

# ASSESSMENT REPORT

## Cadia East Gold/Copper Project

### Surface Preconditioning Modification (06\_0295 – MOD 9)

## 1 BACKGROUND

Cadia Holdings Pty Ltd (Cadia) owns and operates the Cadia Valley mining complex, located approximately 25 kilometres (km) southwest of Orange in the Central Tablelands of New South Wales (see **Figure 1**). The complex is located within the Cabonne and Blayney local government areas.

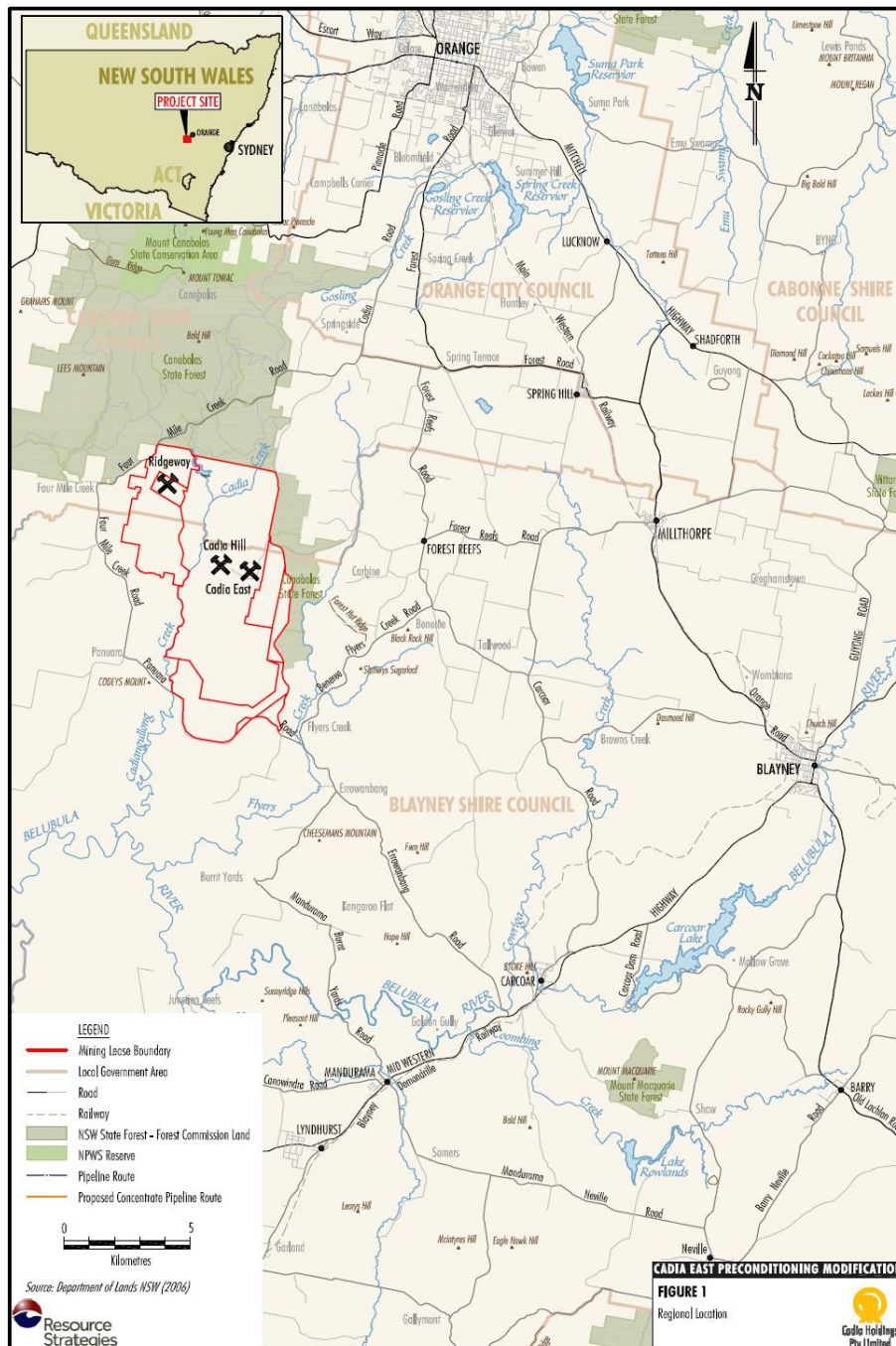


Figure 1: Regional Location

The Cadia Valley mining complex includes the Cadia East underground mine and the Blayney Dewatering Facility, which is located approximately 25 km east of the mining complex in the town of Blayney. It also includes the Cadia Hill open cut mine which ceased operations in 2012, and the Ridgeway underground mine, which was placed on care and maintenance in 2016.

The mining complex operates under the Cadia East project approval (PA 06\_0295), granted by the Minister for Planning on 6 January 2010. The project approval has been modified 8 times, and allows Cadia to undertake the following activities until 30 June 2031:

- extract ore from the Cadia and Ridgeway mines;
- process up to 27 million tonnes (Mt) of ore a year; and
- transfer processed ore via a pipeline to the Blayney Dewatering Facility, where it is dewatered and transported via rail to Port Kembla for export.

The underground mining method (panel caving) at Cadia East involves controlled caving of the rock mass by undercutting a block of ore. Mining progresses by advancing the undercut level beneath the ore block in panels.

In May 2014, the project approval was modified (Modification 4) to allow Cadia to undertake 'preconditioning' of the rock above the orebody by drilling into the rock and using hydro-fracturing or blasting techniques to create fractures in the rock. This process allows better control of the caving and subsidence zones at the surface and reduces the risk of large blocks of rock falling into the mine workings, thereby improving the safety of the mine operations.

The scope of the activity approved under Modification 4 was limited to preconditioning of the rock above a single panel using 10 drill holes. The results proved that hydro-fracturing was effective and Cadia is now seeking to extend the preconditioning program for future panels.

## 2 PROPOSED MODIFICATION

Cadia is seeking to modify its project approval to continue surface preconditioning at Cadia East using hydro-fracturing. The proposed modification involves drilling approximately 150 additional diamond drill holes within the approved Cadia East subsidence zone over the life of the mine (see **Figure 2**). The drill holes would be accessed via approved tracks and drill pads.

As part of this process, water would be pumped from a surface drill rig into the drill holes to generate fractures that would radiate approximately 50 m from each drill hole. The drill holes would be spaced in a staggered 50 metre (m) x 50 m grid array and would extend approximately 400 to 650 m from the surface to the top of the Cadia East orebody. Fractures would be created at vertical intervals of approximately 2 m. The preconditioning works would be undertaken 24 hours a day over a 6-month period.

Water would be sourced from Cadia's approved water supply network, and any seepage would be captured within the mine workings and re-used on site. Cadia does not propose to use any chemicals in the hydro-fracturing process. Waste from this process (i.e. grout fines, water and a biodegradable, organic drilling chemical) would be collected in the drilling sumps and transferred to the existing on-site tailings storage facilities.

As part of the proposed modification, Cadia is also seeking to construct a large warehouse on the site for storing consumables used by the Cadia Valley operations (see **Figure 2**).

Currently, consumables are delivered to a warehouse in Leewood, Orange (approximately 20 km to the north) where they are stored before being dispatched to the mine. To reduce operational costs, Cadia is now proposing to store all consumables in a new on-site warehouse.

The warehouse would be located within the existing/approved surface disturbance areas adjacent to the South Waste Rock Dump, and would include a separate building for lubricant storage and car parking. The proposed warehouse would be approximately 135 m long and 9.5 m high.

Construction of the warehouse would provide jobs for approximately 20 workers. The estimated capital investment value of the modification would be approximately \$45 million.



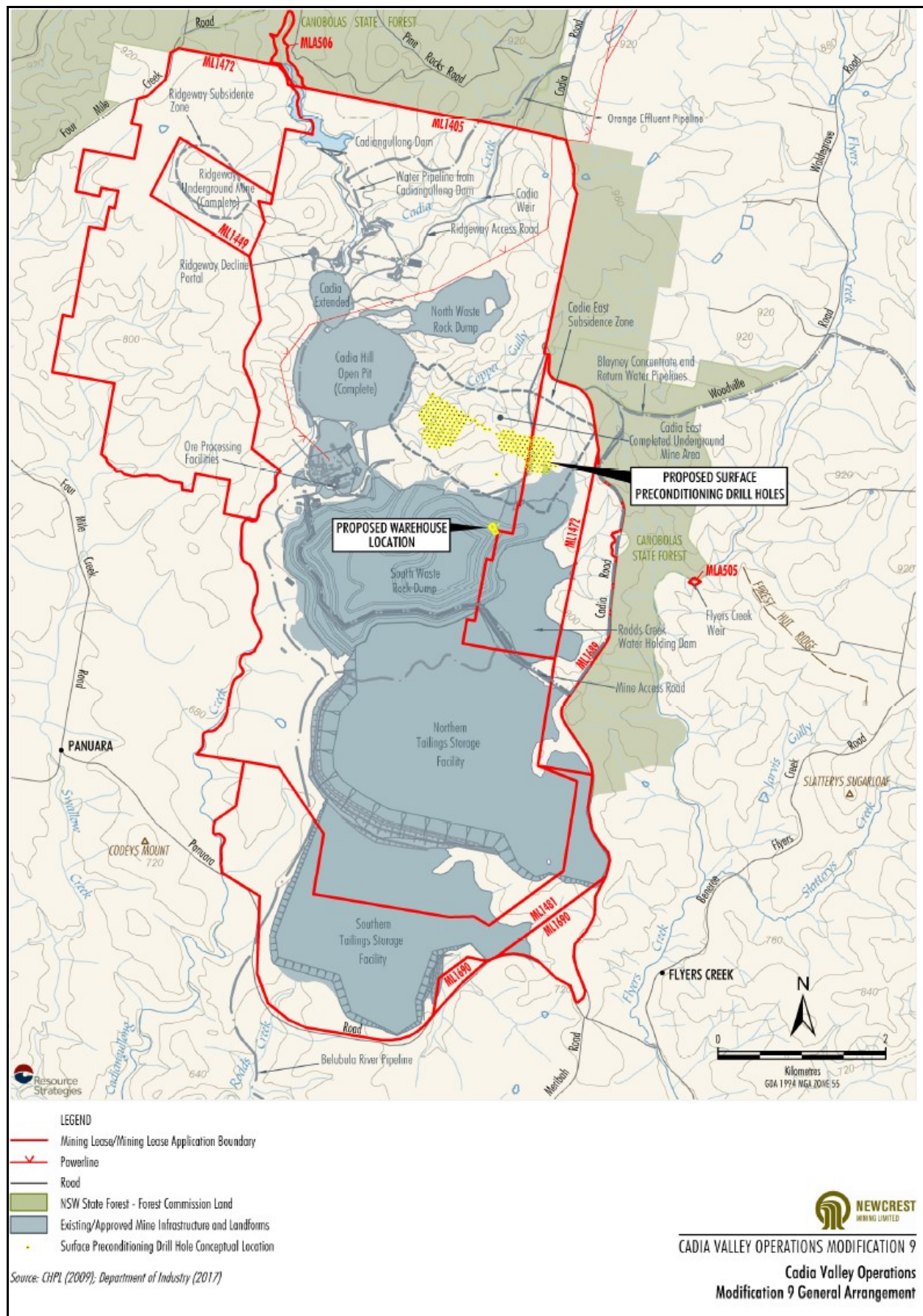


Figure 2: Proposed Modification

Full details of the proposed modification are included in Cadia's Environmental Assessment (EA) (see **Appendix C**).

### 3 STATUTORY CONTEXT

#### 3.1 Section 75W Modifications

The Cadia East Gold/Copper Project was originally approved under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Although Part 3A was repealed on 11 October 2011, the project remains a “*transitional Part 3A project*” under Schedule 6A of the EP&A Act, and hence any modification to the approval must be made under the former Section 75W of the Act.

Based on its assessment, the Department considers that the application can be characterised as a modification as the proposal would not change the approved mining, processing and transport methods, extraction rate, or surface disturbance areas, nor would it significantly increase the environmental impacts of the project as approved. Consequently, the Department considers that the proposed modification is within the scope of Section 75W of the EP&A Act.

#### 3.2 Approval Authority

The Minister for Planning is the approval authority for the modification application. However, under the Minister's delegation dated 16 February 2015, the Director, Resource Assessments, may determine the application. This is because no public submissions in the form of objections were received on the proposal, no reportable political donations were made and Cabonne and Blayney Shire Councils did not object to the proposal.

### 4 CONSULTATION

The Department referred the application to key government agencies for comment and made it publicly available on its website from 15 February 2017.

The Department received advice from three government agencies, none of which object to the proposed modification. A summary of the advice is provided below. Full copies of the advice and Cadia's response are provided in **Appendix D**.

The **Department of Primary Industries – Water** (DPI) requested that Cadia confirm the water source for the proposed additional water demands, and advised that water used for hydro-fracturing should be of similar quality to the local groundwater to avoid any potential impacts. Following provision of additional information by Cadia, DPI does not have any residual concerns (see further discussion in Section 5 below).

The **Environment Protection Authority** (EPA) initially raised concerns about the adequacy of the noise assessment, and specifically the contribution of the proposed preconditioning activities to low frequency noise levels. The EPA also raised concerns about potential impacts to local groundwater, but deferred comment to DPI based on their expertise in this area. Following provision of additional information by Cadia, EPA does not have any residual concerns and supports the proposed modification.

The **Division of Resources and Energy** within the Department of Industry supports the proposed modification and made no recommendations.

### 5 ASSESSMENT

In assessing the merits of the modification application, the Department has considered the:

- previous EAs for the project;
- modification application and existing conditions of approval;
- agency comments on the application;
- applicant's response to agency comments; and
- requirements of the EP&A Act.

## 5.1 Groundwater

The key issue for the proposed modification relates to potential impacts on groundwater due to the pumping of additional water into the host rock.

The EA includes a groundwater impact assessment undertaken by Australasian Groundwater and Environmental Consultants Pty Ltd, which included a review of the groundwater model for the mine and groundwater monitoring data collected since operations commenced.

Approximately 12,000 litres (L) of water would be used per hydro-fracture, amounting to a total volume of 1.8 megalitres (ML) of water for the proposed program. This is a small proportion of the licensed extraction volumes used for operations (15.6 ML/day) and DPI is satisfied that the water can be sourced from Cadia's existing licensed water entitlements.

The proposed hydro-fracturing is not predicted to cause subsidence or induce fracturing beyond that already accounted for in the existing groundwater model. Furthermore, the overlying rock mass is considered highly impermeable, with poorly interconnected fracture networks that do not readily facilitate movement of groundwater.

Consequently, the proposed preconditioning program is not expected to change the amount of water that would drain into the underground workings or discharge to the subsidence zone.

In terms of water quality, the subsidence zone forms a groundwater sink and injected water would drain downward into the underground workings where approximately 60% would be collected and recycled. No additives would be used for the hydro-fracturing and any drilling mud would be directed towards the mine workings. Cadia would also continue to operate in accordance with the conditions of its Environment Protection Licence (5590), which prohibits the pollution of waters.

Notwithstanding, DPI Water raised some minor concerns about the potential for contamination of the aquifer, particularly in relation to the Orange Basalt groundwater source that is used for stock and domestic purposes. In response to these concerns, Cadia has committed to only using freshwater from its on-site dams for hydro-fracturing.

Based on the above, both the Department and DPI are satisfied that the proposed hydro-fracturing would have no additional impact on the groundwater regime beyond that predicted by the existing groundwater model, and would not adversely impact groundwater quality.

The Department also notes that the existing conditions of approval require Cadia to undertake a comprehensive groundwater monitoring program. The Department is satisfied that this program is sufficient to identify any unexpected adverse effects resulting from the activity.

Overall, the Department is satisfied that the proposed modification would have negligible impacts on groundwater above and beyond those already approved for the mine.

## 5.2 Noise

A noise impact assessment undertaken by Wilkinson Murray found that the pumps and drill rig would be at least 13 dBA below the noise criteria at all receivers, and overall mine noise would increase by a maximum of 0.5 dBA at the nearest receivers under worst-case conditions. This increase would not result in any exceedances of the night-time project specific noise levels (PSNLs) at any receiver (i.e. the period when the most stringent PSNLs apply).

The EPA initially raised concerns that the assessment did not include the contribution of the current noise generated on-site and had not considered low frequency noise. However, the EPA accepted that noise sources lower than the relevant criteria by 10 dBA or more would not influence overall noise levels, and that the 0.5 dBA noise increase, including any contributions from low frequency noise, would generally be imperceptible.

As the predicted noise from the drill rig and pumps would be greater than 10 dB below the applicable criteria, and construction of the warehouse would also be at least 10 dBA below the noise limits, the Department is satisfied that the cumulative impacts from all noise sources would remain below the approved noise limits at all nearby sensitive receivers.

The existing approval also requires Cadia to implement a range of noise mitigating, monitoring and management measures. Cadia would also be required to review and revise its existing Noise Management Plan to account for the proposed modification. With these measures in place, the Department is satisfied that the proposed modification would not result in any significant noise impacts at surrounding receivers.

### 5.3 Visual

Potential views of the warehouse from public vantage points would be obstructed by topography, vegetation and the South Waste Rock Dump. Consequently, the Department is satisfied there would be no visual impacts from the proposed warehouse.

### 5.4 Traffic

The proposed modification would mean that all deliveries would be directed to the on-site warehouse. This would marginally increase traffic from current levels, mostly during construction of the warehouse. However, the predicted traffic levels would remain below the long-term traffic levels assessed for the Cadia East Project, as it assumed that all consumables would be delivered to on-site workshops and stores.

Consequently, the Department is satisfied that the expected traffic volumes would be consistent with the approved volumes and that no additional road transport impacts are anticipated because of the proposed modification.

## 6 RECOMMENDED CONDITIONS

The Department has drafted a Notice of Modification (see **Appendix A**) for the proposed modification, as well as a consolidated version of the project approval as modified (see **Appendix B**).

## 7 CONCLUSION

The Department has assessed the merits of the modification in accordance with the relevant requirements of the EP&A Act.

The Department considers that the proposed extension of the surface preconditioning program using hydro-fracturing can be undertaken with no significant impacts on groundwater resources or the amenity of surrounding receivers. The Department is satisfied that the proposed on-site warehouse would not alter the approved disturbance footprint of the mine, and there would be no impacts on the amenity of surrounding receivers.

Overall, the Department believes the modification is reasonable as it would not result in any significant change in environmental impacts beyond those associated with the original project. The extension of the preconditioning program would allow Cadia to mine more efficiently within the required design and safety parameters. The proposed on-site warehouse would facilitate more efficient storage and distribution of consumables, and during construction would provide employment for up to 20 workers.


Consequently, the Department believes the proposed modification is in the public interest and should be approved, subject to conditions.

## 8 RECOMMENDATION

It is recommended that the Director, Resource Assessments, as delegate of the Minister for Planning:

- **considers** the findings and recommendations of this report;
- **determines** that the modification is within the scope of Section 75W of the EP&A Act;
- **approves** the application under Section 75W, subject to conditions; and
- **signs** the Notice of Modification (see **Appendix A**).

 21/4/17  
Rose-Anne Hawkeswood  
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Resource Assessments

 21/4/17  
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A/Director  
Resource Assessments

**APPENDIX A: NOTICE OF MODIFICATION**

## **APPENDIX B: CONSOLIDATED PROJECT APPROVAL**



## **APPENDIX C: ENVIRONMENTAL ASSESSMENT**

See the Department's website at

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=8252](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8252)

## **APPENDIX D: AGENCY COMMENTS AND RESPONSE**

See the Department's website at

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