Mt Piper Power Station
Ash Placement Project

Submissions Report

March 2011

Mt Piper Power Station Ash Placement Project Environmental Assessment Application Reference: 09_0186

SUBMISSIONS REPORT

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1. Introduction

1.1 Overview

1.1.1 The project

This report has been prepared to support Delta Electricity's (Delta) application for approval for the proposed Mt Piper Ash Placement project, under Part 3A of the *Environmental Planning and Assessment (EP&A) Act 1979*. It addresses the responses to the public exhibition of the Environmental Assessment (EA).

Delta has identified a need to expand its current ash placement facilities, which service the Mt Piper Power Station, to enable the further placement of ash once the existing ash placement area has reached capacity. Previous feasibility and site selection studies have selected four broad sites on which Delta is proposing to undertake planning activities and obtain relevant approvals for ash placement.

With the ongoing operation of Units 1 and 2 at Mt Piper, the present ash placement area is expected to require extension within two years. Accordingly, there is need to obtain development consent for ash placement beyond this time and throughout the power station's economic life.

As such, Delta has sought Concept Approval and Project Approval for two of the proposed placement sites - Lamberts North and Lamberts South and Concept Approval for the future development of sites at Neubecks Creek and Ivanhoe No.4. Lamberts North and Lamberts South are currently being mined for coal and Project Approval is being sought for these sites to allow for their development for ash placement.

The area of the proposed ash placement project is shown in **Figure 1-1**.

1.1.2 Change in project timing

The EA anticipated ash placement starting at Lamberts North from around 2015. Subsequent work by Delta has found a need to prepare earlier for brine conditioned ash placement at Lamberts North. Preparation would begin during Q4 2012 and would include ground profiling, construction of bunds and haul roads, and then, starting during Q1 2013, the placement of water conditioned ash up to RL 946. Placement of brine conditioned ash would then start from this elevation using established practices and continue to the capping heights described in the EA at both Lamberts North and Lamberts South. The placement of brine conditioned ash will continue in Area 1 until Lamberts North is ready to accept it.

1.1.3 Project decoupling

Delta is seeking to "decouple" the Concept Plan and Project Approval Application as it applies to Lamberts North and Lamberts South from the Concept Plan Application for Neubecks Creek and Ivanhoe 4.

Due to the timing issues described in **Section 1.1.2**, Delta needs to commence construction works for the Lamberts North and Lamberts South sites no later than the last quarter (Q4) of 2012. Delta believes that it has addressed all the submissions received for these two sites in this Submissions Report and given the timing needs, is seeking Concept Plan and Project Approval for Lamberts North and Lamberts South as soon as practicable.

The submissions received for the Neubecks Creek and Ivanhoe 4 indicate that more information is required if Concept Plan approval is to be granted for these two sites. This will take additional resources and time to gather and analyse. The timing of the Concept Approval for these two sites is not critical compared with the timing of the approvals required for Lamberts North and Lamberts South.

This is because the ash storage capacity available at Lamberts North and Lamberts South is sufficient to provide for the existing Mt Piper Power Station Units 1 and 2 until about 2042-2045, given current production and coal assumptions. This period is the nominal remaining life of the power station. It is unlikely that further ash storage areas would be required beyond that time for this power station. Should the proposed Mt Piper Extension Power Station proceed as coal-fired generation, then the capacity of Lamberts North and Lamberts South to receive ash would be expended well before those dates. This would then require Project Approval to be sought for Neubecks Creek and Ivanhoe No. 4, as indicated in the EA.

Accordingly, this Submissions Report focuses on addressing those submissions received for Lamberts North and Lamberts South in order to obtain Concept Plan approval and Project Approval for both sites. A separate Submissions Report/Preferred Project Report to support Concept Plan approval for Neubecks Creek and Ivanhoe 4 is being considered for a later date.

1.2 Need for the Project

Chapter 2 of the EA outlined the strategic planning and justification behind the proposed ash placement areas. As part of this submissions report further consideration has been given to the consequences of the project not proceeding. If Lamberts North and Lamberts South were not approved for ash storage, a number of possible consequences have been identified. These include:

- The need to seek approval for alternative sites away from the power station proximity and the provision of a means of transporting the ash to those sites by conveyor, truck and/or train. This would have additional environmental impact in terms of transport, timing and other factors. As

indicated in the EA, of the 25 potential sites studied, Lamberts North and Lamberts South would result in "minimum cost and minimal environmental disturbance";

- Seeking a consent modification in Area 1 to place ash to a higher elevation than the current limit RL 960.00. This would extend the life of the existing ash repository by only a few years. From an engineering perspective this would be problematic and may not be structurally feasible, given that the base and placement method were designed for the current RL;
- Increasing the amount of ash re-used from the current 20% to100% ash re-use. This is discussed in the EA and is considered not to be possible within current planning horizons;
- Extending the life of the existing ash placement Area 1 by constraining electrical output of the Mount Piper Power Station. This would lead to:
  - A supply shortfall in the National Electricity Market (NEM) and possible market insecurity by reducing the available spinning reserve. The shortfall would have to be met by increased production from older, less thermally efficient, and more expensive coal-fired generators in NSW, or by importing electricity from neighbouring states which are often constrained by inadequate interstate high-voltage transmission links. Both actions would cause a rise in the carbon dioxide coefficient for NSW and an increase in the wholesale electricity price on the NEM with a consequent increase in retail prices,
  - Direct loss of full-time and part-time jobs associated with the provision of power station services and indirect loss of jobs in the region associated with the supply of coal, generating plant, chemicals, fuel oil, lubricants, generic consumables, vehicles, food and accommodation and office equipment.

1.3 Submissions to the Environmental Assessment

The EA for the Mt Piper Ash Placement Project was placed on public exhibition by the Department of Planning (DoP) from 15 September 2010 to 15 October 2010. A total of 13 submissions were received by the Department, comprising:

- Submissions from NSW Government agencies, namely Roads and Traffic Authority NSW, Forests NSW, Department of Environment, Climate Change and Water, Department of Planning (Heritage Branch), Industry and Investment NSW, Sydney Catchment Authority, NSW Office of Water and NSW Health (Sydney West Area Health Service Centre for Population Health);
- A submission from Lithgow City Council; and
- Submissions from the general community (individuals and groups).

1.4 Analysis of submissions

Government agency submissions and non-government agency submissions in respect to Lamberts North and Lamberts South have been responded to separately within this report. All submissions received by DoP are located on the Department's web site.

Government agency submissions have been responded to individually. This has allowed Delta to respond in detail to specific technical queries and comments. Non-Government submissions in respect to Lamberts North and Lamberts South have also been responded to individually and been categorised according to the key issues raised within the submissions.

1.5 Summary of issues raised in submissions

A summary of the key issues raised within all of the submissions received is outlined in **Table 1-1** below. Each of the issues outlined within **Table 1-1** is discussed in Chapter 2 and Chapter 3 along with Delta's responses to these issues.

▪ Table 1-1: Summary of submissions issues

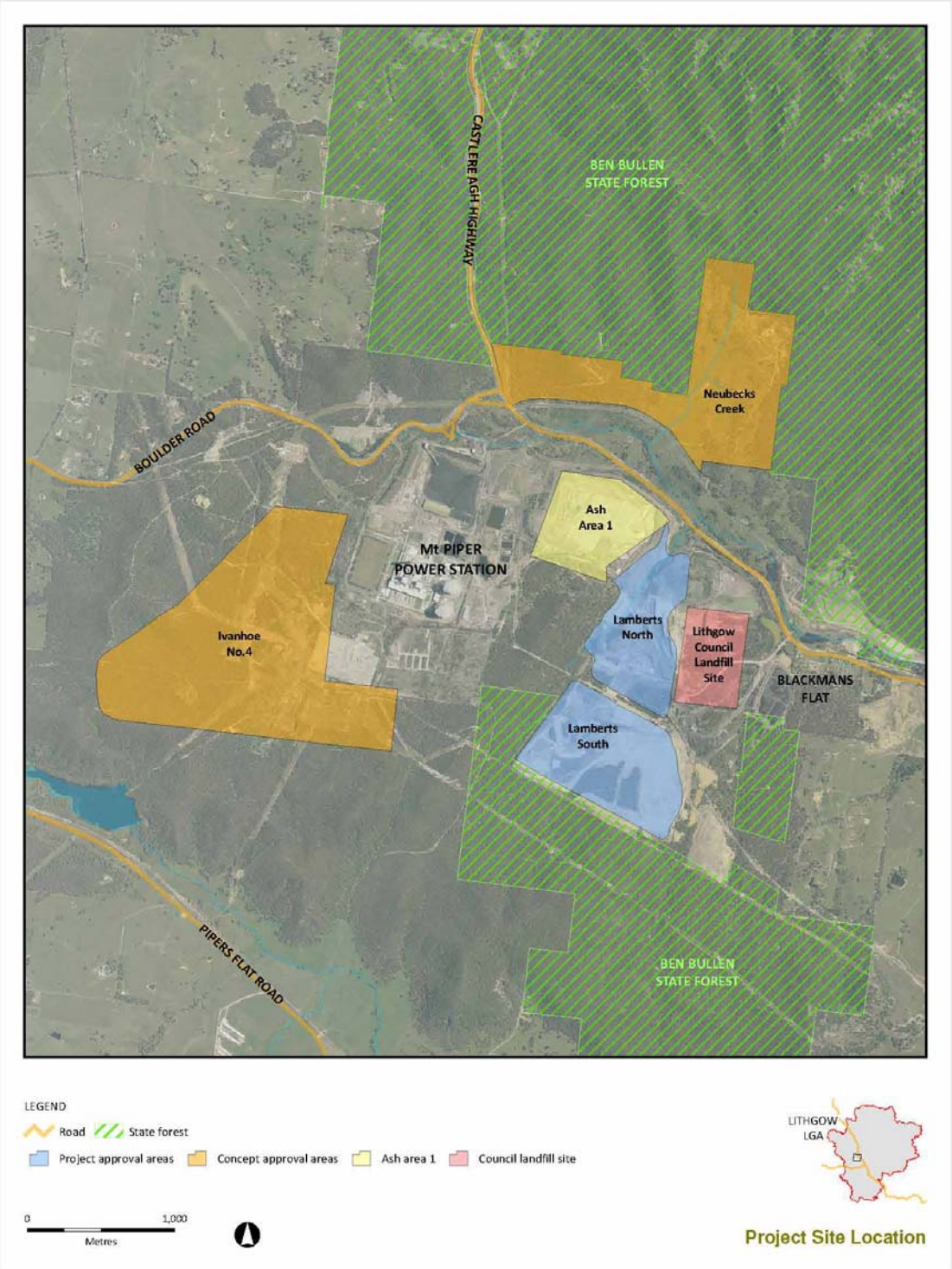
Government Agency	Issue
NSW Roads and Traffic Authority	Traffic associated with Lamberts North and South
Forests NSW	Consultation with Forests NSW Site location and encroachment on forests
Department of Environment, Climate Change and Water	Aboriginal cultural heritage Air quality monitoring Vegetation offsets Noise (background noise level) Surface water discharge
Department of Planning (Heritage Branch)	No historic heritage present
Industry and Investment NSW	No concerns
Sydney Catchment Authority	Impacts of brine conditioned ash on groundwater Additional monitoring Chemical composition of ash Vegetation offsets
Lithgow City Council	Cumulative impacts Visual amenity

	Transportation of ash
NSW Office of Water	Surface water hydrology Groundwater bore data Water quality levels Site water balance
NSW Health	Air quality Noise Water quality
Community Submission	**Issue**
Submission # 1	Ash re-use General project support
Submission # 4	Cumulative impact Separation distances to Blackmans Flat Noise impacts Operating hours Air quality Ash contaminants Visual impact Surface water impacts
Submission # 5	Cumulative impacts Noise impacts Ash contaminants Stability of ash mound
Submission # 10	Human health Water quality Ash contamination Noise impacts Air quality

1.6 Amendments to the draft Statement of Commitments

Amendments to the draft Statement of Commitments are provided in Chapter 4.

Figure 1-1 Mt Piper Site Layout



2. Agency Submissions

NSW Government agencies outlined in Chapter 1 provided submissions to the exhibition of the Mt Piper Ash Placement Project Environmental Assessment. The submissions are summarised in this chapter.

2.1 Roads and Traffic Authority NSW

2.1.1 Submission

The RTA does not object to concept approval for the Lamberts North and Lamberts South part of the project but makes the following comment regarding project approval for that part of the Project:

- While the EA states that the impact on the road network will be minimal in terms of traffic volumes generated during the construction phase there is no detailed information regarding the quantity and nature of the traffic that will be generated;
- Prior to project approval detailed information should be provided setting out:
  - The nature of the traffic generated that will access public roads during the construction phase including materials, equipment and waste transport traffic
  - The respective traffic volumes
  - The hourly distribution of traffic.

2.1.2 Response

The following response is provided by Delta to address the RTA's submission on the Mt Piper Ash Placement Project.

Traffic associated with Lamberts North and Lamberts South

Delta recognises that the RTA does not object to concept approval for the Lamberts North and Lamberts South ash placement areas.

Section 11.3.2 of the EA states that the only traffic anticipated to require use of public roads in the vicinity of the proposed Project Approval sites (Lamberts North and Lamberts South) will occur during the construction period and would be very minor in nature.

Construction and operation of both sites will be on land owned by Delta Electricity or Centennial Coal and no impacts to public roads are anticipated.

A construction workforce of about 20 people would be required. Many of this workforce would be sourced from existing Delta Electricity employees and contractors and as such, additional traffic volumes associated with accessing the site is expected to be negligible. Access to Mt Piper Power

Station and the ash placement sites would be via the existing access from Boulder Road and Castlereagh Highway and consist of normal passenger vehicles. The road network surrounding Mt Piper Power Station has significant spare capacity.

Any minor increases in traffic on the public road network, due to workers accessing the site, would be consistent with the stated construction hours for the proposal; 7am-6pm Monday to Friday and 8am – 1pm Saturdays.

Equipment and machinery required for construction and operation of the site would also be sourced from existing Delta-owned or contracted equipment or Centennial Coal resources and would include standard earthmoving and haulage machinery. It is not expected that additional equipment would require shipping into the site via the public road network.

2.2 Forests NSW

2.2.1 Submission

Forests NSW identified that they were not consulted by Delta during the preparation of the EA. The agency was also concerned that the current mining activity (as shown in EA Figure 3-2) appears to have encroached upon the boundary of the State Forest. As such, Forests NSW made the following comments:

- All boundaries between the land parcels in question and the adjacent Ben Bullen State Forest should be surveyed and clearly delineated by the proponents prior to project commencement;
- An operational buffer should be implemented to avoid unintentional encroachment;
- Rehabilitation requirements should be transferred to the proponents if transfer of ownership takes place.

2.2.2 Response

The following response is provided by Delta to address Forest NSW's submission on the Mt Piper Ash Placement Project.

Consultation with Forests NSW

As requested in the Director General's Requirements (DGRs - S09/01810), Delta notified Industry and Investment NSW on the 11th of February 2010, upon receipt of the DGRs from the DoP. This consultation sought to advise the Agency of the lodgement of the Project Application and the subsequent issuing of DGRs. The Preliminary Environmental Assessment (PEA) in support of the Project Application was also provided. Delta sought input from the Agency to the preparation of the EA.

Delta would be happy to undertake further consultation with Forests NSW should it be required.

Site location and encroachment on forests

Encroachment of the ash placement areas on the adjoining State Forest is considered very unlikely. An operational buffer that would also reduce the volume capacity for ash placement is therefore considered undesirable and unnecessary. The areas proposed for ash placement have been surveyed extensively as part of ongoing mining operations and also as part of the land transfer obligations between Centennial Coal and Delta. The proposed ash placement areas are also delineated from the State Forest by fencing surrounding the site. Construction and operation of the ash placement areas would not occur beyond this fence line.

The transfer of ownership and rehabilitation commitments for the proposed ash placement sites are being resolved amongst Delta, Centennial Coal, and the mine regulator Industry and Investment NSW.

Delta has committed to undertake rehabilitation of the site progressively throughout the life of the placement areas and after capping is completed. Section 3.4.6 of the EA stated that a rehabilitation plan would be prepared for the sites addressing revegetation, landform, surface water management and monitoring and will be periodically updated during the progressive rehabilitation of the sites. Sections 13.2 and 13.3 of the EA detailed Delta's environmental management commitments regarding surrounding areas during construction and operation of the proposed ash placement sites.

2.3 Department of Environment, Climate Change and Water

2.3.1 Submission

DECCW supports the proposal to construct and operate the Lamberts North and Lamberts South ash placement areas subject to the considerations and recommendations outlined within their submission.

DECCW also outlines that Environment Protection Licence 13007 is currently applicable to the current operations at Mt Piper Power Station and that Delta will need to make a separate application to DECCW to vary this licence should project approval be granted for the Mt Piper Ash Placement Project.

Aboriginal Cultural Heritage

DECCW supports the recommendations summarised in Table 13-1, Section 13 of the EA. The Statement of Commitments should be amended to incorporate comments made in Section 9.5.1 of the EA recommending that the Cultural Heritage Management Plan "*...should be revised and updated to cover the protection of these sites into the future*".

Air

DECCW supports the recommendations summarised in Table 13-1 and Table 13-2 of the EA with respect to air but recommends that any project approval be conditioned to require the proponent to develop an air quality monitoring program (or augment any existing plans).

Biodiversity

DECCW notes that approximately 8.9 ha of native vegetation will be impacted upon by the Lamberts Gully South ash placement area. It is evident in the EA that Delta has committed to establishing a biodiversity offset to compensate for the loss of this vegetation, however no timeframe has been provided for the development of this offset.

DECCW also identifies that no explanation has been provided for the derivation of the ratio for the offset (offset ratio 1:1) and that any offsets proposed should comply with DECCW's *Principles for the use of Biodiversity Offsets in NSW* and include justification for the development of any compensatory habitat offset.

DECCW recommends that the following conditions of approval are placed on the Project Approval of the Lamberts North and Lamberts South sites:

> *The proponent must develop and implement a biodiversity offset in consultation with, and to the approval of, DECCW within 6 months of the date of Project Approval to compensate for the loss of:*
>
> - *approximately 7.5 ha of native vegetation (Brittle Gum – Red Stringybark Woodland) including the loss of at least three individuals of the threatened Capertree Stringybark;*
> - *approximately 1.1 ha of native vegetation (Scribbly Gum Woodland); and*
> - *approximately 0.3 ha of native vegetation (Ribbon Gum Woodland)*

Noise

DECCW notes that the daytime rated background noise level (RBL) for the Blackmans Flat Village was reported in the EA to be 44 dB(A). DECCW notes that for previous projects assessed in the region such as the Yarraboldy Extension Project (10_0041), the RBL reported was less than 44 dB(A) and has determined that the day time RBL appropriate for Blackmans Flat should be 36 dB(A) to determine both the daytime construction and operational project specific noise criteria for the Blackmans Flat Village.

The recommended project noise conditions as described below:

Noise generated at the premises must not exceed the noise limits presented in the table below.

Location	*Day*	*Evening*	*Night*
	L_{Aeq}(15 minute)dB(A)	*L_{Aeq}(15 minute)dB(A)*	*L_{Aeq}(15 minute)dB(A)*
All private receiver's within the township of Blackmans Flat	*41*	*38*	*35*
All other residences	*38*	*38*	*35*

Where Day is defined as the period 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays, Evening is defined as the period from 6pm to 10pm, and Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

Noise from the premises during construction must not exceed the limits presented in the table below:

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

Where construction may only occur between the hours of 7am and 6pm Monday to Friday and 8am to 1pm Saturdays. No construction work is to take place on Sundays and Public Holidays.

The noise limits set out above apply under all meteorological conditions except for any one of the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or

b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or

c) Stability category G temperature inversion conditions.

To determine compliance with the Leq(15 minute) noise limits, the noise monitoring equipment must be located at the most affected point:

> *• within 30 metres of a dwelling facade where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises;*
>
> *• approximately on the boundary where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises;*
>
> *• within approximately* 50 *metres of the boundary of* a *National Park or* a *Nature Reserve.*

For the purposes of monitoring noise from the premises to determine compliance with the noise limits:

a) *Class 1 or 2 noise monitoring equipment as defined by AS IEC61672.1-2004 and AS IEC61672.2-2004, or other noise monitoring equipment accepted by the EPA in writing, must be used;*
b) *the modification factors in Section* 4 *of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment;*
c) *the meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station at the premises; and*
d) *stability category temperature inversion conditions are to be determined by the sigmatheta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.*

DECCW will require the existing environment protection licence to be modified to reflect the project specific noise criteria.

DECCW supports the recommendations summarised in Table 13-1 and Table 13-2 of the EA. DECCW notes an inconsistency between the hours of construction work between Table 13-1 and Table 6-10. The Statement of Commitments should be modified to reflect the correct construction times.

Water

DECCW supports the actions proposed in Table 13-1 in Chapter 13 of the EA.

DECCW also notes that there have been no details provided on the exact location of any surface water discharge points at the placement areas at Lamberts Gully North and South. Any discharge of dirty water from these sites would require licensing under environment protection licence 13007. This licence will need to be modified to reflect the need for the additional discharge points including an appropriate monitoring schedule and limits for the identified likely pollutants.

2.3.2 Response

The following response is provided by Delta to address DECCW's submission on the Mt Piper Ash Placement Project.

Aboriginal cultural heritage

The EA (Chapter 9 – Indigenous Heritage) states that the entire areas of Lamberts North and Lamberts South have been completely surveyed in the past and that two known aboriginal heritage sites (AHIMS # 45-1-2601 and # 45-1-0218) are located outside the area proposed for ash placement and are currently protected under a Cultural Heritage Management Plan (CHMP). The EA also recommends that this CHMP be reviewed so as to continue the preservation of these sites in the face of the proposed ash emplacement project.

This recommendation will be added to the Statement of Commitments for the Project.

Air

The EA outlines a range of mitigation measures aimed at minimising impacts to air quality during construction and operation of the ash placement areas (see Chapter 13 of the EA). Delta recognises that DECCW supports the recommendations summarised in Table 13-1 and Table 13-2 of the EA.

Delta also supports DECCW's recommendation that an appropriate air quality monitoring program is established to monitor ongoing operational air quality parameters. Any air quality monitoring program for operational works will be developed in accordance with relevant guidelines and policies and in consultation with DECCW prior to operations commencing.

The preparation of an appropriate air quality monitoring program during the operation of sites has been added to the Statement of Commitments for the project.

Biodiversity

In the EA it is acknowledged that biodiversity offsets totalling 9 ha will be provided to compensate for the 8.9 ha of vegetation which will be removed. It should be noted that an area of approximately 31 ha of newly placed rehabilitation would be removed, but the current biodiversity values of that area are minimal and did not form part of the offset calculation.

The process by which the offset ratio was determined is notional. Delta has perimeter lands ie lands within its ownership in the vicinity of the power station and the 9ha offset assumed was based on that area being nominated within those perimeter lands. It was assumed that 9ha would be located with similar biodiversity values to the 8.9 ha of vegetated area to be lost. The location and area of offsets will be determined by survey of the perimeter lands and the use of DECCW's guidelines as outlined in *Principles for the use of Biodiversity Offsets in NSW.* The exact area of offsets will be determined

when the biodiversity values are determined and following consultation with DECCW. It is possible that any lesser biodiversity value in the offsets would be compensated for by an increase in the area dedicated, but this would only be determined following the necessary surveys and consultation with DECCW.

As the construction works for the area where the vegetation will be lost (Lamberts South) may be some time in the future (after about 2020), the approval condition suggested by DECCW should state that the agreement should be in place 6 months before clearing of the vegetation at Lamberts South begins rather than 6 months after project approval.

Noise

As the RBL for the nearest sensitive receiver locations forms the basis for the project specific noise levels, it is important that the RBLs reflect the specific project site. Therefore a review of the SKM data with respect to the DECCW comments has been undertaken to determine the appropriate RBL for the Ash Placement Project.

While it is recognised that noise levels may vary due to seasonal and other factors, there is not sufficient correlation between the data collected in November 2009 for the 10_0041 Project (Yarraboldy Extension) and December 2009 for the 09_0186 Project (Mt Piper Ash Placement). The Mt Piper Ash Placement data were reviewed with respect to diurnal trends as well as longer term trends between weekdays and weekends. These data were found to be internally consistent and in line with expectations and SKM has no reason to doubt their validity.

The noise data for the Mount Piper Ash Placement Project was collected specifically for that project with the closest receiver locations being considered. On this basis, the RBL of 36 dB(A) taken from the 10_0041 Project for Blackman's Flat site is considered to be inappropriate for the ash storage area for the following reasons:

- The site used to monitor noise levels for the Yarraboldy Extension Project (Project 10_0041) is partially shielded from road traffic noise by the local topography and therefore does not provide a true reflection of receiver noise levels in Blackmans Flat;
- The site used to monitor noise levels for the Project 10_0041 is not representative of the closest or most affected receiver for the Mt Piper Ash Placement Project, or general residences within the village (See **Figure 2-1**).

Additional justification for the predicted noise level is taken from the both the 10_0041 report and the 09_0186 report as follows:

- The logger graphs provided in the Noise Working Paper from the Mt Piper Ash Placement EA demonstrated clear daily trends in the noise monitoring data, indicating an increase in noise levels from about 6:00 am remaining constant throughout the daytime and then decreasing during the

evening. This is expected to be consistent with traffic movements and existing industrial noise from the nearby mining operations in the area;

- The attended monitoring for both projects demonstrated a good correlation for all of the statistical parameters. These levels are also consistent with the unattended monitoring results for the ash placement profile.

Based on the measured RBL for the closest sensitive receiver locations, the project specific noise levels as per the EA are identified for the Ash Placement Project (see **Table 2-1** below). Figure 6-1 of the EA shows these locations

- **Table 2-1 Summary of project specific noise levels**

Intrusiveness Criteria	Day ($L_{Aeq15\ min}$)	Evening ($L_{Aeq15\ min}$)	Night ($L_{Aeq15\ min}$)
Location 1	48 dB(A)	38 dB(A)	35 dB(A)
Location 2	38 dB(A)	38 dB(A)	35 dB(A)

*Location 1 corresponds with the site shown as Project 09_0186 in Figure 2-1

- **Figure 2-1 Monitoring locations in Blackmans Flat**

The recommendations for conditions of approval for operational noise should reflect the noise levels specified in **Table 2-1.** The wording for the condition of approval for operational noise should be:

Noise generated at the premises must not exceed the noise limits presented in the table below.

Location	*Day*	*Evening*	*Night*
	L_{Aeq}(15 minute)dB(A)	*L_{Aeq}(15 minute)dB(A)*	*L_{Aeq}(15 minute)dB(A)*
All private receiver's within the township of Blackmans Flat	*48*	*38*	*35*
All other residences	*38*	*38*	*35*

Where Day is defined as the period 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays, Evening is defined as the period from 6pm to 10pm, and Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

Construction noise goals are derived from the RBL and hence the argument by DECCW that the RBL for residences in Blackmans Flat should be lower leads to a requirement from DECCW that the noise from the premises during construction should not exceed 46 dBA at Blackmans Flat. The goals identified in the EA are shown in **Table 2-2**. These are based on RBL proposed in the EA plus 10 dBA, as identified in Table 6-2 of the Noise Assessment Working Paper, and it is these numbers which should apply for the project.

- **Table 2-2 Summary of construction noise goals**

Receiver	**Noise Goal dBA $L_{Aeq\ (15\ minute)}$**
Location 1	54 dB(A)
Location 2	43 dB(A)

The recommendations for conditions of approval for construction noise should reflect the noise levels specified in **Table 2-2.** The wording for the condition of approval for operational noise should be:

Noise from the premises during construction must not exceed the limits presented in the table below:

Location	*Day*
	L_{Aeq}(15 minute)dB(A)
All private receiver's within the township of Blackmans Flat	*54*
All other residences	*43*

Where construction may only occur between the hours of 7am and 6pm Monday to Friday and 8am to 1pm Saturdays. No construction work is to take place on Sundays and Public Holidays.

There is an inconsistency in the EA between the hours for construction work outlined in Table 13-1 and the recommended hours described in Table 6-1. The construction hours listed in the Statement of Commitments within this report are correct for the Project and stated as:

- 7am – 6pm Monday to Friday; and
- 8am – 1pm Saturdays.

Water

As noted in the EA and in DECCW's submission the water management system for both Lamberts North and Lamberts South would be designed such that there would be no regular controlled release of dirty water from the sites. Should a release of water be required it is acknowledged that the location (s) of the release points would need to be identified and that a licence for such a discharge would be needed prior to operations. The locations and monitoring conditions of the discharge points would be determined as part of the Soil and Water Management Plan to be prepared for the site, in consultation with DECCW.

2.4 Department of Planning (Heritage Branch)

2.4.1 Submission

The Heritage Branch notes that Lamberts North and South have been extensively disturbed through coal mining and the heritage assessment has indicated that there is no historic heritage present in these areas, largely for this reason.

2.4.2 Response

Delta acknowledges the Department of Planning (Heritage Branch) submission.

2.5 Industry and Investment NSW

2.5.1 Submission

The Fisheries and Agriculture Division and the Minerals Division of Industry and Investment NSW had no concerns with the proposal.

2.5.2 Response

Delta acknowledges the Industry and Investment NSW submission and would be pleased to engage with the Agency should further assistance or information be required.

2.6 Sydney Catchment Authority

2.6.1 Submission

The Sydney Catchment Authority (SCA) has reviewed the EA and notes that it has addressed significant issues of concern to the SCA. SCA also considers that the EA has some deficiencies which should be addressed by Delta. These include:

- The long term behaviour, fate and impacts of brine-conditioned ash disposal, including a risk assessment on ground and surface water quality under a range of rainfall events (up to a 100 ARI event and a range of rainfall duration/intensities) have not been addressed in the EA. The SCA recommends that a risk assessment study addressing the behaviour of surface and groundwater under a range of rainfall frequency and duration events be undertaken, and any additional measures necessary to mitigate the leaching of salts and trace elements from the disposal sites be identified and implemented.

  Additionally, appropriate surface and ground water monitoring would be required as part of the water management plan to identify changes and sources of pollutants to ensure appropriate management practices are in place where deleterious impacts on water quality are identified;
- Recent baseline groundwater monitoring for the Lamberts North and Lamberts South sites is based on one-off sampling for a limited number of groundwater bores. The SCA considers that baseline groundwater water quality monitoring points should be evenly distributed within, around and downstream of the disposal sites to enable a better comparison of the potential and actual impact of the ash placement on groundwater;
- The SCA recommends that the proponent should provide information on the likely chemical composition of the ash and the brine, and on how much salt and trace elements are added via the placement of brine-conditioned ash as the EA does not provide this;
- The SCA recommends that more effort is required to explore reuse opportunities for bottom ash as well as fly ash;
- The SCA considers that a geomorphological study of the capacity of Lamberts Gully to accommodate additional flow from Huons Gully should be undertaken;
- The EA states that the project requires about 9 hectares of vegetation clearing and proposes to offset this vegetation clearing, however details of the locations of offsets have not been identified. The SCA considers that offset measures should include the restoration rehabilitation and revegetation of Lamberts Gully and the revegetation and stabilisation of sections of Neubecks Creek downstream of the existing discharge point.

2.6.2 Response

The following response is provided by Delta to address SCA's submission on the Mt Piper Ash Placement Project.

Impacts of brine conditioned ash on groundwater

The long term behaviour and impacts of brine-conditioned ash disposal were considered in the EA, in the context of the studies undertaken for the existing ash placement site (Ash Area 1 as shown on **Figure 1-1**). The EA concluded that there exists sufficient data from the on-going monitoring and the groundwater modelling studies undertaken (by UTS in 1999 and 2007) 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. In particular conductivity readings (as a possible indicator of brine leaching) occasionally exceeded ANZECC criteria, but median values were within guidelines Refer Table 2-3) at Site 1, downstream of Area 1 ash placement area. Higher levels are associated with the mine site operations. Chloride and conductivity levels in Neubecks Creek may have also been exacerbated by the persistent drought between c.2002 and late 2010. More recent monitoring data are being assessed as part of the 2009/2010 monitoring report for Ash Area 1.

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 would be sufficient to ensure that ash placement has limited if any effect on the water quality of Neubecks Creek.

It is recognised that the distribution of groundwater bores to monitor the effects of the ash placement in Lamberts North and Lamberts South needs to be more extensive. The bore holes drilled in Lamberts Gully in December 2009 and discussed in the EA provided only what could be reported in the circumstances of an operating mine site. When better access is available to the sites (following cessation of mining) and prior to any construction works being undertaken, a comprehensive groundwater monitoring program will be implemented consistent with that operating for Area 1.

The establishment of bore hole monitoring sites will form part of the Water Management Plan to be developed for the project. As noted in the EA (section 7.6.2) the information to be collected from any new bore holes established would include water levels, seasonal fluctuations and water quality test results. The water quality parameters would include pH, conductivity, ions (especially chloride) and trace metals. The groundwater modelling undertaken by UTS for the existing Area 1 will be further developed to include new ash placement areas, and the study will include a risk assessment approach addressing the behaviour of surface and groundwater under a range of rainfall frequencies and duration events. As with the previous consent for ash placement, the data from the monitoring sites and modelling would be reported and actions required to be taken, if any, to mitigate any adverse environmental impacts on receiving waters.

The Water Management Plan will also include processes to assess the behaviour of surface and groundwater under a range of rainfall frequency and duration events and will include geomorphological studies of the capacity of Lamberts Gully to accommodate any flow diversions

from Huons Gully. Further details on the Water Management Plan proposed are provided in the response to the NSW Office of Water (see Section 2.8.2)

Chemical composition of ash and brine and reuse of ash

Data on the chemical composition of ash is provided in **Table 2.3.** Ash composition is from routine sampling by Delta undertaken in mid-2009. The totals are raw sums which are not corrected for measurement accuracy on particular components.

- **Table 2-3 Chemical composition of ash**

% mass	LOI*	SiO_2	Al_2O_3	Fe_2O_3	TiO_2	K_2O	MgO	Na_2O	CaO	SO_3	Total
Mt Piper Fly Ash	2.0	70.5	23.1	1.2	0.9	2.2	0.2	0.2	0.3	0.1	100.9
Mt Piper Bottom Ash	0.5	70.2	24.7	1.8	1.0	2.3	0.2	0.3	0.3	0.1	101.5

*LOI is loss on ignition.

Chemical composition of brine is shown in **Table 2-4**.

As outlined in Chapter 2 of the EA, Delta is actively seeking opportunities for the reuse of all ash by-products from Mt Piper. Despite actively seeking these opportunities Delta has only been able to achieve ~20% re-use of all ash produced at Mt Piper.

Vegetation offsets

In the EA it is acknowledged that biodiversity offsets totalling 9 ha will be provided to compensate for the 8.9 ha of vegetation which will be removed. The location and details of the offset areas, including the timeframe of implementation, will be considered in consultation with DECCW.

Offset measures will not include the restoration, rehabilitation and revegetation of Lamberts Gully as this will be addressed as part of the site rehabilitation plan following the placement of ash in the area.

The sections of Neubecks Creek between the existing Mt Piper Power Station discharge point and Lamberts North are upstream of the project area and therefore not affected by the project. Hence any revegetation and stabilisation of these sections are not relevant to this project.

- **Table 2-4 Chemical composition of brine (source Aurecon 2007)**

Table 1.3 - Mt Piper Power Station - Chemical Composition of Brine

Parameter	Values from 1999 SEE				2003 - 2006
	Minimum	Maximum	Average *		
pH	7.6	8.2	7.9		8.1
Cond (us/cm)	46,500	85,600	63,664		127,982
TDS and Major ions		*(mg/L)*			
TDS	94,340	129,500	116,650		137,170
Alk ($CaCO_3$)	980	1,810	1,360		1,346
Cl	18,000	23,000	19,864		23,889
SO_4	41.600	59,000	49,670		66,767
NA	22,318	29,330	25,678		30,103
K	3,448	4,980	4,258		7,362
Ca	663	844	645		606
Mg	3,360	6,530	5,480		9,010
Trace Elements		*(ug/L)*			
As	386	450	409	^^^	143
Ag	2	<1	1.4	^^	<50
Ba	210	427	272	*	30
Be	-	-	17	^	5.8
B	49,100	95,000	73,560	*	115,000
Cd	16	20	19	+	42
Cr &	30	60	49	+	<50
Cu	5,300	9,900	7858	*	7,197
F	12,800	26,000	21,178	*	125,656
Fe	100	6,030	833	*	-
Hg	1.1	1.6	1.35	^^	-
Mn	12,500	22,500	17,530	*	34,000
Mo	2,450	2,840	2,600	^^	-
Ni	3,100	5,370	4,187	*	4,017
Pb	3.7	9	6	^^	-
Se	30	530	245	*	-
Zn	270	5400	2020	*	-

Notes: Notations relate to Average Trace element values, from 1999 Statement of Environmental Effects
* mostly 10 – 15 analyses (sources Hodgson, 1999) – AWT, 1996
** EPA (1999a) ^ one analysis ^^ 3 analyses ^^^ 5 analyses + 6 analyses
& Chromium is total chromium (CrVI <25ug/l)

2.7 Lithgow City Council

2.7.1 Submission

Lithgow City Council has responded in a submission that it supports the principles involved in ash emplacement. Concerns are raised, however, pertaining to the following issues.

Cumulative impacts of industrial development surrounding the locality of Blackmans Flat

Council has concerns that the cumulative impacts of heavy industrial development around the locality are not being substantially investigated as part of any EA.

Visual amenity

Council has concerns over the current heights of existing areas and substantial visual impact these emplacement areas have from Castlereagh Highway and believe that any increase to these current heights will continue to cause unacceptable visual impact. Council expects to see rehabilitation and landscaping conditions imposed to mitigate these concerns.

Transportation of ash

Council is concerned about the transportation of ash via truck on both public and private roads. It suggests that alternative transportation options be investigated.

2.7.2 Response

The following response is provided by Delta to address Lithgow City Council's submission on the Mt Piper Ash Placement Project.

Cumulative impacts of industrial development surrounding the locality of Blackmans Flat

Within the EA, cumulative impacts describe the sum of all effects over time resulting from a range of activities in proximity to the proposed ash placement areas. The cumulative impacts of specific environmental issues have been assessed as part of the overall assessment for those issues and can be found within the relevant chapters of the EA. For the issues where cumulative impacts have been identified and assessed (such as air, noise and water quality), the relevant developments that are currently functioning in the local area which were considered are generally defined within the background monitoring or modelling undertaken. It is not possible to assess with any acceptable level of accuracy the cumulative impacts on the local area of all potential developments which may be under consideration by other proponents.

Consultation undertaken with Agencies during the preparation of the EA specifically commented on the requirement for the assessment of cumulative impacts on air, noise and water of the proposal, given that the immediate area includes power generation (Mt Piper and Wallerawang power stations, Kerosene Vale ash repository) and coal mining activities (Lamberts Gully, Pine Dale, and Enhance Place mines).

Cumulative impacts have been considered for the following issues:

<u>Air quality</u>

The predicted maximum cumulative TSP, PM_{10} and deposited dust levels were assessed for the proposed ash placement areas based on the existing Mt Piper Power Station, the proposed extension to Mt Piper Power Station and also considered the nearby extension of the Kerosene Vale ash storage

area (approximately 4km southeast of the study area). The results of this cumulative assessment can be seen in Table 5-4 of the EA.

The cumulative impact for annual TSP and PM_{10} of the Mt Piper Extension (and associated ash placement site) and the Kerosene Vale ash storage area extension do not exceed the DECCW criteria of 90 and 30µg/m^3. Predicted annual average deposited dust is also within the DECCW criterion of 4g/m^2/month. It follows that the cumulative impacts of the Project will be at acceptable levels.

Noise and vibration

In accordance with the Director General's requirements, cumulative noise impacts from the Mt Piper and Wallerawang Power Stations have been considered as well as the influence from the Western Rail Coal Unloader, the Lamberts Gully mine, and the Springvale-Mt Piper overland conveyor. These sources have been incorporated into a single noise model, which predicts the total noise impact resulting from the identified noise sources.

Attended noise monitoring was undertaken at nearby receiver locations to establish the level and contribution of the various sources that comprised the noise environment for the survey. The results showed that intermittent operational noise from Lamberts Gully mine is audible during the daytime at both locations, but the influence of road traffic noise is the dominant daytime noise source at Blackmans Flat.

The cumulative impacts from surrounding industrial noise influences and the proposed ash placement area are predicted at the receiver locations and compared to the project specific noise goals identified in Table 4-1 of the EA.

Surface water

The DGRs required the EA to assess potential impacts on Neubecks Creek, Coxs River and Huons Creek from the proposed ash placement areas and to consider the cumulative impacts from other activities such as the operation of the Mt Piper Power Station, the current ash placement Area 1, coal mining in the area and the proposed Lithgow Council Waste Management Facility. The Council landfill site has yet to begin operation and as such it was excluded from the overall assessment of water quality. A review of the EIS for that facility was undertaken, however, which indicated potential water quality impacts from contaminants associated with leaching of land fill material as well as pollution from leaks and spills.

The effects on receiving waters were concentrated on Neubecks Creek which drains to Coxs River. Cumulative impacts from other activities within the drainage catchment were considered and the data presented suggested that the main contribution to elevated water quality parameters was due to past, underground coal mining activities rather than the existing ash placement works or the operation of Mt Piper Power Station.

Social impacts

An assessment of the cumulative social impacts affecting local residents was undertaken within the EA. While it is difficult to quantify the cumulative social impact on an area, consultation undertaken and the submissions received from the local community revealed a perception within the local community that the development of the new areas for ash placement will provide a further social burden on local residents, adding to the perceived impacts associated with the on-going coal and power generation activities, plus the new Council land fill and the proposed Mt Piper Extension.

Traffic

A traffic assessment was undertaken for the key roads likely to be utilised for ash placement construction activities. Any deliveries of equipment and materials to the site would occur throughout the construction period time, but such activity would be very minor. The two main roads in the area – Castlereagh Highway and Boulder Road, both are considered to have substantial spare capacity.

As the vehicle numbers using the public road system would be very small, cumulative traffic impacts would be negligible.

Visual amenity

As outlined within the EA, the proposed ash placement sites are located in a region dominated by open cut mining operations, State Forest and power generation facilities such as the existing Mount Piper Power Station and its current ash placement Area 1 located directly adjacent to the proposed development. As such, the study area is not located in an area of high scenic value.

During construction and operation of the ash placement areas, much of the preparatory work and later ash placement will initially be located below ground level with no visual impact on surrounding receivers.

The ash placement areas would be progressively established over a number of years. Following the placement of the ash into the Lamberts South and Lamberts North sites, the ash placement areas would be capped with a layer of reclaimed overburden and rehabilitated/revegetated in accordance with the Site Rehabilitation Plan which would be a requirement of the approval for the project.

Transportation of ash

Transportation of ash to the Lamberts North and Lamberts South sites will be as per the current system of transport for ash placement Area 1. This system utilises an enclosed belt conveyor which discharges into separate surge bins located at Area 1, from which the ash is discharged into an off-road articulated trailer-truck for ash placement. When the conveyor is out of service, ash is taken by truck from the power station to Area 1. Any transportation of ash for the Lamberts North and Lamberts South sites will be entirely on private haul roads. Section 3.4.2 of the EA notes that at some time in the future, the

economic benefit of the conveyor system in its current location may be reassessed and the conveyor realigned to service ash placement as it progresses further from the current location. In particular as placement continues into the Lamberts South area, it may become more viable to relocate or extend the ash transport conveyor toward the Lamberts South area.

2.8 NSW Office of Water

2.8.1 Submission

The NSW Office of Water (NOW) has reviewed the EA and states that the information presented in the EA and technical reports is insufficient to allow for an adequate assessment of potential impacts of the proposed ash placement site of Lamberts North and South, Neubecks Creek and Ivanhoe No.4. However, due to the importance of the Project, NOW has no objection to the concept and development of ash placement areas with recommendations to be implemented prior to project commencement. NOW made the following comments on the EA.

Surface water hydrology

- Climate Data Interpretation – A graph and annual average data is presented and clearly indicated that evaporation exceeds rainfall for all months except June, July and August. Elsewhere, the EA states that rainfall is higher than evaporation within the Mt Piper Area and so it remains uncertain that water will be available on site for dust suppression and rehabilitation.
- Water Courses – There has been no assessment for maximum harvestable rights dam capacity for the site catchments or a comparison of the Maximum Harvestable Right Dam Capacity (MHRDC) with the actual volume of these retention storages.
- NOW requests that Delta provide surface water and groundwater connectivity, water quality and ecological assessments and monitoring programs in Neubecks Creek, Huons Gully and Lamberts Gully in addition to the current water quality monitoring in Neubecks Creek.
- Quality – There are no detailed monitoring results presented in the EA.

Groundwater

- Regional Hydrogeology – NOW considers the search of groundwater bores in the EA inadequate. A bore search should be undertaken to identify all the users in the area of Mt Piper and Wallerawang power stations within a 5 km radius search from each power station. The EA should identify impacts to other water users due to potential groundwater contamination and any groundwater extraction and contingency measures should be developed.
- Water Levels and Quality Monitoring – There are no detailed monitoring results presented in the EA. Only approximate water levels are presented and no water quality data. No water level contours or flow direction maps have been provided along with detailed modelling results from the groundwater model conducted for the current ash disposal area. There are no monitoring bores

indicated for the concept areas and to date no groundwater monitoring has been conducted in them.

- Water is extracted from the Groundwater Collection Basin (GCB) for use on the current and proposed ash disposal areas. All extraction of groundwater is to be licensed.
- Groundwater monitoring program is to be conducted around all proposed ash disposal areas pre, during and post ash disposal. This program is to quantify groundwater quality and quantity within the area and develop trigger levels for negligible impact to ecosystems and other users.

Site water balance

NOW has concerns over the accuracy of the site water balance model and seeks clarification of the site water balance. The site water balance is to be revised prior to project commencement with the balance to take into account:

- The volumes of groundwater seepage into the GCB;
- Provide details on water usage for current ash disposal areas and predicted water usage requirements for years 1 to 5 for the proposed ash disposal areas;
- Updated evaporation calculations including net evaporation from storages; and
- Net runoff generated, stored and used.

NOW also recommends that the proponent identifies an alternative water supply for drought contingency.

Water Management Plan

Groundwater and surface water assessment methodologies and site locations are to be incorporated into the Water Management Plan within 6 months of approval and provide to NOW for review.

2.8.2 Response

The following response is provided by Delta to address NOW's submission on the Mt Piper Ash Placement Project.

Surface water hydrology

Climate data interpretation - The evaporation data presented in Figure 2-2 in Appendix D of the EA are based on evaporation from an open pan (Class A evaporation pan method), which is replenished on a daily basis. For this reason, Figure 2.2 represents evaporation as exceeding rainfall when in reality across the site it does not.

Additionally, although the Figure 2-2 shows the average evaporation exceeds average rainfall in 9 months of the year, the proposed ash placement facility will harvest rainfall runoff from across the catchments of the site, while the evaporation will be lost from water storages on the site. The water harvested from the catchments of the site will exceed the evaporation lost from the water storages at times throughout the year and therefore there will be water available on site to be used for dust

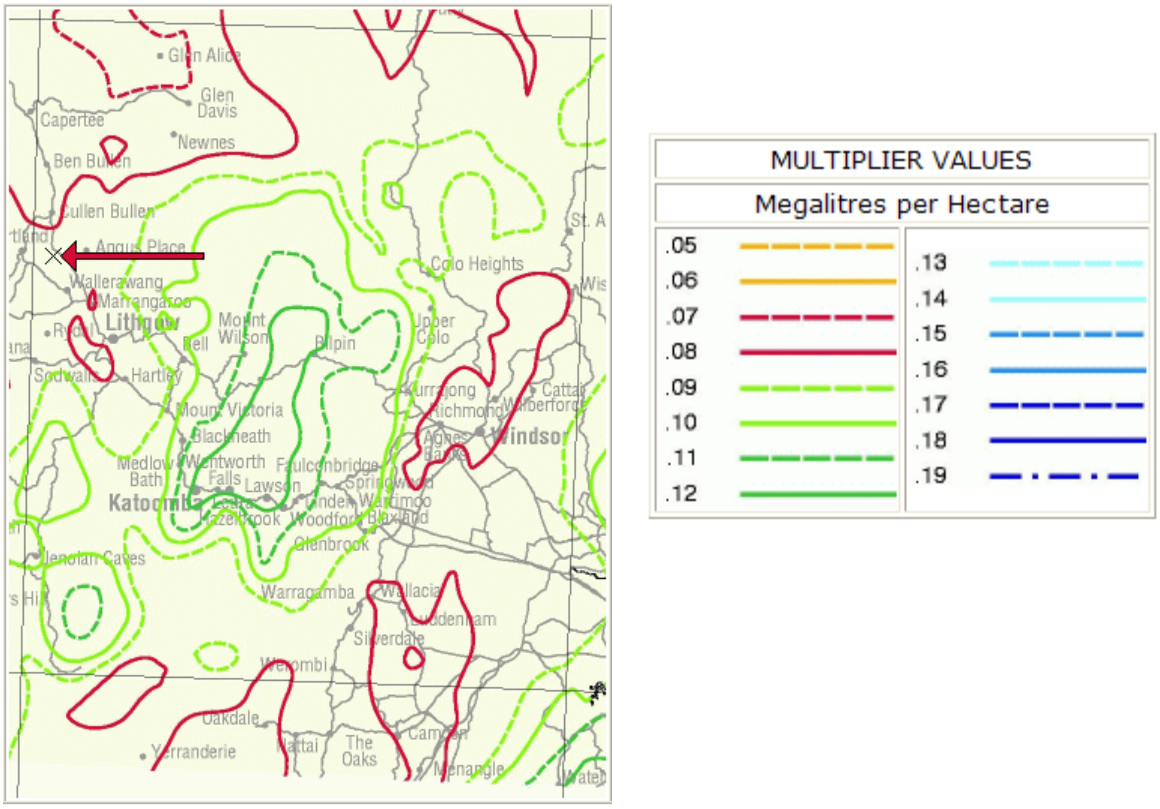
suppression and rehabilitation. Table 2-11 indicates that rainfall data were converted to runoff via conceptual soil storages dependent on land uses on the site, and that monthly average total evaporation was developed using historical data from 1908 to 2010.

Water courses - Landholders in rural areas of NSW are permitted to collect a proportion of rainfall-runoff from their property and store in one or more dams up to a certain size. This allocation of water is known as a 'harvestable right' which is generally intended for essential stock and household requirements but can be used for any purpose. Rural landholders in NSW can build farm dams on minor streams that capture up to 10 percent of the average regional rainfall-runoff for their property without requiring a licence.

The estimated harvestable rights multiplier is 0.8 for the Mount Piper Site, as shown below. This multiplier has been obtained using the online calculator on the NSW Office of Water website (http://www.farmdamscalculator.dnr.nsw.gov.au/cgi-bin/ws_postcode.epl).

Catchment areas for Huons gully and Lamberts Gully are shown in Figure 3-2 of the EA. **Figure 2-2** and **Table 2-5** show the catchment areas together with calculated MHRDC for the site.

- **Figure 2-2 Calculation of MHRDC multiplier (study point used to find harvestable right multiplier value indicated by arrow)**



- **Table 2-5 Site catchment areas**

	Catchment Area km^2 (ha)	MHRDC multiplier	MHRDC (ML)	Total Storage (ML)
Huons Gully	1.15 (115)	0.8	92	16.8
Lamberts Gully	2.59 (259)	0.8	207.2	74.5

Based on the information presented above, it is concluded that the water stored on site does not require a licence as the total storage is less than the MHRDC calculated.

Surface water quality - The surface water quality results provided in the EA are medians of data provided by Delta. As stated in Section 4.2.2 of the working paper (Appendix D of the EA) the original data at sites 0 and 1 are taken monthly from 2000 to 2009 and can be provided to the Office of Water. The data from sites 2 and 3 (2000 – 2007) were provided in summary form only from Centennial Coal. There are no other data or surface water quality monitoring sites available.

Surface water and groundwater connectivity and water quality monitoring programs for the site are to be developed in consultation with DECCW and NOW.

Drainage line diversions will have geomorphic assessments conducted. These will be undertaken as part of the detailed drainage design proposed for the site and be a requirement of the Surface Water Management Plan.

The Surface Water Management Plan will also provide greater definition regarding the proposed temporary sediment dams/ponds proposed during the construction and operational phases of ash placement. Temporary sediment dams would be dug close to and following construction of each placement area, then filled in as the ash is capped and rehabilitation is started. All sediment dams will be cleaned out as required to control run-off, or filled in when no longer required.

Groundwater

The EA stated that water levels in the vicinity of the operating open cut will probably rise on abandonment and backfilling and that the water table may also rise rapidly in response to heavy rainfall events.

Any water level fluctuations are likely to occur in the remaining underground mine workings and any mine water level rise discussed is generally within the existing below ground mine workings. These workings will be cleared by the coal extraction being undertaken and the areas back filled. It is considered unlikely that any water level rises would be above the overburden which is placed in the void once the coal is removed. As noted in Section 3.3.7 of the EA, site regrading / re-profiling of the base footprint of the ash placement areas will be undertaken to manage, divert and collect surface and

subsurface water. Fluctuations in groundwater will generally be confined to that area prior to general movement towards the GCB and Neubecks Creek. Brine conditioned ash will be placed about 30 m above the groundwater and this distance will act as a substantial buffer between the ash and the possibility of groundwater contamination from the brine treated ash.

As noted in Appendix D of the EA, modelling for brine ash was undertaken in 1999 and also in 2007 in Area 1 where there has been no recent mining. The modelling showed that water conditioned ash and brine conditioned ash contributed evenly to concentrations of groundwater discharging into Huons Gully and the GCB. Modelling also showed that there is a low risk that any trace elements generated from ash disposal would increase background levels by more than ANZECC guidelines at Huon Gully or the GCB. There would be no risks at Neubecks Creek, with extremely low concentrations predicted. It is expected that the conclusions drawn from this modelling would be applicable to the proposed Lamberts North and Lamberts South sites.

The subsurface hydrology has not changed. The modelling sought to justify the placement of brine conditioned ash at an adequate buffer distance from the groundwater; the same justification would apply to the new sites of Lamberts North and Lamberts South.

More detailed bore searches have also been undertaken – up to 5km radius around Mt Piper Power Station – and the results are shown in Appendix A. The results of this search have provided no further detail than that already discussed in the EA.

It is recognised that the distribution of groundwater bores to monitor the effects of the ash placement in Lamberts North and Lamberts South needs to be more extensive. The bore holes drilled in Lamberts Gully in December 2009 and discussed in the EA provided only what could be reported in the circumstances of an operating mine site. When better access is available to the sites (following cessation of mining) and as part of any construction works being undertaken a comprehensive groundwater monitoring program will be implemented, consistent with that in Area 1.

Detailed monitoring data and groundwater modelling (by UTS) for Area 1 are available and the results of these studies were discussed in the EA.

The establishment of new bore hole monitoring sites will form part of the Water Management Plan to be developed for the project. As noted in the EA (section 7.6.2) the information to be collected from any new bore holes established would include water levels, seasonal fluctuations and water quality test results. The water quality parameters would include pH, conductivity, ions (especially chloride) and trace metals. The groundwater modelling undertaken by UTS for the existing Area 1 will be further developed to include new ash placement areas. As with the previous consent for ash placement, the data from the monitoring sites and modelling would be reported and actions required to be taken, if any, to mitigate any adverse environmental impacts on receiving waters.

Site water balance

The performance of the water management system for Lamberts North and Lamberts South was assessed for the placement of ash generated from the existing Mt Piper Power Station and for the option of the existing plant plus Mt Piper Extension operation as a coal fired plant. The demand for water for dust suppression and rehabilitation was assessed as 250 kL/d and 450 kL/d respectively.

The water balance model was used to predict the reliability of the water for the rehabilitation and dust suppression demands. This water balance modelling predicts there will be suitable water availability to supply the rehabilitation and dust suppression demand for the proposed ash placement facility.

The reliability of water supplied for dust suppression and rehabilitation is regarded as moderate to high but, in the event of a significantly below average period of rainfall and a shortfall occurring, alternative management processes exist for water management and these were outlined in the EA. The minimum requirement for the management of roads and some working areas was assessed as being 120 kL/d. During these low water availability times, work areas would be minimised, DUSTEX or similar would be used and no water would be used for rehabilitation. Alternative management processes do not include alternative water supply as such an arrangement is not regarded as necessary.

An updated site water balance will be developed as part of the detailed design of the ash storage areas. This will include an allowance for groundwater seepage (previously not included due to the very low inflows predicted), confirmation of the water usage at the current ash placement area and predicted water usage for the new sites. Evaporation calculations will also be reviewed.

Water Management Plan

Groundwater and surface water assessment methodologies and site locations will be incorporated into a Water Management Plan which will be prepared, in consultation with NOW, six months prior to construction commencing. The plan will:

- Provide details of proposed surface and groundwater monitoring and modelling programs and reporting procedures for these programs;
- Identify ‘trigger” levels (assessment criteria) at which remedial measures or contingency plans would need to be initiated;
- Describe possible remedial measures or contingency plans likely to be employed should they be required;
- Provide for annual reporting of surface and groundwater assessment results showing any variations in groundwater quality and quantity relevant to established assessment criteria; and
- Identify the need for long term monitoring beyond the development period.

The Water Management Plan will also:

- Provide an updated site water balance assessment as part of the design development of the ash storage areas;
- Assess the behaviour of surface and groundwater under a range of rainfall frequency and duration events;
- Provide for geomorphological studies of the capacity of Lamberts Gully to accommodate any flow diversions from Huons Gully, and for these studies to inform the detailed design and later operation of Lamberts North and South; and
- Identify monitoring proposed for the concept development sites to be implemented prior to project approval being sought for those sites.

2.9 NSW Health – Sydney West Area Health Service Centre for Population Health

2.9.1 Submission

The following observations and recommendations have been provided by SWAHS in response to the EA.

Air quality

The proponent has conducted an air quality assessment including modelling on the operational phase of the project. It is noted however that the predicted impacts have not taken potential mitigating effects into account and as such may represent a worst case estimate for air quality during the operational phase of the project.

It is also noted that the background particulate matter data is from Bathurst, so may not take account of local sources of particulate matter. Thus, existing particulate air quality may be poorer than assumed in the assessment.

The air quality assessment considers only the first proposed ash emplacement site. Given the relative locations of the other proposed sites and prevailing wind directions it is possible that air pollution impacts on sensitive receptors will be more marked when operations move to the subsequent locations. Air quality modelling should be undertaken for each site prior to approval and include construction stage emissions.

A mechanism such as a community complaint hot−line should be required so that excessive dust impacts can be reported to the site and operations adjusted accordingly.

NSW Health recommends that:

- Air quality modelling should be undertaken for each site prior to approval and include construction stage emissions;

- Proposed mitigation measures should be required to minimise air quality impacts and should be linked, if possible, to approvals for each stage;
- Monitoring of weather conditions, including wind direction, should feed into operational decisions to limit generated dust;
- Local particulate monitoring is recommended for community reporting and for information about exposure to air pollution in the region;
- A community complaint should be provided to allow reporting of dust impacts and to allow operational adjustments.

Noise

It has been noted that the proposed operating hours of the facility from 6am could potentially cause increased risk of noise and sleep disturbance problems for local residents. The following recommendations have been proposed:

- The proponent should investigate the use of noise reduction barriers to protect local residents from any increases in noise levels to the sensitive receptors;
- A mechanism such as a community hot-line should be required so that noise impacts can be reported and documented and operations adjusted accordingly.

Water quality

The main concerns in terms of drinking water relate to the risks of ash contaminants making their way into the drinking water catchments. The following recommendations have been proposed by NSW Health:

- SWAHS would concur with the SCA recommendations that ground and surface water monitoring downstream of the ash repository be conducted and that a risk assessment of the leaching of contaminants under a range of rainfall conditions be done;
- SWAHS would also concur with the SCA recommendation that drains to convey these flood waters be appropriately sited, engineered and stabilised.

2.9.2 Response

The following response is provided by Delta to address SWAHS's submission on the Mt Piper Ash Placement Project

Air quality

Air quality modelling was undertaken for the Lamberts North and Lamberts South sites, as these are subject to a project application. The proposed development of the ash storage comprises a number of overlapping stages of construction, operation and remediation for the Area 1, Lamberts South and Lamberts North sectors. Dust emissions generated from the hauling of ash for emplacement and wind erosion from exposed ash disposal areas are the largest contributing sources to dust emissions during

the proposed works and emissions from these sources are deemed to be greatest during operation of the Lamberts South disposal area due to longer haul roads and greater disposal area. Therefore a worst case was adopted for the dispersion modelling accounting for the operation of Lamberts South and remediation of Lamberts North occurring in parallel. Early stages incorporating construction works and operation of either Area 1 or Lamberts North are likely to generate lower annual dust emissions due to the smaller haul road lengths and exposed areas.

At the time of the study no appropriate PM_{10} or TSP monitoring data were available near the study area and data available from the DECCW's monitoring station at Bathurst were used. While it is noted the closest DECCW monitoring station is located 45km to the west of the study area, Bathurst is considerably more built up than the area surrounding the project site and the monitoring data is considered to provide a conservatively high estimate of background PM_{10} concentrations in the vicinity of the study area.

This conservatism was confirmed from data from 2001 using a low volume (non-standard) air sampler in the area around Mt Piper power station. The data showed that annual average PM_{10} concentrations were around 2 $\mu g/m^3$ (compared with the criterion of 30 $\mu g/m^3$) but the short duration of the monitoring and non-standard measurement technique means that these data would not be considered to be adequate for characterising air quality in the Project area. The data are useful, however, in that they confirm that our approach to the assessment was conservative. The monitoring data from Bathurst was used to get an indication of air quality in the Mt Piper area and for the assessment it was assumed that background PM_{10} concentrations would be around 16 $\mu g/m^3$, which is much higher (more conservative) than the locally collected data.

Mitigation measures such as water sprays will be implemented as required and in response to the results of monitoring data. The operational monitoring program will include appropriate meteorological data (including wind direction) as an advisory on the potential for potential impacts on residential areas to the east of the site. The provision of operational air monitoring program will be a condition of approval for the Lamberts North and Lamberts South project application. The monitoring program would include measurement of local particulate matter.

Delta does not currently have a project specific 'hotline' in place to receive queries from the community. Delta will provide the community with contact details via newsletters, newspaper advertisements and the Delta web site for the Delta construction manager (during the construction period) and the Environment Manager/Western (during operation of the ash placement). Should any member of the community wishing to speak to Delta regarding any Mt Piper ash management issues they will be able to contact Delta via these means.

Noise

Noise reduction barriers have been considered within the EA. Mitigations outlined for noise reduction included the construction of earthen bunds around the boundary of the placement area, specifically consideration to provision of a bund around the boundary of the proposed Lithgow City Council Landfill Site.

The nature of the operations for the ash placement also 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 barrier's effectiveness would be decreased as the noise source moves further from it.

Water quality

The establishment of new surface water and groundwater monitoring sites will form part of the Water Management Plan to be developed for the project. As with the previous consents for ash placement, the data from the monitoring sites and modelling would be reported and actions required to be taken, if any, to mitigate any adverse environmental impacts on receiving waters.

The Water Management Plan will also include processes to assess the behaviour of surface and groundwater under a range of rainfall frequency and duration events and will include geomorphological studies of the capacity of Lamberts Gully to accommodate any flow diversions from Huons Gully.

3. Community Submissions

Members of the community responded to the Environmental Assessment in the form of submissions forwarded to the Department of Planning. In total, four submissions were received from the community and interest groups and responses to these submissions are provided below.

3.1 Submission 1

3.1.1 Submission summary

A respondent from the local community has expressed support for the project and encouraged the use of ash in concrete production.

3.1.2 Response

The support for the project is noted.

3.2 Submission 4

3.2.1 Submission summary

A respondent from the community has expressed the concerns outlined below.

General concerns

The respondent is totally opposed to the proposed Lambert's Gully North and Lambert's Gully South because the separation distance to the residences in Blackmans Flat is inadequate.

The respondent notes that if one option is to proceed then the respondent's support is for the Lamberts Gully South option. The support is only present if the proponent purchases the properties of the residents of Blackmans Flat.

The respondent notes that the existing zoning of the area is Rural 1(a) and not suitable for Heavy Industry, Waste Disposal or Extractive Industry.

The respondent expresses a view that the conclusions reached in the EA are deficient in the following areas:

Cumulative impacts

The noise, air quality, transport, groundwater and surface water pollution fail to take into account the cumulative impacts from other operating or proposed projects in the area.

Noise Assessment

Due to their locations, the noise emissions from the Lamberts North and South have potential for greater impacts on sensitive receivers than the existing ash repository.

Noise exceedances are identified under certain conditions at both Location 1 and 2.

Temperature inversions are not considered in the noise modelling and no consideration is given to wind movement.

Operational hours

The respondent does not agree with the proposed operating hours and suggest that operating hours should therefore be restricted to between 07:00 and 18:00 Monday to Friday and 07:00 and 17:00 on Saturday, and no work on Sundays.

Air quality

The respondent has a concern that the proposed Lamberts Gully North and South sites are closer than the existing facility to nearby residents in Blackmans Flat and therefore the residents will be more susceptible to increased dust in the air from vehicles carrying ash on the unsealed haul roads. The respondent also identifies that the air quality assessment has not assessed the impact of finer particulate matter ($PM_{2.5}$).

The respondent questions the air quality assessment discussing air quality exceedances in Bathurst rather than discussing air quality of Blackmans Flat.

The respondent outlines that there are other projects that are likely to proceed during the life of this project and that the Air Quality Assessment fails to consider the cumulative dust impacts.

Ash contaminants

The respondent suggests that given the new facility is proposed to be closer to and upwind of the homes of Blackmans Flat and that there will be an increase in the amount of airborne ash that will create serious problems in the area.

Visual impact

The respondent describes the current ash dump as an eyesore for everyone travelling along the Castlereagh Hwy to Mudgee. It is recommended that proper rehabilitation plans and enforceable timelines for staged and meaningful revegetation of the ash repository, its bund walls and retaining walls must be submitted prior to approval.

3.2.2 Response

The following response is provided by Delta to address the respondent's submission on the Mt Piper Ash Placement Project.

General concerns

Delta acknowledges the opposition to the project by some members of the local community. As outlined within the EA, ash removal, placement and storage are critical to the long-term ongoing operation of the existing Mt Piper Power Station. As a result, this project involving the provision of further storage areas for ash, is required to keep Mt Piper Power Station in service and so contribute to the maintenance of the existing level of power supply in NSW.

It is acknowledged that Blackmans Flat is close to the proposed development, especially Lamberts North, although the management measures outlined within the EA are demonstrated to be adequate to control potential noise, air and visual impacts on the residents.

The proponent does not intend to purchase the properties of residents of Blackmans Flat.

The existing zoning of the area is Rural 1(a). This is suitable for the proposed use and the use is permissible with consent under the Lithgow LEP.

Cumulative impacts

The noise, air quality and water studies undertaken addressed the Director-General's requirements and considered the cumulative impacts from other relevant projects in the area. This is discussed in the response to Lithgow Council's submission in Section 2.7.

Noise assessment

As noted in the EA, under neutral weather conditions, the operation of the ash placement areas for Lamberts North and South both indicate that compliance with the noise goals would generally be expected for both day time and evening periods. A marginal exceedance of the project specific noise goals may occur at Location 2 when operations reach the Lamberts South placement area by about 2023, based on current assumptions. 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 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 that, without mitigation, there may be exceedances for both receiver locations; 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.

Although these exceedances are marginal, the nature of the operations for the ash placement makes any mitigation needed 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. 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.

The modelling undertaken was consistent with the requirements of the NSW Industrial Noise Policy. This includes consideration of adverse weather where winds of 3 m/s in the direction of the receiver have been assessed. Temperature inversions were not assessed due to the limited hours of operation during the evening.

Operational hours

The proposed operating hours are consistent with those which apply at the existing ash placement area.

The noise and air modelling undertaken for the site assumed the operational hours listed in the EA and it was shown that, given appropriate mitigation measures, it will be possible to comply with noise and air quality goals at the times specified.

Air quality

Despite the new developments being closer to Blackmans Flat than the existing ash placement areas, the modelling undertaken was able to show that air quality effects from the operation of the new ash placement areas will meet relevant criteria and there should be no increase in impacts from the new works. Monitoring and appropriate mitigation measures will be provided to minimise any potential impact on residential areas.

While it is acknowledged that with decreasing size of particulate matter there is an increased chance of particles to penetrate the lower airways contributing to adverse health effect the *National Environment Protection (Ambient Air Quality) Measure 2003* does not currently enforce a standard for ambient $PM_{2.5}$ concentration. Only an advisory goal for the maximum 24-hour concentration (25µg/m^3) and an annual average concentration (8µg/m^3) is provided by NEPM; as such a quantitative assessment of predicted $PM_{2.5}$ concentrations as part of the proposed works is not required as part of the regulatory assessment process.

At the time of the study no PM_{10} or TSP monitoring data were available near the study area and data were used from the DECCW's monitoring station at Bathurst. While it is noted the closest DECCW monitoring station is located 45km to the west of the study area, Bathurst is considerably more built up than the area surrounding the project site and the monitoring data is considered to provide a conservatively high estimate of background PM_{10} concentrations in the vicinity of the study area.

Cumulative impacts from dust from ash storage were considered in the modelling undertaken for air quality.

Visual impact

As outlined within the EA, the ash placement sites are located in a region dominated by open cut mining operations, State Forest and power generation facilities such as the existing Mount Piper Power Station directly adjacent to the proposed development.

During construction and operation of the ash placement areas, much of the ash placement will initially be located below ground level with no visual impact on surrounding receivers.

The ash placement areas would be progressively established over a number of years. Following the placement of the ash into the Lamberts South and Lamberts North sites, the ash placement areas would be capped with a layer of reclaimed overburden and rehabilitated/revegetated in accordance with the Site Rehabilitation Plan which would be a requirement of the approval for the project.

3.3 Submission 5

3.3.1 Submission Summary

The respondent has expressed objection to the project as it will increase current cumulative impacts for the residents of Blackmans Flat and the surrounding environment.

The respondent is concerned about the stability of the ash repository and appreciates that while information has been given that all legislative requirements are met, there is no guarantee that a catastrophic collapse of the ash repository wall could not happen in the event of major natural disasters or due to possible structural weakness due to past history of blasting in the area.

The respondent wishes that Delta has an inclusive approach for the community within the approvals process.

3.3.2 Response

The following response is provided by Delta:

- Cumulative impacts have been considered in the EA, as required by the Director-General. The response to Lithgow Council's submission (provided in Section 2.7) provides a summary of the work done;
- Recent mining operations in Lamberts North and South have involved the stripping of overburden materials and removal of remnant coal seams and pillars that were left behind from previous underground mining operations. In most part the majority of the underground workings and voids have been removed and the area bulk backfilled with overburden materials. However, there may be some areas remaining that could be subject to longer term subsidence. The geometry of the ash repository is designed to achieve the required factor of safety in accordance with accepted engineering practice and methods for assessing the global stability of slopes taking into consideration the achievable strengths of construction materials, proposed batters slopes and design loadings (i.e. seismic and elevated water pressures).

  Construction of the repository will be undertaken under technical specification with required compaction requirements (moisture and density), with quality control testing and surveillance of the placed materials monitored to confirm material compaction and strengths are being achieved. Where materials do not meet the requirements, they will be replaced and re-compacted to meet the required specification requirements. Old underground workings and cavities below the proposed ash placement areas have been removed during subsequent open cut mining by Centennial Coal.

  As part of the detailed design, a review of underground mine working maps would be undertaken in conjunction with open cut mining records to assess which areas may be affected. Where the footprint is within such areas, an assessment would be made at that time on the need for any foundation treatment based on assessed risk and magnitude of subsidence predicted. Where necessary measures such as use of lower bridging layers to support potential voids/sink holes or grouting/backfilling of workings could be undertaken to address this concern.
- Delta will continue to consult the local community through its Western Region Community Reference Group and by other appropriate means.

3.4 Submission 10

3.4.1 Submission Summary

Water quality

The respondent has concerns regarding impacts to water quality for Neubecks Creek from saline metal contaminated brine as the ash placement areas are not lined.

Noise

The respondent states that they do not believe that Delta Electricity can manage noise or dust associated with the disposal of 786,500 m^3 of ash/year, or 2,100,000 m^3/year if a new 2000 MW coal fired power station is built, so close to and upwind of 13 homes in Blackmans Flat.

3.4.2 Response

The following response is provided by Delta:

- The impacts on receiving waters concentrated on Neubecks Creek which drains to Coxs River. The water quality in Neubecks Creek is derived from both groundwater and surface water contributions. The data presented suggested that the main contribution to elevated water quality parameters was due to past, underground coal mining activities rather than the existing ash placement works or the operation of Mt Piper Power Station;
- The potential impacts from noise and air quality on Blackmans Flat were addressed in the relevant parts of the EA. It is clear that, with appropriate mitigation measures, impacts will be able to be managed with or without the proposed Mt Piper Extension Power Station.

4. Statement of Commitments

4.1 Construction Environmental Management and Mitigation

Environmental management commitments proposed during the construction phase are shown in **Table 4-1** below. Where commitments have been added as a result of submissions made these are shown as underlined.

The commitments for the concept approval sites would often be the same as those for the project approval sites. Where they differ the sites to which they apply are shown in the table.

Table 4-1: 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, 8:00am – 1:00pm Saturday, with no construction 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: ■ 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 CEMP. The DMP would include the following mitigation measures and controls: ■ 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
Water quality		
No increased sedimentation of nearby	■ A Soil and Water Management Plan (SWMP) will be prepared and implemented to reduce the potential water quality impacts from the site during construction.	All

Objective	Action	Sites
waterways	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 *Soils and Construction* (Landcom, 2004) and would be maintained and monitored during the construction phase.	
Noise and vibration		
Minimise construction noise impact on surrounding residences	■ 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: ■ 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.	All
Indigenous heritage		
Protection of Indigenous Heritage relics if uncovered	■ Avoidance of sites in Lamberts South study area subject to Cultural Heritage Management Plan (CHMP) prepared prior to coal mining. ■ <u>The existing CHMP for the Centennial mine areas will be re-developed so as to continue the preservation of cultural heritage sites near the ash placement areas.</u> ■ 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.	Lamberts South <u>Lamberts South</u> All
Flora and fauna		
Minimise likelihood of direct impacts on quality habitat areas and to threatened species	■ <u>Prior to construction beginning at Lamberts South develop and implement a biodiversity offset in consultation with, and to the approval of, DECCW to compensate for the loss of 8.9 ha of vegetation</u> ■ Prior to construction beginning and where appropriate: ■ Preclearing surveys to identify habitat trees. ■ Removal of habitat features to be supervised by	<u>Lamberts South</u> All

Objective	Action	Sites
	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.	
Waste Management		
Minimise waste generated and maximise re-use and recycling. Waste disposal to be undertaken when re-use and recycle is not possible	■ A Waste Management Plan (WMP) would be prepared and implemented. This would include: ■ 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
Communication		
Establish effective communication with community and relevant agencies	■ A Communications Plan would be prepared and implemented. This would include: ■ 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

4.2 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 4-2**.

Table 4-2: Environmental Management Measures – Operational

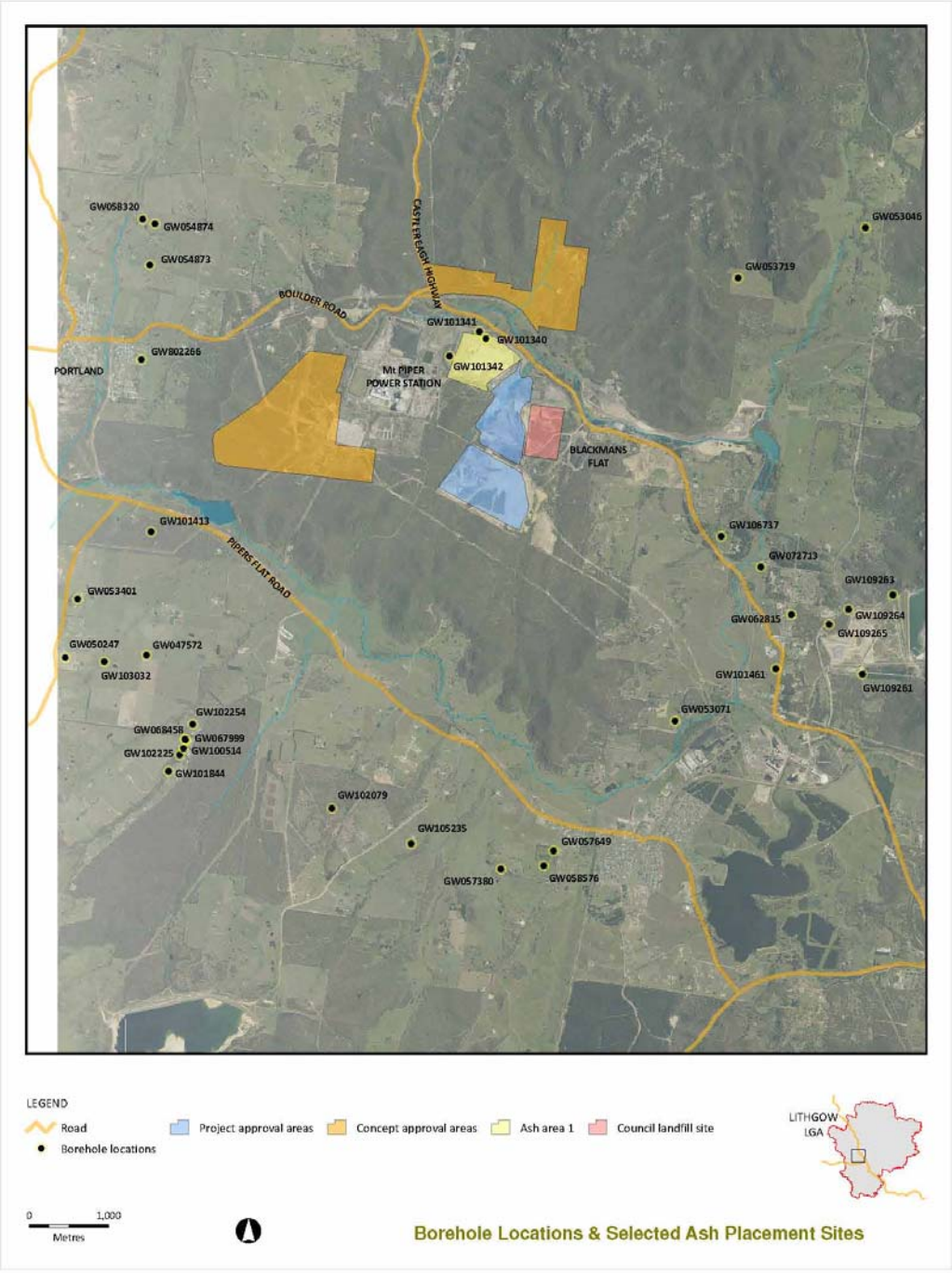
Objective	Action	Sites
Environmental Management		
Minimise impact of operations on surrounding area	An Operational Environmental Management Plan (OEMP) would be prepared and implemented to guide operational activities. It would include: ■ Environmental Management ■ Air Quality ■ Hydrology and Water Quality ■ Noise & Vibration ■ Landscape ■ Waste Management ■ Community Liaison All plans and strategies would be developed in consultation with the relevant agencies.	All
General	■ 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 Environment Protection Licence (EPL) for the site and be described in OEMP.	All
Rehabilitation	■ Rehabilitation of the site will occur progressively throughout the life of the placement areas once capping is completed. ■ A Rehabilitation Plan would be prepared for the sites addressing revegetation, landform, surface water management and monitoring and will be periodically updated during the progressive rehabilitation of the sites.	All
Air quality		
Minimise dust emissions from ash placement areas	■ The site operational plan would include management practices to be implemented to minimise potential for dust emissions. These would include: ■ Conditioning of ash with water or brine ■ Application of sprays ■ Use of water trucks ■ Equipment maintenance ■ Response to complaints. ■ An appropriate air quality monitoring program would be established to monitor ongoing operational air quality parameters. Any air quality monitoring program will be developed in accordance with relevant guidelines and policies and in consultation with DECCW prior to construction commencing.	All All

Objective	Action	Sites
Hydrology and water quality		
Maintain water quality in receiving waterways	▪ Manage water quality runoff by development of water management systems which: ▪ 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. Any releases would be subject to licence requirements. ▪ All sediment dams will be cleaned out as required to control run-off, or filled in when no longer required ▪ Manage groundwater quality by: ▪ Design of ash placement areas to provide buffer to groundwater and to place brine treated ash more than 30m above groundwater (RL 948m AHD) ▪ 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	▪ 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: ▪ 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	▪ 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

Objective	Action	Sites
Landscape and visual		
Improve and manage landscaping	■ A Landscape Management Plan (LMP) will be prepared during detailed design of the project and implemented during and after the ash placement period. The plan would include: ■ Processes for the management of on-site weeds ■ Use of native vegetation for rehabilitation of the sites once ash placement is finished ■ Monitoring of vegetation to ensure it becomes established and to identify any further management requirements ■ Use of screening vegetation to protect views from sensitive viewpoints	All
Community liaison		
Establish effective communication with community	■ Liaise with the community about the operation of the proposed ash placement areas via the existing community relations program - eg consultation with community forum and meetings with stakeholder groups. Provide avenues for community feedback.	All

Appendix A Bore Hole Data

Office of Water Borehole No	Depth (m)	Water depth (m below surface)	Yield (L/s)	Salinity
GW047572	28.9	No record	No record	No record
GW050247	30.5	No record	No record	No record
GW053046	58.5	No record	No record	0-500 ppm
GW053071	15.2	No record	No record	No record
GW053401	25.9	No record	No record	1001-3000 ppm
GW053719	60	No record	No record	V.Salty
GW054873	No record	No record	No record	No record
GW054874	30.4	No record	No record	No record
GW057380	42.7	No record	No record	No record
GW057649	23.5	No record	No record	Fair
GW058320	33	No record	No record	No record
GW058576	No record	No record	No record	No record
GW062815	56.7	No record	No record	Fair
GW067999	53.5	No record	No record	No record
GW068458	53.3	3.05	0.75	No record
GW072713	21.336	No record	No record	Good
GW100514	33	No record	0.75	No record
GW101340	26.9	2.55	No record	No record
GW101341	30.6	18.49	No record	No record
GW101342	28.7	27.2	No record	No record
GW101413	36	22	0.63	No record
GW101461	45	15	0.63	No record
GW101844	50	20	No record	No record
GW102079	43	3	1.51	Good
GW102225	53.4	No record	No record	No record
GW102254	38.1	6.4	0.06	No record
GW103032	58	No record	3	No record
GW105235	72	23.5	1.136	No record
GW106737	No record	No record	No record	No record
GW109261	18.03	9.8	No record	No record
GW109263	6	3.5	No record	No record
GW109264	14.3	4.5	No record	No record
GW109265	14.9	1	No record	No record
GW802266	114	5	0.189	No record


GW058320
GW054874
GW054873
GW053046
GW053719
CASTLEREAGH HIGHWAY
BOULDER ROAD
GW101341
GW101340
GW101342
GW802266
PORTLAND
Mt PIPER
POWER STATION
BLACKMANS
FLAT
GW101413
PIPERS FLAT ROAD
GW106717
GW072713
GW109263
GW053401
GW062815
GW109264
GW109265
GW050247
GW047572
GW103032
GW101461
GW109261
GW053071
GW102254
GW068458
GW067899
GW102225
GW100514
GW101844
GW102079
GW105235
GW057649
GW057380
GW058576
LEGEND
Road
Borehole locations
Project approval areas
Concept approval areas
Ash area 1
Council landfill site
LITHGOW
LGA
0
1,000
Metres
Borehole Locations & Selected Ash Placement Sites