



Mt Piper Power Station Ash Placement Project

ENVIRONMENTAL ASSESSMENT

CHAPTER 11 – ASSESSMENT OF OTHER ISSUES

- August 2010



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11. Assessment of Other Issues

The Director-General's requirements state that:

Notwithstanding the key assessment requirements, the Environmental Assessment must include an environmental risk analysis to identify potential environmental impacts associated with the project (construction and operation), proposed mitigation measures and potentially significant residual environmental impacts after the application of proposed mitigation measures. Where additional key environmental impacts are identified through this environmental risk analysis, an appropriately detailed impact assessment of the additional key environmental impact(s) must be included in the Environmental Assessment.

11.1. General Environmental Risk Analysis

11.1.1. Overview

The Director-General of Planning requires Delta Electricity to prepare an environmental risk analysis to identify potential environmental issues associated with the construction and operation of the project.

The risk analysis process began at the Project Application and Preliminary Environmental Assessment phase, and was further developed in the Environmental Assessment phase. The risk analysis process was used to scope the environmental investigations and guide project design.

Risk analysis enabled the Environmental Assessment to:

- Target those issues identified as key issues in the Preliminary Environmental Assessment. This took into account the significance of the potential environmental impacts and the effectiveness of the proposed management measures in minimising degradation or deterioration of the biophysical or social environment;
- Identify those potential impacts that are not key issues, including those that would be expected to respond well to appropriate mitigation measures and management;
- Identify residual impacts likely to remain after the application of the mitigation measures. Where significant residual impacts remain, this may require greater commitment to management strategies to mitigate the effect or, in some instances, a re-scope of the design at that location.

Identification of Key Issues

The Preliminary Environmental Assessment identified the issues considered to be the key issues pertaining to the proposed Mt Piper Power Station Ash Placement Project, and these were used as the basis for the key issues in the Director-General’s requirements (DGRs) for the project.

The DGRs identified the following key issues for consideration and assessment:

- Air quality impacts;
- Noise impacts;
- Water management;
- Ecological impacts;
- Indigenous heritage;
- Visual amenity.

These key issues have been the focus of the Environmental Assessment for the project.

11.1.2. Risk Analysis Methodology

The environmental risk analysis was undertaken in accordance with the principles of the Australian and New Zealand standard AS/NZS ISO 31000:2009 – Risk Management. It involved:

- Ranking the risk of each identified potential impact by identifying the consequences of the impact and the likelihood of each impact occurring; and
- Considering the probable effectiveness of the proposed mitigation measures to determine the likely residual risk of each impact.

The first step involved an identification of the consequence levels, should an impact occur. The levels are defined in **Table 11-1**.

■ **Table 11-1 Risk analysis consequence definitions**

Consequence Level	Definition
Catastrophic	Would result in a major prosecution under relevant environmental legislation. Would cause long-term and irreversible impacts.
Major	Would result in a fine or equivalent under relevant environmental legislation. Would cause medium-term, potentially irreversible impacts.
Moderate	Would result in medium-term, reversible impacts.
Minor	Would result in short-term, reversible impacts.
Insignificant	Would result in minor, negligible impacts.

The next step involved a definition of the risk rating categories. This was done by considering the frequency of activities that may cause the impact and the probability (or likelihood) of the impact occurring during that activity. The level of likelihood was classed as:

- Very likely – the event is almost certain to occur in the course of normal or abnormal operating circumstances;
- Likely – the event is likely to occur in the course of normal operations;
- Unlikely – the event could occur in the course of normal or abnormal operating circumstances; and
- Very unlikely – the event may occur in exceptional circumstance only.

The risk rating categories determined through the analysis are summarised in **Table 11-2**.

■ **Table 11-2 Risk rating categories**

Risk rating score	Risk category	General description
1, 2 or 3	High	Detailed assessment and planning are necessary to develop appropriate measures to mitigate and manage the potential impacts.
4 or 5	Medium	Potential impacts can be mitigated through the application of relatively standard environmental management measures.
6	Low	Potential impacts either require no specific management measures or are mitigated adequately through other working controls (such as detailed design requirements, normal working practice, quality and safety controls).

The risk rating category of each potential impact was then determined by combining the consequence and likelihood according to the matrix in **Table 11-3**.

■ **Table 11-3 Risk matrix**

		Likelihood			
		Very likely	Likely	Unlikely	Very unlikely
Consequence	Catastrophic	1	1	2	3
	Major	1	2	3	4
	Moderate	2	3	4	5
	Minor	3	4	5	6
	Insignificant	4	5	6	6

As shown in **Table 11.3**, impacts were allotted a risk rating score of between one and six. One represents an impact with major to catastrophic consequences and likely to very likely to occur; six represents an impact with minor to insignificant consequences and unlikely to very unlikely to occur.

The potential effectiveness of the mitigation measures proposed was assessed and the degree of effectiveness of the mitigation measures was classed as:

- Very effective – the measure would increase the risk rating score by three points – for example, from three (high) to six (low).
- Effective – the measure would increase the risk rating score by two points – for example, from two (high) to four (medium).
- Partly effective – the measure would increase the risk rating score by one point – for example, from three (high) to four (medium).
- Not effective – the measure would not change the risk rating.

11.1.3. Environmental Risk Analysis

The environmental risk analysis was based on investigations and a review of the issues during the preparation of the Environmental Assessment, and knowledge from other major power generation projects. The analysis also considered the input from various government agencies and other stakeholders during the consultation process. The analysis specifically considered the mitigation and management measures developed and put forward in the assessment chapters (Chapters 5 to 10) of this Environmental Assessment report as well as the principles for ecologically sustainable development. The results of the environmental risk analysis are presented in **Table 11-4**.

■ **Table 11-4 Environmental risk assessment results**

Environmental issues								
Aspects	Potential adverse impacts	Overall consequence	Overall likelihood	Risk rating	Proposed mitigation measures	Effectiveness	Factor	Residual risk rating
Ecology	<ul style="list-style-type: none"> ■ Effects on threatened species and EECs. ■ Effects on conservation areas 	Major	Unlikely	3 High	Chap 8	Very effective	4	Medium
Indigenous Heritage	<ul style="list-style-type: none"> ■ Effects on known or possible PADs / indigenous sites 	Major	Very unlikely	4 Medium	Chap 9	Effective	5	Medium
Noise	<ul style="list-style-type: none"> ■ Effects on sensitive receivers (residential) 	Moderate	Likely	3 High	Chap 6	Effective	4	Medium
Water management	<ul style="list-style-type: none"> ■ Effects on surface receiving waters ■ Effects on groundwater ■ Effects on water sources ■ Effects on drinking water catchment 	Major	Likely	2 High	Chap 7	Very Effective	4	Medium
Air quality	<ul style="list-style-type: none"> ■ Dust levels exceeding health criteria 	Major	Unlikely	3 High	Chap 5	Effective	4	Medium
Visual amenity	<ul style="list-style-type: none"> ■ Visual impacts on sensitive receivers (residential) 	Moderate	Likely	3 High	Chap 10	Effective	4	Medium
Waste management	<ul style="list-style-type: none"> ■ Discharge of wastes to the environment 	Minor	Unlikely	5 Medium	Chap 11	Effective	6	Low
Economic and social issues	<ul style="list-style-type: none"> ■ Effects on infrastructure and employment ■ Social effects on existing community 	Moderate	Unlikely	4 Medium	Chap 11	Effective	5	Medium

Environmental issues								
Aspects	Potential adverse impacts	Overall consequence	Overall likelihood	Risk rating	Proposed mitigation measures	Effectiveness	Factor	Residual risk rating
Land use implications	<ul style="list-style-type: none"> ▪ Change in land use ▪ Effects on neighbourhood or potential development 	Minor	Unlikely	5 Medium	Chap 11	Effective	6	Low
Traffic and transport	<ul style="list-style-type: none"> ▪ Effects on road network performance and safety 	Minor	Unlikely	5 Medium	Chap 11	Effective	6	Low
European heritage	<ul style="list-style-type: none"> ▪ Effects on known or possible heritage items 	Moderate	Very unlikely	4 Medium	Chap 11	Effective	6	Low

11.1.4. Conclusions

The environmental risk assessment has shown that the key issues of ecology, noise, water management, air quality, visual amenity have a high level of risk, but the implementation of mitigation measures would ensure that the residual level of risk is reduced to medium. There is no key issue that, following implementation of mitigation measures, would present a high level of residual risk.

Other issues that would have a medium residual risk include:

- Indigenous heritage; and
- Socio-economic effects.

The level of assessment undertaken for these issues has determined the likely extent of impacts and recommended appropriate mitigation/management required to ensure that the risk is abated.

Finally, the other environmental issues for the project which had a low residual risk were:

- European heritage;
- Waste management; and
- Traffic and transport.

Although these issues can be routinely managed through the implementation of standard management and mitigation measures, further assessment was undertaken. This assessment is described in the following sections.

11.2. Socio-Economic

Lithgow Council requested consideration be given to the economic, employment and social impact on the Lithgow LGA, and impacts on infrastructure, community facilities and services due to the on-going nature of the proposal should be considered. These issues are discussed below.

11.2.1. Methodology

Social impacts are commonly defined as “*events experienced by people as positive and negative changes in:*

- *Their way of life - the way people live, work, play and relate to one another, organise to meet their needs and generally participate as members of society;*
- *Their culture - beliefs, customs and values;*
- *Their community - its cohesion, character, services and facilities” (Armour, 1992).*

The assessment of social impacts is best undertaken in the project development stage where it can help:

- Promote the quality of life of individuals and communities now and in the future;
- Contribute to the efficient and cost effective use of resources in Government project planning and delivery; and
- Contribute to improved management of project planning and decision making processes.

In evaluating social impacts, it is important to recognise the multiplicity of individuals and groups within the affected population and the range of possible effects across these individuals and groups. The social impact assessment is particularly concerned with the equity of impacts, that is, the nature and distribution of potential impacts, especially with regard to the more vulnerable groups in society.

A social impact assessment is typically conducted as a five step assessment process:

- Step 1 – Community profiling, including demographic characteristics of the study area and identification of key stakeholders;
- Step 2 – Scoping of issues;
- Step 3 – Identify the likely social impacts of the project and its alternatives;
- Step 4 – Estimate and evaluate significance of social impacts according to:
 - Extent, significance and timeframe of potential impacts (including uncertainties)
 - Stakeholder group(s) affected
 - Feasibility of successful mitigation measures; and
- Step 5 – Consider identified social impacts and opportunities to mitigate negative impacts.

A range of information sources have been reviewed in the preparation of this social impact assessment to determine potential issues of concern during both the construction and operational stages of the project. These include:

- 2001 and 2006 Australian Bureau of Statistics Census data;
- The Mt Piper Extension EA (SKM, 2009);
- Lithgow Social Plan 2006-2011, Lithgow City Council (2008); and
- Feedback from the community surveys conducted by the Western Research Institute on behalf of Delta Electricity (2002-2007).

11.2.2. Community Profile

The community and business profile has been described with a view to identifying potential community issues and the structure of the community. This demographic and statistical data has been supplemented with qualitative information about community attitudes and social concerns.

Community, Business and Employment Profile

The Mt Piper Power Station is located in the Greater Lithgow local government area (LGA). The population in the Greater Lithgow area in 2006 was 19,399 (ABS, 2006), compared with 19,197 in 2001, 19,248 in 1996 and 20,253 in 1991 (ABS, 2001). Despite the 5.2% reduction in population between 1991 and 2001, the slight growth in 2006 indicates the decline in population may have been arrested.

The population in the area is predominantly Australian-born, with only about 8% of respondents indicating they were born overseas. Of those born overseas, the main countries of birth were the United Kingdom, New Zealand, Germany and the Netherlands.

The indigenous population comprises about 3% of the Greater Lithgow population. About 92% of the population in the Greater Lithgow area indicated English was the only language spoken at home.

Table 11-5 provides the demographic age profile for the Greater Lithgow LGA.

■ Table 11-5 Age Profiles

Age Group	Number of People	Percentage
0-14	4246	22.1
15-24	2341	12.2
25-44	5372	28.0
45-64	4765	24.9
65+	2448	12.8
Total	19172	100

The majority of residents in the area live in privately owned homes, with about 22% of the population in rental accommodation. High levels of home-ownership often indicate a very stable community.

According to the 2006 census data the unemployment rate in the Lithgow area was 8.5%, which was significantly higher than the national average at that time of 5.2%. The main employment industries in the Greater Lithgow LGA are presented in **Table 11-6**. Over time there has been a general decline in employment within the manufacturing industry and the construction industry,

whereas there has been increased employment within the retail trade, health and community services and education.

■ **Table 11-6 Industries of Employment**

Industry	Number of People Employed in the Greater Lithgow LGA	Percentage of People Employed in the Greater Lithgow LGA
Construction	462	7.1
Education	461	7.1
Mining	775	11.9
Health and community services	749	11.5
Manufacturing	621	9.5
Accommodation and food services	650	10
Retail	866	13.3

Source: ABS, 2006

Community Services and Facilities

There are a range of community services within the Lithgow LGA which provide assistance and support to people with disabilities, senior citizens and other groups in the community. There are also numerous schools, churches, libraries, child care centres and other facilities located in the Lithgow LGA.

Public transport services within the Lithgow LGA are provided by a local bus operator which operates between Portland and Lithgow. The Lithgow Community Transport (Transline) Inc provides a specialist service for frail aged and disabled people of the Lithgow Community who require transport to doctors, hospitals, dentists etc. The Blue Mountains train line connects Lithgow station to the suburban train network.

There are a number of scattered parks, lakes and dams in the Lithgow LGA, which are used for recreational activities such as picnicking, sailing, swimming and fishing. There are also many sporting facilities such as the Lithgow Athletics Club, sports stadium, showground, soccer fields, sporting ovals, tennis courts, bowling clubs, pool and golf course.

11.2.3. Scoping of Issues

Attitudes and Values

Delta Electricity has developed a community relations program to inform to the community of Delta’s operational activities and to develop avenues for community feedback. The following consultation activities are undertaken to provide a link between Delta and the community:

- Community surveys;
- Community stakeholder forums;
- Consultation with key community stakeholders such as local council;
- Sponsorship of local organisations;
- Interaction with the media to provide information about operational and community activities;
- Publication of reports eg. annual reports and state of the environment reports;
- Provision of work experience opportunities;
- Provision of the Energy Expo at Mt Piper Power Station; and
- Provision of daily tours of the power station.

Delta Electricity regularly commissions an independent survey to evaluate the community's perception of Delta's operational impact and community relations program. The Western Research Institute conducted the most recent large survey of Delta's Western Region, which encompasses the Mt Piper and Wallerawang Power Stations, in May and June 2005. A total of 310 surveys were completed. The results from this survey are summarised below:

- The majority of respondents (91%) had heard of Delta Electricity, of which 61% felt positively towards Delta Electricity;
- 46% of respondents could identify electricity generation as Delta's main activity and a further 20% identified Delta as being generally involved in electricity. In 2004, only 37% of respondents named electricity generation as Delta's main activity;
- The main sources of information about Delta Electricity are newspapers (21%) and direct contact with the company (15%). In 2004, direct contact with the company was the most common response (22%), followed closely by newspapers (20%);
- Recall of Delta's community support has risen from 59% in 2004 to 64% in 2005. The most commonly recalled sponsorships were for sporting teams and events;
- 47% of respondents expressed concern about waterway issues relating to drought, low water levels, water pollution etc. 5% were specifically concerned about the closure of Lake Lyell Dam.
- 82% of respondents indicated they have no concerns about Delta's operations in the area (a decrease from 89% in 2004). Of those who expressed concern, stack emissions, water usage and water pollution were the most frequently expressed concerns;
- 61% of respondents indicated they were either very or moderately concerned about environmental issues in the local area. The most frequently expressed concerns were air pollution (37%) and water pollution (27%);

- River health, waste processing programs and the rehabilitation and maintenance of creeks and dams were rated as being the top three environmental issues that Delta should be involved with.

The key issues arising from these surveys that were identified by the Western Research Institute (2005) were:

- 1) Attitude towards Delta Electricity – general recognition of Delta Electricity remained similar to the previous years;
- 2) Drought – the community's concern about water related issues such as water usage, water pollution and river health was evident in responses and Delta's attitude to water efficiency and river health is important;
- 3) Migration – residents who have lived in Lithgow for less than five years tend to have a lower level of recognition and feel less favourably towards Delta Electricity;
- 4) Youth – 18-24 year olds feel the least favourably towards Delta Electricity.

A community focus group assessment was conducted by Western Research Institute (2007). This assessment was similar to that discussed above, but on a smaller scale. The findings of the focus group assessment were:

- There is significant support within the region due to Delta's economic importance and support of the local community;
- There are concerns about Delta's operational impacts on the community and environment, with little community awareness of any significant initiatives being undertaken to reduce these impacts;
- There is some concern about Delta's future employment status in the community;
- There is a lack of community consultation regarding large operational decisions and scepticism about Delta's motivations. These are having a detrimental effect on public opinion, especially amongst residents of the immediate neighbourhood.

11.2.4. Impacts during construction and operation

Employment

A minor social and economic benefit of the construction stage of the proposal is employment generation. Construction is expected to provide up to 20 jobs over the period of site preparation for ash receipt, mainly in 2011 and 2012. No new jobs would be created during the operation of the ash placement sites as it would be carrying on from existing operations.

Where practicable, construction materials would be sourced from the local area, thereby providing economic benefits to local businesses. These would include accommodation providers, food and

general supplies, service stations, engagement of local contractors and purchase of supplies from local outlets.

Community

It is anticipated that a number of people in the local area would be employed during the construction of the proposal, but the numbers would not be such as to attract workforce from outside of the area. The limited extra local employment would have some minor economic benefit but would not put any extra demand on infrastructure or community resources.

Access and Movement

Any deliveries of equipment and materials to the site would occur throughout the standard construction hours. As a worst-case up to 3-4 vehicles per day may occur and would be spread throughout the day.

The movement of construction staff would be concentrated around 6-7am and 2-3pm weekdays. Traffic associated with the average number of construction staff would have no impact on operation of the road network. The Construction Environmental Management Plan (CEMP) and any traffic management components would ensure that all construction traffic utilise existing arterial roads and all construction and employee vehicles park on the site. There would be no change to traffic operations during the operational phases of the project.

Lifestyle and Character

Construction and operational activities can potentially affect the character and amenity of an area. Residents who live adjacent to the site on or near the Castlereagh Highway may be affected by site activities such as vehicle movements and ash placement, although these impacts are not expected to be significant. Due to the topography and vegetation surrounding the Mt Piper Power Station site and the distance to sensitive receptors, the visual (see Chapter 10), dust (see Chapter 5) and noise (see Chapter 6) impacts are not expected to be significant.

Health and Psychological Effect

Construction and operational activities would be undertaken within designated daytime hours, and as a result, sleep disturbance is not likely to occur. Providing dust control measures are implemented during construction works and ash placement, no significant affects on health from are expected.

Increased activity on the site, disturbance to current lifestyle and perceived risks associated with the construction stage, have the potential to cause stress or anxiety to some individuals. In order to minimise these potential impacts Delta would utilise its existing community relations program to keep the community informed about the project.

Equity Issues

The ash placement areas are necessary to allow Mt Piper Power Station to continue to generate electricity. Electricity generated by the Mt Piper Power Station would be distributed across New South Wales via TransGrid's network of high voltage transmission lines and no particular sector of the community would either benefit or be disadvantaged.

The residential areas adjacent to the site have indicated their concerns at on-going development in the area – power generation, coal mining, land fill development. The use of new areas for ash placement will be at the same rate as at the existing area, although it will be closer to residential areas. By maintaining strict control of dust and noise emissions, there will be no change in the perception of impacts resulting from the works and no reason for residences to regard themselves as being treated inequitably as a result of the proposal.

Cumulative Impacts

There is a perception within the local community that the development of the new areas for ash placement will provide a further social burden on locals, adding to the perceived impacts associated with the on-going coal and power generation activities, plus the new Council land fill and the possible Mt Piper Extension.

Cumulative impacts associated with dust and noise have been addressed (in Chapters 5 and 6), and visual impacts have been considered (in Chapter 10), but it is not possible to quantify this possible cumulative social concern. It is clear that it is felt by some members of the community, as evident in the consultation for this project and in the focus group meetings undertaken by Delta.

Some mitigation of this impact would be achieved by further and on-going consultation with the affected community.

11.2.5. Evaluation of the Significance of Impacts

During construction and operation, the potential for adverse social impacts would primarily be associated with activities which generate noise and/or dust. These impacts would be managed in accordance with the mitigation measures presented in this EA and the Construction and Operational Environmental Management Plans and by on-going consultation with the community. Due to the careful management of these physical impacts and the distance between the ash placement site and sensitive receptors, the potential impacts are not considered to be significant.

The potential adverse impacts associated with the proposal are considered to be outweighed by the benefits associated with the ability of the power station to continue operation and the overall associated benefit for the wider community. The project is regarded as of State and regional significance.

11.2.6. Conclusions

The safeguards and mitigation measures identified in this EA would ensure that many of the potentially adverse social impacts are minimised as far as practicable. The community would also be kept informed about the project to ensure they are aware of any upcoming works and the potential impacts which may occur.

Mitigation measures would include:

- Construction
 - Implementation of recommended air quality controls;
 - Implementation of recommended noise controls; and
 - Liaison with the community to keep them informed about the construction works and schedule through the existing community relations program.
- Operation
 - Implementation of recommended air quality controls;
 - Implementation of recommended noise controls;
 - Liaison with the community to keep them informed about the site operation through the existing community relations program; and
 - Rehabilitation to improve visual perception.

11.3. Traffic and Transport

As outlined in the project description, the development of Lamberts North and Lamberts South will occur on land owned by Delta Electricity and/or Centennial Coal. Movement of ash would occur on-site and would not require separate access to the public road network. Equipment needed for construction and access to the site by employees would represent the only access to the road network required.

Should development of Neubecks Creek or Ivanhoe No 4 be intended in the future, it would be necessary to avoid use of the public road system to transport ash from the power station to these sites. With Neubecks Creek it may be possible to use the existing private road (used for coal transport) and this would need to be investigated. It may also be possible to use a conveyor system which would need to cross over the road or roads. These options would be investigated in any subsequent approval required for the development of Neubecks Creek ash placement area.

Should Ivanhoe No 4 proceed, it is likely that all access to the site would be via the power station site.

This assessment assumes that all transport of ash does not require access to the public road network and the only potential impacts are from the travel to and from the power station by workers or construction equipment.

11.3.1. Existing Road and Traffic Conditions

The Mt Piper Power Station is located at the intersection of the Castlereagh Highway and Boulder Road, approximately 17 km north-west of Lithgow. The Castlereagh Highway is a rural highway linking the Great Western Highway north-west of Lithgow with Mudgee and Central Western NSW. It is primarily a two lane undivided road with a 100 km/hour speed limit. Overtaking lanes are provided on many up-hill sections.

Adjacent to Mt Piper Power Station, the Castlereagh Highway is a two lane undivided road, with gravel shoulders and a speed limit of 100 km/hour. North of Boulder Road, the average annual daily traffic (AADT) is around 3,000 axle pairs (2002 RTA data), while north of the Newnes Road intersection (south of Boulder Road) the AADT is around 3,500 axle pairs. Traffic counts undertaken for the Mt Piper Extension study confirm the validity of this figure and indicate that it is equivalent to around 3,000 vehicles per day comprising 13% heavy vehicles.

Boulder Road runs east-west and links Portland with the Castlereagh Highway. Immediately west of the Castlereagh Highway and adjacent to the Mt Piper Power Station, it has two eastbound lanes and one westbound lane, and a 60 km/hour speed limit. West of the power station, it has two lanes, no shoulders and an 80 km/hour speed limit. The most recent RTA volume data for Boulder Road was collected in 1988, when the AADT was around 1,000 axle pairs. Traffic counts collected for this study indicate that the daily volume is around 890 axle pairs or 650 vehicles, comprising 21% heavy vehicles.

The primary measure of performance for rural roads such as the Castlereagh Highway and Boulder Road is the peak hour volume / capacity ratio. Austroads (1998) specifies theoretical two-way capacities for rural roads, taking into account terrain, shoulder width and traffic composition.

The Castlereagh Highway has a two-way capacity of just over 1,900 vehicles per hour. Traffic counts undertaken for this study indicate a peak hour volume of 274 vehicles, resulting in a volume / capacity ratio of 0.14, indicating average speeds of greater than 93 km/hour and a Level of Service A. Boulder Road has a capacity of 1,500 vehicles per hour, and a peak hourly volume of just 62, with a volume / capacity ratio of 0.04, also indicative of Level of Service A. Thus both roads could be considered to have substantial spare capacity.

Traffic counts were undertaken at the intersection of Boulder Road and the Castlereagh Highway to coincide with the peak staff arrival and departure times. The results of intersection analysis show

that acceptable operation is achieved during both peaks, and that there is significant spare capacity at the intersection.

11.3.2. Traffic Impact Assessment

Construction Traffic

It is estimated that a peak workforce of about 20 people would be required. Any deliveries of equipment and materials to the site would occur throughout the construction period time, but such activity would be very minor. These movements themselves would have an insignificant impact on traffic in the area, and if combined with any activity associated with the construction of the Mt Piper Extension (should it proceed) there would be no change in level of impact beyond that identified for the Mt Piper Extension project (SKM, 2009).

Operational Traffic

It has been assumed there would be no increase in the numbers of staff associated with the operation of the ash placement area, hence there will be no change in traffic to or from the site.

Cumulative Effects

As the vehicle numbers using the public road system would be very small, cumulative traffic impacts would be negligible, even if the Mt Piper extension project proceeds.

11.3.3. Conclusions

The road network surrounding the Mt Piper Power Station has significant spare capacity. The potential traffic impacts of the proposal relate to the movement of staff and construction equipment to and from the site and these impacts would be negligible. No mitigation measures for traffic impacts would be required.

11.4. Land Use

11.4.1. Existing Environment

The proposed ash placement sites are owned by either Delta Electricity or Centennial Coal. The Delta Electricity site is occupied by the existing Mt Piper Power Station, including the existing ash placement area.

The proposed ash placement areas at Lamberts North and Lamberts South are currently either predominantly cleared land, have been subject to previous mining activities or are currently being mined.

The possible future ash placement sites at Neubecks Creek and Ivanhoe No 4 have previously been mined in some form but have had vegetation regrowth since. These areas would not be considered

for ash placement unless the areas were further cleared by mining. At the Neubecks Creek site, the site is moderately covered by vegetation although this would be removed by the mining activities. Castlereagh Road is located directly to the west and south of this site. Ben Bullen State Forest is located directly to the north of this ash placement area.

The Ivanhoe No. 4 site is directly south-west of the existing Mt Piper Power Station. The site is covered by moderate to dense vegetation which would be removed for mining activities. Boulder Road is located to the north, and Pipers Flat Road to the south. Ben Bullen State Forest is located approximately 700m to the east.

The township of Blackmans Flat is located approximately 1km east of the proposed Lamberts North placement area. Portland and Wallerawang townships are located approximately 4 km west and 6 km south-east of the power station, respectively. All of the sites are located within land zoned as Rural (general) purposes.

11.4.2. Land Use Impacts

Land use for all sites would be regarded as changing from coal mining purposes to ash placement / storage. Both of these activities are permissible with consent and are consistent with the intent of the zoning. Effectively there would be no change in land use at the sites and the land use proposed is consistent with the general land uses within the area – power generation, coal extraction. Residential development exists close to the proposed ash site at Lamberts North and the proposed development would not have any further effect on that existing land use.

11.4.3. Management and Mitigation Measures

No mitigation measures are required.

11.5. European Heritage

11.5.1. Introduction

European heritage was addressed in the heritage report presented as Appendix F.

The area of Neubecks and Pipers Creeks saw the early establishment of agricultural industries with land grants occurring in the early 1830s. At Blackmans Flat, settlement is said to have begun during the 1850s in an area about one km south of the current Study Area. Alois Neubeck took up land in what is now known as the Neubecks Creek area in the 1880s and built a cottage of wattle and daub in 1888. Heritage assessment of Neubecks Creek in 2005 (Benton 2005) reported the remains of some European buildings and it is possible that these may represent some of those from this period.

Coal mining began in Wallerawang around 1873 with a number of mines being opened on the Lithgow seam at Mount Piper, mid-way between Wallerawang and Lidsdale. The primary mines at Wallerawang included: The Irondale Colliery; Cullen Bullen Colliery; The Ivanhoe Colliery; The Commonwealth Colliery; The Great Western Mine and The Invincible Colliery. Blackmans Flat Colliery had been established by 1875 and was undertaking underground mining operations, as was the Irondale Colliery at Pipers Flat by 1883. Black Diamond Colliery (later known as Huon Mine) was established within the Boulder section in 1902.

The coal and lime industries have prospered in the Blackmans Flat / Portland areas from the mid to late nineteenth century, utilising the rich geological resources of the Illawarra Coal Measures. Between 1870 and 1905 collieries were established at Pipers Mount, Blackmans Flat, Lidsdale, Wallerawang and Angus Place, generally following the railway line.

11.5.2. Survey Results

No non-Indigenous items of heritage have ever been recorded over Lamberts North or South as far as research undertaken can determine.

There are remains of European heritage over the Neubecks Creek site (Benton 2005) and as assessment of the Ivanhoe No. 4 area has not been completed, it is unknown as to whether European heritage is present on this site.

11.5.3. Discussion

Given the high levels of disturbance of the Lamberts North and Lamberts South study areas, it was expected that no items of non-Indigenous items of heritage would remain. The lack of non-Indigenous heritage items at this location is consistent with the fact that while Europeans have settled the general region for nearly 200 years, the area has since been extensively mined. No mitigation measures would be required.

As European heritage evidence is present at Neubecks Creek and possibly at Ivanhoe No. 4, further assessment of these areas to determine the presence of European heritage would be required prior to any use of these areas for ash placement.

11.6. Waste Management

11.6.1. Introduction

The proposal has the potential to generate small quantities of liquid and non-liquid wastes. The key waste streams identified include:

- Excavated material;

- Cleared vegetation;
- Construction waste (packaging material, scrap metal, formwork, pallets, plastic wrapping and cardboard).

The products of electricity generation such as flyash and furnace ash and brine waste are addressed differently within the EA and are not discussed here.

Detail on each of these waste streams is provided below.

11.6.2. Statutory Framework for Waste Management

The main legislation and guidelines that govern the management of waste for the proposal are:

- *Avoidance and Resource Recovery Act, 2001*;
- *Protection of the Environment Operations Act, 1997*;
- *Protection of the Environment Operations (Waste) Regulation, 1996*;
- *NSW Waste Reduction and Purchasing Policy (WRAPP) (EPA, 1999)*;
- *Lithgow Solid Waste Management Plan*;
- *Environmental Guidelines: Assessment, Classification and Management of Non-Liquid and Liquid Waste (EPA, 1999)*; and
- *Contaminated Land Management Act, 1997*.

The principles of waste avoidance, waste reduction, waste re-use or waste recycling would be adopted during the construction and operation phases of the project in accordance with the following legislation and policies that provide the statutory framework for waste management in NSW.

11.6.3. Waste Avoidance and Resource Recovery Act, 2001

The objectives of the *Waste Avoidance and Resource Recovery Act, 2001* (WARR Act) are to encourage the most efficient use of resources, to reduce environmental harm, and to provide for the continual reduction in waste generation in line with the principles of Ecologically Sustainable Development (ESD). To meet the objectives of the Act, waste management options are considered against a hierarchy, comprising:

- Avoiding unnecessary resource consumption;
- Recovering resources through the re-use and recycling of waste; and
- Disposal (as a last resort).

The Act sets the framework for waste management and planning, based on the following objectives:

- To provide for the continual reduction in waste generation;
- To minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the re-use and recycling of waste;
- To ensure that industry shares with the community the responsibilities for reducing and dealing with waste;
- To ensure the efficient funding of waste and resource management, planning and programs and service delivery; and
- To achieve integrated waste and resource management, planning and programs and service delivery on a State-wide basis to assist in the achievement of the objectives of the *Protection of the Environment Operations Act, 1997*.

11.6.4. Protection of the Environment Operations Act, 1997

The *Protection of the Environment Operations Act, 1997* (POEO Act) incorporates the major regulatory and enforcement provisions of the former *Waste Minimisation and Management Act, 1995* (WMM Act). In effect, the POEO Act merges pollution control approvals and pollution control licences into a single process, or one Environment Protection Licence (EPL). EPLs are required for development or activities listed in Schedule 1 of the POEO Act and would incorporate provisions relating to water pollution, noise pollution, air pollution and waste management.

The need for an EPL under the POEO Act was considered with regard to waste, either as waste activity or the site as a waste facility. The following conclusions were reached:

- Waste activities - The proposed development will not generate or store hazardous waste, industrial waste or Group A waste as defined in the POEO Act and is therefore not considered a waste activity; and
- Waste facilities - The term ‘waste facility’ is defined in the dictionary of the POEO Act to mean “...any premises used for the storage, treatment, reprocessing, sorting or disposal of waste (except as provided by the regulations)”. The proposed development is not characterised as a class of waste facility listed in Schedule 1 of the POEO Act.

On the basis of this, a licence would not be required for general waste generated at site under Schedule 1 of the POEO Act.

11.6.5. NSW Waste Reduction and Purchasing Policy (WRAPP)

In 1999, the NSW EPA adopted the *NSW Waste Reduction and Purchasing Policy* (WRAPP). The aim of WRAPP is to ensure that all NSW Government agencies contribute to the achievement of the State’s aim to reduce waste to landfill. WRAPP requires that all state government agencies and

state owned corporations develop and implement Waste Reduction and Purchasing Plans aimed at reducing waste in the following four areas:

- Paper products (general office paper, magazines, newspaper, cardboard, packaging);
- Office equipment (toner cartridges and printer ribbons);
- Vegetation material (tree clippings, leaves and prunings); and
- Construction and demolition material (concrete, excavated rocks and earth and drainage materials).

Waste Reduction and Purchasing Plans must also give priority to purchasing materials with recycled content. As part of WRAPP, Delta Electricity is required to report to DECCW every two years on the progress of their Waste Reduction and Purchasing Plan.

11.6.6. Lithgow Solid Waste Management Plan

In response to calls from the NSW Government to achieve significant reductions in solid waste sent to landfill, local Councils are obliged to establish a plan for waste minimisation. The main objective of the plans was to allow individual Councils to achieve waste reductions through their regulatory functions of development consent and building approvals.

Lithgow Council has produced a Solid Waste Management Plan (SWMP) which provides Waste Management Guidelines adopting the waste management hierarchy of minimisation, recycling, resource recovery and disposal. The aim of the strategy is to review the current solid waste management practices and explore the possibilities in technology associated with waste management that may be adaptable to the current and future waste management strategy.

The recommendations of the SWMP that are particularly relevant to this proposal include:

- Council purchase land at Blackmans Flat for a central waste facility that will implement best management strategy for the separation and disposal of the residual waste;
- Council encourage existing industries to minimise their waste generation and to practise waste recycling wherever possible.

11.6.7. Potential Wastes Generated from Proposal

The construction and operational phases of the proposal would generate different amounts and types of wastes according to the activity undertaken. A summary of the expected waste streams generated is outlined below. The majority of waste generated from the proposal would be in the form of non-liquid waste ie. excavated material and general waste products during construction. Waste quantities provided are estimates based on industry practice and existing guidelines.

Construction Excavated Material

One of the first stages in the construction process would be to level the site. Small quantities of soil would be excavated to enable the foundations for the new structures to be laid. The walkover survey conducted as part of the geology, soils and groundwater survey did not identify any visible signs of contamination and as such, it is expected that all excavated material would be suitable for re-use. Hence, wherever possible, the excavated material would be re-used on site.

Construction Green Waste

It is anticipated that small amounts of green waste would be generated by clearing. Typically, this vegetation would comprise of exotic grasses and weeds, as well as native species.

Construction

It is anticipated that small amounts of general building waste such as packaging materials and plastics would be generated during the construction period. In addition, a small quantity of waste (sewage and domestic rubbish) would be generated if a construction compound is used. Where possible, waste products would be reused or recycled.

Operational Waste

Waste generated from the operation of the ash placement activities would include:

- Used oils, tyres, rags, packaging, oil drums and discarded components associated with on-site vehicle maintenance;
- Paper and associated stationery waste associated with office activity.

11.6.8. Waste Management

Strategies and management measures that would be implemented to achieve minimal waste generation and responsible disposal for the construction and operational phases of the proposal would be developed within Waste Management Sub-plans or similar reports prepared as part of the Environmental Management Plans prepared for the project. The measures within the relevant plans would ensure the incorporation of the principles of avoid, re-use, recycle embodied in the WARR Act.

A Waste Management Sub-plan would be developed for the construction phase of the proposal for incorporation in the Construction Environmental Management Plan (CEMP). The plan would be prepared in accordance with the legislation and guidelines outlined above. The sub-plan would detail any procedures for the management of construction wastes from the site. In addition, the plan would contain an inventory of all waste types anticipated and the preferred options for re-use, recycling or disposal, and would seek to ensure that all waste generation and its fate is recorded such that waste minimisation can be achieved.

Waste management would be a component of the Operational EMP for the operational phase of the facility. It would ensure that initiatives for the sustainable management of waste are given consideration.

11.6.9. Mitigation Measures

Mitigation measures for wastes generated by the proposal are discussed below.

Construction Materials

- Ensure the correct quantities are ordered and delivered to the site;
- Investigate the use of recycled materials;
- Reuse clean excavated material on-site where suitable.

Contaminated Soils and Hazardous Materials

- Identify unsuitable / contaminated material (if found) and dispose of it in accordance relevant NSW legislation; and
- Collect empty oil and fuel drums in suitably designated areas and arrange for a licensed waste contractor to remove them.

Green Wastes

- Chip native vegetation cleared during construction and reuse as mulched material for revegetation;
- Remove all noxious weeds and exotic plant species and, if practicable, dispose of at a licensed landfill facility; and
- Transfer green waste not reused on-site to a green waste facility.

Paper / Cardboard / Packaging

- Develop strategies to encourage reduction and recycling for plastics, paper and packaging products.

Sewage and Water

- Provide portable toilet facilities during construction phase, which would be regularly maintained and ensure wastes are disposed of by a licensed waste contractor in accordance with Council and DECCW requirements or provide access to the existing sewerage system installed for Mt Piper power station.

Domestic Solid Wastes

- Provide recycling facilities to encourage the separation and recycling of all paper, aluminium, glass, and plastic products used during construction and operation; and
- Collect and dispose of all domestic waste at a licensed facility.

11.6.10. Conclusions

Waste management arrangements would be put in place during the construction phase of the ash placement works to maximise the reduction, recycling, and reuse of waste materials. This would be achieved through the implementation of a Waste Management Sub-plan (WMP) during construction. The WMP would be developed and implemented in accordance with the requirements of relevant waste management legislation and policies and incorporated into the Construction EMP for the site.

Waste management requirements for the operational phase would be incorporated into the Operational EMP.



Mt Piper Power Station Ash Placement Project

ENVIRONMENTAL ASSESSMENT

CHAPTER 12 – PROJECT JUSTIFICATION AND CONCLUSIONS

- August 2010



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12. Project Justification and Conclusions

This chapter summarises the project, providing a justification of why the project should proceed in the form described in Chapter 3 - Project Description, with consideration of the environmental, social and economic impacts of the project, the suitability of the sites and the public interest. It addresses the project in the context of ecologically sustainable development and provides a conclusion for the project.

12.1. Strategic Issues

Ash removal, placement and storage are critical to the long-term ongoing operation of the existing Mt Piper Power Station. In the absence of a significant increase in reuse opportunities or an alternative area to place the ash produced during power generation activities, 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 the operations of the power station when the present ash placement area reaches capacity. Either of these outcomes would have associated impacts on the electricity supply to NSW, an economic impact on the local region and both are considered highly undesirable. As a result, this project involving the provision of further storage areas for ash is required to maintain the existing level of power supply in NSW.

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

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

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

12.2. Key Environmental Considerations

12.2.1. Air Quality

Computer-based dust dispersion modelling was undertaken for the Lamberts North and Lamberts South ash placement areas and used to assess the impacts of the proposal, while a qualitative assessment for the proposed Ivanhoe No. 4 and Neubecks Creek sites was undertaken. Meteorological data from the Mt Piper Power Station site were combined with estimated dust emissions from proposed activities to predict off-site TSP, PM₁₀ and deposited dust levels.

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

The results from the assessment indicated that the project is unlikely to cause exceedances of annual PM₁₀, TSP and dust deposition criteria at nearest sensitive receptor locations. There is potential for the maximum 24-hour average PM₁₀ criteria to be exceeded from time to time although it is unlikely that the project will be the cause of such exceedances. It was noted that the probability of the project causing an exceedance of 50 µg/m³ increases with increasing background levels. The maximum 24-hour average model results represented the “worst-day” at each location in terms of potential impacts from the project, and so the probability of maximum project impacts occurring at the same time as maximum background levels would be very low.

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

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

The project also found that emissions are unlikely to cause exceedances of air quality criteria for ash contaminants and odour at all ground-level locations.

12.2.2. Noise

A quantitative noise assessment was undertaken at Lamberts North and Lamberts South using methods prescribed by NSW Government requirements. A qualitative assessment was undertaken for Neubecks Creek and Ivanhoe No 4.

Under neutral weather conditions, the operation of the ash placement areas for Lamberts North and South both indicate that compliance with the established noise goals would generally be expected. A marginal exceedance of the project specific noise goals may occur, without mitigation measures, at one location (known as Location 2 in Chapter 6) when operations reach the Lamberts South placement area in 2023. This is likely to occur in the early stages of the operations due to the topography of the site and the proximity to the receiver at this location near the eastern edge of the placement area.

At Lamberts North, the predicted noise levels under adverse meteorological conditions indicate general compliance during the daytime for both locations, with a marginal exceedance possible without mitigation measures during the latter stages at Location 2. The same result is again expected at Location 2 for the evening period, although an exceedance of up to about 3 dB(A) is possible at Location 1 during this time.

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

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

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

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

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

12.2.3. Water Management

The four project investigation areas are only very small portions of the Upper Coxs River Catchment, which contribute to the Sydney drinking water catchments and development of the ash placement areas would have negligible impact on the Sydney drinking water catchments in terms of water availability.

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

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

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

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

12.2.4. Flora and Fauna

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

Habitat for fauna within the proposed ash placement areas is limited to the remnant vegetation patches in the southern-most area proposed for ash placement. The remnant vegetation is of

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

An assessment of the impacts of this proposal on species, populations and ecological communities listed under TSC Act and the EPBC Act was undertaken. One plant species listed as vulnerable under both the TSC Act and the EPBC Act, Capertee Stringybark (*Eucalyptus cannonii*) was observed in one location comprising three individuals. Previous studies undertaken in the area also recorded the presence of this species in the perimeter lands, and noted its widespread distribution.

Up to three individuals of the *Eucalyptus cannonii* would be removed to accommodate the proposed ash placement. No other threatened flora species were recorded despite targeted searches within areas of suitable habitat, and it is unlikely that other threatened flora species are present considering the extent and type of habitats present and the degree of survey effort undertaken. Hence, the results of the TSC Act and EPBC Act tests of significance indicate the loss of habitat would not significantly affect the viability of threatened species in the area.

The site may provide at least foraging and possibly roosting habitat for a suite of microbat species, and could form part of the territory of Spotted-tail Quoll, owl and glider species. However, the results of the TSC Act and EPBC Act tests of significance indicate the loss of habitat would not significantly affect the viability of threatened species in the area.

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

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

12.2.5. Indigenous Heritage

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

The two previously identified sites, one just west of the Lamberts South (Sites # 45-1-0218) and one to the east of Lamberts South (# 45 -1-2601), remain intact and are currently protected by a CHMP. For the purpose of this project, these two previously registered sites remain as constraints and would be avoided by project impacts.

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

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

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

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

- There is already known evidence of Aboriginal occupation over both the Neubecks Creek and Ivanhoe No. 4 Concept Areas and hence any proposed impacts would need to be assessed

against known heritage values of these locations such that appropriate heritage management measures could be devised;

- A significant component of this process would be Aboriginal community consultation in relation to the assessment for sites, the cultural significance of any recorded locations and with regards to mitigation and management measures.

12.2.6. Visual Amenity

Visual impacts were assessed by comparing the visual modification and visual sensitivity and generally relate to the ability of the landscape to absorb visual modification. The degree to which the environment can absorb any visual impacts is influenced by topography (whether it can be screened) and vegetation (whether it can be concealed). In general, there are more opportunities to minimise the visual impact of a development from distant views and in varied and undulating landscapes than areas of flat terrain.

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

It is evident that high visual impact would result on one key location due to the close proximity of the sensitive receiver to the proposed ash placement areas. Visual impacts from 2 sites would be low to moderate, given their proximity to the proposed development and existing land use. For the finished profile of the sites, the ash placement areas are expected to appear greyish in colour from the viewpoint locations.

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

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

12.3. Ecologically Sustainable Development

Ecologically Sustainable Development (ESD) is a major principle now used in guiding environmental impact assessment and the NSW Government, in its various State of Environment Reports, has suggested the following definition of ESD:

“Using, conserving and enhancing the community’s resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.”

By following an ecologically sustainable path of development, the likelihood of serious environmental impacts arising from economic activity and development should be reduced.

The principles of ESD, as defined in Clause 6 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*, are as follows:

- The precautionary principle – namely, that if there are threats of serious environmental damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- Inter-generational equity – namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
- Conservation of biological diversity (biodiversity) and ecological integrity; and
- Improved valuation and pricing of environmental resources.

The principles of ESD were considered during the assessment of the proposed ash placement.

12.3.1. Precautionary Principle

The precautionary principle was invoked in the means by which the impact assessment was undertaken and mitigation measures identified and prescribed. This was undertaken as follows:

- Potential impacts were identified conservatively, in that all potential impacts were considered and assessed, even if there was no evidence that there may be an impact possible from the proposal;
- Assessment of impacts was undertaken using established and, in some cases, Government prescribed methodology, all of which were conservative in their approach and more likely to identify an impact when one was not necessarily likely; and
- Mitigation measures and monitoring programs were identified that would allow any unforeseen impacts to be addressed as appropriate.

12.3.2. Intergenerational Equity

The maintenance of inter-generational equity is essential in the development of any infrastructure project. This was considered in the proposed ash placement project in that:

- Scarce resources would not be used for the proposed development. In particular all water usage would come from recycled water from the power station (for ash treatment) and from reuse of sediment and ash contaminated water on site (for dust management and site rehabilitation);
- It would provide additional capacity for ash placement without affecting any natural, greenfield sites, as the proposed development at Lamberts North and Lamberts South would be located within the pits of the previous mining activities;
- It would continue to develop opportunities for the re-use of ash, thus reducing the in-ground storage requirements where practicable and the need to mine other resources;
- It would allow continued electricity production of the existing Mt Piper Power Station, contributing to the maintenance of power supply in NSW;
- It would provide for forecast increases in electricity demand by providing an ash repository for the proposed Mt Piper Extension Power Station should it be coal fired; and
- It would provide beneficial environmental outcomes in that it would allow for rehabilitation of the mining pits subsequent to ash placement.

12.3.3. Conservation of Biological Diversity

Overall, the proposed development would have a neutral impact on the biodiversity or ecological integrity of the area proposed for development. Most of the site for the ash placement at Lamberts North and Lamberts South has limited ecological value, as the works would be located within the footprint of previous mining pits which have been previously disturbed and cleared. The area of 9ha of vegetation which would be cleared is of generally good ecological value and, accordingly, a biodiversity offset of the same area will be sought by Delta.

The Environmental Assessment has identified the potential to improve the ecological values in the area by rehabilitating the previous mine sites and revegetating the whole area. This will occur over the life of the ash placement area at Lamberts North and Lamberts South. Weed management measures would be implemented to assist in maintain biodiversity and the ecological values of the site.

12.3.4. Improved Valuation and Pricing of Environmental Resources

Environmental and social impacts have not been quantified in any commercial sense, although the impacts have been identified and mitigation measures identified to manage those impacts.

12.3.5. Summary of Assessment against the Principles of ESD

Assessment of the project against the principles of ESD provided a framework for the proposed ash placement areas to:

- Recognise, describe and assess the effects of the development on environmental resources;
- Avoid irreversible and detrimental damage to ecological resources;
- Enhance the health and quality of the environment, and assist in benefiting present and future generations; and
- Minimise any impact on rare and endangered species and ensure conservation of biological diversity.

In preparing this Environmental Assessment, the potential environmental impacts from the proposed development have been investigated and a range of mitigation measures developed to minimise any adverse effects. All mitigation measures proposed in the Environmental Assessment have been developed based on the principles of ESD. It is clear that the principles of inter-generational equity and conservation of biological diversity are met and, if there is any doubt about potential detrimental effects on the environment, a precautionary approach is applied.

The principles of ESD will be further assessed by Delta Electricity during the detailed design phase of the project. This design assessment will enable Delta Electricity to identify and investigate the feasibility of implementing additional ESD measures, including further opportunities to:

- Minimise the consumption of water and the generation of waste;
- Reduce the impact of the proposal on the biophysical environment and the community; and
- Identify suitable site management practices.

The outcomes of this further ESD assessment will be incorporated as appropriate into the final design of the site or the relevant Construction or Operational Environmental Management Plans.

12.4. Conclusion

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

- In terms of addressing NSW Government policy for providing power generation capacity by providing an appropriate place to store ash products from power generation, thus allowing the existing power station to operate over its full life cycle and the proposed new power station to have a repository for its ash should it be coal fired;

- In providing social and environmental benefits for the general community whilst managing any potentially negative impacts on local communities by adopting appropriate management measures; and
- In that it would not detrimentally affect the health, diversity and productivity of the environment and would assist in these elements being maintained for the benefit of future generations.



Mt Piper Power Station Ash Placement Project

ENVIRONMENTAL ASSESSMENT

CHAPTER 13 – ENVIRONMENTAL MANAGEMENT AND DRAFT
STATEMENT OF COMMITMENTS

■ August 2010



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13. Environmental Management and Statement of Commitments

This chapter summarises the proposed environmental mitigation, monitoring and management provisions for the proposed works. It provides a draft Statement of Commitments by the proponent in relation to environmental impact mitigation, management and monitoring during construction and operation.

13.1. Overview

This chapter addresses the requirements to outline environmental monitoring and management provisions for the proposed works. It also provides a Statement of Commitments by the applicant in relation to environmental impact mitigation, management and monitoring during construction and operation.

The construction and operation of the proposed ash storage areas will be a major undertaking by Delta. The environmental impacts of the proposal have been assessed in this EA and measures to manage those impacts have been outlined. These mitigation measures, along with any conditions of approval issued by the Minister for Planning, would be incorporated into the detailed design, as well as where appropriate, the preparation of construction and operational Environmental Management Plans (EMPs) for the project. The EMPs would typically include:

- Approval conditions and statutory requirements;
- Environmental goals, environmental performance requirements and responsibilities;
- Plans for implementing mitigation measures;
- Reporting, training and induction requirements;
- Environmental performance monitoring and auditing procedures; and
- Clear guidelines for emergency response and incident management plans and responsibilities.

The EMPs would include, where appropriate, sustainability assessment recommendations and safeguards developed during the detailed design phase of the project. The EMPs would become the reference documents that ensure the commitments for environmental protection and management in the EA and subsequent approvals are fully implemented. They would also serve as a framework for confirming the accuracy of impact predictions made in this EA and for measuring the effectiveness of mitigation measures.

The EMPs for construction and operation would be prepared in accordance with the requirements of ISO 9001:2000 and ISO 14001:2004.

13.2. Construction Environmental Management and Mitigation

Environmental management commitments proposed during the construction phase are shown in **Table 13-1** below. The commitments for the concept approval sites are often the same as those for the project approval sites. Where they differ the sites to which they apply are shown in the table. These commitments include the preparation of a construction EMP (CEMP) which would be required prior to any construction activities commencing. The CEMP would detail operating conditions and temporary environmental protection measures to mitigate the impact of construction activities. Other commitments may form part of the terms of contract with the companies or consortium responsible for the project construction, or may be further assessed at the detailed design stage.

Table 13-1: Environmental Management Measures - Construction

Objective	Action	Sites
Environmental Management		
Manage hours of construction work	Proposed hours of construction are 7.00am – 6.00pm Monday to Friday, 7:00am – 1:00pm Saturday, with no work on Sundays or public holidays. The construction EMP will outline protocols for notifying relevant authorities and local residents prior to any works occurring out of normal construction hours. Out of hours work may be required under certain circumstances e.g. to minimise impacts on active operational services (e.g. due to the need to respond to emergencies and unavoidable construction constraints).	All
Minimise impact of construction on surrounding area	A Construction Environmental Management Plan (CEMP) would be prepared and implemented to guide construction activities as outlined below in the following commitments: <ul style="list-style-type: none"> ■ Air Quality ■ Water Quality ■ Noise & Vibration ■ Heritage ■ Flora & Fauna ■ European Heritage ■ Waste Management ■ Communication. All plans and strategies would be developed as part of the CEMP, in consultation with the relevant agencies.	All
Air Quality		
Minimise dust generation during construction	Develop and implement a Dust Management Plan (DMP) as part of the Construction EMP. The DMP would include the following mitigation measures and controls: <ul style="list-style-type: none"> ■ Undertake regular watering of active work areas to reduce wind blown dust emissions; ■ Minimise and stabilise the area of disturbed / exposed land at any one time. 	All

Objective	Action	Sites
Water Quality		
No increased sedimentation of nearby waterways	<ul style="list-style-type: none"> ■ A Soil and Water Management Plan (SWMP) will be prepared and implemented to reduce the potential water quality impacts from the site during construction. General measures to control erosion of soil and sedimentation would be implemented prior to construction works. These measures would be prepared in accordance with the principles and practices in <i>Soils and Construction</i> (Landcom, 2004) and would be maintained and monitored during the construction phase. 	All
Noise and Vibration		
Minimise construction noise impact on surrounding residences	<ul style="list-style-type: none"> ■ Detailed investigation of potential impacts from construction noise using DECCW (2009) <i>Interim Construction Noise Guideline (ICNG)</i>. ■ An Environmental Noise Management Plan (ENMP) would be prepared and implemented prior to the commencement of works to achieve compliance with DECCW criteria where reasonable and feasible. This Plan would include: <ul style="list-style-type: none"> ■ Application of physical noise controls to construction equipment, equipment maintenance and utilising appropriate technology to achieve low levels of construction noise emissions ■ Noise compliance monitoring for all major equipment and activities on site ■ Communication between the community and the construction management to be provided at the start of the works and maintained during the works ■ Investigative monitoring of noise in response to specific complaints. 	Neubecks Creek & Ivanhoe No 4 All
Indigenous Heritage		
Protection of Indigenous Heritage relics if uncovered	<ul style="list-style-type: none"> ■ Further survey, assessment and consultation studies to be undertaken on sites following completion of mining operations to assess potential impacts on any indigenous sites on or in the area of the proposed ash placement. Studies to follow relevant guidelines of DECCW. ■ Avoidance of sites in Lamberts South study area subject to Cultural Heritage Management Plan prepared prior to coal mining. ■ In the event that artefacts of indigenous heritage significance are uncovered during the course of construction, works in the immediate area would cease, DECCW would be notified and expert advice would be sought from an appropriately qualified professional. 	Neubecks Creek & Ivanhoe No 4 Lamberts South All

Objective	Action	Sites
Flora and Fauna		
Minimise likelihood of direct impacts on quality habitat areas and to threatened species	<ul style="list-style-type: none"> ■ Detailed surveys and assessment of vegetated areas remaining following mining activities. Studies to follow <i>Draft Guidelines for Threatened Species Assessment (DEC & DPI 2005)</i>. ■ Prior to construction beginning and where appropriate: <ul style="list-style-type: none"> ■ Habitat offset areas to be negotiated with DECCW and DoP ■ Preclearing surveys to identify habitat trees. ■ Removal of habitat features to be supervised by an ecologist ■ Threatened plant species in the area of the proposed works to be identified and tagged to ensure protection ■ Felled timber to be stockpiled to be used for habitat in rehabilitation areas ■ Topsoil stockpiled to be used for revegetation areas ■ Weed management to be implemented. 	Neubecks Creek & Ivanhoe No 4 All
Waste Management		
Minimise waste generated and maximise re-use and recycling. Waste disposal to be undertaken when re-use and recycle is not possible	<ul style="list-style-type: none"> ■ A Waste Management Plan (WMP) would be prepared and implemented. This would include: <ul style="list-style-type: none"> ■ Measures to minimise waste ■ Investigate the use of recycled materials and other construction materials ■ Waste for disposal would be removed by a licensed waste contractor and disposed of at a licensed landfill facility 	All
European Heritage		
Protection of European heritage	<ul style="list-style-type: none"> ■ Undertake surveys for European heritage following mining activities at sites and identify means to minimise potential impacts on any remaining areas of heritage value 	Neubecks Creek & Ivanhoe No 4
Communication		
Establish effective communication with community and relevant agencies	<ul style="list-style-type: none"> ■ A Communications Plan would be prepared and implemented. This would include: <ul style="list-style-type: none"> ■ Continuation of liaison with Community Reference Group to deal with project construction issues ■ Maintenance of phone line/fax/website to provide opportunity for community input ■ An effective complaints handling procedure to address and respond to issues raised by the community. 	All

13.3. Operational Environmental Management and Mitigation

Mitigation and other environmental management measures identified in the EA and relevant to the operational phase of the project are summarised in **Table 13-2**. These include the preparation of a site Operational Environmental Management Plan (OEMP) which would be required prior to ash placement operations commencing. The OEMP would detail on-going operating conditions and protection measures to mitigate the impact of site operations. Relevant measures would be detailed, as appropriate, in the relevant OEMP to be prepared by the site operators.

The OEMP would be updated as required to reflect any changes in the operation of the site or regulatory requirements.

■ **Table 13-2: Environmental Management Measures – Operational**

Objective	Action	Sites
Environmental Management		
Minimise impact of operations on surrounding area	An Operational Environmental Management Plan (OEMP) would be prepared and implemented to guide operational activities. It would include: <ul style="list-style-type: none"> ■ Environmental Management ■ Air Quality ■ Hydrology and Water Quality ■ Noise & Vibration ■ Landscape ■ Waste Management ■ Community Liaison All plans and strategies would be developed in consultation with the relevant agencies.	All
General	<ul style="list-style-type: none"> ■ The OEMP would provide for regular monitoring and periodic performance reviews of the key performance criteria for air, noise, water management established for the operation of the ash placement. Air, noise and water management performance parameters would be established in the EPL for the site and be described in OEMP. 	All
Air Quality		
Minimise dust emissions from ash placement areas	<ul style="list-style-type: none"> ■ The site operational plan would include management practices to be implemented to minimise potential for dust emissions. These would include: <ul style="list-style-type: none"> ■ Conditioning of ash with water or brine ■ Application of sprays ■ Use of water trucks ■ Equipment maintenance ■ Response to complaints. 	All

Objective	Action	Sites
Hydrology and Water Quality		
Maintain water quality in receiving waterways	<ul style="list-style-type: none"> ■ Manage water quality runoff by development of water management systems which: <ul style="list-style-type: none"> ■ separate clean water from undisturbed catchments and clean water on the site ■ Manage water generated on site using dirty water area and sedimentation dams ■ Allowing no regular controlled releases ■ Using water generated on site for rehabilitation and dust control ■ Allowing releases from sedimentation dams only in large rainfall events following treatment in dams ■ Manage groundwater quality by: <ul style="list-style-type: none"> ■ Design of ash placement areas to provide buffer to groundwater and to place brine treated ash more than 30m above groundwater ■ Undertaking borehole water quality monitoring program through a Water Monitoring program and provide annual monitoring report ■ Monitor receiving water quality through a Water Monitoring program and provision of an annual monitoring report. 	All
Noise and Vibration		
Minimise operational noise impact on surrounding residences	<ul style="list-style-type: none"> ■ An Environmental Noise Management Sub-Plan (ENMP) would be prepared and implemented and would detail methods available to mitigate noise during the operation of the proposal. The ENMP will include: <ul style="list-style-type: none"> ■ More detailed noise modelling as design is developed to test the mitigation effects of using the benched ash mound as a noise barrier. ■ More detailed modelling during detailed design, when a full inventory of operational plant is available, to ensure noise criteria are met. ■ Investigative monitoring of noise in response to specific complaints. Appropriate complaints procedures and means of responding to complaints will be established. 	All
Waste Management		
Reduce the generation of waste	<ul style="list-style-type: none"> ■ Ensure that initiatives for the sustainable management of waste are given due consideration. Such measures would include reduction of materials being brought onto the site, reuse of wastes where practicable and recycling. 	All

13.4. Environmental Reporting

Periodic environmental reports would be prepared to measure performance and progress against the CEMP. During operation, environmental performance and progress will be incorporated as necessary into the respective corporate environmental reporting of Delta and the site operators.

The reports would ensure relevant authorities have access to important environmental information relating to the new facility. Any shortcomings in environmental performance identified by the reporting process would be addressed by updating the EMPs.

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CHAPTER 14 - REFERENCES

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14. References

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