Evolution MINING

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# COWAL GOLD OPERATIONS PROCESSING RATE MODIFICATION

**Environmental Assessment**
**2018**

Resource Strategies

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# 1 INTRODUCTION

This document is an Environmental Assessment (EA) for a modification to the Cowal Gold Operations (CGO), which is located approximately 38 kilometres (km) north-east of West Wyalong in New South Wales (NSW) (Figures 1-1). Evolution Mining (Cowal) Pty Limited (Evolution) is the owner and operator of the CGO.

This EA has been prepared to support a request to modify the CGO Development Consent (DA 14/98) under section 75W of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act) for the CGO Processing Rate Modification (the Modification). A copy of the CGO Consolidated Development Consent (DA 14/98) is provided in Attachment 1.

The Modification involves expansion of the CGO and an increase to the CGO's approved ore processing rate of 7.5 million tonnes per annum (Mtpa) to 9.8 Mtpa.

To allow for the proposed increase in processing rate, the existing Tailings Storage Facilities (TSFs) would be modified to form one larger TSF, which would also accommodate mine waste rock (herein referred to as the Integrated Waste Landform [IWL]).

The Modification would also involve the relocation of water management and other ancillary infrastructure (displaced by the larger IWL footprint) in alternative locations within Mining Lease (ML) 1535 and within Mining Lease Application (MLA) 1.

This EA considers the potential environmental impacts of the Modification in accordance with the Secretary's Environmental Assessment Requirements (SEARs) issued by the NSW Department of Planning and Environment (DP&E) on 17 November 2017 (Attachment 2).

Relevant components of the Modification were referred to the Commonwealth Department of the Environment and Energy (DEE) (Reference 2017/7989). The DEE's Referral decision (dated 6 November 2017) was that the Modification is a controlled action, and therefore, approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) is required.

The controlled action will be assessed under the assessment bilateral agreement with the NSW Government, and as such, this EA has also been prepared to address the DEE's assessment requirements, which are included in the SEARs (Attachment 2).

A reconciliation against the SEARs and the DEE's assessment requirements is provided in Tables 1-1 and 1-2.

## 1.1 EXISTING COWAL GOLD OPERATIONS OVERVIEW

The location of the CGO is shown on Figures 1-1 and 1-2. The area of land to which the CGO's Development Consent (DA 14/98) is relevant includes that underlying ML 1535 and the CGO's water supply pipeline and Bland Creek Palaeochannel Borefield (Figure 1-2).

In addition, Evolution holds Development Consent (DA 2011/64) for the operation of the Eastern Saline Borefield (Figure 1-2) which was granted by the Forbes Shire Council on 20 December 2010.

ML 1535 encompasses approximately 2,636 hectares (ha). ML 1535 is bordered by Evolution's Exploration Licence (EL) 7750. Other ELs held by Evolution in the region include EL 1590, EL 8524, EL 5524 and EL 6593 (Figure 1-1).

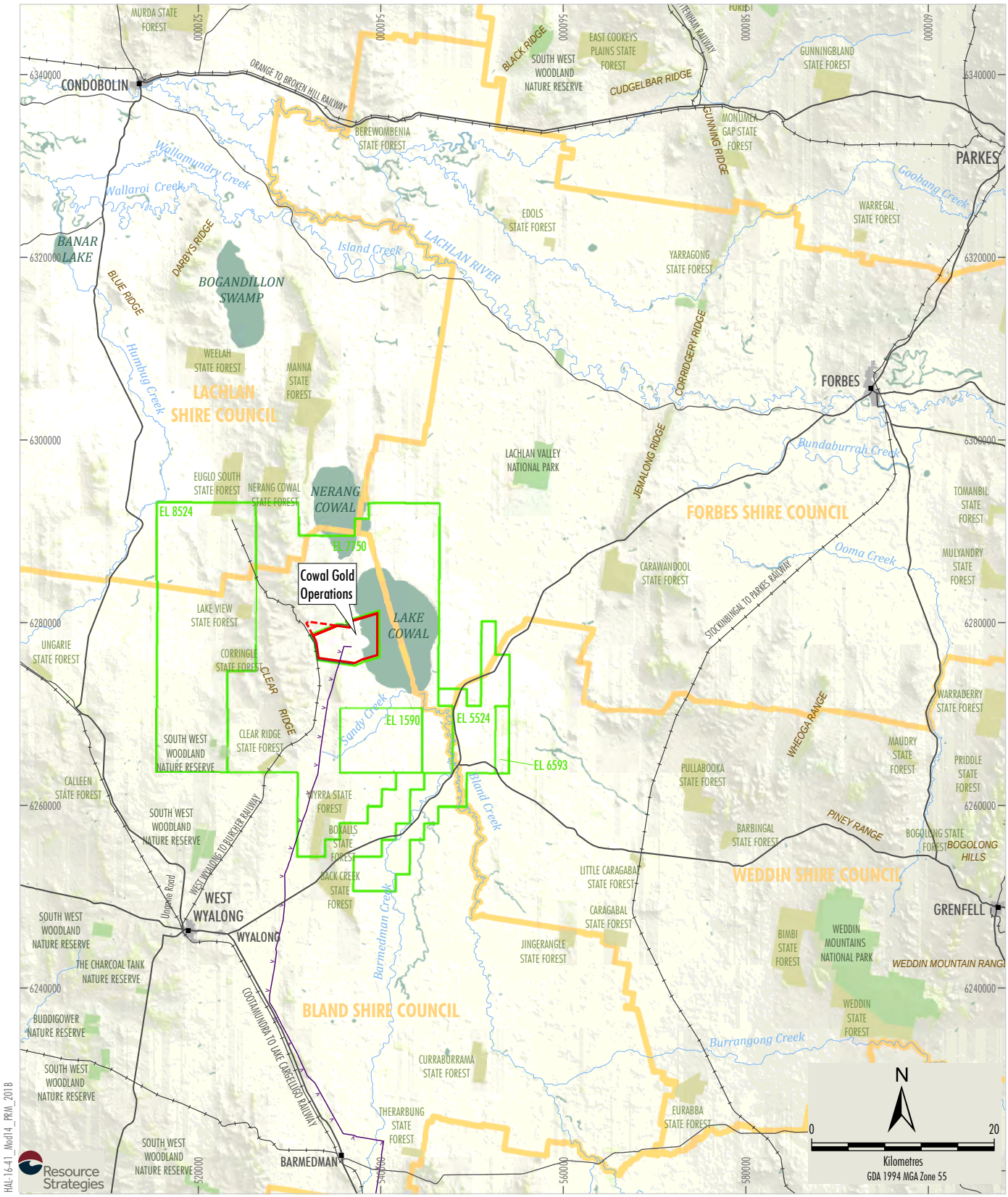
Relevant land ownership within the immediate vicinity of the CGO is shown on Figures 1-3a and 1-3b.

Open pit mining operations at the CGO are supported by on-site facilities including water management infrastructure/storages, a process plant and TSFs. Mined waste rock from the open pit is hauled to waste rock emplacements. Ore mined from the open pit is hauled directly to the primary crusher (adjacent to the process plant), run-of-mine (ROM) pads or low grade ore stockpiles prior to processing.

Mineralised material is also separately stockpiled for potential future processing.

Gold is extracted from the ore using a conventional carbon-in-leach cyanide leaching circuit in the process plant. Tailings are pumped from the process plant via a pipeline to the TSFs. The gold product is recovered and poured as gold bars or doré.

A detailed description of existing operations at the CGO is provided in Section 2.





LEGEND

- Mining Lease Boundary (ML 1535)
- Mining Lease Application (MLA 1)
- Exploration Licence (EL)
- National Park & Nature Reserve
- State Forest
- Local Government Area Boundary
- Electricity Transmission Line
- Railway

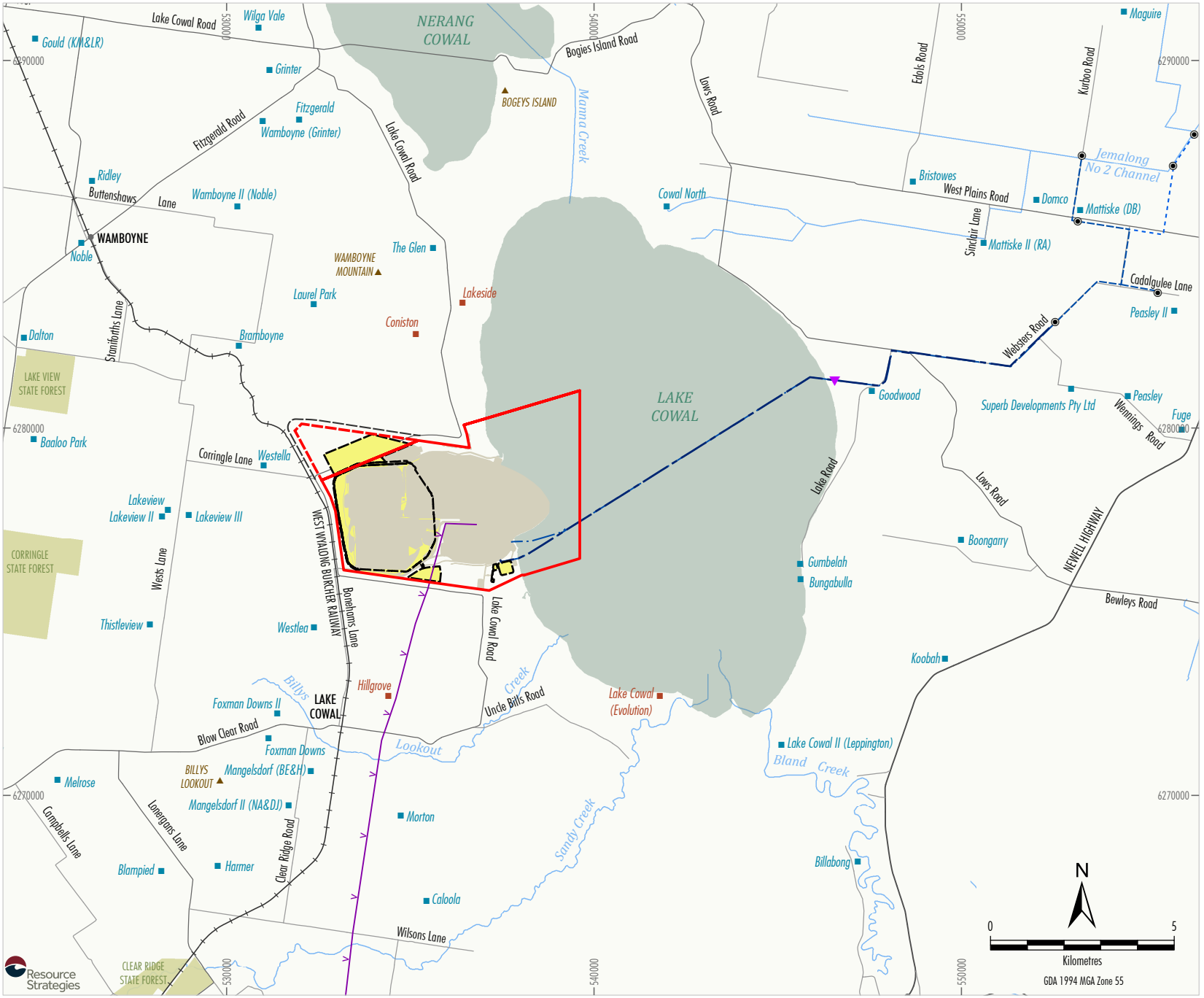
*Source: © NSW Department of Finance, Services & Innovation (2017); Office of Environment & Heritage NSW (2017)*

Evolution Mining Cowal

CGO PROCESSING RATE MODIFICATION

Regional Location

**Figure 1-1**




Evolution Mining Cowal

CGO PROCESSING RATE MODIFICATION

Cowal Gold Operations Location

**Figure 1-2**

**Table 1-1**
**Secretary's Environmental Assessment Requirements – Reference Summary**

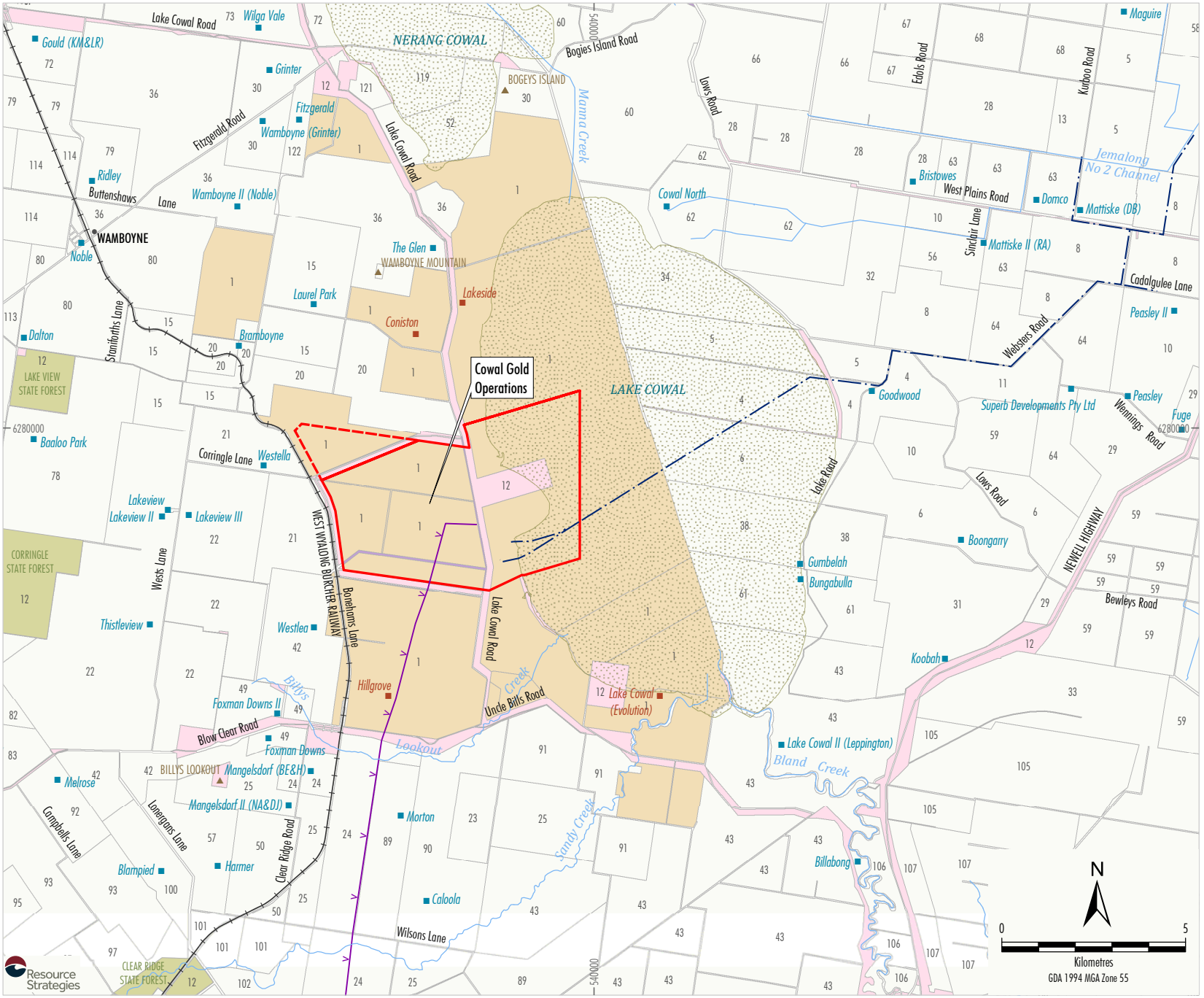
| Summary of EA Requirement[1] | EA Reference |
|---|---|
| ***General Requirements*** | |
| The EA must include: | |
| • A stand-alone executive summary. | Executive Summary |
| • A full description of the Modification. | Sections 3 and 5 |
| • An assessment of the likely impacts of the Modification on the environment. | Section 4 and Appendices A to I |
| • A consolidated summary of all the proposed environmental management and monitoring measures associated with the Modification, and how these measures would be integrated into the existing environmental management framework of the CGO. | Section 7 |
| • The reasons why the development should be approved having regard to:<br>– relevant matters for consideration under the EP&A Act, including the objects of the Act and how the principles of ecologically sustainable development have been incorporated in the design, construction and ongoing operations of the development;<br>– the environmental, economic and social costs and benefits of the development;<br>– the suitability of the site with respect to potential land use conflicts with existing land uses; and<br>– feasible alternatives to the development (and its key components), including the consequences of not carrying out the development. | Section 6.2 |
| The EA must also address the requirements relating to the assessment of matters of national environmental significance under the EPBC Act, in accordance with the Bilateral Agreement between the Commonwealth and NSW Governments. | Table 1-2 |
| ***Specific Issues*** | |
| The EA must address the following specific issues: | |
| • Water; | Section 4.1 and 4.2 and Appendix A and B |
| • Biodiversity; | Section 4.3 and Appendix C |
| • Heritage; | Section 4.4 and Appendix D |
| • Noise and Blasting; | Section 4.5 and Section 4.11.2 and Appendix E |
| • Air Quality; | Section 4.6 and Section 4.11.1 and Appendix F |
| • Land; | Section 4.7 and Appendix G |
| • Visual; | Section 4.8 |
| • Transport; | Section 4.9 and Appendix H |
| • Social & Economic; | Section 4.10 and Appendix I |
| • Hazards; | Section 4.11.5 |
| ***Consultation*** | |
| Consultation with local government, relevant State and Commonwealth Government authorities, service providers, community groups, Registered Aboriginal Parties (RAPs) and affected landowners.<br>The EA must describe the consultation that was carried out, identify the issues raised during this consultation, and explain how these issues have been addressed in the EA. | Section 1.4 and Appendix D |

[1] The complete version of the SEARs is presented in Attachment 2.

**Table 1-2**
**Assessment Requirements Relevant to the EPBC Act – Reference Summary**

| EPBC Act Controlling Provisions[1] | EA Reference |
|---|---|
| ***General Requirements*** | |
| The EA must include: | |
| • a description of the project; | Sections 1 to 3 and Section 5 |
| • assessment of relevant impacts of the Modification on threatened species and communities; and | Section 4.3 and Appendix C |
| • information on proposed avoidance, mitigation and offsetting measures to deal with the impacts of the Modification on the relevant matters. | Section 4.3 and Appendix C |
| ***Key Issues*** | |
| The EA must address issues relating to biodiversity. | Section 4.3 and Appendix C |
| ***Environmental Record of Person Proposing to Take the Action*** | |
| Information in relation to The Environmental Record of a person proposing to take action must include details as prescribed in Schedule 4, clause 6 of the *Environmental Protection and Biodiversity Conservation (EPBC) Regulations, 2000*. | Attachment 2 |
| ***Information Sources*** | |
| The EA must state the source of information, how recent the information is, how the reliabilities of the information was tested, and what uncertainties (if any) are in the information. | Section 8 |

[1] The complete version of the assessment requirements relevant to the EPBC Act is presented in Attachment 2.




LEGEND

- Mining Lease Boundary (ML 1535)
- Mining Lease Application (MLA 1)
- Evolution Mining (Cowal) Pty Limited
- Crown Land
- Local Government
- Private Landholder
- State Forest
- Company-owned Dwelling
- Privately-owned Dwelling
- Railway
- Electricity Transmission Line
- Pipeline

*Refer to Figure 1-3b for Landholder Key*

*Source: Evolution (2018); © NSW Department of Finance, Services and Innovation (2017)*

Evolution Mining Cowal

CGO PROCESSING RATE MODIFICATION

**Land Tenure**

**Figure 1-3a**

HAL-16-41_Mod14_PRM_203A

| Reference No | Landholder |
|---|---|
| 1 | Evolution Mining (Cowal) Pty Limited |
| 2 | Bland Shire Council |
| 3 | Graincorp Operations Limited |
| 4 | BE Mattiske |
| 5 | DB Mattiske |
| 6 | IW Low |
| 8 | PG Hammond |
| 10 | SL Peasley |
| 11 | RG Hammond |
| 12 | The State of New South Wales |
| 13 | West Plains (Forbes) Pty Limited |
| 15 | HJ & WJ Buttenshaw |
| 20 | WJ Buttenshaw |
| 21 | AJ McClintock |
| 22 | The West Pastoral Company Pty Limited |
| 23 | EA & M Mangelsdorf |
| 24 | BE & H Mangelsdorf |
| 25 | NA & DJ Mangelsdorf |
| 27 | State Rail Authority of New South Wales |
| 28 | Bristowes Pastoral Pty Ltd |
| 29 | NJ Fuge |
| 30 | SK & RC Grinter |
| 31 | JA Duff |
| 32 | HE & AJ Duff |
| 33 | AJ Duff |
| 34 | HE Duff |
| 36 | Corrie Vale Pastoral Company Pty Limited |
| 38 | BR Dent |
| 42 | GJ Davies |
| 43 | Leppington Pastoral Co Pty Limited |
| 44 | MH Duff |
| 49 | CL Lee |
| 50 | GF Carnegie |
| 51 | HC & GK West |
| 52 | HJ Buttenshaw |
| 56 | RA Mattiske |
| 57 | RF Harmer |
| 58 | Twynam Pastoral Co Pty Limited |
| 59 | Wyalong Rural Investments Pty Limited |
| 60 | SJ & EP Mickan |
| 61 | ML Dent |
| 62 | WR Low |
| 63 | Domco Trading Pty Limited |
| 64 | Superb Developments Pty Ltd |
| 66 | BV Tooth |
| 67 | HWR McDonald |
| 68 | AJR McDonald |
| 69 | GLR McDonald |
| 70 | KA Maguire |

| Reference No | Landholder |
|---|---|
| 71 | LM & TJ Mackay and LJ & RP Grayson |
| 72 | KM & LR Gould |
| 73 | CI Ridley |
| 74 | HM Corliss and JA & FG Ridley |
| 75 | The Grain Handling Authority Of New South Wales |
| 77 | Country Rail Infrastructure Authority |
| 78 | CF Fuller |
| 79 | IO Ridley |
| 80 | TG & JM Dalton |
| 81 | West Wyalong Local Aboriginal Land Council |
| 82 | LJ Doecke |
| 83 | RJ Moore |
| 85 | JM Ridley |
| 89 | GM & BM Morton |
| 90 | Boltefam Pty Ltd |
| 91 | Zillo Investments Pty Ltd |
| 92 | KA Lindner & GP Lindner |
| 93 | EJ McCarthy |
| 95 | JD & VH Boneham |
| 96 | BY & IG Boyd |
| 97 | Clevedon Properties Pty Ltd |
| 98 | MM Rees |
| 100 | AJ & LF Blampied |
| 101 | MM & MD Carnegie |
| 102 | W Goodwin |
| 103 | LR Martin |
| 104 | MM & MD Carnegie |
| 105 | MK & RT Coles |
| 106 | FR Maslin |
| 107 | Marsden Minoru Pty Limited |
| 109 | EH & JW Maslin |
| 113 | BC & DW Rogers |
| 114 | WJ Worner |
| 116 | IJ Ridley |
| 118 | AB & KM Maslin |
| 119 | ML & CI Ridley |
| 120 | Forbes Shire Council |
| 121 | BJ & RK Gould |
| 122 | DG Fitzgerald |
| 123 | Telstra Corporation Limited |
| 124 | AGL Pipelines (NSW) Pty Limited |
| 126 | D Williams |
| 130 | N.S.W. Grain Corporation Limited |
| 131 | IH Shephard |
| 132 | CR & RD McManus |
| 133 | MA Squier |
| 134 | JT Gray |
| 135 | NA Wilson |

HAL-16-41_Mod14_PRM_001D

Resource Strategies

*Source: Evolution (2017) and Land and Property Information (2017)*

Evolution Mining Cowal

CGO PROCESSING RATE MODIFICATION

**Landholder Key**

**Figure 1-3b**

## 1.2 MODIFICATION OVERVIEW

The Modification involves expansion of the CGO within ML 1535 and a new MLA area (MLA 1, encompassing approximately 255 ha) and an increase to the CGO's approved ore processing rate of 7.5 Mtpa to 9.8 Mtpa.

In general, there would be no change to the existing functionality of the CGO due to the Modification, as the Modification would involve:

- continued mining in the existing open pit for the extraction of gold-bearing ore and waste rock;
- continued use of existing waste rock emplacements in addition to the proposed IWL for the placement of waste rock extracted from the open pit;
- continued use of existing ore processing infrastructure, along with the installation of a secondary crushing circuit within the existing process plant area; and
- continued storage of tailings on-site within the existing TSFs and within the IWL.

The Modification components are shown on Figure 1-4 and Table 1-3 provides a summary comparison of the approved CGO and the Modification components.

The Modification involves **no change** to the following key components of the existing CGO:

- life of the CGO;
- mining methods;
- extent and depth of the open pit;
- lake isolation system;
- maximum waste rock emplacement heights;
- cyanide leaching circuit;
- cyanide destruction method;
- approved cyanide concentration limits in the aqueous component of the tailings slurry;
- water supply sources;
- approved daily or annual extraction limits of the Bland Creek Palaeochannel Borefield;
- site access road;
- power supply;
- exploration activities; or
- hours of operation.

## 1.3 NEED FOR THE PROPOSED MODIFICATION

Recent feasibility studies have identified potential opportunities to maximise the ore processing capacity of the CGO's existing processing plant. On this basis, Evolution proposes to increase the CGO's approved ore processing rate of 7.5 Mtpa to 9.8 Mtpa.

The Modification would improve the financial resilience of the CGO, facilitate the continuity of employment for the CGO workforce, provide job security for local mine employees and contractors (including an additional 10 full time jobs) and continue to stimulate demand in the local and regional economy.

The Modification would result in additional contributions to regional and NSW output and business turnover and household income.

The Modification would include implementation of mitigation measures, and management measures (including performance monitoring), to minimise potential impacts on the environment and community (Section 4).

## 1.4 CONSULTATION

Consultation has been conducted with key State government agencies, local councils, and the local community during the preparation of this EA. A summary of this consultation to date is provided below.

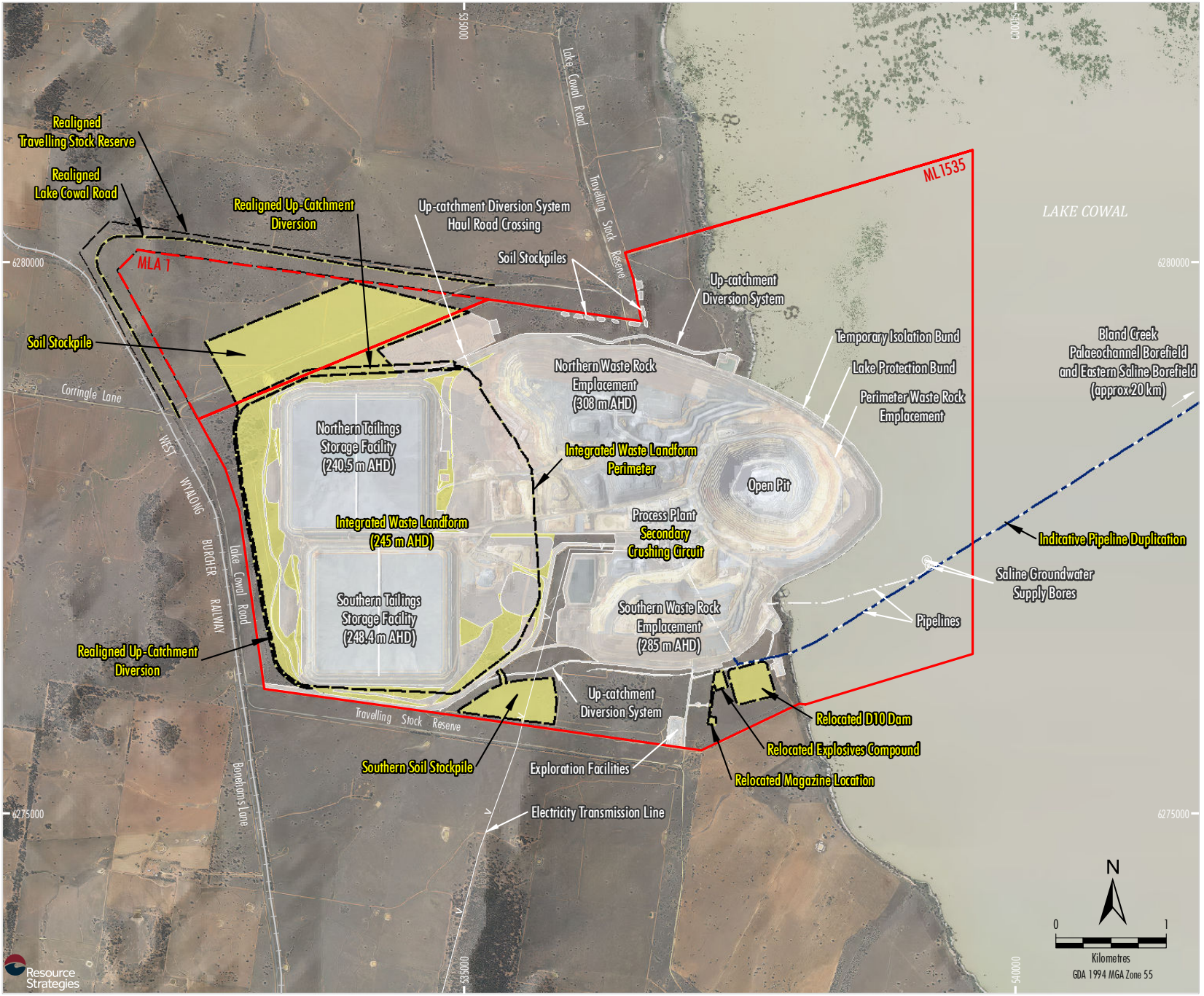
Consultation will continue during the public exhibition of this EA and the assessment of the Modification.

### 1.4.1 State Government Agencies

***NSW Department of Planning and Environment***

Evolution has kept in contact with DP&E through the *Cowal Gold Operations Mine Life Modification Environmental Assessment* (Evolution, 2016) (Mine Life Modification) regarding the proposed Modification.

Evolution met with the DP&E in June and September 2017 to discuss the scope of the EA for the Modification and the assessment and approvals process.




LEGEND

- Mining Lease Boundary (ML 1535)
- Mining Lease Application Boundary (MLA 1)
- Approximate Extent of Approved Surface Development
- Approximate Extent of Additional Modification Surface Disturbance
- Modification Component

*Source: Evolution (2018); © NSW Department of Finance, Services & Innovation (2017)*
*Orthophoto: Evolution (Oct 2017)*

Evolution MINING Cowal

CGO PROCESSING RATE MODIFICATION

Modification General Arrangement

**Figure 1-4**

HAL-16-41_Mod14_PRM_204C

**Table 1-3**
**Summary Comparison of Approved CGO and the Modification**

| Development Component | Approved CGO[1] | Proposed Modification |
|---|---|---|
| Tenement | Development approved to occur within the Development Application areas, including ML 1535. | New ML tenement (MLA 1) proposed to north-west of ML 1535. |
| Mining Method | Open pit mining operations. | No change. |
| Life of Mine | 28 year operational life of the CGO, up to 31 December 2032. | No change. |
| Gold Production | Producing a total of approximately 5.5 Million ounces (Moz) of gold over the life of the CGO. | Minor increase in gold production over the life of the CGO in the order of 6.1 Moz (due to processing of additional mineralised material). |
| Open Pit Extent | Development of the open pit in stages as it is progressively deepened and widened within the existing disturbance area. Total open pit area of approximately 131 ha and final depth of approximately -331 metres (m) Australian Height Datum (AHD). | No change. |
| Ore Production and Processing | Approximately 167 million tonnes (Mt) of ore produced over the life of the CGO. | No change. |
| | Gold extracted from the ore using a conventional carbon-in-leach cyanide leaching circuit. | No change. |
| | Ore processing rate of up to 7.5 Mtpa. | Ore processing rate increase up to 9.8 Mtpa.<br>Increased annual consumption of process consumables (including cyanide use [refer below]).<br>No new process consumables.<br>Construction of a secondary ore crushing circuit within existing process plant. |
| | Processing of approximately 31 Mt of mineralised material. | Processing of approximately 39.3 Mt of mineralised material. |
| Waste Rock Management | Mined waste rock emplaced in the northern, southern and perimeter waste rock emplacements over the life of the CGO. | Emplacement of waste rock around the perimeter of the IWL.<br>No change to footprints of the southern or perimeter waste rock emplacements. |
| | Approximately 309 Mt of waste rock produced over the life of the CGO. | Approximately 299 Mt of waste rock produced over the life of the CGO. |
| | Temporary stockpiling of mineralised material on the northern waste rock emplacement to a maximum design height of approximately 288 m AHD. This material would be processed and the stockpile would be progressively removed. | Increase in elevation of the mineralised material stockpile to 320 m AHD. |
| | Northern waste rock emplacement to be constructed to a maximum design height of approximately 308 m AHD. | No change. |
| | Southern waste rock emplacement to be constructed to a maximum design height of approximately 283 m AHD. | No change. |
| | Perimeter waste rock emplacement to be constructed to a maximum design height of approximately 223 m AHD. | No change. |
| Soil Management | Application of soil resources management strategies/objectives in accordance with the existing Erosion and Sediment Control Management Plan (ESCMP). | No change. |
| | Development of soil stockpiles within ML 1535. | Relocation of soil stockpiles within ML 1535 and development of new soil stockpiles within ML 1535 and MLA 1. |

**Table 1-3 (Continued)**
**Summary Comparison of Approved CGO and the Modification**

| Development Component | Approved CGO[1] | Proposed Modification |
|---|---|---|
| TSFs | Tailings deposited in two TSFs (Northern and Southern).<br>Approved construction of a rock fill buttress cover on the outer slopes of the TSF embankments to provide long-term stability. | Modification/expansion of existing TSFs within ML 1535 (i.e. the IWL) to integrate with the northern waste rock emplacement. |
| | The TSF footprints cover an area of approximately 350 ha. | New footprint for the IWL. |
| | Northern TSF (NTSF) and Southern TSF (STSF) to be constructed to a maximum design height of approximately 264 m AHD and 272 m AHD, respectively. | NTSF and STSF to be constructed to approximately 240 m AHD and 248 m AHD, respectively.<br>IWL within ML 1535 to be constructed to maximum design height of approximately 245 m AHD. Tailings deposition within the IWL would inundate the NTSF. |
| | No construction work on the TSF embankments between the hours of 7.00 am to 6.00 pm. | Waste rock hauled to the IWL and handled 24 hours a day.<br>An increase to the TSF construction fleet. |
| Cyanide Concentration Levels | Use of cyanide in accordance with the approved Cyanide Management Plan (CMP). Cyanide concentrations in the aqueous component of the tailings slurry stream at the process plant not to exceed the following:<br>• 20 milligrams per litre (mg/L) weak acid dissociable cyanide ($CN_{WAD}$) ($90^{th}$ percentile over 6 months); and<br>• 30 mg/L $CN_{WAD}$ (maximum permissible limit at any time). | No change. |
| Cyanide Consumption | Cyanide consumption for the primary and oxide circuits is approximately 0.7 kilograms (kg) and 0.8 kg of cyanide per tonne of ore, respectively.<br>Primary ore leach circuit including recovery of gold from flotation tailings. | Increase in annual cyanide consumption for the primary and oxide circuits by approximately 25 percent (%).<br>No change to approved primary ore leach circuit. |
| Water Supply Sources and Infrastructure | Water used for ore processing is sourced from the following internal and external sources:<br>• Return water from the TSFs.<br>• Open pit sump and dewatering borefield.<br>• Rainfall runoff from mine waste rock emplacements, and other areas which is collected as part of the Internal Catchment Drainage System (ICDS) in contained water storages.<br>• Saline groundwater supply borefield which is pumped from four production bores located in the south-east of ML 1535.<br>• Eastern Saline Borefield located approximately 10 km east of Lake Cowal's eastern shoreline.<br>• Bland Creek Palaeochannel Borefield which comprises four production bores within the Bland Creek Palaeochannel located approximately 20 km to the east-northeast of the CGO.<br>• Licensed water accessed from the Lachlan River which is supplied via a pipeline from the Jemalong Irrigation Channel (i.e. Bore 4 offtake). | No change to water supply sources.<br>Duplication of existing water supply pipeline across Lake Cowal.<br>Recovery of water from the TSFs at an increased rate.<br>Additional use of Lachlan River water, in an average year.<br>No change to existing approved water supply storages, except for relocation of contained water storage D10 within ML 1535. |

**Table 1-3 (Continued)**
**Summary Comparison of Approved CGO and the Modification**

| Development Component | Approved CGO[1] | Proposed Modification |
|---|---|---|
| Water Supply Sources and Infrastructure (continued) | Approval for construction of a new pump station and associated diesel generator and access track on the eastern side of Lake Cowal adjacent to the existing mine water supply pipeline to improve capacity/flows.<br>Approval for construction of a new water supply storage (D10) within ML 1535. | No change (except for relocation of D10 within ML 1535). |
| Bland Creek Palaeochannel Borefield Extraction Limits | The maximum extraction of water from the Bland Creek Palaeochannel will not exceed:<br>• 15 megalitres per day (ML/day); or<br>• 3,650 megalitres per annum (ML/annum).<br>Extraction is managed to maintain groundwater levels above the established NSW Department of Industry – Water (DI – Water) (formerly the NSW Department of Primary Industries – Water [DPI – Water]) trigger levels. | No change. |
| Site Water Management Infrastructure | The existing CGO water management infrastructure is comprised of the following major components:<br>• Up-catchment Diversion System (UCDS) and the ICDS (including the contained water storages);<br>• lake isolation system (comprising the temporary isolation bund, lake protection bund and perimeter waste rock emplacement);<br>• integrated erosion, sediment and salinity control system; and<br>• open pit sump and dewatering borefield.<br>Contained water storage D5 is approved to be modified to accommodate the extension of the open pit (known as D5A).<br>Approval for construction of a new contained water storage/sediment dam for the soil stockpile catchment area located in the north of ML 1535.<br>Relocation of some dewatering bores as the open pit extends beyond the currently installed bores around its perimeter. | No change to the existing lake isolation system.<br>Relocation of a portion of the UCDS and ICDS around the IWL (within ML 1535 and MLA 1) and relocation of approved contained water storage D10 (within ML 1535). |
| Biodiversity Offset Strategy | The Biodiversity Offset Strategy is shown conceptually in Appendix 4 of Development Consent (DA 14/98). | Revised Biodiversity Offset Strategy. |
| Power Supply Activities[3] | Electricity to the site via a 132 kilovolt (kV) electricity transmission line (ETL) from Temora, approximately 90 km south of the CGO. | No change. |
| Exploration | Exploration activities undertaken within ML 1535 in accordance with existing tenement. | No change. |
| Site Access Road | Site access road following existing roads from West Wyalong to the CGO. Light vehicle access from Condobolin and Forbes. | No change to existing site access route from West Wyalong to the CGO.<br>Proposed new site access routes from Forbes and Condobolin for temporary use. |
| Hours of Operation | 24 hour operations, seven days a week. | No change. |
| Employment | The average workforce employed at the CGO is currently approximately 385 people (including Evolution staff and on-site contractor's personnel). During peak periods, the CGO employs up to 435 people. | A minor increase (approximately 10 people) to the average and peak workforce employed at the CGO.<br>Short term construction workforce of up to 100 people (road relocation and pipeline duplication). |

1 Approved CGO approved on 26 February 1999 as modified.

2 Evolution has currently installed two of the four approved production bores.

3 The operations of the Eastern Saline Borefield and Temora to Cowal ETL are approved separately under the EP&A Act.

Evolution also wrote to DP&E on 4 September 2017 with a description of the Modification and a request for SEARs. The DP&E subsequently responded on 17 November 2017 by providing SEARs (Attachment 2).

***Regulatory Agencies***

Evolution provided briefing letters in December 2017 presenting an overview description of the Modification and proposed scope for the EA to the following regulatory agencies:

- NSW Environment Protection Authority (EPA);
- DI – Water (formerly DPI – Water);
- DI – Crown Lands;
- NSW Division of Resources and Geosciences (DRG);
- NSW Office of Environment and Heritage (OEH); and
- NSW Roads and Maritime Services (RMS).

Evolution also briefed the DP&E, EPA and DRG during the Annual Review site visit in September 2017 on the Modification and potential environmental impacts.

Evolution met with DI – Water in March 2018 regarding water management issues associated with the Modification. Long-term seepage drainage, final void water levels and use of Lachlan River water as part of the CGO water supply were discussed.

Evolution also met with the EPA in March 2018. Predicted noise and air quality impacts and IWL seepage mitigation measures were discussed.

*Dams Safety NSW*

In October 2017, the Concept Design for the IWL was submitted to Dams Safety NSW for consideration. The Concept Design was subsequently presented at the Dams Safety NSW meeting held in November 2017.

### 1.4.2 Local Councils

ML 1535 is located within the Bland Local Government Area (LGA), while the Bland Creek Palaeochannel and Eastern Saline Borefields are located within the Forbes LGA (Figures 1-1 and 1-2). In addition, one of the preferred access routes to the CGO (i.e. from Condobolin) is located within the Lachlan LGA.

On 7 June 2017, Evolution provided a presentation on the proposed Modification at a Community Environmental Monitoring and Consultative Committee (CEMCC) meeting of which representatives from the Bland, Forbes and Lachlan Shire Councils are members.

Following this, Evolution provided a briefing letter dated 2 November 2017 to the Bland Shire Council, Forbes Shire Council and Lachlan Shire Council outlining the scope of the Modification, approval process and EA.

Evolution also met representatives of the Bland Shire Council, Forbes Shire Council and Lachlan Shire Council in November 2017 to discuss the Modification.

Engagement with the Councils has lead to the inclusion of road base material (i.e. gravel) for use by the Councils and RMS in the Modification description.

### 1.4.3 Water Users

Evolution met with the Lachlan Valley Water Users Group in August 2017 to describe the Groundwater and Surface Water Assessments that would be undertaken for this EA.

Subsequently, in March 2018, Evolution again met with the Lachlan Valley Water Users Group. The retention of the Bland Creek Palaeochannel Borefield trigger levels and existing licenced extraction limits for the Modification was discussed.

### 1.4.4 Public Consultation

***Community Environmental Monitoring and Consultative Committee***

The CEMCC has been established in accordance with Condition 9.1(d) of the CGO Development Consent (DA 14/98). The CEMCC currently consists of:

- four community representatives (including one member of the Lake Cowal Landholders Association);
- one representative of the Lake Cowal Foundation;
- one representative of the Wiradjuri Condobolin Corporation;
- one representative of the Bland Shire Council;
- one representative of the Forbes Shire Council;

- one representative of the Lachlan Shire Council;
- an independent chairperson; and
- two representatives of Evolution.

The CEMCC provides a mechanism for ongoing communication between Evolution and the community.

The CEMCC holds quarterly meetings, and consultation regarding the Modification was conducted during the June, August and December 2017 meetings as well as the March 2018 meeting. This EA will also be made available to all CEMCC members following submission to the DP&E.

***Affected Landowners***

Evolution consulted with affected landholders (i.e. those impacted by noise) in March 2018. A summary of this consultation is provided in Table 1-4.

In addition, Evolution also discussed the proposal to occasionally use Bodells Lane and Lonergans Lane for site access with relevant local landholders. This included consultation with:

- Ross Harmer.
- Matt Goodwin.
- Shirley Bland.
- Charlie and Beth Boyd.
- Dan Mangelsdorf.
- Ben Mangelsdorf.
- Patricia Spaul.
- Phillip Barber.
- Adrian Blampied.
- Geoff and Helen West.
- Christine Lee.
- Greg Davies.
- Brent and Gina Morton.
- Howard and Betty Mangelsdorf.
- Stewart Hetherington.
- Clevedon Properties.
- Mal Carnegie.

No material issues or concerns were raised regarding the proposal.

Further consultation was undertaken with those in proximity to the proposed Lake Cowal Road relocation and pipeline duplication construction activities.

***Cowal Update Newsletter***

Evolution regularly publishes the "Cowal Update" newsletter to provide the wider community with an update on CGO operations and involvement in community activities and sponsorships. The "Cowal Update" newsletter is mailed out to households in the Bland, Forbes and Lachlan LGAs on an annual basis, and is also distributed with the local West Wyalong newspaper, the "West Wyalong Advocate".

The January 2018 edition of the "Cowal Update" included a description of the Modification, the assessment process and potential environmental impacts.

**Table 1-4**
**Summary of Meetings with Affected Landowners**

| Timing | Landowner | Items Discussed |
|---|---|---|
| March 2018 | 21 McLintock "Westella" | • It was noted that "Westella" is in the acquisition zone under the existing CGO Development Consent (DA 14/98) and that the property will remain within the acquisition zone.<br>• The property is tenanted and no noise issues were expressed by the tenant. |
| March 2018 | 36 Nobel "The Glen" | • It was noted that "The Glen" is in the noise mitigation upon request zone under the existing CGO Development Consent (DA 14/98) and that the Modification noise prediction is reduced by 1 decibel (dB) relative to the Mine Life Modification noise prediction. |
| March 2018 | 42 Davies "Westlea" | • It was noted that "Westlea" is in the acquisition zone under the existing CGO Development Consent (DA 14/98) and that this would continue for the Modification. In agreement with the landowner, a valuation of the property has recently been undertaken. |
| March 2018 | 22 West "Lakeview I, II and III" | • It was noted that "Lakeview III" is in the noise mitigation upon request zone under the existing CGO Development Consent (DA 14/98) and that the property will remain within the mitigation zone. |

***Registered Aboriginal Parties***

Extensive consultation was undertaken with RAPs as part of the Aboriginal Cultural Heritage Assessment (ACHA) (Appendix D).

## 1.5 STRUCTURE OF THIS EA

This EA is structured as follows:

| | |
|---|---|
| Section 1 | Provides an overview of the approved CGO, describes the nature of the Modification and proposed need for the Modification and includes a summary of the consultation undertaken in relation to the Modification. |
| Section 2 | Provides a description of the approved CGO. |
| Section 3 | Provides a description of the Modification. |
| Section 4 | Provides a review of the existing environment, assesses potential impacts associated with the Modification and describes the existing CGO environmental management systems and proposed measures to manage and monitor any additional potential impacts. |
| Section 5 | Describes the rehabilitation and landscape management strategy for the Modification. |
| Section 6 | Provides the planning framework and justification for the Modification. |
| Section 7 | Summary of environmental management and monitoring activities. |
| Section 8 | Lists references referred to in Sections 1 to 7 of this EA. |
| Section 9 | Lists abbreviations, acronyms and terms referred to in Sections 1 to 7 of this EA. |

Attachments 1 to 4, and Appendices A to I provide supporting information as follows:

| | |
|---|---|
| Attachment 1 | Cowal Gold Operations Development Consent (DA 14/98). |
| Attachment 2 | Secretary's Environmental Assessment Requirements. |
| Attachment 3 | Site Verification Certificates. |
| Attachment 4 | Aquifer Interference Policy Considerations and Water Licensing. |
| Appendix A | Hydrogeological Assessment. |
| Appendix B | Hydrological Assessment. |
| Appendix C | Biodiversity Assessment Report and Biodiversity Offset Strategy. |
| Appendix D | Aboriginal Cultural Heritage Assessment. |
| Appendix E | Noise and Blasting Assessment. |
| Appendix F | Air Quality and Greenhouse Gas Assessment. |
| Appendix G | Land Contamination Assessment. |
| Appendix H | Road Transport Assessment. |
| Appendix I | Socio-Economic Assessment. |

# 2 DESCRIPTION OF APPROVED COWAL GOLD OPERATIONS

The existing CGO is shown on Figure 2-1, and the approved layout of the CGO is shown on Figure 2-2.

A summary of existing approvals and operations undertaken at the CGO is provided below. Where relevant, a description of measures incorporated into the existing CGO layout and operation designed to minimise potential environmental impacts is also provided.

## 2.1 COWAL GOLD OPERATIONS APPROVAL HISTORY

A study into the compatibility of the CGO with critical conservation values of Lake Cowal over the long-term was completed and reported in the *Cowal Gold Project Environmental Impact Statement* (EIS) (North Limited, 1998). A Commission of Inquiry was held in November 1998 into the environmental aspects of the CGO and related infrastructure.

Development Consent (DA 14/98) for the CGO and Bland Creek Palaeochannel Borefield water supply pipeline (Figure 1-2) was granted by the NSW Minister for Urban Affairs and Planning under Part 4 of the EP&A Act on 26 February 1999.

Separate approvals processes were also undertaken during the same period for the following related infrastructure components for the CGO:

- Upgrade of the mine access road from West Wyalong to the CGO: Approval for the upgrade of the mine access road was granted by the Bland Shire Council on 21 April 1999 under Part 5 of the EP&A Act.
- Temora to Cowal 132 kV ETL: Approval for the ETL (Figure 1-2) was granted by the NSW Minister for Urban Affairs and Planning on 3 August 1999 under Part 5 of the EP&A Act.

The CGO Development Consent (DA 14/98) has been modified on 13 occasions, *viz.* 11 August 2003 (Mod 1), 22 December 2003 (Mod 2), 4 August 2004 (Mod 3), 23 August 2006 (Mod 4), 12 March 2008 (Mod 5), 11 February 2009 (Mod 7), 28 August 2009 (Mod 8), 10 March 2010 (Mod 6), 17 January 2011 (Mod 9), 6 July 2011 (Mod 10), 22 July 2014 (Mod 11), 13 May 2016 (Mod 12) and 7 February 2017 (Mod 13).

The majority of these modifications have involved minor changes to the CGO, and were assessed under section 96 of the EP&A Act.

Six modifications (Mods 6, 9, 10, 11, 12 and 13) have been assessed under section 75W of the EP&A Act. Mod 13 (i.e. the Mine Life Modification) is the most recent to involve more substantive changes including an eight year extension to the approved life of mine.

Development Consent (DA 2011/64) for the operation of the Eastern Saline Borefield (Figure 1-2) was granted by the Forbes Shire Council on 20 December 2010. The approved operation of the Eastern Saline Borefield includes the use of two production bores to extract water from the Cowra Formation aquifer and the use of existing associated works (including a pipeline) to deliver the saline water to the Bland Creek Palaeochannel Borefield pipeline. Mod 10 of Development Consent (DA 14/98) approved the introduction of saline water from the Eastern Saline Borefield to augment the CGO's external water supply.

## 2.2 ORE DEPOSIT DESCRIPTION AND LIFE OF MINE

The CGO currently mines the E42 ore deposit, which occurs within a sequence of semi-conformable sedimentary, volcaniclastic and volcanic rock, and is overlain by recent sedimentation of the Bland Creek Palaeochannel and lake-fill events.

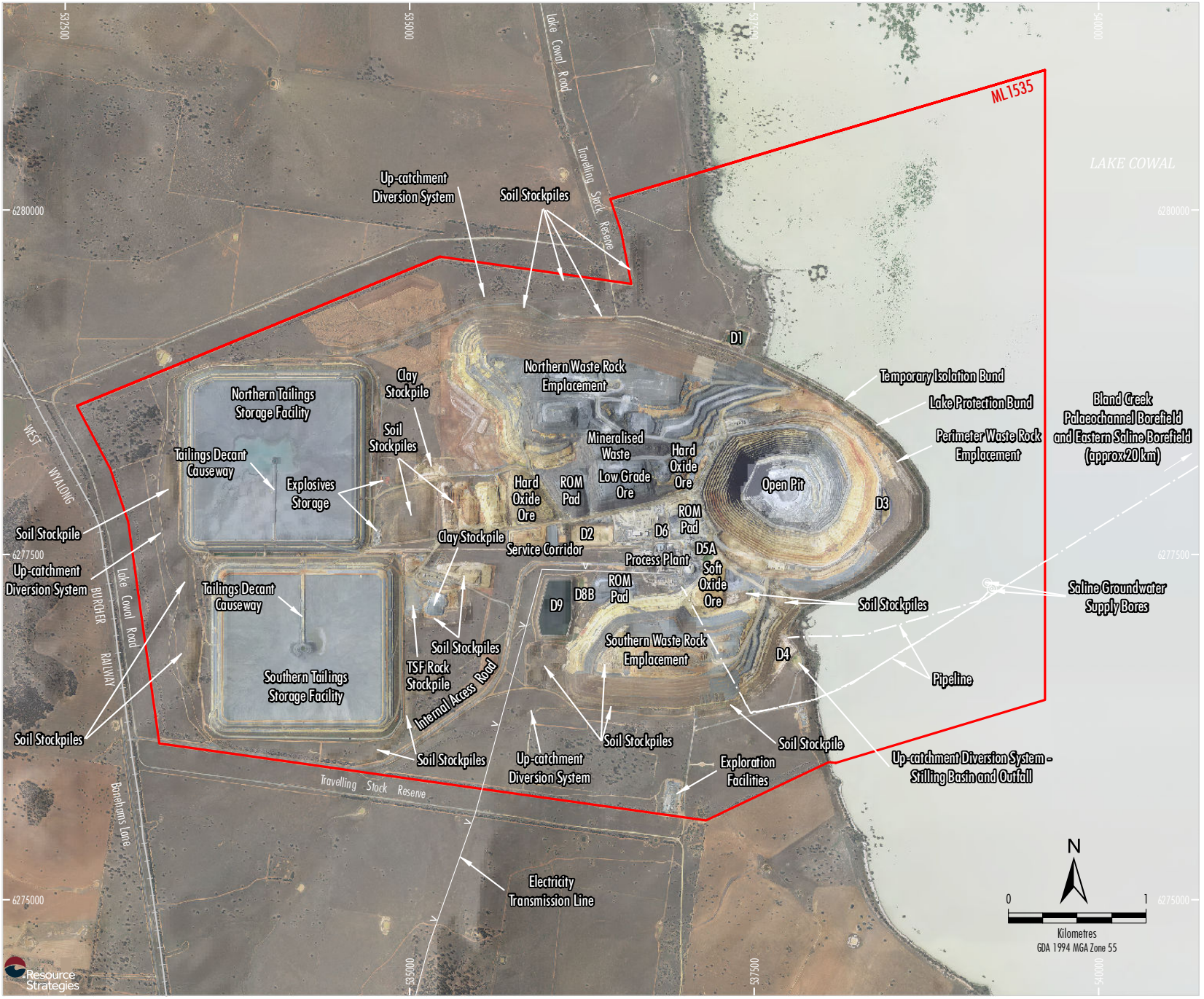
Two ore types are mined at the CGO:

- primary ore, which constitutes 80% of the E42 ore deposit; and
- oxide or weathered ore, which comprises the upper 20% of the ore body.

The two ore types are selectively handled and separated during mining and processing due to the different mineral processing requirements for gold extraction.

The CGO is approved to produce approximately 167 Mt of ore over the mine life. Based on ore grade estimates, total gold production for the approved CGO is approximately 5.5 Moz. In addition, mineralised material is stockpiled separately, and is approved to be processed, subject to market conditions (Section 2.4.2).

Mining operations at the CGO commenced in 2005, and operations are currently approved to continue until 31 December 2032.




LEGEND

Mining Lease Boundary (ML 1535)

*Source: Evolution (2018); © NSW Department of Finance, Services & Innovation (2017)*
*Orthophoto: Evolution (Oct 2017)*

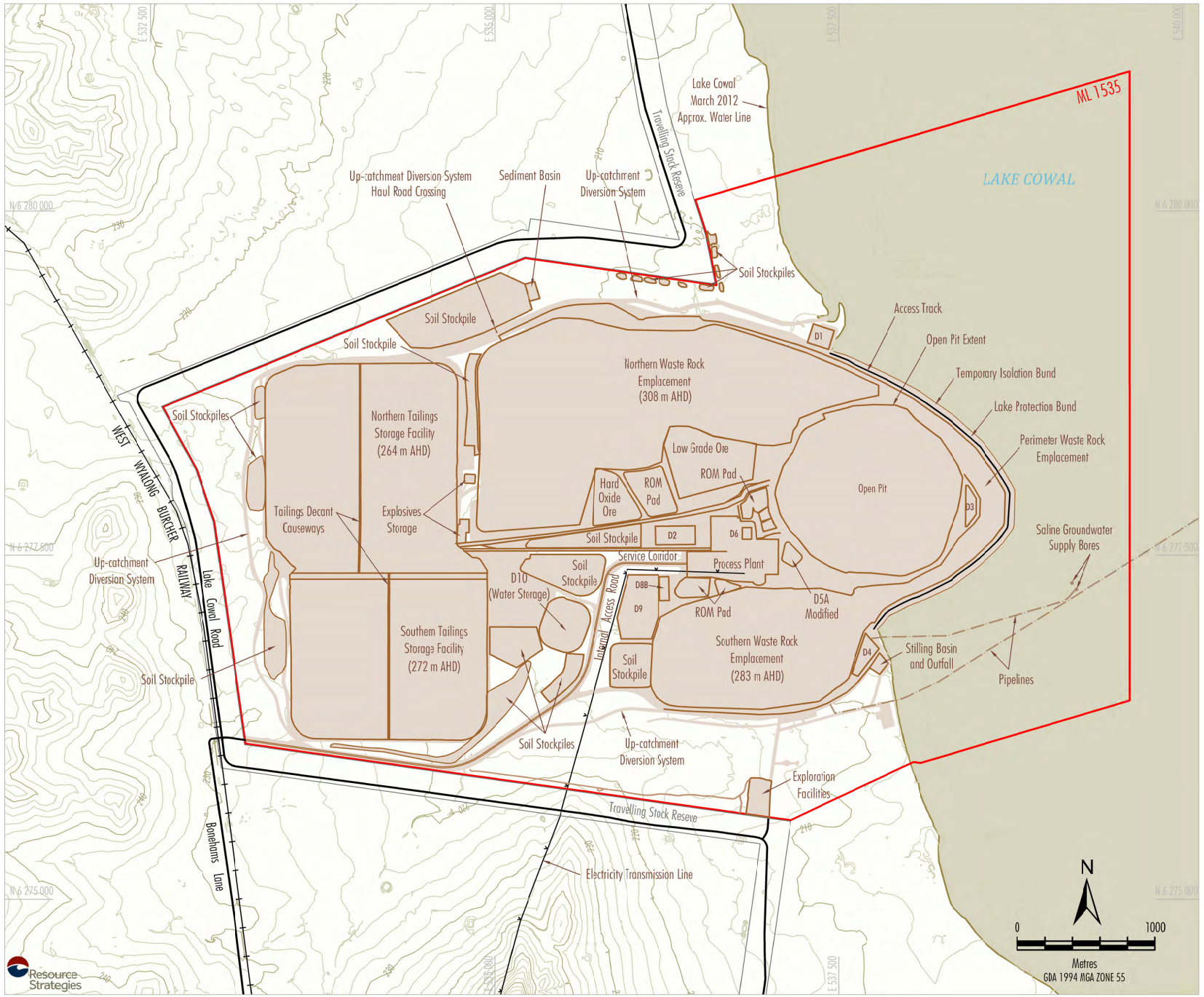
Evolution MINING Cowal

CGO PROCESSING RATE MODIFICATION

Current Status of CGO

**Figure 2-1**

HAL-16-41_Mod14_PRM_208A




Evolution MINING Cowal

CGO PROCESSING RATE MODIFICATION

**Currently Approved CGO Layout**

**Figure 2-2**

## 2.3 MINING OPERATIONS

Mining operations at the CGO are currently conducted in accordance with Development Consent (DA 14/98) and the conditions of ML 1535.

The CGO operates 24 hours per day, seven days per week.

### 2.3.1 Mining Method Overview

Conventional open pit mining methods are used at the CGO. Waste rock and ore is broken through a routine sequence of in-pit drilling and blasting.

Broken waste rock is loaded into large rear dump trucks using hydraulic excavators and is then hauled from the open pit to be placed within the dedicated waste rock emplacements (or for use as construction material). Ore is hauled from the open pit direct to the primary crusher (adjacent to the process plant), ROM pads or to the low grade ore stockpile (Figure 2-2).

The open pit has been developed in stages as the ore body is progressively mined via widening and deepening of the open pit.

### 2.3.2 Open Pit Design

The current open pit area is shown on Figure 2-1. The final dimensions of the currently approved open pit are a surface area of approximately 131 ha and a depth of approximately -331 m AHD (approximately 540 m below the natural ground surface).

The open pit has been designed to operate in consideration of factors of safety appropriate for operating conditions and for the long-term stability of the lake protection bund. Ongoing review of pit wall stability is conducted at the CGO, and berm widths and slope angles are reviewed and monitored through on-going geotechnical studies.

The Monitoring Programme for Detection of any Movement of Lake Protection Bund, Water Storage and Tailings Structures and Pit-Void Walls (LPBMP) (and associated addenda) describes a monitoring programme and management measures in the event of detection of any movement of the open pit walls.

### 2.3.3 Mobile Equipment Fleet

The existing/approved mobile equipment fleet used for ore extraction, waste rock handling, TSF lift and rockfill buttress construction includes:

- excavators;
- haul trucks;
- dozers;
- loaders;
- water trucks;
- articulated dump trucks;
- compactors;
- rollers;
- scrapers;
- graders; and
- drill rigs.

### 2.3.4 Blasting

Ore and waste rock material is broken by drill and blasting techniques. The magnitude of blast sizes is typically approximately 172 kg maximum instantaneous charge. The blasting frequency employed at the CGO is limited to one blast event per day (a single blast event may include a split blast with a number of individual blasts fired in quick succession).

## 2.4 MINE WASTE ROCK MANAGEMENT

A total of approximately 309 Mt of waste rock would be mined over the life of the CGO. Waste rock is placed in a contiguous waste rock emplacement around the open pit consisting of the following three areas (Figure 2-2):

- northern waste rock emplacement;
- southern waste rock emplacement; and
- perimeter waste rock emplacement.

### 2.4.1 Waste Rock Geochemistry

Waste rock geochemistry investigations (North Limited, 1998; Environmental Geochemistry International Pty Ltd, 2004; Geo-Environmental Management Pty Ltd [GEM], 2008; and GEM, 2013) have been conducted for the waste rock mined at the CGO, which have classified waste rock as non-acid forming (NAF). The results indicate:

- oxide waste rock will typically be saline but NAF; and
- primary waste rock will typically be non-saline and NAF, however sulphate salts will be generated if exposed to surficial weathering processes.

As the waste rock is typically NAF, no specific acid rock drainage management measures have been required at the CGO. However, due to the potential for saline seepage occurring from the waste rock emplacements, the waste rock emplacements have been constructed to direct any permeating waters towards the open pit (Section 2.4.2).

### 2.4.2 Northern and Southern Waste Rock Emplacements

The northern waste rock emplacement has been designed to contain the majority of the waste rock generated from the CGO. The northern waste rock emplacement and the southern waste rock emplacement are located to the north-west and south-west of the open pit, respectively (Figure 2-1).

The approved maximum height of the northern waste rock emplacement is 308 m AHD, and the approved maximum height of the southern waste rock emplacement is 283 m AHD (Figure 2-2).

The outer batters of the northern and southern waste rock emplacements are designed to have a final profile with and overall
1 vertical (V):5 horizontal (H) slope.

Design configurations for the northern and southern waste rock emplacements are detailed in the CGO Mining Operations Plan (MOP).

The mine waste rock emplacements have been designed to meet the long-term goal of directing potential seepage generated from waste rock emplacement areas during operation and post-closure toward the open pit.

This has involved construction of a low permeability basal layer for the waste rock emplacements which slopes towards the open pit and would provide drainage control (i.e. the base drainage control zone). Waters permeating through the waste rock emplacements would be intercepted by this low permeability layer and ultimately flow to the open pit.

In accordance with Environment Protection Licence (EPL) 11912 for the CGO, the waste rock emplacement base drainage control zones have been designed with a minimum slope towards the open pit of 1(V):200(H).

The northern waste rock emplacement also contains segregated mineralised material and temporary ROM pad areas. Evolution's current proposal is to process mineralised material if appropriate market conditions allow. However, if appropriate market conditions do not prevail, the mineralised material is proposed to remain as part of the final northern waste rock emplacement landform. Mineralised material is currently stockpiled to a maximum design height of approximately 288 m AHD before recovery of material for processing.

### 2.4.3 Perimeter Waste Rock Emplacement

The perimeter waste rock emplacement has been constructed to surround the open pit to the north, east and south (Figure 2-1).

The perimeter waste rock emplacement forms part of the series of embankments (i.e. temporary isolation bund and lake protection bund) between the open pit and Lake Cowal. The perimeter waste rock emplacement is located behind the lake protection bund (Figure 2-1) and has been constructed from mined oxide waste rock.

The approved maximum height of the perimeter waste rock emplacement is 223 m AHD.

When necessary, Evolution reviews the factors of safety appropriate for the long-term stability of the perimeter waste rock emplacement. These factors are incorporated into the design and development of the perimeter waste rock emplacement as appropriate.

The existing temporary isolation bund and lake protection bund are described further in Section 2.7.

## 2.5 ORE PROCESSING

Ore at the CGO is differentiated into oxide and primary ore. Gold is extracted from the ore using a conventional carbon-in-leach cyanide leaching circuit in the process plant. Recent upgrades to the leach circuit within the process plant will allow for the treatment of flotation tailings to improve gold recovery.

The process plant operates at approximately 890 tonnes per hour (tph) for oxide ore and approximately 950 tph for primary ore on average. The annual ore processing rate at the CGO is currently approved up to 7.5 Mtpa.

The gold extracted from the ore is recovered and poured as gold bars or doré. The finely ground rock residue left after the leaching process (i.e. tailings) is passed through a cyanide destruction process before being discharged to the TSFs.

### 2.5.1 Cyanide Use and Process Consumables

The use of cyanide at the CGO is managed in accordance with the CMP. Sodium cyanide is taken from the storage facility at the CGO as required and mixed in a dedicated mixing tank. The cyanide solution (mixed to 30%) is conveyed to a storage tank then to the leaching circuit in the process plant. Cyanide consumption for the primary and oxide circuits is approximately 0.7 kg and 0.8 kg of cyanide per tonne of ore, respectively.

In addition to cyanide, a number of process consumables (including chemicals and reagents or equivalents) are currently stored and used at the CGO.

### 2.5.2 Cyanide Destruction

As described above, the tailings slurry is passed through a cyanide destruction process before being discharged to the TSFs.

The CGO Development Consent (DA 14/98) details the approved cyanide concentrations in the aqueous component of the tailings slurry stream at the process plant (measured via an automated sampler), which are:

- 20 mg/L $CN_{WAD}$ ($90^{th}$ percentile over 6 months); and
- 30 mg/L $CN_{WAD}$ (maximum permissible limit at any time).

$CN_{WAD}$ levels in the aqueous component of the tailings slurry stream are monitoried twice daily. To date, there has been no exceedance of the approved cyanide concentrations detailed in the CGO Development Consent (DA 14/98).

Cyanide destruction at the CGO is achieved via the use of either Caro's Acid or the INCO (sulfur dioxide) process.

Caro's Acid is a mixture of sulphuric acid and hydrogen peroxide. The INCO process involves the introduction of sulphur dioxide as sodium metabisulphite. Similar to Caro's Acid, the main by-product from the INCO destruction process is cyanate which decays through natural processes. The quantity of reagents added to the tailings (for either the Caro's Acid or the INCO process) is regulated by an online free cyanide measurement to monitor the effectiveness of cyanide destruction in the tailings.

The most recent independent re-certification audit to the International Cyanide Management Code occurred in March 2016, and found that the CGO maintained full compliance during the previous 2 years.

## 2.6 TAILINGS MANAGEMENT

Tailings are delivered from the process plant via a pipeline to two TSFs located approximately 3.5 km west of the Lake Cowal shoreline (Figure 2-1). The approved maximum heights of the NTSF and STSF are 264 m AHD and 272 m AHD, respectively (Figure 2-2). Additionally, the CGO is approved to use the area between the two TSFs as further tailings storage capacity.

An initial starter embankment for each TSF was constructed to provide storage for tailings produced at the commencement of operations at the CGO.

As the TSFs are progressively filled, the embankments are raised in a series of upstream lifts constructed using waste rock stockpiled during mining operations, with the lift section extending from the existing embankment crest and supported by the dry tailings beach. A rock filled buttress cover constructed using waste rock on the outer slopes of the TSF embankments provides additional long-term stability.

The batter slope of each lift is approximately 1(V):3(H), with the overall batter slope of the TSFs approximately 1(V):5(H).

The TSFs embankments are constructed using a mix of clay oxide and primary waste rock material stockpiled during mining operations.

The required free-board is maintained as the storage fills with tailings via the series of scheduled embankment lifts.

Following tailings deposition, supernatant water drains to the central pond and decant towers. The decant tower is accessible via a causeway. An underdrainage pipe network has also been installed to facilitate drainage of the tailings mass. The bulk of the water from each tailings storage drains from the surface of the tailings and collects in the central decant area/well.

This water, as well as underdrainage water, is reclaimed and used within the process plant. The decant system (including access causeway) is progressively raised during development of the TSFs.

Decant causeways across the full width of each TSF are approved, however not yet constructed. If constructed, this would allow each of the existing storages to be divided into two cells.

A number of seepage control measures have been incorporated into the TSFs for the CGO, including:

- the pre-stripping of surficial soils beneath each storage footprint;
- construction of a moisture-conditioned and compacted-low-permeability storage floor, where necessary, to achieve permeability criteria;
- excavation of a central cut-off trench along the length of the starter embankment to a nominal 2.5 m below surface level or to the depth of a low-permeability clay layer, and backfilled with compacted and moisture-conditioned low permeability clay;
- installation of an underdrainage and decant network; and
- installation of a seepage drainage system including perimeter collector pipes on the TSF embankments and sumps at the eastern toe of the NTSF and STSF and the area between the TSFs.

Seepage measures are progressively implemented and informed by investigations such as geophysical testwork, piezometer installation and monitoring and geotechnical drilling.

## 2.7 SITE WATER MANAGEMENT INFRASTRUCTURE

The CGO water management infrastructure is designed to contain potentially contaminated water (contained water) generated within the mining area, and to divert all other water around the perimeter of the site. The existing CGO water management infrastructure is comprised of the following major components described below.

### 2.7.1 Lake Isolation System

The lake isolation system has been constructed to hydrologically isolate the open pit development area from Lake Cowal during mining and post-mining. The lake isolation system is comprised of a series of isolation embankments designed to prevent the inflow of water from Lake Cowal into the open pit development area. The lake isolation system includes the temporary isolation bund, lake protection bund and perimeter waste rock emplacement (Figure 2-1).

### 2.7.2 Up-catchment Diversion System

The UCDS conveys upper catchment surface runoff around the western edge of the CGO and into existing drainage lines to the north and south of the CGO (Figure 2-1).

### 2.7.3 Internal Catchment Drainage System

The function of the ICDS is to separate surface runoff external to the CGO from contained waters generated within the CGO disturbance area.

The ICDS is a permanent water management feature that involves a low bund running alongside the UCDS from the western side of the TSFs extending around the northern and southern perimeter of the northern and southern waste rock emplacements, respectively.

Surface water that is collected within the ICDS is managed by a series of contained water storages, bunds and drains.

Contained water storages D1 to D5A and D8B (Figure 2-2) are used to contain surface water runoff from the mine waste rock emplacements and general site area. Water is pumped to contained water storages D6 or D9 (process water supply storages) (or D10 once constructed) (Figure 2-2) for use during ore processing. The contained water storages have been designed to contain a minimum 1 in 100 year average recurrence interval (ARI) rainfall event or greater. However, D5A, D6, D9 and D10 have been designed to contain a 1 in 1,000 year ARI rainfall event.

Any overflow from contained water storages within the ICDS are directed towards the open pit.

A summary of the function and characteristics of the existing/approved contained storages is provided in Table 2-1.

### 2.7.4 Integrated Erosion, Sediment and Salinity Control System

Sediment control structures, dams and waterways around individual infrastructure components have been constructed at the CGO as part of the ICDS, in accordance with the erosion and sediment control strategies described in the ESCMP.

### 2.7.5 Open Pit Sump and Dewatering Borefield

An open pit dewatering programme is currently in operation at the CGO to manage surface water and groundwater inflows to the open pit.

The surface catchment area draining to the open pit during operation is restricted to the open pit (i.e. incident rainfall) and the small perimeter area.

Water management structures have been installed to divert water from other areas outside the external bund to contained water storages.

The open pit includes water management structures (face seepage collection drains) and an in-pit sump in the floor of the open pit with capacity to contain a 1 in 10 year ARI rainfall event.

Saline groundwater generated during open pit dewatering is pumped to the contained water storages for use in ore processing. Open pit inflows are licensed by Water Access Licences (WALs) 36615 and 36617 (Attachment 4). A network of piezometers has been installed to monitor groundwater draw-down levels over time.

## 2.8 WATER SUPPLY

Water requirements for the CGO include ore processing, as well as dust suppression and potable and non-potable uses.

The total water supply requirement for the process plant is estimated to be approximately 0.9 kilolitres per tonne (kL/t) for primary ore processing and up to approximately 1.7 kL/t for oxide ore processing.

The majority of water used in processing operations is recycled within the process plant. Water losses from the system include tailings pore water and evaporative loss principally from the TSFs. Water used for ore processing is sourced from the following internal and external sources:

- Internal water sources (within the ICDS):
  - water returned from the TSFs, which is stored in contained water storage D6 (process water supply storage);
  - water from the open pit sump which is stored in contained water storages D6, D9 and/or D10 (process water supply storages); and
  - runoff water from the waste rock emplacements, open pit area and other areas within the ICDS which is collected in contained water storages and transferred to the process water supply storages (D6, D9 and/or D10) for re-use in the process plant.
- External water sources (i.e. outside the ICDS):
  - water from the saline groundwater supply bores within ML 1535;
  - water from the Eastern Saline Borefield located approximately 10 km east of Lake Cowal's eastern shoreline;
  - water from the Bland Creek Palaeochannel Borefield, which is pumped from four production bores located approximately 20 km to the east-northeast of the CGO in accordance with approved extraction limits; and
  - licensed water accessed from the Lachlan River, which is supplied via a pipeline from the Jemalong Irrigation Channel.

Some water from the external water supply sources is treated by a Reverse Osmosis (RO) plant prior to use in the process plant or to satisfy other operational requirements. Brine from the RO plant is disposed of in the TSFs.

**Table 2-1**
**Contained Water Storages**

| Storage Number | Catchment/Function | Approximate Storage Capacity (ML) |
|---|---|---|
| D1 (Existing) | Runoff from northern perimeter of the northern waste rock emplacement. Collected water is pumped to D6. | 58 |
| D2 (Existing) | Runoff/seepage from ROM and low grade stockpile areas from the northern waste rock emplacement area, the batters of the NTSF and other areas within the ICDS. Collected water is pumped to D6 or D9. | 198 |
| D3 (Existing) | Runoff from perimeter catchment surrounding the open pit and the perimeter waste rock emplacement areas. Collected water is pumped to D6. | 38 |
| D4 (Existing) | Runoff from the southern perimeter of the southern waste rock emplacement. Collected water is pumped to D6 or D9. | 62 |
| D5A (Existing and modified) | Process plant area drainage collection. Water is pumped to D6. | 79 |
| D6 (Existing) | Process water supply storage. Main source of process plant make-up water requirements. | 19 |
| D8B (Existing) | Runoff from southern waste rock emplacement, the batters of the STSF and other areas within the ICDS. Water is pumped to D9. | 30 |
| D9 (Existing) | Process water supply storage. Storage for raw water. Water is pumped to D6. Some water used for TSFs lift construction. | 731 |
| D10 (Approved but not yet constructed) | Process water supply storage. Storage for raw water. Water is pumped to D9. | 1,500 |

Source: After Appendix B.

ML = mega litres.

Water from the Eastern Saline Borefield and Bland Creek Palaeochannel Borefield is delivered via the mine water supply pipeline. An upgrade to the pumping system (Eastern Booster Pump) is approved, however not yet constructed.

Further description of external water sources is provided below.

### 2.8.1 Saline Groundwater Supply

The locations of the existing saline groundwater supply bores within ML 1535 are shown on Figure 2-1.

Water extraction from the saline groundwater supply borefield within ML 1535 is licensed by WAL 36615 under the *Water Sharing Plan for the Lachlan Unregulated and Alluvial Water Sources 2012*, which has an annual extraction limit of 366 ML[1].

In practice, water extraction from the saline groundwater is currently limited to a maximum of approximately 0.7 ML/day (256 ML/annum) due to the capacity of existing pumping infrastructure.

The existing saline groundwater supply bores are not currently operational due to the inundation of Lake Cowal (i.e. these bores have been decommissioned and would be recommissioned when lake levels recede).

### 2.8.2 Eastern Saline Borefield

The location of the existing Eastern Saline Borefield is shown on Figure 1-2.

Operation of the Eastern Saline Borefield is approved under Development Consent (DA 2011/64) (issued by the Forbes Shire Council) (Section 1.1). The CGO's Development Consent (DA 14/98) was modified on 6 July 2011 to allow the introduction of saline water from the Eastern Saline Borefield to augment the CGO's external water supply.

Water extraction from the bores within the Eastern Saline Borefield is licensed by WAL 36569 under the *Water Sharing Plan for the Lachlan Unregulated and Alluvial Water Sources 2012*. The Eastern Saline Borefield licences have a zero ML licence allocation with an allowable temporary transfer of up to 750 ML/annum per bore.

[1] Based on 1 ML per unit share.

### 2.8.3 Bland Creek Palaeochannel Borefield

The location of the existing Bland Creek Palaeochannel Borefield is shown on Figure 1-2.

Water extraction is licensed by WAL 31864 under the *Water Sharing Plan for the Lachlan Unregulated and Alluvial Water Sources 2012*, which has an annual extraction limit of 3,650 ML[2]. The CGO Development Consent (DA 14/98) currently limits extraction from the Bland Creek Palaeochannel Borefield to 15 ML/day or 3,650 ML/annum.

*Groundwater Contingency Strategy*

In addition to the above, existing extraction from the Bland Creek Palaeochannel Borefield is managed in accordance with groundwater trigger levels developed in consultation with DI-Water and other water users within the Bland Creek Palaeochannel, including stock and domestic users and irrigators, as detailed in the CGO Water Management Plan (WMP).

The trigger levels are as follows:

- Bland Creek Palaeochannel Borefield area: Bore GW036553 (trigger levels of 137.5 m AHD and 134 m AHD).
- Billabong area: Bore GW036597 (trigger level 145.8 m AHD).
- Maslin area: Bore GW036611 (trigger level 143.7 m AHD).

Groundwater levels associated with the Bland Creek Palaeochannel Borefield are monitored by DI-Water.

Investigation and mitigation contingency measures have been developed should groundwater levels reach either relative level (RL) 137.5 m AHD (trigger for investigation) or RL 134 m AHD (trigger for mitigation).

The effect of the above is that pumping from the Bland Creek Palaeochannel Borefield ceases when required to meet the trigger levels described above, and water requirements at the CGO are met by alternative internal or external water supplies, including Lachlan River Water Entitlements (Section 2.8.4).

### 2.8.4 Lachlan River Water Entitlements

Access to water from the Lachlan River Regulated Water Source is licensed by Evolution's High Security WAL 14981 (80 Units), High Security WAL 13749 (zero allocation), and General Security WAL 13748 (zero allocation).

High security and general security zero allocation WALs held by Evolution allow water from the Lachlan River to be accessed, when required, by purchasing temporary water available from the regulated Lachlan River trading market (Appendix B).

During the life of the existing CGO there has been reliable supply of temporary water available from the Lachlan River trading market, including during years of drought.

## 2.9 ELECTRICITY SUPPLY

Electricity to the site is provided via the existing 132 kV ETL from Temora, approximately 90 km south of the CGO.

## 2.10 OTHER SUPPORTING INFRASTRUCTURE AND SERVICES

The CGO has extensive existing infrastructure and services to support its operations, including (in addition to those described in the preceding sub-sections):

- soil stockpiles;
- ROM stockpile areas;
- minor internal roads and haul roads;
- mine access road;
- mineral exploration infrastructure;
- open pit dewatering bores (when required);
- waste storage and transfer facility;
- administration buildings;
- workshop facilities;
- TSF fence; and
- ML 1535 perimeter fence.

[2] Based on 1 ML per unit share.

## 2.11 WORKFORCE

The existing operations at the CGO have an average workforce (including Evolution staff and on-site contractor's personnel) of approximately 385 people. During peak periods, the CGO employs up to 435 people.

## 2.12 MANAGEMENT OF CHEMICALS AND WASTES

***Dangerous Goods and Hazardous and Liquid Wastes***

The on-site storage and management of hazardous and dangerous goods and liquid wastes is undertaken in accordance with the CGO's approved Hazardous Waste and Chemical Management Plan (HWCMP). The HWCMP has been prepared in accordance with relevant legislation, Australian Standards and codes.

***Recyclable Domestic Waste***

Recyclable domestic waste from office buildings and workforce areas is collected regularly and managed by waste disposal contractors.

***Putrescible and Non-Putrescible Waste***

General solid (putrescible) waste and general solid (non-putrescible) waste (as defined in the EPA's [2014] Waste Classification Guidelines) is either recycled or disposed in the waste rock emplacements on-site or in an off-site landfill.

***Bioremediation Waste***

Site-generated hydrocarbon-impacted material (general solid [putrescible] waste) is treated in the on-site designated Bioremediation Facility and is disposed within the waste rock emplacements.

***Trash Screen Oversize Waste***

Trash screen oversize waste from the milling circuit (general solid [putrescible] waste) is disposed within the waste rock emplacements.

***Waste Tyres***

Waste tyres are disposed of within designated areas of the waste rock emplacements.

***Sewage Treatment and Effluent Disposal***

Sewage is treated in the on-site sewage treatment plant and is disposed of to the satisfaction of the Bland Shire Council and the EPA (including the conditions of EPL 11912).

## 2.13 ENVIRONMENTAL MONITORING AND MANAGEMENT

Environmental management at the CGO encompasses a range of management plans and monitoring programmes overseen by statutory planning provisions. Approved and internal management plans/monitoring programmes and/or studies include:

- Air Quality Management Plan (AQMP);
- Biodiversity Offset Management Plan (BOMP);
- Blast Management Plan (BLMP);
- Compensatory Wetland Management Plan (CWMP);
- CMP;
- Emergency Response Plan/Pollution Incident Response Management Plan (ERP/PIRMP);
- Environmental Management Strategy;
- ESCMP;
- Final Hazard Analysis (FHA);
- Fire Safety Study;
- Flora and Fauna Management Plan (FFMP);
- Hazard and Operability Study (HAZOP);
- HWCMP;
- Heritage Management Plan;
- Implementation of the Threatened Species Management Protocol (including Threatened Species Management Strategies) (TSMP);
- Indigenous Archaeology and Cultural Heritage Management Plan (IACHMP);
- Land Management Plan (LMP);
- LPBMP;
- Noise Management Plan (NMP);
- Rehabilitation Management Plan (RMP);
- WMP;
- Soil Stripping Management Plan (SSMP);
- Surface Water, Groundwater, Meteorological and Biological Monitoring Programme (SWGMBMP); and

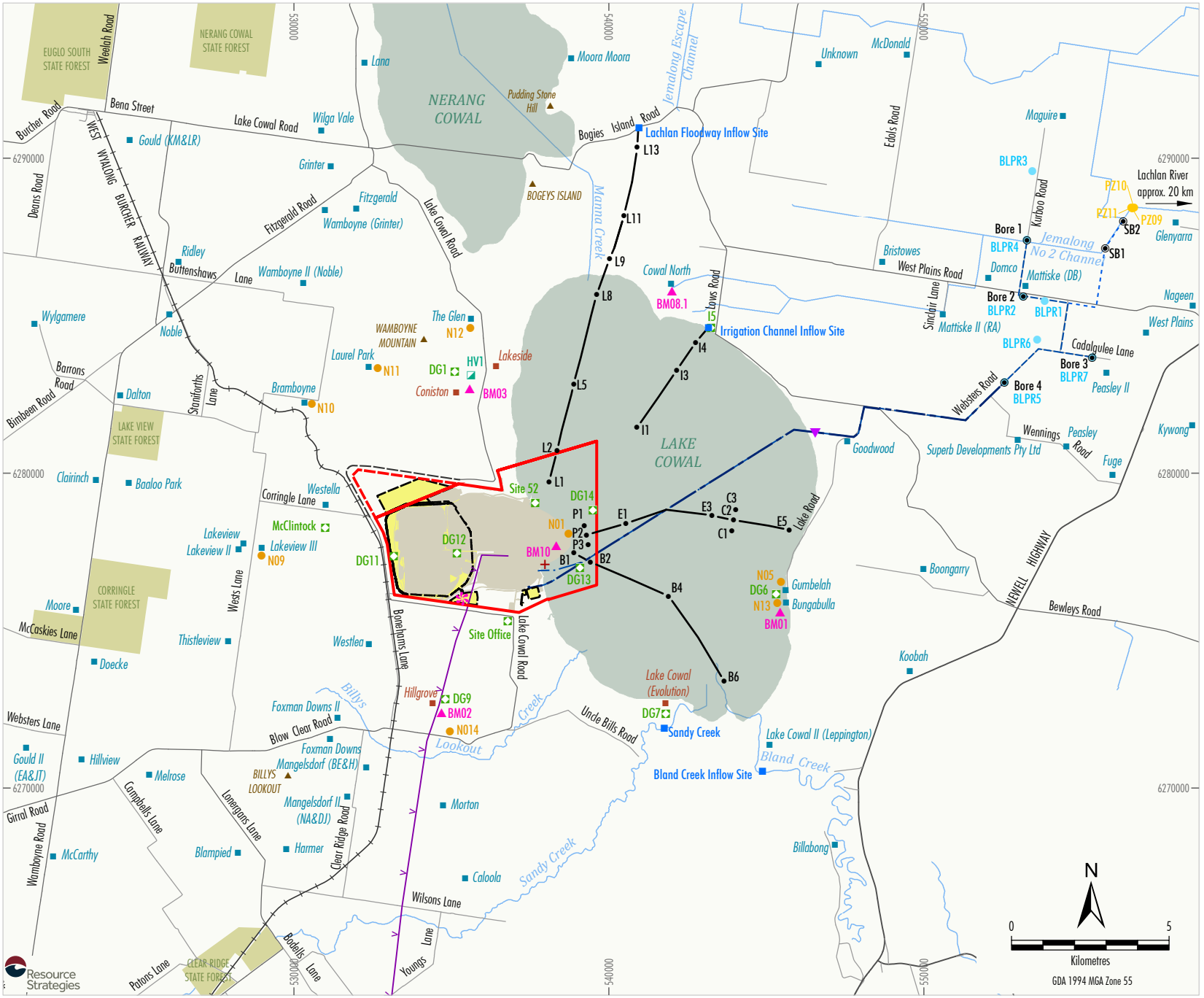
- Transport of Hazardous Materials Study.

Evolution maintains an extensive monitoring programme (Figure 2-3) whereby data is collected, analysed and maintained for reporting, future examination and assessment.

## 2.14 RESOURCE SIGNIFICANCE

Evolution's gold resource statement has been produced in accordance with the *Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves,* (Joint Ore Reserves Committee, 2012) and indicates:

- 43.7 Mt of measured resource;
- 129.71 Mt of indicated resource; and
- 4.24 Mt of inferred resource.


LEGEND
Mining Lease Boundary (ML 1535)
Mining Lease Application (MLA 1)
Approximate Extent of Approved Surface Development
Approximate Extent of Additional Modification Surface Disturbance
Modification Component
Indicative Mine Water Supply Pipeline Duplication
Company-owned Dwelling
Privately-owned Dwelling
State Forest
Railway
Electricity Transmission Line
Mine Water Supply Pipeline
Bland Creek Palaeochannel Borefield
Eastern Saline Borefield
Eastern Pump Station
Blast Monitoring Site
Noise Monitoring Site
CGO Meteorological Station
Lake Level Monitoring Site
Dust Deposition Gauge
TSP High Volume Sampler
Inflow Sample Site
Eastern Saline Borefield Groundwater Monitoring Bore
Bland Creek Palaeochannel Groundwater Monitoring Site
Water and Sediment Quality Monitoring Site
B1 Bland Creek Transect
C1 Control Transect
E1 East Shore Transect
I1 Irrigation Channel Transect
L1 Lachlan Transect
P1 Project Transect
Source: Evolution (2018); © NSW Department of Finance, Services & Innovation (2017)
CGO PROCESSING RATE MODIFICATION
Existing Environmental Monitoring Locations
Figure 2-3
Resource Strategies
HAL-16-41_Mod14_PRM_206C
GDA 1994 MGA Zone 55
Kilometres
0
5
N
Lachlan Floodway Inflow Site
Irrigation Channel Inflow Site
Bland Creek Inflow Site
Site Office
Site 52
LAKE COWAL
NERANG COWAL
Lachlan River approx. 20 km
Jemalong Escape Channel
Jemalong No 2 Channel
Manna Creek
Lake Cowal Road
Bogies Island Road
Bore 1
Bore 2
Bore 3
Bore 4
Lake Cowal (Evolution)
Sandy Creek
Bland Creek
Billys Lookout Creek
Uncle Bills Road
Bonehams Lane
Wests Lane
Lake Road
Websters Road
Cadalgulee Lane
Peasley Road
Wennings Road
Bewleys Road
Newell Highway
Goodwood
Superb Developments Pty Ltd
Gumbelah
Bungabulla
Koobah
Billabong
Boongarry
Nageen
West Plains
Kywong
Fuge
Glenyarra
Peasley II
Mattiske II (RA)
Mattiske (DB)
Domco
Bristowes
Maguire
McDonald
Unknown
Edols Road
Kurboo Road
Sinclair Lane
Loys Road
Cowal North
Lana
Moora Moora
Pudding Stone Hill
BOGEYS ISLAND
Gould (KM&LR)
Grinter
Wilga Vale
Fitzgerald
Wamboyne (Grinter)
Wamboyne II (Noble)
Ridley
Buttenshaws Lane
Wylgamere
Noble
Dalton
Bramboyne
Barrons Road
Bimbeen Road
Stanifarths Lane
Laurel Park
The Glen
WAMBOYNE MOUNTAIN
Lakeside
Coniston
Clairinch
Baaloo Park
Westella
Corringle Lane
McClintock
Lakeview
Lakeview II
Lakeview III
Moore
McCaskies Lane
Doecke
Thistleview
Westlea
Hillgrove
Foxman Downs II
Foxman Downs
Mangelsdorf (BE&H)
Mangelsdorf II (NA&DJ)
BILLYS LOOKOUT
Blow Clear Road
Websters Lane
Gould II (EA&JT)
Hillview
Melrose
Girral Road
Wamboyne Road
McCarthy
Campbells Lane
Lonergans Lane
Clear Ridge Road
Blampied
Harmer
Morton
Caloola
Wilsons Lane
Youngs Lane
Patons Lane
Baddaks Lane
Sandy Creek
Lake Cowal II (Leppington)
EUGLO SOUTH STATE FOREST
NERANG COWAL STATE FOREST
LAKE VIEW STATE FOREST
CORRINGLE STATE FOREST
CLEAR RIDGE STATE FOREST
Weelah Road
Burcher Road
Bena Street
Deans Road
WEST WYALONG BURCHER RAILWAY
Lake Cowal Road
Fitzgerald Road
Ridley
Buttenshaws Lane
Barrons Road
Bimbeen Road
Stanifarths Lane
Corringle Lane
Lakeview
Lakeview II
Wests Lane
Bonehams Lane
Lake Cowal Road
Billys Creek
Uncle Bills Road
Sandy Creek
Bland Creek
Newell Highway
Bewleys Road
Websters Lane
Girral Road
Wamboyne Road
Clear Ridge Road
Wilsons Lane
Youngs Lane
Patons Lane
Baddaks Lane
Lake Cowal Road
Kurboo Road
Sinclair Lane
Loys Road
Webster Road
Cadalgulee Lane
Peasley Road
Wennings Road
Bewleys Road
Newell Highway
Lake Road
Bogies Island Road
Jemalong Escape Channel
Manna Creek
Jemalong No 2 Channel
Lachlan River approx. 20 km
Bore 1
Bore 2
Bore 3
Bore 4
BLPR1
BLPR2
BLPR3
BLPR4
BLPR5
BLPR6
BLPR7
SB1
SB2
PZ09
PZ10
PZ11
L1
L2
L5
L8
L9
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L13
I1
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C3
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DG12
DG13
DG14
HV1
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N05
N09
N10
N11
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BM08.1
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6290000
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5400000

# 3 DESCRIPTION OF THE MODIFICATION

Recent feasibility studies have identified potential opportunities to maximise the ore processing capacity of the CGO's existing processing plant. On this basis, Evolution proposes to modify Development Consent (DA 14/98) under section 75W of the EP&A Act to increase the CGO's approved ore processing rate of 7.5 Mtpa to 9.8 Mtpa (herein referred to as the Modification).

The main activities associated with development of the Modification would include (Figure 1-4):

- increasing the ore processing rate from 7.5 Mtpa to 9.8 Mtpa;
- modification of the existing TSFs to form one larger TSF, which would also accommodate mine waste rock (herein referred to as the IWL);
- relocation of water management infrastructure (i.e. the UCDS and approved location for contained water storage D10) and other ancillary infrastructure (e.g. internal roads and soil and ore stockpiles) elsewhere within ML 1535 and MLA 1;
- installation of a secondary crushing circuit within the existing process plant area;
- duplication of the existing water supply pipeline across Lake Cowal;
- increased annual extraction of water from the CGO's external water supply sources;
- increased consumption of process reagents (including cyanide) and other process consumables;
- an increase in the average and peak workforce employed at the CGO;
- relocation of a travelling stock reserve (TSR) and Lake Cowal Road; and
- provision of crushed rock material to local councils to assist with road base supplies.

Conceptual general arrangements of the Modification for Years 16 (2020), 20 (2024) and 26 (2030) and post-mining are shown on Figures 3-1 to 3-4.

The following sub-sections describe the Modification in further detail. Where relevant, a description of additional measures designed to minimise potential environmental impacts is also provided.

## 3.1 MINING TENEMENT

Mining operations for the CGO are conducted within ML 1535.

In addition, a new MLA (i.e. MLA 1) would be sought to the north of ML 1535 to accommodate soil stockpiles that would be displaced by the construction of the IWL.

## 3.2 ORE DEPOSIT AND LIFE OF MINE

The Modification would involve continued development of the existing/approved open pit to access additional gold-bearing ore within the E42 ore deposit.

The life of the CGO would be unchanged due to the Modification. Mining within the open pit would continue to occur up to Year 20 (2024) and ore processing would continue to be undertaken up to Year 28 (2032).

Changes to ore processing would allow a maximum ore processing rate of 9.8 Mtpa.

An indicative mining and processing schedule for the Modification is provided in Table 3-1.

## 3.3 MINING OPERATIONS

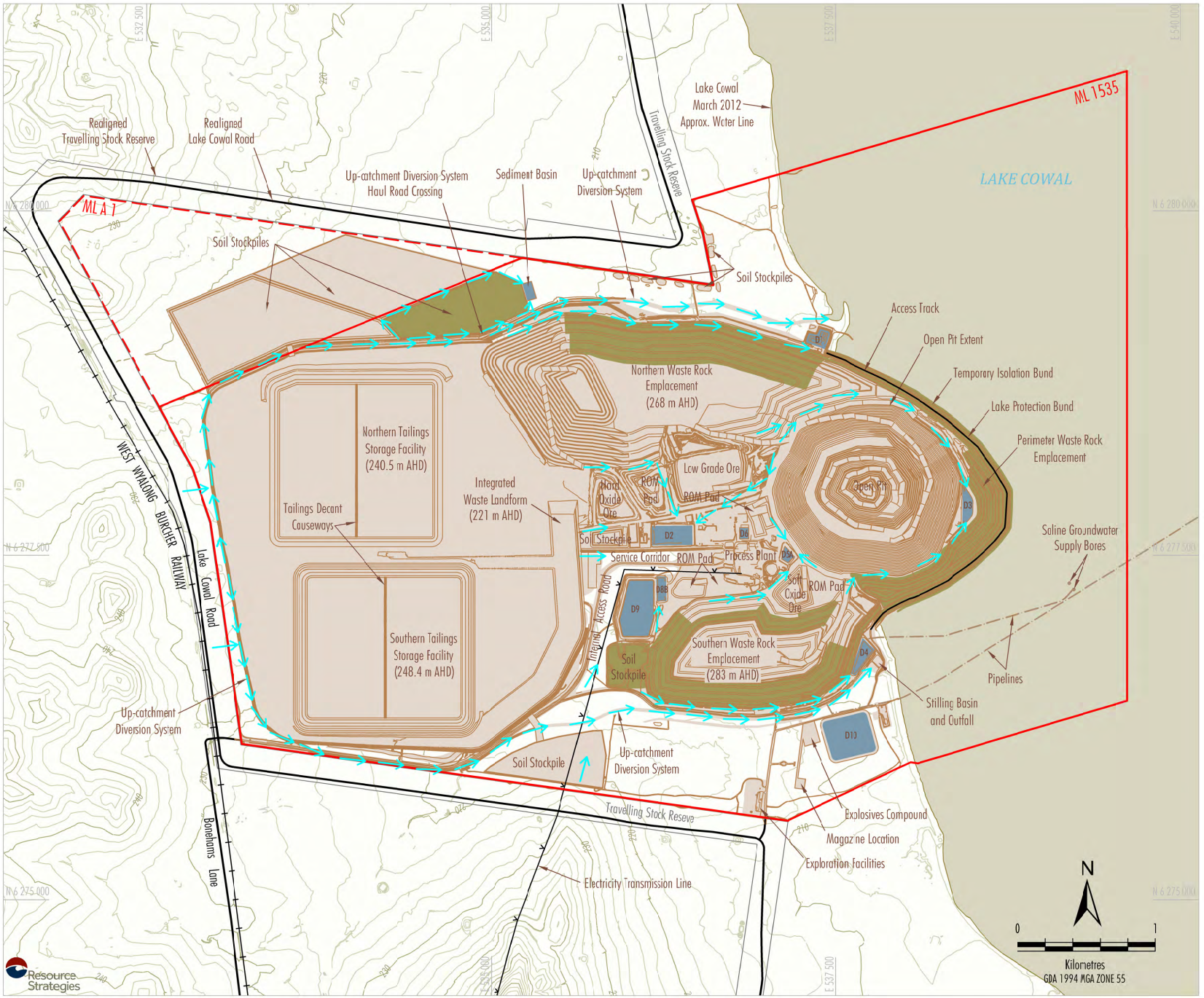
***Mining Method and Schedule***

The Modification would involve the continuation of existing CGO open cut mining methods (Section 2.3). Mining operations would continue to be conducted 24 hours per day, seven days per week, with haulage of waste rock to the IWL and associated handling of waste rock at the IWL also occurring 24 hours per day, seven days per week.

***Open Pit Design***

The Modification would not increase the surface area or depth of the existing/approved open pit. At the end of mining, the open pit would continue to have a maximum depth of approximately -331 m AHD (i.e. approximately 540 m below the natural surface level).

As there would be no change to the extent of the open pit, there would be no change to the existing lake isolation system that currently separates the open pit from Lake Cowal (comprising the temporary isolation bund, lake protection bund and perimeter waste rock emplacement).




LEGEND

- Mining Lease Boundary (ML 1535)
- Mining Lease Application Boundary (MLA 1)
- Approximate Extent of Surface Development
- Contained Water Storage
- Rehabilitated Area (shaped and covered with rock mulch and/or topsoil and vegetation)
- Drainage Path
- Road
- Contour in AHD (2 m Interval)

*Source: Evolution (2018); © NSW Department of Finance, Services and Innovation (2017)*

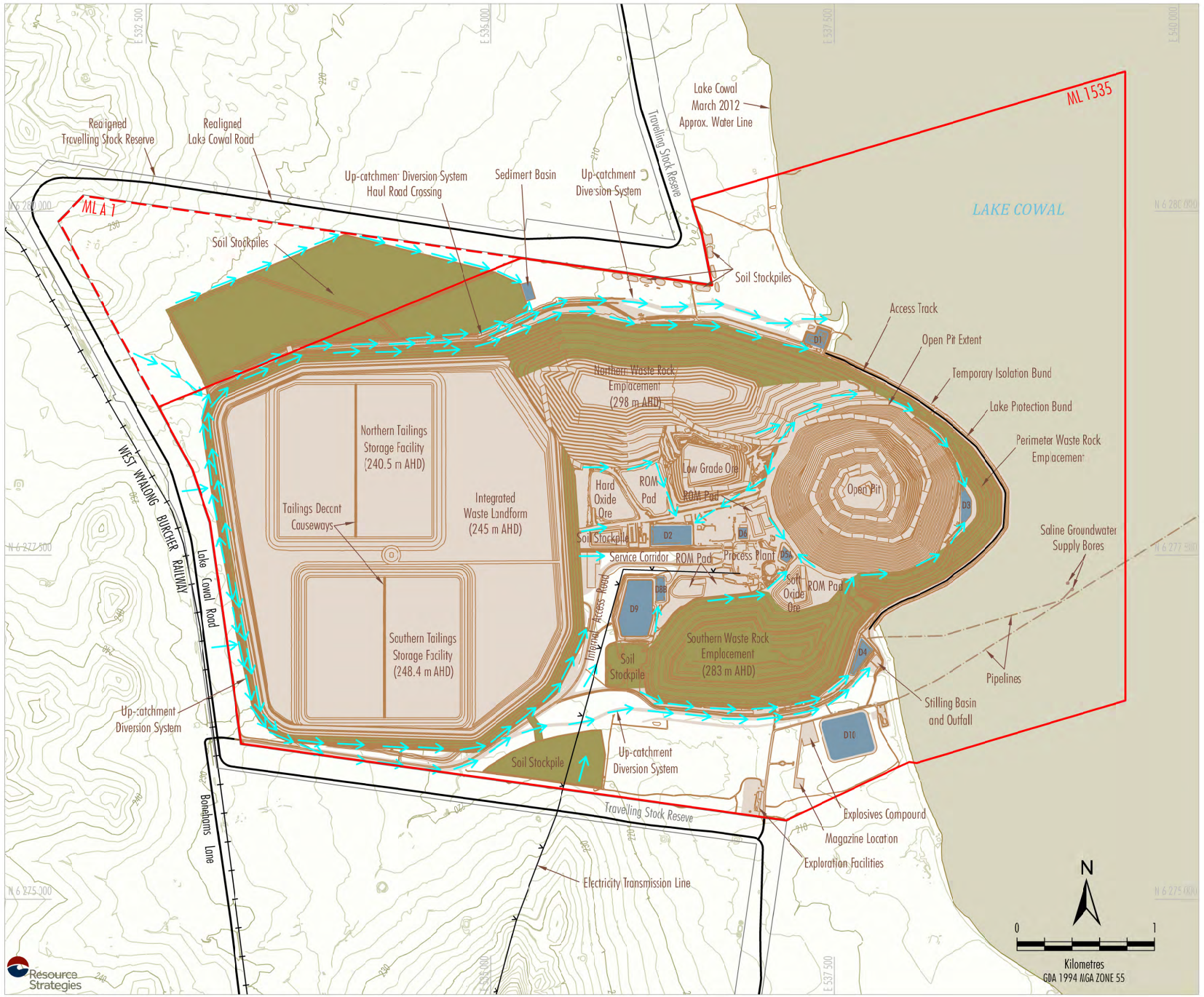
Evolution MINING Cowal

CGO PROCESSING RATE MODIFICATION

**Conceptual General Arrangement Year 16 (2020)**

**Figure 3-1**

HAL-16-41_Mod14_PRM_103E




LEGEND

- Mining Lease Boundary (ML 1535)
- Mining Lease Application Boundary (MLA 1)
- Approximate Extent of Surface Development
- Contained Water Storage
- Rehabilitated Area (shaped and covered with rock mulch and/or topsoil and vegetation)
- Drainage Path
- Road
- Contour m AHD (2 m Interval)

*Source: Evolution (2018); © NSW Department of Finance, Services and Innovation (2017)*

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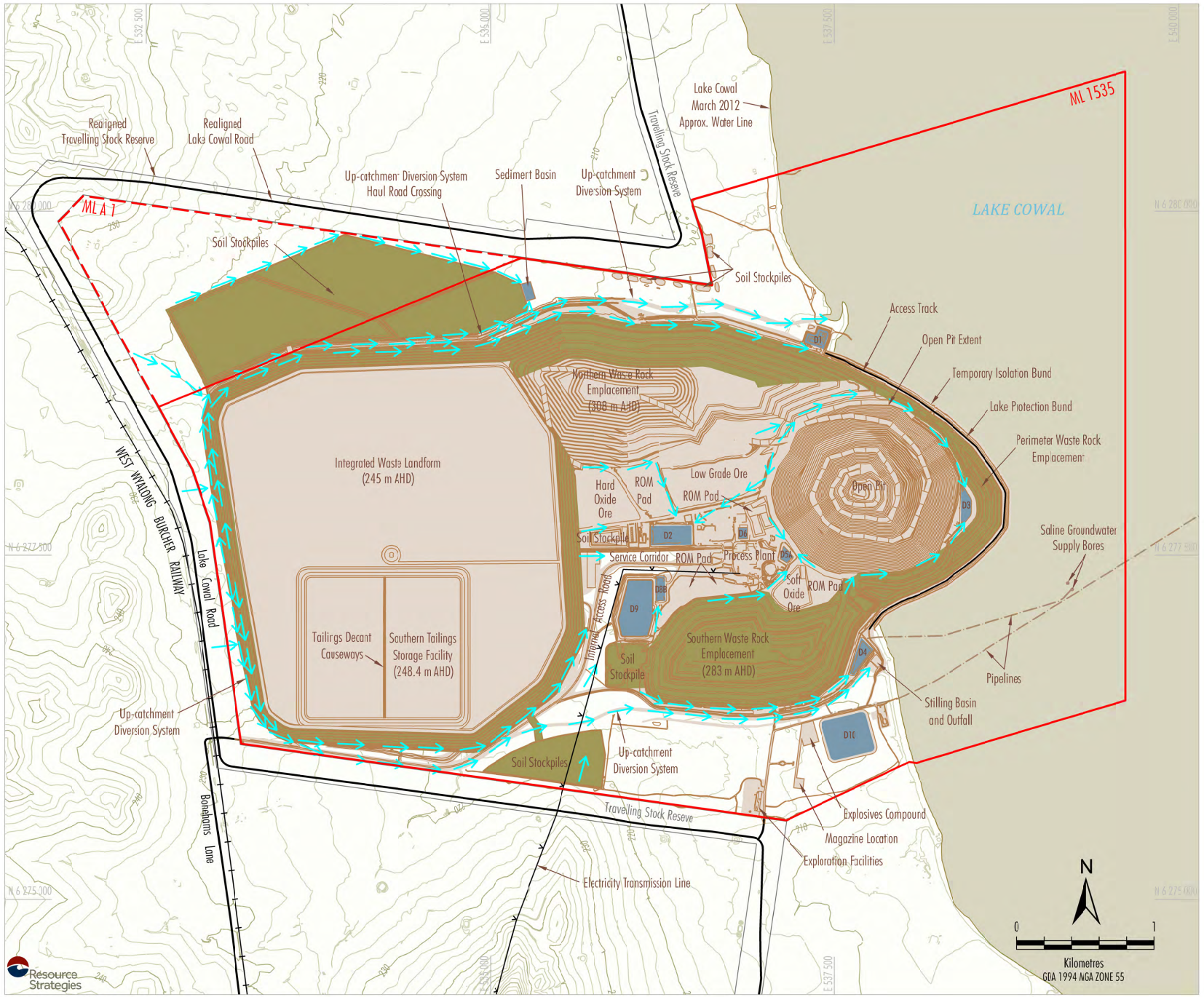
CGO PROCESSING RATE MODIFICATION

**Conceptual General Arrangement Year 20 (2024)**

**Figure 3-2**

HAL-16-41_Mod14_PRM_104E




LEGEND

- Mining Lease Boundary (ML 1535)
- Mining Lease Application Boundary (MLA 1)
- Approximate Extent of Surface Development
- Contained Water Storage
- Rehabilitated Area (shaped and covered with rock mulch and/or topsoil and vegetation)
- Drainage Path
- Road
- Contour m AHD (2 m Interval)

*Source: Evolution (2018); © NSW Department of Finance, Services and Innovation(2017)*

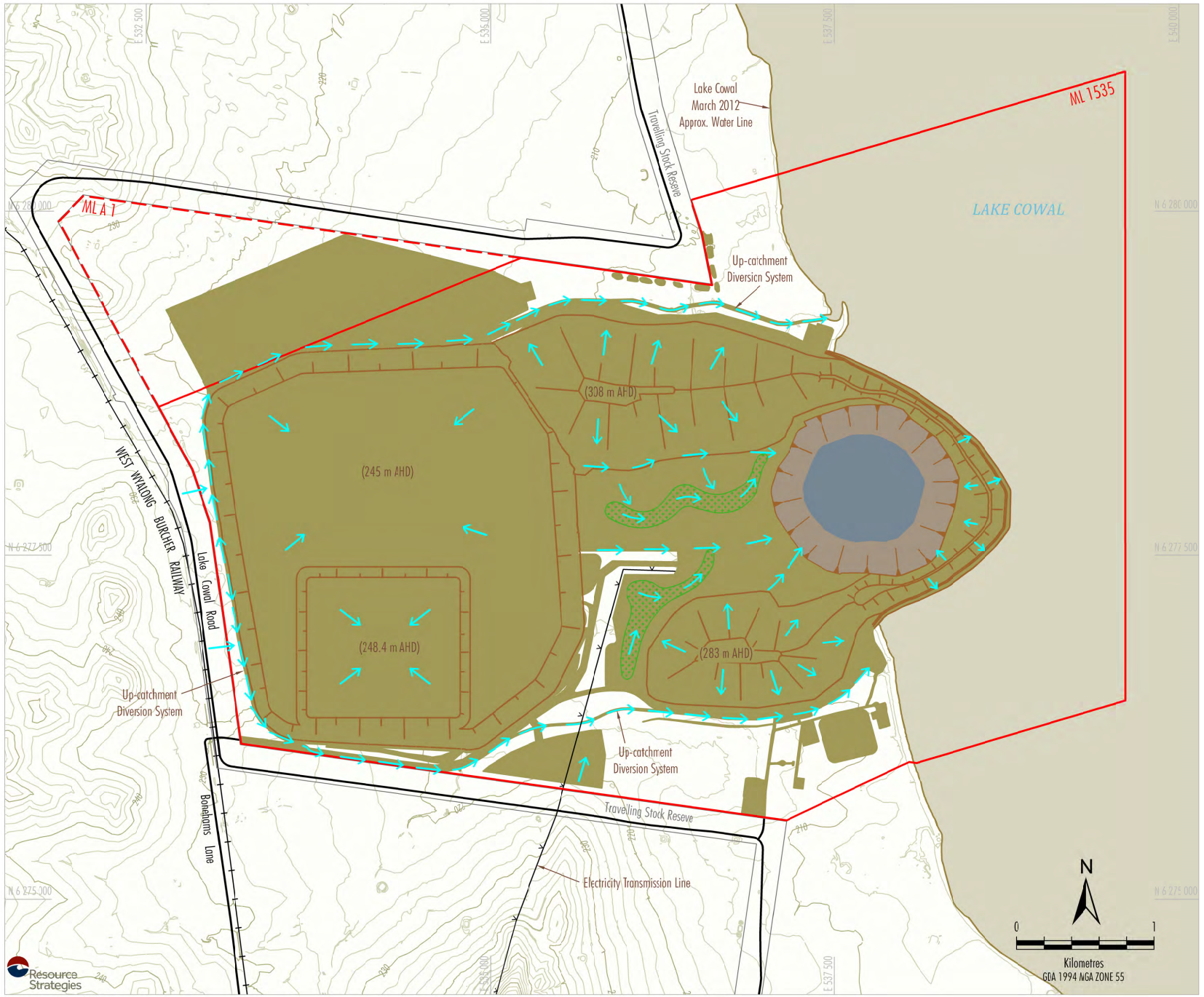
Evolution MINING Cowal

CGO PROCESSING RATE MODIFICATION

**Conceptual General Arrangement Year 26 (2030)**

**Figure 3-3**

HAL-16-41_Mod14_PRM_105E




CGO PROCESSING RATE MODIFICATION

**Conceptual General Arrangement Post-mining**

**Figure 3-4**

HAL-16-41_Mod14_PRM_106A

**Table 3-1**
**Indicative Mining and Ore Processing Schedule**

| | Calendar Year | CGO Year | Ore Mined[1] (Mt) | | | Mineralised Material Mined[1] (Mt) | | | Ore Processed[1,2] (Mt) | | | Waste Rock Mined[1] (Mt) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Oxide | Primary | Total | Oxide | Primary | Total | Oxide | Primary | Total | |
| **Existing CGO** | 2005 to 2017 | 1 to 13 | 16.5 | 94.4 | 110.9 | 5.0 | 14.5 | 19.5 | 5.8 | 76.5 | 82.3 | 216.8 |
| **Modified CGO** | 2018 | 14 | 0.0 | 7.7 | 7.7 | 0.2 | 1.6 | 1.8 | 0.0 | 7.4 | 7.4 | 21.3 |
| | 2019 | 15 | 0.1 | 4.4 | 4.5 | 0.2 | 1.7 | 2.0 | 0.4 | 7.4 | 7.8 | 18.4 |
| | 2020 | 16 | | 2.7 | 2.7 | | 2.3 | 2.3 | 0.4 | 7.5 | 7.9 | 20.4 |
| | 2021 | 17 | | 7.8 | 7.8 | | 3.8 | 3.8 | 0.4 | 8.2 | 8.6 | 12.1 |
| | 2022 | 18 | | 14.3 | 14.3 | | 3.9 | 3.9 | 0.4 | 9.0 | 9.4 | 7.3 |
| | 2023 | 19 | | 8.4 | 8.4 | | 2.6 | 2.6 | 0.4 | 9.1 | 9.5 | 2.4 |
| | 2024 | 20 | | 9.4 | 9.4 | | 3.4 | 3.4 | 0.4 | 9.4 | 9.8 | 0.6 |
| | 2025 | 21 | | 1.4 | 1.4 | | | 0.0 | 0.4 | 9.4 | 9.7 | |
| | 2026 | 22 | | | 0.0 | | | 0.0 | 0.4 | 9.1 | 9.5 | |
| | 2027 | 23 | | | 0.0 | | | 0.0 | 0.4 | 7.3 | 7.7 | |
| | 2028 | 24 | | | 0.0 | | | 0.0 | 0.4 | 7.3 | 7.7 | |
| | 2029 | 25 | | | 0.0 | | | 0.0 | 0.4 | 7.3 | 7.7 | |
| | 2030 | 26 | | | 0.0 | | | 0.0 | 5.0 | 4.5 | 9.5 | |
| | 2031 | 27 | | | 0.0 | | | 0.0 | 6.8 | 2.0 | 8.8 | |
| | 2032 | 28 | | | 0.0 | | | 0.0 | | 3.3 | 3.3 | |
| | *Sub-Total* | | 0.2 | 56.2 | 56.4 | 0.4 | 19.4 | 19.8 | 16.3 | 108.2 | 124.3 | 82.6 |
| **Total** | | | 16.7 | 150.6 | 167.3 | 5.4 | 33.9 | 39.3 | 22.1 | 184.7 | 206.6 | 299.4 |

[1] The sequence and quantities of mining and processing primary and oxide ores, mineralised material and waste rock may change over the life of the mine, subject to detailed mine planning requirements.

[2] The maximum annual ore processed would be 9.8 Mtpa.

Note: Discrepancies in totals due to rounding.

***Mobile Mine Equipment Fleet***

As the open pit dimensions would not change, the existing mobile mine equipment fleet used at the CGO (Section 2.3.3) would similarly not materially change for the Modification.

Following Year 16 (2020), the mobile mine equipment fleet required would continue to decrease proportionally with the decrease in the total waste and ore mined (Table 3-1).

***Blasting***

The typical blast design details and the average blasting frequency (i.e. maximum of one blast event per day) for the existing operations (Section 2.3.4) would remain unchanged for the Modification.

## 3.4 MINE WASTE ROCK MANAGEMENT

***Mine Waste Rock Schedule***

The Modification would not increase the maximum quantity of annual waste rock mined or total mined over the life of mine compared to the approved CGO.

Following Year 16 (2020), annual waste rock quantities would progressively decrease as the ore-to-waste ratio improves.

Mineralised material would continue to be separately stockpiled adjacent to the northern waste rock emplacement (Figure 1-4). The Modification would involve temporarily increasing the design height of the existing mineralised material stockpile (up to approximately 320 m AHD). However, as the approved CGO involves processing of this material, the mineralised material stockpile would be progressively removed (dependent on market conditions) (Table 3-1).

***Mine Waste Rock Geochemistry***

An assessment of the acid-generating potential and metal-leaching behaviour of mine waste rock associated with the development of the Modification has been undertaken (GEM, 2016).

As no change to the open pit is proposed with the Modification, there would be no change to the geochemical characteristics to those from the approved CGO waste rock geochemistry (GEM, 2016). On this basis, existing mine waste rock management strategies would continue to be implemented for the Modification.

Mine waste rock material suitable for use as a cover system for the waste rock emplacements (i.e. for rehabilitation) would also be segregated for use as described in Section 5.

***Waste Rock Emplacements***

Waste rock would be emplaced at the IWL in addition to the existing waste rock emplacements.

A waste rock balance was conducted for the Modification and it was found the volume of waste rock required for the IWL is offset by the volume of waste emplacement that is foregone from the portion of the northern waste rock emplacement displaced by IWL development (Figure 1-4).

Therefore, no change to the approved heights of the northern, southern or perimeter waste rock emplacements is required.

## 3.5 ORE PROCESSING

***Ore Processing Rate and Gold Recovery Methods***

The approved maximum ore processing rate of 7.5 Mtpa would be increased to 9.8 Mtpa.

Gold would continue to be extracted from ore using a conventional carbon-in-leach cyanide leaching circuit. However, the Modification would involve the construction and operation of a new secondary crushing circuit to increase throughput rates. A conceptual primary ore processing flowsheet including the secondary crushing circuit upgrades is provided in Figure 3-5. The secondary crusher would be located within the existing process plant area (Figure 1-4).

The process rate increase would involve an increase in annual cyanide consumption and some other reagents/process consumables (Section 3.5.1). However, no new reagents/process consumables would be used, and no change to the CGO's existing handling or transport methods would be required for the Modification.

***Ore Processing Schedule***

Oxide ore would be gradually processed throughout the life of mine, followed by a short campaign (i.e. during Years 26 and 27 [2030 and 2031]), however, the sequence of processing for primary and oxide ore may change over the mine life, subject to detailed scheduling of mining and processing requirements.

Any changes to the ore processing schedule would be detailed in a revised MOP which would be prepared in consultation with the DRG.

### 3.5.1 Cyanide Use and Process Consumables

No change to the cyanide consumption rate of approximately 0.7 kg of cyanide per tonne of primary ore and approximately 0.8 kg of cyanide per tonne of oxide ore would occur for the Modification, however annual use would increase in line with the increased ore processing rate.

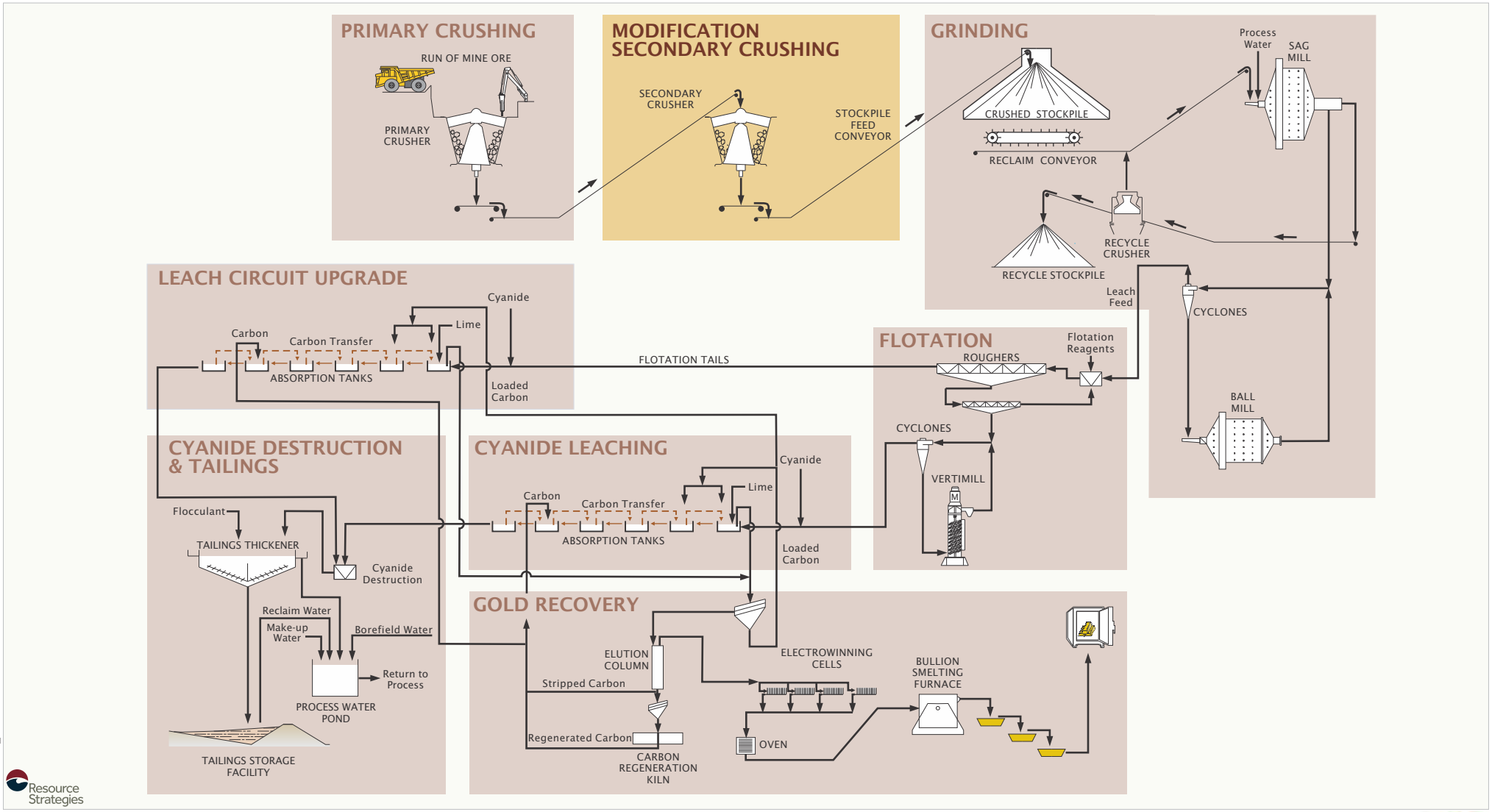
Additional heavy vehicle deliveries would be associated with the additional use of consumables.

### 3.5.2 Cyanide Destruction

The Modification would not change:

- the existing cyanide destruction methods currently used at the CGO (i.e. either Caro's Acid or the INCO process) (Section 2.5.2); or
- the approved $CN_{WAD}$ concentration limits of the aqueous component of the tailings slurry stream (Section 2.5.2).

The quantity of cyanide destruction reagents added to the tailings (for either Caro's Acid or INCO processes) would continue to be regulated by an on-line free cyanide measurement.




HAL-16-41 ML Mod_003A

Resource Strategies

*Source: Evolution (2018)*

Evolution Mining Cowal

CGO PROCESSING RATE MODIFICATION

Indicative Primary Ore Process Flowsheet

**Figure 3-5**

The mitigation and management measures described in the CMP (including the cyanide monitoring process) would continue to be implemented for the Modification.

## 3.6 TAILINGS MANAGEMENT

***Geochemical Characteristics of Tailings***

As no change to the open pit is proposed, there would be no change to the tailings geochemical characteristics to those from the approved CGO (GEM, 2016). As such, existing tailings management strategies would continue for the Modification (GEM, 2016).

***Residual Raises of the Existing Tailings Storage Facilities***

Prior to commissioning of the IWL for tailings storage, the existing TSFs (Section 2.6) would continue to be used to store the additional tailings produced. These facilities would be raised to STSF Stage 7 (248.4 m AHD) and NTSF Stage 6 (240.5 m AHD).

***Integrated Waste Landform***

The Modification would include the development of an IWL to facilitate the storage of tailings over the life of mine. The IWL's design objectives are to (CMW Geosciences, 2018):

- Provide life of mine tailings storage for the CGO.
- Provide optimum removal of water from the facility and return to the plant for re-use for ore processing.
- Optimise tailings storage capacity by maximising tailings density.
- Optimise the earthworks and timing of staging to coincide with open pit mining activities and availability of suitable mine waste material for construction of the IWL.

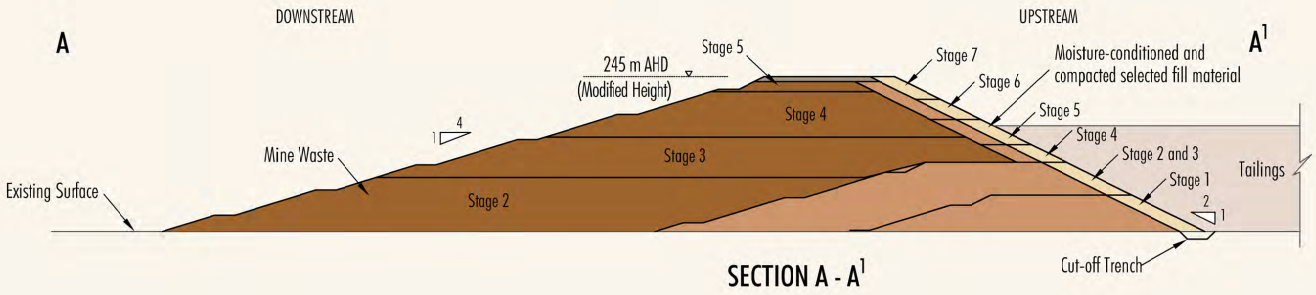
Construction of the IWL would include (CMW Geosciences, 2018):

1. Site preparation including relocation of bores, infrastructure and stockpiles which are presently within the IWL's footprint, and vegetation removal, erosion and sediment control and soil stripping/placement.
2. Construction of a starter embankment comprising an upstream zone of low permeability roller compacted oxide (clayey) mine waste and a downstream waste zone. The waste materials would be sourced from the open pit area. The starter embankment would be approximately 8 m high and would incorporate a cut-off trench excavated into medium plasticity clay in order to reduce seepage losses.
3. The IWL embankments would be constructed progressively between approximately 2020 and 2024 when waste materials are available as part of the mining operation. The IWL starter embankments would be raised in a minimum of four stages using downstream construction techniques. The staged embankment raises would vary in height depending on waste production scheduled from the open pit, however construction would be progressive.
4. A central decant area would be constructed in Stage 1 and a decant accessway would be progressively raised along with the embankments.

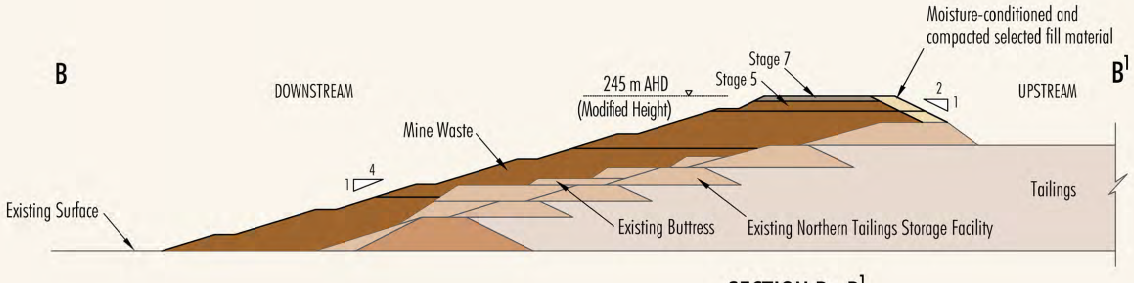
The IWL starter embankment would have design slopes of 1(V):2(H) upstream and 1(V):3(H) downstream. The starter embankment would have a crest width of 28 m. The IWL perimeter embankments would have final design slopes of 1(V):2(H) upstream and 1(V):4(H) downstream and a maximum height of 245 m AHD. Conceptual cross-sections of the IWL are shown on Figures 3-6 and 3-7.

Consistent with the approved TSFs, tailings material would continue to be deposited into the IWL as a slurry under sub-aerial conditions. Free water liberated during settling and runoff from incident rainfall would initially be recovered via temporary pump decants prior to commissioning of a central internal decant pond area, from where it would be subsequently recovered for reuse in the processing plant.

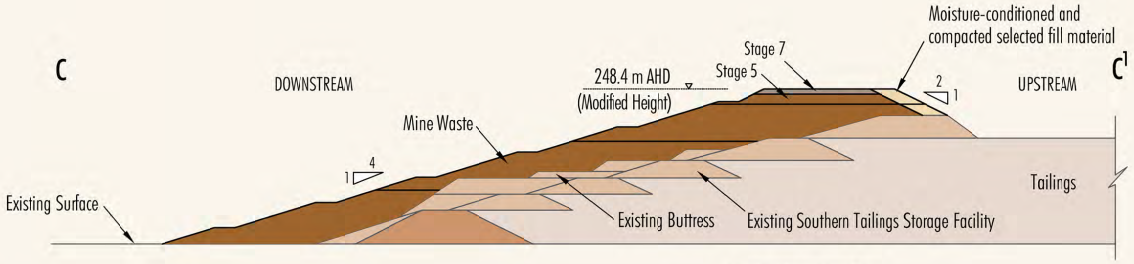
Consistent with the existing TSFs, the tailings deposition would be controlled to promote the segregation of the coarse fraction on the perimeter and the fine fraction towards the centre of the IWL. The different particle settling rates would result in a tailings 'beach' which slopes towards the central decant pond area.



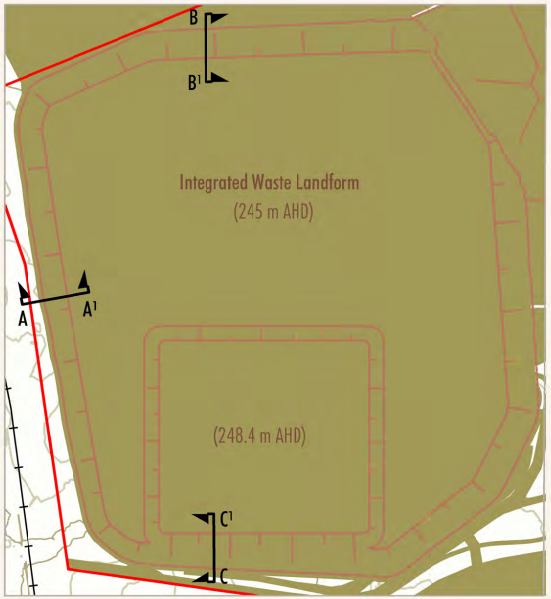

SECTION A - A1




SECTION B - B1




SECTION C - C1




INSET

Refer Figure 3-4

Not to Scale

HAL-16-41 Mod14 PRM 108A

Resource Strategies

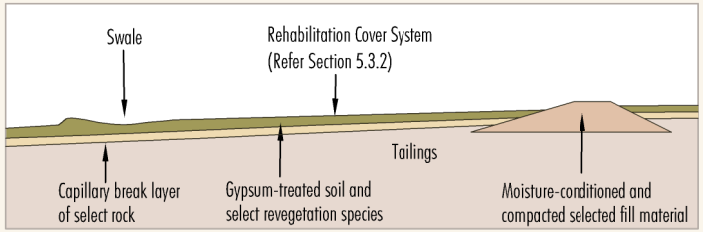
Source: tCMW (2018)

Evolution MINING Cowal

CGO PROCESSING RATE MODIFICATION

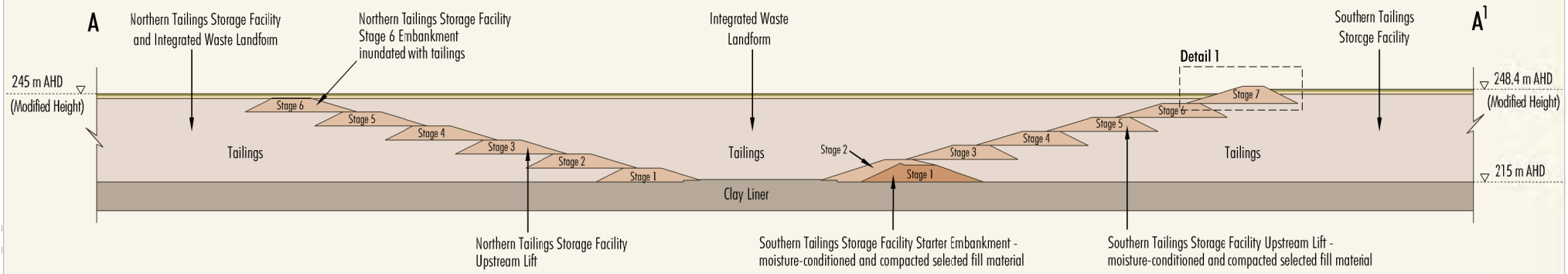
Conceptual Embankment Cross-section of Integrated Waste Landform

**Figure 3-6**




DETAIL 1


INSET
Refer Figure 3-4




SECTION A - A1

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Resource Strategies

*Source: CMW (2018)*

Evolution MINING Cowal

CGO PROCESSING RATE MODIFICATION

Conceptual Cross-section of Central Integrated Waste Landform Area

**Figure 3-7**

The IWL has been designed to maintain a minimum freeboard consistent with the contingency 1 in 1,000 year ARI rainfall event at all times (i.e. as per the WMP).

The low permeability basement layer constructed for the existing TSFs (e.g. targeted vertical permeability of no greater than 1 x $10^{-9}$ metres per second [m/s]) and other existing seepage control measures (Section 2.6) would be replicated for the IWL, and would continue to control seepage for the life of the Modification.

The design configuration for the IWL would be detailed in a revised MOP which would be prepared in consultation with and subject to approval by the DRG. The design, construction, operation and monitoring of the IWL would be conducted in consultation with and to the satisfaction of Dams Safety NSW.

***Integrated Waste Landform Water Management***

An underdrainage system along the eastern perimeter embankment would be constructed to assist in water recovery and the mitigation of seepage (CMW Geosciences, 2018). The underdrainage system will recover water at multiple locations through inclined bores or similar.

The underdrainage lines would comprise slotted pipe surrounded by clean aggregate, wrapped in geotextile and stabilised by select rock. The underdrainage lines grade to sumps with water collected in the underdrains to flow under gravity to the sumps (CMW Geosciences, 2018).

No changes to seepage flow directions are expected for the Modification (i.e. the open pit would continue to act as a sink for seepage flows from the TSFs/IWL) (Appendix A).

### 3.6.1 Interactions of the IWL with the Northern and Southern TSFs

The starter embankment (Stages 1, 2 and 3) incorporates a low permeability cut-off trench excavated into clay material in order to reduce seepage losses (CMW Geosciences, 2018). The cut-off trench would be extended along the northern embankment of the NTSF and the southern embankment of the STSF (i.e. in Stages 3 and 4) where the IWL intersects these facilities in order to intersect seepage migrating through and around the downstream zones of these facilities. The cut-off trench would be backfilled with compacted clayey mine waste and will form the foundation of the upstream zone.

### 3.6.2 Interactions of the IWL with the Northern Waste Rock Emplacement

The outer embankment of the north-western portion of the IWL would be constructed to form an integrated landform with the adjacent northern waste rock emplacement (Figures 3-1 and 3-2).

## 3.7 SITE WATER MANAGEMENT INFRASTRUCTURE

There would be no change to the design objectives of the existing surface water management system (Section 2.7). That is:

- the UCDS would continue to divert up-catchment runoff around the CGO;
- the ICDS would continue to control runoff from active mining areas; and
- the lake isolation system would continue to separate Lake Cowal from the CGO.

There would be changes to the UCDS and ICDS required to maintain the design objectives of the existing water management system as a result of the Modification. This would involve:

- realignment of the UCDS to facilitate the transfer of up-catchment water around the IWL (Figure 1-4); and
- minor changes to the ICDS to accommodate the IWL.

These changes would be constructed in accordance with the existing design criteria for these components of the surface water management system (i.e. in accordance with the WMP).

The existing integrated erosion, sediment and salinity control system would be updated/expanded, as required (Section 2.7.4).

The Modification would not change the approved CGO pit dewatering methods (Section 2.7.5).

## 3.8 WATER SUPPLY

The Modification would increase annual water supply requirements and external water supply requirements relative to the approved CGO (Section 2.8).

The sub-sections below describe the water supply infrastructure and water supply management changes that would be required for the Modification.

### 3.8.1 Duplication of the Mine Water Supply Pipeline

The existing mine water supply pipeline to Bore 4 would be duplicated as part of the Modification (Figure 1-2). The pipeline would be constructed within the existing 40 m pipeline corridor.

The pipeline construction would involve burial of the new pipeline (with a nominal diameter of up to 600 millimetres) to a nominal depth of approximately 1 m. Surface disturbance associated with the pipeline construction would be approximately 6 m, with additional disturbance associated with occasional laydown areas.

Given the pipeline traverses Lake Cowal (Figure 1-2), the construction methodology would be dependent on the water level in the lake. If the lake is dry at the time of construction, the pipeline would be buried as described above. If the lake is fully or partially inundated, the pipeline would be either laid on the lake bed for burial when lake levels recede, or construction would be delayed until lake levels recede. Depending on lake levels and operational requirements, the pipeline is anticipated to be constructed over a period of approximately six months and commissioned in 2019.

The new pipeline would be designed to supply all the external water for the CGO, with the existing pipeline to be retained to provide additional contingency capacity, be left on standby or decommissioned if deemed redundant.

### 3.8.2 Relocation of D10 Dam

As part of the Modification, the approved D10 dam (not yet constructed) would be relocated (Figure 1-4). The existing design criteria for D10 would be used for the relocated D10 (i.e. in accordance with the WMP).

### 3.8.3 Site Water Supply Requirements

Water supply for the Modification would continue to be required for ore processing in the process plant, as well as dust suppression (e.g. haul roads) and other potable and non-potable uses. Supply sources are described in Section 3.8.5.

Consistent with existing operations, the total water supply requirement for the process plant is estimated to be approximately 0.9 kL/t for primary ore processing and 1.7 kL/t for oxide ore processing (Section 2.8).

### 3.8.4 Revised Site Water Balance

A revised site water balance has been completed by Hydro Engineering & Consulting Pty Ltd (HEC) for the life of the Modification, and is presented in Appendix B. A summary of the simulated water balance for the life of the Modification under various climatic scenarios is provided in Table 3-2.

It is expected that the majority of total water requirements for the Modification would continue to be supplied from internal water sources, with the remainder supplied from external water sources (Table 3-2).

### 3.8.5 Water Supply Sources

Consistent with existing operations, site water supply would continue to be preferentially supplied from internal and external water sources according to the following priority:

1. TSF return water.
2. Open pit sump dewatering.
3. Contained water storages.
4. External water sources (i.e. water supply priority from external water sources subject to water market conditions):
    - Saline groundwater supply bores within ML 1535.
    - Eastern Saline Borefield.
    - Bland Creek Palaeochannel Borefield.
    - Lachlan River licensed extraction.

Further detail regarding external water sources is provided below.

***Saline Groundwater Supply***

The existing saline groundwater supply bores within ML 1535 (Section 2.8.1) would continue to be used for the Modification (during suitable lake conditions) in accordance with existing licence conditions under the *Water Sharing Plan for the Lachlan Unregulated and Alluvial Water Sources 2012*.

The revised site water balance for the Modification has considered the expected availability of the existing saline groundwater supply bores due to the inundation of Lake Cowal (Appendix B).

**Table 3-2**
**Simulated Water Balance for the Life of the Modification**

| Expected Water Demand/Supply | 10th Percentile Rainfall Sequence (Dry) | Median Rainfall Sequence | 90th Percentile Rainfall Sequence (Wet) |
|---|---|---|---|
| | (ML/annum) | | |
| ***Outflows*** | | | |
| **Total Expected Water Requirements**[1] | 9,364 | 9,457 | 9,472 |
| ***Inflows*** | | | |
| *Internal Water Sources* | | | |
| Catchment Runoff | 833 | 1,114 | 1,152 |
| Tailings water return | 3,826 | 3,826 | 3,826 |
| Open Pit Groundwater | 216 | 216 | 216 |
| *Subtotal – Internal Water Sources* | 4,875 | 5,156 | 5,194 |
| *External Water Sources* | | | |
| Saline Groundwater Supply Bores within ML 1535 | 139 | 104 | 118 |
| Eastern Saline Bores | 536 | 522 | 518 |
| Bland Creek Palaeochannel Borefield | 2,077 | 1,965 | 1,954 |
| Lachlan River Licensed Extraction[2] | 1,892 | 1,760 | 1,757 |
| *Subtotal – External Water Sources* | 4,644 | 4,351 | 4,347 |
| **Total Expected Water Supply** | 9,519 | 9,507 | 9,541 |

Source: After Appendix B.

[1] Includes water requirements/losses associated with ore process, evaporation, haul road dust suppression and tailings lift construction.

[2] Modelled volume of water actually reaching the CGO – excludes irrigation channel losses.

***Eastern Saline Borefield***

The operation of the existing Eastern Saline Borefield (Section 2.8.2) would continue for the Modification in accordance with Development Consent (DA 2011/64) and existing licence conditions under the *Water Sharing Plan for the Lachlan Unregulated and Alluvial Water Sources 2012*.

***Bland Creek Palaeochannel Borefield***

The operation of the existing Bland Creek Palaeochannel Borefield (Section 2.8.3) would continue for the Modification in accordance with existing licence conditions under the *Water Sharing Plan for the Lachlan Unregulated and Alluvial Water Sources 2012*.

There would be no change to the existing Groundwater Contingency Strategy (i.e. trigger levels) for the management of groundwater levels in the Bland Creek Palaeochannel (Section 2.8.3) due to the Modification.

The Hydrogeological Assessment for the Modification (Appendix A) predicts that a maximum sustainable yield of 4.4 ML/day from the Bland Creek Palaeochannel Borefield over the life of the Modification would maintain groundwater levels above the relevant trigger levels at groundwater bores GW036553, GW036597 and GW036611.

As there be would no change to the existing Groundwater Contingency Strategy (i.e. agreed trigger levels) for the ongoing management of groundwater levels in the Bland Creek Palaeochannel or existing daily and annual extraction limits, no additional impacts to other groundwater users are predicted due to the continued use of the Bland Creek Palaeochannel Borefield for the Modification (Appendix A).

***Lachlan River Water Entitlements***

Water from the Lachlan River would continue to be accessed for the Modification, when required, by purchasing temporary water available from the regulated Lachlan River trading market.

During the life of the existing CGO there has been reliable supply of temporary water available from the Lachlan River trading market, including during periods of drought. DI-Water trading records show that between approximately 4,000 ML and 274,000 ML of temporary water has been traded annually since records began in 2004 (Appendix B). By comparison, the predicted average water requirement from the Lachlan River under a 10$^{th}$ percentile (dry) rainfall sequence is 1,892 ML/annum over the life of the Modification (Table 3-2).

Given the above, it is expected there would be continued reliable supply of water available from the Lachlan River trading market for the Modification (Appendix B).

## 3.9 INFRASTRUCTURE AND SERVICES

***Lake Cowal Road Realignment***

A 3.3 km portion of Lake Cowal Road would be realigned around MLA 1 (Figure 1-4). The road realignment would be constructed to the same standard as the existing Lake Cowal Road (i.e. an unsealed rural road in the order of 6 m wide). The road realignment would be constructed over a period of approximately six months in 2019.

***Mineralised Material Stockpile Area***

The Modification would involve temporarily increasing the design height of the existing mineralised material stockpile to approximately 320 m AHD (Section 3.4). As the Modification would involve processing of mineralised material, the mineralised material stockpile would be progressively removed (dependent on market conditions) (Table 3-1).

***Administration Buildings, Exploration and Workshop Facilities***

The existing administration buildings, exploration and workshop facilities on-site would continue to be used during the life of the Modification.

***Mine Access***

There would be no change to the preferred access routes to the CGO for the Modification.

Use of the primary access road from West Wyalong for light and heavy vehicles would continue for the Modification. Light vehicle and employee shuttle bus access from Condobolin and Forbes would also continue for the Modification.

***Electricity Supply and Distribution***

Electricity to the site would continue to be provided via the existing 132 kV ETL from Temora.

Power on-site would continue to be transferred either by overhead cable or underground cable. Standard electrical safety laws and practices (including vehicle clearance considerations) would apply.

***Site Security and Communications***

Existing site security measures (including the ML 1535 perimeter fence and perimeter buoys during periods of lake inundation) would be retained for the Modification. The existing communications systems would also be retained with augmentations as required over the life of the Modification (i.e. as technological advances allow).

***Potable Water***

The potable water supply for use on-site would continue to be trucked to the CGO. The existing potable water supply network on-site would continue to service the Modification.

## 3.10 MANAGEMENT OF CHEMICALS AND WASTES

As discussed in Section 3.5, the Modification would result in an increase in the annual consumption of several reagents, in line with the processing rate increase from 7.5 Mtpa to 9.8 Mtpa. Notwithstanding, the existing management measures as for the approved CGO (Section 2.12) would continue to apply for the Modification.

## 3.11 ROAD TRANSPORT

The Modification would result in additional deliveries of reagents required for ore processing. These additional movements are considered in the Road Transport Assessment (Appendix H).

The additional heavy vehicle deliveries would be undertaken in accordance with the *Australian Code for the Transport of Dangerous Goods by Road & Rail* (ADG Code) (National Transport Commission, 2017).

There would be minor additional employee vehicle movements associated with the Modification (Section 4.9.2). In addition, traffic movements during the relatively short construction phase (Lake Cowal Road realignment and pipeline duplication) in approximately 2019 would be minimised by the use of buses to transport these employees/contractors to and from site (Section 4.9.2).

The Modification would involve some temporary use of new routes from Forbes and Condobolin at times where existing preferred routes are unavailable (e.g. due to flood inundation or road closures) (Section 4.9.2).

## 3.12 OPERATIONAL WORKFORCE AND HOURS

Consistent with the existing operating hours at the CGO, operation of the Modification would be 24 hours a day, seven days a week.

There would be a minor increase of 10 people to the average and peak CGO workforce due to the Modification.

## 3.13 CONSTRUCTION WORKFORCE AND HOURS

Construction activities associated with the Modification would include the IWL, secondary crusher, pipeline duplication and Lake Cowal Road relocation.

Placement of waste rock at the IWL is considered to be part of the continuation of mining operations of the CGO. Waste rock would be hauled from the open pit for emplacement and reprofiling at the IWL 24 hours per day, seven days per week. Other IWL construction activities (e.g. construction of water management and tailings infrastructure, removal of soil and soil stockpiles within the disturbance footprint and placement of clay materials) would be undertaken during the daytime only (i.e. 7.00 am to 6.00 pm).

Construction of the TSF raises and the Lake Cowal Road realignment would be restricted to daytime hours only.

Construction of the pipeline duplication would also be undertaken daytime only, except where activities are in ML 1535 and adjacent to the CGO on the western side of Lake Cowal (i.e. away from privately owned receivers).

Construction of the secondary crusher is anticipated to commence in Year 17 (2021) and would occur over approximately six months.

Descriptions of the construction activities associated with the pipeline duplication and Lake Cowal Road relocation are provided in Sections 3.8.1 and 3.9, respectively.

Approximately 100 construction workers would be required during Year 15 (2019) to construct the pipeline duplication and Lake Cowal Road relocation. Other workers involved in construction activities (e.g. the IWL) are included in the operational workforce (Section 3.12).

## 3.14 TRAVELLING STOCK RESERVE RELOCATION

TSR No. 17085 would be relocated around MLA 1 as part of the Modification (Figure 1-4). The proposed relocation would continue north from its current north-south alignment adjacent to ML 1535, before turning east and re-joining the existing TSR.

The TSR relocation would be conducted in consultation with DI – Crown Lands and Local Lands Services.

## 3.15 CHANGES SOUGHT TO DEVELOPMENT CONSENT CONDITIONS

### 3.15.1 Transport of Hazardous Materials Study

As part of the Modification, Evolution proposes to remove Development Consent condition 5.4(b)(i). This is because transport of hazardous materials is conducted in accordance with the ADG Code, which sets out the requirements for transporting dangerous goods by road or rail. Furthermore, no incidents involving the transport of hazardous materials have occurred through the operation of the CGO.

Therefore, this condition is proposed to be deleted, as follows:

> ~~*(i) Transport of Hazardous Materials*~~
>
> ~~*The study comprises arrangements covering the transport of hazardous materials including details of routes to be used for the movement of vehicles carrying hazardous materials to or from the proposed development. The study shall be carried out in accordance with the Department's draft "Route Selection" guidelines. Suitable routes identified in the study shall be used except where departures are necessary for local deliveries or emergencies.*~~

*~~The study should also address (1) the issues associated with spills, cleanup procedures, training of clean-up teams, communication, and liaison with organisations such as the fire brigades, District Emergency Management Coordinator (and Committee), Local Emergency Management Committee(s), and state emergency services; (2) inspection and monitoring procedures for chemicals such as explosives, xanthates and cyanides prior to commencement of a trip, to verify the integrity of the packaging; and (3) measures to be taken to ensure that the temperature of the materials does not rise above safe levels.~~*

The management of hazardous materials on site is described in the Hazardous Waste and Chemical Management Plan.

### 3.15.2 Clarification of Reporting of Fauna Deaths

As part of the Modification, Evolution proposes to modify Development Consent condition 3.2(b) to avoid the need for unnecessary reporting of fauna deaths (i.e. in the event of natural causes).

The following changes are proposed to focus this condition on potential for native fauna deaths related to potential cyanide impacts:

*(b) The Applicant shall prepare and implement a Flora and Fauna Management Plan for the development to the satisfaction of the Secretary. The shall be prepared in consultation with DPI (Fisheries) and OEH, and cover the mining lease area and monitoring of bird breeding areas as identified by the Applicant in consultation with OEH.The plan shall include, but not be limited to:*

*(i) methods for monitoring daily and seasonal fauna usage of tailings dams (e.g. species, number, location, habits), and whether deaths or other effects or incidents are occurring. Usage of the tailings dams shall be reported to the OEH on a six monthly basis, unless otherwise directed by the Secretary;*

*(ii) development of a protocol for the reporting of any **cyanide-related** native fauna deaths **~~or other incidents involving native fauna~~** on the **tailings dams** **~~mining lease~~** to the OEH, DRE, CEMCC and in the case of fish, DPI (Fisheries). **Cyanide-related** **~~N~~n**ative fauna deaths **~~except those attributable to physical trauma such as vehicle strike)~~** must be reported as per this protocol within 24 hours (or next working day). The Applicant shall maintain a record of any **cyanide-related** native fauna deaths **~~or other incidents~~** and this record must be published **~~annually on the Applicant's website for the development~~** **in the Annual Review**;*

*(iii) provision for fauna autopsy facilities to enable the cause of any deaths to be quickly determined. The protocol required in sub clause (ii) above shall also detail collection and autopsy of fauna. This shall include but not be limited to collection and recording procedures, autopsy procedures and laboratory tests;*