



Modification 16 Northern Tailings Storage Facility Buttress Optimisation

Attachment E
Approved Mitigation Measures



Cadia Holdings Pty Ltd (CHPL) is the owner and operator of Cadia Valley Operations (herein referred to as Cadia). CHPL is committed to minimising the environmental and community impacts of its activities and has implemented a comprehensive environmental management system to support this commitment. The components of the environmental management system include:

- The Environmental Management Strategy, which outlines the strategic framework for managing environmental performance at Cadia.
- Specific and separate environmental management plans which provide details on the management of environmental aspects and impacts (including environmental obligations and performance targets).
- Site document control system including work procedures, training records, monitoring results, stakeholder engagement register, community complaints, environmental forms, inspection and audit reports.

The environmental management system would continue to apply to Cadia, incorporating Modification 16 (the Modification).

Table E-1 outlines the environmental management plans and strategies required by Project Approval 06_0295, whilst Table E-2 provides a summary of approved mitigation measures.

Table E-1
Environmental Management Plans and Strategies Required by Project Approval 06_0295

Environmental Management Plan	Consultation	Approval
Noise Management Plan / Noise Monitoring Program	EPA	DPHI
Blast Monitoring Program	EPA	DPHI
Air Quality and Greenhouse Gas Management Plan	EPA and CCC	DPHI
Water Management Plan	DCCEEW Water and EPA	DPHI
Biodiversity Management Plan	BCS (now referred to as CPHR)	DPHI
Rehabilitation Strategy	Resources Regulator, NSW Resources, BCS (now referred to as CPHR), DCCEEW Water, Councils and the CCC	DPHI
Aboriginal Cultural Heritage Management Plan	Heritage NSW	DPHI
Historical Heritage Management Plan	Heritage NSW	DPHI
Traffic Management Plan	TfNSW and Councils	DPHI
Environmental Management Strategy	-	DPHI

DPHI = NSW Department of Planning, Housing and Infrastructure.

EPA = NSW Environment Protection Authority.

CCC = Community Consultative Committee.

DCCEEW Water = Department of Climate Change, Energy, the Environment and Water – Water Group.

BCS = Biodiversity, Conservation and Science Directorate.

CPHR = Conservation Programs, Heritage and Regulation.

TfNSW = Transport for NSW.

Table E-2
Summary of Approved Mitigation Measures

Aspect	Mitigation Measures
Surface Water	<p>Cadia’s surface water management plan details all aspects of the water management system at Cadia, including a comprehensive monitoring network. Erosion control strategies include:</p> <ul style="list-style-type: none"> • soil erosion and sediment generation from areas disturbed by mining and construction activities be controlled; and • water quality (particularly in terms of total suspended solids content) in local watercourses be maintained to permitted standards. <p>The Water Management Plan is progressively updated, for example, as the tailings storage facility (TSF) embankment extensions progress and water storage/transfer dams are relocated/enlarged, monitoring of some sites may cease or the site would be relocated.</p> <p>The catchment area of water storage/transfer dams are reviewed periodically to check that the capacity of the water storage/transfer dams is sufficient.</p> <p>No changes to these mitigation measures are required for the Modification.</p>
Groundwater	<p>The groundwater monitoring program at Cadia is extensive. The Water Management Plan also includes a Surface and Groundwater Contingency Plan, including Trigger Action Response Plans (TARPs) that would be invoked should monitoring show any unexpected impact is occurring.</p> <p>Seepage controls at the Cadia TSFs include:</p> <ul style="list-style-type: none"> • General sub-excavation within storage areas to remove topsoil and, if required, any loose or weak soils which may allow shallow, lateral migration of tailings water beneath the storage embankment. • Construction of a low permeability clay core embankment and foundation cut-off key beneath the embankment. • Placement of reworked in-situ clay blanketing in selective areas of the storage floor, where and if required. • Deposition of the tailings into the storages in a manner that maximises storage densities and reduces tailings permeability. <p>CHPL is installing a suite of measures (e.g. membrane, grout curtain, monitoring and extraction bores) to mitigate the potential connection between the Cadia Hill Open Pit TSF and Cadiangullong Creek which allows the storage of unconsolidated tailings above 694 m Australian Height Datum.</p> <p>The groundwater monitoring network is progressively updated, for example, as the TSF embankment extensions progress and water storage/transfer dams are relocated/enlarged, monitoring of some sites may cease or the site would be relocated.</p> <p>No changes to these mitigation measures are required for the Modification.</p>
Bushfire	<p>Cadia has developed and implements a bushfire fuel management plan for the operational mining (mining lease) areas. The aim of the plan is to manage fuel loads within operational areas to prevent catastrophic bushfire events. Actions include knockdown spraying, hazard reduction burns (usually conducted during training exercises), maintenance of large fuel free areas and rapid response capabilities.</p> <p>Bushfire fuel management plans have also been developed for Cadia’s Conservation Offset Areas and farming land.</p> <p>No changes to these mitigation measures are required for the Modification.</p>

Table E-2 (Continued)
Summary of Approved Mitigation Measures

Aspect	Mitigation Measures
Biodiversity	<p>CHPL has developed and implemented a comprehensive Biodiversity Management Plan to provide measures to minimise impacts on flora and fauna and their habitats. Existing measures to avoid, mitigate and manage impacts on biodiversity, as outlined in the Cadia Biodiversity Management Plan include:</p> <ul style="list-style-type: none"> • native vegetation immediately adjoining proposed clearance areas is clearly marked to avoid accidental damage during vegetation clearance activities; • vegetation removal is conducted in accordance with the Cadia Vegetation Clearance process; • management strategies for threatened species identified during surveys prior to disturbance, during construction and throughout operation, including measures such as: <ul style="list-style-type: none"> ○ capture and relocation of fauna; ○ physical disturbance to encourage fauna to move to a new location; ○ alternative felling methods; and ○ relocation of logs and felled trees to adjacent habitat to minimise indirect impacts; • weed control measures; and • animal pest control measures (including destruction of the pest and/or removal of harbour/habitat where possible). <p>CHPL is committed to satisfying the biodiversity credit requirements using offset mechanisms allowed by the NSW Biodiversity Offsets Scheme:</p> <ul style="list-style-type: none"> • contribution to the Biodiversity Trust Fund administered by the NSW Biodiversity Conservation Trust; • purchase of existing credits on the market; • the funding of a biodiversity conservation action; • retirement of biodiversity credits; and/or • mine site ecological rehabilitation. <p>No changes to these mitigation measures are required for the Modification.</p>
Noise	<p>CHPL implements existing noise management and monitoring measures described in the Noise Management Plan to minimise noise emissions and comply with relevant noise criteria.</p> <p>CHPL would implement a real time meteorological monitoring system which would work in conjunction with a Trigger Action Response Plan (TARP) to achieve noise compliance through reducing the construction fleet or other site operations.</p> <p>Noise-enhancing meteorological conditions would be identified by a combination of noise and meteorological monitoring and forecasting.</p> <p>If the real-time monitoring and meteorological forecasting system predicts elevated noise levels at receivers, CHPL operators would refer to the TARP which may require temporary alterations and/or shutdowns, for example alteration to the location (i.e. elevation) and/or shutdowns of a specific dozer, temporarily undertaking activities in locations which provide more topographic shielding from receiver locations, alterations to dumping and haulage operations associated with the TSF construction activities to minimise noise impacts.</p> <p>No changes to these mitigation measures are required for the Modification.</p>
Traffic / Road Transport	<p>Cadia has an Offsite Traffic Management Plan (OTMP) which has been prepared for construction and operational activities associated with Cadia. The OTMP was developed in consultation with Orange City Council, Blayney Shire Council, Cabonne Shire Council and TfNSW and includes details on the following:</p> <ul style="list-style-type: none"> • Cadia heavy vehicle designated transport routes – including avoidance of high-traffic local roads. • Traffic monitoring program – including adherence to speed limits and travel routes. • Driver conduct – including measures for fatigue management and driver behaviour. <p>No changes to these mitigation measures are required for the Modification.</p>

Table E-2 (Continued)
Summary of Approved Mitigation Measures

Aspect	Mitigation Measures
Blasting and Vibration	<p>Blasting management measures for the existing Cadia are described in the Blast Monitoring Program. The Blast Monitoring Program includes the management measures listed below:</p> <ul style="list-style-type: none"> • Vibration and airblast overpressure are monitored, as per the Blast Monitoring Program, to avoid any blasting, vibration or seismic activity exceedances. • To avoid the risk of blasting, vibration or seismic impacts for the community or private property, Cadia records and responds to community complaints as per establishment procedures and inspection and investigation of private property are undertaken as per established processes. • Should any mining induced seismic activity result in damage to public infrastructure, Cadia would manage this by documenting any concerns raised by infrastructure owners on damage from blasting as per established processes and evaluating vibration and airblast overpressure data results against the structural design limits relevant to the specific infrastructure. <p>No changes to these mitigation measures are required for the Modification.</p>
Air Quality	<p>The Air Quality and Greenhouse Gas Management Plan (AQGHGMP) includes air quality monitoring requirements, complaints handling procedures, management measures and stakeholder consultation requirements. Management measures to minimise the generation of wind blown and mine generated dust include, but are not necessarily limited to:</p> <ul style="list-style-type: none"> • Progressive reshaping, revegetation and rehabilitation of exposed land. • Water carts are available to apply water to unsealed roads and haul roads, using both boom sprays and cannons as appropriate for the area. Water cart filling stations with adequate water quantities and pumping facilities are established and maintained. • Where installed, water sprays, dust extraction and suppression systems are operational on all conveyor tips and transfer points. • Dust emission reduction strategies are used on an ongoing basis to control dust before emissions exceed the Dust TARP threshold. These may include; water carts, hydromulch, and dust suppressant. • Scrubbers are installed at all underground crushing stations to remove pollutants prior to discharge of exhaust fumes. • Solid particle concentrations in the ventilation raises are managed to agreed maximum concentrations. All new ventilation discharge points, installed after Modification 15 approval date, will be oriented horizontally with a configuration that reduces emissions to as low as reasonably practical. <p>No changes to these mitigation measures are required for the Modification.</p>
Greenhouse Gas Emissions	<p>Greenhouse gas emissions management measures are currently implemented at Cadia in accordance with the AQGHGMP. Management measures include, but are not necessarily limited to:</p> <ul style="list-style-type: none"> • Investigation of new technologies for the reduction of diesel emissions as they become available. • Recording and reporting on greenhouse gas emissions. • Power Purchase Agreement for renewable energy at Cadia. • Focus on efficient use of diesel by optimising the design of haul roads to minimise distance travelled, minimise re-handling of material, maintaining the mobile fleet in good operating order and engaging with suppliers to identify minimisation at source. <p>No changes to these mitigation measures are required for the Modification.</p>
Visual and Night Lighting	<p>Current management measures include progressive rehabilitation, vegetation screens, architecture and night lighting management (such as reducing night lighting sources and relocating away from receivers).</p> <p>No changes to these mitigation measures are required for the Modification.</p>

Table E-2 (Continued)
Summary of Approved Mitigation Measures

Aspect	Mitigation Measures
Aboriginal Cultural Heritage	<p>Management and mitigation measures for Aboriginal cultural heritage are detailed in Cadia’s Aboriginal Cultural Heritage Management Plan. The management and mitigation measures include (but are not limited to):</p> <ul style="list-style-type: none"> • Environmental Impact Permits (EIP) requested in advance of any ground disturbing works. • Prior to work being undertaken in a sensitive area as defined by the EIP process an environmental briefing will be undertaken which will include a description of potential for Aboriginal sites or object. • A register of known Aboriginal sites, their status and location will be maintained by Cadia. • Demarcation of known Aboriginal sites will be undertaken where works are required in close proximity, to avoid accidental damage. If necessary a fence and/or sign will be erected. • A systematic surface collection program will be undertaken prior to the commencement of any Project-related ground disturbance works in accordance with the surface collection methodology. • Should there be any previously unrecorded Aboriginal objects, this would be managed in accordance with the unexpected finds procedure. • In the event that potential human skeletal remains are identified, Cadia’s standard procedure for human skeletal remains would be followed. <p>No changes to these mitigation measures are required for the Modification.</p>
Historical Heritage	<p>Cadia includes areas of historical heritage which are managed to avoid indirect impacts from the ongoing mining operations. Management and mitigation measures for historical heritage are detailed in Cadia’s Historical Heritage Management Plan. The management and mitigation measures include (but are not limited to):</p> <ul style="list-style-type: none"> • Use of EIPs. • Monitoring as required by the Blast Monitoring Program. • Unexpected finds procedure. • Completion of archival recording. • Salvage of heritage items. • Preparation of interpretation plans. <p>No changes to these mitigation measures are required for the Modification.</p>
Waste	<p>Waste management includes measures to promote best practice disposal of waste products, minimise the production of waste, and meet statutory requirements and corporate standards.</p> <p>No changes to these mitigation measures are required for the Modification.</p>
Social	<p>CHPL would continue to implement a range of existing social impact mitigation and management measures at Cadia.</p> <p>CHPL has implemented an Accommodation Strategy at Cadia to appropriately manage impacts on housing demand and availability, which outlines short and long-term accommodation availability and management techniques. These management techniques include impact management and communication programs.</p> <p>No changes to these mitigation measures are required for the Modification.</p>
CVO Dewatering Facility	<p>The Cadia Dewatering Facility includes dedicated environmental mitigation measures including:</p> <ul style="list-style-type: none"> • Process water management via concentrate storage, the slurry (process water) pond and return (process water) water pond. • Stormwater management via the upstream runoff pond and stormwater collection pond. • Concentrate handling is conducted within an enclosed shed which minimises the likelihood of concentrate being exposed to wind. • Noise mitigation, including restriction of train loading to daytime hours (with train arrivals and departures allowed any time). <p>No changes to these mitigation measures are required for the Modification.</p>