22.0 Environmental Management and Commitments

22.1 Introduction

Environmental Commitments are those environmental management measures formally established to mitigate and manage the potential environmental impacts of the project. These commitments would be incorporated into an EMP for the Project Site. The Proponent currently has a range of environmental policies and procedures under which the existing Project Site activities operate including:

- Waste and Water Management Guidelines; and
- Energy and Greenhouse Gas Management Guidelines.

Prior to commencing operations on site, the selected contractor together with the Proponent would review the completed plans and the EMP (to be prepared for the Project Site). The EMP would contain details of environmental monitoring to be carried out and procedures for reporting the environmental performance of the project.

Boral embraces the principle of sustainable development and is committed to pursuing industry specific best practice. Boral's commitments in relation to the environment (as specified in its *Environmental Policy*) include:

- *Conducting its operations to minimise environmental risk and, wherever practicable, eliminate adverse environmental impacts;*
- *Continual improvement of environmental performance including regular review and the setting of rigorous environmental objectives and quantified targets – particularly with regard to:*
  - *Efficient use of energy (including appropriate use of alternative fuels);*
  - *Conservation of water;*
  - *Minimisation and recycling of wastes;*
  - *Prevention of pollution; and*
  - *Effective use of virgin and recovered resources and supplemental materials.*
- *Open, constructive engagement with communities surrounding operations;*
- *Reducing greenhouse gas emissions from processes, operations and facilities;*
- *Protecting and, where possible enhancing biodiversity values at and around its facilities;*
- *Complying with environmental legislation, regulations, standards and codes of practice relevant to the particular business as the absolute minimum requirement in each of the communities in which it operates;*
- *Conducting business with suppliers and contractors who have a commitment to the values and objectives contained in its environmental policy;*
- *Consulting and collaborating with customers and suppliers in the development of sustainable products;*
- *Remediating its contaminated sites to standards internationally acceptable for the site purpose.*

Boral's *Environmental Policy* also states that Boral would progressively implement and maintain environmental management systems for its businesses based on the international standard ISO-14001 or its equivalent.

In relation to Health and Safety, Boral is committed to providing safe and healthy working conditions for all people involved in the business, including contractors, visitors and the general public. An induction would be held for all personnel prior to the commencement of works at the Project Site to raise awareness of Boral's Occupational Health and Safety (OH&S) plan.

22.2 Summary of Mitigation Measures

Table 64 below summarises the mitigation measures for the project.

Table 64: Summary of Mitigation Measures

Issue	Mitigation Measures
Air Quality	Dust control measures to be employed on the Project Site as follows: • Haul roads to be watered at a rate equal to or greater than 2 L/m^2/hr; • Unloading of trucks containing raw or unusable extracted material to be controlled using water sprays; • Dust from raw material stockpile to be controlled using water sprays; • Dust from existing stockpiles of unusable material and open pits to be controlled using water sprays with chemical additives (surfactants); and • Completed pits to be revegetated as soon as practicable after completion of quarrying activities. Preparation of an AQMP for the Project Site which would include measures to control dust and emissions from the Project Site. Specifically, the AQMP would include details of a dust mitigation program for the Project Site including: • Instantaneous dust monitoring at the most affected Project Site boundary through the installation of an instantaneous dust monitor (such as a TEOM) to alert Project Site personnel when elevated dust levels occur such that operations can be modified to reduce dust impacts; • Revegetation of disturbed soil surfaces on the Project Site in accordance with the RP (**Appendix D**); and • Review of operational practices to ensure 'best practice' techniques are being employed and that operational equipment is working efficiently.
Noise	• Construction of a 10m high earth mound along the northern and eastern Project Site boundary, wrapping around to the western boundary for a length of 150 m and extending around to the southern boundary for 100 m, as illustrated in **Figure 7** of the EA and the Noise Assessment Report located at **Appendix F** of this report. The earth mound is to be constructed in stages as shown in **Figure 7** and detailed in the Noise Assessment Report. • Construction works associated with the earth mound within 300 m of any residences, shall be limited to 7am to 6pm Monday to Friday and 8am to 1pm on Saturdays. • Application of noise reduction treatments to mobile plant used within the quarry to achieve a minimum reduction of 10 dB from noise levels of standard equipment. These treatments may include: - Enclosure of the engine within an acoustic enclosure and/or sealing of gaps around the engine bay; - Use of acoustic louvres / treatments on engine air intakes and cooling air exhausts; - Installation of high attenuation engine exhaust mufflers; and - Lining of the trays/bodies of dump trucks with high impact rubber to reduce loading noise, or using specially designed suspended dump bodies (e.g. Duratray).

Issue	Mitigation Measures
Surface Water	• Adoption of an updated SWMP for soil and water management across the Project Site, including consideration of: - Reconfiguration of the catchment to proportion runoff going to storage pits according to their storage capacity. - Installation of infrastructure to allow Pit 1 to spill to Pit 4 and Pit 4 to spill to Pit 3. - Options for the reuse of water stored on-site for beneficial use in order to increase the extraction regime to improve on-site storage capacity. - Monitoring of storage levels in Pits1, 3 and 4 such that spill risk is managed and the need for additional storage and/or extraction can be readily identified; • The continued use of drains, silt fences and bunding to direct Project Site runoff into appropriate sediment basins and to control erosion; • Stabilisation of disused stockpiles to minimise the risk of erosion; • Diversion of stormwater runoff from Sediment Basins 1, 2 and 3 to Pit 1 upon establishment of Pits 4 and 5; • The use of flocculants in sedimentation basins to increase sediment removal rates if required; • The removal of oil and grease within the sediment basin by volatilisation if required; • Routine maintenance and inspections of drains, sediment basins and bunds; and • The continued supplementation of town water with recycled water for the brick making process.
Groundwater	• Appropriate storage of fuels and hazardous chemicals and the implementation of appropriate work procedures as well as regular inspections and maintenance of equipment and plant to minimise potential for contamination due to spills; • Implementation of an alluvial assessment and groundwater monitoring program in accordance with the methodology provided in **Chapter 11** of the EA to minimise or negate the likelihood of impacts to the alluvial aquifer, base flow to the creeks and groundwater dependant ecosystems (if present). This program would be commenced at least two years prior to the commencement of extraction in Pit 4. • Modification of the proposed pit size as required to ensure the alluvial sediments are not disturbed by the development. • Establishment of a 50 m buffer zone adjacent to Badgerys Creek within which no quarrying activities would take place in order to minimise the likelihood of impacts upon the alluvial aquifer.
Land Use	• Ongoing consultation with the relevant authorities managing the release of land for industrial and urban development within the vicinity of the Project Site to ensure that project activities and management of infrastructure is effectively integrated with future development in the area. • Adherence to the management strategies recommended as part of the RP for the Project Site, to ensure that the full range of options for the future use of the Project Site are preserved.
Rehabilitation	• Rehabilitation works to be carried out on the Project Site generally in accordance with the RP included as **Appendix D** to the EA **Figure 5** and showing the conceptual final landform.

Issue	Mitigation Measures
Traffic and Transport	• Personnel operating trucks and vehicles to and from the Project Site would be required to undertake a site-specific health and safety induction, specifying operating hours, avoidance of the AM and PM peak periods and vehicle speed limits on Martin Road. • A heavy vehicle protocol would be developed for the Project Site and distributed to relevant staff and contractors during induction procedures. The protocol would deal with such issues as timing of vehicle movements, idling of vehicles, speed limits and parking. • Unnecessary vehicle movements would be minimised where possible. • Deliveries would be scheduled on larger capacity 'Truck and Trailer' vehicles rather than 'Truck Only' vehicles where possible to minimise truck movements. • A number of improvements in relation to shoulder widths, and the alignment and sight distances within the vicinity of the horizontal reverse curves would be investigated and may include: - Construction of shoulders at minimum standard widths where required; - Clearing of existing roadside vegetation to improve sight lines within the vicinity of the reverse curves; and - Provision of 'W1-4(L)' warning signposting in advance of the reverse curves to advise motorists of the upcoming curved alignment. • As part of the existing and ongoing operations at the Project Site, a detailed pavement investigation and rehabilitation program would be considered to protect the value of the existing structure of Martin Road.
Geology and Soils	• Stockpiles and batter faces would be stabilised and erosion and sediment controls such as silt fencing would be used on site as temporary measures in the mitigation of sediment pollution to down slope lands and waterways; • Temporary structural methods (including silt fencing) may be used where required to protect newly treated areas, which are generally highly susceptible to erosion. • Disused stockpiles would be revegetated in accordance with the RP prepared for the project; • Bunding and batter slopes for new quarry pits would be designed to minimise the potential for erosion in accordance with the RP for the Project Site; • Roadways would be maintained for the productive life of the pit; • Rehabilitation of the Project Site would be carried out in accordance with the RP for the Project Site (**Appendix D**); • Overburden and unusable material would be used to rehabilitate Pit 2 such that no new stockpiles would be created; and • Water carts would be used to assist with the control of erosion in accordance with the AQMP.
Visual	• Earth bunds of 10 m in height would be erected along the northern and eastern Project Site boundaries and parts of the western and southern Project Site boundaries, to provide acoustic and visual screening of the Project Site from surrounding visual receptors; • Existing disused stockpiles would be rehabilitated in accordance with the RP prepared for the Project Site and included as **Appendix D** to this EA; and • A 50 m riparian corridor would be established along Badgerys Creek providing vegetative screening of the Project Site along the western boundary.

Issue	Mitigation Measures
Cultural Heritage	• Should relics be uncovered during the course of the approved works, works shall cease. In cases where historical items have been uncovered, the NSW DoP's Heritage Branch shall be advised or should indigenous items be uncovered the NPWS shall be advised; • Workers/contractors shall be informed of their obligations under the NPW Act 1974, namely that it is illegal to disturb, damage or destroy a relic without the prior approval of the Director General of DECCW; and • Should human remains be found in, on, or under the land during construction, the responsible party shall: - Contact the local police; - Not disturb or excavate the remains; - Immediately cease all work at the particular location; - Notify the DECCW office as soon as practicable and provide any available details of the remains and their location; and - Not recommence any work at the particular location until authorised in writing by the DECCW.
Ecology	• The following measures would be adopted to minimise potential impacts associated with any required tree removal: - The canopy of the trees would be visually inspected prior to clearing to assess for the presence of fauna. Where bird species are detected the tree is to be nudged prior to felling to encourage the fauna to vacate the tree prior to felling. Trees would be left in situ until the birds leave the canopy; - Felled trees to be left in-situ for at least 24 hours to allow fauna species to relocate. Qualified personnel would be on hand to check for wildlife and relocate them; - Felled wood would be relocated to the remnant woodland (and not placed in piles) or chipped and used in rehabilitation areas; - Should any wildlife be inadvertently injured during the proposed works, WIRES or an accredited veterinarian would be contacted; - A 50 m buffer area would be provided along Badgerys Creek and the Badgerys Creek tributary. Rehabilitation works to be undertaken in this area in accordance with the RP prepared as part of this EA; and - Five native trees would be planted for each mature native tree that is removed. The plantings shall be located adjacent to the riparian vegetation along Badgerys Creek and its tributary.
Waste	• The WMP for the Project Site would be followed and updated as required; • Waste generated on the Project Site would be reused or recycled where possible (as per the WMP); • Waste to be disposed offsite would be classified, transported and disposed of in accordance with the *Waste Classification Guidelines (DECCW, 2008);* and • Plant Managers, Team Leaders, Operators, visitors and contractors would be informed of waste management and disposal procedures to be undertaken on site.

Issue	Mitigation Measures
Hazard and Risk	• Spill kits would be maintained on the Project Site in the vicinity of the liquid storage bund and the diesel storage bund. An additional mobile spill kit would be kept on the Project Site with quarry machinery and plant during quarry campaigns. • Fire extinguishers would be maintained on the Project Site in appropriate locations. • Refuelling of vehicles and plant on the Project Site would be carried out in the designated refuelling area. • Bunding would be installed as appropriate around the die lubricant tank and in other locations where chemicals are stored. • Stockpiles on the Project Site would be maintained at appropriate height and slope of batter and stabilised in accordance with best practice and the RP prepared for the Project Site. • Drains, silt fences and bunding would be used to direct runoff into appropriate sediment basins.

22.3 Statement of Commitments

In accordance with the DGRs issued under Part 3A of the EP&A Act, the following SoC has been developed for the project. The SoC states the Proponent's environmental commitments and details the environmental management and monitoring of the proposed Project. The Proponent is committed to ensuring the preparation and implementation of the environmental management and monitoring plans, further investigations and studies and environmental mitigation measures detailed in the SoC for the proposed Project.

The SoC, prepared in respect of the Project, has been compiled on an issues basis and is informed by the environmental risk analysis and impact assessment undertaken as part of this EA.

Table 65: Statement of Commitments

Issue	Commitment
General	
General	1) The Proponent shall implement all practicable measures to prevent or minimise harm to the environment that may result from the construction, operation or rehabilitation of the Project.
Air Quality	2) The Proponent shall prepare an AQMP for the project to the satisfaction of the Director-General. The AQMP shall detail measures to control dust and emissions from the Project Site including the following measures: • Haul roads to be watered at a rate equal to or greater than 2 L/m2/hr; • Unloading of trucks containing raw or unusable extracted material to be controlled using water sprays; • Dust from the raw material stockpile to be controlled using water sprays; • Dust from existing stockpiles of unusable material and open pits to be controlled using water sprays with chemical additives (surfactants); • Completed pits to be revegetated as soon as practicable after completion of quarrying activities; • Instantaneous dust monitoring to be installed at the most affected Project Site boundary; • Disturbed soil surfaces to be revegetated in accordance with the RP for the Project Site; and • Operational practices to be reviewed to ensure 'best practice' techniques are being employed and that operational equipment is working efficiently.
Noise	3) The Proponent shall implement all practicable measures to undertake the development in a way that minimises the noise generated. 4) The Proponent shall conduct quarrying activities at the Project Site only between the following hours: • 7.00 am to 6.00 pm Monday to Saturday 5) The Proponent shall operate the Brick making facility at the Project Site 24 hours a day, Monday to Sunday. 6) The Proponent shall conduct activities within the storage yard (including deliveries and dispatch) only between the following hours: • 6.00 am to 10.00 pm Monday to Friday • 6.00am to 6.00pm Saturday

Issue	Commitment
	7) The Proponent shall construct an earth bund of a minimum height of 10 m along the northern and eastern Project Site boundary and part of the western and southern Project Site boundaries as shown in **Figure 7** of the EA. The earth mound shall be constructed in stages as specified in **Figure 7** of the EA. 8) Construction works associated with the construction of the earth bund within 300 m of any residences, shall be limited to 7am to 6pm Monday to Friday and 8am to 1pm on Saturdays. 9) The Proponent shall apply a combination of noise reduction treatments to mobile plant used within the quarry to achieve a reduction of 10 dB from noise levels of standard equipment.
Surface Water	10) The Proponent shall manage surface water on the Project Site in accordance with the SWMP prepared for the Project Site (ERM, 2002), including Addendum dated April 2010 (AECOM, 2010) and included as **Appendix C** to this EA.
Groundwater	11) The Proponent shall prepare and implement a Groundwater Monitoring Program for the Project Site generally in accordance with the methodology provided in **Chapter 11** of the EA, subject to consultation with the NOW and the satisfaction of the Director-General of the DoP. The program shall commence at least two years prior to the commencement of extraction in proposed Pit 4. 12) The Proponent shall report the results of the Groundwater Monitoring Program to the Director-General of the DoP on an annual basis. 13) The Proponent shall implement appropriate management measures in relation to groundwater as indicated by the Monitoring Program and agreed with the Director-General. 14) A licence to authorise any groundwater monitoring installation, required as part of this project, shall be obtained from the NOW prior to any drilling commencing. 15) The proponent shall implement an alluvial aquifer mapping and assessment program to inform: - The definition of the boundaries of the alluvial system; - Adjustment to the extent of proposed pits to avoid impacts to the alluvial aquifer; and - The establishment of further mitigation measures (if required) to minimise potential impacts upon the alluvial aquifer. This program shall commence at least two years prior to the commencement of extraction in Pit 4 and the results shall be reported to the NOW and the Director-General of the DoP.
Rehabilitation	16) The Proponent shall carry out rehabilitation works at the Project Site in accordance with the RP prepared for the Project Site and included as **Appendix D** to this EA.

Issue	Commitment
Traffic and Transport	17) The Proponent shall manage traffic movements to and from the Project Site generally in accordance with the following: • Personnel operating trucks and vehicles to and from the Project Site would be required to undertake a site-specific health and safety induction, specifying operating hours, avoidance of the AM and PM peak periods and vehicle speed limits on Martin Road. • A heavy vehicle protocol would be developed for the Project Site and distributed to relevant staff and contractors during induction procedures. The protocol would deal with such issues as timing of vehicle movements, idling of vehicles, speed limits and parking. • Unnecessary vehicle movements would be minimised where possible. • Deliveries would be scheduled on larger capacity 'Truck and Trailer' vehicles rather than 'Truck Only' vehicles where possible to minimise truck movements.
Cultural Heritage	18) The Proponent shall adopt the following measures in relation to the management of cultural heritage on the Project Site: • Should relics be uncovered during the course of the approved works, works shall cease. In cases where historical items have been uncovered, the NSW DoP's Heritage Branch shall be advised or should indigenous items be uncovered the National Parks and Wildlife Service shall be advised; • Workers/contractors shall be informed of their obligations under the NPW Act 1974, namely that it is illegal to disturb, damage or destroy a relic without the prior approval of the Director General of the DECCW; and • Should human remains be found in, on, or under the land during construction, the responsible party shall: - Contact the local police; - Not disturb or excavate the remains; - Immediately cease all work at the particular location; - Notify the DECCW office as soon as practicable and provide any available details of the remains and their location; and - Not recommence any work at the particular location until authorised in writing by the DECCW.
Ecology	19) The Proponent shall adopt the following measures in relation to the removal of any trees on the Project Site: • The canopy of the trees to be visually inspected prior to clearing to assess for the presence of fauna. Where bird species are detected the tree is to be nudged prior to felling to encourage the fauna to vacate the tree prior to felling. Trees to be left in situ until the birds leave the canopy; • Felled trees are to be left in-situ for at least 24 hours to allow fauna species to relocate. Qualified personnel are to be on hand to check for wildlife and relocate them; • Felled wood is to be relocated to the remnant woodland (and not placed in piles) or chipped and used in rehabilitation areas; • Should any wildlife be inadvertently injured during the proposed works, WIRES or an accredited veterinarian shall be contacted; • A 50 m buffer area shall be provided along Badgerys Creek and the Badgerys Creek tributary. Rehabilitation works are to be undertaken in this area in accordance with the RP prepared as part of this EA; and • Five native trees shall be planted for each mature native tree that is removed. The plantings shall be located adjacent to the riparian vegetation along Badgerys Creek and its tributary.

Issue	Commitment
Waste	20) The Proponent shall manage waste in relation to the Project in accordance with the existing WMP for the Project Site, included as **Appendix M** to the EA.
Environmental Management	21) The Proponent shall prepare an EMP for the Project Site to provide environmental management practices and procedures to be followed during the operation of the Project. The EMP shall include, but not necessarily be limited to: • identification of statutory and other obligations that the Proponent is required to fulfil in relation to operation of the Project; • a description of the roles and responsibilities for all key personnel involved in environmental management of the Project; • the environmental policies and principles to be applied to the operation of the Project; and • describe in general terms how the environmental performance of the Project would be monitored and managed.

22.4 Training and Induction

Boral has a *Health and Safety Policy* which outlines its commitment to providing safe and healthy working conditions for all people involved in their business including contractors, visitors and the general public. With any new project involving Boral personnel it is normal procedure to undertake a risk assessment based on the scope of works and then prepare a customised induction for both employees and subcontractors. Project personnel would be required to attend an induction and/or training required for specific sites prior to the commencement of works at the Project Site. The induction would ensure that all personnel are fully aware of their OH&S and environmental responsibilities and gain the necessary knowledge and skills to fulfil their responsibilities. Induction would address general environmental and OH&S management issues including:

- Introduction to Boral Bricks and overview of scope of operations.
- Overview of Company Policies, including OH&S and Environmental and explanation of company safety culture and standards.
- Overview of scope of operations at Badgerys Creek.
- Description of proposed works/project to be conducted.
- Location of, and respect for neighbours and adjoining properties.
- Permitted hours of quarrying operations/specific noise limitations.
- Site OHS requirements including.
    - Heavy and light plant and equipment operations/restrictions;
    - Site Traffic control and Traffic Management Plan/hours of operation/access;
    - Job Safety Analyses/Safe Work Method Staments/Risk Assessment/OHS legislative requirements/Hazards/Controls/Systems and Procedures;
    - Authority to work permits;
    - Emergency response and notification including site evacuation/fire etc;
    - Chemical handling and storage;
    - Manual Handling; and
    - Spill response and procedures;
- Emergency contacts and incident reporting procedures.
- Supervisors and key personnel.
- Site dust and noise monitoring and requirements.
- Waste controls and recycling.
- Site water controls and systems including erosion control.
- Restricted areas and special operations/sensitive areas.

- Location and description of site facilities/amenities.

Where identified in the risk assessment the following items would be included in the induction:

- Discharges to air/water.
- Cultural issues and notification processes should work be carried out in a sensitive area.
- Weed and pest control and flora and fauna preservation/fire controls.

22.5 Inspection, Monitoring and Auditing

Inspection, monitoring and auditing would be undertaken to assess and record whether activities are in compliance with regulatory requirements and the objectives outlined in the Health, Safety and Environment Management System, which guides Project Site operations.

In addition to the conditions of the Minister's approval and the Proponent's SoCs, the proposed works would be carried out in accordance with:

- The relevant requirements of any future Mining Lease;
- Conditions specified pursuant to the EPL.

22.6 Outline of Environmental Reporting

- Environmental reporting is a significant tool for environmental management as it can facilitate the collection of information on environmental impacts and issues and assist in identifying possible solutions in order to minimise these impacts. Environmental reporting also brings benefits to the performance and efficiency of an operation. Environmental reporting is carried out both through the Boral Sitesafe internal reporting system, on a daily basis, and directly to senior management through monthly reports. The key features of the Environmental reporting system include:
- Daily inspection and identification of issues by supervisory staff.
- Entry into the Boral Sitesafe System which provides:
  - Unique identification of each issue including non compliance;
  - Description of the issue;
  - Investigation;
  - Actions;
  - Action completion timeframe and responsibility;
  - Monitoring of action due dates and close out;
  - Management signoff; and
  - Data base of records / incidents.
- The Observations section of Sitesafe allows stakeholder consultation and meetings to be recorded and actions allocated.
- Any internal or external auditing actions are entered into the Sitesafe database.
- Site dust monitoring is conducted monthly at Badgerys Creek.
- An Environmental Report is submitted to Boral Senior Management monthly detailing:
  - Any site non compliance with statutory and licence requirements;
  - Inspections and audits by statutory authorities;
  - Any project or improvement work being conducted on site; and
  - Any complaints received during the month.

The Proponent would ensure that all reporting undertaken in relation to environment and OH&S issues would be in compliance with the relevant licence conditions and regulatory requirements.

22.7 Outline of Environmental Auditing

Environmental compliance auditing would be undertaken to assist in identifying the environmental impacts associated with the construction and operational phases of the Project. Inspection of activities would be undertaken on a regular basis by supervisory staff. On-going monitoring of these activities is essential to ensure compliance with regulatory requirements and conditions of approval. Auditing, together with the implementation of inspection and monitoring programs, would assess the compliance of the Project with regulatory requirements during construction and operation. The Proponent would ensure that records are kept of all auditing that is conducted. Based on results of the audits, the Proponent would ensure modifications and corrective actions are undertaken to rectify any identified environmental impacts or concerns of the project.

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