***MAJOR PROJECT ASSESSMENT:***
***Mt Piper Ash Placement***

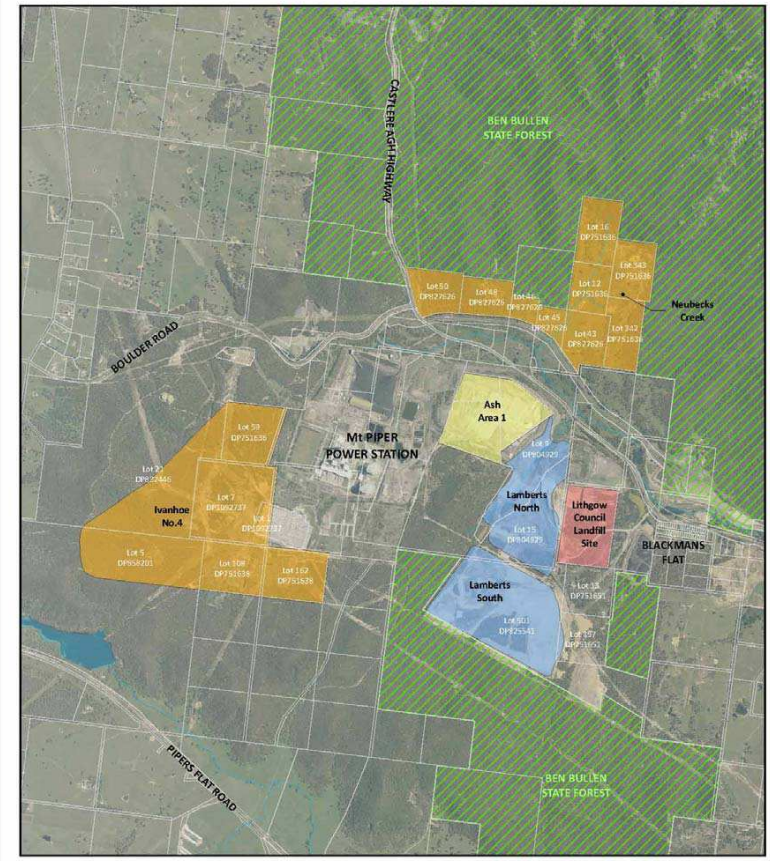


Figure 1-2 Site Location and Land Tenure

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

February 2012

## ABBREVIATIONS/DEFINITIONS

| | |
|---|---|
| Brine | Saline water which is a by product of the water treatment plant at Mt Piper Power Station |
| CEMP | Construction Environmental Management Plan |
| Council | Lithgow City Council |
| Department | Department of Planning and Infrastructure |
| DGRs | Director-General's Requirements |
| Director-General | Director-General of the Department of Planning and Infrastructure |
| EA | Environmental Assessment |
| EPA | Environment Protection Authority |
| EP&A Act | *Environmental Planning and Assessment Act 1979* |
| EP&A Regulation | Environmental Planning and Assessment Regulation 2000 |
| Goaf | Part of a mine from which the coal has been partially or wholly removed; the waste left in old mine workings |
| GCB | Groundwater Collection Basin |
| LEP | Local Environment Plan |
| Minister | Minister for Planning and Infrastructure |
| NOW | NSW Office of Water |
| OEMP | Operation Environmental Management Plan |
| Part 3A | Part 3A of the *Environmental Planning and Assessment Act 1979* |
| PM | Particulate Matter |
| Proponent | Delta Electricity |
| SCA | Sydney Catchment Authority |
| TSP | Total Suspended Particulate |

Cover Photograph: Figure 1-2 Proponent's EA

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*NSW Government*
*Department of Planning and Infrastructure*

## EXECUTIVE SUMMARY

Delta Electricity (the Proponent) is a State-owned Corporation that manages a number of electricity generating facilities throughout NSW, including a coal-fired power station at Mt Piper known as Mt Piper Power Station. The power station has a capacity of 1,400 megawatts provided by two 700 megawatt generating units. The production of this electricity requires the use of approximately 3.8 million tonnes of coal per annum. Mt Piper Power Station is located in the Central West region of NSW, approximately 17km north west of Lithgow.

A by-product of the electricity generation is ash (fly ash and bottom ash). Currently, ash is placed at ash Area 1 (see Figure 1). Ash is transported to Area 1 via a conveyor belt and then by truck via a private haul road. The existing power station has been operating since 1992 and ash Area 1 has approximately 2 years of life remaining. The combustion of coal produces around 855,000 tonnes of ash per annum.

Ongoing ash removal is required for the long-term operation of the existing Mt Piper Power Station. The Proponent has identified a need to expand its current ash placement facilities, at sites known as Lamberts North and Lamberts South. They will service both the Mt Piper Power Station and if required the proposed Mt Piper Power Station Extension, to enable ongoing placement once the existing ash placement area has reached capacity, estimated to be in 2013.

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 and Infrastructure.

The construction of Lamberts North and Lamberts South will require a number of engineering works to enable the ash placement activities to be completed safely, including: stabilisation of the current mine site; the transformation of a section of Huons Creek to a sub-surface drainage line and development of the on-site surface water management system.

The Department is satisfied that the Environmental Assessment (EA) provides an adequate assessment of the issues and constraints associated with the project. The key environmental issues are groundwater and surface water management, loss of native vegetation and threatened species impact, noise impacts, hydrological impacts and dust generation. These concerns were reflected within the submissions received during the exhibition of the Environmental Assessment. The Department acknowledges that the extent to which these impacts can be minimised or avoided is limited due to the proximity to residents, but nevertheless is able to comply with relevant standards.

The Proponent has proposed a number of management and mitigation measures to minimise the impacts of the project on the surrounding environment and community. These are reflected in the Statement of Commitments and include: minimising environmental and amenity impacts; monitoring of groundwater, surface water, noise and air quality, so as to enable detection of, and timely response to, identified impacts; progressive rehabilitation of ash placement areas to minimise dust generation and implementation of a dust suppression system for active areas of ash placement to mitigate fugitive dust emissions.

In addition, the Department has recommended conditions of approval which both define performance standards that the project must meet and identify monitoring and assessment requirements that build on the assessment undertaken to date as a means of ensuring the impacts of the project are minimised. These requirements include the evaluation and monitoring of noise, air quality, surface and groundwater quality and hydrology and the preparation and implementation of construction and operation environmental management plans.

The Department considers that there is potential to reuse ash and therefore reduce the power stations reliance on disposal and the associated impacts on the community and natural environment. The Government has established a waste hierarchy of avoidance, resource recovery and disposal, and turning waste into recoverable resources is a priority for NSW. The ash produced from the Mt Piper Power Station should be seen as a resource, and not simply a waste, and managed accordingly. Consequently, the Department has recommended that the Proponent prepare and implement a Long-Term Ash Management Strategy, including a program for investigation and assessment of alternative ash management measures, with a stipulated goal of 40% reuse of ash by 31 December 2020. The percentage of reuse has been determined taking into consideration the market reuse opportunities and demand for ash from power stations. The Department considers that reuse in combination with disposal is a more balanced and sustainable approach which will ensure that ash management practices are optimised while reducing the environmental impacts of the project.

Following a thorough assessment of the Environmental Assessment, Response to Submissions, and the Commitments made by the Proponent, the Department is satisfied that the impacts of the project can be appropriately mitigated or managed to acceptable levels. The Department acknowledges that there will be residual impacts on the surrounding environment and local community but these will be further reduced following the implementation of the recommended conditions of approval. It is concluded that the residual impacts are acceptable given the benefits that the project would provide to the State through continued provision and reliability of power supply.

In summary, the Department is satisfied that the proposed project is on balance justified, in the public interest and can be designed, constructed and operated to meet acceptable environmental and amenity limits subject to the implementation of recommended conditions of approval and the Proponent's Statement of Commitments. Consequently, the Department recommends that the Deputy Director-General as delegate for the Minister for Planning and Infrastructure under delegation enforced from 1 October 2011 grant approval for the Lamberts North and Lamberts South ash placement areas.

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# 1. BACKGROUND

Delta Electricity (the Proponent) is a State-owned Corporation that manages a number of electricity generating facilities throughout NSW, including a coal-fired power station at Mt Piper known as the Mt Piper Power Station. The power station has a capacity of 1,400 megawatts provided by two 700 megawatt generating units. The production of this electricity requires the use of approximately 3.8 million tonnes of coal per annum. Mt Piper Power Station is located in the Central West region of NSW, approximately 17km north west of Lithgow.

Ash placement and storage is required for the long-term operation of the Mt Piper Power Station. Ash is produced as a by-product of electricity generation through the burning of coal. The Proponent has identified a need to expand its current ash placement facilities, which service the Mt Piper Power Station, to enable the further placement of ash once the existing ash placement area has reached capacity, estimated to be in 2013.

The combustion of coal produces around 855,000 tonnes of ash per annum, which is currently stored at Area 1 (refer Figure 1). Ash is transported to Area 1 via a conveyor belt (approximately 860m long) and then by truck via a private haul road. The existing power station has been operating since 1992 and ash Area 1 has approximately 2 years of life remaining.

Two types of ash are produced at the power station – bottom ash (10-15% of the total) and fly ash (85-90% of the total). Bottom ash consists of larger particles which fall to the bottom of the boiler while fly ash contains finer particles which are carried up through a fly ash collection plant via hot exhaust gases. Fly ash may be conditioned with water or alternatively conditioned with brine (a boiler water treatment by-product). Conditioning the ash allows for compaction and better handling of the ash and reduces the creation of nuisance dust. The brine alters the ash's chemical composition and can be toxic to the environment. Therefore, brine ash is required to be placed separately within the ash placement area.

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 granted for the new power station, called Mt Piper Extension, on 12 January 2010 by the then Minister for Planning.

The Proponent originally sought concept and project approval for ash placement areas at Lamberts North and Lamberts South and concept approval for the future development of ash placement areas at Neubecks Creek and Ivanhoe No.4 sites (See Figure 1). This was to cater for the ash generated from the existing Mt Piper Power Station and to accommodate ash from the proposed Mt Piper Extension Project should it proceed as a coal fired power station.

As more detailed information is required for the assessment of the Neubecks Creek and Ivanhoe 4 components, the Proponent sought to 'decouple' the concept plan and project approval and is seeking project approval for Lamberts South and Lamberts North only. The proposed ash storage at Lamberts South and Lamberts North is sufficient to provide the existing Mt Piper Power Station with capacity until approximately 2042-2045 based on current coal consumption. It is unlikely further ash storage would be required unless the proposed Mt Piper Extension Power Station proceeds as coal-fired generation. Should the Mt Piper Extension Power Station proceed, separate approval would be required to be sought for Neubecks Creek and Ivanhoe No. 4 ash placement areas.

While Lamberts North and Lamberts South are currently being mined for coal, project approval is being sought for these sites to allow for their development for ash placement from 2013 once mining ceases. The ash placement areas proposed are primarily within the current workings of the Centennial Coal operated Lamberts Gully Mine and on land owned by either Delta Electricity or Centennial Coal.

The project site is located within the Lithgow local government area. Figure 2 below shows the regional location of the project site.

The project sites adjoin Ben Bullen State Forest, coal mines and power generation facilities.

Blackmans Flat is located approximately 1km away from Lamberts North and Lamberts South and has a population of approximately 178. The community of Blackmans Flat has expressed concern in regard to health impacts from the power station and ash placement facility.

## Figure 1: Site Layout

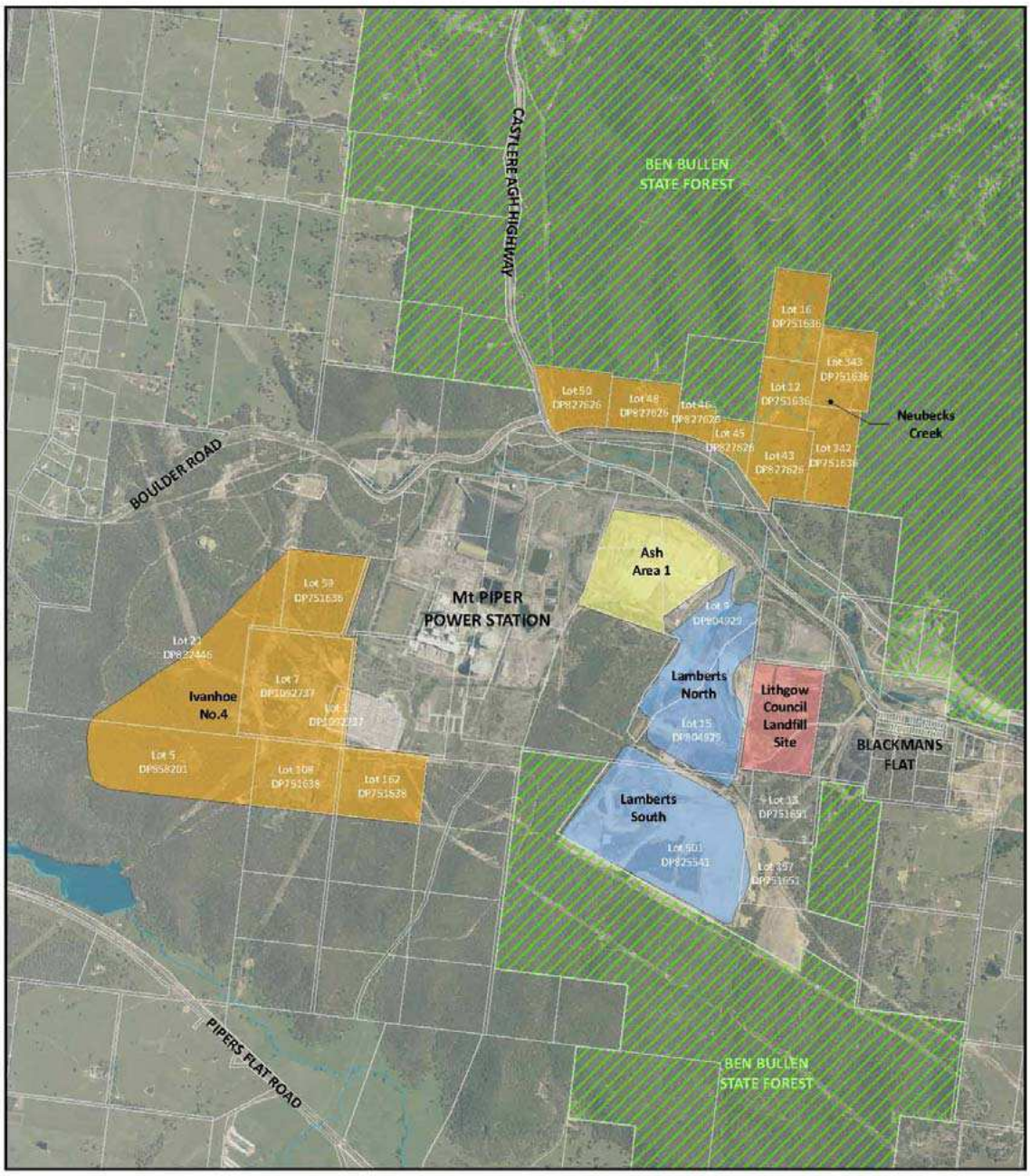
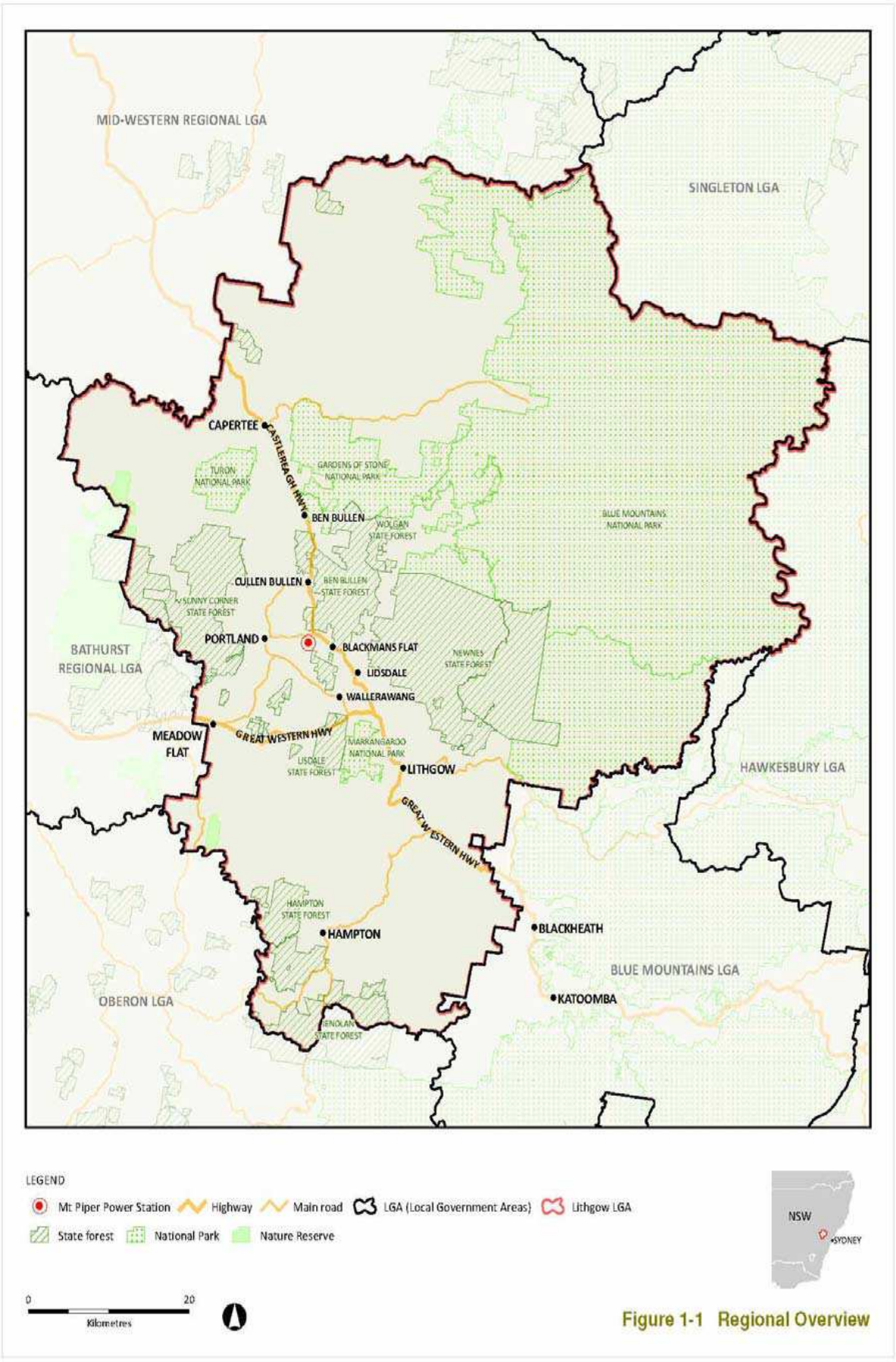



Figure 1-2 Site Location and Land Tenure

**Figure 2: Project Location**



# 2. PROPOSED PROJECT

## 2.1. Project Description

Lamberts South and Lamberts North are currently being mined for coal. Prior to ash placement the sites need to be prepared in order to store the ash effectively and safely. At the completion of mining activities the remaining overburden materials excavated to extract coal will be placed back into the excavations and/or remain in stockpiles, where materials will later be used in the construction of earth banks, fill areas and for use as capping materials for the ash storage facility.

Re-profiling of the landform will occur to re-establish surface water and drainage across the sites and to prepare for future ash placement. Where areas are not planned to receive ash for many years, maintenance such as stabilisation of mine areas/benches may be necessary for safety/operational purposes, with temporary rehabilitation of stockpile and disturbed areas to control soil erosion and dust until these areas are later required for ash placement.

Preparation and construction works will occur in various stages to allow for the continual placement of ash. Once the areas are suitable for ash placement, ash would be transported to the site and placed within the ash placement area. The construction of Lamberts North would also take approximately 3 to 6 months. Before the completion of Lamberts North, construction would start at Lamberts South, which would also take approximately 3 to 6 months. Consideration would be given to relocating/extending the existing ash conveyor from its current location near Area 1 to Lamberts North (Option 1) or to a site closer to Lamberts South (Option 2) to minimise the requirement for truck haulage across the site. Further details of these works are presented in Table 1.

Lamberts North will essentially be an extension of Area 1. The available volume for ash placement in Lamberts North has been estimated at approximately 6,850,000 m3 (in-situ volume) based on the design footprint of 43 hectares. Works at Lamberts North would involve clearing and grubbing of the proposed footprint area and re-grading/re-profiling of the Huons Gully to remove/relocate any existing stockpiles remaining from mining operations.

Lamberts South is located immediately to the south of Lamberts North. The available volume for ash placement in Lamberts South has been estimated at approximately 15,000,000 $m^3$ (in situ volume) based on the design footprint of 61 hectares. Lamberts South would commence following the near completion of Lamberts North.

The project has a capital value of $50 million and will provide up to 20 full time jobs during construction and up to 8 full time jobs for operation.

Ash placement activities are expected to be between 6am-8pm Monday to Friday and 6am-5pm Saturdays and Sundays, in line with current hours of operation at Area 1.

**Table 1: Key Project Components**

| Aspect | Description |
|---|---|
| *Site Preparation* | **Clearing and Grubbing**<br>Prior to ash placement, areas designated for ash placement will be cleared of any vegetation and unsuitable materials. Clearing and grubbing would be undertaken using bulldozers and/or excavators.<br>**Re-grading/re-profiling**<br>Earthworks would comprise of relocation and rehabilitation of stockpiles and grading remaining excavation areas from previous mining activities. This activity would involve the use of dozers and/or graders and stockpiling |

| Aspect | Description |
|---|---|
| | and/or hauling of material across the site.<br><br>**Earthworks and Fill Construction**<br><br>Soil banks are to be constructed to assist in the containment and placement of ash to form the proposed profiles around the ash placement boundary and to assist with surface water diversion and containment and placement of ash. Soil banks would be constructed from on-site soils and overburden materials disturbed during previous mining activities (site stockpiles or borrow areas), and placed in compacted layers to required design levels.<br><br>**Temporary Rehabilitation and Stockpile Remediation**<br><br>Previously disturbed areas from mining would be maintained and remediated to control surface water flows and soil erosion. Where areas are not programmed to receive ash for many years, maintenance such as stabilisation of quarry areas/benches may be necessary for safety/operational purposes.<br><br>**Access and haul roads**<br><br>Access and haul roads would be created, the haul roads are in the order of 12m wide or three times the width of the largest vehicle. Access and haul roads would be established progressively as ash is placed.<br><br>**Huons Creek Drainage Area (also known as Huons Gully)**<br><br>The Proponent is proposing to construct a rock drainage blanket along the invert of the current Huons Creek to collect subsurface flows. The subsurface rock drainage blanket would be constructed in the invert of the gully by the placement of rock fill wrapped in geotextile or graded filter material to reduce erosion of surrounding materials and to allow for water flow.<br><br>**Sediment Dams**<br><br>Sediment dams will be constructed to entrap soil and other particles eroded from rehabilitated areas due to rainfall runoff. There will be a number of sediment dams which accept runoff from capped and rehabilitated areas of both Lamberts North and Lamberts South. The sediment dams will provide additional storage for water captured on site and water from the sediment dams will be used for rehabilitation and dust suppression. Overflows from any sedimentation dams will be collected in retention dams.<br><br>Diversion drains would be constructed to divert runoff from Ben Bullen State Forest around the ash placement areas into Neubecks Creek. |
| *Operational Activities* | **Conditioning and Transportation of Ash**<br><br>Flyash is collected by filters with 0% moisture content within an enclosed system silo. Ash is conditioned and dampened to prevent dust, by spraying mist with either fresh or brine water into the flyash via a rotary paddle which mixes the water and the ash together. The conditioning prevents dust and enables proper compaction of the fly ash after placement to minimise infiltration of surface water. Normally 18% moisture content is required for compaction of flyash after placement to minimise infiltration of surface water. The ash is then transported from the silo to the conveyor.<br><br>Furnace ash does not need to be conditioned because it is collected in water-filled troughs underneath each boiler and trucked directly to the ash placement area.<br><br>Conditioned fly ash is then transported via an enclosed conveyor belt into surge bins located within the ash storage area from which the ash is |

| Aspect | Description |
|---|---|
| | discharged to trucks for ash placement. When the conveyor is out of service, ash is transported via truck to the ash placement area.<br><br>The current system of transport will be maintained for the proposed ash placement sites. The Proponent has stated that at some time in the future, the economic benefit of the conveyor system in its current location may be reassessed and the conveyor realigned to service ash placement as it progresses further from the current location. In particular, as placement continues into the Lamberts South area, it may become more viable to relocate or extend the ash transport conveyor toward the Lamberts South area.<br><br>**Ash Placement**<br><br>Ash conditioned with fresh water is placed to the desired height in 'pads', to a proposed elevation of up to 946 m AHD. Above this level, ash moisture conditioned with brine is permitted. Typically ash is placed by:<br><br>• delivering ash to the working face via truck and dumping into position;<br><br>• the ash is then spread and shaped via dozer operation; and<br><br>• ash is then compacted using a controlled number of passes with a bulldozer and/or truck to achieve required compaction.<br><br>The main aquifer in the proposed Lamberts North and Lamberts South ash storage area is partly saturated, with standing ground water levels generally below 920m RL discharging eastwards towards water courses such as Lamberts Gully.<br><br>Lamberts South would have a final maximum relative level (RL) of 1000 m AHD. The Lamberts North site would have a final maximum RL of 980 m. The standard method for capping requires the capping material (overburden from mine spoil) to be placed to an approximate depth of 750mm to 1 m.<br><br>Present disposal practices require the brine conditioned ash to be placed 35-40 m above the water table. Groundwater quality results and modelling suggest this height would be sufficient to ensure brine does not leach through to the groundwater. Further modelling will be conducted to ensure this approach is suitable for Lamberts South and Lamberts North. However, if the brine conditioned ash is to be placed at a greater height, the overall height of the ash mounds will remain the same. The Proponent has indicated that fresh ash is to be placed 1 m above the maximum anticipated groundwater level.<br><br>The ash is treated to achieve a compaction of 95%, relative to its maximum standard compaction. The process involves the use of machine compacting including rollers and rubber-tyred vehicles. Ash is placed in layers and stepped to produce an overall batter slope of approximately 1(V):4(H), with benches added every 10m in vertical height change. Bunds are constructed (minimum 500 mm) at batter extents to prevent discharge of surface water over the benches and down batter slopes to minimise scour and erosion and also to ensure separation of surface water runoff from brine conditioned areas.<br><br>Existing water storages on the project site will be utilised as part of the site Water Management System.<br><br>Dirty water storage areas would be constructed and used to collect and store rainfall runoff from the active ash placement area. Excess runoff would be stored and used for rehabilitation and dust suppression as required. |

| Aspect | Description |
|---|---|
| | Surface water runoff is drained away from permanent batters and directed to flow along benches and/or formalised channels (away from batters to maintain stability and minimise erosion). Runoff water would be directed into the dirty water storage areas via drainage channels.<br><br>Ash is managed by controlling the moisture condition during placement and by the use of artificial dust suppressors, sprinklers and water carts to minimise the generation of dust.<br><br>At the completion of each pad, the pad is covered with overburden from the mine, the area is then progressively re-vegetated as part of ongoing landscaping and re-vegetation program. Capping will occur progressively as each area reaches its design height. Capping will also be routinely applied to external and permanent batters. Re-vegetation of permanent batters of the ash placement area marks a final stage in the operation stage of ash placement. Re-vegetation would occur progressively throughout the life of the placement areas once capping is completed. |

## 2.2. Project Need and Justification

Ash removal, placement and storage are critical to the long-term ongoing operation of the existing Mt Piper Power Station. Additional ash disposal capacity is required to ensure the longevity of the power station's operation as the disposal capacity of the current area will be exhausted by the end of 2013. The power generating units at the Mt Piper Power Station have asset design lives to 2042-2045.

Lamberts North and Lamberts South provide sufficient area to provide ash storage for the existing Mt Piper Power Station Units 1 and 2 until 2042-2045. However, should the Mt Piper Extension Project proceed as a coal fired plant, the life of Lamberts North and Lamberts South would be reduced and the areas are predicted to be filled by 2026 assuming a commissioning date for the Mt Piper Extension Project to be 2016/2017.

In the absence of a significant increase in reuse opportunities or an alternative area for ash placement, Mt Piper Power Station Units 1 and 2 would be required to either reduce production to extend the operational life of the existing ash placement area or close down when the present ash placement area reaches capacity. However, continued operation is required to ensure the reliability and security of the State's electricity supply.

Should ash storage capacity be affected, any shortfall may have to be met by increased production from other older, less thermally efficient, and more expensive coal-fired generators in NSW or by importing electricity form neighbouring states which would be constrained by inadequate high-voltage transmission lines. This would in turn cause an increase in the wholesale electricity supply price on the National Electricity Market.

At present, there has been limited market interest in the reuse of ash from the power station. The Proponent has supported research into the reuse of ash and is committed to providing continued support as well as pursuing potential market opportunities. While the Proponent seeks alternative methods of ash disposal, including reuse, it is proposed to expand the ash placement areas as a means of securing the continued operation of the power station.

The EA presents a number of options and justifies the selection of the preferred options on environmental and economic grounds. Whilst the Department concurs with the Proponent in the need for additional ash disposal capacity to ensure the viability of the Mt Piper Power Station, it considers that further review and optimisation of ash management measures is required in granting project approval. This issue is addressed in Section 5.7 of this report.

# 3. STATUTORY CONTEXT

## 3.1. Major Project

On 20 October 2009 the then Minister for Planning declared the project to be subject to Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) under section 75B of that Act. Therefore the Minister for Planning and Infrastructure is the approval authority.

Part 3A of the EP&A Act, as in force immediately before its repeal on 1 October 2011 and pursuant to Schedule 6A to the EP&A Act, continues to apply to *transitional Part 3A projects.* Director-General's environmental assessment requirements (DGRs) were issued in respect of this project prior to 1 October 2011 and the project is therefore a *transitional Part 3A project*. Consequently, this report has been prepared in accordance with the requirements of Part 3A and associated regulations, and the Minister for Planning and Infrastructure (or his delegate) may approve or disapprove of the carrying out of the project under section 75J of the Act.

On 1 October 2011, the Minister for Planning and Infrastructure delegated his responsibility for the determination of project applications under Part 3A of the EP&A Act to the Deputy Director-General, Development Assessment and Systems Performance where:

- the relevant local Council has not made an objection;
- a political disclosure statement has not been made; and
- there are less than 25 public submissions in the nature of objections.

Lithgow City Council did not object to the proposal, no political donations were made and the project received fewer than 25 submissions in the nature of objections. The Deputy Director-General can therefore determine the project under delegated authority.

## 3.2. Permissibility

The project site falls within the local government area of Lithgow and is zoned 1(a) Rural (General) under the *Lithgow Local Environmental Plan 1994* (LEP). Pursuant to the LEP, the proposed development is permissible with consent. Under the Environmental Planning and Assessment Model Provisions Delta Electricity is defined as a public utility. The LEP adopts the Environmental Planning and Assessment Model Provisions with respect to public utility undertakings and, as such, nothing in the LEP shall be construed as restricting or prohibiting or enabling the consent authority to restrict, prohibit or enable the carrying out the project.

## 3.3. Environmental Planning Instruments

There are no environmental planning instruments that substantially govern the carrying out of the project. The Department highlights that other than in relation to zoning and permissibility, the *Lithgow Local Environmental Plan 1994* includes no particular provisions that substantially relate to the proposal.

The project involves the transformation of a section of Huons Creek to a sub-surface drainage line. This creek flows into the Neubecks Creek which flows into the Coxs River, which forms part of the Sydney drinking water catchment. The *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011* applies to Part 4 consents and Part 5 activities of the EP&A Act. However, there are no provisions for Part 3A projects. Nevertheless, the Department has assessed the water quality impacts in Section 5 of this assessment.

### 3.4. Objects of the EP&A Act

Decisions made under the EP&A Act must have regard to the objects of the Act, as set out in Section 5 of the Act. The relevant objects are:

*(a) to encourage:*
- *(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
- *(ii) the promotion and co-ordination of the orderly and economic use and development of land,*
- *(iii) the protection, provision and co-ordination of communication and utility services,*
- *(iv) the provision of land for public purposes,*
- *(v) the provision and co-ordination of community services and facilities, and*
- *(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
- *(vii) ecologically sustainable development, and*
- *(viii) the provision and maintenance of affordable housing, and*

*(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and*

*(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.*

It is important to recognise that while the EP&A Act requires that the principles of ecologically sustainable development be encouraged, it provides other objects that must be equally included in the decision-making process for the subject proposal. The Department's assessment has given due consideration to relevant objects of the Act in its assessment including:

- the promotion and co-ordination of the orderly and economic use and development of land – as stated in section 2.1 the project has a capital value of $50 million and will provide up to 20 full time jobs during construction and up to 8 full time jobs during operation. As the site will have been mined for coal prior to operation of ash placement, ash placement provides for further economic use and development of the land;
- the proper management and development of cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment – the Department's assessment of the need for the project (Section 2.2) has considered the need for ensuring reliable electricity supply to facilitate the ongoing efficient functioning, development and social and economic welfare of NSW;
- the protection, provision and co-ordination of communication and utility services and provision of land for public purposes – has been considered in the Department's assessment of the need for the project (Section 2.2) which has considered the need for public utilities; and
- the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats – biodiversity offsets will be developed to minimise the impact of 9ha of native vegetation to be cleared. The Department's assessment on ecology has been addressed in Section 5.

### 3.5. Ecologically Sustainable Development

The EP&A Act adopts the definition of Ecologically Sustainable Development (ESD) found in the *Protection of the Environment Administration Act 1991*. Section 6(2) of that Act states that ESD requires the effective integration of economic and environmental considerations in decision-making processes and that ESD can be achieved through the implementation of:

*(a) the precautionary principle;*
*(b) inter-generational equity;*
*(c) conservation of biological diversity and ecological integrity; and*
*(d) improved valuation, pricing and incentive mechanisms.*

The Department's assessment of the impacts of the project (section 5) is based on a comprehensive assessment to ensure that appropriate and adequate measures are put in place to prevent the threats of serious or irreversible environmental damage, consistent with the precautionary principle.

The Department has recommended a condition which requires the Proponent to further investigate and research the re-use of ash, which would allow for greater ecological sustainability of the ash placement facility in the future. The vegetation to be removed will be offset and on completion of the ash placement the area will be rehabilitated with native vegetation.

Ash placement is required in order for the power station to continue operating. Should the ash placement not go ahead, this shortfall would have to be met by increased production from other older, less thermally efficient, and more expensive coal-fired generators in NSW or by importing electricity from neighbouring states which would be constrained by inadequate high-voltage transmission lines. NSW requires reliable electricity supply to meet the needs of existing and future demand consistent with the principles of inter-generational equity. Therefore continuing ash placement within an already disturbed ecological footprint will reduce the impacts on potentially undisturbed ecologically rich areas.

The Department is satisfied that the project would not pose a significant risk to the conservation of biological diversity and ecological integrity as the project would be undertaken on an already disturbed area.

In addition to the above, the agency and community consultation undertaken as part of the assessment process (see Section 4 of this report), address objects 5(b) and (c) of the Act.

### 3.6. Statement of Compliance

In accordance with section 75I of the EP&A Act, the Department is satisfied that the Director-General's environmental assessment requirements have been complied with.

## 4. CONSULTATION AND SUBMISSIONS

### 4.1. Exhibition

Under section 75H(3) of the EP&A Act, the Director-General is required to make the EA of an application publicly available for at least 30 days. After accepting the EA, the Department publicly exhibited it from 15 September 2010 until 15 October 2010 (30 days) on the Department's website, and at the Department of Planning, Nature Conservation Council, Lithgow City Council, Lithgow Library Learning Centre and Portland Library. The Department also advertised the public exhibition in the Lithgow Mercury on the 14 September 2010 and the Orange Central Western Daily, Sydney Morning Herald and Daily Telegraph on 15 September 2010 and notified relevant State and local government authorities in writing.

The Department received 13 submissions during the exhibition of the EA - 9 submissions from public authorities and 4 submissions from the general public and special interest groups. Of these, three objected to the project. The remainder did not specifically state a position although raised issues for consideration in the Department's assessment.

A summary of the issues raised in submissions is provided below. The submissions raised were related to both Concept and Project Approval which included Lamberts North, Lamberts South, Neubecks Creek and Ivanhoe 4 sites.

### 4.2. Public Authority Submissions

9 submissions were received from public authorities.

**Sydney Catchment Authority (SCA)**

- The SCA considered that the project should be constructed and operated in a manner which does not adversely affect the quality of surface and ground waters beyond the boundaries of the site, consistent with the Regional Environmental Plan requirement for achieving a neutral or beneficial effect on water quality.
- The SCA considered that the long-term behaviour, fate and impacts of brine-conditioned ash disposal, including a risk assessment on ground and surface water quality under a range of rainfall events had not been addressed in the EA and that the EA did not provide adequate information on the chemical composition of ash and brine.
- The SCA raised concern regarding increasing levels of chloride concentration from an average of 20 to 50-100 mg/L.
- The SCA recommended that a risk assessment addressing the behaviour of surface and groundwater under a range of rainfall frequency and duration events be undertaken, and measures necessary to mitigate the leaching of salts and trace elements from the disposal sites be identified and implemented.
- The SCA also requested additional surface and ground water monitoring be conducted as part of the water management plan and noted baseline groundwater monitoring for the Lamberts North and Lamberts South was based on one-off sampling for a limited number of groundwater bores. The SCA considered that baseline groundwater water quality monitoring points should be evenly distributed within, around and downstream of the disposal sites.
- The SCA raised concerns about the long term impacts on water flows in Lamberts Gully Creek, including the need for a geomorphic study of the capacity of Lamberts Gully Creek to accommodate additional flows. The surface water management includes diversion drains to separate dirty and clean water which would be designed to convey the 100 year ARI flood from the external catchments. The SCA consider that these drains should be appropriately located, engineered and stabilised.
- Details of vegetation offsets from the 9 hectares which are to be cleared were not detailed in the EA. The SCA considered that offset measures should include the restoration, rehabilitation and revegetation of Lamberts Gully Creek and the revegetation and stabilisation of sections of Neubecks Creek.
- The SCA considered that more effort was required to explore opportunities for the beneficial reuse of ash.

**Roads and Traffic Authority (RTA) (now known as NSW Roads and Maritime Services (RMS))**

- The RMS requested details on the nature of the traffic generated that will access public roads during the construction phase including materials, equipment and waste transport traffic, the respective traffic volumes and the hourly distribution of traffic. Based on further information provided the RMS would assess whether a Traffic Management Plan, Vehicle Management Plan, Works Authorisation Deed, Road Occupancy Licence or any other road safety or traffic management measure would be required prior to those activities occurring (note however, that the Proponent has indicated that there will be limited use of public roads as the majority of equipment is already on site).

**Heritage Branch of Department of Planning (now part of the Office of Environment and Heritage (OEH))**

- The OEH noted that the heritage assessment indicated that there is a high likelihood of historic heritage existing to some extent at the Neubecks Creek and Ivanhoe No.4 sites, however this was documented via a desktop study. The Proponent has agreed that prior to these sites being used, a field survey of these two areas would take place and all potential impacts would be assessed at this time (note Neubecks Creek and Ivanhoe 4 sites are not being assessed at this stage and will be assessed at a later stage, should the Proponent subsequently seek approval).

**Trade and Investment (including the Department of Primary Industries)**

- Trade Investment had no concerns with the proposal from the Fisheries or Agriculture divisions, nor were there concerns from the Minerals Division.

**Department of Environment, Climate Change and Water (DECCW) (now known as the Environment Protection Authority (EPA))**

- The EPA supported the Statement of Commitments with respect to indigenous heritage matters, but recommended that they be amended to ensure that the Cultural Heritage Management Plan be revised and updated to cover the protection of previously recorded cultural heritage sites.
- The EPA raised concern regarding the claim that the project was unlikely to cause exceedances of annual $PM_{10}$ total suspended particulates and deposited dust criteria at the nearest sensitive receptor locations, and that no ongoing dust monitoring has been proposed to assess the validity of these claims. Accordingly, the EPA recommended a condition requiring the development of an air quality monitoring program.
- Insufficient information was provided for EPA to comment in detail on the proposed Neubecks Creek and Ivanhoe No4 emplacement areas in respect to air quality.
- The EPA considered that the offsets proposed did not comply with EPA's *Principles for the use of Biodiversity Offsets in NSW* and recommended a condition of approval in regards to biodiversity offset, and that any offset proposal should aim to meet the "improve or maintain" objective. EPA also recommended that the Proponent address the data requirements of the Biometric and Threatened Species tool methodology (PVP tools) as a means of determining an improve or maintain outcome for biodiversity offsets.
- The EPA considered there was insufficient information to comment in detail on the proposed Neubecks Creek and Ivanhoe No.4 emplacement areas, and noted that the Neubecks Creek and Ivanhoe No.4 areas have several listed threatened flora and fauna species that are likely to occur. Further assessment will be required within the areas (note Neubecks Creek and Ivanhoe 4 sites are not being assessed at this stage and will be assessed at a later stage, should the Proponent subsequently seek approval).
- The EPA noted that the day time rated background noise level (RBL) for the Blackmans Flat Village was reported in the EA to be 44dB(A). The noise report for the Yarrabodly Extension Project (Project 10_0041) reported a RBL for Blackmans Flat Village of 36 dB(A). Accordingly, the EPA believes the RBL for the project should be 36 dB(A). The EPA recommends the statement of commitments be updated to reflect Saturday work from 8:00am to 1:00pm. The EPA stated that it will require the existing environment protection licence to be modified to reflect the project specific noise criteria.
- The EPA requested further details on the exact location of surface water discharge points.

**Forests NSW (Part of Department of Primary Industries)**

- Forests NSW raised concern regarding the lack of consultation from the Proponent in relation to the project.
- Forests NSW raised concern that the current mining practices have encroached upon the boundary of Ben Bullen State Forest. Forests NSW requested that all boundaries

between the land parcels in question and the adjacent Ben Bullen State Forest should be surveyed and clearly delineated.
- Forests NSW suggested a buffer should be put in place to protect the Ben Bullen State Forest.
- Forests NSW required that the rehabilitation requirements of any areas disturbed by current mining activities should be transferred to the Proponent if a transfer in ownership takes place.

**NSW Health**
- NSW Health raised concern that the air quality modelling did not take into account local sources of particulate matter such as coal-fired power stations, existing ash emplacements, local use of solid fuel heaters and open cut coal mining, and that the existing particulate air quality may be poorer than assumed in the assessment.
- NSW Health raised concern regarding the predicted increment in annual average $PM_{10}$ and that the predicted maximum daily increment at sensitive receiver 1 is substantial, and that the $PM_{10}$ air quality modelling should also be conducted on the development stage of the proposal.
- The NSW Health considered that the Proponent should monitor local particulate matter to provide a mechanism to report results to the community.
- The NSW Health considered that the Proponent should investigate noise reduction barriers.
- NSW Health agreed with the SCA recommendation that ground and surface water monitoring should be conducted downstream of the ash repository and that a risk assessment of the leaching of contaminants under rainfall be conducted. NSW Health also agreed that drains should be appropriately sited, engineered and stablised in order to cope with floods.

**Lithgow City Council (Council)**
- Council raised concern about the cumulative impacts of industrial development surrounding the locality of Blackmans Flat.
- Council raised concern with the proposed increased heights of the proposed ash emplacement areas in regards to visual impacts and requested a definitive rehabilitation and landscaping condition be imposed on the development.
- Council raised concern over the transportation of ash via trucks and sought further information on or substantial conditions relating to the investigation of other sources of transportation and that no ash will be allowed to be transported via vehicle or truck.

**NSW Office of Water (NOW)**
- The NOW raised concern regarding the availability of water for dust suppression and rehabilitation, based on rainfall and evaporation rates.
- The NOW raised the issue that there had been no assessment for maximum harvestable rights dam capacity for the site catchments or a comparison with the actual volume of these retention storages.
- The NOW raised concerns with monitoring of water quality, including its detail and that there were no surface water quality monitoring sites in water courses other than in Neubecks Creek.
- The NOW considered that the groundwater bore search was not adequate. Water quality results were average measurements for water quality and water levels approximate and that there was not sufficient information to assess the impacts to groundwater. Groundwater levels should be measured to give an indication of water levels due to climatic variability within the region.
- NOW requested that water level contours/flow direction maps be provided.
- NOW raised concerns about the accuracy of the site water balance model, and that there has been no indication of an alternate water supply for drought contingency. NOW

requested further details on water usage for current ash disposal area and predicted water usage requirements.

### 4.3. Public Submissions

Four submissions were received from the public. This included a submission from the Lithgow Environment Group.

Of the four public submissions, three (75%) objected to the project and, one (25%) supported the project. The key issues raised in public submissions are listed in Table 2.

**Table 2: Summary of Issues Raised in Public Submissions**

| | Issue | Proportion of submissions (%) |
|---|---|---|
| Flora and Fauna | • Impacts of Neubeck's Creek and Ivanhoe No.4 sites on Ben Bullen State Forest and Mt Piper Reserve.<br>• Opposed to Neubecks Creek option because *Hakea microcarpa* and the Endangered Ecological Community (EEC) of Montaine Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps occurs on the site.<br>• Rehabilitation plans and enforceable timelines should be submitted prior to approval. | 75 % |
| Land Acquisition/ Human Health | • Impacts of Lamberts South and Lamberts North on human health. Support for the project on this basis would result in acquisition of residences at Blackmans Flat. | 75 % |
| Contamination | • Concern regarding saline metal contaminated brine and fly ash leaching from the proposed areas and contaminating surface water and groundwater and no licence limits are proposed for salinity, heavy metals, fluoride and boron.<br>• The EA did not address other toxic substances used in large quantities at Mt Piper Power Station including water treatment chemicals, corrosion inhibitors and polychlorinated biphenyls (PCBs).<br>• Concern regarding dust containing heavy metals reaching residents at Blackmans Flat.<br>• Concerned with the pollution of Neubecks Creek.<br>• Concern regarding contaminants entering the environment in the event of a flood. | 75 % |
| Air Quality | • Concern regarding the close proximity of Lamberts Gully North and South to 13 homes in Blackmans Flat village and potential dust impacts.<br>• The Lithgow Environment Group is concerned a similar dust pollution incident which occurred at Kerosene Vale Stage 2 Ash Repository in February | 75 % |

| | Issue | Proportion of submissions (%) |
|---|---|---|
| | 2009 will occur at Mt Piper.<br>• Concern regarding dust generation from haulage routes.<br>• The EA did not discuss fine particulate matter $PM_{2.5}$.<br>• The Air Quality Assessment in the EA did not consider the cumulative impacts of dust and discusses air quality exceedances in Bathurst but does not discuss the history of air quality in Blackmans Flat.<br>• Residents fear another occurrence of dust storms which occurred in 2003 and 2004 at Mt Piper Ash repository. | |
| Surface and Groundwater Quality | • Concern regarding water pollution. Concerns have been raised previously with SCA and EPA. | 50 % |
| Consultation | • Lithgow Environment Group does not believe the concerns raised with Delta Electricity have been acted upon. | 25 % |
| Property Value | • Concern regarding value of properties of Blackmans Flat if the project is to go ahead. | 25 % |
| Stability of the ash repository | • Concern regarding the structural stability of the ash repository in the event of a major flooding, earth quake or structural weakness due to past blasting. | 25 % |
| Noise | • Concern from residents regarding the cumulative noise impacts and exceedances which were predicted within the EA.<br>• The EA predicts compliance under neutral weather conditions but did not consider noise generated from wind and did not consider temperature inversions. | 50% |
| Cumulative Impacts | • The EA did not assess cumulative impacts from the Lithgow City Council Waste Management Facility adjacent to the Lamberts Gully North and South, Pine Dale Mine, Coal Link Haul Road, Extension of Angus Place Colliery, Extension of Mt Piper Power Station, increased haulage along the Castlereagh Highway through Blackmans Flat and Neubecks Creek Mine. | 25 % |
| Operation Hours | • The proposed operation hours of 6:00am to 8:00pm Monday to Friday and 6:00 am to 5:00 pm on Saturday and Sunday are not acceptable. | 25 % |
| Visual impact | • Visual impacts to those travelling along the Castlereagh Highway to Mudgee. | 25 % |

The Department has considered the issues raised in submissions in its assessment of the project.

### 4.4. Proponent's Response to Submissions

The Proponent provided a response to the issues raised in submissions (see Appendix C). The response included a Submissions Report which 'decoupled' the Concept Plan and Project Approval Application as it applies to Lamberts North and Lamberts South from the Concept Plan Application for Neubecks Creek and Ivanhoe 4. The effect of this change is that project approval is being sought for Lamberts South and Lamberts North only.

The Proponent's response to submissions was made publicly available on the Department's website on the 8 August 2011 and also forwarded to the Environment Protection Authority, Sydney Catchment Authority and NSW Office of Water for comment. The following submissions were received in response to the Proponent's Submissions Report:

Environment Protection Authority (EPA)

- Does not support the raising of the project specific noise levels for residential receivers in Blackmans Flat.
- Considers that the location used by the Proponent's consultants to develop the project specific noise limits does not reflect the average noise environment at Blackmans Flat.
- Recommend a condition that requires the development of a biodiversity offset within 12 months of project approval.

*Department's Consideration*

The Department has recommended conditions of project approval requiring noise levels for residential receivers to be consistent with the EPA's comments and has recommended that offsets be determined within 12 months of project approval.

Sydney Catchment Authority (SCA)

- The SCA considered that for a valid comparison of post and pre ash placement groundwater monitoring data, the percentiles used in the comparison of data should be the same.
- The SCA was not satisfied that the ash placement would not have impacts on the environment. The SCA conducted an analysis of the most recent groundwater quality monitoring report and indicated that an increase in chloride concentration over the last 10 years in groundwater bores located downstream of ash placement areas when compared to upstream bores had occurred. The SCA recommended the UTS (2007) groundwater model be updated to incorporate the increasing chloride concentrations. The SCA stated that the updated modelling would allow for predictions on the long term behaviour, fate and impacts of ash placement.

*Department's Consideration*

The Department liaised extensively with the SCA to ensure their concerns were addressed by the Proponent. Consequently the Department requested the Proponent to provide the above information requested by the SCA. The Department notes that the percentile issues will be further addressed during the update of the UTS (2007) model. As part of Delta's Annual Update Report 2010 for Ash Area 1, further investigations were conducted into the increased chloride levels at bore hole D10. The annual report concluded that the recent increase in the magnitude of the chloride spikes at borehole D10 may be due to the runoff from cooling tower blowdown (high in chloride concentration) conditioned ash batters. This has occurred since 2007.

The report concluded that construction of exposed brine conditioned ash batter in this area requires batter runoff controls, such as lining surface water run off collection ponds to reduce infiltration of run off into the groundwater, to be implemented. The Department included a condition which required the Proponent to update the UTS (2007) groundwater model. This condition satisfied SCA's concerns along with the condition which requires the Proponent to line surface water run off collection ponds.

NSW Office of Water

- Stated the information presented in the EA and technical reports is insufficient to allow for an adequate assessment of potential impacts of the proposed ash placement sites of Lamberts North and Lamberts South, Neubecks Creek and Ivanhoe 4.

*Department's Consideration*

Various government agencies raised concern regarding the lack of information provided for the concept sites – Neubecks Creek and Ivanhoe 4 and notes that these sites do not form part of this assessment. The Department believes sufficient information has been provided to assess the impacts of Lamberts North and Lamberts South.

# 5. ASSESSMENT

The Department considers the key environmental issues for the project to be:

- Surface Water Management;
- Groundwater Management;
- Air Quality;
- Water Demand Management - Operation;
- Flora and Fauna;
- Noise; and
- Ash Management.

## 5.1. Surface Water Management

**Issue**

The Lamberts South and Lamberts North area contains two waterways referred to as Huons Creek and Lamberts Gully Creek (see Figure 3). The Proponent believes these creeks are derived from the original Lamberts Gully which was present when the Western Main Colliery (disused mine) holding was active. Huons Creek drains to a large pond known as Huons Pond or the Groundwater Collection Basin (GCB) (see Figure 3). The GCB is an impoundment which is not connected to Neubecks Creek. Water from the GCB is currently pumped to settlement ponds and reused on site. Lamberts Gully Creek drains through the existing Lamberts Gully Coal Mine and then into Neubecks Creek.

Neubecks Creek is the receiving water for discharges from the existing and proposed ash placement areas (see Figure 3), which can influence the water quality entering the Coxs River, which flows into Warragamba Dam. Warragamba Dam is part of Sydney's drinking water supply. It is therefore important that the proposed ash placement areas are constructed and operated in a manner that does not adversely impact the quality of surface water beyond the site boundary.

*Construction*

Construction impacts include earthworks associated with regrading/re-profiling of the site, construction of haulage roads and surface drainage works. The construction impacts have the potential to affect the water quality of Neubecks Creek by generating sediment and pollutants such as nutrients, heavy metals and other potential toxicants that attach to the sediment particles. If works are not managed properly, impacts could increase salinity, turbidity, sedimentation, nutrients and metal concentrations that could be toxic to aquatic organisms. There is also a risk of eutrophication (a process where water bodies receive excess nutrients that stimulate excessive plant growth).

*Operation*

During operation there is the potential for sediment and contaminants to be mobilised in runoff from the following:

- disturbed areas;
- active ash placement areas; and
- completed ash placement areas prior to capping and revegetation.

In order to operate the facilities, a site surface water management system would be developed. This would allow for capture and reuse of contaminated/polluted runoff. The surface water management system would involve the separation of clean water (surface water which has not been in contact with ash) from dirty water (surface water which has come in contact with ash). Dirty water generated on site will be diverted to sediment dams which will capture runoff from the exposed ash placement areas. The dirty water will be reused on site for rehabilitation and dust suppression. The adequacy of the sediment dams to control runoff will be monitored, including water quality testing of sediment dams and water

storages to ensure any discharge is appropriate for release into receiving waters. The dirty water storage areas would be developed progressively with the active ash placement areas. Clean water would be diverted away from ash placement areas and into Neubecks Creek. This management method is currently used at the existing ash placement facility (Ash Area 1). This would mean a water extraction licence would not be required.

There will be no regular controlled releases of the dirty water. However, during large rainfall events, water from sediment dams may be released into Neubecks Creek after the water has been treated through the dams. The EPA has stated there should be no regular controlled releases of dirty water from the sites and that the exact location of discharge points to Neubecks Creek needs to be identified and any discharge of dirty water from these sites would require a revision to environment protection licence No. 13007.

Once the ash placement is complete and rehabilitation is established, there would be no need for sediment dams and runoff would return to Neubecks Creek.

In order to gain an indication of the current water quality of Neubecks Creek and the potential impacts from the existing ash placement area (Ash Area 1), the Proponent conducted water quality monitoring of Neubecks Creek at two locations and a further two locations were sampled by Springvale Coal from 2000-2009 and 2000-2007 respectively. Surface water sampling locations are identified in Figure 4. Neubecks Creek is the primary receiving water from discharges from Ash Area 1 and the proposed Lamberts North and Lamberts South sites. The key indicators of concern with respect to water quality include electrical conductivity (as a measure of salinity), total dissolved solids, chloride and trace metals.

The results from the surface water monitoring indicated that:

- pH levels were within the ANZECC 2000 guidelines for freshwater aquatic life;
- electrical conductivity was recorded to be elevated at all sites;
- chloride ion levels appeared to be consistently low at the sampling points; and
- metals concentrations were shown to be elevated in Neubecks Creek at Site 1 (in particular silver, arsenic, cadmium, chromium, copper and zinc), at Site 0 (silver and aluminium) and at Site 2 and 3 (manganese and zinc).

The Proponent noted that the lower pH, increased manganese and zinc indicated that the flow in Neubecks Creek was dominated by groundwater inflow during dry weather. The Proponent identified that local groundwater has elevated levels of these metals due to the acid sulphate conditions in the local underground mine waters.

No concerns were raised from the SCA or the EPA regarding the above heavy metal concentrations.

The development of the ash facility will modify the landform and therefore has the potential to affect the flooding regime of the local creeks. Diversion drains would be designed to convey the 100 year ARI flood event.

The Proponent has also committed to implementing erosion and sediment controls, consistent with the principles set out in Landcom's *Managing Urban Stormwater: Soils and Construction* (the Blue Book) to mitigate water quality impacts. These will be detailed in the Construction Environmental Management Plan (CEMP) and Operation Environmental Management Plan (OEMP).

**Figure 3: Water Catchment Plan (taken from the Proponent's EA).**

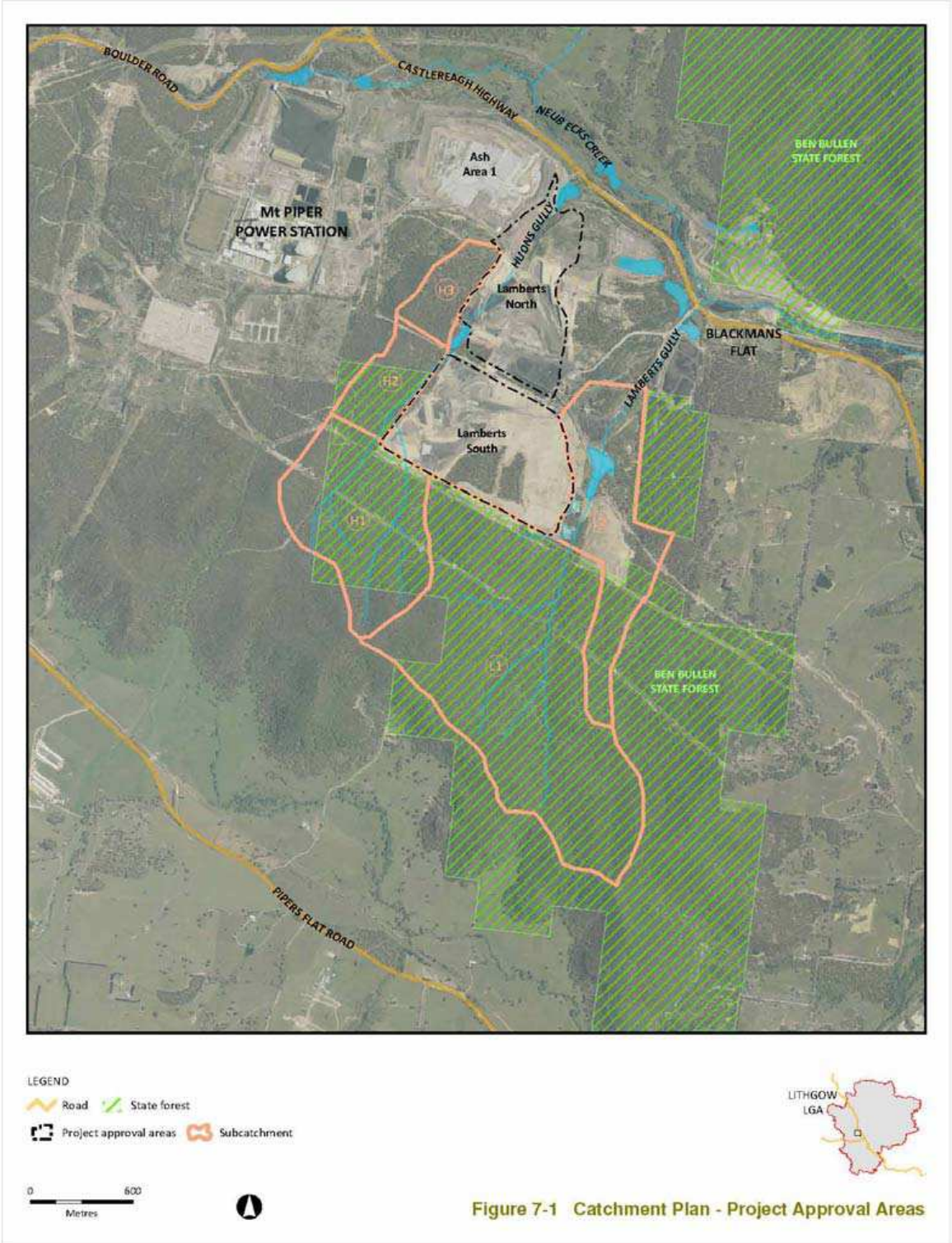
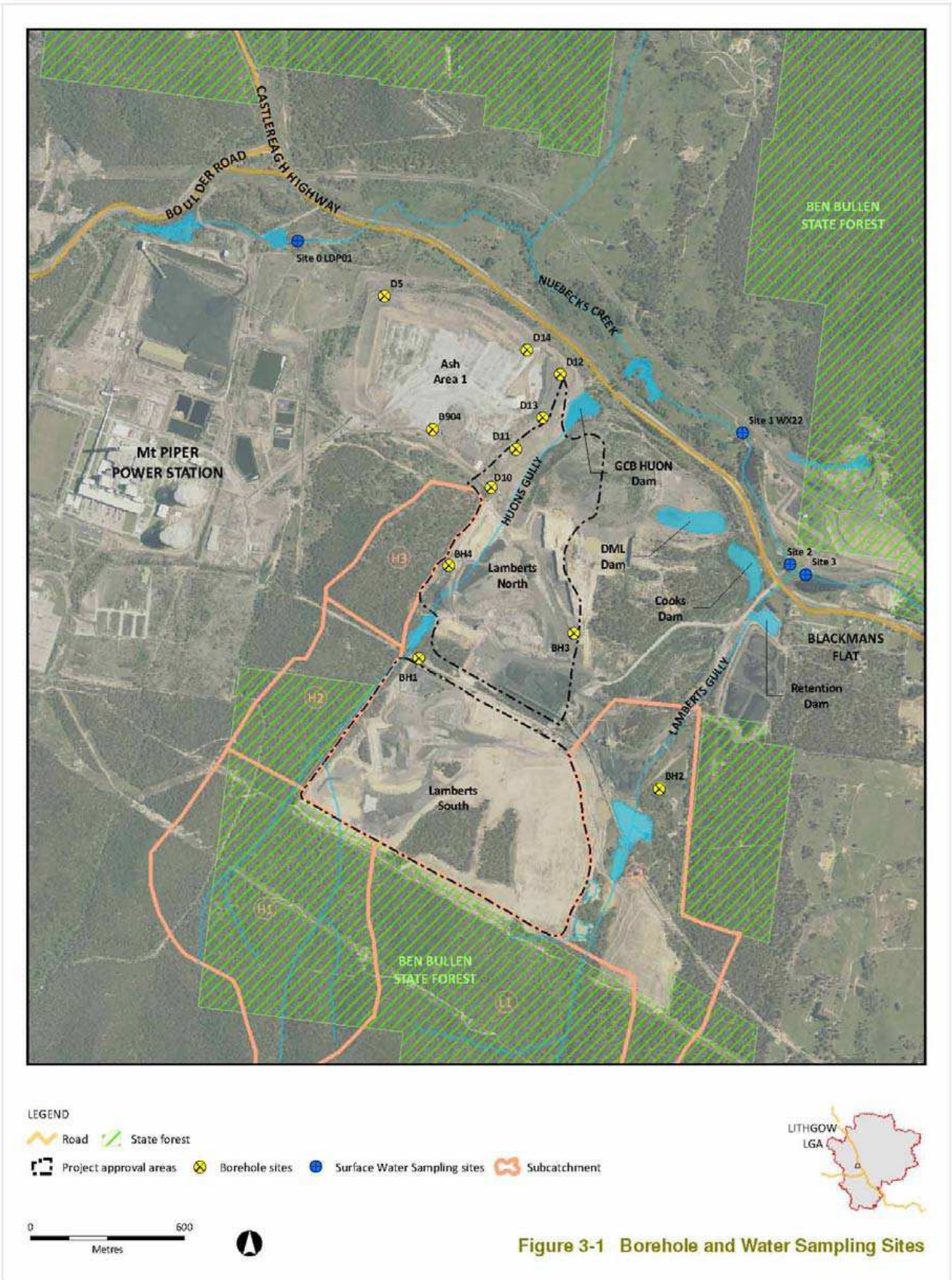


**Figure 4: Borehole and Surface Water Sampling Locations (taken from Proponent's EA)**



**Consideration**

The Department considers that the risk of erosion and sedimentation of waterways during construction and operation can be managed through the implementation of erosion and sediment controls. This has been reflected within the recommended conditions of approval which require the preparation of a Soil and Surface Water Management Plan as part of the CEMP and the OEMP for the site.

As indicated above development has yet to commence at the Blackmans Flat WMF. The Department understands that further permits and consents will be required before the development can occur and these will provide opportunities for ensuring appropriate surface water management measures are implemented at the site. The recommended conditions of approval for the ash placement require the Proponent to consult with Council in developing its management plans and will provide opportunities for Council to consider interactions between the two projects.

The main surface water quality risk associated with the project is the inflow of contaminated/polluted water from the site into Neubecks Creek both during construction and operation of the project. Should contaminated/polluted flows enter Neubecks Creek, these could have adverse impacts on aquatic flora and flora depending on the type and concentration of contaminants in the flow. There is also the potential for any contaminants to migrate downstream into the Coxs River, which forms part of Sydney's drinking water supply.

The Department acknowledges that the Proponent has proposed to manage surface water quality impacts during construction and operation through implementing a number of measures that have been successfully employed on the site as part of Ash Area 1 operations, including: the implementation of erosion and sediment control measures; separation of clean and dirty waters; and capture and reuse of contaminated/polluted runoff from the ash placement area during both construction and operation and reusing the water generated from capped and rehabilitated areas to satisfy the demands for rehabilitation and dust suppression.

The SCA raised concerns about whether Lamberts Gully Creek had the capacity to deal with high rainfall events, therefore the Department has recommended the Soils and Surface Management Plan for operation includes a process to assess the behaviour of surface water under a range of rainfall frequency and duration events, and geomorphic studies on the capacity of Lamberts Gully Creek to accommodate runoff from Ben Bullen State Forest (see Figure 3). Should the geomorphic study show that Lamberts Gully Creek is unable to accommodate flow diversions then the Proponent will be required to identify an alternate flow diversion.

At the completion of each ash pad, the pad would be capped with mine spoil and the area progressively re-vegetated to reduce the risk of erosion. The Department has recommended a Landscape Revegetation Plan to ensure the long term stabilisation of the site. The Department has further recommended that vegetation be carefully selected by a qualified expert to ensure rehabilitation works do not compromise the long term integrity of the capping.

The Department has also recommended that surface water quality monitoring be conducted up and down stream from Lamberts North and Lamberts South for a period of no less than 5 years following completion to ensure the capping is effective in containing ash and contaminants and a contingency plan to address potential surface water quality exceedances is prepared. This condition addresses the SCAs requirement for ongoing monitoring.

The Department believes the impacts on surface water quality can be appropriately managed to an acceptable level, both during construction and operation and has therefore recommended the following conditions of approval requiring the Proponent to:

- prepare a Soil and Surface Water Management Plan for construction and operation detailing:
    - measures to minimise erosion and the discharge of sediment/pollutant laden waters during construction;
    - the design of the drainage surface water management system. This is to be developed in consultation with the SCA and sent to the Director-General for approval and be developed in consultation with the relevant government agencies;
    - separation of clean and dirty water flows and provision for the treatment, recycling/reuse and/or discharge of flows;
    - a site water balance including water usages for ash placement areas, sources of water and quantity of runoff generated;
    - demonstration that Lamberts Gully Creek has capacity to cope with additional flow under various rainfall events and identification of alternative water management measures;
    - a risk assessment of surface water quality under a range of different rainfall events and associated mitigation measures for a range of rainfall events that may occur; and
    - a surface water monitoring program and remedial measures should levels exceed acceptable trigger levels.
- line surface water runoff collection ponds (sediment dams);
- update the OEH licence 13007 to include discharge points, monitoring schedules and identified likely pollutants; and
- avoid earthworks within 50 m of Neubecks Creek.

### 5.2. Ground Water Management

**Issue**

*Construction*

The Proponent has stated that it is highly unlikely that groundwater will be impacted upon during construction, as construction works will be above the water table.

*Operation*

There is the potential for chlorine, fluorine and heavy metals to leach out of the ash and migrate into groundwater and potentially enter Neubecks Creek. Depending on the type and concentration of pollutant(s), this may have implications for downstream users of groundwater and groundwater dependent ecosystems. The Proponent has indicated that currently there are 3 bores within a 3 km radius of the Mt Piper Power Station site which are used for stock and domestic purposes.

Groundwater bores were installed to monitor the existing ash placement area (Ash Area 1) (see Figure 4 for groundwater bore locations). Average concentrations of eight groundwater bores were presented in the EA.

The Proponent has stated that the existing ground water quality is influenced by the previous coal mine workings. The Proponent believes sulphate, boron, nickel, manganese and iron are naturally elevated in the groundwater due to the local mineralisation. The Proponent noted that elevated trace element concentrations were particularly evident at bores adjacent to areas of mine coal pillars. The Proponent has stated that the effect of the underground mine water quality is reflected in the values for the Groundwater Collection Basin (GCB). In particular, there are higher sulphate, boron, nickel and zinc concentrations.

Chloride is regarded as an indicator of brine leachates. Chloride levels recorded in groundwater boreholes were below the adopted guideline of 350 mg/L. However high chloride levels were observed in borehole D11 and an increase in chloride levels were observed in borehole D10. The Proponent stated that the elevated chloride concentrations at these locations indicate a separate localised source of chloride likely to be due to a salt deposit disturbed by previous mining activities.

The SCA raised concern regarding the increase in chloride levels in groundwater boreholes. The Department requested further information regarding groundwater modelling and chloride concentrations. As part of the Annual Update Report 2010 for Ash Area 1, Delta investigated the increase in chloride levels and concluded that the recent increase in chloride levels at groundwater monitoring bore D10 (see Figure 4) was due to runoff entering unlined sediment dams from an area of exposed brine conditioned (saline affected) ash batters (exposed working face), together with the use of cooling tower water (blow down water). To minimise impact on the local groundwater, it was recommended that the surface water runoff ponds be lined and that Delta investigate the feasibility of installation of lined ponds to collect the runoff from the exposed brine batters. This approach is to be adopted for the surface water collection ponds for Lamberts North and Lamberts South.

The Proponent has identified that the main aquifer is partly saturated, with standing water levels generally below RL 920m, discharging eastwards towards water courses such as Lamberts Gully Creek. The Proponent stated that the water table may rise rapidly in response to heavy rainfall events. The Department requested confirmation from the Proponent regarding the impacts of the water table rising. The Proponent stated that in the event the groundwater does rise above the soil profile to the ash storage area that impacts will be temporary.

The ash placement modelling conducted for Ash Area 1 indicated that the brine conditioned ash placed at 946m, which is 35-40m above the groundwater level at Ash Area 1, would not pose any groundwater risks. Therefore a similar approach for Lamberts North and Lamberts South will be adopted. Further modelling for Lamberts South and Lamberts North will be conducted to ensure this approach is suitable.

**Consideration**

The main groundwater risk associated with the project is the contamination of groundwater flows and leaching of contaminants in the ash to Neubecks Creek and private bore holes.

As discussed above, the Proponent claims that there is sufficient data from the existing and on-going monitoring and 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 and runoff from brine conditioned batters to unlined surface water collection ponds which then seeps into the groundwater. This highlights the need for best management practises including the lining of surface water collection ponds and containment of mine spoil and the need for groundwater monitoring.

The Proponent has stated groundwater would be managed by:

- regrading and profiling of storage areas to provide a base area above groundwater for the placement of ash materials;
- placement of brine treated ash at defined heights above groundwater levels to minimise risk of seepage into the groundwater table;
- lining surface water collection ponds;
- updating of the UTS (2007) groundwater model, with the results of the updated model sent to the SCA; and
- undertaking a groundwater quality monitoring program.

As discussed in section 4.4 it is recommended that Delta update the Mt Piper groundwater UTS 2007 groundwater model to take into account the increase in chloride levels. The results from the updated groundwater UTS model (used to predict future impacts) shall be sent to the SCA. Once the model has been updated a risk assessment of ground and surface water quality impacts under a range of rainfall events must be conducted and predictions updated on the long term behaviour, fate and impacts of ash placement. In addition, the implementation of a monitoring program will meet the SCA's requirement for ongoing monitoring of the potential impact of the project on groundwater quality.

Accordingly, the Department has recommended a condition of approval requiring the Proponent to develop a Groundwater Management Plan in consultation with the SCA, to identify impact assessment criteria, and a protocol for investigating exceedances of the criteria and a response plan to address exceedances. A key component of the Plan is a requirement to identify, in association with the monitoring program, any groundwater quality impacts, and to address the consequences of any such impacts by implementing remedial measures which are to be identified in the CEMP and OEMP. Such a proactive approach would enable the Proponent to promptly implement appropriate management measures should any adverse groundwater impacts be detected. The Department considers that this is an adequate approach to managing the residual risk.

There is also a low to moderate residual risk that groundwater could be impacted in the unlikely event that the capping should fail (i.e. the leachate permeates through the capping) or the rate of infiltration differs to that in the field trials. Consequently, the Department has recommended a condition of approval requiring the Proponent to implement, in consultation with the SCA, a groundwater monitoring program throughout the life of the project and for a minimum of five years following final capping and landscaping of the ash placement sites, as a means of detecting any impacts on groundwater quality that may arise through the failure of the capping and to implement mitigation measures if required.

The Department believes that the SCA's and community's concerns regarding the need for appropriate groundwater impact assessment criteria, monitoring of impacts, and response mechanisms in the case of groundwater impacts arising, can be addressed through the recommended monitoring program and management plan.

Overall, the Department is satisfied that the recommended conditions of approval and implementation of the management measures detailed in the statement of commitments will adequately manage and minimise the potential impacts of the project on groundwater.

### 5.3. Air Quality

**Issue**

*Construction*

The preparation of the proposed Mt Piper Ash Placement areas will require bulk earthworks which have the potential to generate dust and emissions. Dust would be generated primarily from:

- clearing of vegetation and topsoil;
- loading of material to and from trucks and truck movements; and
- wind erosion from stockpiles and roads.

The Proponent has stated that the appropriate safeguards would be required to minimise potential air quality impacts during construction including watering of exposed soils during dry windy days, stabilising work areas and minimising areas of surface disturbance.

*Operation*

The operation of the project will involve the haulage and placement of significant amounts of ash (approximately in the order of 855,000 tonnes per annum). Although the ash is conditioned with water to approximately 15% moisture content to minimise the potential for dust generation, there is an elevated risk of air quality (dust) impacts arising from placed ash until the exposed surfaces are stabilised. There is also the potential for dust to be generated during the placing of ash, shaping of the placed ash, and from vehicles travelling along the private haul road to and from the conveyor belt to the ash placement areas and wind erosion from unsealed surfaces and stockpiles. Dust not only has an adverse visual impact, but also is a nuisance factor, and can have adverse impacts on human health depending on the nature of the contaminants inhaled and length of exposure.

An air quality assessment was undertaken, involving dispersion modelling to determine the air quality impacts of the ash placement areas. The contaminants considered were total suspended particulate matter (TSP), particulate matter ($PM_{10}$) and deposited dust. The Proponent made assumptions on background levels of an annual average of 32µg/$m^3$ TSP, 16 µg/$m^3$ Particulate Matter with equivalent aerodynamic diameter less than or equal to 10 microns ($PM_{10}$) and 1.2g/$m^2$/month dust deposition.

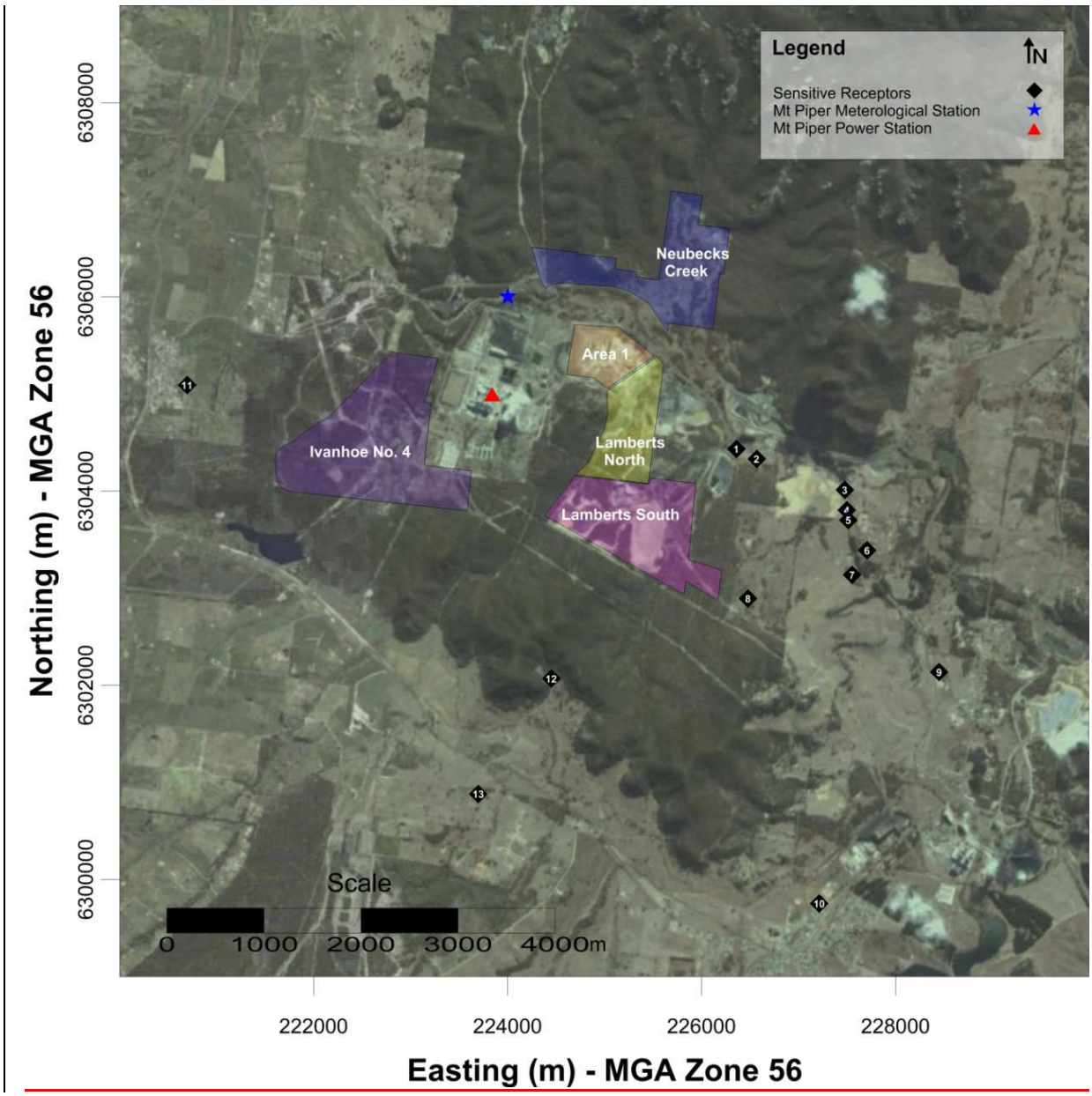
The Proponent stated the assessment followed the procedures outlined in the *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW* (DEC, 2005). The annual average for $PM_{10}$ was derived from the EPA air quality monitoring station at Bathurst (approximately 45km away). In the absence of data on existing TSP concentrations the annual average for TSP was calculated to be double the annual $PM_{10}$ concentration. Deposited dust recorded near Wallerawang Power Station from a monitor approximately 4km away was used to predict the annual average level of deposited dust.

The modelling indicated that the annual average TSP 90 µg/$m^3$ criterion contour was not exceeded beyond the site boundary for the proposal. However, sensitive receivers in the locale are predicted to experience an annual incremental increase in TSP concentration of less than 6 µg/$m^3$. The Proponent therefore concluded that there would be no adverse impacts in terms of annual average TSP concentrations.

With regard to $PM_{10}$, sensitive receiver 1 (see Figure 5) is predicted to experience the highest maximum 24 hour average concentration of 15.6 µg/$m^3$, which is below the relevant criterion of 50 µg/$m^3$. The Proponent also indicated that all sensitive receivers are predicted to experience an annual $PM_{10}$ concentration of less than the relevant criterion of 30 µg/$m^3$. The highest incremental increase is predicted to be 4.5 µg/$m^3$ at sensitive receiver 1. However, NSW Health state that 4.5 µg/$m^3$ at sensitive receiver 1 is a substantial increase. NSW Health indicated that further $PM_{10}$ air quality modelling should be undertaken for each site prior to approval and include construction stage emissions.

However, it should also be noted that the assessment of $PM_{10}$ assumed a "worst case" scenario with no controls in place to reduce dust emissions. Dust suppression measures such as application of sprays to exposed surfaces within the placement area and use of water trucks on unpaved haul roads would also be applied to the proposed ash placement areas.

Figure 5: Location of sensitive receivers (taken from Proponent's EA)




Should the Mt Piper Extension Project go ahead as a coal-fired plant this would result in a generation of an additional 1,314, 000m$^3$ of ash requiring placement. Cumulative impacts for annual $PM_{10}$, TSP and deposited dust for the proposed Mt Piper Ash Placement, Mt Piper Extension and Kerosene Vale (the ash repository for Wallerawang Power Station, located approximately 4km south east of Mt Piper) ash storage areas are estimated in Table 3 for the most sensitive receiver (receiver 1).

**Table 3:** Potential cumulative impacts at sensitive receiver 1 (taken from Proponent's EA).

| Pollutant | EPA Criterion | Maximum Cumulative Impact |
|---|---|---|
| Annual $PM_{10}$ (µg/m$^3$) | 30 | 28.9 |
| Annual TSP (µg/m$^3$) | 90 | 47.4 |
| Deposited Dust (g/m$^2$/month) | 4 | 2.4 |

Predicted cumulative impacts are expected to meet EPA's criteria. Background levels included the operation of Ash Area 1. Background levels are anticipated to be lower as Ash Area 1 would not be operational once Lamberts North and Lamberts South are in operation.

The results from the assessment indicate that the operation of Lamberts North and Lamberts South is unlikely to cause exceedances of annual $PM_{10}$, TSP and dust deposition criteria at the nearest sensitive receiver. However, there is potential for the maximum 24-hour average $PM_{10}$ criteria to be exceeded from time to time.

The Department notes that an ammonia based nitrogen oxides reduction system (known causes of odours associated with power stations) is currently in use at Mt Piper Power Station and that no odour issues have arisen with the current ash placement area.

**Consideration**

The Department is satisfied that dust and emission impacts associated with construction can be mitigated through the implementation of the Construction Environmental Management Plan (CEMP). The Department therefore has included a condition that an Air Quality Management Plan be developed as part of the CEMP, in consultation with the EPA and provide details of all dust control measures to be implemented during the construction of the project.

The Department acknowledges that dust will be generated from the project during the transportation and placement of ash and that appropriate mitigation and management measures will need to be implemented.

The Department is satisfied that the assessment undertaken of potential dust deposition rates and conclusions drawn regarding potential dust impacts are adequate. The Department acknowledges that the Proponent's conclusions are based on correlations with dust deposition levels and the assumption that $PM_{10}$ data from Bathurst are a reasonable surrogate for conditions at Mt Piper. Discussions have been undertaken with the EPA regarding the suitability of the modelling based on data gathered at Bathurst and the EPA believes that the data would provide an appropriate estimate of TSP and $PM_{10}$. The Department agrees with the EPA that ongoing monitoring at sensitive receivers is necessary to ensure that the ash placement areas are appropriately managed.

NSW Health stated that the predicted increase in annual average and daily $PM_{10}$ was substantial and recommended that given the present high background concentrations of $PM_{10}$ further air quality modelling should be conducted. The Department acknowledges NSW Health's concerns, however the impacts from Lamberts North and Lamberts South are not expected to be significantly different from the current Ash Area 1 impacts. Whilst there will be a new ash disposal area, the sources of dust are replacing an existing ash disposal facility. The Department also notes that the modelling is based on a worst case scenario with the assumption that no controls have been put in place to reduce on-site dust emissions. Therefore, it is likely that the impacts will be less than what is predicted in the EA.

Notwithstanding, the Department has recommended a condition of approval requiring the Proponent to prepare an air quality monitoring program in consultation with NSW Health and the EPA. The monitoring program is to be maintained throughout the life of the project and include, but not necessarily be limited to, dust monitoring. The Department has also recommended periodic reporting to the EPA, and for annual reports detailing the monitoring results to be submitted to the Director-General.

The Department accepts that provided all the nominated environmental commitments are implemented during operations, dust generation from the project would be minimised. Notwithstanding this, the Department believes that the Proponent should be required to assess alternative methods of ash placement with the aim of minimising the exposure of

active placement areas and hence the potential for dust generation. This would ensure that best practice management is implemented and is consistent with the principle of minimising impacts as far as practicable. Accordingly, the Department has recommended that an Air Quality Management Plan be developed addressing this matter, which would include a protocol for the investigation of, and a response plan to address, visible emissions from the ash placement areas and a range of other air quality issues.

The Department considers that through its recommended conditions of approval, and the application of the identified mitigation measures, that the air quality impacts of the project can be appropriately managed.

### 5.4. Water Demand Management - Operation

**Issue**

The development of the ash placement facilities require water to be used for rehabilitation and dust suppression. The required water for the proposed ash placement would be sourced from water harvested from the surface areas of the proposed ash placement facility. By implementing water demand management processes on-site, an alternative water supply would not be required. Accordingly, there will be no requirement to use water from the Coxs River system for dust management and rehabilitation works for the Mt Piper Ash Placement.

The Proponent has stated that 250 k/L per day is required for dust suppression from ash produced from Mt Piper units 1 & 2 and Mt Piper extension and that 450 kL/day used for conditioning of the ash is not included as this would involve the reuse of water from the power station.

The Proponent has stated that the water balance model predicts that on average over the life of the project, daily dust suppression and rehabilitation demand is predicted to be satisfied for 80-82% of the time, assuming maximum daily water usage. This identifies water availability as a potential issue.

The Proponent has stated that during drought the minimum requirement for dust management with Mt Piper units 1 & 2 and the Mt Piper Extension operating is 120kL/day, which is required for water carts to supply 40 kL/hr for 3 hours per day (120 kL/day) to suppress dust along unsealed roads. During this time no water would be used on rehabilitation areas.

The Proponent would manage periods of low water availability by controlling dust by minimising work areas and using DUSTEX (dust suppressant made from lignin) instead of water. Least used areas would be capped with a layer of overburden and the remaining areas would be capped with DUSTEX, allowing sprinklers to be turned off and no water required. The working areas would be minimised and rotated to allow continued placement without affecting production.

The Proponent has stated the water requirements for rehabilitation would be minimised by the use of native plants which are drought tolerant. In the case of extreme conditions, no water would be used for the rehabilitation.

**Consideration**

The Department has considered water availability during low rainfall periods and the Proponent's capacity to suppress dust, particularly as water is not proposed to be drawn from other water sources. The Department notes that where water availability is low, water use will be reduced by reducing the water used on rehabilitated vegetation, vegetation selected will be native and drought tolerant, DUSTEX will be used to suppress dust generated from the ash placement areas and the working face of the ash placement area will be minimised.

During low water availability periods the Department considers that meteorological monitoring should be conducted to predict high winds and that proactive and alternative measures are put in place to suppress dust. As such, the Department recommends the OEMP identifies management measures and contingency plans should low rainfall occur and standard dust suppression not be available.

### 5.5. Flora and Fauna

**Issue**

The proposed ash placement area comprises an area of approximately 108 ha over Lamberts North and Lamberts South. The majority of this area comprises disturbed lands currently part of an active mine and areas rehabilitated following mining activities. However, there are three patches of high quality remnant vegetation in the southern most area proposed for ash placement.

The project will involve clearing of up to 8.9 hectares (ha) of remnant vegetation and 31.4 hectares of rehabilitated vegetation. The EA indicated that the remnant vegetation is of high habitat value, supporting an abundance and diversity of foraging, refuge and breeding opportunities for fauna. The Proponent argues that the impact on local populations is not considered significant.

Expected clearing areas for identified vegetation communities are summarised below in Table 4.

**Table 4 - Expected Vegetation Clearing for Lamberts South and North**

| Vegetation Community | Area to be Cleared (ha) |
|---|---|
| Brittle Gum – Red Stringyback Woodland | 7.5 |
| Scribbly Gum Woodland | 1.1 |
| Ribbon Gum Woodland | 0.3 |
| Rehabilitation Areas | 31.4 |
| **Total clearing** | **40.3** |

The location of the above communities and threatened flora species is shown in Figure 6.

One plant species listed as threatened under both the *Threatened Species Conservation Act 1995* and the *Environment Protection and Biodiversity Conservation Act 1999*, the Capertee Stringybark (*Eucalyptus cannonii*) (see Figure 6) was observed in one location comprising 3 individuals. Previous studies indicated the presence of this species in the perimeter lands. The Proponent has stated that up to three individuals of *Eucalyptus cannonnii* will be removed to accommodate the proposed ash placement. The Proponent has stated that the *Eucalyptus cannonnii* proposed to be removed will not be offset.

No other threatened flora species were recorded, and whilst searches were conducted within areas of suitable habitat, the Proponent argues that 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. The test of significance undertaken indicated that habitat loss would not significantly affect the viability of threatened species in the area.

**Figure 6: Vegetation Communities and Threatened Flora Species**

No threatened fauna species were identified on site during the field surveys. However, the remnant open forest and woodland vegetation is likely to provide habitat for threatened species including microbats and woodland bird species and it is noted that threatened species have previously been detected in the area. The site is likely to provide at least foraging and possibly roosting habitat for a suite of mircobat species and could form part of the territory of Spotted-tail Quoll, owl and glider species. Notwithstanding, the test of significance indicated the loss of habitat would not significantly affect the viability of threatened species in the area.

To mitigate the biodiversity impacts of the project, the Proponent has proposed several measures. These comprise:

- pre-clearing survey to identify significant hollow-bearing habitat trees in areas of remnant vegetation in the proposal area, with the aim of identifying fauna occupying trees and other habitats;
- the removal of hollow-bearing trees and other habitat features (fallen timber, wombat burrows) under the supervision of an ecologist to ensure fauna species are relocated safely to adjacent habitats or in the case of juvenile or injured fauna, these would be given to a qualified local wildlife carer for rehabilitation;
- timber felled for clearing and existing fallen timber would be stockpiled for use in future rehabilitation activities on top of the ash placement to be used as habitat for terrestrial fauna and erosion control;
- the top soil within the areas of remnant vegetation will be salvaged and re-spread over existing ash placement sites. Topsoil is likely to have a significant seed bank; and
- native species will be used within revegetation of the ash placement.

The Proponent has also stated that an area of up to 9 hectares of remnant vegetation would be offset to ensure there is no net loss of flora and fauna values in the area, which equates to a proposed 1:1 offset. A time frame for the development of this offset was not provided.

**Consideration**

The Department considers that the Proponent has generally provided an adequate description of the existing environment and assessed the potential impacts associated with the proposed expansion of the ash disposal facility. The flora and fauna studies covered the whole study area and included a review of existing information and general and targeted flora and fauna surveys using a range of standard methods and techniques for recording species. The flora and fauna investigations identified threatened flora species present but also acknowledged that other threatened species may be present at the site. The Department is satisfied that the level of impact can be managed through offsets.

Whilst a 1:1 offset ratio has been proposed by the Proponent, given threatened species will be removed and the area has the potential to include threatened fauna the Department believes a greater offset ratio may be appropriate, but will need to be determined through the demonstration of an "improve or maintain outcome". It is also noted that 31 ha of newly rehabilitated area would be removed, and that this area did not form part of the offset calculation.

The Department recognises that the 31ha of newly planted rehabilitated vegetation is only 2 years old and has limited ecological value, and that the Proponent will rehabilitate the area once ash placement is completed. However, the Department considers that the values lost should still be considered when developing final offsets, noting it will be some years before the Proponent can commence its rehabilitation. Accordingly, it is recommended that the condition requires that the 31 ha be considered in developing the final offset package.

The Department has therefore recommended that the Proponent prepare a Biodiversity Offset Management Plan that complies with the EPA's Principles for the use of Biodiversity Offsets in NSW and which includes justification for the development of any compensatory habitat offset. To ensure that the proposal is implemented as proposed, the Department has also recommended that a satisfactory Biodiversity Offset Management Plan be finalised within 12 months of the date of approval. The Proponent must demonstrate in the Biodiversity Offset Management Plan how the offset will meet an 'improve or maintain' outcome.

### 5.6. Noise

**Issue**

*Construction*

Construction hours for Lamberts South and Lamberts North would be Monday to Friday 7am to 6pm, Saturday 8am to 1pm and no work on holidays or public holidays.

The construction activities for the Lamberts North and Lamberts South areas would involve the preparatory works prior to ash deposition. The following construction activities have the potential to generate noise:

- clearing and grubbing of remnant vegetation across the site;
- re-grading/profiling of the existing Huons Creek area to remove any existing stockpiles from current mining operations;
- extension of haul roads;
- construction of earth banks; and
- placement of drainage material.

The Proponent has stated that the proposal has been assessed in accordance with the *NSW Interim Construction Noise Guideline* (DECC 2009). The EPA requires, where reasonable and feasible, noise from the premises during construction should not exceed the following limits:

**Table 5: Noise criteria – during construction (as per the *NSW Interim Construction Noise Guideline* (DECC 2009))**

| Location | Day* $L_{AEQ\ (15\ minute)}$ dB(A) |
|---|---|
| All private receiver's within the township of Blackmans Flat | 46 |
| All other residences | 43 |

* Day: 7am to 6pm

The predicted noise levels for construction are based on the use of an excavator, a dozer and a dump truck operating simultaneously. The modelling predictions presented in the EA indicate that the noise levels from construction activities would be below the above noise criteria.

*Operation*

Operation of the ash placement areas involve the transportation, distribution and compaction of the ash within the placement area. Operational hours for the Lamberts North and Lamberts South areas would be between 6.00 am and 10.00pm Monday to Friday and 6.00am and 5.00pm Saturday and Sunday.

The key noise generating activity associated with the operation of the project will be the haulage of ash by trucks along the private haul roads, and return of empty trucks. Sensitive receivers are located to the east and south of Lamberts North and Lamberts South. During

the morning, noise levels in the area are increased due to traffic movements on the Castlereagh Highway. On average it is anticipated there will be 6 truck loads per hour.

The Proponent has stated that the noise objectives presented in the EA have been derived in accordance with the *NSW Industrial Noise Policy (EPA 2000)*, with operational noise impacts assessed at the nearest affected receiver locations for both Lamberts North and Lamberts South ash placement areas. Modelling assumed that truck haulage would be used to transport ash. Should the conveyor belt be used in conjunction with truck haulage noise impacts are expected to be reduced from the predicted levels. Figure 7 identifies the sensitive receiver locations (Location 1 and Location 2).

**Figure 7: Location of proposed ash placement areas and sensitive receiver locations (taken from the Proponent's EA).**

Following consultation with the EPA, the EPA stipulated the following noise criteria, which better reflects the representative background noise levels at Blackmans Flat (as opposed to the criteria identified by the Proponent):

**Table 6: EPA Operational Noise Criteria**

| Location | Day (7am to 6pm) | Evening (6pm to 10pm) | Night (10pm to 7am) |
|---|---|---|---|
| | $L_{AEQ\ (15\ minute)}$ dB(A) | $L_{AEQ\ (15\ minute)}$ dB(A) | $L_{AEQ\ (15\ minute)}$ dB(A) |
| All private receiver's within the township of Blackmans Flat | 42 | 38 | 35 |
| All other residences | 42 | 38 | 35 |

These limits do not apply where adverse (wind speeds greater than 3m/s) meteorological conditions occur.

Under neutral weather conditions, the operation of the ash placement areas of Lamberts North and Lamberts South will generally comply with the noise goals for both daytime and evening periods. If mitigation measures are not put in place then it is expected that marginal exceedances (1 dB(A)) may occur at Location 2 when operations reach Lamberts South area in 2023. This would likely occur in the early stages of the operation of Lamberts South due to the topography of the site.

Under adverse meteorological conditions at Lamberts North, general compliance during the daytime for both receiver locations is expected with a marginal exceedance possible during final stages at Location 2. At Lamberts South, the results generally indicate exceedances for both receiver locations without mitigation measures during the evening. The exceedances are predicted to be up to 4 dB (A) at Location 2, but are expected to reduce to approximately 1-2 dB (A) at both locations during the final stage of works.

The Proponent has stated that a benched ash mound may be used as a noise barrier, and has indicated that where the top of the barrier is 4m higher than the ground level of the equipment, a 5-6 dB(A) reduction in the noise level at the receiver is possible. However, they did not state whether this benching would be achievable due to safety and process constraints.

The Proponent has stated that noise monitoring will be conducted:
- when works and activities have commenced at a new location;
- every 12 months; and
- in response to complaints, where necessary.

Sleep Disturbance

The emission of peak noise levels for an instant or very short time period may cause sleep disturbance to residents. Sleep disturbance criteria have been developed for the operation of the project in accordance with the *Environmental Noise Control Manual* (EPA, 1994). However, an assessment of sleep disturbance was not undertaken as ash haulage and placement would not be undertaken during the night-time except in emergency situations, for example, situations involving major equipment breakdowns.

Vibration

A quantitative assessment of ground borne vibration was not undertaken as the Proponent determined that vibration levels, and any associated annoyance or structural damage, would be negligible during both construction and operation of the project given the separation distances from these activities to the nearest potentially impacted receivers.

**Consideration**
The Department concurs with the EPA's noise criteria, which is more representative of the background noise levels at Blackmans Flat. It is noted that predicted noise levels are generally equal to or below the EPA's criteria, with the exception of Lamberts South where marginal exceedances are expected in the initial stages of works under neutral weather conditions and during adverse weather conditions, where the criteria is expected to be exceeded by 4db(A) during the evening. The Department considers that this level of exceedance can be addressed with appropriate management and/or mitigation measures, which will be identified in the CEMP.

The Department has therefore also recommended a condition which requires a Noise Management Plan to be included as part of the required CEMP and OEMP for the project. The plans are required to include identification of all potentially affected sensitive receptors and all activities to be carried out at the project site (as the Proponent focused its assessment on the noisiest activities). Where the noise objectives are predicted to be exceeded, the plan must include an analysis of feasible and reasonable mitigation measures that can be implemented to reduce noise impacts. This must include the feasibility of noise reducing benching, and other mitigation measures at the source of noise or at the sensitive receiver.

As noted above, sleep disturbance is unlikely to be an issue due to the hours of operation. The Department further notes that vibration is anticipated to be negligible.

### 5.7. Ash Management

**Issue**
The existing power generation capacity of Mt Piper Units 1 & 2 is approximately 105,00 tonnes per year of bottom ash and 750,000 tonnes per year of fly ash. Currently the existing ash re-use amount is about 200,000 tonnes per year which is a reuse rate of approximately 23%. The predicted ash production rate for Mt Piper Units 1 & 2 plus Mt Piper extension is 2,500,000 tonnes per year with re-use predicted to stay at the same amount, which would mean a reuse rate of 8%.

The Proponent has stated that ash can be potentially beneficially reused for cement making, horticultural purposes, soil stabilisation, engineered fill and road bases, aggregate, geopolymers and zeolite. The Proponent has stated that it will continue to investigate the reuse of the ash in each potential reuse area, with fly ash use in the cement industry having greatest potential. The Proponent has claimed that it has engaged a firm to identify opportunities for the re-use of fly ash so that market opportunities can be expanded.

**Consideration**
Whilst the Department concurs with the Proponent in the need for additional ash disposal capacity to ensure the viability of the Mt Piper Power Station beyond 2013, it considers that further review and optimisation of ash management measures is required in granting project approval. Fly ash can be beneficially reused in a number of applications including the manufacture of cement, brick and building blocks, as a stabiliser in fill and road bases, backfilling of mine sites and horticultural uses. A number of power stations in NSW already reuse ash including Eraring Power Station which reuses 32% of its ash in cement manufacturing.

Turning waste into recoverable resources is a priority for NSW and in keeping with this philosophy, the Department believes that the Proponent should reuse a greater portion of ash as an alternative to disposal at Lamberts South and Lamberts North. This would not only extend the life of Lamberts South and Lamberts North but also have the flow on effect of

delaying impacts on other land areas which would be required for ash placement once the design capacity of Lamberts South and Lamberts North has been reached. Consequently, the recommended conditions of approval include a requirement for the preparation and implementation of a Long-Term Ash Management Strategy including a program for investigation and assessment of alternative ash management measures, with a stipulated goal of 40% reuse of ash by 31 December 2020. The Department considers that the recommended condition provides a balanced and sustainable approach to ensuring the viability of the power station in the future, optimising ash management practices at the power station and minimising environmental impacts to acceptable levels within the context of the need for the project.

### 5.8. Other Issues

The Proponent has also assessed the potential effects of the project on visual amenity, waste, traffic and transport and indigenous heritage, and has committed to implementing measures to minimise associated impacts. The Department is satisfied with the assessment and the management measures proposed by the Proponent and its consideration of these issues is provided in Table 11.

**Table 11: Department's Consideration of Other Environmental Issues**

| Issue | Department's Consideration |
|---|---|
| Visual Amenity | Lamberts South would have a final maximum reduced level (RL) of 1000 metres. Lamberts North site would have a final maximum RL of 980 metres. Residents located to the east of the ash placement areas will have a changed view compared to the existing vista, with the level of impact influenced by the distance of the viewer and the level of screening between the viewer and ash placement area.<br><br>The Proponent has indicated that visual impacts will be managed through industry recognised mitigation measures such as tree screening and landscaping, with the final placement capped and revegetated where required, and that these measures will be incorporated into the Operation Environmental Management Plan.<br><br>The Department considers that the final landform should be vegetated in a manner which visually complements the local environmental values and vistas. To ensure this occurs, the Department has recommended a condition of approval requiring the Proponent to prepare a Landscape/Revegetation Plan for the site which identifies design objectives, revegetation measures and long-term maintenance procedures. The Department is satisfied that this condition will provide for enhancement of the visual compatibility of the site with the surrounding landscape as well as ensure the long-term stabilisation of the site. |
| Waste | Waste generated during construction would consist of excavated material, stockpiles, cleared vegetation, construction waste (packaging material, scrap metal, formwork, pallets, plastic wrapping and cardboard).<br><br>The Proponent has stated a Waste Management Sub-Plan will be prepared, which would form part of the CEMP. The Proponent has stated that waste management would also be a component of the OEMP. The Department considers that waste generated during construction and operation can be appropriately managed through the implementation of the CEMP and OEMP. Accordingly, the Department has included a condition that waste management is to be included in the CEMP and OEMP. |

| Issue | Department's Consideration |
|---|---|
| | |
| Traffic and Transport | It is estimated that a peak workforce of 20 people would be required. The Proponent stated the vehicle movements during construction would have an insignificant impact on traffic in the area as the vehicle movements would be mostly contained within the project site.<br><br>Operational staff movements will be the same as existing operations and, as such, the Proponent has indicated that there will be no additional traffic impacts.<br><br>Access and haul roads would be created as per the current ash Area 1 facility. The haul roads would be approximately 12m wide or three times the width of largest vehicle. Access and haul roads are proposed to be established progressively as ash placement continues to face areas. The Proponent proposes to continue the existing haul roads from ash Area 1 to Lamberts North and extend to the boundary of Lamberts South.<br><br>The Proponent is also considering relocating/extending the existing ash conveyor from its current location near ash Area 1 to Lamberts North (Option 1) or a site closer to Lamberts South (Option 2) to minimise the requirement for truck haulage across the site.<br><br>To address impacts of extended haul roads, such as noise and dust, the Department has recommended a condition requiring the Proponent prepare an Ash Transportation Plan, which should justify the use of either truck haulage access roads and/or the extension/relocation of the conveyor and the impacts and mitigation measures associated with the preferred option.<br><br>As the works and truck movements will be contained within the site boundaries, the Department is satisfied that the recommended conditions of approval provide the necessary measures for managing construction and operation traffic impacts to an acceptable level. |
| Aboriginal Heritage | The project sites fall within the boundaries of the Bathurst Local Aboriginal Land Council (BLALC). The Proponent stated that an advertisement seeking expression of interest from indigenous community organisations was placed in the local paper (the 'Lithgow Mercury') on the 23 of January 2010. Letters were also issued to Aboriginal groups or individuals known to have an interest in indigenous heritage within the study area, which described the proposed heritage assessment methodology and opportunities for input into the proposed heritage management measures for the Aboriginal Cultural Heritage Management Plan.<br><br>To ensure no items were adversely impacted upon a site ground truthing visit was also made to the study area. Groups who expressed interest in being part of the consultation process were kept informed and were invited to comment on the draft EA. The Proponent stated that no comments were received from any of the registered stakeholders regarding the draft EA.<br><br>The Proponent stated that no new aboriginal sites were recorded at Lamberts North and Lamberts South. In total, there have been nine previously recorded sites within or in close vicinity of the Lamberts North and Lamberts South study areas. Seven of the sites have been destroyed by previous site activities. The remaining site 45-1-02818 is on the boundary of the Lamberts South and Ben Bullen State Forest and is at least |

| Issue | Department's Consideration |
|---|---|
| | 50 m from the edge of the proposed works. The other site 45-1-4601 is approximately 500 m to the east of the Lamberts South site, on land which will be retained by Centennial Coal.<br><br>These two sites were recorded previously in 2005 and as a result a Cultural Heritage Management Plan (CHMP) was developed and now governs the management of these sites. The Department therefore recommends that the Proponent update the CHMP to cover the protection of these sites as a result of the project.<br><br>The Proponent has also committed to ceasing work in the event that heritage sites or items are discovered and ensuring that such sites are reported, assessed and appropriate management measures put in place.<br><br>The Department is satisfied that the project would not significantly affect Aboriginal heritage items. The Department believes that the Proponent's commitment to "stop work" should any items be discovered, is a suitable mitigation measure and has incorporated recommended conditions of approval in this regard to reinforce this commitment. |

## 6. RECOMMENDATION

The Department accepts that there is a need to expand the existing Mt Piper Ash Placement area to Lamberts South and Lamberts North. The proposed project presents the best available option for resolving future ash placement capacity issues, whilst reuse opportunities are explored and implemented.

Following a detailed assessment of the Environmental Assessment, Submissions Report and the submissions on the project, the Department is satisfied that the project is on balance justified and that the impacts of the project can be appropriately mitigated and/or managed to an acceptable level of environmental performance. Consequently, the Department recommends that the Deputy Director-General approve the Mt Piper Ash Placement project, subject to the recommended conditions of approval.

Through its assessment, the Department has determined that the key assessment issues for the proposal relate to operational noise, air quality, surface and groundwater quality and ecology. The Department acknowledges that the project would have some relatively minor residual impacts on the environment and the amenity of residents during its construction and operation. The Department believes these impacts can be appropriately managed through the implementation of the CEMP and the OEMP.

Overall, the Department is satisfied that the implementation of the mitigation measures proposed as part of the Proponent's Statement of Commitments, as well as additional measures outlined as part of the recommended conditions of approval, will ensure that potential impacts are minimised to an acceptable level and the project will not unduly impact the environment or community. Further, the Department considers that approval of the project would provide considerable benefits to the State, region and local area in providing continued electricity supply to meet the increasing demand for power. Consequently, the Department recommends that the project be approved subject to the recommended conditions of approval.

13/2/12

**A/Director**
**Infrastructure Projects**

13.2.12

**Executive Director**
**Major Projects Assessment**

16/2/12

Deputy Director General
Development Assessment & Systems Performance

## APPENDIX A ENVIRONMENTAL ASSESSMENT

See the Department's website at:
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=3574

## APPENDIX B SUBMISSIONS

See the Department's website at:
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=3574

## APPENDIX C PROPONENT'S RESPONSE TO SUBMISSIONS

See the Department's website at
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=3574

## APPENDIX D RECOMMENDED CONDITIONS OF APPROVAL