MOOLARBEN COAL PROJECT

Stage 2

SECTION 6

Statement of Commitments

SECTION 6 – STATEMENT OF COMMITMENTS

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6. STATEMENT OF COMMITMENTS BY MCM

6.1 Introduction

The Director-General's Environmental Assessment Requirements for the environmental assessment of the Stage 2 project and modification to the Stage 1 Approval require '…a statement of commitments, outlining all of the proposed environmental management and monitoring measures…' to be included in the EA (this report). This section outlines MCM's commitments in fulfilment of that requirement.

The MCP will comprise the integrated operation of:

- Stage 2, for which approval is now being sought under Section 75 E of the EPA Act (Stage 2 Project Approval).
- Stage 1 for which planning approval (Stage 1 Project Approval) was granted by the Minister for Planning on 6 September 2007, and which was modified on 26 November 2008 and on 18 December 2008, and which is proposed for modification again as described in Section 4.6 to enable the integration of Stage 2 with Stage 1.

Moolarben Coal Mines proposes, and is committed, to the operation of the MCP as one integrated coal mining project.

6.2 MCM Commitments

Moolarben Coal Mines makes the following commitments in respect of the construction and operation of the MCP.

These commitments by MCM:

- Are made in addition to, and adjust, the commitments made in the Stage 1 application to take into account the Stage 2 approval and the integration of Stage 2 with Stage 1, which comprise the MCP.
- Apply to the operation of the MCP (Stage 1 and Stage 2).

These commitments shall prevail in the event of any conflict between these commitments and the Stage 1 commitments.

(1) Operate as One Complex

Moolarben Coal Mines commits to construct, operate and manage the MCP as one coal mine complex:

- In accordance with the applicable Stage 1 and Stage 2 approvals.
- In an environmentally responsible manner.
- In compliance with the principles of ecologically sustainable development.
- In accordance with best practice.
- By the application of best available technology economically achievable (BATEA).

Moolarben Coal Mines commits, to the extent practicable and as may be required by the Director-General, to apply for and obtain further approvals (single or integrated), licences and/or authorities as are required for the operation of the MCP as one integrated mining complex.

(2) Environmental Management Strategy

Moolarben Coal Mines commits to develop, implement and maintain an Environmental Management Strategy (EMS) for the operation of the MCP as one mining complex with one EMS.

Moolarben Coal Mines commits that the EMS will:

- Provide an overall environmental management framework to meet the Stage 1 and Stage 2 approval conditions, legislative and regulatory requirements, license conditions, commitments and project-specific objectives and targets.
- Take into account the issues identified by the EA and the experts' reports on which it is based.
- Identify potential harm to the environment before it occurs.
- Enable responses to be carried out which prevent or minimise harm to the environment that may result from the construction, operation and rehabilitation of the MCP.
- Establish the environmental management roles and responsibilities of key personnel.
- Establish procedures to ensure the effective ongoing operation and implementation of the EMS, including the obtaining of relevant approvals and environmental compliance monitoring and reporting procedures.
- Provide a framework for review and continual improvement of the EMS.

The EMS will be developed in consultation with relevant Government agencies and to the satisfaction of the Director-General.

The EMS will incorporate environmental management plans and monitoring programs as required by the Director-General. These may include plans and programs for:

- Noise Monitoring and Management.
- Blast Monitoring and Management.
- Air Quality Monitoring and Management.
- Water Monitoring and Management.
  - Site Water Balance.
  - Erosion and Sediment Control.
  - Surface Water Monitoring.
  - Groundwater Monitoring.
  - Surface and Groundwater Response.
- Aboriginal Heritage Management.
- Heritage Management.
- Subsidence Management.
- Landscape Management
  - Rehabilitation and Offset Management.
  - Creek Rehabilitation.
  - Aquatic Habitat Rehabilitation.
  - Final Void Management.

  - Mine Closure.

- Energy Savings Actions.
- Greenhouse Gas Minimisation.
- Waste Management.

Environmental management plans and monitoring programs committed to for Stage 1 will be extended to cover Stage 2. This will include environmental management plans and monitoring programs developed and implemented for construction, operation and closure.

(3) Contributions by Voluntary Planning Agreement for the MCP

(3.1) Adjustment to the Voluntary Planning Agreement for Stage 1 of the MCP

The introduction of Stage 2 to the MCP will result in changes to the indicated mining schedule contemplated in the Stage 1 Approval. This will affect the timing of payments to be made by MCM to the MWRC under the terms of the existing Stage 1 VPA. The Stage 1 VPA will need to be adjusted to ensure that the intention of the VPA is achieved.

Moolarben Coal Mines commits to amend the existing Stage 1 VPA as follows:

- The 'Monetary Contribution – open cut product coal' of $1,000,000 to be paid in accordance with the Stage 1 VPA by 'Three equal instalments to be paid over a three year period, with the first instalment to be paid within seven days of the first loading of and dispatch of coal produced from the open cut operations from the Project' will be paid on the first loading and dispatch of coal produced from the open cut operations of either Stage 1 or Stage 2 of the MCP.
- The 'Monetary Contribution – underground product coal' of $300,000 to be paid in accordance with the Stage 1 VPA by 'One instalment to be paid within seven days of the first loading and dispatch of coal produced from the underground operations of the Project' will be paid on the first loading and dispatch of coal produced from the open cut operations of either Stage 1 or Stage 2 of the MCP.
- The 'Road Maintenance Contribution – Cope Road and Ulan Road' of $1,000,000 to be paid in accordance with the Stage 1 VPA by 'Three equal instalments to be paid within seven days of the commencement of construction' will be paid within seven days of the commencement of construction of any part of the MCP mine complex. The first instalment was paid to MWRC on 18 February 2009.
- The 'Road Maintenance Contribution – General' of potentially $1,250,000 to be paid in accordance with the Stage 1 VPA by instalments of '$62,500 each year for a period of 20 years with the first instalment to be paid on the first anniversary of the loading and dispatch of coal produced from the operations of the Project' will be paid on the first anniversary of the loading and dispatch of coal produced from the open cut operations of either Stage 1 or Stage 2 of the MCP.
- The 'Community Infrastructure Contribution' of potentially $1,000,000 to be paid in accordance with the Stage 1 VPA by instalments of '$100,000 each year for a period of 10 years with the first instalment to be paid on the first anniversary of the first loading and dispatch of coal produced from the operations of the Project' will be paid on the first anniversary of the loading and dispatch of coal produced from the open cut operations of either Stage 1 or Stage 2 of the MCP.

(3.2) Stage 2 Voluntary Planning Agreement

In addition to the economic benefits described above, MCM commits to provide financial support to the MWRC through the payment of contributions in accordance with a voluntary planning agreement (VPA) for Stage 2 to be made between MCM and MWRC. The VPA for Stage 2 will be in addition to the $4,550,000 being voluntarily contributed to MWRC as part of Stage 1, and will compliment the commitments MCM has with MWRC under its Stage 1 VPA.

Moolarben Coal Mines commits to make additional (to Stage 1) payments to MWRC based on increased output of product coals when Stage 2 is operational. The Stage 2 contributions will comprise staged payments for each 0.5 Mtpa incremental increase above the Stage 1 approved product output (i.e., when the MCP output is greater than 10 Mtpa) up to a total contribution value for Stage 2 of $1,365,000.

Moolarben expects that MWRC will use this money to finance road maintenance, community infrastructure and other needs in the local area and throughout the LGA.

(4) Land Purchase

Moolarben Coal Mines commits to accept an obligation to purchase (if so requested by any affected private landholder under the conditions of the Stage 2 Approval) any land at which noise or air quality limits determined in the Stage 2 Approval trigger such an obligation, due to the operation of the MCP.

(5) Shift Change

Moolarben Coal Mines commits to schedule its major employee shift changes at times outside the hours of 8.15 to 9.00 a.m. and 3.15 to 4.00 p.m. Monday to Friday to seek to reduce overlap of employee traffic and school-related traffic.

(6) Water

Moolarben Coal Mines commits to:

- Compensate or replace (to a similar quality and quantity) waters lost by a private landholder as a consequence of the construction or operation of the MCP.
- Undertake a baseline study (including the accurate surveying of locations) of all groundwater access points identified within the groundwater census.
- Maintain environmental flows in Murragamba Creek and Eastern Creek.

(7) Mine Water Sharing

Moolarben Coal Mines commits to apply its reasonable endeavours to participate in a water-sharing arrangement with Ulan and Wilpinjong coal mines with the objective of:

- Optimising the use of mine water in the most appropriate manner.
- Minimising harm to the environment.
- Optimising the benefits from the existing mining infrastructure and operations.
- Minimising the removal of water from the environment by the mines.
- Minimising the discharge of treated mine waters to the environment.

(8) Employ Local People

Moolarben Coal Mines commits to, wherever practicable and feasible, employ appropriately qualified persons residing within the MWRC area, and provide job opportunities for local and indigenous people.

(9) Traineeships

Moolarben Coal Mines commits to provide traineeships for young persons residing within the MWRC area.

(10) EEC Offset

Moolarben Coal Mines commits to:

- Provide like-for-like off-site offsets for EEC (and EPBC Act CEEC equivalent) actually destroyed in the construction and operation of the MCP at a ratio of 2:1.
- Provide for the long term security of these offsets by offering the land on which they occur to the DECC for inclusion in the National Estate.
- Or if unacceptable as National Estate land addition, providing for the long term security of these offsets by a Voluntary Conservation Agreement (VCA) (or the like) for the duration of the MCP that will secure the implementation of the offset for future protection under the Native Vegetation Act and other like legislation.

(11) Native Vegetation

Moolarben Coal Mines has identified in excess of 1,300 ha of existing native vegetation on company owned land that will not be directly impacted by mining. Moolarben Coal Mines commits to conserve and enhance the lands to offset the clearing of native vegetation for Stage 2.

(12) Mine Subsidence

Moolarben Coal Mines commits, prior to any sub-surface mining that may cause any subsidence, or as may be required by the DPI-MR, to:

- Prepare, to the satisfaction of the DPI-MR, a Property Subsidence Management Plan (PSMP) in accordance with the requirements of the DPI-MR as at the time the PSMP is made.
- Obtain and comply with a Subsidence Management Plan (SMP) for the MCP in accordance with the requirements of the DPI-MR at the time the SMP is made.

(13) Protection of Features

Moolarben Coal Mines commits to design and operate its underground mines (UG1 and UG2) so as to protect the integrity of:

- The Munghorn Gap Nature Reserve.
- Any significant Aboriginal rock art in the area of surface subsidence above UG1 and UG2.

(15) Aboriginal Cultural Heritage

Moolarben Coal Mines commits, for the duration of the MCP, to:

- Provide a keeping place for Aboriginal artefacts.
- Protect Aboriginal cultural heritage sites identified on land adjacent to that part of Murragamba Creek, between OC4 and the Munghorn Gap Nature Reserve, that will not be disturbed by mining.
- Protect Aboriginal cultural heritage sites on those parts of the Red Hills property (Property 14) and Powers property (Property 44) within the Stage 2 Project Area not disturbed by mining.

(16) Murragamba Creek and Eastern Creek

Moolarben Coal Mines commits to realign and reconstruct the mined sections of Murragamba Creek and Eastern Creek to be geomorphologically, hydraulically and ecologically sound, to the satisfaction of the DWE and DPI-Fisheries.

(17) Real Time Monitoring and Management

Moolarben Coal Mines commits to real-time air quality and noise monitoring to proactively manage operations to minimise the dust and noise impacts of the MCP on non mine-owned property.

6.3 Environmental Management and Monitoring Summary

Environmental management and monitoring is described in Section 5 and summarised in **Table 6.1** (environmental management) and **Table 6.2** (monitoring).

Table 6.1 Environmental management summary

Category	Management Measures
Air Quality Section 5.1	• Standard industry dust control measures and use of chemical dust suppressants on trafficked areas, to provide better dust control. • Investigate where the standard controls can be improved. • Development of a series of real-time PM_{10} concentration trigger levels to allow management actions to be taken to avoid exceedence of 24-hour PM_{10} criterion at non-mine owned residences. • Real-time dust monitoring, triggers levels and subsequent management measures. • Develop and implement a spontaneous combustion management plan (SCMP) including the following measures for both surface and underground mining operations: – An adequate number of intake and return roadways to enhance ventilation in the underground workings. – No loose coal will be stored underground. – Minimisation of coal fracturing, to avoid leakage paths and heating sites. – Coal will not be left in stockpiles for longer than two weeks. – Goafs of worked out longwall panels will be unventilated and when the individual panels are completed the walls will be sealed off and the pressure around the seals equalised. – Longwall panels will initially be developed in discrete blocks that allow monitoring by atmosphere analysis.
Greenhouse Gas Section 5.2	• Regular maintenance of plant and equipment. • Monitoring of haul truck payloads to ensure maximum efficiency of haulage is consistently achieved. • Promote the importance of energy efficiency through the use of energy efficient equipment and utilities (e.g. high efficiency lights with photo-sensors and timers) and the efficient use of energy intensive equipment (e.g. ensure pumps are sized correctly for the required throughput). • Monitoring and accounting of fuel use. • Investigate use of hybrid diesel/LNG engines for mining fleet. • Investigate use of biodiesel blends as an alternate fuel. • Promotion of car pooling among mine employees. • Investigate installation of heat pump hot water systems instead of standard electric hot water systems. • Investigate installation of heat pump air conditioning systems boosted by gas heaters instead of standard electric heaters. • Investigate use of LED lighting.

Table 6.1 Environmental management summary (cont'd)

Category	Management Measures
Noise and Blasting Section 5.3	• Supply contracts for plant and equipment will include sound power levels as specified by the Noise consultant in its Noise Impact Assessment. • Upgraded mufflers on excavators to reduce exhaust noise tones below 500 Hz, and on haul trucks to reduce noise emissions in both uphill and downhill travel. • Construction of low gradient haul roads, where feasible. • Broadband reverse alarms on all mobile plant items. • Avoid night time operational activities in exposed areas that are close to residences. • Blast only under favourable meteorological conditions, where practicable. • All blasts will be undertaken during designated blasting times (currently 9:00 to 17:00 Monday to Saturday as approved for Stage 1). • A 500-m exclusion zone will be established around blast events and blasting will be designed to ensure that fly rock is controlled within this zone. • Maintain equipment and machinery. • Maintain haul roads free of pot-holes or unnecessarily rough areas to reduce haulage related noise. • Provide awareness and understanding of construction noise issues through site inductions for all staff, contractors and visitors to MCP including the promotion of noise reducing universal work practices. • If noise criteria are exceeded, MCM will notify the land owner and offer mitigation measures (e.g. air conditioning, insulation or double glazing of windows). • If exceedance >5 dB(A), MCM will notify the land owner and report it to the DoP and the DECC, and the land owner will have the right to request MCM acquire their property. • Reduce or avoid the use of stereos outdoors, avoid the slamming of vehicle doors and avoid shouting/yelling, unless required for safety. • Avoid dropping materials from a height. • Contractors and operators of equipment and machinery will consider: – Reducing throttle settings and turning off equipment when not in use. – Avoiding metal to metal contact on equipment. – The use of quieter equipment (e.g. rubber wheeled tractors instead of steel tracked tractors). – Sound-power level measurement of plant and equipment prior to working on site. • Ensure design and construction of infrastructure employs appropriate noise suppression methods. • Mine personnel to evaluate environmental risks and measures and inform site managers.

Table 6.1 Environmental management summary (cont'd)

Category	Management Measures
Groundwater Section 5.4	• Develop groundwater trigger values for water level and quality, which will be used to initiate a management response in case of impacts. • Annually review of monitoring data by an experienced hydrogeologist. • Periodic recalibration and re-running of groundwater model to update model impact predictions. • Undertake Regional Water Supply and Monitoring Investigation in consultation with DECC, DWE, DPI and Ulan and Wilpinjong coal mines.
Surface Water Section 5.5	• Divert clean surface water runoff around the site to maintain environmental flows. This may require temporary storage. • Use groundwater inflows to open cut mining areas for mine water supply. • Capture runoff from disturbed or operational areas, store in sedimentation ponds and use for dust suppression and for the irrigation of rehabilitated areas. • Maximise re-use of mine water. • Water sharing with neighbouring coal mines, where possible. • If there is surplus dirty water, treat and discharge to meet EPL conditions. • Develop and implement a detailed Creek and Aquatic Habitat Rehabilitation Plan for Murragamba and Eastern creeks, including completion criteria for the rehabilitated and realigned creeks. • Supplement environmental flows to Wilpinjong Creek from the Splitters Hollow Dam, where required. • Erosion and sediment control measures during construction, including: – Construct and regularly maintain catch drains, silt fences and sedimentation ponds downslope of all construction activities and disturbance– areas. – Revegetate disturbed areas as soon as practicable. • Establish oil collection and separation systems downslope of high trafficked hardstand and storage areas (although not an erosion and sediment control measure this will avoid contamination of off-site surface runoff from these areas). • Develop and implement a sediment and erosion control program that includes frequent inspection and repair and maintenance of control structures. • Clearly identify and delineate areas to be disturbed to minimise erosion. • Only clear areas to permit the progress of mining. • Minimise the number of roads and tracks constructed. • Construct catch drains, silt fences and sedimentation ponds to capture and contain runoff from disturbed areas.

Table 6.1 Environmental management summary (cont'd)

Category	Management Measures
Surface Water Section 5.5 (cont'd)	• Construct road, cut and fill and other earthworks batters with a gentle slope to maximise long term slope stability. • Reshape, apply topsoil and vegetate road, cut and fill and other earthworks batters as soon as practicable. • Vegetate earthen bunds. • Reshape, rehabilitate and revegetate disturbed areas as soon as practicable. • Surface water contingency measures include: – Provision of flocculation equipment on sedimentation ponds to improve the rate of sedimentation. – Augmenting the sedimentation ponds to create greater retention volume and residence time to increase the potential for suspended sediment to settle. – Increasing pumping capacity at each sedimentation pond to minimise the potential for sediment laden discharges. • Regular inspection and maintenance of sediment ponds and control structures to maintain suitable integrity and adequate freeboard. • Use captured and stored dirty water for irrigating rehabilitated areas immediately surrounding the structures to improve stability and erosion control. • Use the conceptual water balance to monitor the performance of on-site water management, and to inform upgrades or changes to water storages and other water management provisions that may be occasionally required at the site.
Ecology Section 5.7	• Avoid ecologically important areas where possible. • Establish, restore and reinstate functional aquatic (creek), terrestrial and riparian corridors. • Increase the net native vegetation cover within the locality, both temporarily and permanently. • Enhance the ecological values of remnant aquatic ecological resources and of native vegetation cover and associated habitats. • Conserve fauna habitats through managed salvage and compensatory works. • Establish and enhance wildlife connectivity between conservation reserves and adjoining unreserved native vegetation cover. • Incorporate specific rehabilitation techniques for use in an integrated rehabilitation strategy designed to restore key ecological function. • Offset areas of significant ecological values. • Ensure that the development is consistent with the DECC's Guidelines on developments adjoining DECC land. • Integrate important ecological values to 'seed' the future restoration works including revegetation and rehabilitation initiatives. • Develop and implement a rehabilitation and offset management plan which aims to revegetate all cleared lands owned by MCM and to improve local biodiversity values.

Table 6.1 Environmental management summary (cont'd)

Category	Management Measures
Ecology Section 5.7 (cont'd)	• Establish habitat corridors of sufficient width and ecological condition between Munghorn Gap Nature Reserve and Goulburn River National Park to facilitate regional movements of fauna. • Re-establish ecological function conducive to the development of Box Gum Woodland species in the rehabilitated open cut mining area. • Maintain at least a 20 m buffer between any open cut mining operations or infrastructure and the adjacent Munghorn Gap Nature Reserve. • UG2 will not encroach within 140 m of the nature reserve, and a barrier of unmined coal will be maintained to minimize the risk of subsidence related impacts on the Munghorn Gap Nature Reserve. • Undertake progressive creek diversion and restoration works to maintain and embellish creek aquatic and riparian ecological function and connectivity. • Undertake progressive terrestrial and aquatic fauna habitat salvage works in the directly impacted areas and restoration works throughout retained landscapes. • Manage fauna populations during mining and in the reinstated post-mining landscape to maintain the balance between common and sensitive species. • Take all necessary steps to prevent, control and eradicate listed environmental and noxious weeds from the Stage 2 Project Area.
Subsidence Section 5.8	• If significant unpredicted loss of surface water flow occurs, identified cracking in drainage lines will be remediated by infilling the surface cracks with materials comprising a high clay content, or by locally regrading and recompacting the surface. • Restrict access to any cliff and surrounds if the cliff becomes unstable. • If unpredicted significant surface cracking occurs on steep slopes, remediated by infilling with soil or other suitable materials or by locally regrading and compacting the surface. • Prepare a management plan for the Gulgong-Sandy Hollow rail line in consultation with the ARTC, if required, to maintain the rail line in a safe and serviceable condition. • Prepare a management plan for Carrs Gap Road in consultation with MWRC, if required, to maintain the road in a safe and serviceable condition. • Prepare a monitoring, management and response plan to the satisfaction of the owners of the cable for the optical fibre cable prior to mining Longwalls 1 to 5. • Develop plans for the safe placement of spoil on the steep slopes which are above longwalls.

Table 6.1 Environmental management summary (cont'd)

Category	Management Measures
Subsidence Section 5.8 (cont'd)	• Develop plans to maintain stability of the highwalls during the underground mining period. • If any stones from the dry stone wall on the old Wollar Road become dislodged during mining, they will be replaced in the correct positions following the completion of mining. • Protect overhang site at Cliff C7 by leaving a block of unmined coal below the site. • Care will be taken during any ground surface remediation to avoid disturbance of any of the archaeological sites. • Provision of expert subsidence advice to the Aboriginal community via a presentation by MCM to discuss the Stage 2 subsidence assessment. • Re-establish survey control marks following the completion of mining, as required.
Aboriginal Heritage Section 5.9	• Salvage and recording of Aboriginal heritage sites. • Conserve and preserve Aboriginal heritage sites outside the likely area of disturbance. • Undertake archaeological salvage and test excavations including a suitable lithic analysis of all material collected as part of the salvage operations. • Surface collection of Aboriginal objects. • Identify, manage and monitor Aboriginal rock art sites. • Monitor earthworks in locations with the potential for Aboriginal burials. • Intensive in situ recording. • Ongoing monitoring and assessment of subsidence impacts including protection, analysis and recording of sites at risk of subsidence. • Controlled gridded surface collection of isolated archaeological finds and low density artefact scatters (133 sites in total). • Test excavation and salvage of 34 sites within the cleared valley floor areas within the OC4 footprint. • Intensive surface recording including fine scale mapping and photography for six sites. • Leave a block of coal beneath the rock art site (36-3-0134 / S2MC 236) between the longwalls (see Section 5.8), and ensure that blasting associated with open cut mining operations does not exceed the ground vibration criteria of 40 mm/s at this site. Start ground vibration levels monitoring when mining is within 400 m of the rock shelter. • Items above UG1 and UG2 that require protection from potential rock falls (i.e. sites within overhangs, near cliffs or steep rock faces) will be either removed from the overhangs or protected by minimising the risk of rock fall from the overhang. • Provide a Keeping Place for the purpose of housing and curating all salvaged Aboriginal objects and archaeological material during the life of the MCP.

Table 6.1 Environmental management summary (cont'd)

Category	Management Measures
Aboriginal Heritage Section 5.9 (cont'd)	• Prepare and implement an Aboriginal Heritage Management Plan, including the following: – A program to assess and record local Aboriginal heritage values of the area. – Contingency measures to ensure the recording, protection and mitigation of significant Aboriginal objects of a unexpected nature not expected, including any Aboriginal skeletal remains. – Procedures for the ongoing consultation and involvement of the Aboriginal community in the conservation and management of Aboriginal heritage within the Stage 2 Project Area. – Procedures to notify the DECC of all currently known and future Aboriginal sites discovered, removed or salvaged during the operational life of Stage 2. – Procedures for the full reporting of mitigation actions for all identified Aboriginal objects, and the involvement of the Aboriginal community with regards to these mitigation actions. – All necessary applications for care and control of Aboriginal objects to the community will be made where such care and control is sought by the Aboriginal community. • MCM will set aside two areas within Properties 14 and 44 not affected by mining for the conservation of Aboriginal heritage for the duration of Stage 2. • Where possible archaeological sites on other MCM-owned land outside the Stage 1 and Stage 2 disturbance footprints will be conserved as these areas will not be disturbed by MCM construction or mining activities.
Non-Aboriginal Heritage Section 5.10	• Heritage sites within the Stage 2 Project Area that will not be disturbed by construction or mining activities and are in locations that may be visited by mine employees will be fenced off to prevent accidental damage, for the duration of the MCP. • Heritage sites within the Stage 2 Project Area that will not be directly impacted or disturbed by construction or mining activities, but are still subject to deterioration, will be considered for archival recording, in accordance with NSW Heritage Office standards. • Heritage sites within the Stage 2 Project Area that will be directly impacted or disturbed by construction or mining activities, will be considered for archival recording, in accordance with NSW Heritage Office standards and in consultation with MWRC, the Mudgee Historical Society or a professional archaeologist, where required.

Table 6.1 Environmental management summary (cont'd)

Category	Management Measures
Soils Section 5.11	• Develop a soil management strategy for Stage 2. • Identity and quantify topsoil and subsoil resources. • Strip and stockpile topsoil and subsoil in accordance with government and industry best practice guidelines. • Manage topsoil and subsoil to preserve the health and viability of the stockpiled resource for future rehabilitation work. • Implement the following measures to prevent or arrest land degradation from occurring: – Monitor and report occurrences of soil erosion and landform irregularities. – Minimise area of disturbance. – Prepare an erosion and sediment control plan in accordance with the requirements of Managing Urban Stormwater: Soils and Construction (Landcom, 2004) for all open cut mining and infrastructure disturbance areas. – Design erosion control and drainage works in accordance with Urban and Sediment Control Guidelines (DLWC, 1992). – Where underground mining activities cause surface irregularities, implement appropriate soil conservation measures immediately. – Temporary revegetation of degraded land areas proposed for mining in future years, and progressive rehabilitation of all disturbed areas, using appropriate local species. – Construct all access roads and haul roads with appropriate pavement surfaces and storm water drainage systems. – Segregate potentially contaminating activities (e.g. refuelling of equipment and vehicles, and storage of chemicals) from areas containing stockpiled soils and soils with the potential for rehabilitation. – Store potential contaminants in appropriate containers over hard surfaces. – Locate spill kits near potentially contaminative activities and staff trained as how to manage spills and leaks. • Implement the following soil salinity management measures: – Where practicable, strip and stockpile saline soil types separately over an aggregated substrate to allow leaching of salt. – Select species for rehabilitation purposes that are tolerant of saline environments as well as water logged environments, which usually associated with salinity occurrence. – Minimise application of saline water for irrigation or dust suppression. • Implement the following soil health management measures: – Apply appropriate soil ameliorants (e.g. superfine lime and gypsum) and fertiliser.

Table 6.1 Environmental management summary (cont'd)

Category	Management Measures
Soils Section 5.11 (cont'd)	– Establish a cover crop for soil protection purposes and improvement in organic matter levels, such as native grasses. – Use imported organic materials such as biosolids. • Implement the following measures for long-term viability of soil resources: – Locate soil stockpiles outside proposed mining areas. – Keep vehicular traffic to a minimum on the soils to be stripped. Prevent traffic from going over soils that are sensitive to structural degradation, wherever possible. – Use loaders and trucks rather than scrapers to minimise structural degradation. – Construct stockpiles with a 'rough' surface condition to reduce erosion hazard, improve drainage and promote revegetation. – Where practicable, soil stockpiles will be no more than 60 cm high to maintain the soil microflora and macroflora biology. However, where site constraints do not permit this, stockpiles will be no higher or deeper than 3 m to avoid the development of anaerobic conditions. – Fertilise and seed stockpiles which are to be inactive for extended periods to maintain soil structure, organic matter content and microbial activity. – Install silt fences around stockpiles to prevent loss of stockpiled soil through erosion prior to vegetative stabilisation. – Deep-rip stockpiles prior to the reapplication of stockpiled soil for rehabilitation to establish aerobic conditions. – Apply soil ameliorants at the required rate to dispersive soil stockpiles where necessary. – Implement weed control strategies, particularly for noxious weeds.
Transport Section 5.12	• Maintain access along all public roads will be at all times, with the exception of the local farm roads proposed to be closed. • Construct detours around the worksite where temporary road closures are required. Where it is not possible to provide a two-way detour, portable traffic signals will be used to regulate traffic flow. • Heavy vehicle movements, and in particular over-sized loads, will be arranged so as to minimise disruption to traffic during, before, and after school periods. • Development and implement a traffic management plan (including for over-sized vehicles entering and exiting the Stage 2 Project Area during construction). • Clear vegetation to the west of the proposed access point on Ulan-Wollar Road to improve visibility. • Apply to MWRC to reduce the speed limit on Ulan-Wollar Road in the vicinity of the proposed access point to 70 km/hour.

Table 6.1 Environmental management summary (cont'd)

Category	Management Measures
Transport Section 5.12 (cont'd)	• Construct bunds to reduce the impact of headlight glare from mine vehicles on passing motorists on Ulan-Wollar Road. • Early morning and evening shift changes will be outside school bus service times, and where feasible will be offset from existing Ulan and Wilpinjong mine shift changes over time to minimise peak traffic loads on the road network. • Delivery of fuel, stores and explosives will be outside of school bus service hours and peak traffic times, where possible. • MCM will work with MRWC and Ulan and Wilpinjong coal mines to generally improve road safety and traffic management on the local road network.
Visual Section 5.13	• Replace the existing native vegetation that will be removed as part of the mining process, as well as other cleared and degraded areas within MCM owned land. • Retain existing vegetation around the new infrastructure areas and on road fringes of OC4 where possible. • Bunding and planting along the edge of Ulan-Wollar Road where it abuts OC4. • Install light columns and low brightness floodlights at a height of less than 15 m within the infrastructure areas. • Use of horizontal wall mounted lights with low brightness to light areas around the workshop to 50 lux, and adjacent hardstand areas to 10 lux. • Shield floodlights in the open cut area to the maximum extent practicable. • Screen lighting will from offsite viewers where possible while maintaining working practices.
Social and Economic Section 5.14	• Employ workers in the local area, wherever possible. • Implement an unbiased employment program which includes job and training opportunities that: – Encourages women to become part of the Stage 2 workforce, similar to other mine sites operated and managed by FRL. – Encourages Indigenous Australians to become part of the Stage 2 workforce. • Support local businesses through the sourcing and use of materials, equipment and services from the local area, wherever possible. • Provide information, guidance and support for workers relocating from other areas in relation to finding accommodation and essential services.
Hazards and Risks Section 5.15	• Include potential incidents listed in the Hazard Analysis in the site emergency response plan, along with other incidents identified to have on-site impact to mine equipment and personnel. • Include hazards in the drill exercises, conducted during regular emergency response drills, to ensure the readiness of the Mine Rescue Team. • Fit all on-site vehicles with at least one dry powder type extinguisher. Larger vehicles will carry at least one 9 kg dry powder extinguisher and smaller vehicles at least one 4.5 kg dry powder extinguisher. • Develop and implement an integrated bush fire management strategy.

Table 6.1 Environmental management summary (cont'd)

Category	Management Measures
Hazards and Risks Section 5.15 (cont'd)	• Carry out the transportation, handling, storage and management of all hazardous materials used on-site in accordance with the relevant legislation, guidelines and standards. • If any potentially contaminated areas on Stage 2 land are found, these will be assessed and appropriate management measures implemented.
Waste Section 5.16	• All personnel working on-site will attend compulsory induction program. • An ongoing monitoring program will occur through the use of weekly waste assessments and feedback to personnel. • Keep the mine site free of litter. • No long-term storage of any waste materials. • A waste register and documentation register will be maintained. • Bins will be placed in all office and workshop areas. • Waste types will be segregated with clear instructions provided for personnel. • All non-toxic waste will be securely stored in appropriate receptacles and removed from site and disposed of by licensed contractors. • Recyclable materials will be collected by a licensed waste contractor and disposed of at a licensed recycling facility. • Any hazardous waste will be stored in an environmentally safe manner and not come into contact with any incompatible waste. • Waste hydrocarbons will be placed in suitable containers and remove from the mine site for disposal at either an EPA-approved hydrocarbon waste site or a recycling depot. • Runoff water from mobile equipment service areas will be directed to an interceptor trap. • Dispose of all sewage in accordance with NSW Department Health and the DECC requirements and guidelines for on-site sewage disposal. • Geochemically characterise overburden to determine the occurrence of PAF prior to mining. • Undertake further leach column tests for Stage 2 PAF materials to determine the amount requiring specific management, with the mining schedule updated accordingly. • Blend PAF material with NAF or PAF-LC to form a composite that is NAF. • Manage any overburden that remains PAF after blending to ensure that ARD does not occur following closure. • Test rejects and tailing to determine whether it is PAF. • Treat any acidic water generated and requiring discharge from site to ensure that it meets the discharge limits (pH 6.5 to 8.5). • Treat materials with sodic and dispersion potential as required with gypsum or lime if exposed on dump surfaces or will be placed in engineered structures.

Table 6.1 Environmental management summary (cont'd)

Category	Management Measures
Rehabilitation Section 5.18	• Undertake progressive mine rehabilitation works that integrate key environmental gradients supportive of baseline ecological function to embellish and link retained vegetated and revegetated landscapes. • Undertake progressive creek diversion and restoration works to maintain and embellish creek aquatic and riparian ecological function and connectivity. • Integrate important ecological values to 'seed' the future restoration works including revegetation and rehabilitation initiatives. • Establish off-site conservation outcomes for non-threatened native vegetation communities and EECs/ CEECs lost due to direct impacts. • Develop and implement a rehabilitation and offset management plan which aims to revegetate all cleared lands owned by MCM, improve local biodiversity values and restore key ecological function. • Rehabilitation methods will include: – Depletion of nitrogen in topsoils through the revegetation and management of cleared lands prior to mining with perennial native grasses. – Use of salvaged habitat. – Control of Sifton Bush prior to topsoil recovery, to reduce dominance in rehabilitated landscapes. – Exclusion of frequent fires in the landscape to reduce stimulation of opportunistic exotic perennials. – Integration of sediment ponds to form 'chain of ponds' features in the final landform to increase water availability. – Employment of permanent revegetation activities, which will include seeding cleared areas, and introducing clumped tree and shrub plantings to enhance the landscape and ecological values. – Employment of temporary revegetation activities prior to mining to rehabilitate existing cleared, disturbed and degraded areas. – Rehabilitation of grassy woodland patches and linked where possible with the 'chain of ponds' structures. – Rehabilitation of shrubby woodlands to connect grassy woodland patches. – Rehabilitation of open woodland/ shrubland/ grassland mosaic throughout the remainder of the landscape. • Develop a monitoring program to determine early rehabilitation success, to determine the need for any remedial actions and assess whether the rehabilitation efforts will meet the long-term post-closure land use objectives.

Table 6.2 Environmental monitoring summary

Category	Parameters/ Actions	Location	Frequency
Air Quality	Real-time air quality monitoring: dust deposition.	Properties 52, 16, 2, 46, 31, 36, 29A, 37. Spring Street (Ulan Village).	Monthly.
	Real-time air quality monitoring: PM_{10} (TEOM).	Property 6. Ulan Public School.	Continuous.
	Real-time air quality monitoring: PM_{10} (high volume air sampler).	Spring Street (Ulan Village).	Every 6 days.
Noise and Blasting	Real-time noise monitoring. (Noise Monitor 1 (NL1)).	R160A Ulan Public School.	Continuous.
	Mobile noise monitoring (Mobile noise monitor).	R26 (Ulan Road). R169 (Cope Road).	Selected periods during mining of OC1.
		R22 (Ulan Road). R23 (Ulan Road) or R41A (Ulan Road).	Selected periods during mining of OC2.
		R30 (Moolarben Road). R35 (Moolarben Road). R47 (Mayberry Road).	Selected periods during mining of OC3.
	Attended noise monitoring to determine compliance with noise criteria. (Attended noise monitor).	R160A Ulan Primary School (external).	Quarterly or as required.
		R26 (Ulan Road). R169 (Cope Road) and others predicted to be 1-2 dB(A) below noise criteria.	Selected periods during mining in OC1 and OC2.
		R22 (Ulan Road), R23 (Ulan Road) or R41A (Ulan Road).	Selected periods during mining of OC2.

Table 6.2 Environmental monitoring summary (cont'd)

Category	Parameters/ Actions	Location	Frequency
Noise and Blasting (cont'd)		Representative site for Ridge Road residences nearest to MCP (e.g., R63, R70, or R172).	Selected periods during mining of OC2.
		R30 (Moolarben Road). R35 (Moolarben Road). R47 (Mayberry Road).	Selected periods during mining of OC3.
		R138 (Wollar Road).	Selected periods during mining of OC4.
		Nearest non-mine related residences to Cope and Ulan roads.	Selected periods during construction and mining.
	Background noise control monitoring. (Continuous noise logger).	In vicinity of furthest Ridge Road residence to the MCP.	Continuous.
	Ground vibration monitoring.	Aboriginal rock art shelter above UG2 Ulan-Wollar Road Gulgong-Sandy Hollow rail line The 330-kV transmission line	Prior to blasting in OC4 if within 500 m of these features.
Groundwater	Determine baseline conditions (water quality, level and flow).	All groundwater access points identified in the groundwater census.	Prior to mining.
	Groundwater level.	Dewatering, water supply and monitoring bores.	Monthly or continuous from automated loggers.
	Volume of pumped groundwater.	Dewatering and water supply bores.	Ongoing.
	Groundwater quality.	Dewatering and water supply bores.	Quarterly
	Groundwater quality.	Selected monitoring bores.	Annual

Table 6.2 Environmental monitoring summary (cont'd)

Category	Parameters/ Actions	Location	Frequency
Surface Water	Flow.	Gauging stations at the downstream end of Murragamba and Eastern Creeks.	Weekly during periods of low flow.
	pH, turbidity, EC/salinity and total suspended solids.	Stage 1 monitoring sites and: • In the downstream reaches of Murragamba Creek and Eastern Creek before discharging into Wilpinjong Creek. • Downstream of Splitters Hollow Dam before its confluence with Wilpinjong Creek. • A site located on Wilpinjong Creek as the creek flows out of the Stage 2 (and EL 6288) Area. • A site located on Wilpinjong creek upstream of its confluence with Murragamba Creek. • A site located on Wilpinjong Creek upstream of its confluence with Eastern Creek. • A site located on Bora Creek upstream of mine infrastructure areas (monitoring site SW10).	During representative flow events.
	Water quality.	All major water storages and sedimentation ponds.	After significant rainfall (i.e., greater than 20 mm rain in 24 hours).
	Visual inspection for integrity.	All major water storages and sedimentation ponds.	After significant rainfall.
	Water level.	Stage 2 water storages.	At least quarterly and after significant rainfall.
Subsidence	Visual monitoring of subsidence.	Drainage lines.	As the longwalls mine beneath the drainage lines.
		Vegetation communities	As the longwalls mine beneath the vegetation communities.

Table 6.2 Environmental monitoring summary (cont'd)

Category	Parameters/ Actions	Location	Frequency
Subsidence (cont'd)		Cliffs, overhangs, rock ledges and steep slopes, including archaeological and heritage sites.	During mining, until mine subsidence movements have ceased.
	Ground survey for movement.	Cliffs C7 to C10.	During mining, until mine subsidence movements have ceased.
		Rail line.	During extraction of Longwalls 1 to 5.
	Subsidence monitoring using optical fibre sensing techniques, such as optical time domain reflector monitoring.	Powerlines and communication cables.	During the extraction of Longwalls 1 to 5.
	Settlement monitoring, e.g. survey of reflectors placed on the out of pit emplacement or aerial laser scan techniques.	Out of pit emplacements.	As longwalls mine beneath out-of-pit emplacements.
	Movement of highwalls using visual inspection and survey lines established along the top and bottom of the highwalls.	Highwalls	As longwalls are mined.
	Photographic record of the condition of the dry stone wall.	Dry stone wall.	Prior to and followiing Longwalls 6 and 7.
Aboriginal Heritage	Visual inspection during earthworks.	Locations with the potential for Aboriginal burials.	As required during earthworks.
Soils	Soil erosion.	All mining areas.	Continuous.
Waste	pH, EC and acidity/alkalinity. Sulfate. Metals: aluminum, arsenic, cobalt, copper, iron, manganese, nickel and zinc.	Open cuts, underground operations, coal stockpiles and overburden emplacements.	Quarterly.
	Waste assessment.	All areas.	Weekly

Table 6.2 Environmental monitoring summary (cont'd)

Category	Parameters/ Actions	Location	Frequency
Rehabilitation	Monitoring will include: • Runoff water quality. • Surface and slope stability. • Effectiveness of erosion and sediment control measures. • Soil and root zone properties. • Structural attributes of plant communities. • Composition of plant communities. • Comparison of revegetated and rehabilitated sites with control sites. • Abundance of fauna. • Presence of weeds and pest species. • Indicators of ecosystem functioning.	Rehabilitated areas.	Ongoing during rehabilitation activities.

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