ASSESSMENT REPORT
Cowal Gold Mine
Mine Life Extension (DA 14/98 MOD 13)

1 BACKGROUND

The Cowal Gold Mine is an existing open cut gold mine owned and operated by Evolution Mining (Cowal) Pty Limited (Evolution). The mine is located on the shoreline of Lake Cowal, approximately 37 kilometres (km) northeast of West Wyalong, within Bland Shire local government area (see **Figure 1**).

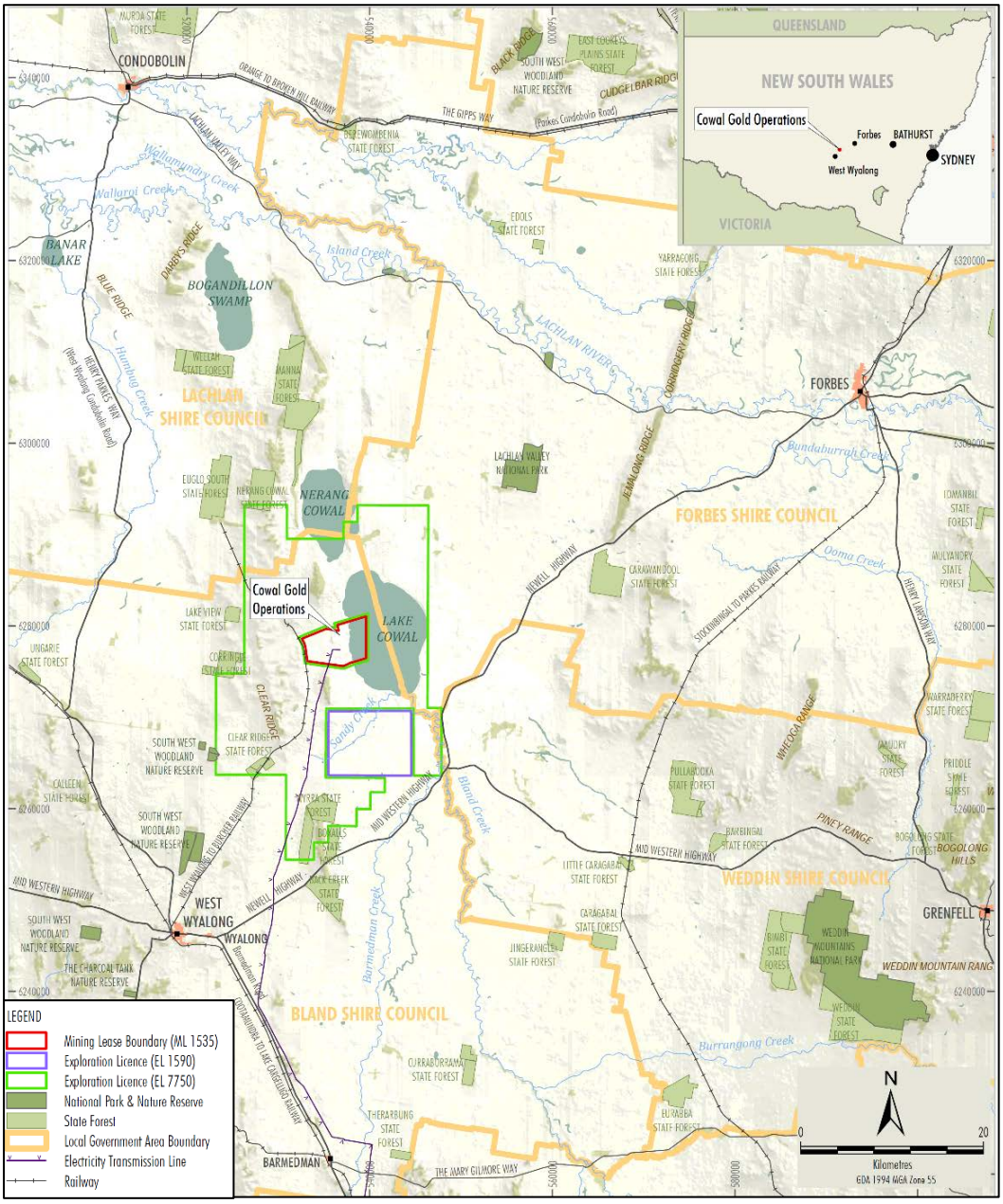

Figure 1: *Regional Location*

The Cowal Gold Mine has been operating since 2005. The mine currently operates under the Cowal Gold Mine Development Consent (DA 14/98), granted by the then Minister for Urban Affairs and Planning on 26 February 1999, following a Commission of Inquiry.

The development consent has been modified on 12 occasions, and allows Evolution to undertake the following activities until 31 December 2024:

- extract ore from a single open cut pit, utilising conventional drill and blast, load and haul methods;
- process up to 7.5 million tonnes of ore per year and produce approximately 3.8 million ounces (Moz) of gold over the life of the project;
- extract gold from the ore using a conventional carbon-in-leach cyanide leaching circuit in the process plant;
- operate the Bland Creek Palaeochannel borefield; and
- undertake progressive rehabilitation of the site.

The Cowal Gold Mine is located in a semi-arid, predominantly cleared agricultural landscape used for livestock grazing and grain cropping. A number of farms and residences are located around the mine, with the closest being about two km west of site (see **Figure 3** below).

Small remnants of native vegetation are located several km to the west of the mine, and along the Lake Cowal shoreline. When inundated, Lake Cowal provides important habitat for migratory waterbirds and is used by commercial fishers. When dry, the bed of Lake Cowal is used for grazing and cropping.

2 PROPOSED MODIFICATION

Evolution has identified additional gold resources below the existing open cut pit, at depths greater than currently approved for extraction. The proposed modification would enable the extraction of this resource, and would increase gold production from 3.8 to 5.5 Moz over the life of the project, and extend the mine life by eight years (from 2024 to 2032).

Key aspects of the modification include (see **Figure 2**):

- increasing the depth of the existing open cut pit by 70 metres (m) – from 470 to 540 m below the natural ground level;
- changing the height and configuration of the tailings storage facilities (TSFs), including:
  - converting the area between the existing TSFs into a new tailings storage area;
  - increasing the height of the Southern TSF by 17 m – from 255 to 272 m Australian Height Datum (AHD);
  - increasing the height of the Northern TSF by 16 m – from 248 to 264 m AHD;
  - constructing a rock buttress on the outer slopes of the TSFs to increase stability; and
  - increasing the size of the TSF embankment lift fleet;
- temporarily increasing the design height of the existing mineralised material stockpile – from 273 to 288 m AHD; and
- upgrading the leach circuit within the processing plant to facilitate the extraction of gold from tailings and maximise gold recovery.

Additional waste rock resulting from the modification would either be used for buttressing the TSFs, or stored at the mineralised material stockpile until such time that the material is processed. Consequently, the dimensions of the existing waste rock emplacements would not change: the Northern Rock Emplacement would remain the highest point on site at 308 m AHD, and the Southern Rock Emplacement would not exceed 283 m AHD.

There would be a minor extension of the TSF footprints (within currently approved disturbance areas) to accommodate the rock buttress. The modification would not change the approved annual ore processing rate, mining and processing methods, or hours of operation. The proposed modifications would not significantly alter the approved rehabilitation objectives or the final land form design for the site (see **Section 5.4** for further discussion).

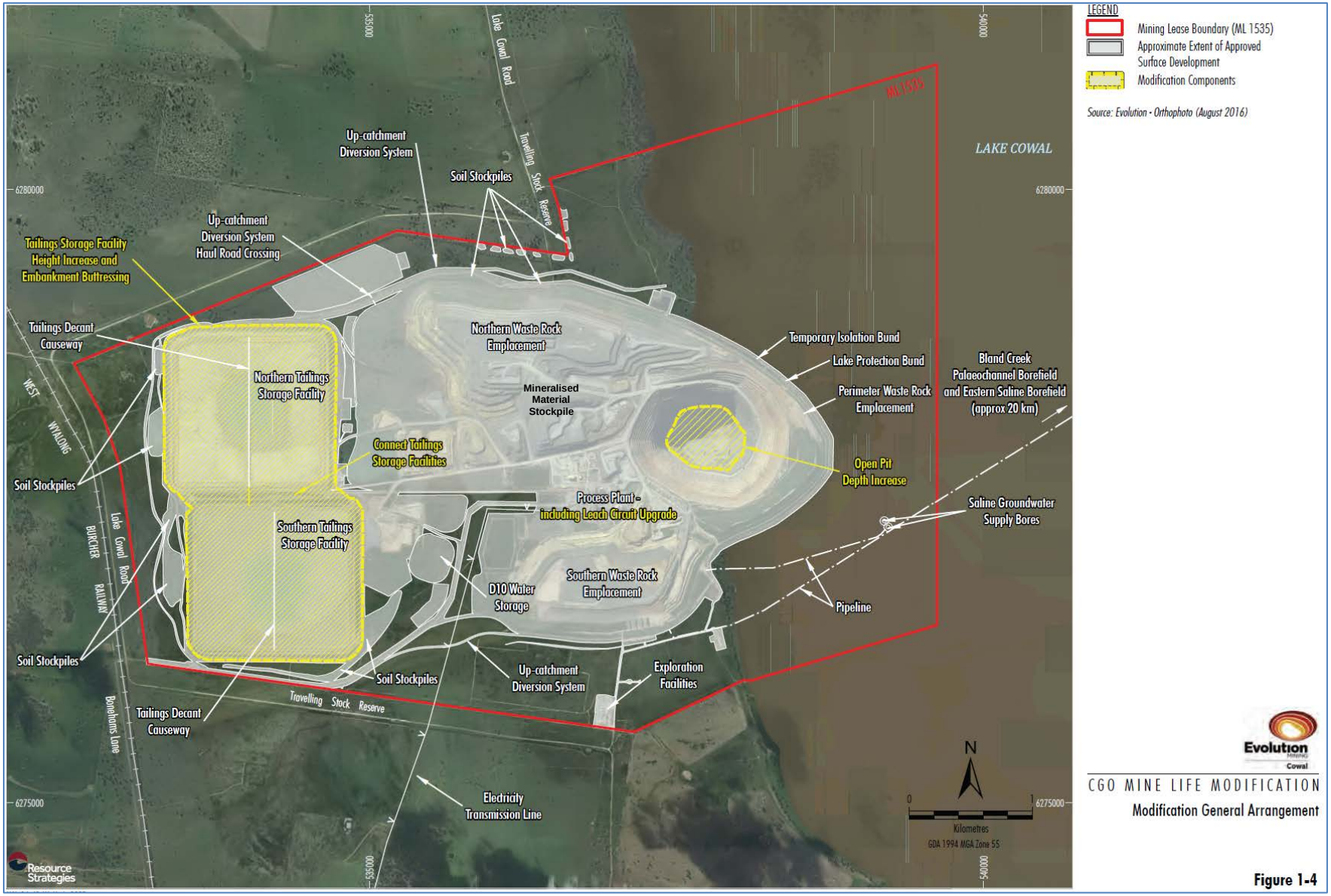

Figure 2: *Proposed Modification*

3 STATUTORY CONTEXT

3.1 Section 75W

The project was originally approved under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Clause 8J(8) of the *Environmental Planning and Assessment Regulation 2000* requires modifications of such development consents to be carried out under Section 75W of the EP&A Act. Although Part 3A was repealed on 1 October 2011, the project remains a 'transitional Part 3A project' under Schedule 6A of the EP&A Act, and hence any modification to the consent 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 methods or increase the volume of ore approved to be processed and transported in any given year, 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 Bland Shire Council did not object to the proposal.

3.3 Environmental Planning Instruments

The Department has considered the modification against the provisions of the relevant environmental planning instruments, and is satisfied that none of these instruments substantially govern the carrying out of the modification.

4 CONSULTATION

The Department publicly exhibited the application and accompanying documents from 18 November until 8 December 2016. A total of 73 submissions were received, including 65 from the general public (all supporting the proposal), and eight from government agencies (none of which objected to the proposal).

The general public, including individuals and local community groups, typically cited the benefits offered by the mine life extension, including the ongoing employment opportunities and social and economic benefits of the project to the region.

Some agencies initially raised concerns about aspects of the proposal which have subsequently been addressed through the provision of additional information and/or revised conditions of consent. A summary of agency submissions is provided below. Full copies of the submissions, and Evolution's Response to Submissions, is provided in **Appendices D** and **E**.

The **Environment Protection Agency** (EPA) supported the modification, subject to the inclusion of revised noise criteria being included in the modified consent (see **Section 5.1** of this report for further discussion).

The **Department of Primary Industries – Water** (DPI Water) requested additional information confirming that no significant concentrations of dissolved arsenic and cyanide had leached from the TSFs into surrounding groundwater. Evolution provided this information to the satisfaction of DPI Water. DPI water also included a number of general recommendations consistent with requirements under the existing consent (i.e. Water Management Plan update, continued monitoring of groundwater resources and measures to minimise clean water runoff to the final void).

The **Roads and Maritime Services** (RMS) raised no concerns about the proposed modification, but requested that Evolution regularly review measures to manage driver fatigue over the life of the project. Evolution provided details of the measures it currently has in place (to the satisfaction of RMS), and has committed to review these periodically.

Bland Shire Council strongly supports the proposed modification, principally on the grounds of the economic and social benefits that would result from the eight year mine life extension.

Both **Forbes Shire Council** and **Lachlan Shire Council** support the modification, and requested that Evolution continue contributing to road maintenance expenses as per the existing arrangements (see **Section 5.4** for further discussion).

Lachlan Shire Council also included a number of general recommendations consistent with requirements under the existing consent (i.e. continued operation of the Community Consultative Committee and existing employee transport arrangements, and identification of long term initiatives to support local communities through the mine closure process).

The **Division of Resources and Energy** (DRE) within the Department of Industry confirmed its support the proposal, and the **Office of Environment and Heritage** (OEH) raised no concerns and made no recommendations about any aspect of the proposed modification.

5 ASSESSMENT

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

- conditions of consent for the mine;
- modification application and Environmental Assessment (EA; see **Appendix C**);
- relevant environmental planning instruments, policies and guidelines; and
- requirements of the EP&A Act.

5.1 Noise

Existing situation

Under the existing consent, three properties are entitled to acquisition upon request on the basis that noise from the mine is expected to exceed 40 decibels (dBA). One of these properties (Coniston) was recently acquired by Evolution. Noise at five additional properties is permitted to exceed the project specific noise level (PSNL) of 35 dBA by a maximum 1 to 2 dBA (see **Table 1**). Noise from the mine at all other receivers must not exceed 35 dBA.

Noise predictions

Under worst case conditions (expected to occur infrequently) modelling predicts that noise from plant and vehicle movements associated with the modification would result in increased noise at 10 properties (excluding Coniston), and decreased noise at two properties (see **Table 1** and **Figure 3**).

Of the 10 properties predicted to experience increased noise:

- five would experience marginal or moderate noise impacts (3 to 5 dBA above 35 dBA), and would be entitled to additional noise mitigation measures upon request, including double-glazing, insulation, and/or air conditioning; and
- two would experience (continued) significant noise impacts (> 5 dBA above 35 dBA), and would continue to be entitled to acquisition upon request.

Table 1: *Modelled noise impacts*

Receiver	Day/Evening/Night $L_{eq, 15\ min}$		Entitled to Additional Noise Mitigation
	Criteria	Predictive Modelling	
22a – Lakeview	35	37 (+2)	-
22b – Lakeview II			
49b – Foxham Downs II			
90b – Caloola II		38 (+3)	Yes
22c – Lakeview III		39 (+4)	Yes
61a – Bungabulla	36	34 (- 2)	-
38 – Gumbelah[1]		35 (- 1)	-
20 – Bramboyne		38 (+2)	Yes
36a – The Glen			
15- Laurel Park [1]	37	39 (+2)	Yes
42 – Westlea	Entitled to voluntary acquisition	43	-
21 – Westella		44	-
1a – Coniston		Recently acquired	-

[1] *Existing noise agreement in place*

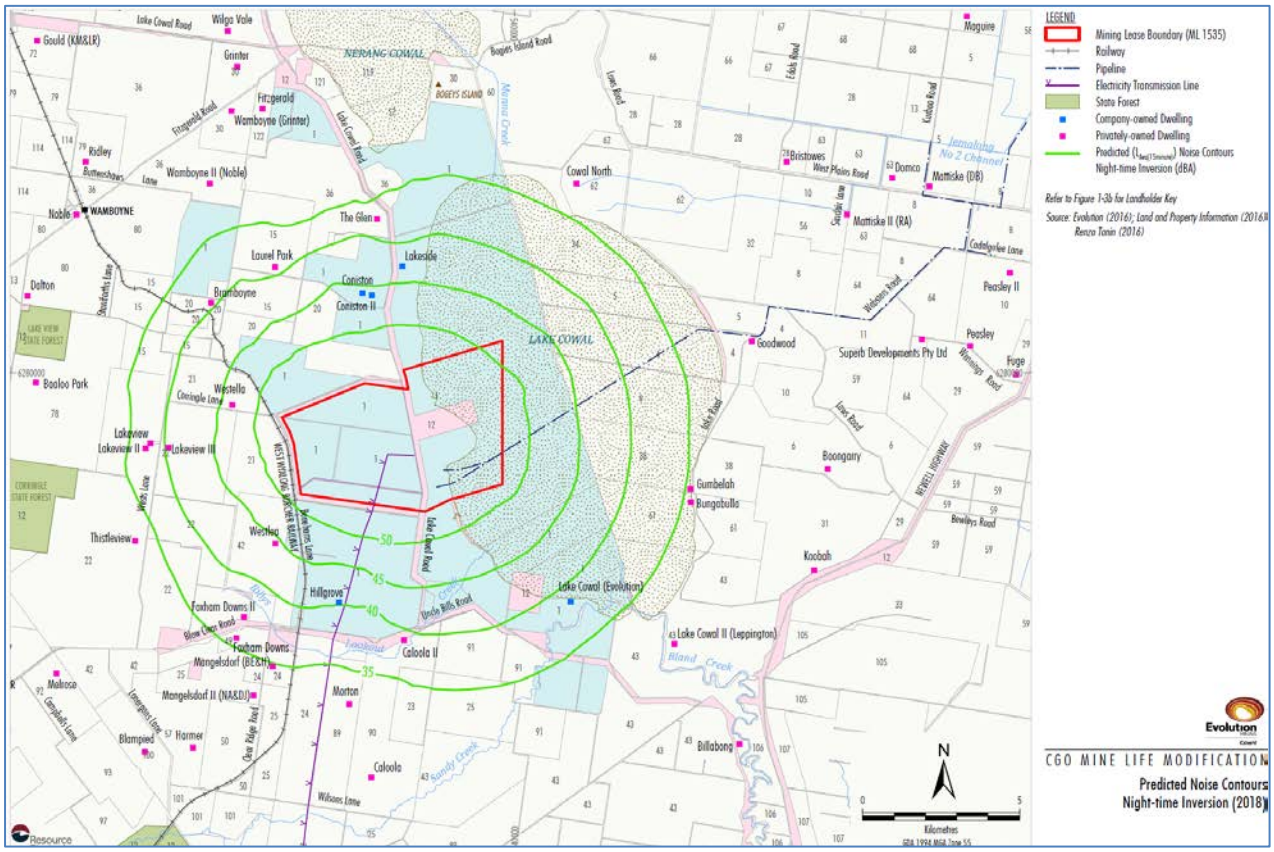

***Figure 3**: Surrounding Receivers*

Mitigation

In accordance with the *NSW Voluntary Land Acquisition and Mitigation Policy* (VLAMP; 2014), Evolution considered a range of reasonable and feasible noise mitigation measures to minimise the potential noise impacts of the modification, including:

- scheduling TSF lift works (including rock buttress construction) during the daytime only;
- replacing the existing haul truck fleet;
- applying noise attenuation kits to the existing haul truck fleet; and
- constructing acoustic bunding and/or relocating noise sources on the waste rock emplacements.

The only mitigation measure found to appreciably reduce noise levels in a reasonable and feasible manner was the daytime scheduling of TSF construction works. This measure was incorporated in the noise modelling for the modification. All other options were found to be relatively ineffective, or the expected capital cost was considered unreasonable.

Evolution has consulted with the owners of surrounding properties to explain the outcome of the noise assessment, and their noise mitigation entitlements. The Department also notes that none of these landowners made a submission objecting to the proposal.

Both the EPA and the Department are therefore satisfied that Evolution has demonstrated and applied all reasonable and feasible noise mitigation measures.

Recommended conditions

The Department has recommended conditions requiring Evolution to:

- comply with revised noise criteria;
- implement additional noise mitigation measures upon request at properties predicted to experience marginal or moderate noise impacts;
- restrict the height of the TSFs and the mineralised material stockpile; and
- limit TSF embankment and rock buttress construction to daytime hours.

Consistent with the existing consent, Evolution is required to update its Noise Management Plan.

5.2 Water

Groundwater

The open cut pit intersects the Cowra formation alluvial groundwater system and the underlying fractured rock groundwater system, with the pit expansion to extend further into the fractured rock system.

The maximum predicted groundwater inflow to the pit associated with existing operations is 252 mega litres (ML) a year, including 10% from the alluvial system and 90% from the fractured rock system. However, current monitoring data suggests that groundwater inflow to the pit is significantly less than the predicted maximum (i.e. 146 ML a year), even following the recent Lake Cowal lake-fill events.

The modification would not change the maximum predicted groundwater inflow during operations or post-closure. Nor would it significantly increase the extent of drawdown around the open cut pit, which is largely limited to the mining lease boundary.

In regard to potential interactions with Lake Cowal, the Department notes that the natural clay layers that act to isolate the lake from the underlying aquifers would remain intact, as would the existing lake isolation system.

Given that the level of drawdown would remain similar to current levels, that there are no groundwater dependent ecosystems or other water users in the vicinity of mine, and that Lake Cowal would remain isolated from the pit, the Department considers that the environmental impacts resulting from the increased pit depth would be negligible.

Monitoring data indicates that groundwater levels in the vicinity of the TSFs has gradually risen due to the percolation and movement of seepage from the TSFs. Evolution is evaluating management and contingency measures to maintain groundwater levels below the ground surface, including potentially pumping groundwater to the Southern TSF. Following mine closure, the elevated groundwater level surrounding the TSFs is expected to dissipate over time.

DPI Water requested that trigger levels and contingency measures for rising groundwater levels near the TSFs be developed in an updated Water Management Plan. Consistent with the existing consent, Evolution is required to update its Water Management Plan to account for the modification.

In regard to water quality, monitored groundwater pH levels and electrical conductivity concentrations within the mining lease are generally consistent with the background (i.e. pre-mining) levels. Waste rock and tailings material associated with the modification would be geochemically similar to tailings from existing operations, and as such, there would be no change in groundwater quality outcomes due to the modification. Any seepage from the waste rock emplacements and modified TSFs would continue to migrate to the open cut pit.

The EPA raised no concerns about water quality, and noted that there is no trend suggesting that cyanide has leached from the TSFs into surrounding groundwater.

Surface Water

The modification would not change the clean water diversion system or the dirty water catchment system, and as such, there would be no change to the area already excised from the Bland Creek Catchment. Additionally, no spills from contained water storages are predicted for the revised site water balance.

The use of some reagents and process consumables (including cyanide) would increase. However, chemicals and fuels would continue to be stored within existing storage areas (see **Section 5.3** for further discussion).

Lake Cowal would continue to be protected from mining activities through a series of bunds, and no water is permitted to be released to Lake Cowal under the existing consent. Both the Department and the EPA consider that the continued implementation of the surface water management system would ensure negligible impacts on surface water quality.

Water use

The internal and external sources of water would not change as a result of the modification. Adequate licences are available to account for the ongoing take of water associated with the modification, and DPI Water has raised no concerns in regard to the ongoing use of water from existing sources.

Water levels at bores surrounding the project borefields could be maintained over the life of the modified project, and there would be no change to the existing trigger levels and contingency measures.

Evolution would continue to operate the Bland Creek Palaeochannel Borefield and Eastern Saline Borefield in accordance with the existing Groundwater Contingency Strategy to minimise impacts to other groundwater users.

Recommended Conditions
Consistent with the existing consent, Evolution is required to update its Water Management Plan in consultation with DPI Water and the EPA. With the implementation of the updated management plan, the Department considers that the existing conditions of consent would account for the proposed modification.

5.3 Hazardous Material

Operation of the upgraded leach circuit would involve an increase in cyanide consumption (from 0.3 to 0.7 kilograms per tonne of primary ore during primary ore processing) and other reagents and process consumables (hydrochloric acid, lime, oxygen, sodium metabisulfite and sodium hydroxide).

These increases would not change the existing cyanide destruction methods, the approved cyanide concentration limits in the tailings slurry, the existing consumables storage areas, or the handling or transport methods.

Additionally, the modification would not change the potential impact mechanisms to the environment, or their associated consequences and likelihoods, such that risk levels would change from those previously assessed in the Preliminary Hazard Analysis (PHA), Hazard and Operability Study (HAZOP) or Final Hazard Analysis (FHA). Subsequently, no change to the overall PHA, HAZOP study or FHA risk assessment findings would result from the modification.

Evolution would continue to implement the mitigation and management measures detailed in the approved Cyanide Management Plan (including the cyanide monitoring process). The transport of hazardous materials would continue in accordance with the existing Cowal Gold Project Transport of Hazardous Materials Study.

The Department notes that the EPA has raised no concerns about the management of hazardous materials, and that with the existing measures in place, no hazardous events or incidents have occurred at the mine since operations commenced.

Evolution is required to review the approved environmental management plans and monitoring programs with respect to hazards, and if necessary, updated these plans to account for the modification. The Department considers the measures in the existing consent would account for the proposed modification.

5.4 Other Issues

Table 2: *Consideration of other issues*

Issue	***Consideration***	***Recommendations***
Transport	• Upgrades to the leach circuit would result in 1 to 2 additional truck deliveries a day during periods of primary ore processing. Truck movements would therefore increase from 12 two-way movements a day, to a maximum of 14, which is below the existing limit of 15 two-way movements a day. • The modification would result in project-related traffic using public roads for an additional eight years. The Department notes that the primary access route to the site was upgraded in 2005 to accommodate the project, with additional resurfacing occurring in 2016. Evolution has committed to update its Traffic Management Plan, including measures to manage driver fatigue, in consultation with relevant agencies. • Evolution would continue to contribute to the maintenance and repair of local roads in the Bland, Forbes and Lachlan council areas in accordance with the *Cowal Gold Mine Memorandum of Understanding on Road Maintenance*. All councils are satisfied with the continuation of this arrangement. • With these measures in place, the Department considers that the capacity, safety and efficiency of the road network would be maintained of the extended life of the project.	• No additional conditions of consent are required.

Issue	*Consideration*	*Recommendations*
Dust	• Under a worst case scenario, the modified project is expected to comply with 24-hour PM_{10} and $PM_{2.5}$ criteria, and annual average TSP, PM_{10}, $PM_{2.5}$ and deposited dust criteria, at all receivers. • The EPA is satisfied that the existing air quality monitoring program would accommodate the proposed modification. • The Department considers that the existing conditions of consent would continue to effectively manage dust associated with the modified project, including the requirement to revise the Air Quality Management Plan to account for the proposed modification.	• No additional conditions of consent are required.
Greenhouse Gas	• Average annual Scope 1 and 2 emissions from the modification (0.24 million tonnes carbon dioxide equivalent) would represent approximately 0.041 percent of Australia's commitment under the Kyoto Protocol (591.5 Mt CO2-e) and a very small proportion of global greenhouse emissions. • Evolution would continue to calculate and report annual greenhouse gas emissions for the project in accordance with its existing requirements under the Commonwealth National Greenhouse and Energy Reporting System.	• No additional conditions of consent are required.
Biodiversity	• The modification would not clear any vegetation. • The approved cyanide concentration limits of the tailings slurry would be maintained, and potential risks to fauna interacting with the TSFs would not change. Existing fauna deterrence methods at the TSFs would also continue to be implemented. • The Department and OEH consider that the modification would not result in any additional biodiversity impacts.	• No additional conditions of consent are required.
Rehabilitation	• Changes to the final landform due to the modification include a 3% increase of the final pit void volume, and an increase in the height and footprint of the TSFs. • The Department and DRE are satisfied that the revised rehabilitation plan would retain the existing approved final landform design, land use and rehabilitation objectives. • DRE raised no concerns in this regard, and Evolution is required to revise its Mining Operations Plan, subject to approval by DRE. • Evolution is also required to update its Rehabilitation Management Plan to account for the proposed modification, and has committed to identifying long term initiatives to support local communities through the mine closure process.	• No additional conditions of consent are required.

6 RECOMMENDED CONDITIONS

The Department has prepared a Notice of Modification (see **Appendix A**) and a consolidated version of the development consent (see **Appendix B**) for the proposal.

In summary, the proposed amendments to the conditions include:

- an eight year mine life extension (to 2032);
- increases to the heights of the TSFs and mineralised material stockpile;
- limiting TSF rock buttress construction to daytime hours;
- revised noise criteria and noise acquisition and mitigation provisions;
- updated figures that reflect the revised project (i.e. deeper pit and modified TSFs); and
- a number of administrative changes, including updated definitions and agency names.

Evolution has reviewed the recommended conditions and has no objections.

7 CONCLUSION

The Department has assessed the modification application and supporting information in accordance with the relevant requirements of the EP&A Act.

The Department considers that with the implementation of the above amendments to the conditions, as well as updated management plans, the proposed modification would not result in any significant environmental impacts beyond those already approved under the existing development consent.

While the modification would increase noise emissions from the mine at certain receivers, the Department and the EPA consider that Evolution has incorporated all reasonable and feasible measures to minimise and mitigate these noise emissions.

The Department notes that the modification would provide additional socio-economic benefits to the local, state and national economies for an additional 8 years, including the on-going employment of up to 435 people.

Consequently, the Department considers that the proposed modification is in the public interest, and recommends that it should be approved, subject to conditions.

8 RECOMMENDATION

It is **RECOMMENDED** that the Director, Resource Assessments, as delegate of the Minister:

- **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 (**Appendix A**).

7/2/17

Elle Donnelley
A/Senior Planner
Resource Assessments

7/2/17

Clay Preshaw
A/Director
Resource Assessments

APPENDIX A: NOTICE OF MODIFICATION

APPENDIX B: CONSOLIDATED DEVELOPMENT CONSENT

APPENDIX C: ENVIRONMENTAL ASSESSMENT

APPENDIX D: SUBMISSIONS

APPENDIX E: RESPONSE TO SUBMISSIONS