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Our Ref: D2011/43263

Mr Brett McLennan
EMGA Mitchell McLennan
PO Box 21
St Leonards NSW 2001

Attention: Rachael Russell

Dear Sir/Madam

**Draft Response to Submissions Report on Berrima Colliery MP 10_0172 and
Berrima Cement Works DA No 401-11-2002-i MOD 6**

I refer to your email dated 30 September 2011 providing the draft Response to Submissions report and requesting any further comments from the Sydney Catchment Authority (SCA).

The SCA still considers revegetation of other pasture land on Boral Lands (eg the Cement works site at Berrima) should be undertaken to offset the water quality impact associated with the clearing of 3.6 hectares of native woodland vegetation to ensure a neutral or beneficial effect on water quality would be met for that aspect of the development. On other matters related to the draft Response to Submissions report, the SCA considers that it has satisfactorily addressed the majority of our issues previously raised in relation to the draft Environmental Assessment.

The SCA is satisfied that the revised water quality monitoring program will include testing for additional metals such as nickel, manganese and iron, and addresses the issue of event-based sampling under a representative range of rainfall events. The SCA concurs with the proposed use of ANZECC "Environmental Health" thresholds rather than "Aesthetic Purposes" thresholds as trigger levels for future water sample reporting.

SCA flow data for the Wingecarribee River at Berrima Weir (upstream of the mine) and at Greenstead (downstream of the mine) is available from 1991 onwards. This may provide useful long-term information to evaluate the impact of mine water discharge on flow, and assist in the development of an effective event-based water quality monitoring program.

If you wish to discuss any matter raised in this letter please do not hesitate to contact Neil Cowley on 4886 9417 or via e-mail neil.cowley@sca.nsw.gov.au

Yours sincerely

 21/10/11
DR PETER DAVIES
Senior Manager Sustainability

Cc: Clay Preshaw, Department of Planning and Infrastructure



Office of Environment & Heritage

Your reference

Our reference:

Our contact:

FIL09/15437:DOC11/50193:PW

Paul Wearne (02) 4224 4100

Major Projects Assessment
Mining and Industry Projects
(Attention: Mr Clay Preshaw)
Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Mr Preshaw

RESPONSE TO SUBMISSIONS BERRIMA COLLIERY CONTINUED OPERATIONS (MP 10_0172) AND BERRIMA CEMENT WORKS DA NO 401-11-2002-i MOD 6

I am writing in reply to your email request for comment dated 18 October 2011 regarding the Draft Response to Submissions Report for the Berrima Colliery Continued Operations Project and Berrima Cement Works coal stockpile development.

The Office of Environment and Heritage (OEH) has undertaken a review of the Draft Response to Submissions Report which has revealed that it has not fully addressed the issues and concerns raised in OEH's response to the Environmental Assessment dated 5 August 2011 and 8 October 2011. While there is still outstanding information OEH considers that many of these issues and concerns can be addressed through Conditions of Approval. However, OEH would only support the project if the attached advice is considered by the Department of Planning and Infrastructure (DoPI) and recommended conditions are secured as Conditions of Approval. You should note that the recommended conditions attached relating to environmental studies (especially those relating to water discharge) are essential for determining licence requirements that provide appropriate environmental protection for compliance with environmental legislation. These recommended conditions relate to:

- Water Management – Berrima Colliery
- Subsidence Assessment and Groundwater Investigation – Berrima Colliery
- Wastewater Management
- Air Quality
- Noise Assessment
- Flora and Fauna - Berrima Colliery

OEH also considers that the information obtained from the additional studies and monitoring programs proposed in the attached Conditions will not only guide the operations in meeting contemporary standards but also assist in informing any future mine expansion proposals.

In addition, Boral Resources (the proponent) holds an Environment Protection Licence (EPL No 1698) for the Berrima Cement Works, while Delta Mining Pty Ltd holds the EPL No 608 for Berrima Colliery. OEH requests that DoPI should consider the Conditions on both of these EPLs when drafting Planning Approval

The Department of Environment, Climate Change and Water is now known as the
Office of Environment and Heritage, Department of Premier and Cabinet

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Conditions, to ensure that they are consistent. Finally, OEH will be requiring the transfer of the EPL from Delta Mining Pty Ltd to the proponent for the Berrima Colliery if approval is granted. This will ensure consistency with the Project Approval and so that environmental stewardship and responsibility lies with the entity that has the highest level of management control of the site.

Should you require any further information, please contact the above officer on (02) 4224 4100.

Yours sincerely



07 NOV 2011

GISELLE HOWARD
Director Metropolitan
Environment Protection and Regulation
Office of Environment and Heritage
Department of Premier and Cabinet

Att

ATTACHMENT 1

OFFICE OF ENVIRONMENT AND HERITAGE - REVIEW OF RESPONSE TO SUBMISSION

1. Water Management – Berrima Colliery

1.1 Minewater Discharge and Impact Assessment

The Response to Submissions Report (RTS) proposes a continuation of the mine's current water quality monitoring program with a surface water sample taken upstream, downstream and in the minewater discharge at different frequencies. A slightly expanded set of water quality parameters are proposed in Table 7.1 but no explanation is given for their inclusion or for the value of "concentration limits". The RTS proposes that after two years of water quality monitoring "a site specific suite of trigger values will be determined in consultation with the authorities".

The Office of Environment and Heritage (OEH) notes that under the ANZECC guidelines, site specific water quality criteria are determined by testing the effect of the wastewater, or specific components of wastewater, on representative species of in stream fauna and flora through bioassessment techniques. Site specific criteria are not determined by measuring existing water quality impacts on streams or rivers.

The proposed upstream/downstream water quality monitoring program also has limitations because it does not define the mixing zone or sediment and bioaccumulation impacts. OEH believes that the primary source of analysis of the impact of the discharge on river water quality should be through assessment of: mine water quality and its toxicity; the amount of minewater discharged; and the receiving river flow regimes. Modelling can be used to determine mixing zones and dilution of any toxicity or chemical(s) of concern in the river.

OEH considers that sampling and analysis of whole effluent toxicity (direct toxicity assessment) is necessary to assess the effect of the discharge on downstream river health and to determine site specific criteria for water quality. However this technique has not been included in the proposed monitoring program in the RTS document.

The RTS proposes an aquatic ecology monitoring program based on the AUSRIVAS model (Page 32, 7.2.3). OEH agrees with the application of in stream assessment but considers that bioassessment using in-situ media collectors is a more appropriate technique for this scenario of minewater discharge.

OEH recommends that the following Condition be secured as a Condition of Approval for the project. The Condition provides clear guidance on the level and extent of minewater characterisation and assessment required to determine the impact of the discharge on river health and on-going licence limits and requirements.

Minewater Characterisation

The Proponent must assess the possible impact of the minewater discharge through LDP1 on Wingecarribee River using the risk based process described in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000).

The proponent must submit a draft report to DoPI and OEH containing a proposed program for the assessment of discharged minewater in accordance with National Water Quality Management Strategy, ANZECC 2000 Guidelines no later than 21 March 2012. The program and associated study must be developed in consultation with OEH. The program must include but not necessarily be limited to assessment of:

Generally

- The Wingecarribee River as an upland freshwater river in South Eastern Australia for chemical and physical stressors under the guidelines for protection of aquatic ecosystems, ANZECC 2000. The condition of the river should be considered in terms of both a 'high conservation system' and a 'slightly to moderately' disturbed system.
- The water quality objectives for the Wingecarribee River in the "NSW Healthy Rivers Commission of Inquiry into the Hawkesbury Nepean Catchment".
- Maps and descriptions of the upstream and downstream geomorphology of the Wingecarribee River.
- Identification of downstream users and uses (type and amount) of the discharged water classified in accordance with relevant ANZECC 2000 Guidelines. (The study should determine whether the discharge provides a beneficial environmental flow or other usage benefit to downstream users. The study should also determine whether the quality of discharged water limits current use or potential uses of the water.)
- The range of dilution of the discharge based on current and proposed flow regimes (environmental flow releases from Wingecarribee Reservoir) and natural catchment drainage.

Specifically

1. Chemical Characterisation

Characterisation of the flow, chemical composition and load of chemical and physical stressors and toxicants in the discharge of minewater to the Wingecarribee River.

2. Toxicity Assessment

The whole effluent toxicity (direct toxicity assessment) of the discharge.

3. Biota Assessment

The effects of the discharge on river health quantitatively in terms of changes to in-stream biota in the Wingecarribee River.

4. Fate Assessment

The fate in the environment of chemicals contained in the discharge.

Note:

It is expected that:

- water quality sampling of the discharge from licensed Discharge Point (LDP) 1 will be carried out every week for a period of six months and samples will be analysed for at least the following substances based on OEH's experience of typical pollutants found in minewater discharges:
- Volatile organics (including halogenated compounds) - USEPA Method 8260B
- Total Petroleum Hydrocarbons (C6 - C9 and C10 - C36) - USEPA Method 8015
- Organochlorine Pesticides - USEPA method 8270C or USEPA method 8081B, depending on the required detection limits
- Semivolatile organic compounds including Polycyclic Aromatic Hydrocarbons and Phenols - USEPA method 8270C
- Unknowns by GC/MS library search - USEPA 8270C (Test for any non-target compounds that are chromatographable. Drilling fluids used in mines usually have alcohols and fatty acid compounds)
- Polychlorinated biphenyls (PCBs) - USEPA Method 8082
- Metals - USEPA Methods 3005A (ICP Method)
- Alkalinity (by APHA 2320), pH (by APHA 4500), and conductivity (by APHA 2510)
- Hardness (by APHA Method 2340b Hardness by calculation and 2340c EDTA titrimetric Method)

- *direct toxicity assessment will be carried out on six occasions over a six month period and testing performed for acute and chronic toxicity in accordance with the modified USEPA guideline. Where acute or chronic toxicity is detected in a sample, the sample must undergo further toxicity identification evaluation (TIE) testing to determine which components of mine water are likely to be the cause of toxicity. Advice should be sought from the OEH regarding acceptable methods for TIE testing.*
- *in-stream biota assessment utilise artificial habitat collectors based on similar studies undertaken in the Southern Coalfields. Reference should be made to "Effects of Mine Water Salinity on Freshwater Biota Investigations of Coal Mine Water Discharge in NSW". ACARP Project C15016. Published 01/01/2010*
- *the Proponent will install a flow monitoring device to improve the accuracy of measurement of the amount of water discharged from LDP 1. The existing method of measurement using daily manual readings at Licence Monitoring Point 4 does not provide a sufficient level of accuracy of the flowrate.*
- *The flow monitoring equipment (primary flow control structures and continuous flow-sensing and recording equipment) should have a level of accuracy better than or equivalent to 10 per cent of the mean flow rate. Equipment must be calibrated (or where appropriate, serviced and adjusted) according to the manufacturer's instructions or at least once a year to demonstrate the range of accuracy that has been achieved.*

2. Subsidence Assessment and Groundwater Investigation – Berrima Colliery

2.1 Subsidence

OEH believes that many of its comments in relation to the inadequacy of the Subsidence Assessment in the Environmental Assessment (EA) are not adequately addressed in the RTS. In particular, the RTS response does not present convincing argument or evidence that connective cracking has not occurred or will not occur in the future. OEH again refers the proponent to our previous comments on the EA for use during the preparation of future subsidence assessments and extraction management plans. Some specific comments on the RTS follow.

The RTS states that "It is disputed that the relatively shallow cover depth has resulted in "very site specific or localised impacts" due to lack of surface cracking or erosion etc above any of the extracted panels to date" (Appendix E, page 5 DgS Report). OEH notes that in contrast, the EA infers that one of the groundwater monitoring bores has gone dry as a result of undermining and has been replaced.

The RTS claims that anomalously high stress (or other subsidence results) are "unlikely to be real" or are simply due to disturbance (page 37). OEH notes that there are many areas in the southern coalfield where unexplained (real) high stress values have been predicted or observed and where impacts have occurred. If the high stress values are real then they are a result of local geology and can result in real impacts. It is not appropriate to subjectively dismiss unexpected results without further detailed assessment.

In reply to the comments provided by OEH and NSW Office of Water (NOW) regarding mine layout, the RTS now states explicitly (and clearly) that the mine employs total extraction techniques. However on page 39, the RTS states in response to a NOW comment that: "There are no longwalls as the operations uses bord and pillar extraction". This is an example of how the use of terminology creates the impression of lower potential impact. Total extraction methods effectively act like a longwall since all the coal is removed and no pillars are left standing. Consequently it is the subsidence levels and not the extraction technique which is the determining factor in the extent and intensity of impact.

The RTS cites ACARP Project C15013 regarding (lack of) impacts to Native and Agricultural Environments. However, ACARP has also produced reports more appropriate to the local topography and geology. These include ACARP Reports (C8005 & C9067) for cliffs, gorges and river systems and ACARP Report C13009 for groundwater over shallow depth of cover mines. When dealing with Beltana Mine in ACARP Report

C13009 [depth of cover 50-190m; panel width 272m; seam thickness 2.75m], Seedsman and Dawkins (ACARP 2006) found that:

"Where subsidence cracking directly intersected or sheared piezometers, post subsidence permeability measurement was generally not able to be conducted as bores (WP20N, EPS5, EPS10 and EPS20) could not be filled sufficiently to conduct a falling head permeability test (page 62).

Below the soil and weathered rock horizon, long-term standing water level falls of at least 3.25m were observed within the sandstone/shale sequence following subsidence. The permanent bedrock cracking and shearing in this horizon was pervasive and interconnected and in some cases the piezometers could not be filled to test post subsidence permeability as the water drained out faster than it could be introduced (page 66).

It is probable that the goaf and surface cracked zones were interconnected within the 66m to 69m depth of cover on the east line, and were potentially connected in the 120m to 140m depth of cover on the west line to generate a continuous zone of infinite permeability through cracks between the surface and the underlying workings within the tensional zone of the northern and southern panel."

In summary, OEH believe that many of our comments in relation to the inadequacy of the Subsidence Assessments in the EA have not been addressed adequately in the RTS. OEH recommends that the proponent consider our previous comments and seek the advice of Department of Trade and Investment Regional Infrastructure and Services (DTIRIS) (Resources and Energy) during the preparation of any subsequent Subsidence Assessments and Extraction Management Plans.

2.2 Groundwater

OEH considers that any impact to the groundwater regime above the mine is an important consideration since it is a high quality water resource for agriculture and the environment. The predicted subsidence parameters are above thresholds for bed rock fracturing and there is a potential for surface to seam fracturing. In general, the EA has not provided an adequate assessment of potential aquifer impacts and the Groundwater Monitoring Program proposed in the RTS does not appear to be sufficiently comprehensive at this stage to resolve the issue. Many of the SOC involve actions that should have been done to support the EA rather than as a response to Government Agency's comments on its inadequacy.

OEH asked for an investigation into the possible hydraulic connectivity between the Wingecarribee River and the mine including the possibility that the river could "leak" towards the mine. Boral has proposed radiometric dating of groundwater or if inconclusive, monitoring bores adjacent to the river (Page 26, 6.3.1). OEH believes that the proposed program should be reviewed by an independent expert to determine whether the approach proposed is likely to be most effective in determining the possible hydraulic connectivity.

OEH requested that the proponent provide greater consideration of predicted increase in the minewater make as the mine expands. OEH was expecting a quantification of the expected changes in volumetric flows and predicted changes in groundwater quality. The RTS response is insufficient and states that "A significant increase in the volumes of seepage pumped from the mine is not expected" (Page 25, 6.2.1).

The RTS states that consideration of arrangements for continued discharge or cessation of flow following mine closure would be undertaken following an aquatic ecology monitoring program (Page 35, 7.3). OEH considers that the investigation into the likely location of discharge following mine flooding and possible alternatives for discharge locations should be considered during the groundwater investigations proposed in the RTS report. This is because the EA did not address this issue which is of concern for not only environmental reasons but for mine rehabilitation.

OEH recommends that the following requirement be included in the Conditions of Approval for the project. The Condition provides guidance on the extent of groundwater assessment required to determine the impact on aquifers. OEH also recommends that the draft monitoring proposal be peer reviewed by an independent expert organisation prior to submission to Government Agencies.

Groundwater Investigation

The Proponent must examine the effect of Berrima Coal mine on local groundwater aquifers and groundwater fed surface streams. The proponent must submit a draft report to DoPI, Sydney Catchment Authority (SCA), OEH, NOW containing a proposed program for the groundwater investigation no later than 31 March 2012. The program and associated study must be developed in consultation with NOW and OEH. The program must include but not necessarily be limited to assessment of:

- *groundwater systems including confined and unconfined aquifer systems, flow patterns and area(s) of aquifer depressurisation caused by the mine*
- *hydraulic connectivity between mining areas (current and past) and surface waters or shallow groundwater systems. This investigation requires a Groundwater Monitoring Program designed using BACI principals with adequate baseline data (over two years) and monitoring bores directly above the proposed total extraction areas*
- *whether surface water flows in creeks, streams and rivers have been reduced by impacts on shallow aquifers and surface water*
- *whether water dependent ecosystems and agricultural productivity are likely to be negatively affected as a consequence of reduced flows and depressured groundwater systems*
- *whether the Wingecarribee River and Medway Creek are reduced through direct hydraulic connection with mine and if so what length and area(s) of the waterways are affected*
- *the expected changes in the volume of groundwater make and its quality over time due to continued mining in approved and proposed mining areas*
- *The flooding behaviour of the mine following mine closure based on best knowledge of past, current and future working. Include most likely point(s) of egress, possibility of sealing the mine discharge points and the advantages and disadvantages of creating an alternative release point for the minewater.*

This investigation requires a Groundwater Monitoring Program designed using BACI principals with adequate baseline data (over at least two years) with monitoring bores directly above the proposed total extraction areas.

The proponent must engage an independent expert to review the draft Groundwater Monitoring and Assessment Program. The draft program and the independent expert review must be submitted to DoPI for approval by the due date. SCA, OEH, NOW must be consulted in preparation of the document by the due date.

3. Wastewater Management

The RTS describes the proposed installation of a Sewage Treatment Plant (STP) following approval of Wingecarribee Shire Council (WSC) and SCA (Page 33, 7.2.5). As OEH is the Approved Regulatory Authority for the site, OEH should be consulted on the proposed design of the STP and irrigation scheme (which should meet the OEH's Guideline "Use of Effluent by Irrigation" October 2004).

OEH recommends that the following requirement be included in the Conditions of Approval for the project. The Condition provides performance criteria for the sewage treatment and re-use scheme.

Wastewater Management

The proponent must improve the sewage management system to the satisfaction of the Director-General by replacement of the existing septic tank and adsorption trench with a STP and a disposal or re-use scheme that meets contemporary standards no later than 31 December 2012.

The goal of the system should be to maximise the reuse of treated wastewater and achieve a zero direct discharge to surface waters (subject to the above performance objectives). Reuse options examined should include but need not be limited to dust control on coal stockpiles and/or irrigation on adjacent farmland. Treatment options examined should include but need not be limited to treatment of all blackwater and greywater in a wastewater treatment system using contemporary technology sized for likely future workforce levels.

The proponent must investigate and provide a written report on an integrated wastewater system that demonstrates how the following environmental performance objectives will be satisfied:

- *Protection of surface waters*
- *Protection of groundwater*
- *Protection of lands*
- *Protection of plant and animal health*
- *Prevention of public health risks*
- *Provides resource use*
- *Protects community amenity.*

The written report must be submitted to the DoPI, SCA, OEH, NOW for review by 31 March 2012.

The proponent must install a new Wastewater Treatment System and notify DoPI, SCA, OEH, NOW of commencement of operations by the Due Date.

4. Air Quality

4.1 Dust Mitigation Measures and Real Time Dust Monitoring

Berrima Colliery

OEH recommended in its submission on 8 August 2011 that the proponent should be required to undertake a site specific Best Management Practice (BMP) determination to identify the most technically and economically feasible measures to minimise dust emissions (TSP, PM10 and PM 2.5). This BMP determination should be transparently linked to the AQA and any relevant Air Quality Management Plans.

A review of the report prepared by Environ dated 26 September 2011 and attached to the Submissions Report states that such an assessment was undertaken. This revealed that wheel generated particulates from unpaved roads; wheel generated particulates from paved roads, wind erosion from coal stockpiles and coal crushing were the top four mining activities associated with the site that contributed to uncontrolled TSP, PM₁₀ and PM_{2.5} emissions. The report also states that the proponent will investigate the technical and feasibility of best practice measures to address these issues from the site.

The Submission Report also states that additional measures are proposed including:

- sealing 300m of access road to the Loch Catherine Stockpile from the intersection with Medway Road; and
- use of a street sweeper which is to be shared with the cement works on internal roads and around the pit top.

In addition, the report also states that current watering practises to control dust at the site will remain. However it also states that due to the scale and nature of mining activities at the colliery additional dust mitigation controls are not warranted.

The Submissions Report states that air quality impacts associated with activities from the mine was identified as an issue in a number of public submissions. Since OEH's submission on the EA, OEH has received a number of community complaints regarding dust from road transport of coal. While during a recent site inspection on 15 September 2011 at the Loch Catherine Stockpile Area considerable wind blown dust and dusts associated with road haulage activities was observed. (See Photos 1 and 2).

While the proponent has responded to the recent complaints to OEH regarding dust from road transport of coal by initiating the covering of coal loads, as previously stated in OEH response to the EA, OEH believes there is a need for improvements in dust management at the site both currently and associated with the proposed project.

While the proponent states *that due to the size and scale of the mining operation additional dust control systems are not required*, OEH does not support this comment. While historically the Berrima Mine is one of the smaller and older mines in the Southern Coalfield, the proponent should be aiming for an operation that meets contemporary environmental performance standards. This should not be difficult for a smaller mining operation.



Photo 1: Wind Blown Dust from the Loch Catherine Stockpile Area

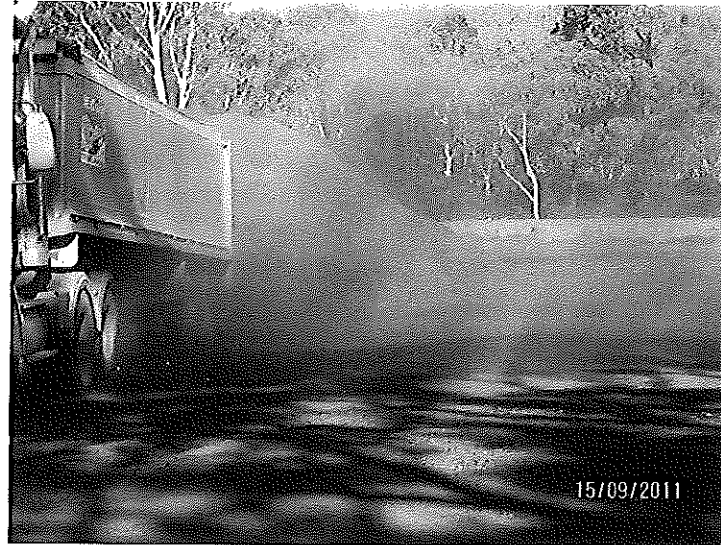


Photo 2: Dust Associated With Truck Haulage of Coal at the Loch Catherine Stockpile Area

OEH recommended in its submission on 8 August 2011 that the proponent *install and operate a dust deposition, and airborne particulate monitoring network including ambient PM10 monitoring around the Medway pit top to confirm the predictions in the EA and to monitor ongoing environmental performance.* Further, OEH recommended that this recommendation be secured as either as an additional SOC or Condition of Approval.

The proponent in their Submissions Report states that the proponent will implement ambient PM10 monitoring within limited duration campaigns prior to and following the proposed increase in production.

In this regard, OEH recommends that a real time monitoring system should be implemented that assesses the performance of dust management measures at the site and associated road haulage activities. Such a system should also be used to guide the implementation of both reactive and proactive dust mitigation measures.

OEH considers that the recent approaches applied and approved by the Planning Assessment Commission (PAC) for the Gujarat NRE No1 Preliminary Works Project would be relevant for this project. While the scale of both operations is different, there are similarities in terms of potential environmental impacts. Both proposals involve underground coal mining operations including older pit top operations; they are in close proximity to the community and involve the road haulage of coal product. In this regard, we recommend that the following conditions be applied to this project that was recommended by the PAC for the Gujarat NRE No1 Preliminary Works Project. These are as follows:

The Proponent shall:

- (a) *implement best practice air quality management on site, including all reasonable and feasible measures to minimise the off-site odour, and dust emissions generated by the project including those generated by any spontaneous combustion on site*
- (b) *minimise any visible air pollution generated by the project*
- (c) *regularly assess the real time air quality monitoring and meteorological forecasting data, and modify and/or suspend operations on site to ensure compliance with the relevant Conditions of this Approval to the satisfaction of the Director-General.*

The Proponent shall prepare and implement an Air Quality and Greenhouse Gas Management Plan for the project to the satisfaction of the Director-General. This Plan must:

- (a) be prepared in consultation with OEH, and submitted for approval to the Director-General within six months of this Approval*
- (b) describe the measures that would be implemented to ensure compliance with the relevant Conditions of this Approval, including a real-time Air Quality Management System that employs both reactive and proactive mitigation measures*
- (c) describe the measures that would be implemented to minimise the release of greenhouse gas emissions from the site; and*
- (d) include an Air Quality Monitoring Program, that uses:*
 - a combination of real-time monitors and supplementary monitors to evaluate the performance of the project; and*
 - includes a protocol for determining exceedances with the relevant Conditions of this Approval.*

Berrima Cement Works

OEH in their Submission on the EA dated 5 August 2011 recommended that an Air Impact Assessment (AIA) should be undertaken for the site due to the close proximity of the New Berrima Township and the intensification in coal handling activities at the site. However, the proponent in their Submissions Report state that an AIA is not warranted due the large size of the industrial site and that the stockpile will only contribute minor or negligible dust emissions. In addition, a number of dust management measures are in place to manage any potential air quality impacts from the proposed stockpile development. OEH considers that the above assumptions cannot be made regarding the level of impact unless an AIA is undertaken.

As stated in our previous response to the EA there has also been a history of dust issues from the Berrima Cement Works site from areas including unsealed roadways and stockpiles. In response, OEH has been working with the proponent through Pollution Reduction Programs (PRP) on the development of a Fugitive Dust Management Plan. The aim of this Program is to minimise the local impact of fugitive dust emissions from the site. It requires the development of a Plan that includes an investigation of fugitive dust controls for a number of areas and activities at the site.

In the absence of an AIA and to verify the performance of the dust control measures proposed in the Submissions Report, OEH recommends that a real time air quality system should be installed and maintained at the site. Such a contemporary system would also assist in guiding the deployment of reactive and proactive dust mitigation measures at the site. In this regard, we recommend that the following conditions be secured as Conditions of Approval.

The Proponent shall:

- (a) implement best practice air quality management on site, including all reasonable and feasible measures to minimise dust emissions generated by the project*
- (b) minimise any visible air pollution generated by the project; and*
- (c) regularly assess the real time air quality monitoring and meteorological forecasting data, and modify and/or suspend operations on site to ensure compliance with the relevant Conditions of this Approval to the satisfaction of the Director-General.*

The Proponent shall prepare and implement an Air Quality Management Plan for the project to the satisfaction of the Director-General. This Plan must:

- (a) be prepared in consultation with OEH, and submitted for approval to the Director-General within six months of this Approval;*

- (b) describe the measures that would be implemented to ensure compliance with the relevant Conditions of this Approval, including a real-time air quality management system that employs both reactive and proactive mitigation measures; and
- (d) include an Air Quality Monitoring Program, that uses:
 - a combination of real-time monitors and supplementary monitors to evaluate the performance of the project; and
 - includes a protocol for determining exceedances with the relevant Conditions of this Approval.

4.2 Off-site Transport

A key element of the project involves the transport of coal from the site through the Medway Village and past rural residences to the Berrima Cement works site for stockpiling. While we support the recently established procedure for coal loads to be covered when they leave the site, the potential issue of material carry over onto sealed road surfaces needs to be addressed. OEH considers that wash technology is not unique in the mining and industrial sector. In this regard, we recommend the following requirement be secured as a Condition of Approval.

- All vehicles leaving that have been on unsealed surfaces at the premises must be subject to equipment or facilities to provide a cleaning process for the removal of materials from wheels and underneath the bodies of vehicles. The facilities must be designed and installed or existing facilities augmented with the aim of:
 - (a) preventing materials being carried from the premises to external surfaces; and
 - (b) collecting, treating and management of polluted water from any vehicle maintenance and truck wash areas in such a way that does not cause pollution of surface and ground waters.

4.3 Requirements to monitor weather

Both the Air Quality Impact Assessment and the Noise Impact Assessment (NIA) have used meteorological data from both the Bureau of Meteorology (BOM) weather station at Moss Vale and the Boral Cement's weather station at New Berrima. Both these sites are distant from the Colliery with the BOM Moss Vale weather station approximately 14 km away. OEH considers that weather station data from these locations would not appropriately reflect the local meteorological conditions at the Medway site. In this regard to assist in compliance and EA validation issues, OEH recommends that a weather stations should be established at the site and have provided the following Condition.

A weather station must be established and maintained at the premises so as to be capable of continuously monitoring the parameters specified in the following table.

Parameter	Units of Measure	Frequency	Averaging Period	Sampling Method
Air temperature	°C	Continuous	1 hour	AM-4
Wind direction	°	Continuous	15 minute	AM-2 & AM-4
Wind speed	m/s	Continuous	15 minute	AM-2 & AM-4
Sigma theta	°	Continuous	15 minute	AM-2 & AM-4
Rainfall	Mm	Continuous	15 minute	AM-4
Relative humidity	%	Continuous	1 hour	AM-4

5. Noise Assessment

5.1 Requirements for Noise Impact Statement – Berrima Cement Works

The proponent states that in their Response to Submissions Report that a NIA is not required as existing noise conditions on the cement works Environment Protection License (EPL 1698) would appropriately address the proposed new stockpiling activities.

As indicated in the note of the condition, the noise limits in the EPL only applied during the Kin 6 upgrade project. This project is complete and at this time there are no noise limits on the premises. However, OEH has been negotiating with the proponent for the development of project specific noise limits for the premises in respect to operational noise. This has been subject to a Pollution Reduction Program No 7 with an expected completion date 30 December 2011. After this date, OEH will be undertaking further negotiations with the proponent on an appropriate time frame for inclusion of noise limits on the EPL. This may also include negotiations on the undertaking of specific noise mitigation measures to meet these limits.

We recommend that the development of project specific noise levels associated with the above PRP should include the proposed stockpile project. In this regard, we seek a Condition that recognizes this program for determining appropriate noise limits and the inclusion of this project in this process.

5.2 Noise Mitigation Measures - Berrima Colliery

OEH recommended in its submission on 8 August 2011 that due to existing noise emissions being above Project Specific Noise Levels the proponent should document all feasible and reasonable noise mitigation measures including a time-frame for implementation.

The proponent states in their response to submissions that the proponent does recognise that there are opportunities to reduce its noise emissions from the Berrima Colliery. In this regard, a Noise Management Plan will be prepared that will satisfy the above requirements. Further, the proponent proposes to keep a complaint register where noise and other complaints from residents will be recorded and if necessary actions implemented to address the source of the complaint. These commitments have also been included in the proponent's Revised SOC.

OEH supports these commitments and recommend that these commitments should be secured as Conditions of Approval. OEH does not need to be consulted on, receive a copy of, and will not approve, a "Noise Management Plan" developed by the proponent for the Colliery and/or the Cement Works. However, in an audit, if any, of the work's environmental performance OEH might ask to see the Plan and to see evidence that the Plan is being implemented.

OEH also support the intent of WSC's recommended Condition that any site equipment, when replaced, should meet contemporary operational noise standards. However, we would recommend that the Condition be strengthened as follows and be secured as a Condition of Approval:

"That any site equipment, when replaced, should meet contemporary operational noise standards and should aim to have a noise output at least five decibels below the background noise level (ten decibels below the Project Specific Noise Levels) with the objective of noise emissions from the whole premises reducing over time to contemporary standards."

5.3 Road Traffic

OEH in its submission on the EA dated 8 August 2011 raised concerns regarding haulage activities prior to 7am in the morning. In addition, further information was also requested on this issue.

OEH is aware that environmental impacts associated with trucks and road haulage is commonly raised in public submissions associated with major coal project developments. The Response to Submissions for this project had also raised concerns regarding road traffic noise impacts. OEH considers a major source of public complaints is noise from general engine noise, engine brakes and banging tail gates. These impacts are only compounded in evening night-time and morning hours.

The EA states that the recorded heavy vehicles on Medway Road (124 movement per day) are mostly colliery associated heavy vehicles travelling to and from the Berrima Colliery. This represents about 37% of

all heavy vehicle traffic movements on this road. It's also estimated that there will be a 26.6% increase in vehicles per day as a result of a production increase to 460,000 tpa. Thus the colliery premises is the major generator of truck traffic on Medway Road.

For the purposes of noise impact assessment, the proponent suggested in the Response to Submissions that Medway Road could also be defined as a principle haulage route.

The EPA *Environmental Criteria for Road Traffic Noise* (ERCTN) states that the concept of 'principal haulage routes' has been endorsed by the former Department of Urban Affairs and Planning's North Coast Extractive Industries Standing Committee. Ways of identifying 'principal haulage routes' and managing associated adverse impacts have not yet been fully defined. This infers that:

- principal haulage routes have specific, unique adverse impacts above and beyond those of roads that are not so identified; and,
- if Medway Road is defined as a principal haulage route (by some authority), the management of road traffic noise from such a road is required to be beyond the measures identified for general roads in the ERCTN. In this regard a suite of reasonable and feasible mitigation measures should be explored to mitigate the impacts associated with truck haulage.

In the absence of alternative trucking routes, restricting haulage activities to day-time hours is a feasible and reasonable noise mitigation measure to provide communities a period of respite from the potential noise impacts that may arise as a result of trucking activities that are predominantly generated from a single premises.

In this regard, OEH supports the WSC's suggested Condition to restrict noise generating activities such as loading and road haulage to day-time hours. The Response to Submissions states that *noise generating activities such as loading and haulage are restricted to the hours of 7.00am to 6.00pm Monday to Friday and 7.00am to 1.00pm Saturdays with no loading and haulage to occur on Sundays or Public Holidays*. OEH recommends that this commitment be secured as a Condition of Approval.

In addition, OEH also recommends the development and implementation of a Traffic Management Plan. In this regard, OEH recommends that the following Condition also be secured as a Condition of Approval:

A Traffic Noise Management Strategy (TNMS) be developed and implemented within six months of this Approval for the management of operational noise impacts associated with road haulage of materials. This is to improve operation transport, to ensure that feasible and reasonable noise management strategies for vehicle movements associated with the facility are identified and applied, that includes but are not necessarily limited to the following:

- *driver training to ensure that noisy practices such as the use of compression engine brakes are not unnecessarily used near sensitive receivers*
- *a holistic examination of truck traffic generated by the cement works to reduce traffic noise impacts on the community*
- *best noise practice in the selection and maintenance of vehicle fleets*
- *movement scheduling where practicable to reduce impacts during sensitive times of the day, or evening (trucking shall be contained to day and evening operations only)(evening operations may be pending) communication and management strategies for non licensee/proponent owned and operated vehicles to ensure the provision of the TNMS are implemented*
- *a system of audited management practices that identifies non conformances, initiates and monitors corrective and preventative action (including disciplinary action for breaches of noise minimisation procedures) and assesses the implementation and improvement of the TNMS*
- *specific procedures to minimise impacts at identified sensitive areas*

- *clauses in conditions of employment, or in contracts, of drivers that require adherence to the noise minimisation procedures and facilitate effective implementation of the disciplinary actions for breaches of the procedures.*

5.4 Rail Transport Opportunities

The proponent is seeking approval for a modification that involves five export campaigns per year, undertaken over periods of five to seven days. The campaigns will involve the transport of coal from the Berrima Cement Stockpile to Port Kembla for export. The proponent proposes to utilise an existing 180 truck movements per day set for clinker and replacing them with coal haulage. Despite this switch there still will be an additional 62 truck movements per day from the site. However, this is dependant on the proponent seeking markets for this material.

OEH considers that rail haulage has significant environmental benefits over road haulage. OEH supports measures to avoid progressive increases in truck movements and their associated cumulative environmental impacts. These impacts can include reduced air quality, increased greenhouse gas emissions and increased noise. There is also potential public health impacts associated with the vehicle emissions from trucks. The Illawarra Airshed does not at all times satisfy the current air quality goals for fine particulates and photochemical smog (ozone). Vehicle emissions are known to be significant contributor to these pollutants.

While the EA and Response to Submissions indicates that rail is available at the Berrima Cement Works site, it is not economically viable at this time to construct coal loading infrastructure. In this regard, as previously recommended in our response on 5 August 2011, OEH recommends that the proponent should continue to investigate opportunities for rail haulage. This should be secured as a Condition of Approval.

5.5 Additional Noise Conditions - Berrima Colliery

In addition to the above Conditions OEH also recommends that the following Noise Conditions be secured as Conditions of Approval:

1. *Noise generated at the premises must not exceed the noise limits presented in the table below. The locations referred to in the table below are based on those in Figure 12.2 Noise Assessment Locations in the Environmental Assessment Report "Berrima Colliery Continued Operations Environmental Assessment – Volume 1 May 2011".*

Noise Limits – All noise limits are in dB(A)

<i>Location</i>	<i>LAeq,15 minute Daytime</i>	<i>LAeq,15 minute Evening</i>	<i>LAeq,15 minute Night</i>	<i>LAMax Night</i>
1	42	39	35	45
2	42	39	35	45
3	42	39	35	45
4	41	39	35	45
5	40	38	35	45
6	39	36	35	45
7	38	35	35	45

8	37	35	35	45
9	40	38	35	45
10	36	35	35	45
11	36	35	35	45
12	36	35	35	45
13	35	35	35	45
14	35	35	35	45
15	35	35	35	45

2. For the purpose of Condition 1:
 - Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays
 - Evening is defined as the period 6pm to 10pm; and
 - Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.
3. The noise limits set out in Condition 1 apply under all meteorological conditions except for any one of the following:
 - a) Wind speeds greater than three metres/second at ten metres above ground level; or
 - b) Stability Category F temperature inversion conditions and wind speeds greater than two metres/second at 10 metres above ground level; or
 - c) Stability Category G temperature inversion conditions.
4. For the purposes of Condition 4:
 - a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station established at this site; and
 - b) Stability category temperature inversion conditions are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.
5. For the purposes of determining the noise generated at the premises a Class 1 or 2 noise monitoring equipment as defined by AS IEC61672.1-2004 and AS IEC61672.2-2004, or other noise monitoring equipment accepted by OEH in writing, must be used.
6. To determine compliance:
 - a) with the $L_{eq(15 \text{ minute})}$ noise limits in Condition 1, the noise monitoring equipment must be located:
 - within 30 metres of a dwelling façade where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises
 - approximately on the boundary where any dwelling is situated 30 metres or less from the property boundary that is closest to the site; and
 - within approximately 50 metres of the boundary of a National Park or a Nature Reserve.
 - b) with the $L_{A_{Max}}$ noise limits in Condition 1, the noise monitoring equipment must be located within one metre of a dwelling façade
 - c) the noise monitoring equipment must be located in a position that is:
 - at the most affected point at a location where there is no dwelling at the location; or
 - at the most affected point within an area at a location prescribed by Conditions 6(a) or 6(b).

7. *An exceedance of these limits will still occur where noise generated from the site in excess of the appropriate limit specified in Condition 1 is detected:*
 - *in an area at a location other than an area prescribed by Condition 6; and/or*
 - *at a point other than the most affected point at a location.*
8. *For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.*
9. *The Proponent shall prepare and implement a Noise Monitoring and Verification Program within six months of this Approval. The Plan must include but not necessarily be limited to the following:*
 - a) *details of a Noise Monitoring Program that: uses a combination of real-time and supplementary attended monitoring to evaluate the performance of the project*
 - b) *verifies noise predictions identified in the EA*
 - c) *a program to assess the performance of any implemented noise mitigation measures*
 - d) *identifies any non compliance with conditions detailed in Condition 1*
 - e) *provides details of procedures to address any non-compliance; and*
 - f) *outline procedures to manage responses to any complaints or issues raised by the owners of affected residences.*

6. Flora and Fauna - Berrima Colliery

6.1 Rehabilitation

OEH has recently provided advice to DTIRIS regarding the closure of old mine adits at the Loch Catherine Coal Stockpile Area in relation to threatened bat species. In this regard, OEH recommends that the protection of any threatened bat species be recognised in the proposed rehabilitation objectives. OEH recommends that the following objective be applied:

Closure of portals and vent shafts – safe and stable to satisfy DRE Requirements and no significant impact on threatened bats.

We also recommend that the following rehabilitation objective be identified for the mine site and other land affected by the project to address ecosystem function and compatibility with surrounding landscape. OEH also recommends the following:

Restore ecosystem function including maintaining or establishing self-sustaining ecosystems comprising of:

- *Local native plant species (unless the DG of DTIRIS agrees otherwise); and*
- *A landform consistent with the surrounding environment.*



Office of Water

Major Development Assessments
Department of Planning and Infrastructure
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Our ref : ER20870
Your ref: 10/02259

26 October 2011

Attention: Clay Preshaw

Dear Clay

**SUBJECT: RESPONSE TO SUBMISSIONS BERRIMA COAL PROJECT APPLICATION
NUMBER MP10_0172**

I refer to your email dated 18 October 2011, requesting the NSW Office of Water (NOW) to review the Applicants Response to Submissions for the Berrima Coal Project Environmental Assessment (EA). NOW has reviewed the Response to Submissions and provides the following comments and recommended conditions of approval.

The operation is located within Zones 1 and 2 of the Nepean Management Zone of the Sydney Basin Nepean Groundwater Management Area (no. 607) of the Sydney Basin (Greater Metropolitan Region). The two management zones are managed under different rules, due to differing levels of commitment in the groundwater source zones. Nepean management zone 1 is fully committed to current levels of groundwater take. This may place constraints on the increase in production from the Berrima Coal proposal.

NOW advises that it is still assessing the Applicants groundwater licence application under Part 5 of the *Water Act 1912 (WA)*, which if approved would ultimately be converted to a water access licence (WAL) within the Sydney Basin Nepean Groundwater Management Area. Central to NOWs assessment is understanding the potential impacts on the groundwater regime overlying and surrounding the Berrima Coal Project site, in order to protect the Windgecarribee River and connected groundwaters to the Wingecarribee River, Jacky Jackys and Mandemar Creeks.

As such, NOW requests that the recommended conditions provided in Attachment A are incorporated into the Ministers consent for the Application if determined to be approved.

NOW requests that any approval granted to the Berrima Coal Application is conditioned with performance criteria that identify existing and likely groundwater impacts, including any existing or potential surface/groundwater connectivity under the current rate of production of 0.22 Mt per annum, prior to any increase of production to the proposed 0.46 Mt per annum.

The provision of additional groundwater data to establish baseline conditions and determine trigger levels for any expansion of operations is necessary in the context of fully

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committed groundwater extraction occurring in the Nepean Management Zone 1 of GWMA 607.

If you require further information please contact Jodie Dabovic, Planning and Assessment Coordinator on (02) 4904 2571.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'm. mignanelli', with a stylized flourish at the end.

Mark Mignanelli
Manager Major Projects, Mines and Assessment

**NOWS RECOMMENDED CONDITIONS OF APPROVAL FOR BERRIMA COLLIERY
COAL EXTENSION PROJECT**

1) Groundwater

Prior to any increase of production above the current extraction of 0.22 Mt per annum, the Applicant must develop and submit additional groundwater investigations to NOW for assessment and endorsement. The additional actions/information is to be provided by the Applicant in consultation with and to the satisfaction of NOW:

- a) Installation of additional monitoring bores within the alluvium and coal seam aquifers for the assessment of groundwater within and adjacent to the mining area.
- b) Detailed hydrogeological assessment of the mining area to enable characterisation of groundwater inflows into the mining area and the degree of depressurisation due to mining activities.
- c) Surface/groundwater connectivity assessment for Wingecarribee River and associated 5th order tributary of Mandemar Creek adjacent to the project area, including but not limited to:
 - i) Installation of monitoring bores near the water courses of Wingecarribee River and Mandemar Creek;
 - ii) Stygofauna and hyporheic zone macroinvertebrate sampling for the characterisation of population dynamics (including species present and water quality/level requirements;
 - iii) Age dating of water collected from groundwater and hyporheic zone of the water courses.
- d) Preparation of a Groundwater Management Plan to include but not limited to:
 - i) Water quality parameters to be monitored;
 - ii) Monitoring frequency for quality (minimum of monthly sampling);
 - iii) Water level monitoring (installation of level loggers);
 - iv) Monitoring of groundwater dependent ecosystems;
 - v) Measured and predicted site water balance; and
 - vi) Trigger criteria to detect impacts from the operation.

2) Surface water

The Surface Water Management Plan must be updated in consultation with NOW and include the following:

- a) A detailed water quality monitoring program to be implemented for Wingecarribee River and Mandemar Creek to coincide with the groundwater monitoring to inform the surface/groundwater connectivity studies.
- b) Development of trigger criteria for detecting impacts to the water courses due to the mining operations.

3) Groundwater Dependant Ecosystems

NOW requires a program to monitor the response of groundwater dependant ecosystems (GDE) to extraction of groundwaters and depressurisation of surrounding geological strata to be developed in consultation with and to the satisfaction of NOW. This program is to include, but not limited to:

The following undertaken and submitted to NOW for assessment prior to project approval and is to include:

- a) A schedule of groundwater dependant ecosystems, including any threatened ecological communities or threatened species which are regarded as groundwater dependant, and to include stygofauna.
- b) The GDE monitoring program is to be developed in consultation with and to the satisfaction of NOW.
- c) Establish monitoring bores of groundwater quality and groundwater levels for any identified groundwater zones supporting GDEs and water sources identified in and adjacent to the mining area.
- d) The monitoring is to include terrestrial, macrophytes and macroinvertebrates within the water sources and stygofauna within aquifers.
- e) Development of trigger criteria for detecting impacts to the ecosystems due to the mining operations.
- f) Submit a report to NOW of the monitoring and outcomes within one month of the completion of the baseline monitoring program. NOWs review and assessment will inform the longer term monitoring requirements for the project.

4) Reporting

An annual report is to be submitted to NOW which includes all groundwater, surface water and GDE monitoring and any exceedances in trigger criteria.

**End Attachment A
26 October 2011**