

***MAJOR PROJECT ASSESSMENT:
Berrima Colliery Continued Operations
(MP 10_0172)***

***MODIFICATION ASSESSMENT:
Berrima Cement Works Coal Stockpiling
(DA 401-11-2002-i Mod 6)***



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

March 2012

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Cover image: Berrima Colliery site, *Berrima Colliery Continued Operations Environmental Assessment* (EMGA Mitchell McLennan, May 2011)

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EXECUTIVE SUMMARY

Boral Cement Limited (Boral) is seeking approval to continue operation of its existing Berrima Colliery, an underground coal mine located immediately east of the village of Medway in the Wingecarribee local government area, for a period of eight years. As part of its proposal, Boral is also seeking approval to increase extraction from current levels of around 220,000 tonnes per annum of run of mine (ROM) coal up to 460,000 tonnes per annum. Concurrently with this project application to continue mining operations at Berrima Colliery, Boral has lodged a separate modification request to amend the development consent for its Berrima Cement Works to allow coal stockpiling on that site. Boral proposes to store up to 25,000 tonnes of coal at the cement works for transport to Port Kembla Coal Terminal in five campaigns per annum.

Berrima Colliery is an important regional source of employment and investment, and plays a significant role in the supply of coal to Cement Works in New South Wales. Continued operation of the Colliery in an environmentally acceptable and sustainable manner is important to the maintenance of these existing local, regional and State benefits.

The Environmental Assessments (EAs) for the project application and modification request were publicly exhibited during June and July 2011. A total of 69 submissions were received in relation to the project application (eight from public authorities and 61 from the public (44 in support and 17 objections)). 68 submissions were received in relation to the modification request (four from public authorities and 64 from the public (42 in support and 22 objections)). Submissions from other Government agencies raised issues including subsidence, surface and groundwater impacts, noise and dust management.

Key issues raised in public submissions focused on traffic impacts, particularly along Medway Road, and the environmental and amenity issues generated by heavy vehicle movements through the village of Medway. Other key concerns included noise, dust, consultation, groundwater, subsidence and ecological impacts. Submissions received in support of the project were generally based on the significance of the Colliery to State and regional employment and investment.

The issue of most significance raised by the community in relation to both the continuation and expansion of mining operations and coal stockpiling related to traffic generation, including potential amenity and safety impacts. Despite an extended process of discussions between Wingecarribee Shire Council and Boral, agreement has not been reached between them concerning a number of details related to Boral's commitment to upgrade Medway Road in a series of stages linked to the development of the project. The Department has recommended conditions which substantially satisfy the Council's requests, although not in all respects. Subject to the implementation of the recommended two stage upgrade of Medway Road, appropriate road maintenance contributions by Boral to the Council and specified limitations on haulage hours, the Department is satisfied that traffic impacts through Medway village can be managed and are reasonable.

Boral's coal extraction takes place under an existing approved Subsidence Management Plan (SMP). A number of significant surface structures have been identified that would need to be protected from potential subsidence impacts resulting from continued underground mining, including the Renahan property, two large earth dams, and the Alcorn and Belbin properties. Boral has proposed Subsidence Protection Zones (SPZs) around these structures. The Department considers this approach to be an appropriate response to the need to protect these structures and has reflected the need and configuration of these SPZs in the recommended conditions of approval. Conditions relating to the protection of other surface infrastructure, structures and public safety have also been recommended.

The Department has also recommended that an adaptive management approach be applied to potential subsidence, to monitor mining impacts as the project progresses and to adjust the mining method and/or panel layout in response if unexpected outcomes are identified. Through the implementation of adaptive management, and a comprehensive Extraction Plan, the Department is satisfied that acceptable subsidence outcomes can be achieved and residual risks can be managed effectively.

There is limited historical groundwater monitoring data for the site. However, the Department considers that potential impact on groundwater aquifers is manageable given that mining has occurred on the site for over 85 years (and therefore the majority of groundwater depressurisation is likely to have already occurred) and the continuation of mining operations would generally move no closer to

sensitive areas such as the Wingecarribee River than historical operations. Recommended conditions of approval include up-front and ongoing monitoring to inform the adaptive management of the project to ensure that future groundwater impacts are minimised.

Boral has demonstrated that water discharged to the Wingecarribee River is of generally good quality but typically has elevated manganese concentrations. Elevated manganese levels are more likely to be an aesthetic or amenity issue (particularly the potential to stain clothing) rather than to pose any risk to human health. Notwithstanding, the recommended conditions of approval include comprehensive monitoring of water quality, including the development of appropriate trigger values for watercourse health. The Department has also recommended the preparation of a comprehensive Water Management Plan covering surface water, groundwater, erosion and sedimentation, and monitoring and management of groundwater dependent ecosystems.

On balance, the Department is satisfied that the impacts of continued mining operations and the stockpiling of coal can be minimised and managed such that the net outcome of the project would be substantially positive, and therefore in the public interest.

Wingecarribee Shire Council originally objected to the project on a wide range of grounds. On 23 November 2011, the Council resolved to “not oppose” the project, contingent “only” on a series of conditions, including that Boral pay the Council to undertake the proposed upgrade of Medway Road, that these upgrades take place according to a particular timetable, and that Boral pay a road maintenance levy for Medway Road of 8 cents/kilometre/tonne. Council later reaffirmed this position at its meeting of 22 February 2012. While Boral’s commitments and the Department’s proposed conditions satisfy most of Council’s requirements, they do not so in all respects. In these circumstances, it is necessary that the project is determined by the Planning Assessment Commission.

BACKGROUND

1.1 Introduction

This report represents a combined assessment of two separate but related applications made by Boral Cement Limited (Boral):

- a project application made under section 75E of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the continued operation of the existing Berrima Colliery, with minor upgrades (MP10_0172); and
- a modification request under section 75W of the EP&A Act to permit an increase in coal stockpiling capacity at the existing Berrima Cement Works (DA 401-11-2002-i Mod 6).

1.2 Project Location

Berrima Colliery is located immediately west of the Wingecarribee River and the village of Medway, in the Wingecarribee local government area (see Figures 1 and 2). The Colliery's Pit Top Area is located only a few hundred metres west of Medway, with coal stockpiled at Loch Catherine, about 1 kilometre (km) southwest of the village. Berrima Cement Works is located approximately 8 km east of the Pit Top Area, near New Berrima, in the Wingecarribee local government area (see Figures 1 and 2).



Figure 1: Project Location

1.3 Existing Operations

1.3.1 Berrima Colliery

Berrima Colliery has operated intermittently since 1872, with the village of Medway established in 1926 principally to service the site. Coal is currently extracted from the Wongawilli seam using underground mining methods at a rate of approximately 220,000 tonnes per annum (tpa) of run-of-mine (ROM) coal. Historically, extraction has varied from 125,000 tpa to 460,000 tpa, with maximum design capacity being 500,000 tpa. Current mining equipment includes two continuous miners, two shuttle cars, a feed breaker and three breaker line supports.

Coal is brought to the surface through a portal in the Pit Top Area (see Figure 3), just west of Medway. The coal is crushed in the Pit Top Area (with no other beneficiation required) before being transferred by truck to the Loch Catherine site for stockpiling (see Figure 4). Coal is currently then hauled by road from the Loch Catherine site to the Colliery's principal customer, Berrima Cement Works. From time to time the Colliery has supplied other customers, including the Berrima Power Station, the Tallawarra Power Station and Boral's Maldon Cement Works, located east of Picton. The Colliery currently generates approximately 32 coal truck deliveries (64 movements) per day, all of which travel along Medway Road, through the village of Medway.

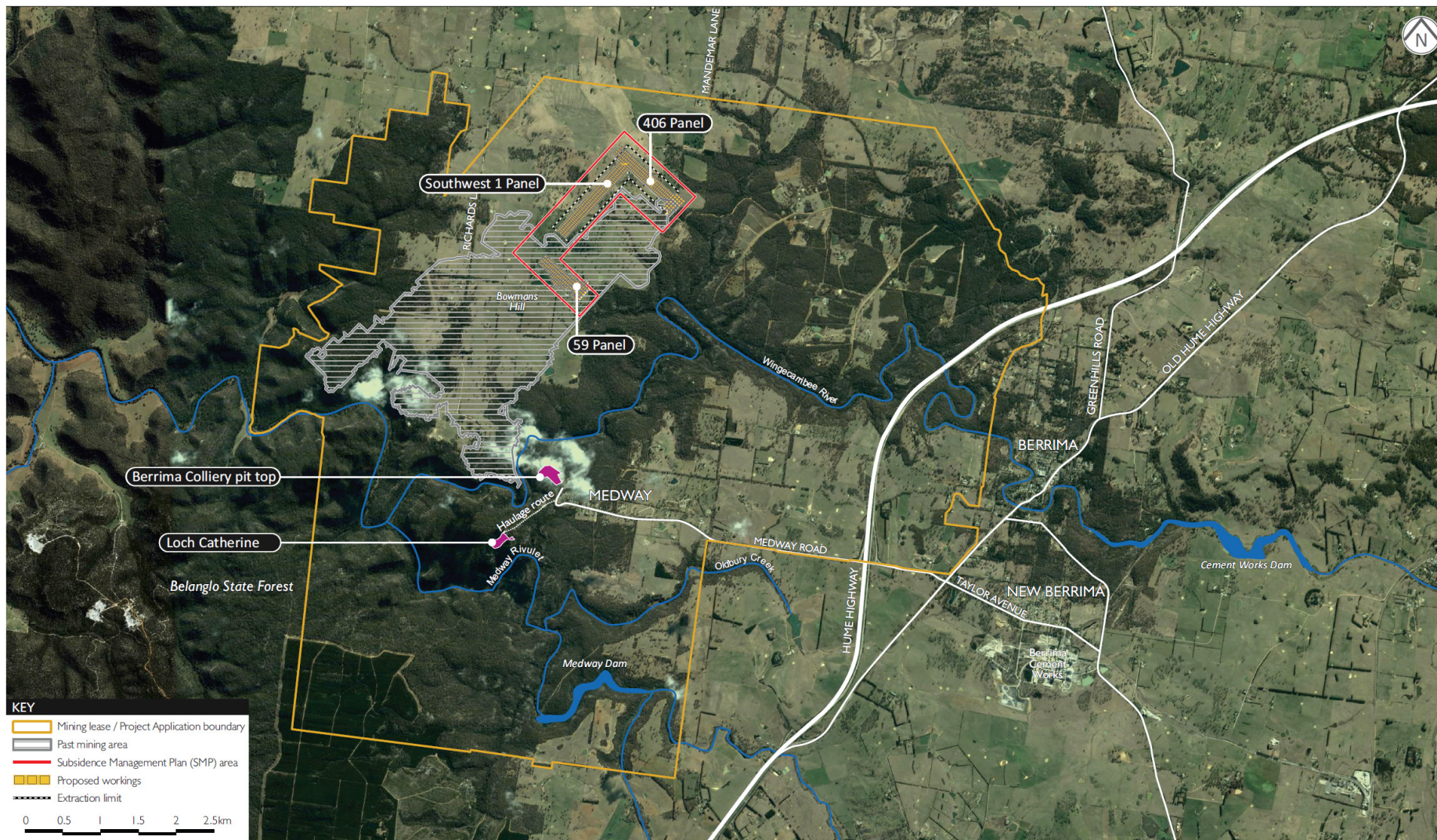


Figure 2: Project Layout

1.3.2 Berrima Cement Works

Berrima Cement Works has been in operation since 1929, and currently produces approximately 1.4 million tpa of cement products for supply to domestic and international markets. The Cement Works has approval under a Ministerial development consent issued in 2003 to produce up to 1.56 million tpa. The Cement Works requires supply of between 200,000 and 230,000 tpa of coal for cement production. This coal is sourced entirely from Berrima Colliery and its Loch Catherine stockpile site. Coal is currently stored on site in a dedicated silo in the southeast corner of the site, with occasional outdoor, uncovered stockpiling of up to 15,000 tonnes of coal. The layout of Berrima Cement Works site and the location of the proposed new coal stockpile are shown in Figure 5.

Product and material transport to and from the site is undertaken by road, with approximately 36 deliveries (72 movements) of shale, minerals or coal coming to the site each day, and 105 daily despatches (210 movements) of clinker and cement to Port Kembla and other local cement customers.

1.4 Project Setting

Berrima Colliery is located within an existing mining lease (CCL 748, see Figure 2), which covers an area of some 6,157 hectares (ha) to the west of Berrima. Past mining areas are flanked on the east and south by the Wingecarribee River, and by relatively undisturbed vegetation to the east, south and west (generally associated with the Belanglo State Forest). The key exception to this is the corridor to the west of the Pit Top Area containing Medway Road and the village of Medway.

Most of the historical mining areas, as well as those parts of the site now proposed to be mined, are either sparsely vegetated or devoid of vegetation. The majority of land overlying the mining lease area is privately owned, and used for agriculture (principally grazing) in lots ranging from 40 to 100 ha.

The village of Medway, comprising approximately 30 dwellings, is located a few hundred metres east of the Pit Top Area. The Hume Highway, Old Hume Highway and the town of Berrima are located approximately 4.5 km, 5.5 km and 6.5 km further east, respectively.

Berrima Cement Works is located south of New Berrima, with Taylor Avenue forming the boundary between the town and the cement works. A lightly vegetated section of the site separates New Berrima and Taylor Avenue from processing areas approximately 300 metres (m) further south. Berrima Cement Works site is connected to Berrima Colliery site via Taylor Avenue and Medway Road. The Hume Highway and the Old Hume Highway are the principal transport routes through the region, transecting it in a northeast to southwest orientation.

A shale quarry and stockpiling area is located to the west and southwest of the cement works site. Water management infrastructure is located in the eastern portion of the site, and drains to the east before connecting with Cement Works Dam, near the Wingecarribee River.

The locality is generally rural in character, with the key exceptions being New Berrima and Berrima located approximately 2 km to the north, across the Wingecarribee River. Significant local vegetation is generally restricted to riparian areas of the Wingecarribee River, and areas between New Berrima and the river.

1.5 Requirement to Obtain Development Consent

The continued operations of Berrima Colliery have previously relied on longstanding exemptions for existing mines from requiring development consent under Part 4 of the EP&A Act. Consent was not required due to provisions in the previous *Wingecarribee Local Environmental Plan 1989*, which reflected the *Environmental Planning & Assessment Model Provisions 1980*, with the effect that consent was not required for development carried out on a mine for the purposes of a mine, and also due to similar provisions then in place under the *Mining Act 1992*.

However, due to the introduction of Part 3A of the EP&A Act on 1 August 2005 and the related passage of both the former *State Environmental Planning Policy (Major Development) 2005* and amendments to the *Environmental Planning & Assessment Regulation 2000*, the mine requires either development consent under Part 4 or project approval under Part 3A to continue operations after 31 March 2012. Boral therefore requires a new project approval for mining to continue to operate the Berrima Colliery. Boral's coal extraction takes place under an existing approved Subsidence Management Plan (SMP), Mining Operations Plan (MOP) and Environment Protection Licence (EPL).

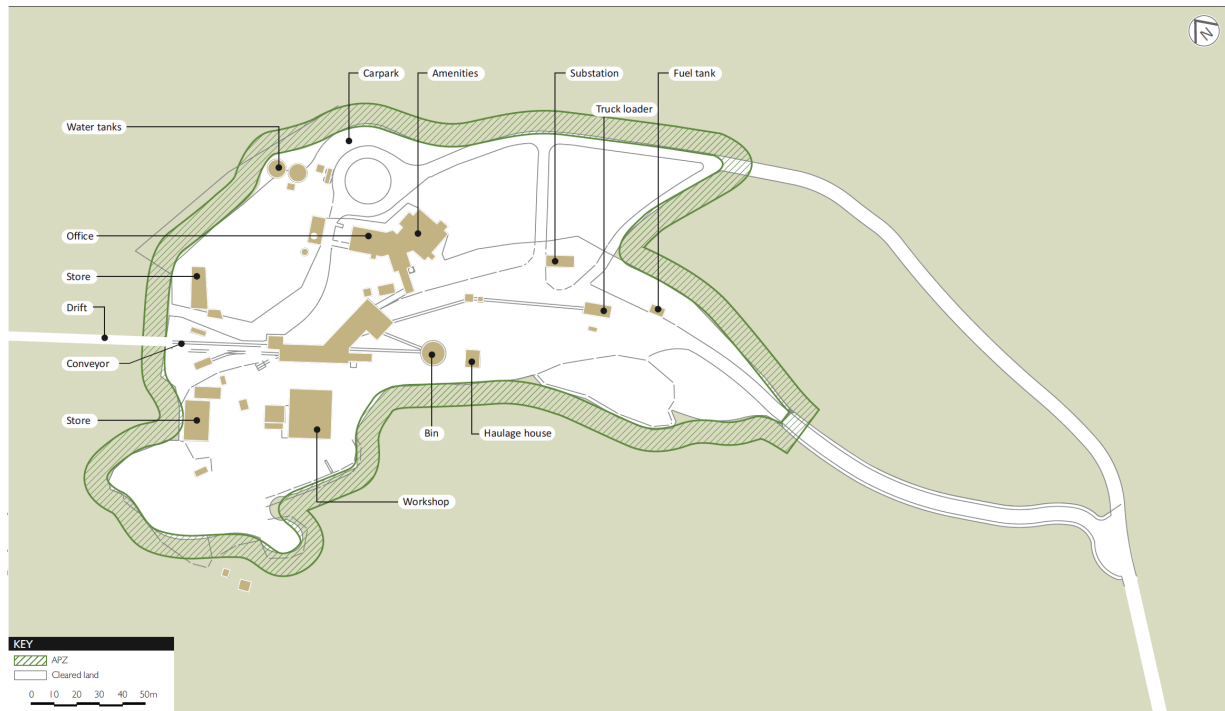


Figure 3: Configuration of the Berrima Colliery Pit Top Area



Figure 4: Configuration of the Loch Catherine Site



Figure 5: Location of Proposed Coal Stockpile at Berrima Cement Works

PROPOSED PROJECT

2.1 Berrima Colliery

Boral proposes to continue the operation of Berrima Colliery, including underground extraction of up to 460,000 tpa of ROM coal. Proposed mining operations would occur between 2 and 2.5 km to the north of Medway, generally to the northeast of previous mining areas. ROM coal would be stockpiled at the Loch Catherine site before being transported by road to customers. Between 120,000 and 250,000 tpa would be hauled to Berrima Cement Works. Coal not transferred to the cement works (210,000 to 340,000 tpa) would be hauled by road to other Boral operations, domestic customers and to Port Kembla Coal Terminal for export by ship.

All major components of the project are summarised in Table 1. Site layouts for the Colliery Pit Top Area and the Loch Catherine site are shown in Figure 3 and Figure 4. The project is described in full in the Environmental Assessment (EA), which is attached as **Appendix D**.

Table 1: Major Components of the Project

Aspect	Description
Project Summary	Continued operations at Berrima Colliery, including: • continued underground mining of coal using bord and pillar methods within the currently approved footprint; • production of up to 460,000 tpa of ROM coal; • continued operation of existing mine facilities and support structures, with replacement and upgrade of the main amenities septic system; • expansion of the Loch Catherine stockpile area to the north and west, to increase stockpile capacity from 100,000 tonnes to 115,000 tonnes; • continued transportation of product coal by road to current and future markets or to stockpiling areas; • provision of new Asset Protection Zones (APZ) around the Colliery's Pit Top Area and the Loch Catherine stockpile site; and • rehabilitation of the site at the conclusion of mining operations.
Extraction Areas	Extraction within Panels 59, SW1 and 406 (see Figures 2 and 7). Panels SW1 and 406 would involve secondary extraction. Panel 59 has already had first workings extracted, and no second workings are proposed.
Stockpiling Areas	Expansion of the Loch Catherine stockpile area from 100,000 tonnes to 115,000 tonnes.
Extraction Rate	A maximum production rate of up to 460,000 tpa. Current operations produce around 220,000 tpa of ROM.
Depth of Extraction	Between 130 and 180 m below ground level.
Processing and Facilities	The Pit Top Area includes basic coal handling infrastructure such as coal conveyors, a coal storage bin and coal truck loading station. The site also includes administration and support buildings, a workshop and stores, fuel storage and a substation. Coal washing is not required and coal washing/ processing capacity is not available. The Loch Catherine site comprises a clear stockpile area and surface water management infrastructure.
Water Management	Approximately 3 megalitres (ML) of groundwater is expected to seep into the mine each day (approximately 1,095 ML per annum). Up to 0.038 ML/day of this would be used for dust suppression, wash down of equipment and ablutions, and a further 0.3 ML/day is used by Medway residents for non-potable purposes. The majority of groundwater (approximately 98%) would continue to be discharged to the Wingecarribee River in accordance with the site's existing Environment Protection Licence (EPL 608).
Product Transport	Coal would be transported by road, with truck numbers expected to increase from the current 32 coal truck deliveries per day (at 220,000 tpa) to a maximum of 68 coal truck deliveries per day (at 460,000 tpa). Between 120,000 tonnes and 250,000 tonnes of coal would be transported to Berrima Cement Works. Remaining coal (between 210,000 tpa and 340,000 tpa) would be delivered by road to other customers such as Maldon Cement Works and Port Kembla Coal Terminal (PKCT) to the north, the limestone kilns at Marulan and Galong limestone mines to the south, and Waurin Ponds Cement Works near Geelong.
Project Life	Eight years.
Employment	The site currently employs 38 staff. This would increase to 63 employees if production reaches the proposed maximum of 460,000 tpa.
Capital Value	\$3.8 million.

Aspect	Description
<i>Construction</i>	The majority of construction works would involve clearing an additional 20 m of vegetation around the Pit Top Area and Loch Catherine site to provide adequate Asset Protection Zones. Some clearing and earthworks would also be required at the Loch Catherine site to facilitate expansion of the coal stockpile (see Figures 3 and 4).
<i>Hours of Operation</i>	The Colliery would operate 24-hours per day, seven days per week for 340 days of the year. This represents an increase in operations from the current 210 days of operation each year. Coal transfer between the Colliery and Loch Catherine would remain unchanged, being between 6:00 am and 9:00 pm Mondays to Fridays, and 7:00 am to 1:00 pm on Saturdays. No haulage would occur between the sites on Sundays or public holidays. Haulage of coal from the Loch Catherine site to off-site customers would be restricted to 7:00 am to 6:00 pm Mondays to Fridays, and 6:00 am to 2:00 pm on Saturdays. No off-site haulage would occur on Sundays or public holidays. Coal would be transported from Berrima Cement Works to PKCT during five campaigns per year, with each campaign expected to be conducted over a five to seven day period. Campaign haulage would be conducted from 4:00 am to 4:00pm.
<i>Rehabilitation</i>	Rehabilitation of the site after cessation of mining would include removal of all surface infrastructure. The mine entry and ventilation shaft would be sealed and any contamination or waste on the sites would be removed. The sites would be contoured to fit within the surrounding landscape and would be revegetated using locally endemic native species. The existing bridge over the Wingecarribee River would be maintained for ongoing access to the sites.

2.2 Berrima Cement Works – Coal Stockpiling

Boral proposes to modify the existing consent for the upgrade of Kiln No. 6 at Berrima Cement Works to permit stockpiling of up to 25,000 tonnes of coal on the site. The coal would be stockpiled temporarily and would be transported by road to PKCT through five campaigns per year. Campaigns would include road transportation of coal to PKCT over a focused period of five to seven days, timed to coincide with the arrival of coal ships at the port.

Berrima Cement Works is shown in Figure 2, and the location of the coal stockpile, a proposed new weigh bridge and truck circulation patterns within the site are shown in Figure 5. The proposed coal stockpile would not result in any changes to the operation of the cement works itself. The modification is described in full in the modification EA, which is attached as **Appendix E**.

2.3 Project Need

Boral argues that Berrima Colliery has been in existence since 1872 and is supported by well-established infrastructure. Continued operation of the Colliery would continue its positive social and economic effects through employment and investment, as well as ongoing contributions to the cement industry through provision of an appropriate fuel feed. Given the significance of cement supply to the State's construction industry from facilities such as Berrima Cement Works, Boral argues that the Colliery's continued operations would have broad positive implications for the region and the State.

Boral has justified the need for an increase in production capacity at the Colliery based on the poor commercial viability of operations at lower production levels. It has argued that current operations are marginally viable at best, and additional production capacity is required to support the ongoing commercial viability of the Colliery. Boral also argues that coal stockpiling is a fundamental requirement of increased output at the Colliery, with the stockpile acting as a buffer between variability in coal production and the requirement for rapid ship loading at PKCT. It is preferable to use the existing Cement Works site for stockpiling, rather than developing an alternative greenfield site or expanding the Colliery into surrounded vegetated areas.

The Department generally agrees with the justification presented by Boral for continued operations at the Colliery and for coal stockpiling at the cement works. While the Colliery is relatively small compared with other mining operations in New South Wales, it forms an important contributor to the economically-significant cement industry. Much of the Colliery's justification, and the justification for coal stockpiling at the cement works, stems directly from the significance of the cement industry. Further, it is preferable from an environmental planning perspective to derive as much benefit as possible within environmental constraints from existing developed sites such as the Colliery and Cement Works, rather than developing alternative locations.

STATUTORY CONTEXT

3.1 Permissibility

Berrima Colliery constitutes development for the purpose of underground coal mining, which is permissible with development consent under *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (the Mining SEPP). The Mining SEPP prevails over the provisions of *Wingecarribee Local Environmental Plan 2010*, which would otherwise prohibit parts of the project on land zoned E2 – Environmental Conservation and E3 – Environmental Management (but not the remainder of the project on land zoned RU2 – Rural Landscape).

Berrima Cement Works is located on land zoned IN3 – Heavy Industrial, in which development for the purpose of general industries and heavy industries is permissible with development consent. Coal stockpiling on the cement works site is considered consistent with characterisation of the development as general or heavy industry, and is therefore a permissible use. Further, even if coal stockpiling were not to be considered to be for the “purpose of ... industry” or unrelated to the existing Cement Works (as has been suggested in some submissions on the proposal), it would nonetheless be a permissible use on the land since it is not a nominated prohibited use.

3.2 Major Project – Continued Operations at Berrima Colliery

The project was declared to be a major project under Part 3A of the EP&A Act because it constitutes development for the purposes of coal mining, and therefore met the criteria in clause 5 of Schedule 1 of the former *State Environmental Planning Policy (Major Development) 2005*.

Part 3A of the EP&A Act, as in force immediately before its repeal on 1 October 2011 and as modified by Schedule 6A to the Act, continues to apply to the project application, since it is a “transitional Part 3A project” for the purposes of Schedule 6A. Consequently, the Minister for Planning and Infrastructure is the approval authority for the project application. However, the proposed modification falls within the Minister’s delegation to the PAC dated 14 September 2011, because Wingecarribee Shire Council has made an objection to the project (see Section 4). Consequently, the PAC must determine the application.

3.3 Modification Request – Berrima Cement Works

On 12 May 2003, the then Minister for Infrastructure and Planning granted development consent for an upgrade of Berrima Cement Works, generally involving an upgrade to Kiln No. 6 and associated works. The development was declared to be State Significant Development under the provisions of the former *State Environmental Planning Policy No. 34 – Major Employment-Generating Industrial Development* (SEPP 34).

Clause 8J(8) of the *Environmental Planning and Assessment Regulation 2000* specifies that development consents granted under SEPP 34 are subject to modification under section 75W of the EP&A Act. Further, clause 12, Schedule 6A of the EP&A Act provides for the continued operation of section 75W despite the repeal of Part 3A. Consequently, the Minister for Planning and Infrastructure is the approval authority for the project application. However, the proposed modification falls within the Minister’s delegation to the PAC dated 14 September 2011, because Wingecarribee Shire Council has made an objection to the project (see Section 4). Consequently, the PAC must determine the application.

The Department is satisfied that the proposed coal stockpiling operations to be undertaken at Berrima Cement Works are appropriately dealt with as a modification to the existing development consent, rather than a new development application.

3.4 Other Approvals

Under section 75U of the EP&A Act, a number of other approvals have been integrated into the major project approval process and are not required to be separately obtained for the project. These include particular water-related approvals under the *Water Management Act 2000* and (possibly) heritage-related approvals under the *National Parks and Wildlife Act 1974*.

Under section 75V of the Act, while a number of further statutory approvals are still required to be obtained, these may only be granted in a manner that is substantially consistent with any Part 3A approval. Such approvals include an EPL under the *Protection of the Environment Operations Act 1997*.

The Department has consulted with the relevant public authorities responsible for these other approvals (see Section 4) and has considered the issues relating to these approvals in its assessment of the project (see Section 5). None of the relevant authorities object to the project on grounds related to these other approvals.

3.5 Exhibition and Notification

The EA for the project (see **Appendix D**) was exhibited from 6 June 2011 until 22 July 2011, which exceeds the statutory minimum 30-day public exhibition period. The EA for the modification request (**Appendix E**) was concurrently exhibited during the latter part of this period (from 28 June 2011 until 22 July 2011).

The EA documents were made available at the offices of the Department, Council and the Nature Conservation Council during the exhibition period, as well as being available on the Department's website. The Department notified Council and other Government agencies of the public exhibition period, and placed advertisements in local newspapers to notify the public. This satisfies the requirements in Section 75H(3) of the EP&A Act.

During the assessment process, the Department also made a number of documents available on its website, including the project application and request for modification; Preliminary Environmental Assessment; Director-General's environmental assessment requirements; the two EAs; public and agency submissions; and Boral's Response to Submissions.

3.6 Environmental Planning Instruments

The Department considers that Boral has adequately considered the application of environmental planning instruments to the project and modification. There are no environmental planning instruments that substantially govern the carrying out of the project, such as required to be considered under section 75I of the EP&A Act.

While the *Wingecarribee Environmental Plan 2010* does not include any provisions that would substantially govern the carrying out of the project or the modification), and does not include relevant specific development controls or standards, the Department has considered the Plan and is satisfied that the project and modification are not inconsistent with the aims and objectives of the underlying land use zonings (E2 – Environmental Conservation, E3 – Environmental Management and RU2 – Rural Landscape for the continued operations at the Colliery and IN3 – Heavy Industrial for the cement works). Further, *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* specifies that the project is permissible.

3.7 Objects of the Environmental Planning and Assessment Act 1979

Decision-makers are required to consider the objects of the EP&A Act when making decisions under the Act. These objects are detailed in Section 5 of the Act, and include:

'The objects of this Act are:

- (a) *to encourage:*
 - (i) *the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
 - (ii) *the promotion and co-ordination of the orderly and economic use and development of land,*
 - (iii) *the protection, provision and co-ordination of communication and utility services,*
 - (iv) *the provision of land for public purposes,*
 - (v) *the provision and co-ordination of community services and facilities, and*
 - (vi) *the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
 - (vii) *ecologically sustainable development (ESD), and*
 - (viii) *the provision and maintenance of affordable housing, and*
- (b) *to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and*
- (c) *to provide increased opportunity for public involvement and participation in environmental planning and assessment.'*

The Department is satisfied that the project encourages the proper use of resources (Object 5(a)(i)) and the promotion of orderly and economic use of land (Object 5(a)(ii)), particularly as the project relates to the continued operation of an existing colliery. Coal stockpiling at Berrima Cement Works is considered to be consistent with the industrial use of the site, and an efficient use of spare land on the site (compared with development of an alternative site for the sole purpose of coal stockpiling).

The encouragement of environmental protection (Object 5(a)(i)) is considered in detail in Section 5 of this report. Based on this consideration, the Department is satisfied that the impacts of the project and modification can be mitigated and/or managed to ensure an acceptable level of environmental performance.

Finally, the Department has fully considered the encouragement of ecologically sustainable development (ESD) (Object 5(a)(vii)) throughout its assessment of the merits of the two applications, and sought to integrate all significant economic and environmental considerations and avoid any serious or irreversible damage to the environment, based on an assessment of risk-weighted consequences. Based on this consideration, the Department is satisfied that the project and modification can be carried out in a manner that is consistent with the principles of ESD.

3.8 Statement of Compliance

Under section 75I of the EP&A Act, the Director-General's report is required to include a statement relating to compliance with the Director-General's environmental assessment requirements issued with respect to the project. The Department is satisfied that the environmental assessment requirements have been complied with.

CONSULTATION

Submissions received during the public exhibition period for the project application and modification request raised issues associated with one or both applications. A summary of the number, nature and authors of the submissions is presented in Table 2 below.

Table 2: Summary of Submission Sources

Submission Source	Berrima Colliery Project Application	Berrima Cement Works Modification
Private individuals	58 (43 in support, 15 objections)	63 (42 in support, 21 objections)
Public interest groups	3 (one in support, two objections)	1 (one objection)
State and local government agencies	8 (one objection, five raised issues for consideration, two raised no objections)	4 (one objection, two raised issues for consideration, one raised no objection)
Total submissions	69	68
<i>Total objections</i>	<i>18</i>	<i>23</i>
<i>Total support</i>	<i>44</i>	<i>42</i>
<i>Total non-objection/issues raised</i>	<i>7</i>	<i>3</i>

A summary of the issues raised in submissions is provided below, with a full copy of these submissions provided in **Appendix F** and Boral's Response to Submissions provided in **Appendix G**. The frequency distribution of issues raised by public submissions for both project application and modification request is shown in Figure 6 below.

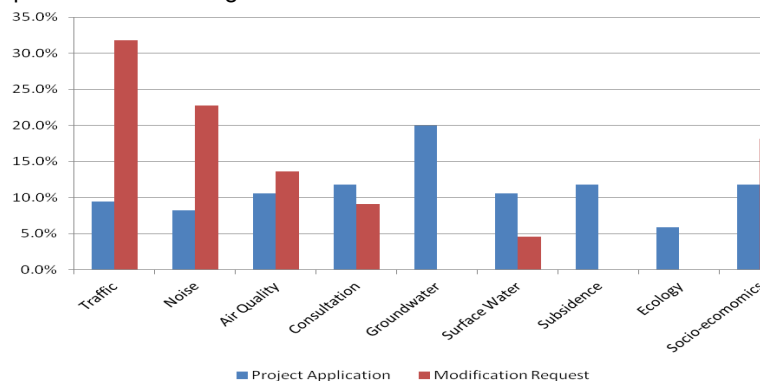


Figure 6: Frequency of Issues Raised in Submissions

4.1 Submissions from Public Authorities

Project application

The **Office of Environment and Heritage** (OEH), identified a number of issues where it considered there remained some uncertainty or lack of clarity around the EA's assessment methodologies or predicted impacts. Of these, it identified the following as being of key significance:

- lack of clarity around the quantity or quality of mine water discharges to the Wingecarribee River, and a lack of data to characterise the receiving waters;
- concern over the potential for the project to cause connective fracturing between the mine and the surface, and the effect that this might have on surface and groundwater. OEH also suggested that the groundwater assessment presented in the EA was based on limited verified groundwater data;
- uncertainty or lack of clarity around the assumptions underpinning the subsidence assessment for the project, as well as calibration of the subsidence model;
- insufficient details of noise mitigation measures proposed to be applied to the project to minimise noise impacts predicted to be above applicable noise criteria, and the need to clarify the existence or otherwise of a morning shoulder period for project-related traffic;
- insufficient details of measures to be applied to minimise dust generation from the site.

In addition to these key issues, the submission made by OEH also provided general comments on flora and fauna impacts, impacts on Aboriginal cultural heritage and the adequacy of current environmental monitoring at the site.

The **NSW Office of Water** (NOW) questioned the extent and representativeness of data employed for groundwater and surface water impact assessments, particularly extrapolation of the limited data set to characterise the existing environment and to predict likely impacts. NOW also raised concerns that the EA focused principally on upland swamps rather than on other potentially-affected groundwater dependent ecosystems, such as those reliant on watercourse baseflows or underlying aquifers.

The **Land & Property Management Authority (Crown Lands)** (LPMA) identified the presence of Crown lands within the mining lease area, and the existence of Native Title claims over various parcels of land within the mining lease. The LPMA indicated that separate approvals may be required if Crown roads require closure and noted that Native Title claims are unlikely to affect mining operations.

The **Division of Resources and Energy** (DRE) within the Department of Trade and Investment, Regional Infrastructure and Services requested that any approval granted for the project reflect the need to prepare a Rehabilitation Plan within three months of approval.

Roads and Maritime Services (RMS), formerly the Roads and Traffic Authority, raised no objection to the project, and noted planned future improvements to Medway Road. RMS also indicated that the road network surrounding Berrima Colliery and Berrima Cement Works has ample capacity to cater for existing and future traffic volumes (including additional traffic from the project).

The **Sydney Catchment Authority** (SCA) raised concerns that no offsets were proposed for the 3.6 ha of vegetation proposed to be removed as part of the project that proposed water quality monitoring does not include event-based sampling, and that the Soil and Water Management Plan for the project should reflect separation of clean and dirty water catchments.

The **Heritage Branch** of OEH noted that no historical heritage items are located within the study area, and that there is unlikely to be impact on listed heritage items.

The submission from **Wingecarribee Shire Council** objected to the project, although this objection was subsequently varied significantly following consideration of Boral's Response to Submissions report (see section 4.3) and later commitments by Boral regarding road upgrades. Initially, Council's principal objection was on the basis that the mine should continue at current extraction rates (220,000 tpa) for supply to local and domestic customers and not be intensified to 460,000 tpa to accommodate increased coal transfers to PKCT. Council also argued that if approval was granted for continued mining operations, then Boral should be required to construct a haul bypass road around Medway village and enter into a Voluntary Planning Agreement for upgrade and maintenance of Medway Road. Council's original submission also included comments and recommended conditions in relation to noise, dust and water quality, hours of operation, B-double haulage routes, mine subsidence and community offsets (contributions to community infrastructure and services).

On 23 November 2011, Council resolved to “not oppose” the project, contingent “only” on a series of conditions, including that Boral pay the Council to undertake the proposed upgrade of Medway Road, that these upgrades take place according to a particular timetable, and that Boral pay a road maintenance levy for Medway Road of 8 cents/kilometre/tonne. Council later reaffirmed this position at its meeting of 22 February 2012. Council’s submission, along with the two subsequent Council resolutions, is included in **Appendix F**. While Boral’s commitments and the Department’s proposed conditions satisfy most of Council’s requests, they do not so in all respects. In these circumstances, it is necessary that the project is determined by the Planning Assessment Commission.

Stockpiling Modification

The submission made by OEH raises a number of issues, including the potential for transport of coal to PKCT by rail, the management of dust, the lack of a noise impact assessment for the modification, mitigation of potential road traffic noise and management of run-off from dust suppression activities. OEH indicated that further information or clarification concerning these issues would be required before it could recommend appropriate conditions of approval.

DRE indicated that it raised no objection to the modification.

RMS raised no objection to the modification, subject to the preparation and implementation of a Traffic Management Plan.

Council objected to the modification on the same grounds as its objection to the continued operation of Berrima Colliery (ie operation above the existing 220,000 tpa production rate) and argued that stockpiling at Berrima Cement Works should be subject to a fresh development application (rather than a modification of the existing consent).

4.2 Submissions from the Public

Public submissions received in support of the project application and modification request highlighted the longstanding history of the coal mining operations, the benefits of the project (particularly in terms of job security, regularisation of regulation of the Colliery through a comprehensive planning approval and the economic benefits of the project to the local and regional community) and the adverse socio-economic impacts should the Colliery close.

Public submissions objecting to the project application for continued mining operations raised the following concerns:

- **Traffic** – particularly heavy vehicle movements and their impacts on Medway village. Concerns were raised about the standard of Medway Road and its ability to accommodate additional traffic. Some submissions suggested road upgrades or a bypass road around Medway;
- **Noise** – including both operational and traffic-related noise, with a particular focus on the veracity of the noise assessment process;
- **Air Quality** – significant concerns raised in submission related to dust generation and dust impacts on the surrounding community. Submissions raised concern about dust from project operations as well as dust generated by truck movements along poorly maintained roads and from overloaded and/ or uncovered coal trucks;
- **Community and Consultation** – the community consultation process and information about the project to the community was highlighted as being inadequate;
- **Groundwater** – public submissions were generally concerned with the veracity of the groundwater impact assessment, with questions raised around the appropriateness and/ or representativeness of assumptions and data applied to the assessment;
- **Subsidence** – concerns were raised about subsidence impacts on receivers further afield from the Colliery, as a result of changes in groundwater hydrology; and
- **Ecology** – the area required to be cleared for Asset Protection Zones was questioned, and concern was raised about the impacts of this clearing on unique flora and fauna.

Public submissions objecting to the modification request for approval to stockpile coal at Berrima Cement Works raised the following concerns:

- **Traffic** – particularly heavy vehicle movements associated with coal haulage to PKCT and their impacts on surrounding communities;
- **Noise** – principally around the lack of consultation with local communities on noise issues; and
- **Community and Consultation** – public submissions suggested that Boral had tried to ‘sneak in’ the modification request separate to the continued operations at Berrima Colliery, and had not consulted the local community on coal stockpiling at the cement works site.

Residents of Medway and Surrounding Properties

The Department received a lengthy submission from the *Residents of Medway and Surrounding Properties* (ROMASP) which objected to both the project application and modification application. Many of the residents represented by ROMASP also made individual submissions concerning the project and/or the modification. The initial version of ROMASP's submission was received during the exhibition period in July 2011, and a later revised version was received in August 2011 (both are included in **Appendix F**). The submission was accompanied by an expert engineering report on the potential road and traffic impacts, prepared by Rob Parker Engineering Pty Ltd.

ROMASP's key concerns relate to potential road and traffic impacts on Medway Road associated with increased coal production and road haulage, including the standard and width of Medway Road, and driver safety issues. The expert engineering report that accompanied the submission made a number of recommendations for road upgrades including proposed road widths, signposting and line-marking. Other concerns raised by ROMASP include potential noise and dust impacts, as well as a perceived lack of community consultation by Boral.

Many of ROMASP's concerns and recommendations are similar to those raised by Council. The Department has carefully considered these concerns and has taken them into account in drafting the recommended conditions of approval, particularly in relation to the recommended staged road upgrade. In addition, other recommended conditions would require Boral to implement a Road Transport Protocol which would include a Traffic Management Plan and a Drivers' Code of Conduct.

The Department also notes ROMASP's concerns about community consultation and has encouraged Boral to further engage with the community throughout the application process. The recommended conditions of approval would also require Boral to undertake ongoing consultation through the Community Consultative Committee (CCC) process.

4.3 Response to Submissions

Following the public exhibition period, Boral prepared a consolidated Response to Submissions to address issues raised in submission on both the project application and the modification request (see **Appendix G**). The Response to Submissions includes additional specialist studies/ comment, including an updated Soil and Water Management Plan for the Loch Catherine site, additional air quality assessment for the continued operations of the Colliery and clarification of the subsidence assessment.

The Response to Submissions was notified on the Department's website and provided to OEH, NOW, SCA and Council for consideration, with each of these agencies responding as follows:

- OEH confirmed that the Response to Submissions adequately addressed the issues raised in its submission, and provided recommended conditions of approval;
- NOW confirmed that it would not object to approval of the project and issued recommended conditions of approval. It also indicated that Boral's groundwater licence application is still under assessment and would be determined in due course;
- SCA indicated that it was satisfied with the updated water quality monitoring program for the project, but maintained that offsets should be provided for vegetation lost as part of the project;
- Council's amended position is to not oppose the project, provided "only" that Boral upgraded Medway Road and paid road maintenance contributions in the exact manner requested by Council (see **Appendix F**). It also maintained its view that coal transport of coal from Berrima Cement Works to PKCT for export should be subject to a fresh development application rather than modification of an existing approval.

ROMASP also provided a response to Boral's Response to Submissions in December 2011 (see **Appendix F**). ROMASP again raised concern about potential traffic impacts and emphasised the need for significant upgrades to Medway Road.

ASSESSMENT

The Department considers that the key issues associated with the project and modification are:

- subsidence impacts (continuation of mining operations);
- surface water and groundwater impacts (continuation of mining operations);
- traffic impacts (both continuation of mining operations and coal stockpiling at Berrima Cement Works);
- noise impacts (both continuation of mining operations and coal stockpiling); and
- air quality (dust) impacts (both continuation of mining operations and coal stockpiling).

5.1 SUBSIDENCE IMPACTS

The EA includes a Subsidence Impact Assessment (SIA), undertaken by Ditton Geotechnical Services, which assesses the predicted subsidence associated with proposed mining in extraction panels Southwest 1 (SW1), 406 and 59, and the potential implications for surface infrastructure. Coal extraction at Berrima takes place under an existing Subsidence Management Plan (SMP), approved by DRE. The proposed project would involve little variation from existing operations and approvals. Underground mining would continue within the existing approved SMP area, specifically Panel SW1 and Panel 406.

5.1.1 Subsidence Modelling and Predictions

First workings have already been undertaken in Panel 59, and Boral proposes not to undertake secondary extraction in this area. Panel 59 must remain open to provide access and ventilation to Panels SW1 and 406, and to other possible future extraction panels. Consequently, pillar integrity must be maintained and no extraction leading to subsidence (i.e. second workings) is proposed to take place. Boral proposes to conduct both first and second workings within Panels SW1 and 406, with an extraction ratio of up to 85%. These panels are located 130-180 m below ground surface, with depth of extraction increasing from east to west, with an average proposed extraction height of 2.6m.

Boral highlights that significant data exists, both for historical operations at Berrima Colliery and for the Southern Coalfield more generally, to support reasonably accurate predictions about the project's likely subsidence performance. Based on this previous mining experience, subsidence associated with second workings is typically no more than 60% of the extraction height, and often as low as 10% to 40% given the stiffness of remnant coal pillars. Where extraction is limited to first workings, then very low levels of subsidence result, generally less than 20 millimetres (mm).

Boral's Response to Submissions addressed a number of queries raised in submissions in relation to the accuracy and calibration of the SIA's subsidence model. Applying the subsidence model to existing Panels 403, 404, 405 and 500, and comparing modelled (ie predicted) results to actual measured subsidence, indicates that the model is accurate to within 1% - 8% in maximum vertical subsidence predictions and to within 10% for maximum tilt predictions. The Department considers that these levels of accuracy are very good, and that the subsidence modelling presented in the EA, as updated in the Response to Submissions, represents a reliable estimate of maximum impacts, and is more than sufficient to satisfactorily inform the assessment process.

Modelling suggests that Panel SW1 is likely to generate maximum subsidence of 0.55 m, and maximum tilt of 11 mm/m. Panel 406 is predicted to generate maximum subsidence of 0.24 m and maximum tilt of 5 mm/m. Even taking into account the maximum modelling errors noted above, the most affected panel (SW1) would experience subsidence of no more than 0.59 m (ie 0.55 m plus 8%) and tilt of no more than 12 mm (11 mm plus 10%).

In the Department's view, these levels of vertical subsidence are very low compared with many other underground mines, where subsidence commonly is above 1.0 m, and sometimes reaches 4.5 m. However, the levels of tilt are reasonably high, reflecting the low depth of cover above the extracted seam at Berrima. High levels of tilt have the potential to impact on built structures and infrastructure, and also on natural features such as clifflines and watercourses. Surface cracking has not previously occurred above panels in Berrima. However, based on the predicted maximum tensile strains, surface cracking widths of between 10 and 30 mm may occur and repair works may be required.

5.1.2 Impacts on Built Structures and Farm Infrastructure

Land immediately above the proposed extraction panels comprises private landholdings which are substantially cleared of trees and used primarily for grazing of livestock. The key potential subsidence impact relates to damage to structures and farm infrastructure, rather than to ecological impacts or

impacts on land use. Based on predicted subsidence effects, Boral has considered the potential for recent and proposed extraction to affect houses and other structures, dams, earthen embankments, power poles and roads. In most cases, the EA concluded that these structures and other improvements would either not be affected enough to cause structural damage or that (in the case of small embankments and dams, power poles and roads) the cost of mitigation measures to avoid or offset potential impacts was acceptable.

However, the SIA identified three groups of built structures and farm infrastructure as requiring particular protection from subsidence impacts associated with second workings. The cost of mitigation to avoid or offset impacts on these structures, or the level of risk involved, has led Boral to implement or propose 'Subsidence Protection Zones' (SPZs) around each of them. These SPZs are essentially areas around the features within which second workings have not or would not take place. Predicted subsidence impacts, including the location of the SPZs, are shown in Figure 7.

The first of these groups is the residences on the Alcorn and Belbin properties, above Panel 404. This panel has already been extracted, with an SPZ which prevented subsidence impacts to the residences. The second is two large earth embankment farm dams above Panel 59, which were identified as representing a low to medium hazard risk to life and/or property in the event of any breach of their earthen walls. First workings in Panel 59 have also already been extracted, and no second workings are proposed. Consequently, any need for a SPZ is moot. The last group is three structures (a house, cottage and machinery shed) on the Renahan property, above Panel SW1, which is yet to be extracted. Based on experience with the SPZ for the Alcorn and Belbin residences, Boral proposes to establish an SPZ for the three structures on the Renahan property based on applying the following restrictions within a minimum setback distance based on a 26.5° angle of draw:

- first workings only;
- pillars of minimum 19.5 m width with a width/height ratio of 7.5; and
- two-layered roof and floor bearing capacity for layers of 4.5 m and 2 m thickness above and below the pillars.

5.1.3 Impacts on Environmental Values

Potential environmental values that may be affected by subsidence include biodiversity, Aboriginal heritage and surface and groundwaters. Boral has delineated a SMP area within which all subsidence impacts from the three panels are expected to be contained (including all the land affected by the already-extracted Panel 59). This SMP area covers approximately 172.48 ha, and includes vegetation communities mapped as follows:

- 152 ha of cleared land;
- 10.06 ha of *Wingecarribee Woodland on Valley Floors* (two remnant stands of 9.76 and 0.3 ha);
- 2.32 ha of *Mittagong Sandstone Woodland on Lower Slopes*;
- 4.16 ha of *Robertson Basalt Tall Open-forest* Endangered Ecological Community (EEC) in three remnant stands of 3.56 ha, 0.5 ha and 0.1 ha; and
- 3.94 ha of *Southern Highlands Shale Woodlands* EEC in three remnant stands of 1.88 ha, 1.56 ha and 0.5 ha.

Much of the remnant vegetation is located along the boundaries of the SMP area, and as such, is expected to experience minimal subsidence. The two stands of remnant vegetation comprising the major remnants of the two EECs listed above fringe the southwestern extent of Panel SW1. The EA predicts minimal subsidence in this area and minimal impacts on these EECs. The Department concurs with this conclusion. However, these EEC remnants are in good condition, despite being relatively small and isolated. The Department has therefore recommended that Boral be required to manage impacts on EECs and threatened flora and fauna so as to ensure negligible impacts.

The only Aboriginal heritage item identified within the SMP area is a small artefact scatter (Boral-OS1) in the northwest corner of the area. The site is also expected to be minimally affected by subsidence, with a negligible threat of damage.

There are no permanent watercourses within the SMP area, and as such, subsidence is unlikely to directly affect watercourses. Changes to surface hydrology are not expected to be significant; given the dominant land use (ie grazing), first workings only beneath the two major farm dams, and the limited amount of drainage-sensitive vegetation. The closest major watercourse, the Wingecarribee River, is located well to the east and outside the predicted subsidence zone. Potential impacts on Wingecarribee River from groundwater depressurisation are considered further in section 5.2 below.

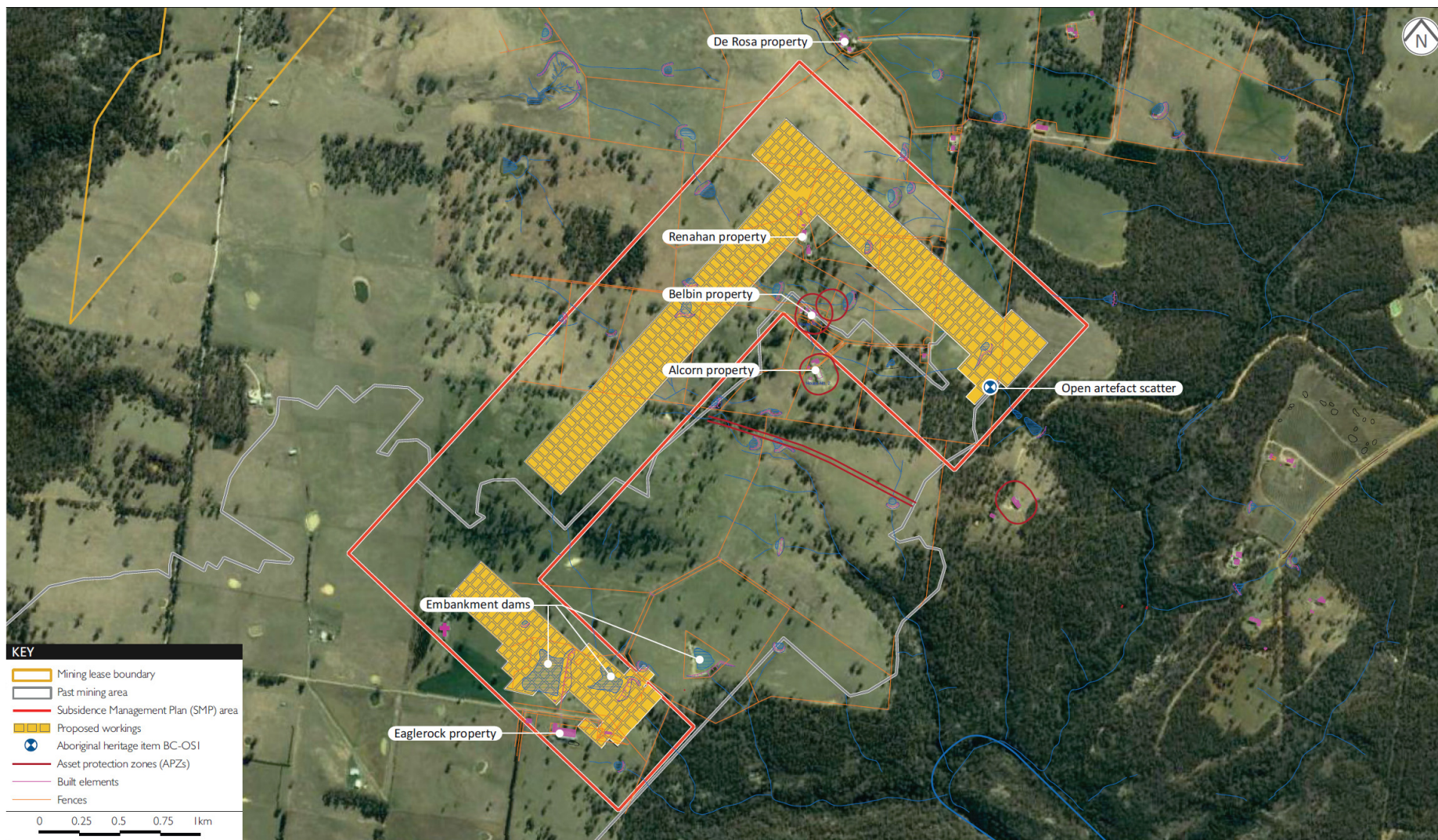


Figure 7: Predicted Subsidence and Surface Structures

Several submissions, including those from key environmental agencies, raised concerns over potential surface cracking and consequent connectivity between surface and groundwater. This issue was the subject of considerable debate between the OEH and Boral through the submissions and Response to Submissions process. Boral has argued that the potential for connective cracking, while it exists, is minimal and well understood from previous mining in the area. While the Department agrees with OEH that there is a risk of connective cracking, it considers that this risk is low given the historical experience at the Colliery, and is within manageable limits subject to the application of a rigorous adaptive management approach. It is likely that the risk of connective cracking in Panels SW1 and 406 is not materially different to adjacent panels which have already been mined (ie Panel NW2 and Panels 401 - 404). The Department therefore concurs with Boral's position and considers that, through a combination of historical experience and the application of the adaptive management approach required under recommended conditions of approval, the residual risk of connective cracking can be effectively managed.

5.1.4 Conclusion

The Department considers that the key subsidence-related issue associated with the project is potential impact on built structures and farm dams, as identified by Boral in the EA. However, Boral's proposals to manage these potential impacts are sound. To ensure adequate and appropriate protection of significant structures, the Department recommends conditions reflecting the SPZs proposed by Boral, including the identified SPZ design criteria. In addition, the Department recommends a condition of approval requiring Boral to manage subsidence impacts to ensure that public infrastructure remains safe and serviceable; and to provide repair, replacement or compensation in the event of any damage.

Achievement of these outcomes would be articulated in an Extraction Plan for the project, including a Public Safety Management Plan and Built Features Management Plan. These plans would be required to outline contingency measures in the event of damage to built structures or unpredicted subsidence impacts, and would be based on an adaptive management approach. The Extraction Plan, including its focus on adaptive management, would also be fundamental to addressing the risk of connective cracking between the surface and the mine.

In summary, the Department is satisfied that the SIA has adequately identified and addressed potential subsidence impacts associated with the project. While there are residual risks of impact to surface structures and connective cracking, these risks have been addressed through the recommended conditions of approval, which are focused on avoidance (in the case of the proposed SPZs) and adaptive management (in the case of connective cracking).

5.2 SURFACE AND GROUNDWATER IMPACTS

The EA includes a Groundwater Impact Assessment (GWIA) undertaken by Australasian Groundwater and Environmental Consultants. The potential impacts of continued mining on groundwater were examined using analytical equations. No numerical model was developed due to the limited monitoring data available at the mine. The EA also includes a Water Quality Assessment prepared by Strategic Environmental and Engineering Consulting.

5.2.1 Site Water Balance

Current mine operations experience an average groundwater inflow into the mine void of 2.83 ML/day, with a range of 2 to 3.5 ML/day. Continued operations at the site are expected to increase the average inflow to 3.1 ML/day.

Relatively small volumes of this mine water (0.038 ML/day) are currently used on-site for non-potable uses (including dust suppression, washdown of equipment and ablutions). A larger volume (0.3 ML/day) is used by Medway residents for non-potable uses. The remaining minewater is discharged to the Wingecarribee River by the mine under an EPL administered by OEH.

The site water balance and general water management would not change significantly as a result of continued operations, although there may be a minor increase in discharges to the Wingecarribee River as a result of the small increase in groundwater inflows to the mine. OEH has indicated that it is prepared to continue to license discharges to the river, and has recommended conditions relating to the characterisation and management of mine water quality. These conditions have been incorporated into proposed conditions setting out requirements for a Water Management Plan for the project.

5.2.2 Impacts on Groundwater

The GWIA highlights that there is limited groundwater monitoring data in and around the existing mine, and generally insufficient information to conclusively determine the extent of current groundwater depressurisation as a result of mining activities. However, the GWIA considers that this limited groundwater monitoring data is sufficient to infer that depressurisation within the seam is likely to extend less than one kilometre from the current mine workings.

Boral argues that Berrima Colliery has been in existence and operation for over 85 years, and as such, it is reasonable to assume that groundwater hydrology is approaching steady-state conditions. That is, the zone of depressurisation around the existing mine workings is likely to have reached close to its maximum extent. Boral also argues that the continuation of mining operations would not significantly increase the total exposed coal seam face (relative to the existing extensive workings) and as a consequence, it is unlikely to significantly increase groundwater infiltration rates. This assertion is supported by the calculations of predicted groundwater inflows to the mine, which indicate roughly a 10% increase over the life of the project, to 3.1 ML/day.

While the Department accepts that Boral's groundwater assumptions and assertions hold merit, the absence of actual monitoring data to calibrate and confirm these assumptions means that Boral's position cannot yet be confirmed. However, the Department also considers that the risk to groundwater hydrology as a result of continued operations is likely to be both low and manageable. The Department accepts that groundwater depressurisation is likely to have approached its maximum extent as a result of historical mining operations, and continued operations are unlikely to significantly increase this. Coal extraction would not move any closer to the more sensitive areas, including those along the Wingecarribee River. Any additional depressurisation effects are likely to expand to the north and west, away from the river. Further, the timeframes for mining allow for additional groundwater monitoring to be undertaken during the early stages of the project and for that monitoring data to be applied (if warranted) to an adaptive management approach.

The submission made by NOW to Boral's Response to Submissions generally endorses the need for additional monitoring data to inform an adaptive management approach. The proposed monitoring program is aimed at confirming groundwater conditions in the area, and any potential connection between groundwater aquifers and surface water. NOW has recommended that this monitoring be undertaken and completed prior to the project being permitted to extract more than 220,000 tpa. While the Department appreciates NOW's desire to place a trigger on the need to undertake groundwater monitoring, it considers that a time-based trigger is more appropriate than an extraction rate limit. It should be noted, for example, that potential groundwater impacts would be more closely linked to the spatial extent of extraction and exposed extraction face, rather than the rate of extraction itself. On this basis, the Department has recommended a condition of approval that reflects initiation of NOW's proposed monitoring requirements within seven months of approval, rather than based on coal extraction rates. The recommended condition of approval is expressly intended to inform adaptive management of future coal mining and would be used to inform the preparation of the project's broader Water Management Plan.

Boral has lodged an application with NOW for approval to extract groundwater (ie the groundwater inflows to the mine). NOW has indicated that it does not object to the project and would assess and determine the groundwater licence application in due course.

5.2.3 Impacts on Surface Water

Currently, groundwater that seeps into mine workings is extracted and discharged to the Wingecarribee River under the terms of the mine's EPL, with only about 10% beneficially re-used on site or for non-potable uses in Medway village. The current EPL includes discharge limits for oil and grease, suspended solids, pH and biological oxygen demand.

The EA includes a series of water quality objectives for the project based on guidelines for human contact, values for 'forested areas and drinking water catchment' for the Hawkesbury-Nepean River system, ANZECC water quality guidelines for recreational purposes, and guideline values issued by the SCA for the catchment. The EA compares water quality monitoring data from previous operations with these water quality objectives and notes that:

- most but not all potential pollutants are currently included in the water quality monitoring program;
- concentration of most pollutants is low, and in many cases, undetectable;

- water quality objectives are met by current mine discharges with the exception of manganese (consistently about 3,000 micrograms/litre (µg/l), which is 30 times the water quality objective), nickel (at 150-200 µg/l, which is about twice the water quality objective) and pH (on one occasion this was recorded at 6.21, compared with a lower limit of 6.5);
- iron is elevated, but does not exceed the water quality objectives, although it has been recorded above the relevant objective in the Wingecarribee River itself;
- while turbidity is not regularly monitored, total suspended solids concentrations are generally very low (< 5 milligrams/litre);
- discharge water is suitable for domestic re-use (as is currently the case for non-potable uses in Medway).

Boral highlights that the key water quality issue is manganese. At the concentrations recorded, there are no known health issues, but there may be aesthetic issues including staining of clothes.

Boral proposes to continue discharge of groundwater to the Wingecarribee River subject to the requirements of its EPL. Despite this being current practice, OEH, NOW and SCA have raised concerns about potential water quality and hydrological impacts and have suggested that more detailed characterisation of discharge water and water quality in the Wingecarribee River is required. While the Department accepts the agencies' position that a continuation of current performance does not necessarily imply that the highest-achievable environmental outcomes are being attained, it still considers ongoing discharge of mine water to be low risk, given the monitoring data presented in the EA and the fact that discharges have been occurring for many years. The Department does, however, consider it appropriate to accept recommendations made by the agencies that Boral develop a more comprehensive water quality monitoring program and that data from such a program is then used to establish a broader suite of water quality objectives for the project.

Boral has committed to expanding the current monitoring program to include a wider range of water quality parameters, derived from the ANZECC guidelines for maintaining ecosystem health and SCA's Drinking Water Guidelines. Boral notes that this monitoring program would be integrated with an ecological monitoring program. This proposal is supported by the Department as it would monitor in-stream biota and identify any changes which may occur as a result of the project. The Department supports the view of the SCA and the commitment from Boral to incorporate event-based sampling under a representative ranges of rainfall events into the monitoring program.

Recommended conditions require a Surface Water Management Plan, including development and implementation of a program, in consultation with NOW and OEH, to monitor surface water discharges, surface water flows and quality, and water quality in the Wingecarribee River and Mandemar Creek. Boral would also be required, based on the outcomes of the water quality monitoring, to establish detailed surface water quality and watercourse health impact assessment criteria, including trigger levels for investigating potentially adverse surface water impacts. The Department is satisfied that this management approach would ensure that the project continues to meet acceptable environmental outcomes, and that these outcomes would improve over time.

5.2.4 Domestic Wastewater Management

There are currently two septic systems operating at the Pit Top Area, one of which services the amenities area and requires replacement. Boral has proposed to replace the existing septic treatment system with a modern Aerated Wastewater Treatment System, with buried tanks plumbed into the existing pipe work from the amenities. Wastewater treated by this system would then be irrigated over grassed areas, thereby requiring no direct discharge to surface waters. OEH has recommended a condition of approval that binds Boral to providing this wastewater system upgrade. The Department accepts this recommendation and has proposed a condition which would require upgrade of the system by 31 December 2012, to the satisfaction of OEH, unless otherwise agreed with OEH.

5.2.5 General Water Management

The Department has recommended conditions of approval that require site water management to be in accordance with the terms of any necessary groundwater licences and the discharge requirements specified under the site's EPL.

To provide an overarching framework for water management, the Department has recommended that Boral be required to develop and implement an integrated Site Water Management Plan, including a:

- *Site Water Balance*, to track and manage water on site, with a focus on reusing and recycling water where reasonable and feasible to do so;

- *Erosion and Sedimentation Control Plan*, to ensure that vegetation clearing works and surface water run-off from non-process areas are managed to minimise the potential for erosion and sedimentation;
- *Surface Water Management Plan*, including a comprehensive water quality monitoring program;
- *Groundwater Monitoring Program*, to monitor project impacts on aquifers, and to implement appropriate mitigation measures in the event that adverse impacts are detected;
- *Groundwater Dependent Ecosystems Monitoring Program*, to ensure that any impacts on groundwater dependent ecosystems are quickly identified and appropriate contingency measures are implemented; and
- *Surface Water and Groundwater Response Plan*, to respond to any incident of elevated surface or groundwater impacts.

5.2.6 Surface and Ground Water Management at the Cement Works

Stormwater from the existing coal stockpile area is directed into settling ponds at the southwestern side of the cement works, where it is treated before being discharged into Stony Creek, which flows into Wingecarribee River. Water monitoring is conducted at the discharge point into Stony Creek in accordance with the site's EPL. There have been no significant breaches of the EPL's water quality conditions in the past and OEH has not raised any concerns about surface water impacts from the proposed modification. The Department is satisfied that the existing water management procedures are sufficient for the proposed coal stockpiling.

5.3 TRAFFIC IMPACTS

The project EA includes a Traffic Impact Assessment (TIA) undertaken by ARUP Pty Limited, which assesses all operational traffic impacts of the project. This includes the assessment of the key intersection affected by the project - the Old Hume Highway/Medway Road/Taylor Avenue intersection. The EA for the modification request includes a second TIA, also undertaken by ARUP Pty Limited, which focuses on the traffic impacts associated with coal stockpiling and campaign dispatch.

5.3.1 Site Access

All coal extracted at Berrima Colliery is currently transported off-site by road, and this would continue as part of continued operations. Access to the Colliery is from the western end of Medway Road, which is the only access road to the Colliery from the Hume Highway and the Old Hume Highway. Medway Road is a two lane sealed rural road, with speed limits varying between 50 and 80 km/h. The sealed width is typically 7 m, and no less than 6.5 m, with sealed or unsealed shoulders of more than 0.5 m. All traffic generated by Berrima Colliery along Medway Road passes through Medway village, located approximately 300 m from the Colliery.

Coal is proposed to be transported from Berrima Colliery for temporary stockpiling or direct delivery to several locations – including:

- the stockpile site, located around 1.5 km southwest of the Colliery on the 'Loch Catherine' property, with access via an unsealed private access road from Medway Road at Medway village;
- Berrima Cement Works, located 7 km east of the Colliery, via Medway Road, Taylor Avenue and Argyle Street and/or Perth Street. Coal not used at the cement works would be stockpiled (up to 25,000 t at any one time) for eventual transportation to PKCT in up to five 'campaigns' per year;
- PKCT via Medway Road, Hume Highway, Picton Road, Mount Keira Road, The Link Road, Southern Freeway, Masters Road, Springhill Road and Port Kembla Road; and
- customers north and south of the project site, via Medway Road, the Hume Highway and/or the Old Hume Highway.

5.3.2 Intersection Performance

The two TIAs considered potential impacts on the following key intersections:

- the Old Hume Highway/Medway Road/Taylor Avenue intersection, the key intersection between the Colliery and Berrima Cement Works; and
- three intersections along the future coal haulage route, focusing on the Masters Road/Springhill Road intersection, considered to be the busiest intersection between Berrima Cement Works and PKCT.

Intersections between the Colliery and the Cement Works

The Old Hume Highway/Medway Road/Taylor Avenue intersection, which was upgraded to a roundabout in 2005, currently operates at Level of Service (LOS) A with an average delay for waiting traffic of seven seconds. The intersection also has a very low degree of saturation (0.123), indicating that it has significant spare capacity to accommodate additional traffic. As a result of the project, during typical operating conditions this intersection would experience an increase of up to 96 heavy vehicle movements/day (or 6 additional heavy vehicle movements/hour). These movements are between the Colliery and the cement works, or to customers south of Berrima. Given the intersection's current performance, its low degree of saturation and existing low traffic volumes, the TIA concluded that the project was unlikely to have any significant impact on the intersection's safety or LOS. The TIA therefore did not undertake any further analysis of predicted traffic increases at this intersection. The Department is satisfied that this is an appropriate level of assessment and concurs with Boral's conclusion that the project is unlikely to significantly affect this intersection.

Under the 'worst case' scenario for the proposed coal export campaigns from the cement works to PKCT (ie five-day campaign haulage of 25,000 tonnes of coal), there would be an additional 320 heavy vehicle movements/day. Of these, 60 movements would occur between Loch Catherine and PKCT and 242 movements would occur between the cement works and PKCT. This short-term increase in movements would be offset by the suspension of transport of cement clinker from the cement works to PKCT (180 movements/day) and between the Colliery and the cement works (60 movements/day). This would result in a net increase of 100 movements/day between the cement works and PKCT during campaign coal haulage, with no increase in movements along Medway Road (due to the movements from Loch Catherine to PKCT being offset by those from the Colliery to the cement works).

The TIA for the modification request considered the potential impacts of this additional traffic on the Old Hume Highway/Medway Road/Taylor Avenue intersection. The assessment concluded that there would be no change in the LOS of the intersection, but a very minimal increase in the average delay (increasing from 7 seconds to 7.1 seconds) and degree of saturation (increasing from 0.123 to 0.127).

Intersections between the Cement Works and PKCT

A 2008 TIA conducted by Cardno Eppell Olsen for the PKCT project application was reviewed to consider the potential impacts of the project. The three intersections considered along the haulage route (Springhill Road's intersections with Masters Road, Port Kembla Road and Tom Thumb Road) currently perform with acceptable LOS with some spare capacity. The busiest intersection, (the Masters Road/Springhill Road intersection) would experience an additional 100 movements/day or seven additional movements/hour during the proposed coal haulage campaigns. Boral has argued that this would be a very minor increase in traffic for a limited duration (only during five haulage campaigns per year) and would therefore have a minimal impact on the road network.

The RMS advised that it does not object to the application. It considers that the road network surrounding the Colliery and the cement works has ample capacity to cater for the levels of traffic proposed by the project.

The Department considers that the continued operations project and the associated modification request would not have a significant impact on the performance of key intersections. These impacts could be further reduced if the current consideration of gazetted Medway Road for use by B-doubles is implemented (thereby enabling increased individual haulage volumes and decreased numbers of heavy vehicle movements).

5.3.3 Road Maintenance

The ROMASP submission and other public submissions raised concerns over the current condition of Medway Road, and questioned how the increased traffic movements proposed under the project application would further degrade its condition and safety. This position was shared by Council, which originally objected to the project application, unless Boral committed to constructing a bypass road, as well as upgrading and maintaining the remaining section of Medway Road, including a maintenance levy and pavement condition reports.

Boral considered that the construction of a bypass road around Medway would be cost prohibitive (in the order of \$5 - 7 million), given the 8 year extension of mining operations being sought. This figure also did not include other costs associated with construction of a bypass road, such as land acquisition and property adjustments. Further, Boral argued that it would only transfer existing traffic

noise impacts to properties that are currently not impacted. Boral has instead proposed a staged upgrade of Medway Road, with:

- *Phase 1* – to be implemented within one year of gaining project approval: upgrading Medway Road through Medway village to a width of 10 m (with the retention of the existing pavement). Damaged sections of Medway Road would also be repaired with asphalt spray seal; and
- *Phase 2* – upgrade of the remaining 80 km/hr section of Medway Road to a width of 10 m and the upgrade of 20 m of Liebmanns Road and upgrades to nine property driveways to AUSTROAD standards; to be commenced within 6 months of the project reaching coal sales of 330,000 tpa, or in 2015 providing that the project has by that time reached coal sales of 250,000 tpa in any year, whichever is the sooner; and
- road maintenance levy of 15 cents/tonne of coal dispatched along the full 4.3 km length of Medway Road, which is equivalent to 3.49 cents/tonne/km of the road.

Boral proposes to undertake the upgrade works itself, but has reserved the option to pay Council to undertake the works, with a contribution of up to \$1 million (excluding GST) for the Phase 1 works, and a contribution of up to \$1.7 million (excluding GST) for the Phase 2 works.

The Department concurs that the construction of the bypass would not be justified, given the high cost and time required to complete construction in the context of the limited current project life, and in light of Boral's proposal to improve the condition of Medway Road. It is noted that Council, after considering Boral's commitments, advised that it was withdrawing its request for a bypass but would revisit this issue if any future application for expansion or continuation of the Colliery is submitted.

However, the Council has not agreed with Boral's proposal in full. Council resolved on 23 November 2011 (and reaffirmed on 22 February 2012) to the effect that:

- *Phase 1* (see above) should include an initial pavement investigation within 3 months of project approval, and if that investigation determines that the existing pavement is "not suitable" for Boral's proposed upgrade, then Boral should investigate other options (ie granular overlay, in-situ pavement stabilisation or thicker Asphalt Concrete (AC) overlay), with all works to be completed by Council (at Boral's expense) within 12 months of project approval;
- *Phase 2* should include an initial pavement investigation within 12 months of project approval, including investigations of the previous road widening to ensure its ongoing viability, with all works to be completed by Council (at Boral's expense) within 24 months of project approval;
- an indexed road maintenance levy, commencing at 8 cents/tonne/km of coal dispatched along Medway Road, to be utilised by Council for the road's maintenance; and
- a further pavement investigation along the full length of Medway Road 7 years after project approval, and if that investigation determines that "significant changes" have taken place since the upgrades, and that the maintenance levy has been insufficient to carry out "necessary maintenance work", then Boral must contribute (proportionate to its usage) to funding of any necessary further maintenance works.

The Department considers that many of Council's proposals have merit, in particular the initial pavement investigations and proposed timetables for completion of both the Phase 1 and Phase 2 works. The Department has recommended conditions of approval that reflect Boral's proposed road upgrade works, as proposed to be amended by Council (including 2-stage phasing of works). However, it also considers that Council's proposed road maintenance levy rate of 8 cents/tonne/km of Medway Road travelled is excessive. This proposed rate exceeds similar road maintenance levies accepted by many other councils across the State affected by coal and quarry projects, which generally range between 3 and 5 cents/tonne/km. Boral's offer is within this range (3.49 cents/tonne/km). The Department is unaware of any particular local issue that would justify a substantially higher road maintenance rate. The Department therefore proposes an indexed road maintenance levy commencing at 4 cents/tonne/km (equivalent to 17.2 cents/tonne).

Further, the Department does not agree that it is necessary for Council to insist on doing the upgrade works itself, but at Boral's (unlimited) expense. If Council wishes to undertake these works, then it should submit a competitive tender to Boral, which should then be entitled to select the least-cost solution. The Department also considers that the final pavement investigation should only be undertaken by Boral if it is intending to close the project at the end of its projected 8-year life. That is, if Boral lodges an additional project application (or modification) seeking to extend the proposed project life, then further maintenance or upgrades of Medway Road or a new bypass should be addressed as part of that application. Further, the Phase 2 road upgrade should be undertaken no later than the two

years proposed by Council. Finally, the Department considers that the initial pavement investigations should be undertaken by an independent expert acceptable to both parties, but paid for by Boral.

The Department has proposed conditions to achieve these recommended outcomes.

5.3.4 Other Issues

Public submissions raised concerns regarding overloaded, uncovered and speeding heavy vehicles travelling along Medway Road; and potential safety conflicts with school buses and recreational events held by the Shoalhaven Cycle Club. Boral has made a number of commitments relating to additional signage (such as school bus warnings), methods for haulage drivers to communicate with school bus operators, and consultation with the cycle club to minimise conflicts during race days and other events along Medway Road. An existing drivers' code of conduct would also continue to apply to drivers associated with both the Colliery and the cement works.

The Department considers that Boral's Statement of Commitments, which includes the abovementioned controls, goes some distance in addressing the concerns of the community. Nonetheless, the Department considers that the community's concerns remain valid and has recommended the following additional measures to be imposed as conditions of approval:

- development and implementation of a Road Transport Protocol, including a Traffic Management Plan and a Drivers' Code of Conduct. This would include mechanisms to respond to community complaints, such as staggering of heavy vehicle movements and travel speeds, and procedures to ensure compliance (including infringements);
- monitoring the amount of coal transported off site, and maintaining accurate records that are publicly available; and
- completion of an independent traffic audit within 12 months of project approval and every subsequent 12 month period, unless otherwise agreed by the Director-General. This audit would identify and recommend any additional measures to reduce or mitigate adverse impacts to improve the performance of the project, after considering haulage records, accident records, performance of the road network and the effectiveness of the Code of Conduct.

The following additional conditions are recommended in relation to the stockpiling modification to minimise and manage the potential local and regional impacts of coal haulage campaigns:

- limitation of coal haulage campaigns between the cement works and PKCT to five events per calendar year, with campaigns to be limited to seven days in duration;
- restriction of campaigns to between 4 am and 4pm, and a requirement for Boral to endeavour to avoid movements on Sundays and public holidays to minimise impacts on the road network, and to provide periods of respite;
- suspension of all haulage of cement clinker haulage from the cement works and coal between the Colliery and cement works during coal haulage campaigns, to partially offset the increase in heavy vehicle movements associated with campaigns; and
- implementation of a specific Traffic Management Plan to mitigate and manage impacts on the road network between the cement works and PKCT.

5.4 NOISE IMPACTS

Both EAs included noise impact assessments (NIAs) undertaken by EMGA Mitchell McLennan in accordance with the *NSW Industrial Noise Policy* (INP). The Department notes that the ROMASP submission raised concerns about the accuracy of the NIA for the project application and the location of the monitoring sites used. However, acoustic specialists at both the Department and OEH have carefully considered the NIA and are satisfied with its quality and accuracy.

5.4.1 Colliery Project

Operational Noise

The project NIA considered potential impacts on surrounding sensitive receivers during the day, evening and night periods, under various meteorological conditions. The modelling demonstrates that the night time noise criterion of 35 dB(A) would be met at all receivers under all weather conditions, but highlights a number of exceedances of day time and evening criteria under windy conditions. The outcomes of the noise modelling for the day and evening periods is presented in Table 3 below, with predicted exceedances shown in bold text. Figure 8 shows noise contours for the day time period (assessed to have the greatest potential impacts), relative to surrounding receiver locations.

Table 3: Noise Modelling Results – Day and Evening

Receiver	Day			Evening		
	Criteria (dB(A))	Calm Conditions (dB(A))	Windy Conditions (dB(A))	Criteria (dB(A))	Calm Conditions (dB(A))	Windy Conditions (dB(A))
1	37	36	42	35	<35	39
2	37	36	42	35	<35	39
3	37	39	42	35	35	39
4	37	<35	41	35	<35	39
5	37	<35	40	35	<35	38
6	37	<35	39	35	<35	35
7	37	<35	38	35	<35	<35
8	37	36	37	35	<35	<35
9	37	35	40	35	<35	38
10	37	<35	36	35	<35	<35
11	37	<35	36	35	<35	<35
12	35	<35	36	35	<35	<35
13	35	<35	<35	35	<35	<35
14	36	<35	<35	36	<35	<35
15	36	<35	<35	36	<35	<35

The results of the noise modelling presented in Table 3 indicate that noise exceedances are expected to be up to 5dB(A) above INP criteria during windy conditions. The most significant exceedances are predicted to occur at receivers 1 - 5 and 9, at which INP criteria are expected to be exceeded by 3-5 dB(A) during the day and 3-4 dB(A) during the evening. Predicted exceedances at receivers 6, 7 and 12 are only 1-2 dB(A).

The Department considers that predicted exceedances in this range should lead to on-site noise management, particularly noting that weather-based implementation of mitigation measures (including scheduling of works) may be a reasonable and feasible option for minimising noise impacts. On this basis, and consistent with its practices in respect of other mining projects, the Department has recommended noise limits consistent with the maximum noise predictions at each receiver location.

In addition to these noise limits, the Department has recommended the imposition of noise goals consistent with INP noise criteria for those locations where exceedances have been predicted. Boral would be required to prepare and implement a Noise Management Plan, including ongoing proactive measures to target attainment of the longer-term noise goals. The Department has also imposed a range of operating conditions including a requirement for Boral to implement best practice noise management to minimise the operational, low frequency and road traffic noise of the project. The conditions specifically require Boral to minimise the noise impacts of the project during windy conditions and temperature inversions.

Hours of Operation

The EA proposes that coal transfer between the Colliery and Loch Catherine would remain unchanged from the existing hours, being between 6:00 am and 9:00 pm Mondays to Fridays, and 7:00 am to 1:00 pm on Saturdays. No haulage would occur from the Colliery on Sundays or public holidays. Haulage of coal from the Loch Catherine site to off-site customers would be restricted to 7:00 am to 6:00 pm Mondays to Fridays, and 6:00 am to 2:00 pm on Saturdays. No off-site haulage would occur on Sundays or public holidays.

Council's position has been that noise generating activities such as loading and hauling carried out at the Colliery, which is in reasonable proximity to residences, should be restricted to 7:00 am to 6:00 pm Monday to Friday, and 7:00 am to 1:00 pm Saturdays. In response, Boral offered to restrict direct dispatch of coal from either the Colliery or Loch Catherine *directly* to customers to the hours proposed by Council, but that it required that haulage hours from the Colliery to the stockpiles at either Loch Catherine and the cement works should continue as proposed in the EA. Council officers accepted that this was a reasonable compromise, but Council declined to accept their recommendation. The Department agrees that it is a reasonable compromise in that it has continued the existing hours of haulage to Loch Catherine and the cement works, but has removed two hours from permitted haulage to other customers on Saturday morning and afternoon. The Department has therefore included these hours of operation within the recommended conditions of approval.



Figure 8: Noise Contours (Day Period) and Surrounding Receivers

Traffic Noise

The EA also presents an assessment of road traffic noise associated with continued operations at Berrima Colliery. The assessment demonstrates that applicable road traffic noise goals would be met during both the day and evening periods.

Construction Noise

Given the minor scale and nature of vegetation clearing works at the Pit Top Area and at the Loch Catherine site, and the fact that these works would be undertaken concurrently with ongoing operations, a separate construction noise impact assessment was not undertaken for the project. The Department is satisfied with this approach.

5.4.2 Stockpiling Modification

Campaign haulage of coal from the cement works is proposed to take place between 4:00 am and 4:00 pm, up to 7 days per week. It is noted that very few submissions directly related to the existing or proposed levels of noise associated with trucking from the cement works.

The coal stockpiling NIA reports that noise monitoring has indicated that existing (total) road traffic noise already exceeds road traffic noise goals. In such cases, OEH's *Environmental Criteria for Road Traffic Noise* guideline recommends that additional traffic should not increase existing noise levels by more than 2 dB(A). The nearest affected residences are on Taylor Avenue, which is already a significantly noise-affected environment. This is partly due to the impact of heavy vehicles transporting inputs and products to and from the cement works, which may occur 24 hours per day under the existing consent. Existing night-time peak hour movements are 117, with 28% of these being heavy vehicle movements. This peak is anticipated to increase by up to 11 heavy vehicle movements per hour during the limited periods of campaign haulage. The existing modelled noise environment is 56 dB(A) during the night-time peak hour (excluding the current impact from the cement works) and 60 dB(A) (including that impact). This is modelled to increase to no more than 61 dB(A) under the proposed campaign haulage.

The NIA therefore demonstrates that the coal stockpiling proposal is not expected to increase road traffic noise impacts at residential premises measured at the standard distance of 15 m from Taylor Avenue and Medway Road by more than 2 dB(A) above the existing noise levels.

The coal stockpiling NIA does not address operational noise, based on Boral's view that stockpiling activities are likely to be fully masked by the greater noise generated by the cement works. Boral therefore is not seeking to alter the noise limits in the existing cement works consent. The Department considers this approach to be acceptable, and does not consider that additional conditions of approval (beyond the consent's existing operational noise limits, which are set out in condition 3.3 of the existing consent) are necessary.

5.5 AIR QUALITY IMPACTS

5.5.1 Colliery Project

The EA for the colliery project includes an air quality impact assessment (AQIA) undertaken by ENVIRON. The AQIA considers suspended and deposited dust impacts at 16 receiver locations: 11 in the village of Medway; two approximately 1-1.5 km east-southeast of the Loch Catherine site; two approximately 1 km northwest of the Colliery's Pit Top Area; and one site representative of New Berrima township.

Dust deposition associated with the project was predicted to meet the criterion for monthly incremental increases in dust deposition at all receivers (a maximum of 1.07 gm²/month compared with a goal of 2 gm²/month) as well as the cumulative dust deposition criterion (a maximum of 2.42 gm²/month compared with a goal of 4 gm²/month). Maximum annual total suspended particulate (TSP) concentrations (14.4 µg/m³) and maximum annual PM₁₀ concentrations (8.7 µg/m³) were also comfortably below the relevant criteria of 90 µg/m³ and 50 µg/m³, respectively.

The AQIA also identified that annual average cumulative PM₁₀ impacts would not exceed the relevant criterion (22.7 µg/m³, compared with a criterion of 30 µg/m³). There is some potential for daily average cumulative PM₁₀ to occasionally exceed the criterion of 50 µg/m³. However, these predicted exceedances are generally caused by elevated background dust levels, rather than by the Colliery. Comparison of the likelihood of occurrence of the maximum daily average PM₁₀ concentration from the project (18 µg/m³) and a background PM₁₀ concentration >32 µg/m³ (giving an exceedance of the

criterion) indicates that these events would coincide less than 2% of the time. On this basis, Boral argues that an exceedance of the daily average PM₁₀ criterion at the most affected receiver is highly unlikely.

To ensure that acceptable air quality outcomes are met, Boral proposes to undertake watering of unpaved roads, that paved road silt loadings are minimised and that speed limits are enforced on road sections in the vicinity of Medway village (for both haulage and delivery trucks).

The Department is generally satisfied that Boral has demonstrated that continuation of mining operations would not adversely affect local and regional air quality. To ensure this outcome is achieved, the Department has recommended that Boral be required to develop and implement a formal Air Quality and Greenhouse Gas Management Plan (AQGMP), with a particular focus placed on minimisation and management of dust. The Department notes that the ROMASP submission raised concern about the current management of air quality in the vicinity and believes that the implementation of a formal AQGMP would address many of these concerns.

5.5.2 Stockpiling Modification

The EA for the stockpiling modification includes a qualitative review of potential dust generation and mitigation measures. Boral highlights that, while the nearest receivers are located approximately 440 m south-southwest of the site, predominant winds come from the west and west-northwest, acting as a natural mitigation against dust from the proposed stockpile travelling towards receivers. Notwithstanding, Boral proposes to implement the following mitigation measures to ensure that dust generation is minimised:

- for unsealed haul roads:
 - use of dedicated main haul roads and restriction on use of other unsealed roads and areas;
 - progressive sealing of unsealed haul roads;
 - use of a water cart for spraying haul roads when required;
 - potential use of dust suppression agents to reduce use of water for dust suppression;
 - restricting vehicle speeds to 20 km/h on unsealed roads;
 - installation of 'rumble grids' and consideration of use of water sprays or wheel washes, where unsealed roads transition to sealed roads, to prevent tracking of dust;
- for the coal stockpile:
 - compaction of the stockpile batters to minimise wind pick up of dust;
 - installation of water sprays or use of water cart to keep the stockpile surface wet if dust is being created; and
 - cessation of stockpile creation and extraction during periods of high winds, if dust generation cannot be controlled.

The Department generally supports the mitigation measures proposed by Boral and is satisfied, subject to their implementation, that dust generation and associated impacts could be managed within acceptable limits. The Department has recommended conditions of approval that require Boral to implement all reasonable feasible dust minimisation measures as part of the coal stockpiling proposal.

5.6 SOCIO-ECONOMIC IMPACTS

Berrima Colliery currently employs 38 people, and Berrima Cement Works employs 155 people. Continuation of mining operations at the Colliery is expected to increase direct employment numbers by 25, bring total staff numbers to 63 on a full time basis. Employment numbers at the cement works are not expected to change, although indirect employment would increase through the employment of additional transport workers associated with the proposed occasional campaign haulage of coal. A similar indirect increase in employment numbers is also expected as a result of increased haulage of coal from the Colliery. In this context, the project would have a positive impact on employment in the region. In contrast, if the project is not approved, existing employment would be lost. This issue was a key focus in the public submissions received in support of the project application and modification request, and the Department recognises that this potential loss of employment in the context of this particular region would be a significant socio-economic impact.

Boral argues that Berrima Colliery is important as the principal supplier of coal to its Berrima Cement Works, and has historically also supplied other cement manufacturers in the region, including Boral's Maldon Cement Works. The Berrima and Maldon Cement Works together are estimated to supply more than 60% of the State's cement needs. Boral quotes 2006 census data which suggests that the

construction industry directly employs 13,722 people in the Illawarra region, and is the fifth largest employer in the region.

The Department recognises the significance of Berrima Colliery to employment and investment at a local, regional and State level. The Colliery has its own direct benefits but, more importantly, it makes a significant contribution to the support of the State's cement industry. If continued operations at the Colliery are not approved, there would likely be a substantial adverse socio-economic effect through the loss of employment for the site's current 38 staff, as well as a significant risk of flow-on effects to the cement industry. It may well be possible for Berrima Cement Works to secure a coal supply from elsewhere, but such an alternative would likely be at a greater distance and therefore associated with higher commercial and environmental costs. It is therefore preferable to maintain current operations at the Colliery.

5.7 OTHER ISSUES

The EAs for the Colliery project and stockpiling modification considered a number of other relevant issues, which are addressed in Table 4 below.

Table 4: Assessment of Other Issues

Issue	Consideration and Assessment	Conclusion and Recommendations
<i>Ecology</i>	- Continued operations at Berrima Colliery would require clearing of approximately 2.59 ha of native vegetation, to provide Asset Protection Zones (APZs) around the Pit Top Area (1.35 ha) and around the Loch Catherine site (1.24 ha). - The vegetation comprises approximately 0.08 ha of <i>Wingecarribee Woodland on Valley Floors</i>, and 2.51 ha of <i>Mittagong Sandstone Woodland on Lower Slopes</i>. Neither of these communities is listed as endangered. - Coal stockpiling at the cement works would not require any vegetation clearing.	- SCA has argued that the loss of 2.59 ha of vegetation should be offset. - While the Department appreciates SCA's concerns to maintain and enhance vegetation in the catchment over time, it does not consider the loss of 2.59 ha of vegetation to be significant in the local context, or sufficient to require an offset. Further, the cost of establishing and managing such an offset does not seem appropriate, particularly given the purpose of the clearing (ie to establish APZs). - Given the small area of vegetation to be cleared, and the limited life of the project (eight years), the Department is satisfied that it is more appropriate to address this issue through final rehabilitation of the site, at which time the vegetation loss would be remedied through rehabilitation with locally endemic native species. - However, the vegetation to be cleared represents potential koala habitat (noting that koalas have been previously recorded within 10 km of the site) and as such, the Department has recommended that a suitably qualified ecologist be present on site during vegetation clearing to recommend appropriate measures to avoid and protect koalas should they be found on the site at that time. - Four unsealed mine adits located near the Loch Catherine site have the potential to provide roosting habitat for bats. As part of site rehabilitation, the Department has recommended that all portals and ventilation shafts should be decommissioned and made safe and stable, but that habitat for threatened species (eg bats), should be maintained where practicable. This would mean closing the adits to access by persons, but maintaining access for small animals such as bats.
<i>Heritage – Colliery Project</i>	A single Aboriginal heritage site (Boral-OS1) has been identified above proposed Panel 406, in	The Department is satisfied with the level of heritage assessment undertaken for the project and generally concurs

	an area likely to be affected by subsidence. The site has been assessed as having moderate scientific significance. - Subsidence under the site is expected to be approximately 20 mm, which is unlikely to cause any impact to either the site or its significance. - There are no non-Aboriginal heritage items likely to be directly or indirectly affected by the project.	with its conclusions. The Department proposes conditions requiring Boral to develop an Aboriginal Heritage Management Plan for the project. It considers that no other heritage-specific conditions are required to mitigate, monitor or manage potential impacts on heritage items.
<i>Rehabilitation – Colliery Project</i>	- At the conclusion of the project, mine entrances and vent shafts are proposed to be sealed and all surface infrastructure would be removed. - The Pit Top Area and the Loch Catherine site would be revegetated with locally endemic native species. - Infrastructure to access the site would be retained to enable future access for maintenance and inspection.	- The Department is satisfied with the general approach proposed for the rehabilitation of the site. - The Department has recommended conditions requiring Boral to prepare and implement a comprehensive Rehabilitation Management Plan for the site to the satisfaction of DRE, and in consultation with the Department, the Council and the project Community Consultative Committee.

RECOMMENDED CONDITIONS

The Department has prepared recommended conditions of approval for the continuation of mining operations project (see **Appendix B**), and the cement works modification (see **Appendix C**). These conditions and summarised in **Appendix A**. The conditions are required to:

- prevent, minimise, and/or offset adverse impacts of the projects;
- set standards and performance measures for acceptable environmental performance;
- ensure regular monitoring and reporting; and
- provide for the ongoing environmental management of the projects.

Key conditions include phased upgrades to Medway Road to ensure that it remains safe and reliable and its use is consistent with best practice management of local air quality and acoustic amenity. In addition to upgrading the road, Boral would be required to contribute to its ongoing maintenance, commensurate with its contribution to traffic along this route.

Traffic issues were a major concern raised in the ROMASP submission and other public submissions, and the Department has recommended a suite of stringent conditions including haulage hours (both in and around Berrima Colliery and to/from the cement works) to ensure that public amenity and safety are protected. Boral would be required to prepare and implement a Road Transport Protocol to govern traffic movements and a specific Transport Management Plan to provide an overarching framework for the management of haulage campaigns between the cement works and PKCT. An independent traffic audit of road haulage to and from the Colliery would be required on a regular basis (every 12 months, unless otherwise agreed by the Director-General).

The Department has also recommended a series of conditions to manage subsidence, groundwater and surface water impacts that would include a monitoring program and adaptive management system to ensure an ongoing, proactive approach to managing and minimising impacts from the project. This adaptive management approach would be fundamental in reducing residual environmental impacts. To provide a clear framework for environmental performance management, the Department has recommended a suite of required subsidence impact performance measures, including protection of sensitive structures, other surface infrastructure, and environmental values (focused principally on biodiversity and heritage).

Boral, OEH, DRE and Council were consulted over the draft conditions of approval. Council did not provide a final comment. The Department has carefully considered the responses by OEH and DRE and made appropriate changes to the draft conditions. Boral has reviewed the final draft conditions and has accepted them.

CONCLUSION

The Department has assessed the project application for continuation of mining operations at Berrima Colliery, and the modification request for coal stockpiling at Berrima Cement Works, including the accompanying EAs and Boral's Response to Submissions.

Berrima Colliery is an important regional source of employment and ongoing investment, and plays a significant role in the supply of coal to the Berrima and Maldon Cement Works. Continued operation of the Colliery in an environmentally acceptable and sustainable manner is important to the maintenance of these existing industries and their consequent local, regional and State benefits.

It is important that the potential environmental impacts of the project and the modification are minimised to the greatest extent reasonable to ensure that these benefits are realised without adverse impacts on the environment, public health or amenity. The Department is satisfied that Boral has achieved this outcome, and has recommended conditions of approval to give effect to appropriate mitigation of impacts.

The Department is satisfied that the impacts of the project are able to be minimised, managed, offset, and/or compensated to ensure an acceptable level of environmental performance. Consequently, the Department recommends that Berrima Colliery continued operations and the modification request to stockpile coal at Berrima Cement Works be approved, subject to strict conditions of approval.

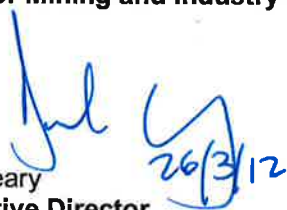
RECOMMENDATION

It is recommended that the Planning Assessment Commission, as delegate for the Minister:

- consider the findings and recommendations of this report;
- approve the project application, subject to conditions, under section 75J of the EP&A Act;
- approve the modification request, subject to conditions under section 75W of the EP&A Act;
- sign the attached project approval (see **Appendix B**); and
- signed the attached modification approval (see **Appendix C**).



Howard Reed 26.3.12
A/Director Mining and Industry Projects



Daniel Keary 26/3/12
A/Executive Director
Major Project Assessments



Richard Pearson 30/3/12
Deputy Director-General
Development Assessment and Systems Performance