in Area 1, such as application of sprays and molasses to exposed surfaces and water trucks on unpaved haul roads, would also be applied to the proposed expansion areas. Consequently, dust concentrations and deposition levels should be lower than predicted.

Assessment of the Ivanhoe No. 4 and Neubecks Creek found that ash placement at these sites could have the potential to generate dust and may require further detailed assessment in accordance with the DECC *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in* NSW, should these areas be required for ash storage.

Noise

A noise assessment was undertaken using methods prescribed by NSW Government requirements. Under neutral weather conditions, the operation of the ash placement areas for Lamberts North and South both indicate that compliance with the established noise goals would generally be expected. Without mitigation a marginal exceedance of the project specific noise goals may occur at one

location when operations reach the Lamberts South placement area in 2023. This is likely to occur in the early stages of the operations in this area due to the topography of the site and the proximity to the receiver at this location near the eastern edge of the placement area.

At Lamberts North, the predicted noise levels under adverse meteorological conditions indicate general compliance during the daytime for assessed locations, with a marginal exceedance possible during the latter stages at one site. Without mitigation the same result may be expected at that site for the evening period, and an exceedance of up to about 3 dB(A) is possible at another site during this time.

At Lamberts South, the results generally indicate exceedances for receiver locations without mitigation measures, The exception during this phase of works is the location at Blackmans Flat for the daytime period, which is expected to comply even under adverse weather conditions. The exceedances during the evening period are predicted to be up to 4 dB(A) at the other assessed location. These are expected, however, to reduce to approximately 1-2 dB(A) at both locations during the final stage of works.

The nature of the operations for the ash placement makes mitigation feasible by utilising the benched ash mound as a noise barrier. Testing various barrier options has indicated that where the top of the barrier is 4 m higher than the ground level of the equipment, a 5-6 dB(A) reduction in the noise level at the receiver location is possible.

There are limitations to this method due to the mobile nature of the noise sources and the movement of trucks to and from the dump location, since the barriers effectiveness would be decreased as the noise source moves further from it. While the use of the ash placement as a barrier has been identified as a potential solution, the construction of the ash mound and its progression through the site will require more detailed planning and may be subject to safety and process constraints.

Placement of fly ash and furnace ash at the proposed Ivanhoe No. 4 and Neubecks Creek sites could have potential noise impacts on nearby sensitive receivers and would require further detailed assessment.

Modelling predictions for construction noise indicate that the noise levels from construction activities would be below the project noise goals at the receiver locations. No construction noise mitigation measures would be required.

Water Management

The project investigation areas are only very small portions of the Upper Coxs River Catchment and would have negligible impact on the catchment in terms of water availability.

The proposed ash placement facilities would not require water allocations or licences to operate, as the facilities would be supplied by the water harvested from the disturbed areas of the sites. The water would be used for rehabilitation and dust suppression to supply to the operation. The water sourced from the disturbed areas of the proposed ash placement facility would be achieved by the development of the site water management system developed for each site to manage surface runoff from the sites.

Existing surface water and groundwater data were reviewed. There exists sufficient data from the on-going water monitoring and groundwater modelling studies undertaken to show that the main contribution to elevated water quality parameters in Neubecks Creek is due to past, underground coal mining activities rather than the existing ash placement works at Area 1 or the operation of Mt Piper Power Station.

The management of works at the existing Area 1 is appropriate to minimise the risk of a discharge from the construction and operation of the active ash placement areas. A continuation of these practices in the Lamberts North and Lamberts South areas, as well as similar practices at the Neubecks Creek and Ivanhoe No 4 sites, would be enough to ensure that ash placement has limited if any effects on the water quality of Neubecks Creek.

To reduce potential water quality impacts of the site during construction, general measures to control erosion of soil and sedimentation would be implemented prior to construction works.

Flora and Fauna

The proposed ash placement area (approximately 108 ha in the Lamberts North and Lamberts South areas) comprises mostly disturbed lands, currently part of an active mine and areas rehabilitated following mining activities. Native vegetation within this proposal area is limited to three patches of vegetation at the southern end of the Lamberts South area, totalling about 9 ha. There will also be impacts to regenerating vegetation within rehabilitation areas at the northern and southern end of the two areas.

Habitat for fauna within the proposed ash placement areas is limited to the remnant vegetation patches in the southern-most area proposed for ash placement. The remnant vegetation is of generally good habitat value, supporting an abundance and diversity of foraging, refuge and breeding opportunities for fauna. Although there is vegetation adjacent to the ash storage areas, the loss of habitat (particularly the hollows, trees with decorticating bark and wetland) constitutes a net loss for the locality with consequences for local fauna, including reduced breeding and refuge habitat opportunities and disturbance to remaining habitats. However, impacts on local populations would not lead to an increased risk of extinction, and hence the loss of habitat is considered not significant. Remaining areas of the ash storage area are cleared and modified lands and there are no areas of conservation value for fauna.

An assessment of the impacts of this proposal on species, populations and ecological communities listed under TSC Act and the EPBC Act was undertaken. One plant species listed as vulnerable under both the TSC Act and the EPBC Act, Capertee Stringybark (*Eucalyptus cannonii*) was observed in one location. Up to three individuals of the *Eucalyptus cannonii* would be removed to accommodate the proposed ash placement. No other threatened flora species were recorded despite targeted searches within areas of suitable habitat, and it is unlikely that other threatened flora species are present considering the extent and type of habitats present and the degree of survey effort undertaken. Hence, the results of the TSC Act and EPBC Act tests of significance indicate the loss of habitat would not significantly affect the viability of threatened flora species in the area.

No threatened fauna species (TSC Act or EPBC Act) were identified on the site during the field surveys. The site may provide at least foraging and possibly roosting habitat for a suite of microbat species, and could form part of the territory of Spotted-tail Quoll, owl and glider species. However, the results of the TSC Act and EPBC Act tests of significance indicate the loss of habitat would not significantly affect the viability of threatened fauna species in the area.

An area of up to 9 ha of remnant vegetation would be offset to ensure there is no net loss of flora and fauna values in the area. This would provide a habitat offset of 1:1. Although no threatened species or ecological communities would be affected by the loss of the 9 ha of vegetation, the generally good habitat value would suggest that an offset would be appropriate. The remnant vegetation within the offset location should have similar habitat attributes as the remnant vegetation within the proposal area, comprising a relatively mature area of vegetation with an abundance of hollow trees and fallen timber. Although only three specimens of Capertee Stringybark would be lost to the development, the proposed offset area should contain specimens of that species, if possible.

The Neubecks Creek and Ivanhoe No 4 sites, although previously subject to mining activities, have remnant or regrowth areas of vegetation and associated potential ecological values. These would need to be further assessed in the project approval phase before any approvals are given for ash placement.

Indigenous Heritage

Previous cultural heritage surveys of the Lamberts North and Lamberts South areas demonstrate that this area was used in the past by Aboriginal people. However, as a result of the wholesale nature of the subsequent disturbance associated with open cut mining operations and the reshaping of the ground surface soils which has completely modified the entire local landscape, there is now very low / zero potential for intact archaeological deposits over the proposed ash placement study area.

The two previously identified sites, one just west of the Lamberts South and one to the east of Lamberts South, remain intact and are currently protected by a Cultural Heritage Management Plan. For the purpose of this project, these two previously registered sites remain as constraints and would be avoided by project impacts.

Surveys undertaken at both Neubecks Creek and Ivanhoe No. 4 also identify these areas as having been used in the past by indigenous groups with a number of sites known to occur in areas where ash placement could potentially occur. Further assessment and survey of the Ivanhoe No. 4 Concept Area in the project approval phase would be required to ensure all indigenous heritage has been adequately identified and documented.

With regards to the general results over the study area (all sites) the following general management would be implemented:

- Avoidance of impact - If this can be done, then a suitable curtilage around the recorded sites would be determined so as to ensure their protection both during the short term construction phase of development and in the long term use of the area;
- If impact is unavoidable - then an Aboriginal Heritage Impact Permit – (AHIP) may be applied for from the NSW DECCW and approval would depend on many factors including the assessed significance of the recorded sites. Sites of moderate to high significance and/or potential may require either test or salvage excavation, or more detailed recording, as part of the conditions of an AHIP being granted. Sites of low significance may have an AHIP approved with no further archaeological assessment being required, or with an approved monitoring programme. Once granted, the local Aboriginal communities may wish to collect or relocate artefacts, whether temporarily or permanently, if necessary. Consultation with the Indigenous community is required for all AHIP applications.

In reference to Neubecks Creek and Ivanhoe No. 4 areas:

- There is already known evidence of Aboriginal occupation over both the Neubecks Creek and Ivanhoe No. 4 Concept Areas and hence any proposed impacts would need to be assessed against known heritage values of these locations such that appropriate heritage management measures could be devised;
- A significant component of this process would be Aboriginal community consultation in relation to the assessment for sites, the cultural significance of any recorded locations and with regards to mitigation and management measures.

Visual Amenity

Visual impacts were assessed by comparing the visual modification and visual sensitivity and generally relate to the ability of the landscape to absorb visual modification. The degree to which the environment can absorb any visual impacts is influenced by topography (whether it can be

screened) and vegetation (whether it can be concealed). In general, there are more opportunities to minimise the visual impact of a development from distant views and in varied and undulating landscapes than areas of flat terrain.

Photomontages were used to assess the impacts of the ash placement areas at Lamberts North and Lamberts South. Photomontages were produced for three key locations which would have views of the proposed development. The photomontages show that only the tops of the proposed ash placement areas would be visible from the surrounding areas. It follows that the beginning of the placement below ground would not be visible from these places.

Without mitigation it is evident that high visual impact would result on one key location due to the close proximity of the sensitive receiver to the proposed ash placement areas. Visual impacts from 2 sites would be low to moderate, given their proximity to the proposed development and existing land use. For the finished profile of the sites, the ash placement areas are expected to appear greyish in colour from the viewpoint locations.

Following ash placement, the resultant ash mounds would be capped, revegetated and rehabilitated. Given that the rehabilitated and revegetated ash placement areas would be readily absorbed into the surrounding natural environment and the long distances between the sensitive viewing locations and the proposed ash areas, the visual impact of the proposed development would be low.

Development of ash placement areas at Neubecks Creek and Ivanhoe No 4 of a similar scale to those proposed at the Lamberts North and South are likely to result in visual impacts to surrounding receivers. A detailed visual impact assessment including line of sight analysis would be undertaken once preliminary design of ash placement areas is completed. This would be used to identify potentially visually sensitive sites in the study area.

Environmental Assessment of Other Issues

Other issues considered included socio-economic, traffic and transport, European heritage, waste management and land use. Any impacts from these issues would not be apparent or would be managed by standard management practices.

Environmental Management and Draft Statement of Commitments

The mitigation measures identified as commitments in this Environmental Assessment, along with any conditions of approval issued by the Minister for Planning, would be incorporated into the construction and operation of the ash placement areas, as well as the preparation of Construction and Operational Environmental Management Plans (EMPs) for the project.

Project Justification

In preparing this Environmental Assessment, the potential environmental impacts from the proposed development have been investigated and a range of mitigation measures developed to minimise any adverse effects. All mitigation measures proposed in the Environmental Assessment have been developed based on the principles of ESD.

It is clear that the principles of inter-generational equity and conservation of biological diversity are met and, if there is any doubt about potential detrimental effects on the environment, a precautionary approach is applied.

It is concluded that the development of the Mt Piper Ash Placement project is justified:

- In terms of addressing NSW Government policy for providing power generation capacity by providing an appropriate place to store ash products from power generation, thus allowing the existing power station to operate over its full life cycle and provide for a new power station;
- In providing social and environmental benefits for the general community whilst managing any potentially negative impacts on local communities by adopting appropriate management measures; and
- In that it would not detrimentally affect the health, diversity and productivity of the environment and would assist in these elements being maintained for the benefit of future generations.