MAJOR PROJECT ASSESSMENT
Kerosene Vale Stage 2
Ash Repository Area

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

November 2008

Published November 2008
NSW Department of Planning
www.planning.nsw.gov.au

EXECUTIVE SUMMARY

Delta Electricity (the Proponent) is a State-owned Corporation that manages a diverse set of electricity-generating assets located throughout NSW, including a coal-fired power station at Wallerawang, known as Wallerawang Power Station. The Wallerawang Power Station has a total electricity production capacity of 1,000 megawatts provided by two 500 megawatt generating units. The power station provides electrical output to the Sydney metropolitan region and Wellington in the central west of NSW.

A by-product of the electricity generation is ash (fly ash and bottom ash). Currently, ash is placed at the Kerosene Vale Ash Repository which is located approximately 2.5 km north-east of the Wallerawang Power Station. Ash is hauled to the Repository by trucks along a private haul road from the power station. Ash placement at the Repository was divided into two stages. The Stage 1 placement was designed to operate for five years and is now reaching its design capacity.

In order to maintain power production, additional ash disposal capacity is required. As such, the Proponent proposes to expand ash placement activities into the Stage 2 area. This area has an approximate capacity of 5.5 million cubic metres, and would provide an estimated 11 years of storage, bringing the total storage capacity at the Repository (Stages 1 and 2) up to 8.0 million cubic metres. The proposed expansion is subject to Part 3A of the *Environmental Planning and Assessment Act 1979* and requires the approval of the Minister for Planning.

The expansion of the Repository will require a number of engineering works to enable the ash placement activities to be completed safely including: the realignment of a section of Sawyers Swamp Creek which flows along the east and north of the site; construction of a stabilisation structure (berm); and modification of the on-site surface water management system.

The Department is satisfied that the Environmental Assessment provides a representative assessment of the issues and constraints associated with the project. The key environmental issues are operational noise impacts (resulting from ash haulage and placement), impacts on aquatic and riparian ecology, surface and groundwater impacts, hydrological impacts, dust generation, and the potential for sterilisation of coal reserves. These concerns were reflected within the submissions received during the exhibition of the Environmental Assessment. The Department acknowledges that the extent to which these impacts can be minimised or avoided is limited by the existing location of the Repository and its proximity to residents, coal reserves and Sawyers Swamp Creek.

The Proponent has proposed a number of management and mitigation measures to minimise the impacts of the project on the surrounding environment and community. These are reflected in the Statement of Commitments and include: limiting operations to 7.00 am to 10.00 pm to reduce noise impacts; monitoring of groundwater quality, surface water quality, aquatic ecology, noise and air quality so as to enable detection of, and timely response to, any identified impacts; implementation of erosion and sediment controls to reduce impacts on water quality; capping and progressive rehabilitation of ash placement areas to minimise dust generation and water infiltration (and hence potential leaching); implementation of a dust suppression system for all active areas of ash placement to mitigate fugitive dust emissions; and modified staging of ash placement activities to accommodate future potential coal mining at the Repository.

In addition, the Department has recommended conditions of approval which define performance standards that the project must meet and identifies monitoring and assessment requirements that build on the assessment undertaken to date as a means of ensuring the impacts of the project are minimised. These requirements include the evaluation and monitoring of noise, air quality, surface and groundwater quality and hydrology, the rehabilitation of aquatic and riparian environments, and the preparation and implementation of construction and operation environmental management plans. The Department has also recommended conditions of approval which require an adaptive management approach to the management and mitigation of impacts.

The project area is underlain by coal reserves with an estimated current export value of $123M. The Centennial Coal Company Ltd (Centennial) holds underground mining leases and surface exploration titles over the project area and intends to extract the coal from certain areas of the Repository in the immediate future provided that the necessary approvals can be obtained. The expansion of the

Repository does not necessarily preclude coal mining by Centennial. Both projects can proceed simultaneously provided that a cooperative approach to staging of their respective operations is undertaken.

In light of this, the Proponent has committed to revised staging of ash placement to address concerns related to coal sterilisation and to provide time for Centennial to investigate the feasibility of mining in the area and obtain the necessary approvals. The Department acknowledges that the modified timing only provides a limited window of opportunity for coal extraction but considers that it is the most reasonable and feasible measure available considering the Proponent is constrained by the need to continue to generate electricity and dispose of the ash by-product.

The Proponent's proposal to modify the staging has been reflected in the recommended conditions of approval which require ash placement activities to be managed in accordance with the staged placement activities detailed in the Submissions Report. The Department considers this to be the best balance in terms of providing an opportunity for coal extraction and ensuring the continued supply of electricity from the Wallerawang Power Station.

The Department considers that there is potential to reuse ash and therefore reduce the power station disposal needs and impacts on the community and natural environment. The Government has established a waste hierarchy of avoidance, resource recovery and disposal, and turning waste into recoverable resources is a priority for NSW. The ash produced from the Wallerawang Power Station should be seen as a resource, and not simply a waste, and managed accordingly. Consequently, the Department has recommended that Delta prepare and implement a Long-Term Ash Management Strategy, including a program for investigation and assessment of alternative ash management measures, with a stipulated goal of 40% reuse of ash by 31 December 2013. The percentage of reuse has been determined taking into consideration the market reuse opportunities and demand for ash from power stations. The Department considers that reuse in combination with disposal is a more balanced and sustainable approach which will ensure that ash management practices are optimised while reducing the environmental impacts of the project.

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

In summary, the Department is satisfied that the proposed project is on balance justified, in the public interest and can be designed, constructed and operated to meet acceptable environmental and amenity limits subject to the implementation of recommended conditions of approval and the Proponent's Statement of Commitments. Consequently, the Department recommends that the Minister grant approval for the Kerosene Vale Stage 2 Ash Repository.

CONTENTS

1. BACKGROUND

1.1 Ash Generation and Management at the Wallerawang Power Station

Delta Electricity (the Proponent) is a State-owned Corporation that manages a number of electricity generating facilities throughout NSW, including a coal-fired power station at Wallerawang known as Wallerawang Power Station. The power station has a capacity of 1,000 megawatts provided by two 500 megawatt generating units. The production of this electricity requires the use of approximately 2.4 million tonnes of coal per annum.

Ash is produced as a by-product of electricity generation through the burning of coal. Two types of ash are produced at the power station – bottom ash (10-20% of the total) and fly ash (80-90% of the total). The combustion of coal produces between 450,000 and 500,000 tonnes of ash per annum which is currently stored at the Kerosene Vale Ash Repository (refer Figure 1). Ash is transported to the Repository in trucks via a private haul road. The Repository was originally constructed between 1960 and 1990 during which time it was filled with a combination of by-product ash from the Wallerawang Power Station and mining spoil, and capped. Delta Electricity recommenced placing ash at the Repository in 2002 upon changing from wet to dry ash producing activities at Wallerawang Power Station. Prior to 2002, wet ash was pumped via a pipeline system to Sawyers Swamp Creek Ash Dam (see Figure 1).

Figure 1: Stages 1 and 2 Ash Placement Areas – Kerosene Vale Ash Repository
(Parsons Brinckerhoff, 2008)

Ash placement activities at the Repository have been divided into two stages (refer Figure 1). Stage 1, which comprises placement of ash in the south-western area of the site, was approved in 2002 and is reaching design capacity. Delta Electricity is seeking Project Approval to extend its existing dry ash placement activities at the Repository into the Stage 2 area to provide capacity for additional ash storage for

an estimated 11 years. Approval is being sought under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 Location

The Repository is located within the Lithgow Local Government Area, some 2.5 km north-east of the Wallerawang Power Station (Figure 1) and 10 km north-west of Lithgow (Figure 2). It is 1.5 km east of Lidsdale and approximately 4.5 km north-east of the community of Wallerawang.

The project is located within the boundary of the power station on Delta owned land consisting of the following lots in Wallerawang:

- Lot 16 DP 555844;
- Lot 17 DP 855844; and
- Lot 5 DP 829137.

Figure 2: Project Location
(Parsons Brinckerhoff, 2008)

1.3 The Surrounding Environment

The Kerosene Vale Ash Repository is located within the upper catchment of the Coxs River, which forms part of the Hawkesbury-Nepean River system and flows to Lake Burragorang. The site is adjacent to the Sawyers Swamp Creek Ash Dam, and Sawyers Swamp Creek flows along the eastern and northern boundaries of the site. This creek joins the Coxs River immediately to the north of the town of Lidsdale, approximately 2 km downstream from the site.

Land zoning in the area is mainly rural and predominant land uses in the surrounding area include coal mining, livestock grazing, and timber production in the adjacent Newnes State Forest. The nearest town is Lidsdale.

Approximately 25 hectares (or 65%) of the Stage 2 placement area falls within areas subject to mining leases and four small areas have been identified as being of interest for future coal mining (refer Section 5.7 of this report). The majority of these areas are located on the eastern and northern edges of the proposed Stage 2 placement area.

Three vegetation communities occur on the site – pine plantation (12 hectares in the south east), remnant woodland (0.7 hectares in the west) and native revegetation area (21 hectares occupying the majority of the site). The native revegetation community is in poor condition.

2. PROPOSED DEVELOPMENT

2.1 Project Description

The proposed Stage 2 ash placement activities would involve the extended use of the Kerosene Vale Ash Repository from the open face of Stage 1 to the edge of the original storage area (see Figure 1), for the storage of ash generated at the Wallerawang Power Station. The extension would have a capacity of 5.5 million cubic metres and provide for approximately a further 11 years of ash placement. A description of the ash management activities is provided in Section 2.2.

In order to enable the proposed Stage 2 ash placement activities to be undertaken safely, a number of engineering works are proposed in parallel with ash placement activities including:

- realignment of approximately a 380 m section of Sawyers Swamp Creek along the northern side of the site;
- construction of a stabilisation structure (berm) along the length of the existing bund wall on the northern side of the site to strengthen and stabilise the existing wall;
- development of a surface water retention structure to capture runoff from the site; and
- relocation of the existing water transfer system from Sawyers Swamp Creek ash dam and the associated retention canal.

The construction activities will be undertaken in parallel to operations and will form part of the ongoing management contract for the Repository. There will be no increase in the number of operations staff. The construction workforce is anticipated to peak at approximately 20 personnel.

2.2 Ash Management

Ash generated by the Wallerawang Power Station is pneumatically conveyed from the point of generation to two storage silos located at the power station. The ash is conditioned (with water) to approximately 15% moisture content to minimise the potential for dust generation and enhance compaction on placement over the Repository. The conditioned ash is then transported from the storage silos to the Repository in semi-trailers or trucks with attached dog-trailers via an existing private haul road (refer Figure 1). It is estimated that approximately 130 vehicle trips per day (i.e. 65 delivery and return empty cycles) would be required.

The Proponent has indicated that truck movements and ash placement are proposed to be restricted to 7 am to 10 pm, Monday to Sunday except in emergency or abnormal operational situations where movements may be required outside of these hours. Such situations include the breakdown of plant and/or equipment at the Wallerawang Power Station or Repository.

On delivery to the Repository, the ash would be deposited at the operating ash placement area. Lifts, compactors and bulldozers would be used to place the ash in stable landforms. The Environmental Assessment proposes that ash placement would occur in stages with placement commencing in the easterly corner working back to the boundary with the Stage 1 area and then north towards Sawyers Swamp Creek. However, this has been amended to allow an investigation to mine coal in certain areas of the Repository (refer Section 5.7 of this report).

Capping of the exposed ash areas would be undertaken progressively as ash areas reach the proposed design height of 940 m Australian Height Datum. This equates to a maximum height of 25 m above the existing surface level. It is proposed that capping material would be obtained from the pine plantation area in the south east of the site. The Repository would be revegetated on completion of ash placement. The design life of the Repository has been estimated at 11 years based on current power production and associated ash quantities and assuming nil reuse.

2.3 Project Need

Additional ash disposal capacity is required to ensure the longevity of the power station's operation as the disposal capacity of the current area will be exhausted by the end of 2008. The power generating units at the Wallerawang Power Station have asset design lives to 2026 and 2031. Should additional ash disposal capacity not be found, the power station would be forced to reduce operations to extend the life of the Stage 1 area, and eventually cease operating which is neither a viable nor feasible outcome.

At present, there has been limited market interest in the reuse of ash from the power station. The Proponent has been actively supporting research into the reuse of ash and is committed to providing continued support as well as pursuing potential market opportunities. While the Proponent seeks alternative methods of ash disposal, including reuse, it is proposed to expand the Repository as a means of securing the continued operation of the power station. Continued operation is required to ensure the reliability and security of the State's electricity supply.

The Environmental Assessment presents a number of options and justifies the selection of the preferred option (expansion of the Kerosene Vale Repository) on environmental and economic grounds. Whilst the Department concurs with the Proponent in the need for additional ash disposal capacity to ensure the viability of the Wallerawang Power Station, it considers that further review and optimisation of ash management measures is required in granting project approval. This issue is addressed in Section 5.1 of this report.

3. STATUTORY CONTEXT

3.1 Part 3A of the Act

By way of an Order published in the Government Gazette on 29 July 2005, the Minister for Planning declared under section 75B(1) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) that development would be subject to Part 3A of the Act where:

- it is an activity subject to Part 5 of the EP&A Act for which the Proponent is also the determining authority; and
- in the opinion of the Proponent, the activity would significantly affect the environment and would (in the absence of the Order) require an environmental impact statement (EIS) to be obtained.

The proposed project is classified as an activity under Part 5 of the Act for which the Proponent is also a determining authority. The Proponent also determined that the project would significantly affect the environment, and therefore would have required the preparation of an EIS. Consequently, the project is subject to the Minister's declaration and is a project to which Part 3A of the Act applies.

3.2 Permissibility

The project site falls within the local government area of Lithgow and is zoned 1(a) Rural (General) under the *Lithgow Local Environmental Plan 1994* (LEP). Pursuant to the LEP, the proposed development is permissible only with Council consent. However, the LEP adopts the Environmental Planning and Assessment Model Provisions with respect to public utility undertakings and, as such, nothing in the LEP shall be construed as restricting or prohibiting or enabling the consent authority to restrict, prohibit or enable the carrying out the project i.e. the project is permissible without consent.

3.3 Relevant Environmental Planning Instruments

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

The project involves the realignment of a section of Sawyers Swamp Creek. This creek flows into the Coxs River which is a part of the Sydney drinking water catchment. However, the *Drinking Water Catchments Regional Environmental Plan No.1* does not apply to the project by virtue of section 75R(3) of the EP&A Act.

3.4 Minister's Approval Power

On 27 February 2007, the Director-General issued Environmental Assessment Requirements for the preparation of an Environmental Assessment report for the project, pursuant to section 75F(3) of the EP&A Act. The Proponent submitted a draft Environmental Assessment report to the Director-General in February 2008. The draft report was considered inadequate. The Proponent submitted an amended report in March 2008 which adequately addressed the Director-General's requirements issued for the Project Application.

The Project Application and accompanying Environmental Assessment were placed on public exhibition from 2 April 2008 until 5 May 2008 and submissions invited in accordance with Section 75H of the EP&A Act.

The Department has met all of its legal obligations so that the Minister can make a determination regarding the project.

3.5 Commonwealth Legislation

The Proponent determined that the project would be unlikely to have a significant impact on any matters of national environmental significance or potential habitat. Therefore, a referral to the Commonwealth Department of the Environment, Water, Heritage and the Arts under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was not made.

4. CONSULTATION AND ISSUES RAISED

4.1 Introduction

The Department received a total of nine submissions of which five were from Government agencies and four were from the public. Five of the submissions were received during the exhibition of the Project Application, and four were received following the close of the exhibition period. A supplementary submission was received from the Department of Environment and Climate Change in response to the submissions which were forwarded to it pursuant to section 75(H)(b) of the EP&A Act.

4.2 Submissions from the Public

Four public submissions were received and consisted of one from a special interest group, one from a mining company and two from local residents. Key issues raised in the submissions are summarised below.

1. Noise impacts, including:
   - operational noise levels associated with ash haulage and placement, particularly at night time and in the early hours of the morning;
   - adequacy of the noise assessment; and
   - the impact on residential amenity.
2. Impacts on aquatic ecology resulting from the realignment of Sawyers Swamp Creek.
3. Impacts on surface water quality and hydrology resulting from ash placement and the realignment of Sawyers Swamp Creek.
4. Groundwater quality and hydrological impacts arising from ash placement.
5. Potential sterilisation of coal resources.
6. Need for alternative methods of ash management and transfer.
7. Decrease in property values.
8. Ineffective complaints handling system.

4.3 Submissions from Government Agencies

The Department received submissions from the Department of Environment and Climate Change, the Department of Primary Industries (Fisheries), the Department of Primary Industries (Coal Advice and Resource Assessment), the Sydney Catchment Authority and the Department of Water and Energy.

Each of the agencies identified a number of key issues for further consideration/information including: noise impacts; ecological impacts; surface and groundwater quality impacts; hydrological impacts; air quality impacts; and operating hours and operational arrangements.

Comments made by each agency are summarised below.

- The ***Department of Environment and Climate Change*** (DECC) indicated support to the project but identified a number of concerns relating to operational noise, dust and the method of ash placement. With respect to operational noise, the DECC recommended an operational noise criterion and the construction of a noise barrier or alternatively a new access route to minimise the impact of truck haulage on sensitive receivers. It also recommended that noise monitoring be undertaken and stipulated recommended hours for operation and construction.
- The ***Department of Primary Industries (Fisheries)*** (DPI - Fisheries) was satisfied with the recommended management and mitigation measures in the Environmental Assessment and recommended that a Site Management Plan be prepared to address the management of the Sawyers Swamp Creek realignment, riparian restoration, and surface and groundwater quality and flows. DPI (Fisheries) also recommended monitoring of the aquatic ecosystem and that compensation be provided for the loss of any aquatic habitat and the impact of the development on local waterways.
- The ***Department of Primary Industries (Coal Advice and Resource Assessment)*** (DPI-CARA) indicated a need to consider the potential for coal sterilisation in determining the Project Application.
- The ***Sydney Catchment Authority (SCA)*** raised concerns over the potential impacts of the project on surface and groundwater quality and recommended requirements for surface and groundwater quality monitoring, including impact assessment criteria and the need for a response plan to address exceedances against criteria and any observed impacts. The Authority also recommended that the proponent be required to install in-stream controls in the reach upstream of the proposed realignment of Sawyers Swamp Creek and expressed concern with the potential impact of the use of bottom ash in on-site structures on water quality.

- The ***Department of Water and Energy*** (DWE) recommended the preparation of a Vegetation Management Plan and Works Plan for the realigned section of Sawyers Swamp Creek, including requirements relating to site rehabilitation, in-stream stability, riparian zone management, and monitoring of water quality, riparian restoration, and creek hydrology.

4.4 Submissions Report

On review of the issues identified in submissions, the Department required the Proponent to prepare a Submissions Report to address each of the issues raised. As part of this process, the Proponent reviewed each submission and made specific comment on each of the issues raised.

On the basis of the submissions received from the Centennial Coal Company Ltd (Centennial) and the DPI (CARA), the Proponent intends to modify its staging of ash placement and construction activities so as to extend the time period before identified coal reserves are potentially sterilised. The proposed modifications are as follows:

- Ash placement - the placing of ash was originally proposed to head in an easterly direction from the Stage 1 area into the pine plantation area and then in a northerly direction. To allow access to the coal reserves, the Proponent now proposes to place ash in a north-easterly direction and then move to the areas over the pine plantation providing 9-12 months for Centennial to gain the necessary approvals and commence extraction in south-west area of the Repository (refer Section 5.7 of this report);
- Realignment of Sawyers Swamp Creek – realignment of the creek would be delayed from early 2009 until late 2010 to allow Centennial the opportunity to seek approval and extract coal resources in the northern part of the Repository; and
- Surface water management – to facilitate the revised staging, surface water runoff would be directed in a southerly direction back to the existing surface water canal and the originally proposed pond until placement moves to the pine plantation area.

It is considered that these amendments are acceptable and do not significantly change the nature and scope of the original proposal nor will they result in additional adverse impacts. As such, the Department was satisfied that a Preferred Project Report was not required for the project.

The Department provided the opportunity for Government agencies and the local Council to comment on the Submissions Report. The DECC, SCA, DPI (Fisheries), and DWE provided further comment to the Department.

The DECC restated proposed operational noise criteria for the project and recommended the construction of a noise barrier along the private haul road to reduce noise impacts and ensure compliance with noise criteria.

The SCA reiterated the need for conditions of approval relating to groundwater and surface water quality monitoring, the investigation of exceedances in water quality criteria, and the development of response plans to address exceedances and impacts. The Authority also recommended the provision of information on the water quality impacts of the reuse of ash in on-site structures and associated mitigation measures as an alternative to prohibiting such use.

The DPI (Fisheries) reiterated its recommended conditions of approval and indicated that it had no concern regarding the proposed modifications to the project.

The DWE noted the Proponent's commitment to address its recommended conditions of approval by way of implementation of a rehabilitation plan for Sawyers Swamp Creek and sought reassurance that this would occur.

5. ASSESSMENT OF ENVIRONMENTAL IMPACTS

After consideration of the Environmental Assessment, submissions received, Submissions Report, and the Government agency responses to the Submissions Report, the Department has identified the following key environmental issues associated with the project:

- ash management;
- noise impacts associated with operations and construction;
- ecological and hydrological impacts associated with the realignment of Sawyers Swamp Creek;
- surface and groundwater quality impacts;
- air quality impacts; and
- sterilisation of coal reserves.

The Proponent has also assessed the potential impacts of the project on soils (including erosion and sedimentation), Aboriginal and non-indigenous heritage, traffic and landscaping, and considered the impacts associated with lighting of operations and waste generation. These issues are considered to be minor and although adequately assessed, require consideration and specific conditions of approval. The Department's consideration of these issues is addressed in Section 5.8.

5.1 Ash Management

Issue

The Project Application and Environmental Assessment are based on 100% disposal of ash from the Wallerawang Power Station at the Kerosene Vale Ash Repository. The Proponent has committed to continue discussing and investigating ash reuse options and opportunities, and contributing to and supporting research to assess, improve and explore new reuse options for fly and bottom ash. However, there is no commitment from the Proponent towards a goal for reuse.

Issues Raised in Submissions

One public submission raised the fact that ash reuse occurs in other countries and questioned what research had been undertaken on ash reuse in Australia.

Consideration

Whilst the Department concurs with the Proponent in the need for additional ash disposal capacity to ensure the viability of the Wallerawang Power Station beyond 2008, it considers that further review and optimisation of ash management measures is required in granting project approval. Fly ash can be beneficially reused in a number of applications including the manufacture of cement, brick and building blocks, as a stabiliser in fill and road bases, backfilling of mine sites and horticultural uses. A number of power stations in NSW already reuse ash including Eraring Power Station which reuses 32% of its ash in cement manufacturing.

Turning waste into recoverable resources is a priority for NSW and, in keeping with this philosophy, the Department believes that the Proponent should reuse a portion of ash as an alternative to disposal at the Repository. This would not only extend the life of the Repository but also have the flow on effect of delaying the sterilisation of other land areas which would be required for ash placement once the design capacity of the Repository has been reached. Consequently, the recommended conditions of approval include a requirement for the preparation and implementation of a Long-Term Ash Management Strategy including a program for investigation and assessment of alternative ash management measures, with a stipulated goal of 40% reuse of ash by 31 December 2013. The Department considers that the recommended condition provides a balanced and sustainable approach to ensuring the viability of the power station in the future, optimising ash management practices at the power station and minimising environmental impacts to acceptable levels within the context of the need for the project.

5.2 Noise and Vibration

Issue

<u>Operational Noise</u>

The key noise generating activity associated with the operation of the project will be the haulage of ash by trucks along the private haul road, and return of empty trucks. Sensitive receivers located to the west of the private haul road between the Repository and Wallerawang Power Station are already exposed to elevated truck noise levels associated with the existing haulage of ash along the private haul road and to noise from

machinery used in ash placement. They are also exposed to the noise of coal trucks which travel along the private haul road from the Angus Place Colliery in the north to the Wallerawang Power Station. Residential properties at Lidsdale are between 15 and 40 metres lower than the haul road which runs on a ridge separating the Repository from Lidsdale.

At present, ash haulage may occur 24 hours a day. Under the project, it is proposed that haulage be limited to 7.00 am to 10.00 pm seven days a week, except during emergency events, significantly decreasing night-time (10.00 pm to 7.00 am) noise impacts. However, the elimination of night-time haulage will have the effect of intensifying the number of truck movements, and hence noise, during the daytime and evening period. The worst case scenario is 12 ash truck movements per 15 minute period.

Operational noise generated by the haulage of ash has been assessed in accordance with the *NSW Industrial Noise Policy* (EPA, 2000) and considered both intrusive noise impacts and the impact on local noise amenity during the daytime (7.00 am to 6.00 pm) and evening period (6.00 pm to 10.00 pm). Table 1 sets out the adopted noise goal and predicted noise impacts for ash haulage at receivers under neutral meteorological conditions, as determined by the Proponent. Figure 3 shows the location of the monitoring stations.

Table 1: Predicted Operational Noise Impacts

Location	Time Period	Noise Goal	Existing Ash Haulage Noise Levels $L_{Aeq,\ 15\ min}$ dBA	Predicted Ash Haulage Noise Levels $L_{Aeq,\ 15\ min}$ dBA	Change in Ash Haulage Noise Levels from Existing Operations	Cumulative Ash and Coal Haulage Noise Levels $L_{Aeq,\ 15\ min}$ dBA
Site 1 Skelly Rd	Worst case 15 min scenario	42	38.5	39	+0.5	42
	Daytime	42	30	31.5	+1.5	35.5
	Evening	43	29	31	+2	35
Site 2 Skelly Rd	Worst case 15 min scenario	42	34.5	35	+0.5	37
	Daytime	42	24.5	26	+1.5	30
	Evening	43	23.5	26	+2.5	30
Neubeck St	Worst case 15 min scenario	42	38.5	39	+0.5	42
	Daytime	42	30	31.5	+1.5	35.5
	Evening	43	29	31	+2	35
Site 3 Wolgan Rd	Worst case 15 min scenario	42	29.5	30	+0.5	33
	Daytime	42	20.5	22	+1.5	26
	Evening	43	19.5	21.5	+2	26
Site 4 Maddox Ln	Worst case 15 min scenario	42	25.5	26	+0.5	29
	Daytime	42	17	18.5	+1.5	22.5
	Evening	43	16	18	+2	22.5
Site 5 Woodlands	Worst case 15 min scenario	42	24.5	25	+0.5	28
	Daytime	42	15.5	17	+1.5	21
	Evening	43	14.5	17	+2.5	21

Based on the noise assessment, the Proponent determined that daytime and evening noise impacts associated with ash haulage are expected to increase by up to 2 dB(A) and 2.5 dB(A), respectively. Worst case 15 minute scenario noise impacts were determined by the Proponent to increase by less than 1 dB(A). These increases are compliant with the adopted intrusive noise design goals for the project. In addition, the predicted noise levels from fly ash truck movements are predicted to be compliant with the Proponent's adopted noise goal.

Figure 3: Noise Monitoring Locations
(Parsons Brinckerhoff, 2008)

Noise will also be generated by heavy equipment (bulldozer and compactor) used in ash placement. The Proponent has assessed that the noise impact will be no greater, and in some instances less, than the current operations due to the increased distance between ash placement activities and sensitive receivers, with predicted noise impacts being 9-10 dB(A) less than the noise goals determined in accordance with the *NSW Industrial Noise Policy* (EPA, 2000).

In regards to the cumulative impact of ash trucks and coal trucks, the Proponent has determined that noise levels are predicted to result in compliance at sensitive receivers during the daytime and evening periods. However, worst case 15 minute scenario noise impacts at some receivers along Skelly Road and Neubeck Street will be at the level of the intrusive noise design goal determined by the Proponent (refer Table 1) which raises the need for further consideration of noise impacts.

Construction Noise

Noise will be generated by the operation of dump trucks, excavators and bulldozers required for the construction of the stabilisation berm, realignment of Sawyers Swamp Creek, modification of the internal surface water management system, and extraction of capping material from the former pine plantation area. The impact of construction noise has been assessed in accordance with the *Environmental Noise Control Manual* (EPA, 1994) which allows a 10 dB(A) increase above current background noise levels where the construction period is between four and 26 weeks. Construction noise levels have been predicted to be compliant with the noise design objectives at all potentially affected receivers.

Heavy vehicle movements associated with the construction stages of the project will be limited to a total of approximately 30 heavy truck movements as only limited materials and equipment will need to be delivered to the site. The Proponent has indicated that such a low number of movements will not have a major impact on local or regional traffic and has committed to developing and implementing noise management measures as part of the Construction Environmental Management Plan for the project.

Sleep Disturbance
The emission of peak noise levels for an instant or very short time period may cause sleep disturbance to residents. Sleep disturbance criteria have been developed for the operation of the project in accordance with the *Environmental Noise Control Manual* (EPA, 1994). However, an assessment of sleep disturbance was not undertaken as ash haulage and placement will no longer be undertaken during the night-time, except in emergency situations.

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

Issues Raised in Submissions

Noise generated by trucks hauling ash along the private haul road was the main concern addressed in the public submissions. In addition, other truck generated noise (including reversing alarms and closing of tail gates), and machinery operating throughout the night and/or during the early hours of the morning, and the impact of such noise on sleep, amenity and property values due to the proximity of operations to sensitive receivers were also concerns. The need for a noise barrier was raised in addition to restricting operating hours, use of a conveyor system to transfer the ash, increasing ash storage capacity at the power station, relocating the haulage route and point of site access, and ineffective complaints handling procedures.

The DECC stated that it was satisfied with the assessment and recommended conditions relating to the hours of operation. It also recommended an operational noise criterion of 40 dB(A) $L_{Aeq\ (15\ minute)}$ for operations and that noise monitoring be undertaken and assessed against the criterion specified by DECC. It also recommended that the Proponent implement mitigation measures to ensure that noise impacts comply with the noise criterion.

In further correspondence, the DECC strongly recommended the establishment of a noise barrier along that section of the haul road that runs adjacent to Skelly Road, or alternatively the construction of a new haul road to access the site in the south, to guarantee compliance with the operational noise criterion, including criteria for sleep disturbance. Following its review of the Submissions Report, the DECC reiterated its proposed operational criterion and the need for the construction of a noise barrier.

In regards to construction, the DECC recommended a condition limiting the hours of construction. It also recommended that noise monitoring of activities be undertaken and assessed against the construction noise limits specified in the Environmental Assessment.

Consideration

Operational Noise
The efficiency of noise propagation over long distances can be significantly affected by weather conditions. Of most interest are source to receiver winds and the presence of temperature inversions as both these conditions can enhance received noise levels. The *NSW Industrial Noise Policy* (EPA, 2000) recommends consideration of wind effects if they are a feature of the area i.e. wind speed of 3m/s or less occurring for at least 30% of the time in any assessment period and season.

Following an assessment of wind data spanning 2004 to 2007 from the Mount Piper Meteorological Station, the Proponent determined that there was not a gradient or drainage wind flow regime present for more than 30% of the time. Consequently, the modelling of noise impacts was based on neutral meteorological conditions. Although the Proponent's determination is accurate based on the data set used, it is contrary to the outcomes of noise modelling for other projects which have used data from the Mount Piper Meteorological Station spanning different time periods. For example, the Stage 1 noise assessment for the Repository, which was based on 12 months of data from 1997 from the Mount Piper Meteorological Station, concluded that wind is a feature of the area. A more recent assessment of a mining proposal using data between 2006 and 2007 from the Mount Piper Meteorological Station also indicated that wind was a feature of the area with winds from the south and southwest triggering consideration under the *NSW Industrial Noise Policy* during the daytime period, and from the east, southeast and south triggering consideration during the evening period.

The exclusion of noise enhancing winds can lead to an underestimation of the predicted noise impacts. To this end, the Department has recommended a condition of approval requiring the Proponent to undertake an Operational Noise Review to confirm the operational noise impacts of the project, and compliance with the project noise criterion, within 60 days of commencing operations. Where noise monitoring indicates noise levels in excess of the noise criterion or predicted noise levels, the Department has recommended a condition requiring the Proponent to submit a report detailing:

- an assessment of all reasonable and feasible mitigation measures for reducing noise at the source; and
- recommended measure(s) for reducing noise at the source, including timing of implementation.

The Proponent has proposed an operational noise criterion of 42 dB(A) $L_{Aeq\ (15\ minute)}$ for the project based on a consideration of the amenity and intrusive noise criterion determined for the project, in accordance with the *NSW Industrial Noise Policy.* While the Department notes that the project would meet the self-imposed noise limits placed on the project by the Proponent in most circumstances, the Department has received advice from the DECC that this limit is not entirely appropriate in this instance. The DECC has recommended an operational criterion of 40 dB(A) $L_{Aeq\ (15\ minute)}$. This criterion has been determined based on the consideration of the noise impact assessment presented by the Proponent in the Environmental Assessment and the Submissions Report, and is consistent with the *NSW Industrial Noise Policy* which states that where the Proponent predicts that noise levels from an industrial development would be below the project-specific noise levels, then the noise limits specified in the licence/consent conditions should reflect the noise levels that the Proponent states would be achieved (i.e. the predicted noise levels). This is to:

- ensure that the best-management practices and best available technology described in the noise impact assessment report are actually adopted by the Proponent;
- ensure that the level of achievable performance presented by the Proponent to the public, through public documentation (such as an environmental impact assessment) is achieved;
- optimise the opportunity for further industrial development in the area without an unacceptable degradation of the acoustic amenity of the area; and
- fulfil a general aim of the environmental assessment process to minimise environmental impacts.

The Department concurs with the DECC's approach and is of the opinion that the Proponent should implement best practice management with the aim of minimising the impacts of the project on acoustic amenity. Consequently, the recommended conditions of approval propose an operational noise criterion of 40 dB(A) to ensure preservation of amenity and protection against excessive intrusive noise.

In its submission, the DECC recommended that the Proponent should construct a noise barrier along the private haul road, or alternatively a new haul road to access the Repository, to reduce the noise impact from trucks and achieve the specified noise criterion. The Department is of the opinion that the Proponent should be provided with the flexibility to determine how it will comply with the operational noise criterion, rather than the Department specifying the management measures to be imposed. Upon further discussion, the DECC agreed with this approach. Consequently, the Department has recommended conditions of approval requiring the Proponent to prepare and implement the following in consultation with the DECC:

- a noise monitoring program for the life of the project as a means of ensuring ongoing compliance;
- where noise monitoring identifies a non-compliance, provide an assessment of all reasonable and feasible mitigation measures for reducing noise at the source including (but not limited to) construction of a noise barrier and alternative ash haulage routes and conveyance mechanisms; and
- an Operational Noise Management Plan detailing measures to mitigate and manage noise during the operation of the project.

To mitigate and/or compensate for any noise impacts of the project in excess of the operational noise criterion following implementation of source controls, the Department considers the Proponent should be required to:

- undertake additional noise mitigation such as building treatments at affected sensitive receivers upon request by the landowner (unless the landowner has applied for land acquisition); and
- acquire property where the noise level exceeds the operational criterion by more than 5 dB(A), where requested by the landowner.

Consequently, the Department has recommended conditions of approval reflecting these requirements. This approach is consistent with the approval for the Angus Place Coal Project (06_0021) which included criteria for the application of building treatments and land acquisition for sensitive receivers affected by noise

generated by coal truck movements along the private haul road (as well as mining activities) which is used by the ash haulage trucks.

Based on the outcomes of the existing modelling, the operational noise criterion should not be exceeded at nearby sensitive receivers. Hence it is unlikely that the Proponent would be required to provide additional noise measures or acquire property. This would be confirmed following implementation the Operational Noise Review (as recommended by the Department) and ongoing noise monitoring.

The Department acknowledges that the DECC and residents have concerns over the noise generated by the existing operations at the Repository. Many of the concerns relate to ash truck movements and placement activities during the early hours of the morning and throughout the night-time period with the consequent direct adverse effect of sleep disturbance, annoyance, and interference to listening. There is also potential for secondary effects on physical and mental health as a result of long-term annoyance and prolonged disturbance to sleep.

The Proponent has indicated that, except in the case of emergency situations (e.g. breakdown of plant and/or equipment or a direction under the National Electricity Rules to maintain or increase power generation for system security), ash truck movements and placement activities will be restricted to 7 am to 10 pm, Monday to Sunday hence eliminating noise during the night-time and early hours of the morning. The Department has reflected these operating hours in the proposed conditions of approval. The Department has also recommended a condition of approval requiring the Proponent to undertake a review of the logistical arrangements for ash haulage and placement during the first six months of operation with the aim of determining the feasibility of later start and/or earlier finishing times.

The Department has recommended a definition of "emergency situations" to ensure that there are no ordinary operations outside the recommended operating hours. In addition, to ensure that placement activities outside the hours of operation are an emergency event, the Department has recommended conditions requiring the Proponent to:

- notify the DECC prior to undertaking any emergency operations;
- notify the Director-General in writing within seven days of undertaking any emergency operations; and
- in the event of successive emergency situations, submit to the Director-General a report on the emergency operations and measures for avoiding their recurrence.

Further, the Department has recommended a condition of approval requiring the Proponent to notify nearby sensitive receivers in advance where it is known that emergency ash haulage and/or placement will be required outside of the recommended hours of operation. This will provide for sensitive receivers to be prepared for noise disturbance.

In acknowledging the contribution of truck movements to noise levels, the Department has also recommended a condition of approval requiring the Proponent to implement measures to ensure noise attenuation of trucks.

In regards to the public's concern over existing ineffective noise complaints handling procedures, the Department has recommended a condition of approval outlining the requirements for complaints handling.

The Department is satisfied that the recommended conditions of approval should provide the necessary mitigation measures to minimise wherever possible the operational noise impacts generated by the project, and that appropriate mechanisms are in place to confirm and re-evaluate the need for any further mitigation.

Construction Noise

The Department is generally satisfied that the construction assessment approach adopted by the Proponent is appropriate and consistent with the *NSW Environmental Noise Control Manual* (EPA, 1994). While the Department acknowledges that the cumulative noise impacts associated with construction would be below the adopted noise goals, it recognises that construction noise may be audible at nearby sensitive receivers on occasions and therefore cause annoyance. To limit the possible effects of noise on nearby sensitive receivers, the Department has recommended as conditions of approval for the project:

- restrictions on the hours and days of construction;
- a construction noise objective;
- requirements for construction noise monitoring; and

- the preparation and implementation a Construction Noise Management Plan detailing the construction schedule, noise generating activities, procedures for assessing construction noise compliance, and measures for minimising and managing construction noise impacts.

Based on these measures, the Department considers that construction activities would not significantly impact on the acoustic amenity of sensitive receivers.

5.3 Realignment of Sawyers Swamp Creek

Issue

The project will involve the realignment of Sawyers Swamp Creek to the north of its current alignment (refer Figure 4). The section of creek to be realigned is degraded and does not constitute a natural waterway having been subject to realignment and channelisation over the years as a result of previous and current land uses in the area. The Proponent has identified that the realignment would entail the loss of approximately 380 metres of the existing creek channel and associated aquatic and riparian habitat and assemblages. However, none of the habitats to be affected are considered to be of high ecological importance at a local or regional level, and the area does not provide critical habitat for any taxa.

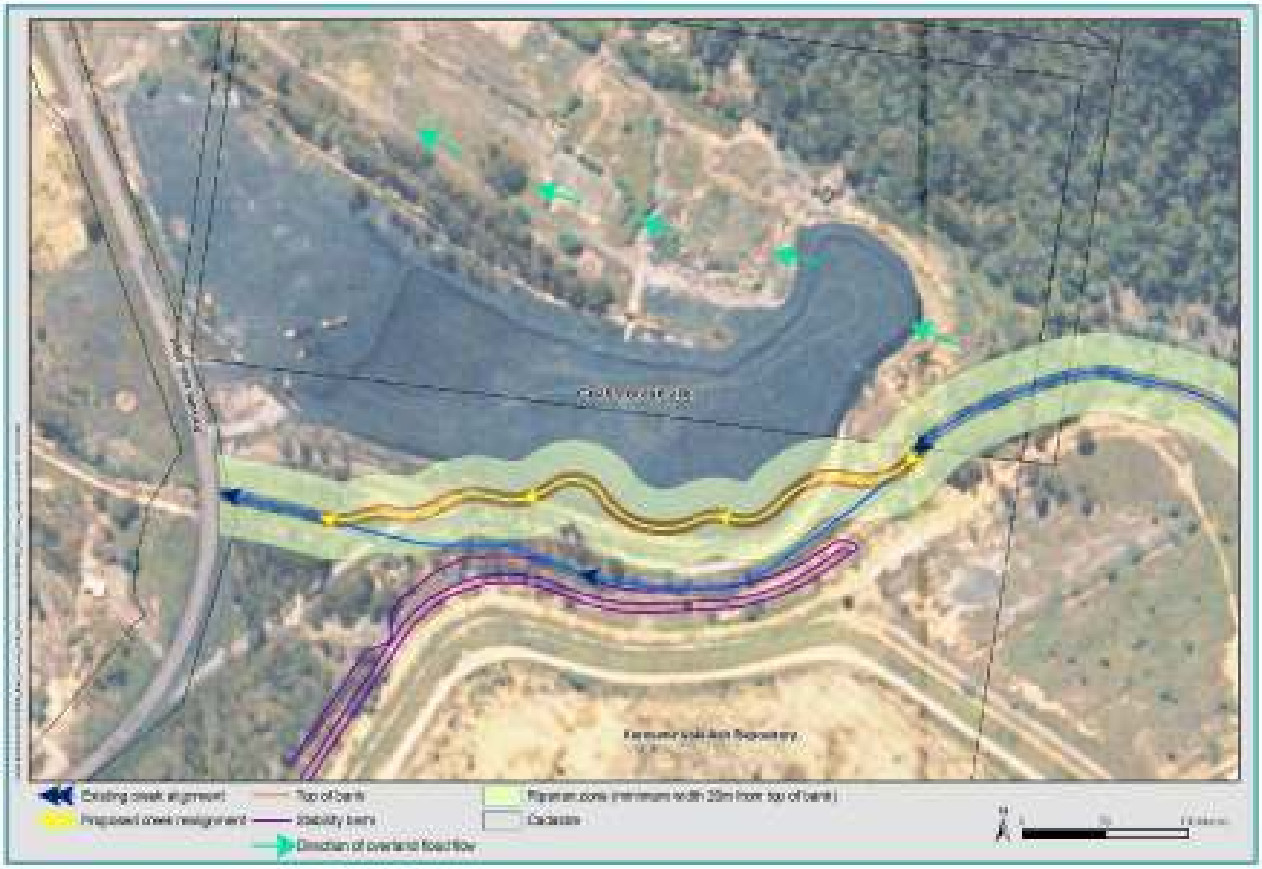

Figure 4: Proposed Realignment of Sawyers Swamp Creek
(Parsons Brinckerhoff, 2008)

No threatened species or populations, or endangered ecological communities were recorded in the project area. Although two threatened species (Macquarie perch and Australian grayling) have published ranges that include the general region of the study area, no surveys have recorded the presence of either the Australian grayling within the study area or the Coxs River catchment, or Macquarie perch in the Coxs River catchment above Lake Wallerawang.

There are a variety of potential impacts to upstream and downstream sections of the creek that may occur as a result of the realignment including changes to the creek geomorphology and flow regimes. The physical perturbations involved in constructing a new section of channel could also affect a number of physical and chemical processes which in turn may cause changes to aquatic ecology both in the immediate vicinity of, and upstream and downstream of, the realigned channel.

In order to ensure the creek's long-term stability and minimise the potential for impacts, the Proponent has committed to implementation of a Rehabilitation Plan for the creek involving rehabilitation of the in-stream and riparian environments, and incorporation of pool and riffle sequences into the geomorphology of the realigned creek section. The realigned planform has been developed in consultation with the DWE and based on historic information on the creek alignment, reference reaches and empirical modelling. The Proponent has also committed to monitoring of the aquatic and riparian ecology and creek hydrology upon realignment of the creek.

Issues Raised in Submissions

The DPI (Fisheries) stated that it was satisfied that the Environmental Assessment adequately described the potential impacts on aquatic habitat and the measures needed to manage and mitigate those impacts. It also indicated that it supports the recommendations for the management, monitoring and restoration of Sawyers Swamp Creek. The DPI (Fisheries) recommended that a Site Management Plan be prepared and specifically address the management of the Sawyers Swamp Creek realignment, riparian restoration of the creek and include an ongoing monitoring program that quantifies the impacts of the development on aquatic habitats within the creek and downstream within the Coxs River. It also recommended the provision of compensatory habitat to replace the aquatic habitat that will be lost through the realignment of the creek. Further, the DPI (Fisheries) recommended that the creek realignment comprise appropriate bank characteristics, pool-riffle sequences and native riparian vegetation.

The DWE recommended the establishment of a 20 metre wide riparian zone on both sides of Sawyers Swamp Creek for its entirety within the site, consisting of local native plant species. It also requested that the conditions of approval require:

- the preparation of a Vegetation Management Plan (in accordance with the DWE *Guidelines for Controlled Activities (February 2008): Vegetation Management* Plans) for site rehabilitation that demonstrates the protection of any remnant local native riparian vegetation at the site and restores any riparian zones affected by the development; and
- all areas and activities described in the Vegetation Management Plan be maintained for a period of at least five years and monitoring of the riparian zone occur for a five year period upon the completion of planting.

In regards to hydrology, the DWE recommended that the realignment of Sawyers Swamp Creek must emulate a stable natural watercourse system and incorporate meanders and suitable pool and riffle sequences. It also recommended that the creek form and rehabilitation/restoration works be consistent with the *Works and Watercourse Design Guideline* (DWE, 2007). In addition, the DWE recommended monitoring of the realigned creek for a period of five years.

The SCA indicated that the Proponent should be required to incorporate in-stream structures in the reach upstream of the proposed realignment so that the proposed realignment and rehabilitation works are not compromised by upstream erosion. It also recommended that the Rehabilitation Plan for the creek include details of initial and ongoing weed control.

Consideration

The Department acknowledges that the realignment of Sawyers Swamp Creek is necessary for the construction of a stabilisation berm required for the long-term stability of the Repository, and is satisfied that the realignment has been designed to minimise the impacts on aquatic and riparian ecology. It is also satisfied that the ecological impacts would largely be restricted to already disturbed vegetation and habitat of low conservation value and that there is no significant impact to endangered ecological communities or threatened species.

Although the realignment of the creek will result in the loss of approximately 380 m of the channel, the Proponent has committed to providing a realigned channel with key structures such as pool and riffle sequences to allow the creek to emulate as close as practical a natural channel morphology. The Proponent has also committed to rehabilitating the instream and riparian zones of the realigned channel. The Department considers that the rehabilitation works proposed as part of the project provide a significant opportunity to help improve and restore the existing disturbed ecosystem to a more natural environment, hence enhancing the creek's ecological value. Further, the proposed rehabilitation works will provide long-term enhancement of native vegetation communities in the area as well as assist in preserving and stabilising the existing environmental habitat upstream and downstream of the realigned section of creek.

In regards to the SCA's recommendation to incorporate in-stream controls in the reach upstream of the proposed realignment, the Department has recommended a condition of approval requiring the Proponent to detail any proposed in-stream controls upstream of the creek realignment in the Rehabilitation Plan for the creek.

With respect to the DPI (Fisheries) recommendation for a Site Management Plan addressing the creek realignment and DWE's request for a Vegetation Management Plan, the Department notes and concurs with the Proponent's proposal to prepare a single Rehabilitation Plan for the creek realignment which addresses the requirements of the Government agencies and any relevant government guidelines. To reflect this, the Department has recommended a condition of approval requiring the Proponent to prepare a Rehabilitation Plan addressing the restoration and ongoing maintenance of the instream area and riparian corridor (including weed management) for the realigned section of Sawyers Swamp Creek. The Rehabilitation Plan is to set out the objectives and outcomes of the rehabilitation works, performance criteria, details of the realignment and restoration works, and mitigation measures to be implemented should there be a decline in ecosystem health.

The Department has also recommended implementation of hydrological and ecological monitoring programs to monitor and quantify the impacts of the creek realignment. This monitoring, combined with the mitigation measures (including any compensatory measures which may be required by the DPI) recommended as part of the Rehabilitation Plan, will ensure that any potential impacts are effectively identified, managed and offset.

The recommended conditions of approval propose that the Rehabilitation Plan and associated monitoring programs are prepared in consultation with, and to the satisfaction of, the DPI (Fisheries) to ensure the satisfactory realignment and rehabilitation of Sawyers Swamp Creek and its associated riparian environment. The DWE has indicated that it does not require further involvement in the assessment process.

Overall, the Department supports the conclusions of the Proponent's assessment and is satisfied that with the implementation of the proposed Statement of Commitments and the recommended conditions of approval, the aquatic and hydrological impacts of the project can be managed. In particular, the Proponent's commitment to rehabilitate the realigned creek section in a manner that would result in an improvement in the creek's current condition and offset any loss of aquatic habitat is an important compensatory measure to offset the impacts of the project and is supported.

5.4 Surface Water Quality

Issue

The project is within the Upper Coxs River catchment. The Coxs River forms part of the Hawkesbury-Nepean River System and flows to Lake Burragorang which is part of Sydney's drinking water supply. It is therefore important that the Repository is constructed and operated in a manner that does not adversely impact the quality of the surface water beyond the site boundary.

Water quality monitoring by the Proponent at sites within Sawyers Swamp Creek and the Coxs River indicates that that while some water quality parameters (e.g. iron, manganese and lead) are within ANZECC guidelines for the protection of aquatic ecosystems, other parameters exceed the guideline values including copper, zinc, aluminium, boron, nitrogen, and conductivity, with the median pH lower than the guideline value. The contribution of the Repository activities to concentration levels compared to contaminant inputs from past and existing land use activities in the local area and upstream reaches of the catchment is not known. However, monitoring by the Proponent indicates that the water quality in Sawyers Swamp Creek (downstream of the site) has remained similar throughout the Stage 1 placement activities suggesting that current ash placement activities are not significantly increasing contaminant levels in the creek.

There is the potential for sediment and contaminants to be mobilised in runoff from active ash placement areas, finished placement areas prior to capping and revegetation, and from disturbed areas of the site. The Proponent has determined that only 5% of annual rainfall is expected to be discharged as runoff from the Repository and has proposed a water management system based on separation of clean and contaminated/polluted water, with all contaminated/polluted water captured and either reused on site or directed to a treatment plant at the Wallerawang Power Station from where, if required, it is discharged to the Coxs River under licence. Based on this, the Proponent has concluded that the potential for contaminants to be discharged in surface runoff from the site is low.

Earthworks associated with the realignment of Sawyers Swamp Creek, clearing of the former pine plantation area and construction of the stabilisation berm also have the potential to generate contaminants that could be mobilised in runoff and consequently impact on water quality. In particular, there is the potential for increased sediment loads which in turn can smother benthic habitats and organisms. The Proponent has proposed to address this issue by installing erosion and sediment controls and minimising the period of time that soils are exposed.

Issues Raised in Submissions

The SCA was concerned with the impact of the project on surface water quality and recommended water quality criteria as well as the preparation of a surface water monitoring program incorporating:

- pre-construction baseline data on surface water flows and water quality in Sawyers Swamp Creek;
- a program for monitoring surface water flows and quality in Sawyers Swamp Creek;
- wet weather monitoring;
- expansion of the proposed monitoring program to include dissolved oxygen and turbidity;
- a protocol for investigating identified exceedances of water quality criteria; and
- a response plan to address potential exceedances and water quality impacts.

The SCA also indicated concern over the potential leaching of trace elements into Sawyers Swamp Creek from bottom ash should it be used in the proposed stabilisation berm and recommended that no ash be utilised for this purpose. It also raised concern over the potential for water to infiltrate into the ash and leach trace elements and be discharged at the interface of the base of the ash and underlying capping in the form of surface water discharge.

The DWE supported the avoidance of earthworks within 50 m of any watercourse.

The DPI (Fisheries) recommended that a Site Management Plan be prepared and address, among other issues, the water quality in Sawyers Swamp Creek.

The DECC stated that the Proponent must comply with Section 120 of the *Protection of the Environment Operations Act 1997*, unless otherwise stipulated by Environment Protection Licence 766.

The key concern raised in the public submissions was the impact of polluted runoff (and leachate) from the Repository on water quality in Sawyers Swamp Creek and other nearby waterways, and the absence of any strategies to reduce the level of contaminants in flows emanating from the site.

Consideration

The main surface water quality risk associated with the project is the inflow of contaminated/polluted water from the Repository into Sawyers Swamp Creek both during construction and operation of the project. Should contaminated/polluted flows enter Sawyers Swamp Creek, these could have adverse impacts on aquatic flora and flora depending on the type and concentration of contaminants in the flow. There is also the potential for any contaminants to migrate downstream into the Coxs River, which forms part of Sydney's drinking water supply. The Department acknowledges that the Proponent has proposed to manage this issue by implementing a number of standard measures that have been successfully employed on the site as part of the Stage 1 operations including: the implementation of erosion and sediment control measures; separation of clean and contaminated/polluted runoff; and capture of contaminated/polluted runoff from the Repository during both construction and operation.

The Department is satisfied that with the implementation of these measures, the impacts on surface water quality can be appropriately managed. Notwithstanding this, the Department has recommended conditions of approval requiring the Proponent to:

- prepare and implement an Erosion and Sediment Control Plan detailing the measures to minimise erosion and the discharge of sediment/pollutant laden waters;
- avoid earthworks (not associated with the realignment of the creek) within 50 m of Sawyers Swamp Creek;
- prepare a Site Water Management Strategy detailing the separation of clean and contaminated/polluted water flows and provisions for the treatment, recycling/reuse and/or discharge of flows.

The Proponent contends that current ash placement activities at the Repository do not significantly impact on the water quality in Sawyers Swamp Creek, as illustrated by existing water quality monitoring results. Consequently, the Proponent claims that continued ash deposition should not result in a decline in water

quality, especially in light of the proposed surface water management measures which are aimed at capturing and preventing the egress of contaminated/polluted water flows into Sawyers Swamp Creek. In addition, the Proponent claims that the realignment of a section of the creek will not adversely affect water quality but rather result in improved water quality through decreased scour. To verify this, the Proponent has committed to implementing a surface water quality monitoring program. The Department agrees with this approach and the implementation of a surface water quality monitoring plan (prepared in consultation with the DPI (Fisheries) and SCA) is reflected within the Department's recommended conditions of approval. The implementation of a monitoring program also satisfies the SCAs requirement for ongoing monitoring of the potential impact of the project on surface water quality.

In regards to the SCA's concerns over potential exceedences in surface water quality, the Department has recommended a condition of approval requiring the Proponent to develop a Surface Water Management Plan in consultation with the relevant Government agencies which identifies the impact assessment criteria for Sawyers Swamp Creek, a protocol for investigating exceedances of the criteria, and a response plan to address exceedances. The preparation of such a plan also satisfies the DPI (Fisheries) request for a plan which addresses water quality in the creek. A key objective of the Plan is to identify and address the consequences of a range of water quality incidents that could occur and detail the associated response measures. Such a proactive approach would enable the Proponent to promptly respond to any potential incidences and implement appropriate management measures should any adverse water quality impacts be detected. The Department considers that this is an adequate approach to managing the residual risk and ensuring that surface water quality would not be significantly impacted.

In the Submissions Report, the Proponent responded to SCA's concerns regarding the potential leaching of trace elements from bottom ash intended for use in the proposed stabilisation berm. In its response to the Submissions Report, the SCA recommended that either no ash be used or that information relating to water quality impacts of the ash be provided along with associated mitigation impacts. The Department considers that the potential risks to water quality associated with the use of bottom ash in the stabilisation berm are no greater than the risks imposed by ash placement at the Repository as the Proponent intends to encapsulate the bottom ash in the berm. In addition, the Department is of the opinion that such use of the bottom ash is consistent with sustainable reuse practices. Consequently, the Department has recommended conditions of approval requiring the monitoring of water quality impacts rather than prohibiting the use of bottom ash.

The Department is satisfied that with the implementation of the above management and mitigation measures, and recommended conditions of approval, the surface water quality impacts associated with the operation of the Repository can be appropriately managed and the residual risk minimised to an acceptable level.

5.5 Groundwater Water Hydrology and Quality

Issue

There is the potential for trace minerals and heavy metals to leach out of the ash and migrate within groundwater. Depending on the type and concentration of pollutant(s), this may have implications for downstream users of groundwater and groundwater dependent ecosystems. The Proponent has indicated that currently there are 89 bores within a 10 km radius of the Repository. Most of these are registered for private/domestic use (i.e. stock or irrigation), with nine registered for State Government and local government uses.

Monitoring of groundwater quality by the Proponent has indicated concentrations of many trace elements are higher at monitoring bores down-gradient of the Repository than at up-gradient locations but similar to the surface water quality at potential discharge locations (Lidsdale Cut and Sawyers Swamp Creek). Groundwater is known to infiltrate surface water and detection of trace elements in the surface water suggests the source of contamination may be the existing Stage 1 ash placement activities. With the exception of boron and iron, all levels are less than ANZECC irrigation guideline values. However, some of the metals and trace elements have been detected at levels greater than the ANZECC guidelines for the protection of aquatic ecosystems including copper, lead, boron, iron, and zinc but are consistent with local and regional water quality. In addition, pH levels were slightly acidic.

There is the potential for a slight increase in groundwater levels, and hence groundwater discharge, at the Repository in the short term as a result of the increased pressure of the ash as it is placed, leading to a reduction in pore volume. However, this impact would be managed to an acceptable level through the use of staged ash stacking and capture of all discharges at the interface of the new ash placement and historical material. Hence, there should be little or no effect on surface water quality as a result of this discharge.

Issues Raised in Submissions

The SCA indicated a need for the Proponent to develop and implement a groundwater monitoring program incorporating groundwater impact assessment criteria, monitoring of groundwater flows and quality, a protocol for the investigation of exceedances of criteria, and a response plan to address potential exceedances and impacts.

The DWE indicated support for the groundwater quality monitoring program outlined in the Environmental Assessment and recommended that its implementation be required as a condition of approval.

The main issue raised in the public submissions was leaching from the Repository into local groundwater aquifers and underground mine workings and contamination of private bores utilised for stock and domestic use. In particular, one of the public submissions made claims that elevated levels of chromium (VI) and selenium in minewater at the Springvale Colliery were derived from leachate from the Repository. However, no quantifiable evidence is available to support the claim.
Other concerns included:

- potential failures in the underlying capping;
- a lack of investigation into subsurface permeability rates;
- increased trace element concentrations in groundwater due to increased residence times of water in the ash layer;
- an absence of contingencies in the event that groundwater levels become unacceptable, including trigger levels; and
- the need for additional monitoring bores in areas up- and down-gradient of the site.

Consideration

The main groundwater risk associated with the project is the contamination of groundwater flows, and hence private bore water supplies, through the leaching of contaminants in the ash.

The Proponent claims that contamination of groundwater supplies is unlikely to be significant as the area on which the ash will be placed is (or will be) capped. Hence, any leachate would be unlikely to permeate through to the groundwater table and instead discharge at the interface of the new ash placement and underlying capping and be captured as part of the site's water management system. In addition, the final landform feature will be progressively capped limiting the potential for infiltration and hence leaching of trace elements in the ash. Further, the Proponent contends that the likelihood of contaminants leaching into the groundwater is very low based on the results of field trials of the infiltration rates at the Mount Power Piper Station which demonstrated a very low average infiltration rate of 0.59% on uncapped areas and 0.07% on capped areas.

The Department is of the opinion that these measures should reduce the potential for groundwater impacts to an acceptable level. However, there is a low to moderate residual risk that groundwater could be impacted in the unlikely event that the underlying capping should fail (i.e. the leachate permeates through the capping) or the rate of infiltration differs to that in the field trails. Although the ash from the Mount Piper and Wallerawang Power Stations may be of a comparable quality, the field trials did not account for any geotechnical differences between the ash repository sites. Consequently, the Department has recommended a condition of approval requiring the Proponent to implement, in consultation with the SCA, a groundwater monitoring program throughout the life of the project and for five years following final capping and landscaping of the Repository, as a means of detecting any impacts on groundwater quality that may arise through failure of the capping.

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

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

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

5.6 Air Quality

Issue

The operation of the project will involve the haulage and placement of significant amounts of ash (approximately in the order of 500,000 tonnes per annum). Although the ash is conditioned with water to approximately 15% moisture content to minimise the potential for dust generation, there is an elevated risk of air quality (dust) impacts arising from placed ash until the exposed surfaces are stabilised. There is also the potential for dust to be generated during the placing of ash, shaping of the placed ash, and from vehicles travelling along the private haul road to and from the Wallerawang Power Station and the Repository.

Dust deposition monitoring is currently undertaken by the Proponent at five sites including immediately to the north-west of the repository (350 m to the east of the residential areas in Lidsdale) and west of the residential area. Dust deposition rates in excess of the DECC amenity based criteria for dust fallout (4 g/m^2/month) have been experienced on occasions at the site to the north-west of the Repository. Examination of the dust indicated that the higher recordings were associated with high proportions of combustible material not directly associated with the operation of the Repository. Monthly deposition rates are generally low and comply with the criteria specified in the *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW* (DEC, 2005).

The Proponent undertook an air quality assessment involving dispersion modelling to determine the air quality impacts of the Repository. The contaminants considered were total suspended particulate matter (TSP), deposited dust, and particulate matter (PM_{10}). The assessment for deposited dust was based on the Proponent's dust deposition monitoring results with the modelling for TSP based on an extrapolation of dust deposition levels. PM_{10} emissions were estimated using ambient monitoring results from Bathurst.

The modelling indicated that, at the most affected resident, the annual average PM_{10} concentration would increase by 3 ug/m^3 giving a total concentration of 23 ug/m^3 which is less than the DECC assessment criterion of 30 ug/m^3 (DEC, 2005). The average annual TSP concentration would increase by 4 ug/m^3 giving a total of 34 ug/m^3, compared to the DECC assessment criterion of 90 ug/m^3 (DEC, 2005). The calculated average annual dust deposition rate was 0.5 g/m^2/month giving a total of less than the DECC assessment criterion of 4 g/m^2/month (DEC, 2005) provided that background levels do not exceed 3.5 g/m^2/month. Consequently, the Proponent concluded that emissions associated with the operation of the Repository would contribute only very minor increases in long-term dust concentrations and deposition levels at the residential areas of Lidsdale.

The Proponent has committed to implementing an air quality management plan and managing dust emissions using standard techniques including monitoring of dust deposition, minimising the area of uncovered ash face and watering in areas of site activity.

Issues Raised in Submissions

Issues raised in the public submissions included:

- the impact of dust on human health;
- dust emanating from haulage trucks and during ash loading;
- deposition of ash in residential areas and creeks;
- increases in ash deposition upon the changeover from wet ash to dry ash disposal;
- ability of the Proponent to effectively manage dust emissions, including maintaining a 15% moisture content in the ash;
- non-compliance with air quality criteria;
- impact of, and potential for recurrence of, a major dust incident in September 2007; and
- lack of site-specific meteorological data.

The DECC indicated that the premises must be maintained in a condition which minimises or prevents the emission of dust. It also advised that the Proponent address alternative options for ash placement to minimise the exposure of ash surfaces to prevailing winds and potential offsite dust impacts.

Consideration

The Department is satisfied that the assessment undertaken of potential dust deposition rates and conclusions drawn regarding potential dust impacts are adequate. The Department acknowledges that existing air quality with respect to TSP and PM_{10} is not well characterised and that the Proponent's conclusions are based on correlations with dust deposition levels and the assumption that PM_{10} data from Bathurst are a reasonable surrogate for conditions at Lidsdale. Discussions have been undertaken with the DECC regarding the suitability of the existing monitoring program or whether there is a need to extend the program to include monitoring of dust at additional sites as well as for TSP and PM_{10}. The DECC has indicated that these issues are currently under consideration and requested that the conditions of approval provide for flexibility in terms of the scope of the monitoring program.

In light of this, the Department has recommended a condition of approval requiring the Proponent to prepare an air quality monitoring program in consultation with, and to the satisfaction of, the DECC. The monitoring program is to be maintained throughout the life of the project and include, but not necessarily be limited to, dust monitoring. The Department has also recommended periodic reporting to the DECC, and for annual reports detailing the monitoring results to be submitted to the Director-General.
The Department acknowledges that dust can be generated from the project during the transportation and placement of ash if appropriate mitigation and management measures are not implemented. Dust not only has an adverse visual impact, but also is a nuisance factor, and can have adverse impacts on human health depending on the nature of the contaminants inhaled and length of exposure.

The Department accepts that provided all the nominated environmental commitments are implemented during operations, dust generation from the project would be limited. Notwithstanding this, the Department believes that the Proponent should be required to assess alternative methods of ash placement with the aim of minimising the exposure of active placement areas and hence the potential for dust generation. This would ensure that best practice management is implemented and is consistent with the principle of minimising impacts as far as practicable. To this end, the Department has recommended that an Air Quality Management Plan be developed addressing this matter and include a protocol for the investigation of, and a response plan to address, visible emissions from the Repository.

In order to minimise the potential for fugitive dust emissions and the consequent adverse impacts on the amenity of nearby residents and local and regional air quality, the Department has also recommended conditions requiring the Proponent to:

- document and implement an operating protocol for the Repository irrigation system;
- cease all activities in the event that there are visible dust emissions;
- ensure that the load carrying compartments of all ash haulage trucks are covered at all times except when loading and unloading; and
- develop and document the timing and progressive implementation of revegetation works for ash placement areas as they are completed.

In regards to maintaining a 15% moisture content in the ash as a means of suppressing dust generation, the Proponent has indicated that the moisture level is automatically controlled and monitored at the Wallerawang Power Station, with three water supply sources available to allow automatic transfer between sources if the primary water supply is affected. Hence, this moisture level would be maintained at all times.

Overall, the Department is satisfied that the Proponent's proposed mitigation measures and the Department's recommended conditions of approval should provide the necessary mitigation measures to minimise the air quality impacts of the project.

5.7 Sterilisation of Coal Resources

Issue

The Kerosene Ash Repository Area is underlain by significant coal reserves. The Centennial Coal Company Ltd (Centennial) holds underground mining leases and surface exploration titles over the majority of the Repository area. Evaluation work by Centennial has identified that there are approximately 989,000 tonnes of coal reserves in the vicinity of the Repository. These coal remains will become sterilised if no coal is removed prior to Stage 2 ash placement.

Centennial has estimated the economic cost of this sterilisation is:

- $123M current export value;
- $6.9M in royalties to NSW State Government; and
- $9M direct benefit to the local community.

The above mentioned loss is in addition to 271,000 tonnes (approximate) which has been sterilised by the Stage 1 ash placement activities. Figure 5 illustrates the location of the coal reserves.

Figure 5: Potential Coal Sterilisation Areas

Issues Raised in Submissions

The DPI (CARA) noted the Proponent's commitment to stage activities to optimise the timeframe in which Centennial could access the remaining coal reserves, and indicated that the Department of Planning must consider coal sterilisation when determining the application.

The submission from Centennial raised concern over the potential sterilisation of coal resources in the vicinity of the Stage 2 area (with specific reference to the realignment of Sawyers Swamp Creek potentially sterilising some 325,000 tonnes of coal) and resultant economic loss. The submission suggests an integrated coal recovery/ash emplacement area to recover all remaining economically viable coal in the area whilst satisfying the Proponent's requirement for ongoing ash placement.

Centennial noted that the extraction of coal could significantly increase the capacity of the Repository by five years or alternatively lower the design height while still maintaining the design life, and concludes with a request for a single Part 3A planning approval which addresses both ash emplacement and removal of coal within the project footprint.

Consideration

The Proponent has committed to revised staging of ash placement to address concerns related to coal sterilisation and to provide time for Centennial to investigate the feasibility of mining in the area and obtain the necessary approvals. This would involve:

- deferral of the Sawyers Swamp Creek alignment until 2010 to allow Centennial time to seek approval for extraction activities in Areas 3 and 4 and avoid multiple creek realignments;
- modified surface water runoff and capture based on the modified ash placement activities; and
- reduced depth of excavation of the pine plantation area.

The placing of ash was originally proposed to head in an easterly direction from the existing placement area (i.e. Stage 1) into the pine plantation area and then in a northerly direction which would have affected the potential coal in Area 2. The Proponent now proposes to place ash in a north-easterly direction to the limit of what is safe within stability constraints of the existing berm and then move to the area over the pine plantation once other areas have reached capacity. This staging would provide Centennial between nine

and 12 months to obtain the relevant approvals and commence extraction in Area 2. After this time, operational constraints would mean that ash placement over the pine plantation area would need to occur in line with the original proposal. The proposed modified staging would not change the overall impacts of the project and management measures committed to by the Proponent.

The Department considers that the proposed modified staging is a reasonable and feasible measure for providing Centennial with time for obtaining the necessary approvals for the extraction of coal within the location of the Repository. The Proponent's proposal to modify the staging has been reflected in the recommended conditions of approval which require ash placement activities to be managed in accordance with the staged placement activities detailed in the Submissions Report.

The Department acknowledges that the modified timing only provides a limited window of opportunity for Centennial. However, the Proponent is constrained by the need to continue to generate electricity and dispose of the resultant ash by-product. The only other alternative to the proposed staging would be to reduce or cease electricity production. The Department considers that this is neither feasible nor reasonable as the Wallerawang Power Station is an integral component of the State's energy generation system and a reduction in electrical output would have significant ramifications in terms of the reliability and availability of power supply to the Sydney metropolitan region and Wellington.

In regards to Centennial's request for a single Part 3A project approval, the Department considers that this is not possible on the basis of the current Project Application, as many of the environmental impacts and management measures associated with the extraction of coal are different in nature and scale to the proposed project. A new Project Application would be required addressing both activities. The Proponent's requirement for extra storage capacity is immediate due to the Stage 1 capacity constraints and, as such, the Proponent is not in a position to extend the timeframe for obtaining approval.

5.8 Other Issues

The Proponent has also assessed the potential effects of the project on archaeology and heritage, soils (erosion and sediment control), visual amenity, and traffic, as well as the impacts associated with lighting and waste generation, and has committed to implementing measures to minimise any associated impacts. The Department is satisfied with the assessment and the management measures proposed by the Proponent and its detailed consideration of these issues is provided in Table 2. None of the submissions raised concerns in relation to the issues presented in Table 2.

Table 2: Department's Consideration of Other Environmental Issues

Issue	Department's Consideration
Visual Amenity	Upon completion of ash placement activities, the placement will have a completion height of about 940 m AHD and will be up to some 25 m above the existing surface level. Residents located to the west and south-west of the Repository will have a changed view compared to the existing vista, with the level of impact influenced by the distance of the viewer and the level of screening between the viewer and Repository. The Proponent has indicated that any visual impacts will be managed through industry recognised mitigation measures such as tree screening and landscaping, with the final placement capped and revegetated where requried, and that these measures will be incorporated into the Operation Environmental Management Plan. The surrounding landscape comprises vegetated slopes in the west (beyond Sawyers Swamp Creek Ash Dam), north-east and south-east with areas in the north-west to south-west consisting predominantly of cleared lands with scattered trees and rural residential properties, and isolated forest patches. The Department considers that the final landform should be vegetated in a manner which visually complements the local environmental values and vistas. To ensure this occurs, the Department has recommended a condition of approval requiring the Proponent to prepare a Landscape/Revegetation Plan for the site which identifies design objectives, revegetation measures and long-term-maintenance procedures. The Department is satisfied that this condition will provide for enhancement of the visual compatibility of the site with the surrounding land fabric as well as ensure the long-term stabilisation of the site.

Table 2 (continued): Department's Consideration of Other Environmental Issues

Issue	Department's Consideration
Erosion and Sediment Control	The project will involve the construction of a stabilisation berm, realignment of Sawyers Swamp Creek, and relocation of surface water management controls all of which will require major earthworks. Consequently, there is a high risk of erosion and sedimentation impacts arising during construction until the exposed areas are stabilised. The Proponent has committed to implementing standard erosion and sediment controls, consistent with the principles set out in Landcom's *Managing Urban Stormwater: Soils and Construction* (the Blue Book) to mitigate this impact. These will be detailed in the Construction Environmental Management Plan and Operation Environmental Management Plan. The Department considers that the risk of erosion and sedimentation of waterways during construction can be managed through the implementation of Erosion and Sediment Control Plans. This has been reflected within the recommended conditions of approval which require the preparation of an Erosion and Sediment Control Plan as part of the Construction Environmental Management Plan for the site.
Traffic and Transportation	<u>Construction</u> The construction workforce will predominantly comprise existing operation staff. Consequently, traffic movements associated with construction staff will be limited. The Department acknowledges that there will be a minor short-term increase in traffic movements on the local road network in association with the mobilisation/demobilisation of earthmoving equipment during construction of the stability berm and realignment of Sawyers Swamp Creek, and the import of materials. However, the number of movements involved will be low and therefore unlikely to disrupt local traffic flows. The Department recognises that it is not possible to prohibit heavy vehicles moving through local streets, and hence eliminate their impact on the amenity and safety of sensitive receivers. However, it is possible to reduce the level of impact through implementation of appropriate mitigation and management controls. Consequently, the Department has recommended conditions of approval that require the Proponent to: ▪ minimise construction traffic queuing and idling in local residential streets; ▪ minimise the use of local roads/residential streets; and ▪ comply with a Construction Vehicle Code of Conduct prepared to manage driver behaviour along the local road network. The Department has also recommended a condition of approval requiring the Proponent to prepare a Construction Traffic Management Plan detailing haulage routes and construction vehicle volumes. The Department is satisfied that the recommended conditions of approval should provide the necessary measures for managing construction traffic impacts to an acceptable level. <u>Operation</u> Operational staff movements will be the same as existing operations and, as such, the Proponent has indicated that there will be no additional traffic impacts.
Lighting	Operational lighting during evening and night-time ash placement activities has been an issue during existing ash placement activities and the Proponent has committed to directing lighting away from residential properties as far as practical without jeopardising the safety of operations. The Department is satisfied with this approach and and has recommended a condition of approval to reinforce this commitment. The Department has also recommended a condition requiring the proponent to adhere to the Australian Standard *AS4282:1997 – Control of the Obtrusive Effects of Outdoor Lighting* to minimise the impact of lighting on residents.

Table 2 (continued): Department's Consideration of Other Environmental Issues

Issue	Department's Consideration
Aboriginal and non-indigenous heritage	The Repository area is highly disturbed from previous open cut mining, ash placement and pine planting with the effect of completely removing or modifying any strata that may have been expected to contain archaeological evidence. Although, no historical relics or sites or places of Aboriginal heritage significance were recorded on the site, a small area in the westernmost portion of the site has been less disturbed and is considered to have low-moderate potential to contain Aboriginal objects. This area will not be subject to ash placement or construction activities and the Proponent has committed to minimising disturbance near this area. The Proponent has also committed to ceasing work in the event that heritage sites or items are discovered and ensuring that such sites are reported, assessed and appropriate management measure put in place. The Department is satisfied that the project would not significantly affect Aboriginal or non-indigenous heritage items. The Department believes that the Proponent's commitment to minimise disturbance in the western portion of the project area, educate on-site personnel with regards to the protection of heritage sites, and to "stop work" should any items be discovered are suitable mitigation measures and has incorporated recommended conditions of approval in this regard to reinforce these commitments.
Waste	The Department considers that the main impacts associated with waste management would be restricted to the construction stages of the project. Waste streams will include green waste (from clearing and grubbing), demolition waste (from modified surface water management systems), general construction waste and general rubbish. The Proponent has committed to managing all wastes in accordance with the relevant guidelines. The Department is satisfied with this approach and has recommended a condition of approval to ensure that this commitment is implemented along with a condition recommending that no waste generated outside the site is stored, treated or disposed of on the site.

6. CONCLUSIONS AND RECOMMENDATIONS

The Department accepts that there is a pressing need to expand the existing Kerosene Vale Ash Repository Area into the Stage 2 area as the existing approved Stage 1 ash placement area is reaching capacity. The proposed expansion of the Repository presents the best available option for resolving the capacity issue while reuse opportunities are explored and implemented.

Following a detailed assessment of the Environmental Assessment, Submissions Report and the submissions on the project, the Department is satisfied that the project is on balance justified and that the impacts of the project can be appropriately mitigated and/or managed to an acceptable level of environmental performance. Consequently, the Department recommends that the Minister for Planning approve the Kerosene Vale Stage 2 Ash Repository Area project, subject to the recommended conditions of approval.

Through its assessment, the Department has determined that the key assessment issues for the proposal relate to operational noise, surface and groundwater quality, hydrology, aquatic and riparian ecology, and potential sterilisation of coal reserves. While the project will provide enhancements to the existing ecological and hydrological attributes of the local environment through the rehabilitation of part of Sawyers Swamp Creek, the Department acknowledges that the project would have residual impacts on the environment and the amenity of residents during its operation.

Of particular note is operational noise. The Department acknowledges that the Proponent's approach to limit ash haulage and placement from 7.00 am to 10.00 pm, seven days a week is a significant improvement over current operations which allow ash haulage and placement 24 hours a day. However, to ensure that the amenity of residents is not significantly impacted, the Department has recommended an operational noise criterion and for an operational noise review to be undertaken to ensure that the criterion is not exceeded. The Department is confident that this in conjunction with the requirements for ongoing noise monitoring, the preparation of a noise management plan, and conditions providing for the application of building treatments and land acquisition will ensure the protection of residential amenity.

Potential impacts on surface and groundwater quality are also major concerns. The Proponent has committed to a number of environmental management and mitigation measures in its Statement of Commitments to protect water quality. In addition, the Department has recommended conditions that specifically address potential water quality issues including the ongoing monitoring of water quality and the preparation of surface and groundwater management plans. The Department is of the opinion that if properly implemented, these measures would ensure that the operational impacts of the project on water quality are effectively managed.

In regards to the potential sterilisation of coal reserves, the Department is satisfied that the Proponent's proposed modifications to ash placement activities and construction elements of the project are reasonable and feasible measures for providing the Centennial Coal Company with time for obtaining the necessary approvals for the extraction of coal within the location of the Repository. The Department acknowledges that the modified timing only provides a limited window of opportunity, however, the Proponent is constrained by the need to continue to generate electricity and dispose of the resultant ash by-product.

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

.

APPENDIX A – RECOMMENDED CONDITIONS OF APPROVAL

APPENDIX B – STATEMENT OF COMMITMENTS

APPENDIX C – RESPONSE TO SUBMISSIONS

APPENDIX D – ENVIRONMENTAL ASSESSMENT