Cowal Gold Mine Underground Development & Modification 16

State Significant Development and Modification Assessment (SSD 10367 & DA14/98 Mod 16)

Planning Secretary's Assessment Report

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Subtitle: State Significant Development and Modification Assessment (SSD 10367 & DA14/98 Mod 16)

Cover image: Cowal Gold Mine (Source: Evolution)

Executive Summary

Background

Evolution Mining (Cowal) Pty Limited (Evolution) owns and operates the Cowal Gold Mine, an open cut gold mine located approximately 38 kilometres (km) north-east of West Wyalong in the Central West Region of New South Wales (NSW).

The mine is located within the Bland Shire local government area and covers an area of approximately 2,981 hectares (ha). The open cut pit is located against the western foreshore of Lake Cowal with the mine's surface infrastructure and facilities located to the west of the open cut pit.

The mine has been in operation since 2005 under development consent DA14/98, which allows extraction of approximately 167 million tonnes (Mt) of ore by open cut methods and on-site processing at a rate of up to 9.8 million tonnes per annum (Mtpa), until 2032.

The mine employs up to 500 people during peak periods and is a significant employer in the region.

In October 2020, Evolution submitted a State Significant Development (SSD) application for an underground mine (SSD Project) to provide access to approximately 27 Mt of ore identified as the GRE46 deposit. A modification application for DA14/98 (Mod 16) was submitted concurrently to support ancillary surface changes that are required to facilitate the SSD Project.

The Project

Evolution proposes to construct and operate a new underground mine (SSD Project) accessed from the existing Cowal Gold Mine. Ore extracted from the underground mine would be processed under the existing development consent using existing above ground facilities. Consequently, a modification of the existing surface infrastructure (Mod 16) would also be required to facilitate the SSD Project.

Underground Development (SSD Project)

The proposed SSD Project involves the expansion of mining operations to include the underground mining of approximately 27 Mt of ore until 2040 and includes the following key components:

- excavation of two declines to provide underground access and ventilation;
- development of a box-cut entry adjacent to the open-cut pit;
- development of an estimated 1,106 stopes via drill and blast techniques;
- development of a paste fill plant;
- extraction of ore via long hole open stoping;
- backfilling of stopes with cemented paste fill material;
- installation of services, including power, water and communications; and
- an underground workshop area.

The proposal would require up to 160 full time equivalent employees (FTE) and contractors during peak construction stages and about 230 FTE employees during operation in addition to the mine's existing workforce.

Surface Changes to Support the Underground Development (Mod 16)

The proposed modification (Mod 16) is required to support the SSD Project and includes:

- an extension of the life of mining operations from 2032 to 2040;
- transport of ore by truck from the underground mine to the run-of-mine stockpile, primary crusher and/or temporary stockpiles;
- modification of the existing ore processing facility to accommodate ore from the underground mine;
- transport and emplacement of waste rock from the underground mine to existing emplacement areas;
- an increase in the final height of the integrated waste landform; and

- minor upgrades to the existing mine infrastructure area.

The proposed modification would not change the existing approved disturbance footprint, hours of operation, ore processing rate or existing operational workforce. The proposal is described in detail in the Environmental Impact Statement (EIS) and Modification Report (see **Appendix A**).

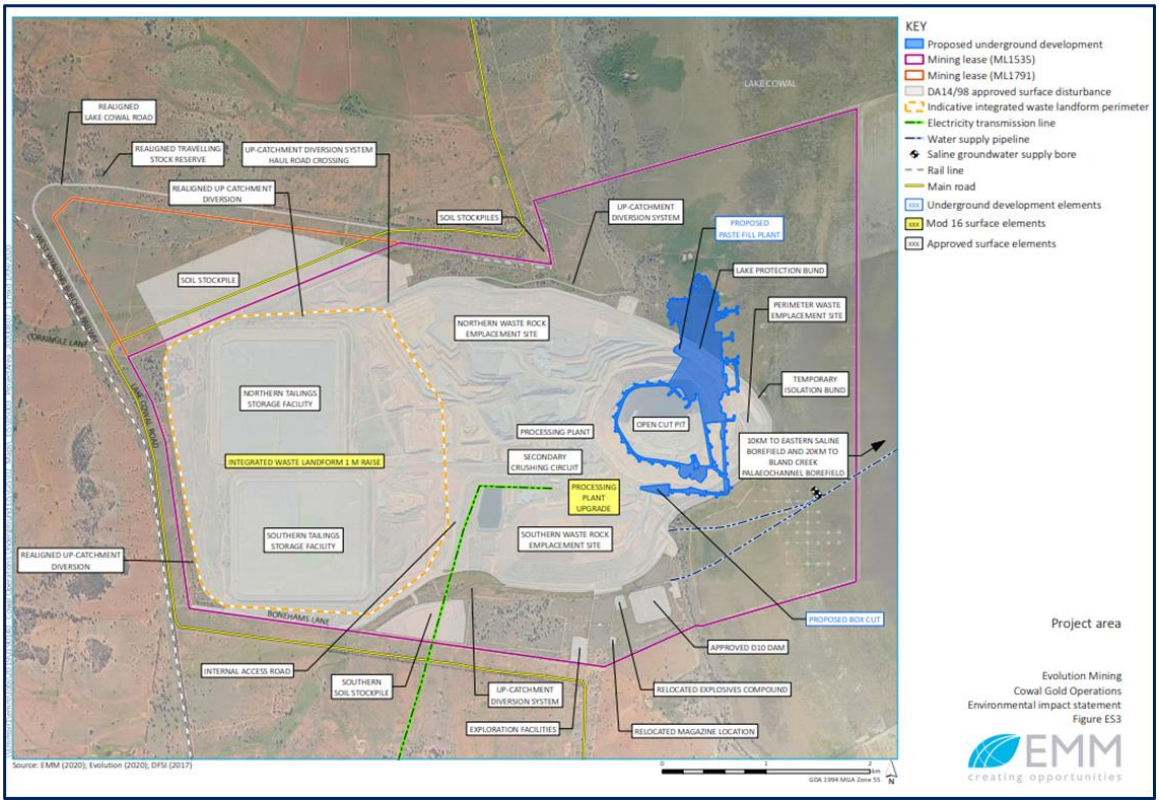

Figure E1 | Existing and Proposed Mine Plan

Statutory Context

The SSD Project is a State Significant Development (SSD) under Part 4 of the EP&A Act, as it is development for the purposes of gold mining and mining-related works that has a capital investment value of more than $30 million, which is specified in clause 5 of Schedule 1 to *State Environmental Planning Policy (State and Regional Development) 2011* (the SRD SEPP).

Mod 16 was lodged under Section 4.55(2) of the EP&A Act as the Cowal Gold Mine was originally approved under Part 4 of the EP&A Act.

The Minister for Planning and Public Spaces (Minister) is the consent authority for both the SSD Project and Mod 16 applications. However, under the Minister's delegation of 26 April 2021, the Director Resource Assessments may determine the SSD Project and Mod 16 applications because there were fewer than 10 unique submissions by way of objection, Bland Shire Council (BSC) did not object to the proposal and Evolution did not make any political donations.

Strategic Context

Australia is known to hold the largest gold mine reserves in the world and is the second largest gold producer behind China. The global demand for gold has been long established and is not expected to slow down. Key drivers for ongoing and increased global gold supply relate to its intrinsic characteristics as a rare metal, currency and commodity.

The Cowal operation contains current reserves of 4,609,903 ounces of gold, which is the second largest gold reserve in NSW. If the SSD Project is approved, the combined operations of the open cut and underground mines would make Cowal Gold Mine the third largest gold mine in NSW in terms of capital

expenditure and would provide a range of direct and indirect economic benefits to the local area, the region and the State.

Engagement

The Department exhibited the EIS and Modification Report from 26 October 2020 until 22 November 2020 and received a combined total of 17 submissions from community members. Except for one objection to Mod 16, all submissions from community members were in support of the SSD Project and Mod 16 proposal. Advice was received from 16 public agencies. While none of the public agencies objected to the SSD Project or Mod 16, several commented on particular aspects and made recommendations.

Assessment

In assessing the merits of the SSD Project and Mod 16, the Department has considered the submissions and advice received; the likely environmental, social and economic impacts; the suitability of the site; relevant environmental planning instruments (EPIs); and the public interest, in accordance with the requirements of the EP&A Act. The Department also engaged an independent expert to review the groundwater aspects of the proposal.

Water Resources

The site is located in the Lachlan River catchment, and is directly adjacent to Lake Cowal, with the proposed underground mine located below the lake's western shoreline.

Lake Cowal is a freshwater, shallow, ephemeral lake covering an area of approximately 13,000 hectares. It is the largest internal lake in New South Wales, holding around 150 gigalitres of water when full, and nationally recognised for its diversity of wildlife, in particular its wetland waterbird species.

The mine is separated from the surrounding catchment and the lake through the mine's surface water management system, including up catchment and internal diversion systems and a lake isolation bund to separate Lake Cowal from flood waters.

The potential impacts of the SSD Project on water resources, including groundwater and surface water was a key issue raised in submissions. The EIS includes specialist groundwater and surface water assessments, which have benefited from the comprehensive monitoring data and modelling from the existing open cut mining operations.

The Department engaged Mr Hugh Middlemis of HydroGeoLogic to undertake an independent peer review of the groundwater assessment and groundwater-related issues raised in submissions. Groundwater resource impacts were also reviewed by specialist hydrogeologists within DPIE Water.

Water Balance and Licensing

The mine operates a preferential water use system, sourcing water from a number of different internal and external sources. This preferential system would be continued for the SSD Project, with the key water sources including (from highest to lowest preference):

1. Reclaimed water from the integrated waste landform (IWL).
2. Open cut and underground mine inflows.
3. Catchment runoff in on-site water storages.
4. Eastern Saline Borefield (ESB), comprising 2 bores located 10 kilometres to the east of Lake Cowal.
5. Bland Creek Paleochannel Borefield (BCPB), comprising 4 bores located near the ESB.
6. Saline bores within the mining lease, comprising 2 bores in Lake Cowal, which could be used when lake conditions allow.
7. Licenced water from the Lachlan River.

Around 63% of the SSD Project's water needs would be sourced from the internal reclamation sources (i.e. reclaimed water, mine inflows and catchment runoff), while around 37% would be sourced from external supplies (i.e. the borefields and the Lachlan River).

The Department is satisfied that the water use associated with the proposal is unlikely to have a significant impact on water availability and water supply in the applicable water sources. Nonetheless, the Department has recommended conditions requiring Evolution to preferentially source water from the internal and saline supplies; ensure it has adequate water licences for all stages of the project; and maintain a detailed water balance for the project, including measures to minimise water use and maximise water use efficiency.

Groundwater

The aquifers in the vicinity of the project area have been depressurised by inflows into the open cut pit and by extraction from the groundwater supply borefields. Groundwater inflows are predicted to increase from the existing 1 ML/day (to the open cut pit), to a peak of 2.8 ML/day (to the pit and underground working) in the year 2031 and continue at this rate until the end of mining in 2038/39. Inflows to the underground mine would be limited by paste filling of the stopes, and inflows would gradually recover to pre underground mining inflow rates about 30 years after mining.

Groundwater inflows into the pit have remained steady regardless of whether Lake Cowal is empty or full, which supports the case that there is minimal hydrogeological connection between the lake and the open cut pit. Water loss from the lake also correlates well with evaporation for comparable inland lakes in NSW (i.e. approximately 80% of pan evaporation). In this regard, when it is full, Lake Cowal loses approximately 200 ML/day due to evaporation. The total predicted inflow to the underground mine (i.e. approximately 1.8 ML/day), most of which is from the Primary Rock Unit, is minor compared to this evaporation.

The groundwater modelling indicates that the maximum cumulative drawdown associated with the open cut and underground development would be confined within the existing mining lease, apart from small areas to the north and south where the 1 m drawdown contour extends just outside the lease area.

No privately-owned groundwater bores are predicted to be affected, which are all located well beyond the mining lease boundary. No exceedances of the minimal impact considerations in the *NSW Aquifer Interference Policy* are predicted.

The key risk to groundwater quality associated with the SSD Project is the potential for solute/contaminant migration from the IWL and other infrastructure and processing areas. However, contaminant transport modelling indicates that potential contaminants would not affect any off-site groundwater users, and the open cut pit would continue to act as a groundwater sink, which would prevent any possibility of groundwater from the IWL/TSFs reaching Lake Cowal. Accordingly, the Department is satisfied that the SSD Project is unlikely to have any significant impact on groundwater resources and groundwater users surrounding the mine or to Lake Cowal.

DPIE Water recommended that additional monitoring bores are installed in the bed of Lake Cowal to monitor potential impacts on the lake. The Department agrees and has recommended conditions requiring Evolution to include these monitoring bores as part of its Water Management Plan and water monitoring program. The Department has also recommended other conditions consistent with DPIE Water's and Mr Middlemis' recommendations, including requirements for Evolution to periodically validate the groundwater model and to prepare and implement a detailed groundwater monitoring program and groundwater contingency strategy as part of the Water Management Plan.

Surface Water

The Department considers that the existing surface water management system at the mine would be adequate to manage any potential impacts to surface water from the surface facilities associated with the

underground mine development. However, the Department has recommended conditions requiring Evolution to prepare and implement a detailed surface water management plan as part of the Water Management Plan, including a detailed monitoring program.

Subsidence

The proposal involves underground mining adjacent to and beneath Lake Cowal to extract ore from the GRE46 mineral deposit using a sub-level open stoping (SLOS) mining method to mine 1,106 stopes, ranging from a depth of around of -80 m AHD to -850 m AHD..

Subsidence impacts and potential environmental consequences on Lake Cowal was a key concern raised by government agencies, particularly from potential piping or 'chimneying' (stope failure resulting in a chimney like formation up to the surface above the mine), which would provide a direct connection from Lake Cowal into the underground workings.

However, the mine has been designed to minimise subsidence effects and predicted subsidence movements are very small, with vertical subsidence at the surface predicted to be less than 15 millimetres (mm) and uplift predicted to be no more than 25 mm (in isolated areas).

In addition, to provide increased structural integrity to the underground precinct and limit any subsidence or risk of chimneying, following extraction the stopes would be filled with cemented paste material made from waste rock and tailings.

The Resources Regulator and the Department accept that the risk of subsidence impacts, in particular chimneying are very low and that the SSD Project would be highly unlikely to impact the integrity or the hydraulic processes of the lake.

However, the Department has recommended precautionary conditions requiring among other things, an adaptive management approach with the development of TARPs and detailed risk assessments to inform of any potential stope instability in areas deemed to have an elevated risk, and that potential impacts are monitored, reported and validated via a comprehensive Subsidence Monitoring Program.

Traffic and Transport

The mine is accessed via a number of preferred routes from surrounding urban centres, including West Wyalong, Forbes and Condobolin. The majority of project-related traffic occurs along the West Wyalong route, given that it is the closest urban centre to the mine. Approximately 80% of the additional workforce is predicted to be based in the West Wyalong area, with approximately 10% based in Condobolin and 10% based in Forbes. Evolution would continue to operate its shuttle bus service between the mine and the towns of West Wyalong, Condobolin and Forbes.

During the peak construction phase of the project there would be an additional 210 daily traffic movements on the road network (ie. 105 in, 105 out), comprising approximately 10 truck, 32 bus and 168 light vehicle movements. During the operational phase, the number of additional vehicle movements on the road network would be around 110 per day (ie. 55 in, 55 out), comprising 10 truck, 16 bus and 84 light vehicle movements.

The assessment indicates that total traffic levels would remain within the relevant Austroads design guidelines for each route and all roads. However, Evolution has committed to upgrading the Newell highway with a Basic Right Turn intersection treatment at its intersection with West Plains. The Department has recommended conditions requiring Evolution to undertake this upgrade in accordance with the Austroads guidelines and to the satisfaction of Transport for NSW (TfNSW).

The Department also notes that Evolution has an existing road maintenance funding agreement (recently revised and executed) with Bland, Lachlan and Forbes Shire Councils, which includes the allocation of $150,000 every 3 years (CPI indexed) to each Council on a rotating and ongoing basis. In addition, as

most of the additional traffic associated with the underground mine would be between West Wyalong and the mine, the Planning Agreement between Evolution and Bland Shire Council includes an additional annual payment of $60,000 (CPI indexed) for road maintenance.

Accordingly, the Department is satisfied that the cumulative traffic associated with the Cowal open cut and underground mine can be managed in a manner that would not result in any significant traffic-related impacts on the local and regional road network.

The Department has recommended conditions requiring Evolution to update the Transport Management Plan for the mine in consultation with TfNSW and the Councils.

Other Issues

The Department is satisfied that the other issues associated with the SSD Project and Mod 16, such as noise and blasting, air quality, visual, biodiversity, Aboriginal and historic heritage, social and economic, hazards and waste management can be adequality managed under the recommended conditions of consent.

Evaluation

The Department has assessed the development application, EIS, submissions, agency advice, the Evolutions Submissions Report, the independent groundwater expert report, and a range of additional information in accordance with the requirements of the EP&A Act.

Based on its assessment, the Department considers that the environmental and amenity impacts of the Project are not significantly greater than those associated with the existing mining operations, and the additional impacts can be managed to achieve an acceptable level of environmental performance, in accordance with applicable guidelines and policies.

The Department notes that Evolution has agreed to the terms of a VPA with Bland Shire Council, which includes a total contribution of around $8.5 million over the indicative 20 year mine life.

The Department recognises the benefits in extracting additional resources while utilising existing infrastructure and reducing the capital costs. The Department also considers that the project would provide major economic and social benefits for the region and to NSW as a whole, including direct capital investment of about $276 million and up to an additional 230 jobs during operations.

The Department has recommended a comprehensive and precautionary suite of conditions to ensure that the project complies with relevant criteria and standards, that the impacts are consistent with those predicted in the EIS, and that residual impacts are effectively minimised, managed and/or at least compensated for.

The Department has carefully weighed the impacts of the Project against the significance of the resource and the socio-economic benefits. Overall, the Department's assessment concludes that the Project achieves a reasonable and appropriate balance between maximising the recovery of a gold resource of State significance and minimising the potential impacts on surrounding land users and the environment as far as is practicable. Consequently, on balance, the Department considers that the project is in the public interest and recommends approval, subject to the recommended conditions of consent.

Contents

1 Introduction

1.1 Background

Evolution Mining (Cowal) Pty Limited (Evolution) owns and operates the Cowal Gold Mine, an open cut gold mine located approximately 38 kilometres (km) north-east of West Wyalong in the Central West Region of New South Wales (NSW) (see **Figure 1**).

The mine has been in operation since 2005 under development consent DA14/98, which allows extraction of approximately 167 million tonnes (Mt) of ore by open cut methods and on-site processing at a rate of up to 9.8 million tonnes per annum (Mtpa) until 2032.

The mine employs up to 500 people during peak periods and is a significant employer in the region.

In October 2020, Evolution submitted a State Significant Development (SSD) application for an underground mine (SSD Project) to provide access to approximately 27 Mt of ore identified as the GRE46 deposit. A modification application for DA14/98 (Mod 16) was submitted concurrently to support ancillary surface changes that are required to facilitate the SSD Project.

This Assessment Report considers the SSD Project and Mod 16 applications together and provides an environmental assessment under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 Project setting

The mine is located within the Bland Shire local government area and covers an area of approximately 2,981 hectares (ha). The open cut pit is located against the western foreshore of Lake Cowal with the mine's surface infrastructure and facilities located to the west of the open cut pit.

Lake Cowal is an ephemeral freshwater lake and covers an area of over 13,000 ha when full, making it the largest natural inland lake in New South Wales. It is nationally recognised for its diversity of wildlife, in particular its wetland waterbird species. Its primary inflows come from Bland Creek and occasionally from the Lachlan River during flooding events.

The area surrounding the mine is generally flat, with the immediate surrounding land predominantly used for agricultural and grazing purposes, typical of the broader land use in the region. In drier periods, the bed of Lake Cowal is utilised for grazing and occasional cropping when receding water storage levels allow for access. Evolution owns approximately half of the land within Lake Cowal and does not allow agricultural production in this area.

The mine is surrounded by several rural residential properties, eight of which are located within 5 km of the mine. The closest property is located approximately 2.3 km south-west of the mine (see **Figure 2**).

The mine's water supply is preferentially derived from onsite sources. External make up water is provided via the Lake Cowal pipeline which transects part of Lake Cowal and draws from the Eastern Saline Borefield and the Bland Paleochannel Borefield, located to the north east of the mine.

The land in the SSD Project and Mod 16 area is all owned by Evolution except for two land parcels held by the crown.

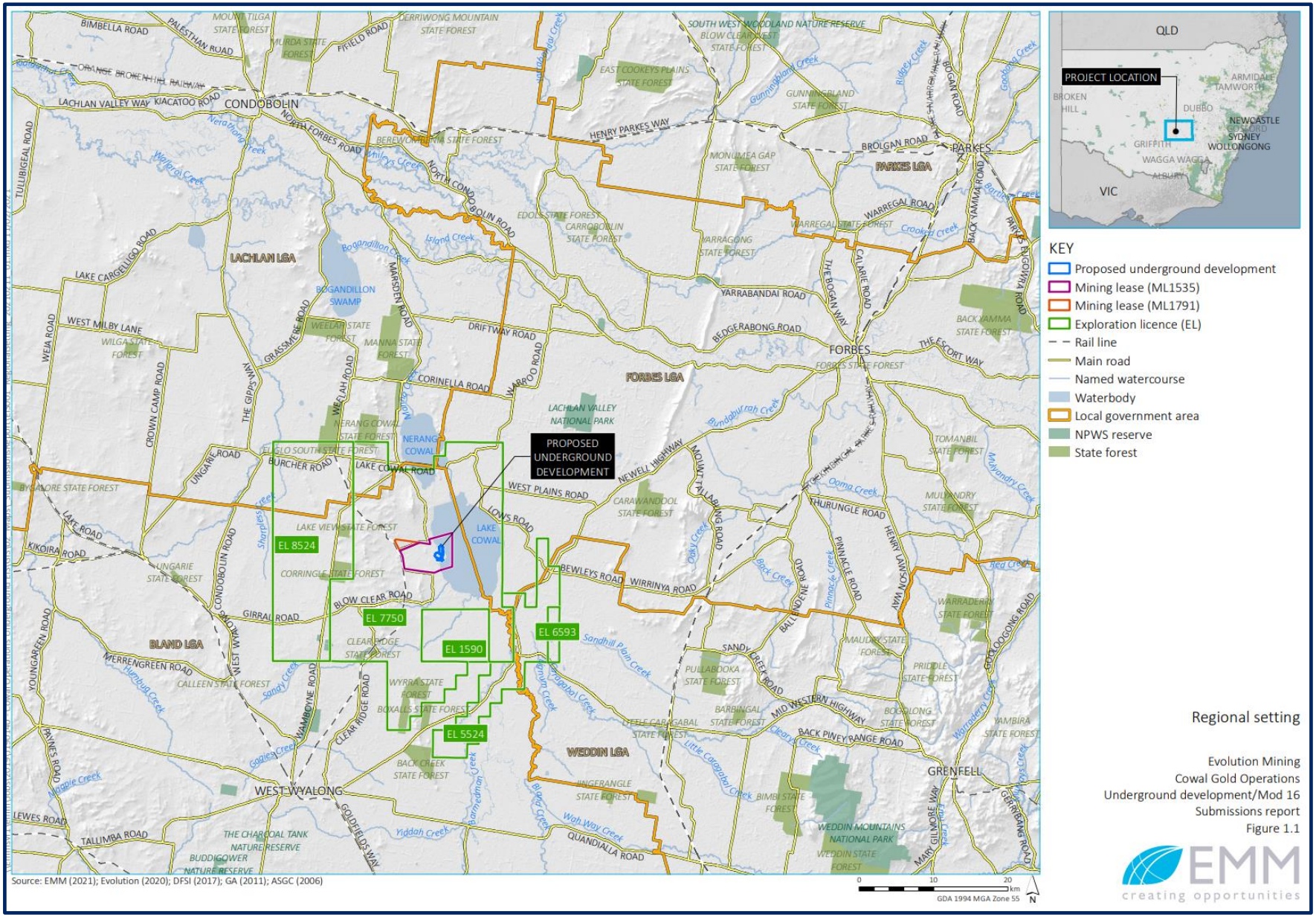

Figure 1 | Cowal Gold Mine Regional Context

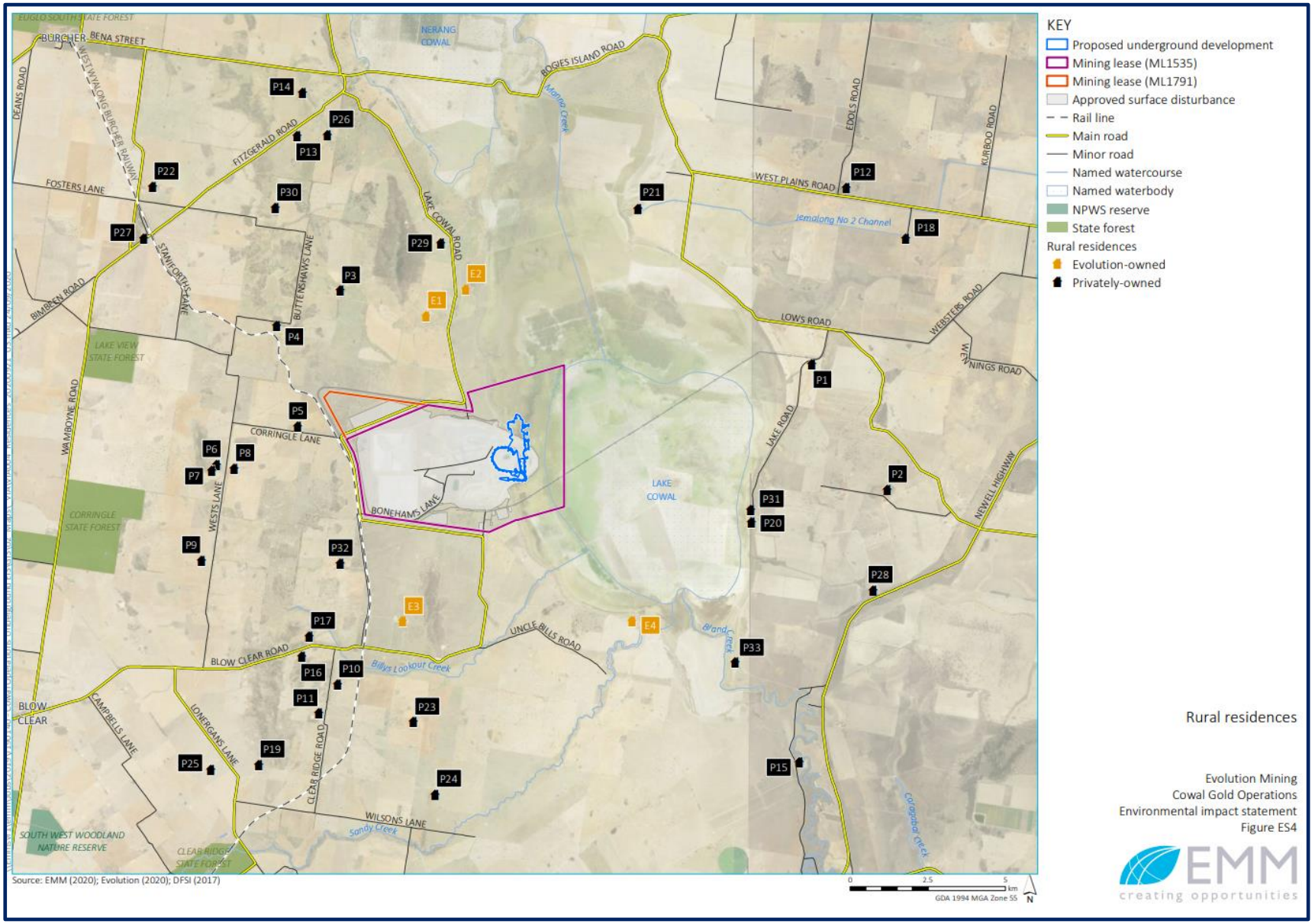

Figure 2 | Local Setting and Rural Residences

1.3 History of Mining at Lake Cowal

In 1981, resource company North Limited commenced early mineral exploration on the western side of Lake Cowal. By 1988, exploration had concentrated on the Endeavour 42 (E42) ore body and a development application for an open cut gold mine was submitted in 1995. Following the initial refusal of its first application (on environmental grounds), North Limited submitted a second application with a redesigned proposal which sought to be more compatible with the high conservation values of Lake Cowal. The second application was submitted in March 1998 and the mine was later approved by the Minister for Urban Affairs and Planning in February 1999 following a Commission of Inquiry.

While initial concerns were raised about the mine's compatibility with the long-term conservation values of Lake Cowal, the Commission of Inquiry found that the project could be operated without significant impact to the surrounding environment. Further, in consideration of the concerns of environmental groups, the Lake Cowal Foundation was established as a not-for-profit Environmental Trust, to be utilised for enhancing and protecting Lake Cowal.

Despite initial environmental concerns, the mine has received broad support from the community and local Councils, particularly for its contributions to the local economy and helping to sustain nearby towns since its commencement.

The mine has historically been owned and operated by several companies including North Limited, Rio Tinto, Homestake Australia limited and Barrick (Cowal) Pty Ltd. On 24 July 2015, Evolution acquired Barrick and is the current owner and operator of the mine.

1.4 Existing Approval and Operations

DA14/98 was granted development consent by the then Minister for Urban Affairs and Planning on 26 February 1999, and subsequently modified on 15 occasions. Evolution is permitted to undertake the following activities until 31 December 2032:

- extract an estimated 167 Mt of ore from the open cut pit using conventional drill, blast and load and haul methods;
- process up to 9.8 Mtpa of ore on site;
- extract gold from the ore using a carbon-in-leach cyanide leaching circuit;
- produce up to 6.1 million ounces (Moz) of gold;
- emplace tailings and waste rock in an Integrated Waste Landform (IWL); and
- progressively rehabilitate the site.

The mine consists of two holdings under the *Mining Act 1992* (Mining Act) including Mining Leases ML1535 and ML1791. A separate approval (DA 2011/64) from Bland Shire Council allows for the development and operation of the Eastern Saline Borefield, which supplies water to the mine. A 100 km 132 kV electricity transmission line from Temora provides power to the mine site.

Evolution currently mines the E42 open cut pit, which is isolated from Lake Cowal by a bund constructed around its eastern perimeter. The open cut pit is approved to a final depth of around 531 metres (m) below ground level and will have a total pit area of about 131 ha at its completion.

Ore is mined using convention drill and blast methods and is then transported from the pit to the mine's processing plant for onsite crushing and processing. Low-grade ore is stockpiled for future processing. Mined waste rock is transported to onsite emplacement locations including the northern, southern and perimeter waste rock emplacement areas.

Gold extraction is undertaken using a carbon-in-leach cyanide leaching circuit in the mine's processing plant. The gold product is recovered and poured as gold bars. Process tailings are pumped to a cyanide destruction circuit before emplacement in the IWL.

The IWL was approved under Modification 14 and combines the northern waste rock emplacement and the Northern and Southern Tailings Storage Facilities (TSF). The IWL is approved to a final maximum height of 245 m Australian Height Datum (m AHD).

A secondary ore-crushing circuit is approved but has not yet been constructed. Once completed, the secondary circuit would allow for increased ore processing throughput rates, up to the approved 9.8 Mtpa.

Access to the mine is provided via several routes from nearby regional towns including West Wyalong, Forbes and Condobolin. Daily shuttle buses are provided to transport mine staff to and from these towns. Heavy vehicles use the preferred mine access route between West Wyalong and the mine, unless local conditions prevent access (eg. flooding), in which case various alternate routes are utilised.

The approved mine layout is shown in **Figure 3** and **Table 1** provides a summary of the existing development consent when compared against the proposal.

In early 2019, Evolution commenced exploration of the GRE46 mineral deposit to investigate underground conditions in the area hosting the target ore body. An exploration decline has been used to gather various technical and environmental assessments to inform the SSD Project mine design.

2 Project

Evolution proposes to construct and operate a new underground mine (SSD Project) accessed from the existing Cowal Gold Mine. Ore extracted from the underground mine would be processed under the existing development consent using existing above ground facilities with some changes to existing infrastructure. Consequently, a modification of the existing surface infrastructure (Mod 16) would also be required to facilitate the SSD Project.

On 29 September 2020, Evolution lodged a SSD application under Division 4.7 of the *Environmental Planning and Assessment Act 1997* (EP&A Act) and an associated modification application under section 4.55(2) of EP&A Act (see **Appendix A**).

2.1 Cowal Gold Operations Underground Development (SSD Project)

Scope of the SSD Project

The proposed SSD Project involves the expansion of mining operations to include the underground mining of approximately 27 Mt of ore until 2040 and includes the following key components:

- excavation of two declines to provide underground access and ventilation;
- development of a box-cut entry adjacent to the open-cut pit;
- development of stopes via drill and blast techniques;
- development of a paste fill plant;
- extraction of ore via long hole open stoping;
- backfilling of stopes with cemented paste fill material;
- installation of services, including power, water and communications; and
- an underground workshop area.

The proposed underground development would extend north from the open cut pit and below Lake Cowal to a final depth of approximately -850 m AHD, or about 1,050 m below ground level. Mining would be wholly contained within the existing ML 1535 and cover a total subsurface area of about 135 ha (see **Figures 3** and **4**).

Extraction Method

Ore extraction would target the GRE46 mineral deposit using a sub-level open stoping (SLOS) mining method. Stopes would be progressively developed from the top down with an estimated 1,106 stopes

to be excavated over the life of the mine. Mined stopes would be progressively back filled using a cemented paste produced in the proposed paste fill plant to limit the risk of any surface subsidence impacts, including potential impacts to Lake Cowal.

The main access to the underground mining area would be via a box cut entry and decline located on the southern boundary of the open cut pit. This primary decline would provide access for personnel and materials and be used to transport ore to the surface. A secondary decline would provide access via a portal in the open cut pit and be mainly used for ventilation but also utilised as a secondary access point and egress in the case of an emergency.

Construction of the decline and development drives are expected to occur over a period of up to two years. Ore extraction and production would continue until the end of 2040.

The proposal would require up to 160 full time equivalent employees (FTE) and contractors during peak construction stages and about 230 FTE employees during operation in addition to the mine's existing workforce.

The SSD Project would require development of additional surface and underground infrastructure including a paste fill plant and other ancillary facilities including power, water and communication services, underground workshop area, wash bay, ablutions, and crib room. Augmentation of existing surface infrastructure would be required to support the proposed underground development and is further outlined in Section 2.2 (below) and **Table 1**.

2.2 Surface Changes to Support the Underground Development (MOD 16)

Scope of Modification

The main purpose of the proposed modification is for changes to the existing approved development to support the SSD Project. The proposed modification would include new and modified surface facilities and includes:

- an extension of the life of mining operations from 2032 to 2040;
- transport of ore by truck from the underground mine to the run-of-mine stockpile, primary crusher and/or temporary stockpiles;
- modification of the existing ore processing facility to accommodate ore from the underground mine;
- transport and emplacement of waste rock from the underground mine to existing emplacement areas;
- an increase in the final height of the integrated waste landform; and
- minor upgrades to the existing mine infrastructure area.

The proposed modification would not change the existing approved disturbance footprint, hours of operation, ore processing rate or existing operational workforce.

The changes proposed under Mod 16 would not affect the existing open cut mining operations, which would continue as approved. Mod 16 would integrate the mine's existing surface infrastructure and facilities with the proposed SSD project, optimising and improving the efficiency of mining operations.

The key components of the SSD Project and Mod 16 are outlined in **Table 1** and shown in **Figures 3, 4** and **5**. Currently approved activities under DA14/98 are also included in **Table 1** for comparison purposes.

The proposal is described in detail in the Environmental Impact Statement (EIS) and Modification Report (see **Appendix A**).

Table 1 | Comparison of Approved Project with SSD Project and Proposed Modification 16

Component	Approved Project	SSD and Mod 16
Mine / Project Life	• 31 December 2032	• end of 2040 (8 year increase)
Mine Method and Description	• open cut mining (drill, blast, load and haul) • extraction of E42 mineral deposit • ore transported to the surface by truck	• underground mining with main access via box-cut entry • extraction of GRE46 mineral deposit • ore transported to the surface by truck • top down sub level open stoping (SLOS) • backfilling of stopes with cemented paste material
Total Production	• approximately 6.1 million ounces (Moz) of gold	• approximately 7.9 Moz of gold (1.8 Moz increase)
Processing Rate and Estimated Total Resource	• ore processing up to 9.8 Mtpa • extract an estimated total 167 Mt of ore	• no change to ore processing rate • extract an additional estimated total 27 Mt of ore
On-site Ore Transport and Processing	• ore transported from the open cut pit by truck to temporary stockpile before being processed • secondary ore processing circuit within processing facility is already approved but yet to be constructed.	• no change to onsite ore transport • upgrades to processing facility to include: – a tailings de-slimer – an ore receival bin and mill feed conveyor; and – upgraded elution circuit.
Waste Rock and Tailings Storage Facilities (TSF)	• northern, southern and perimeter waste rock emplacements • integrated waste landform (IWL), northern and southern TSF	• approximately 5.74 Mt of additional waste rock • increase the final height of the IWL by 1 metre, from 245 m AHD to 246 m AHD
Cyanide use	• use of conventional carbon-in-leach cyanide leaching circuit	• minor increase in annual cyanide usage to account for higher grade ore
Water Supply and Management	• water supply pipeline • saline water supply pipeline (within ML 1535) • water diversion systems • temporary isolation bund • lake protection bund • Bland Creek Paleochannel Borefield (approved under DA 14/98)	• no change to water supply sources • development of underground dewatering infrastructure • development of pipelines to connect the tailings deslimer, paste fill plant and processing facility • augmentation of water storages • no changes to water diversion systems
Mine Site Access and Ancillary Facilities	• access roads, internal roads and haul roads • electrical transmission lines • workshop facilities • administration buildings and bathhouse buildings	• development of paste fill plant • development of ventilation systems and electrical reticulation • augmentation of existing surface infrastructure within the approved surface disturbance footprint to include: – administration facilities, offices, car parking, warehouses and stores, vehicle washdown facilities, heavy vehicle and light vehicle maintenance workshop and maintenance bays, control room, fuel farm, core yards and drill sheds, hard stands and go lines, ablutions and changerooms,

Component	Approved Project	SSD and Mod 16
		communications infrastructure, access roads, water storages and other minor ancillary infrastructure.
Traffic, Access Routes and Road Upgrades	• average of 125 light vehicles and 100 heavy vehicles a day • primary access route from West Wyalong	• an additional 84 light and 21 heavy (105 total) vehicles a day during peak construction • an additional 55 vehicles during peak operations • no change to the primary access route from West Wyalong • upgrade to the intersection of West Plains Road with Newell Highway
Rehabilitation and Closure	• progressive rehabilitation to safe, stable and non-polluting landforms, in accordance with the mine's rehabilitation objectives • final void	• no changes to rehabilitation areas or objectives • backfilling of stopes with cemented paste via borehole from paste fill paste plant located on the surface • underground mine stopes to be fully backfilled as mining progresses
Workforce	• up to 500 employees during peak periods (including contractors)	• open cut pit workforce to remain unchanged • additional 160 full time equivalent (FTE) employees during construction and 230 FTE employees during operations
Hours of Operation	• 24 hours a day, 7 days a week	• no change • standard construction hours for ancillary works located outside the mine footprint
Capital Investment Value	• approximately $210 million	• approximately $276 million

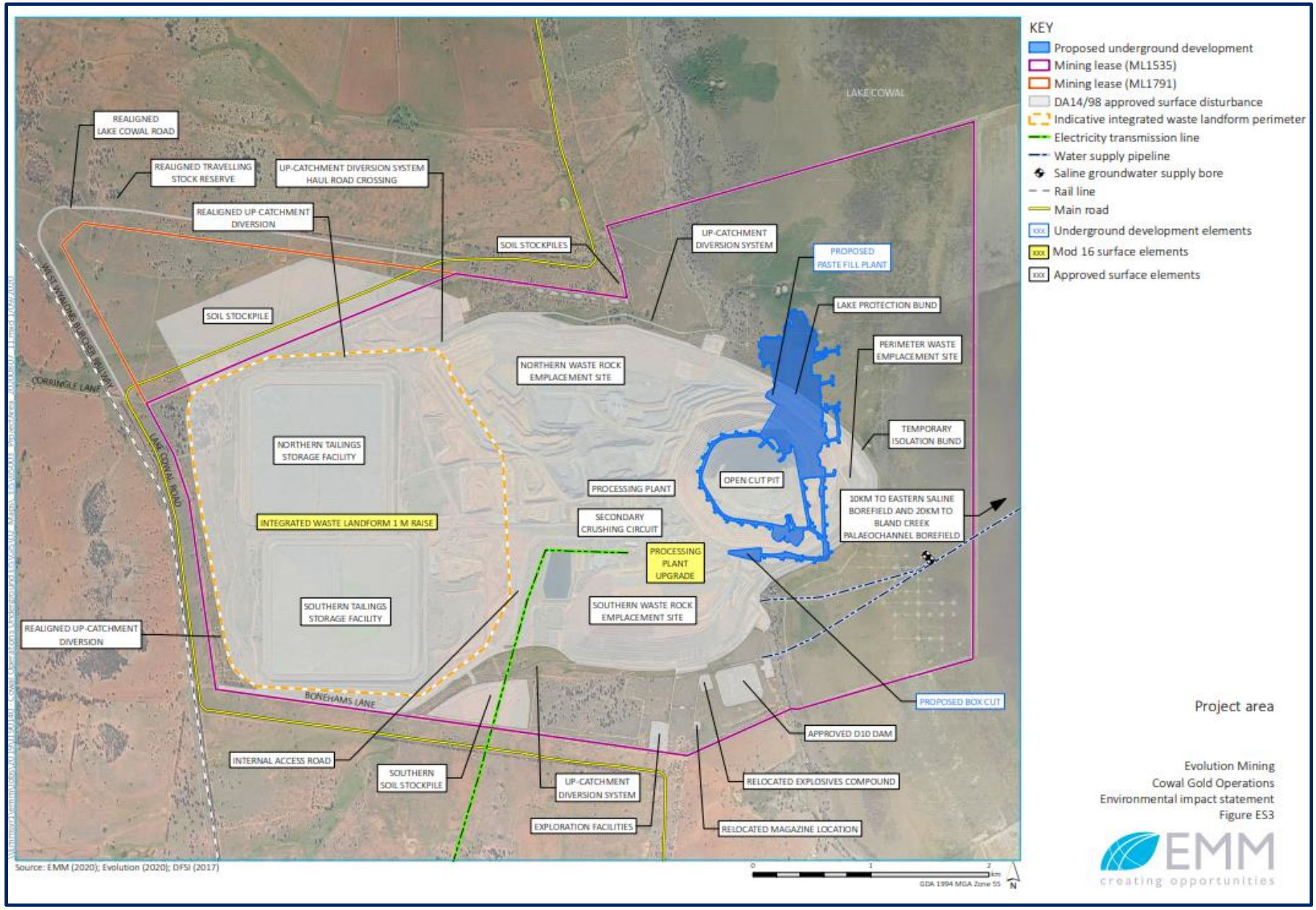

Figure 3 | Existing and Proposed Mod 16 / SSD Project Mine Layout

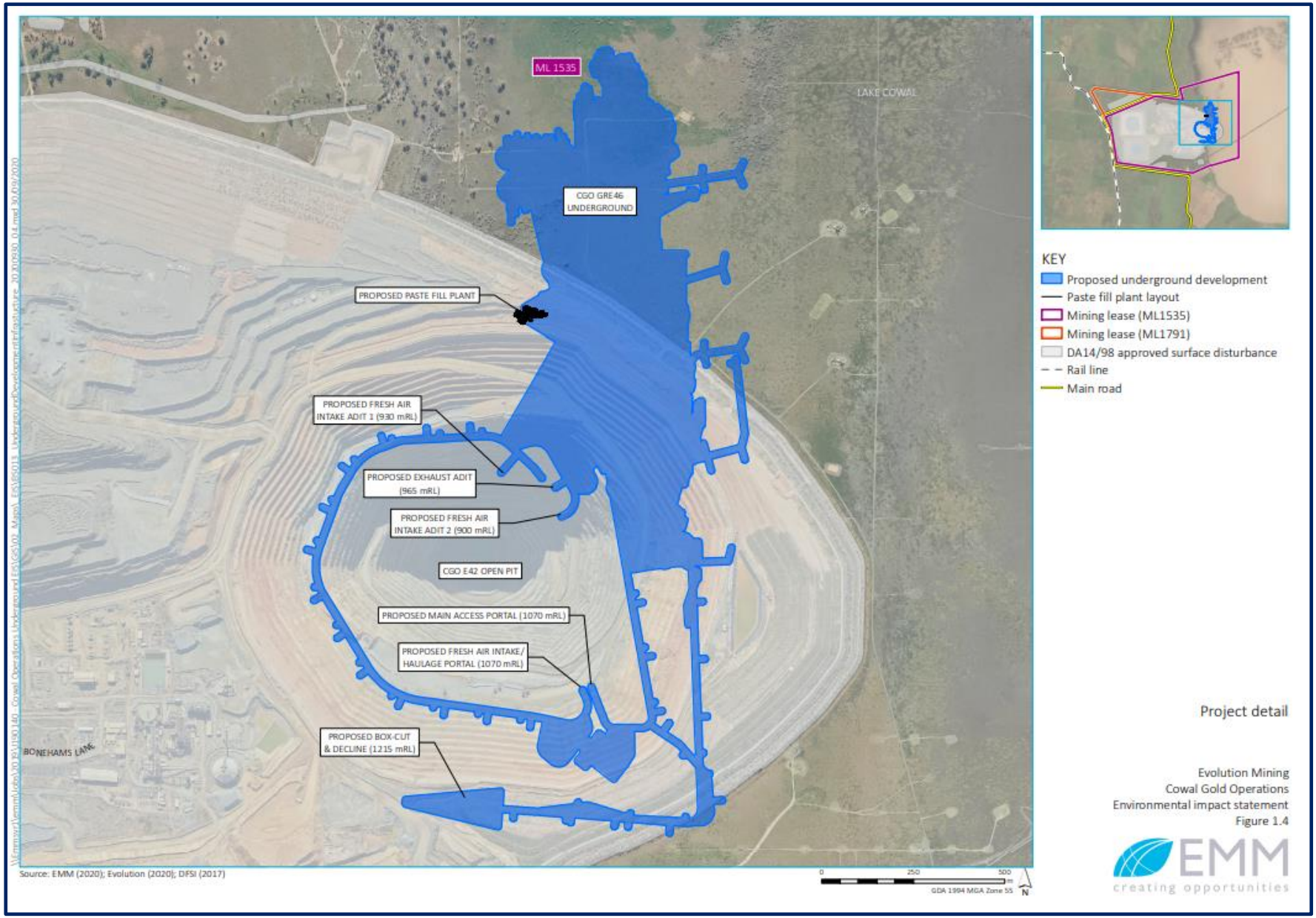

Figure 4 | Proposed SSD Project Mine Layout

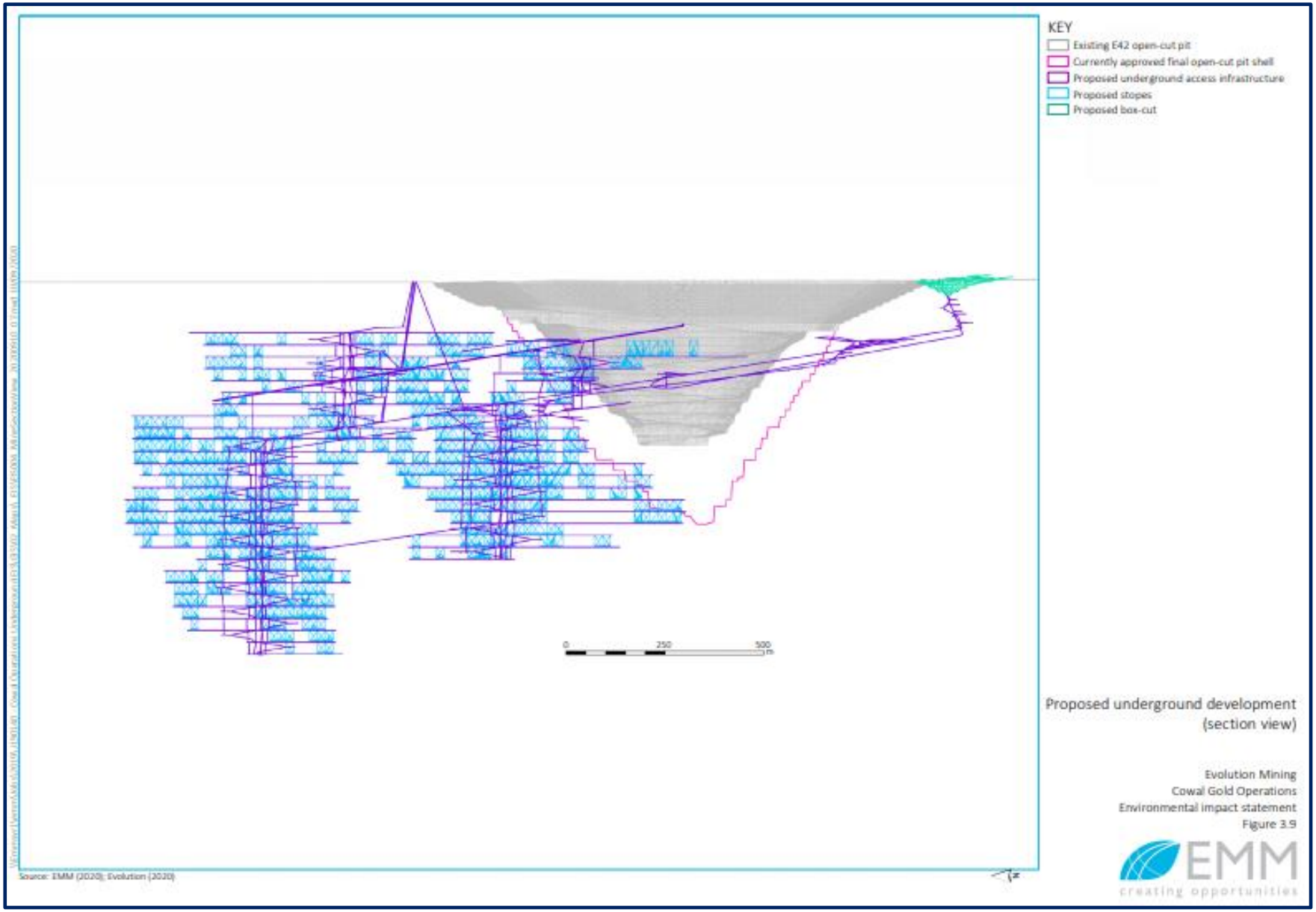

Figure 5 | Proposed SSD Project Section View

2.3 Other Related Development

The Social Impact Assessment (SIA) undertaken for the SSD Project and Mod 16 identified potential negative social impacts in relation to the additional workers required for the SSD Project in the local region and limited housing availability.

To account for the increased mine workforce required for the proposal, Evolution have explored a range of worker accommodation options and lodged a development application with Bland Shire Council (DA2021/0114), for the construction of an accommodation village in West Wyalong. The proposal was approved by Bland Shire Council on 24 August 2021 and would provide accommodation for up to 176 people and help to mitigate the potential impacts on local housing markets.

2.4 Justification for the Proposal and Alternatives

Evolution argues the proposal is justified because of the ongoing and additional benefits that would be provided through the continuation of mining beyond 2032, including:

- ongoing employment and job security and additional employment for local employees and contractors;
- SLOS mining method would provide a cost effective, high level of resource recovery without the surface impacts associated with alternative mining methods such as sub-level or block caving mining, which would generally result in increased associated surface subsidence;
- the strategic use of existing infrastructure to support the extraction and processing of an accessible gold resource is a logical and an economical use of the land; and
- additional economic and net production benefits to Australia and NSW, direct economic benefits (through employment and wages), and positive contributions to regional NSW, local businesses and household incomes.

Evolution has considered different mining methods for mining the GRE46 mineral deposit including use of conventional open-cut and sub level caving and block caving methods. However, the company has found that these methods would be uneconomical and/or result in far greater environmental impacts when compared with the SSD Project and Mod 16 proposal.

Evolution also argues that not proceeding with the SSD Project would result in an end to mining operations by 2032. The identified gold resource would remain unmined and subsequent employment, royalties and other economic benefits would not be realised.

The Mod 16 proposal is justified primarily as a component required to facilitate the SSD Project. Mod 16 would essentially provide improved operational efficiencies and the capacity to support the additional material required to be processed and managed at the mine.

3 Strategic Context

3.1 Resource and Economic Context

Australia is known to hold the largest gold mine reserves in the world and is the second largest gold producer behind China. In NSW, gold mining has been occurring since the 1850s and NSW is currently the second largest gold producing state behind Western Australia. Gold mining operations are generally focused in the Central West region of NSW within the Lachlan Orogen geological subdivision, which provides the main mineral ore deposits for gold resources (see **Figure 6**).

The global demand for gold has been long established and is not expected to slow down. Key drivers for ongoing and increased global gold supply relate to its intrinsic characteristics as a rare metal, currency and commodity. Indirectly, the demand for raw metals, such as gold, is attributed to a range

of broad factors including the global growth of a middle class reliant on urbanisation and electrification along with the increased use of minerals in technological developments[1].

The NSW Minerals Strategy (February 2019) notes the increased global demand for metals and outlines its key goal of growing mineral exploration and mining in NSW to become "a major global supplier of metals for the economies of today and the future."[2]

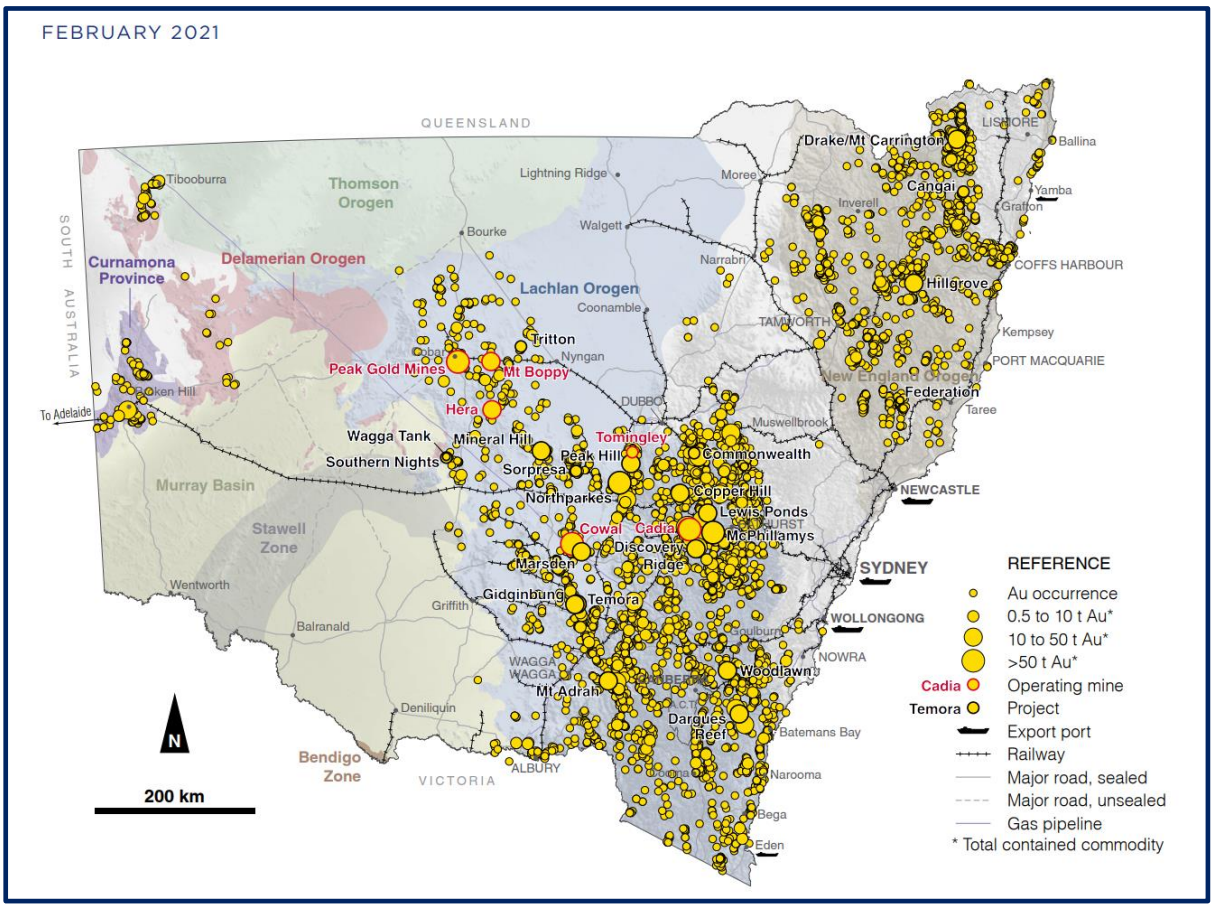

Figure 6 | NSW Gold Resource (source Department of Regional NSW 2021)

In the 2020 financial year (FY20), global gold production fell by approximately 3.9% [3], the largest annual decline since 2013 and is largely attributed to the disruptions caused by the global COVID-19 pandemic. Australian gold production has remained relatively unimpacted from the pandemic and is expected to grow in the immediate future to a peak in 2023-24, after which gold production is predicted to decline by 2.1% annually to 2025-26.

In FY20, NSW produced 1,286,163 ounces of gold with a value of AUD$3.1 billion, accounting for about 12% of Australia's gold production. Cowal Gold Mine was the second largest gold producer in NSW with Cadia Valley Operations being the largest. Cowal produced 262,035 ounces of gold in FY20, making up about 21% of New South Wales' annual gold production, or about 2.5% of Australia's annual gold production.

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[1] Future of Minerals in NSW Report – 2020.
https://www.resourcesandgeoscience.nsw.gov.au/__data/assets/pdf_file/0012/1202007/Future-of-Minerals-in-NSW-Report-2019.pdf

[2] Department of Regional NSW - Mining, Exploration and Geoscience, *NSW Minerals Strategy 2019*.
https://www.resourcesandgeoscience.nsw.gov.au/__data/assets/pdf_file/0007/852505/NSW-Minerals-Strategy-2019-02.pdf

[3] Office of the Chief Economist, Resources and Energy Quarterly Review, March 2021.
https://publications.industry.gov.au/publications/resourcesandenergyquarterlymarch2021/documents/Resources-and-Energy-Quarterly-March-2021.pdf

There are currently seven gold mines (gold as principal commodity) operating in NSW, all of which include an underground mining component, except for Cowal. Cadia Valley Operations and Tomingley Gold Mine are mixed method mines, undertaking both underground and open cut mining.

The Cowal operation contains current reserves of 4,609,903 ounces of gold, which is the second largest gold reserve in NSW. If the SSD Project is approved, the combined operations of the open cut and underground mines would make Cowal Gold Mine the third largest gold mine in NSW in terms of capital expenditure and would provide a range of direct and indirect economic benefits to the local area, the region and the State.

3.2 Strategic Plans and Policies

The SSD Project is located on land covered by the Department's *Riverina Murray Regional Plan 2036,* and borders land covered by the Department's *Central West and Orana Regional Plan 2036.* Both regional plans include key goals which set out the vision for the region and specific directions intended to guide the delivery of new and established industries.

These regional plans acknowledge the importance of managing sustainable mineral resources and the need to find a balance between varying economic, social and environmental outcomes. The Department has considered the objectives of the relevant regional plans and provides further discussion of environmental, social and economic costs in Sections 6 and 7.

4 Statutory Context

4.1 Underground Development (SSD Project)

The proposed underground development is classified as SSD under Division 4.7 of the EP&A Act, as it is development for the purpose of gold mining and mining-related works that has a capital investment value of more than $30 million, which is specified in clause 5 of Schedule 1 to *State Environmental Planning Policy (State and Regional Development) 2011* (the SRD SEPP).

Permissibility

Development associated with the SSD Project would be located on land within the Bland Shire LGA, on land zoned RU1 Primary Production under the *Bland Local Environmental Plan 2011* (Bland LEP). Under the Bland LEP, development for the purpose of underground mining is prohibited. However, the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (the Mining SEPP) ensures that the SSD Project is fully permissible with consent. Under the Mining SEPP, development for the purposes of underground mining is permissible on any land in NSW.

Administrative and Procedural Requirements

Under the EP&A Act and Regulation there are several administrative and procedural requirements that must be addressed before a consent authority can determine a development application.

This includes requirements applying to:

- development applications generally in Part 4 of the EP&A Act and Part 6 of the EP&A Regulation, particularly the provisions in Division 1 and Schedule 1 of the EP&A Regulation;
- development applications for SSD, including the provisions in Section 4.7 of the EP&A Act and Divisions 6 of the EP&A Regulation;
- the preparation of EISs in Schedule 2 of the EP&A Regulation; and
- mandatory community participation, including the obligation to exhibit the development application for SSD projects and the associated EIS for at least 28 days.

The Department has conducted a detailed review of the steps taken on the SSD Project and confirms that all of the relevant administrative and procedural requirements have been met.

Integrated and Other NSW Approvals

Under Section 4.41 of the EP&A Act, several approvals are integrated into the SSD approval process and consequently are not required to be separately obtained for the proposal. These include:

- approvals relating to heritage required under the *National Parks and Wildlife Act 1974* and the *Heritage Act 1977*; and
- certain water approvals under the *Water Management Act 2000* (WM Act).

Under Section 4.42 of the EP&A Act, several other approvals are required but must be substantially consistent with any consent granted for the project. These include:

- a mining lease under the *Mining Act 1992*;
- consents under the Roads Act 1993;
- an Environment Protection Licence (EPL) under the *Protection of the Environment Operations Act 1997*;
- notification under the *Work Health and Safety (Mines) Act 2013* for high risk activities, including emplacement of reject materials; and
- water access licences under the *Water Act 1912* and/or the WM Act.

Evolution currently holds most relevant leases and licences under these Acts and can obtain any other licences required for the SSD Project where required. The Department has consulted with the relevant government authorities responsible for these other approvals (see Section 5), and considered the relevant issues relating to these approvals in its assessment of the development (see Section 6). None of the relevant authorities object to the SSD Project.

4.2 Modification 16

The Cowal Gold Mine was originally approved under Part 4 of the EP&A Act. Accordingly, any modification to the development consent must be made under Section 4.55 of the EP&A Act.

Scope of Modification

The modification application and Modification Report were lodged under Section 4.55(2) of the EP&A Act. The Department has reviewed the scope of the modification and considers that:

- the proposed changes are relatively minor in comparison to the approved project;
- there would be no change to the approved open cut mining extent, ore processing rate, transport methods or hours of operation;
- the impacts of the development as modified would be similar to the impacts of the approved project (see Section 6), and
- the development would remain substantially the same development as originally approved.

Therefore, the Department is satisfied the proposed modification is within the scope of section 4.55(2) of the EP&A Act and does not constitute a new development application. Accordingly, the Department considers that the application should be assessed and determined under section 4.55(2) of the Act.

The Department also considered:

- advice provided concerning the proposed modification (see Section 5); and
- the relevant matters in Section 4.15(1) of the EP&A Act, including:
  - the provisions of relevant environmental planning instruments (see Section 4.3);
  - the likely impacts of the proposed modification, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality (see Section 6);
  - the public interest, including any relevant objects of the EP&A Act (see Section 4.3); and
  - the reasons given by the approval authority for the grant of the original approval (see below).

Reasons for Original Approval

In determining the original Cowal Gold Mine application, the then Minister for Urban Affairs and Planning (following a Commission of Inquiry) concluded that the benefits of the project outweighed the residual environmental impacts and imposed a range of strict conditions to appropriately manage the impacts. The Department has considered the proposed modification against the reasons given for determining the project and is satisfied that the proposed modification does not affect the decision that was previously made. The proposed modification would allow similar benefits to be realised at local, regional and State levels.

4.3 Mandatory Matters for Consideration

The Department's assessment of the Project has given careful consideration to all necessary statutory requirements. These include the:

- objects of the EP&A Act, set out in section 1.3 of the Act; and
- matters listed under section 4.15(1) of the EP&A Act, including applicable Environmental Planning Instruments (EPIs) and regulations.

Apart from considering the statutory requirements in their own right, the Department has carefully considered Section 5 of the EIS for the SSD Project and Section 4 of the Modification Report for Mod 16, where Evolution has considered applicable legislation and environmental planning instruments in detail.

The Department has considered all statutory requirements in its assessment of the SSD Project and Mod 16 and provides a summary of this consideration in respect of the objects of the EP&A Act and a general overview of the applicable EPIs below. Further consideration of the provisions of applicable EPIs can be found in **Appendix B**.

Objects of the EP&A Act

The objects of the EP&A Act are the underpinning principles for all decision making under the Act. They must be considered by the consent authority when determining a development application under the Act. The Department has assessed the SSD Project and Mod 16 against the objects found in section 1.3 of the EP&A Act. Table G1 of **Appendix B** summarises how the Department considers that the SSD Project and Mod 16 can be undertaken in a manner that is consistent with these objectives, including Ecologically Sustainable Development (ESD).

Environmental Planning Instruments

Several environmental planning instruments apply to the SSD Project and Mod 16 proposal, including:

- *State Environmental Planning Policy (Mining Petroleum Production and Extractive Industries) 2007;*
- *State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP);*
- *State Environmental Planning Policy 33 (SEPP No. 33) – Hazardous and Offensive Development;*
- *State Environmental Planning Policy 55 (SEPP No. 55) – Remediation of Land;*
- *State Environmental Planning Policy Infrastructure 2000;* and
- *Bland Local Environmental Plan 2011.*

The Department has considered the proposal against the relevant provisions of these instruments. The Department considers that the proposal can be undertaken in a manner that is generally in accordance with the aims, objectives and provisions of these instruments (see **Appendix B**).

4.4 Biodiversity Development Assessment Report

Section 7.9(2) of the *Biodiversity Conservation Act 2016* (BC Act) requires all applications for SSI and SSD to be accompanied by a Biodiversity Development Assessment Report (BDAR) unless the

Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity values.

Evolution included a BDAR with its application. As such, the statutory requirements of the BC Act have been met.

4.5 Consent Authority

In accordance with Section 4.5(a) of the EP&A Act and clause 8A of the SRD SEPP, the Minister for Planning and Public Spaces (Minister) is the consent authority for both the SSD Project and Mod 16 development applications. However, under the Minister's delegation of 26 April 2021, the Director Resource Assessments may determine the SSD Project and Mod 16 applications because there were fewer than 10 unique submissions by way of objection, Bland Shire Council did not object to the proposal and Evolution did not make any political donations.

5 Engagement

5.1 Public Engagement and Consultation

The Department publicly exhibited both the EIS and Modification Report on the Department's website from 26 October 2020 until 22 November 2020.

The exhibition was advertised in the *Condobolin Argus*, *West Wyalong Advocate* and *Forbes Advocate* and the applications were referred to Bland Shire Council (BSC), Lachlan Shire Council (LSC), Forbes Shire Council (FSC) and relevant State government agencies for advice.

5.2 Submissions Summary

A summary of the submissions and advice from government agencies is provided below. A copy of all submissions received from agencies and the general public is provided in **Appendix A**.

SSD Submissions

In response to the exhibition, the Department received a total of 27 submissions, including 16 from state and local government agencies (none of which objected to the proposal) and 11 from members of the general public (all in support of the proposal). No submissions were received from special interest groups.

Mod 16 Submissions

In response to the exhibition, the Department received a total of 22 submissions, including 16 from state and local government agencies (none of which objected to the proposal) and 6 from members of the general public (5 in support of the modification and 1 objection). No submissions were received from special interest groups.

Agency Advice

None of the government agencies object to the proposal, although some raised issues related to their regulatory roles and provided comment on particular aspects or proposed recommended conditions.

A summary of the government agency comments and recommendations is provided in **Table 2** and a copy of all advice received from agencies is provided in **Appendix A**. These comments and recommendations are considered in more detail in Section 6.

Community Submissions

The Department received a combined total of 17 submissions from community members for the SSD Project and Mod 16. All submissions from community members were in support of the SSD Project and Mod 16 proposal, except for one objection to Mod 16.

Community members in support of the SSD Project and Mod 16 provided comments, generally highlighting the benefits, including the additional and ongoing employment opportunities and positive outcomes for local communities and businesses as well as the wider economy in the region. Submissions also included comments advocating Evolution as a responsible and environmentally conscious miner that has a positive reputation in the wider community.

The key comments and concerns raised in the one submission objecting to Mod 16 largely focused on the water resources, including:

- the volumes of water taken from ground water bores and other water users in the region;
- the Lachlan Valley water allocations, particularly during drought periods and reduced inflows;
- the accuracy of predicted future meteorological conditions; and
- post mining conditions, and rehabilitation and remediation outcomes with particular concerns about the water table.

Independent Expert Advice - Groundwater

The Department engaged an independent groundwater expert, Mr Hugh Middlemis from Hydrogeologic, to complete an independent review of the groundwater assessment for the SSD Project and provide advice on groundwater aspects of the proposal. The *Cowal Gold Underground Development Groundwater Assessment Peer Review* report is provided in **Appendix A**. The groundwater expert advice is considered in more detail in Section 6.

5.3 Submissions Report

On 26 February 2021, Evolution provided its Submissions Report to the Department (see **Appendix A**). The Submissions Report provides a response to the issues raised in submissions received during the public exhibition period (including government agency advice) and a response to the advice and recommendations of the independent expert for groundwater.

5.4 Additional Information Requests

NSW government agencies provided further advice on the Submissions Report (see **Appendix A**) and during the assessment process, the Department requested that Evolution provide additional clarification and information in response to the Department and agencies. This includes:

- Finalising the voluntary planning agreement between Evolution and Bland Shire Council.
- Responding to the TfNSW advice and comments regarding the required upgrade of the intersection of Newell Highway and West Plains Road.
- Confirming the funding agreement for road maintenance across the three LGAs.
- Outcomes of negotiations with Forbes and Lachlan Shire Councils regarding ongoing community funding and Councils for a VPA.

This additional information is provided in **Appendix A.**

Table 2 | Agency Advice

Agency	Advice	Consideration and Conditions
Water Group	• Initially requested additional information and clarification in relation to the groundwater model, groundwater impacts and surface water impacts, including the following key aspects: – conceptual and numerical improvements to the groundwater model; – confirmation of independent peer review of the groundwater model; – water balance details; – connectivity between the existing open cut pit operations and lakebed sediments of Lake Cowal; and – consideration of minimal impact considerations under the Aquifer Interference Policy, including cumulative impacts. • Accepted the subsequent additional ground water assessment work provided by Evolution to address DPIE Water's initial comments. • Recommended the following, if the project was approved: – installation of at least two additional monitoring bores, to be located in the bed of Lake Cowal, to monitor potential impacts on the lake and provide confirmation of the predicted minimal impacts on the groundwater table; – expanding the groundwater monitoring program; – accounting for the groundwater take between groundwater sources and reporting against existing water licences; – periodic review and validation of the groundwater model; and – updating the mine's Water Management Plan.	• The Department has recommended performance measures requiring negligible impact or environmental consequences for Lake Cowal and any watercourses. • The Department has recommended conditions addressing DPIE-Water's recommendations, including requiring Evolution to: – construct at least two nested monitoring bores, to be located in the bed of Lake Cowal; – recalibrate the groundwater model within two years of commencement of the development and every five years thereafter; – undertake comprehensive quantitative uncertainty assessment for future modelling programs; and – update the mine's existing Water Management Plan prior to construction activities;
Biodiversity Conservation and Science Directorate (BCS)	• Noted that there would be no direct and immediate (above-ground) impacts on biodiversity or habitat. • Raised concerns about the potential for subsidence in the form of chimneying (stope failure to surface) and subsequent indirect impacts to the wetland habitat at Lake Cowal. • Requested a technical expert review of the subsidence risk, potential for chimneying and related impacts. • The Resources Regulator provided advice to confirm that the subsidence assessment in the EIS is sufficient and that the proposed mitigation and controls are appropriate and acceptable. • Accepted the Resources Regulator advice and confirmed that based on this advice, there is a negligible risk of impacts to biodiversity and habitat. • Recommended ongoing monitoring of subsidence mitigation methods.	• The Department has included conditions requiring the ongoing monitoring of subsidence, including the requirement to prepare and implement a Subsidence Monitoring Program.

Agency	Advice	Consideration and Conditions
Environment Protection Authority (EPA)	• Noted that all existing limits in DA 14/98 would remain except for the IWL limit, which would increase by 1 metre to a maximum height of 246m AHD. • Noted that there would be no additional air, noise, surface water, groundwater and waste impacts predicted from the SSD Project. • Advised that the mine's Environment Protection Licence No 11912 (EPL) would require a variation and relevant environmental management plans would require updating, in consultation with the EPA.	• DA 14/98 requires any relevant environmental management plans to be updated within 3 months of the approval of any modification. • The Department has included a condition requiring the revision and update of relevant environmental management plans.
Mining, Exploration & Geosciences (MEG)	• Provided a Resource and Economic Assessment. • Did not raise any concerns and advised that the proposal would be an efficient use of resources ensuring an appropriate return to NSW Government including $124 million in royalties and $3.9 billion total revenue in current dollars. • Noted that Evolution held the appropriate mining titles for the proposal and considers that the objects of the *Mining Act 1992* and clause 15 of the Mining SEPP are satisfied.	• Incorporated into the recommended conditions.
Resources Regulator	• Did not raise any concerns and advised that it considered the subsidence assessment in the EIS to be sufficient and that the proposed subsidence mitigation methods and controls are appropriate and acceptable.	• The Department has included conditions requiring Evolution to: – comply with a range of detailed rehabilitation objectives; – update the existing Rehabilitation Management Plan; and – prepare and implement a detailed Subsidence Monitoring Program. • RR supports the recommended objectives.
Transport for NSW (TfNSW)	• Emphasised the need to minimise impacts on the existing road network and noted the potential risks for employees traveling to and from the mine, particularly shift workers. • Supports the use of employee shuttle bus services and recommended the adopted fatigue management practices be reviewed regularly. • Recommended the intersection of the Newell Highway with West Plains Road be constructed as a Basic Right Turn (BAR) intersection treatment, at no cost to TfNSW. • Evolution acknowledged that the existing BAR at the Newell Highway and West Plains Road intersection is inadequate and agreed to upgrade the intersection at its own cost.	• The Department has recommended a condition requiring Evolution to: – upgrade the intersection of Newell Highway and West Plains Road prior to commencing mining operations; and – update the existing Transport Management Plan for the mine to include traffic associated with development of the underground mine
Department of Primary Industries		
DPI Fisheries	• Confirmed that Lake Cowal is considered a Key Fish Habitat under the *Fisheries Management Act 1994.*	• The Department notes that no impacts are predicted and that therefore additional offsets are not required for the development.

Agency	Advice	Consideration and Conditions
	• Noted that in the extremely unlikely event of stope failure and subsequent environmental impacts to Key Fish Habitat and/or Endangered Ecological Communities, appropriate offset would be required, in consultation with DPI Fisheries.	
DPI Agriculture	• Advised it has no comment on the proposal.	• Comments noted.
NSW Rural Fire Service	• Recommended that a Fire Management Plan be prepared.	• The SSD Project and modification do not introduce any increased bushfire risk at the site. • The existing approval requires Evolution to ensure the development is suitably equipped to respond to fires and assist RFS. • Evolution has an Emergency Response Plan in place which includes details on managing fires and has committed to consult with RFS on revisions to this plan if the project is approved.
Heritage NSW	• Considered it unlikely that Aboriginal objects would be affected by the proposal. • Noted existing Aboriginal Heritage Impact Permits (AHIP) at the mine and accepted that the Aboriginal cultural heritage assessment had been undertaken in accordance with the due diligence code. • Acknowledged that Bland Shire Council would be the determining authority for a separate but related proposal for a workforce accommodation village (WAF), to be located in West Wyalong, and that any potential impacts to Aboriginal cultural heritage would require an AHIP.	• The Department considers that Aboriginal cultural heritage is unlikely to be impacted by the proposal and notes the existing conditions requiring Evolution to prepare and implement an Indigenous Archeology and Cultural Heritage Management Plan.
DPIE Crown Lands	• Recommended Evolution make applications for landowners consent. • Indicated that all Crown Land and Crown Roads within a Mining Lease must be subject to a compensation agreement issued under Section 265 of the *Mining Act 1992*, to be agreed and executed prior to any mining activity taking place. • Advised that any compensation agreement may include conditions requiring the Mining Lease Holder to purchase Crown land impacted by mining activity. • Evolution acknowledged that there are three parcels of land owned by the Crown that would be used for activities relating to the proposal and that existing landowner agreements and access arrangement with Crown Lands are already in place.	• Incorporated into the recommended conditions.

Agency	Advice	Consideration and Conditions
Bland Shire Council	• Commented on the positive ongoing relationship between the mine and community and expressed strong support for the proposal • Confirmed it had agreed on terms of its Voluntary Planning Agreement (VPA).	• Comments noted. • Evolution and Bland Shire Council have agreed to the terms of a VPA, which includes contributions towards community initiatives and ongoing maintenance of roads in the Bland local government area.
Forbes Shire Council	• Commented on the positive contribution that the mine has on the local and regional communities including funding for various programs and events as well as employment for about 50 people. • Noted that the proposal would increase traffic movements at the West Plains Road and Newell Highway intersection and requested it is upgraded to a Basic Right Turn (BAR), but did not consider the Basic Left Turn (BAL) to be required due to the minimal mine related traffic making a left turn. • Noted the deteriorating condition of West Plains Road and that use of this road would continue to increase with a growing number of mine employees choosing to reside in Forbes. • Recommended: – conditions requiring the upgrade of the West Plains Road and Newell Highway Intersection to provide a BAR and the upgrade of West Plains Road; and – Evolution enter into a joint VPA between Forbes, Bland and Lachlan Shire Councils.	• The Department has recommended conditions requiring Evolution to: – upgrade the intersection of Newell Highway and West Plains Road prior to commencement of mining operations; and – update the existing Transport Management Plan for the mine. • The Department has further considered traffic impacts in Section 6.3 below. • The Department notes that Evolution did not propose to enter a VPA with Forbes or Lachlan council, given the project is located in Bland Shire Council area and that most employees and traffic movements are predicted to be within the Bland Shire Council area. • Bland Shire Council has separately approved an accommodation village in West Wyalong to support peak construction and operational workforces, and encourage people to reside locally. • Evolution would continue to provide a shuttle bus service for its workers located in Forbes and Condobilin for worker safety and reduce traffic movements. • The Department accepts that a joint VPA is not warranted.
Lachlan Shire Council	• Commented that it is generally supportive of the proposal and recognises the benefits provided to the wider community. • Noted the additional traffic generation but acknowledged the proposed mitigation measures to monitor impacts to local roads and uphold the existing road maintenance agreements between Evolution and LSC. • Requested that Evolution's community contributions to Lachlan Shire Council are consolidated into a joint VPA between Forbes, Bland and Lachlan Shire Councils.	• Comments noted. • The Department has recommended conditions requiring Evolution to update the existing Transport Management Plan for the mine. • The Department has further considered traffic impacts in Section 6.3 below. • The Department notes that Evolution did not propose to enter a VPA with Forbes or Lachlan council, given the project is located in Bland Shire Council area and that most employees and traffic movements are predicted to be within the Bland Shire Council area. • The Department accepts that a joint VPA is not warranted.

6 Assessment

In assessing the merits of the SSD Project and Mod 16 applications, the Department has considered the:

- EIS, Modification Report and Submissions Reports;
- agency and public submissions;
- independent expert advice
- previous environmental assessments for the project;
- modification applications and existing conditions of approval; and
- requirements of the EP&A Act, including the objects of the Act.

The Department considers the key issues for the project relate to water resources, subsidence impacts and traffic and transport.

6.1 Water Resources

The potential impacts of the SSD Project on water resources, including groundwater and surface water was one of the key issues raised in submissions, and has long been recognised by authorities and land users as a key issue associated with the Cowal Gold Mine, particularly given the finite nature of good quality water resources in the region, and the project's location adjacent to Lake Cowal.

A number of specialist water resource assessments have been undertaken for the SSD Project to understand the resource and assess the potential impacts of the project. These assessments have benefited from the extensive monitoring data and modelling available from the operations of the existing open cut mine.

The EIS includes specialist groundwater and surface water assessments, undertaken by Coffey Services Australia (Coffey) and Hydro Engineering & Consulting (HEC), respectively. Whilst not detailed in the EIS, Evolution later clarified that the groundwater assessment was also peer reviewed by EMM's groundwater assessments group, led by Dr Doug Weatherill.

The EIS assessments were informed by a number of other specialist assessments, including the subsidence assessment undertaken by Beck Engineering, and a geochemistry assessment undertaken by Geo Environmental Management (GEM).

The Department engaged Hugh Middlemis of HydroGeoLogic to undertake an independent peer review of the groundwater assessment and groundwater-related issues raised in submissions (see **Appendix A**). The project's water resource impacts were also reviewed by specialist hydrogeologists within DPIE Water.

DPIE Water and Mr Middlemis raised a number of initial issues in relation to the groundwater assessment in the EIS, with the key issues including:

- that the assessment included limited field data, especially in relation to potential connectivity between the underground mine and the lakebed sediments of Lake Cowal;
- that the model didn't include the whole of Lake Cowal, and included limited observational data near the eastern edge of the lease;
- that several conceptual and numerical issues of the model require clarification and/or resolution;
- that additional detail on the water balance is required;
- that, following revision of the model, further consideration of minimal impact considerations under the NSW Aquifer Interference Policy is required, for both groundwater and surface water, including further consideration of cumulative impacts; and
- a number of other technical issues with the model.

Given these issues, DPIE Water initially concluded that the groundwater model was not 'fit for purpose' for assessing the groundwater impacts of the project. Mr Middlemis considered that the assessment

was nominally fit for purpose, but did recommend a range of corrective actions because he considered that the assessment only provided an indicative 'low-confidence' prediction of the likely impacts.

The Department facilitated a number of meetings in November 2020, February 2021, and March 2021 with DPIE Water, Mr Middlemis and Evolution to further explore and clarify the information required to address these issues.

Based on these meetings and the issues raised in submissions, Evolution provided a supplementary groundwater assessment as part of its Submissions Report. The assessment included additional groundwater modelling and a range of other information to clarify and supplement the original groundwater assessment. This information included:

- additional evidence to demonstrate the poor connectivity between Lake Cowal and the underlying groundwater system;
- a detailed summary of field data;
- contaminant migration modelling and impact assessment;
- additional groundwater take and drawdown information;
- groundwater pressure decline at groundwater users' bores;
- information on the potential for fracturing above the underground mining stopes and declines;
- numerical model details; and
- monitoring and model verification mitigation measures.

Based on this detailed additional information, and following further consultation, both DPIE Water and Mr Middlemis subsequently confirmed that the revised groundwater assessment and model had adequately addressed the issues raised in their earlier advice. Both DPIE Water and Mr Middlemis have now confirmed that the model is 'fit for purpose' for assessing the water-related impacts of the project.

Catchment Context

The site is located in the Lachlan River catchment, and is directly adjacent to Lake Cowal, with the proposed underground mine located below the lake's western shoreline (see **Figure 7**).

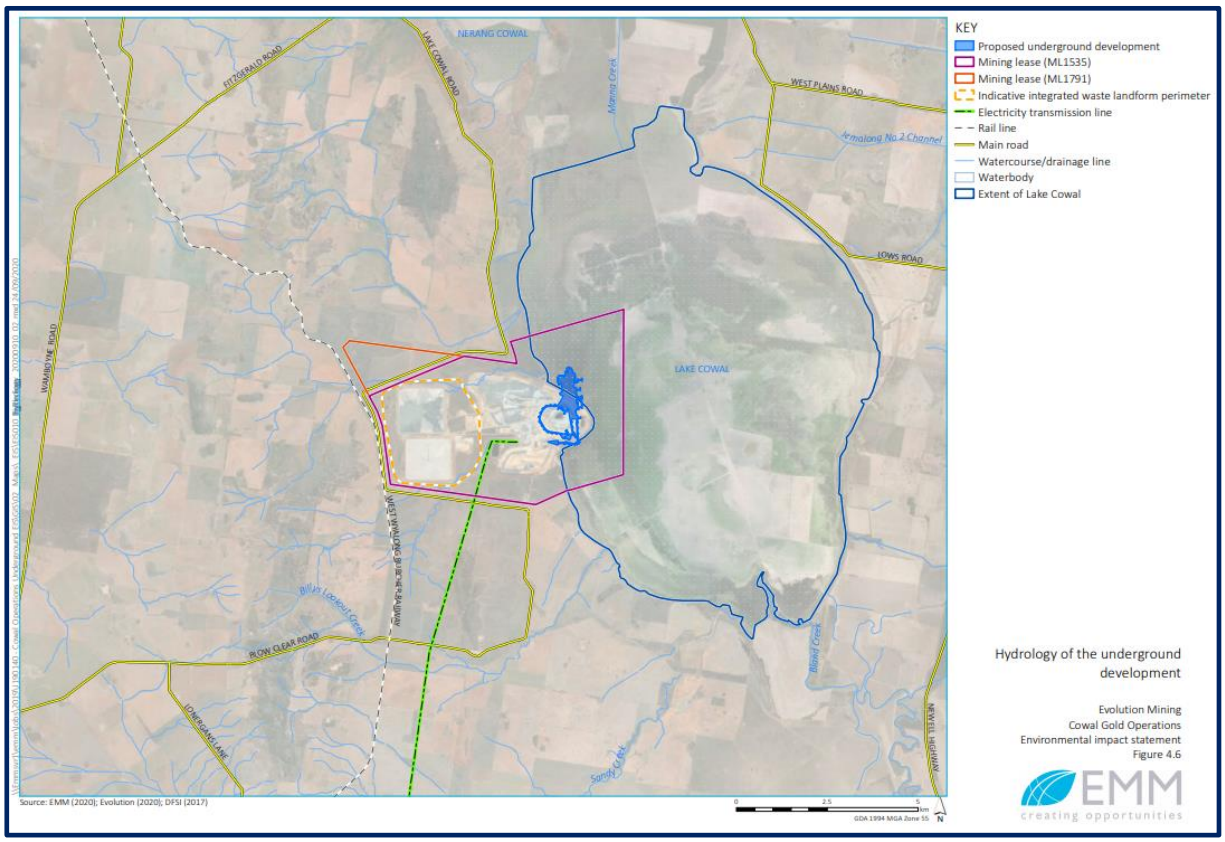


Figure 7 | Hydrological Context

Lake Cowal is located in the alluvial fan of the Lachlan River. It is a freshwater, shallow, ephemeral lake covering an area of approximately 13,000 hectares. It is the largest internal lake in New South Wales, holding around 150 gigalitres of water when full, and is up to 4 metres deep.

The lake is fed by floodwaters from the Lachlan River to the north and Bland Creek to the south. The time between flood events is highly variable (from months to up to 30 years), although historically the lake holds water about 50% of the time. It takes about 2 to 3 years to dry out when full, and is used periodically for grazing and cropping between flood events.

The existing mine is separated from the surrounding catchment and the lake through the mine's surface water management system, which includes:

- an Up-Catchment Diversion System (UCDS), which diverts clean run-on water around the disturbance areas;
- an Internal Catchment Drainage System (ICDS), which collects and manages all run-off from within the disturbance areas; and
- a Lake Isolation System, including a lake protection bund to separate the mine from Lake Cowal and flood waters.

The proposed surface infrastructure changes associated with the project are all located within the ICDS, and would be managed in accordance with the existing surface water management system.

Groundwater Aquifer Context

There are 4 main hydrogeological units in the vicinity of the project area, namely (from nearest the surface to deepest):

- *Transported Unit* – near the surface, comprising about 20 m of alluvium (clay and more permeable gravel and sandy clay);
- *Saprolite Unit* – comprising approximately 35 m of extremely weathered rock and clay of relatively low hydraulic conductivity;
- *Saprock Unit* – comprising approximately 30 m of moderate to highly weathered rock and some clay; and
- *Primary Rock Unit* – comprising fresh rock, underlying the Saprock Unit, with low fracturing and low hydraulic conductivity.

The proposed underground mining operations (stopes) would be located in the Primary Rock Unit (see **Figure 8**).

The groundwater table ranges from about 6 m to 81 m below ground level (123 m to 216 m AHD), and is highest in the western area of the site beneath the TSF and IWL, and lowest in the eastern area below the open cut pit.

The aquifers in the vicinity of the project area have been depressurised by discharges into the open cut pit, and by extraction from the groundwater supply borefields (see below).

Inflows into the open cut pit total approximately 1 megalitre per day (ML/day). Groundwater inflows have remained steady regardless of whether Lake Cowal is empty or full, which supports the case that there is minimal hydrogeological connection between the lake and the open cut pit. This is assumed to be because the lakebed sediments and rock layers have very low permeability and act as an aquitard between the lake water and the underlying aquifers (see further discussion below).

Water Balance and Licencing

The mine operates a preferential water use system, sourcing water from a number of different internal and external sources, with priority given to reclaimed water and sources of lower quality over higher quality water sources that are beneficially used by other agricultural and other land users in the region.

This preferential system would be continued for the SSD Project, with the key water sources including (from highest to lowest preference):

1. Reclaimed water from the IWL;
2. Open cut and underground mine inflows;
3. Catchment runoff in on-site water storages;
4. Eastern Saline Borefield (ESB), comprising 2 bores located 10 kilometres to the east of Lake Cowal (see **Figure 9**);
5. Bland Creek Paleochannel Borefield (BCPB), comprising 4 bores located near the ESB;
6. Saline bores within the mining lease, comprising 2 bores in Lake Cowal, which could be used when lake conditions allow; and
7. Licenced water from the Lachlan River.

The water balance model for the project (including the underground and open cut mines), based on these supplies for medium, dry and wet climate sequences, is reproduced in **Table 3** below.

Table 3 | Modelled Water Balance (averaged over the mine life, ML/yr)

	Dry Sequence (10th percentile)	Median Sequence	Wet Sequence (90th percentile)
Inflows			
Reclaimed water IWL	2,579 (35%)	2,579 (35%)	2,579 (35%)
Open cut and underground inflows	685 (9%)	685 (9%)	685 (9%)
Catchment runoff	1,114 (15%)	1,380 (19%)	1,443 (19%)
ESB	438 (6%)	430 (6%)	421 (6%)
BCPB	1,777 (24%)	1,628 (22%)	1,597 (21%)
Saline bores in ML	52 (<1%)	43 (<1%)	49 (<1%)
Lachlan River water	754 (10%)	686 (9%)	676 (9%)
Total inflow	**7,399**	**7,430**	**7,449**
Outflows			
Evaporation	960 (13%)	1,011 (14%)	1,037 (14%)
Haul road dust suppression	223 (3%)	222 (3%)	221 (3%)
Construction water	93 (1%)	93 (1%)	93 (1%)
Process plant supply	5,880 (81%)	5,880 (80%)	5,880 (80%)
Overflow	0	0	0
Underground mine vent loss	134 (2%)	134 (2%)	134 (2%)
Total outflow	**7,290**	**7,340**	**7,364**

As indicated in the table, around 63% of the SSD Project's water needs would be sourced from the internal reclamation sources (i.e. reclaimed water, mine inflows and catchment runoff), while around 37% would be sourced from external supplies (i.e. the borefields and the Lachlan River).

It is noted that these figures are averaged over the life of the SSD Project, and that peak demands for each of the water sources would vary considerably over the SSD Project life (see **Figures 8** to **10**).

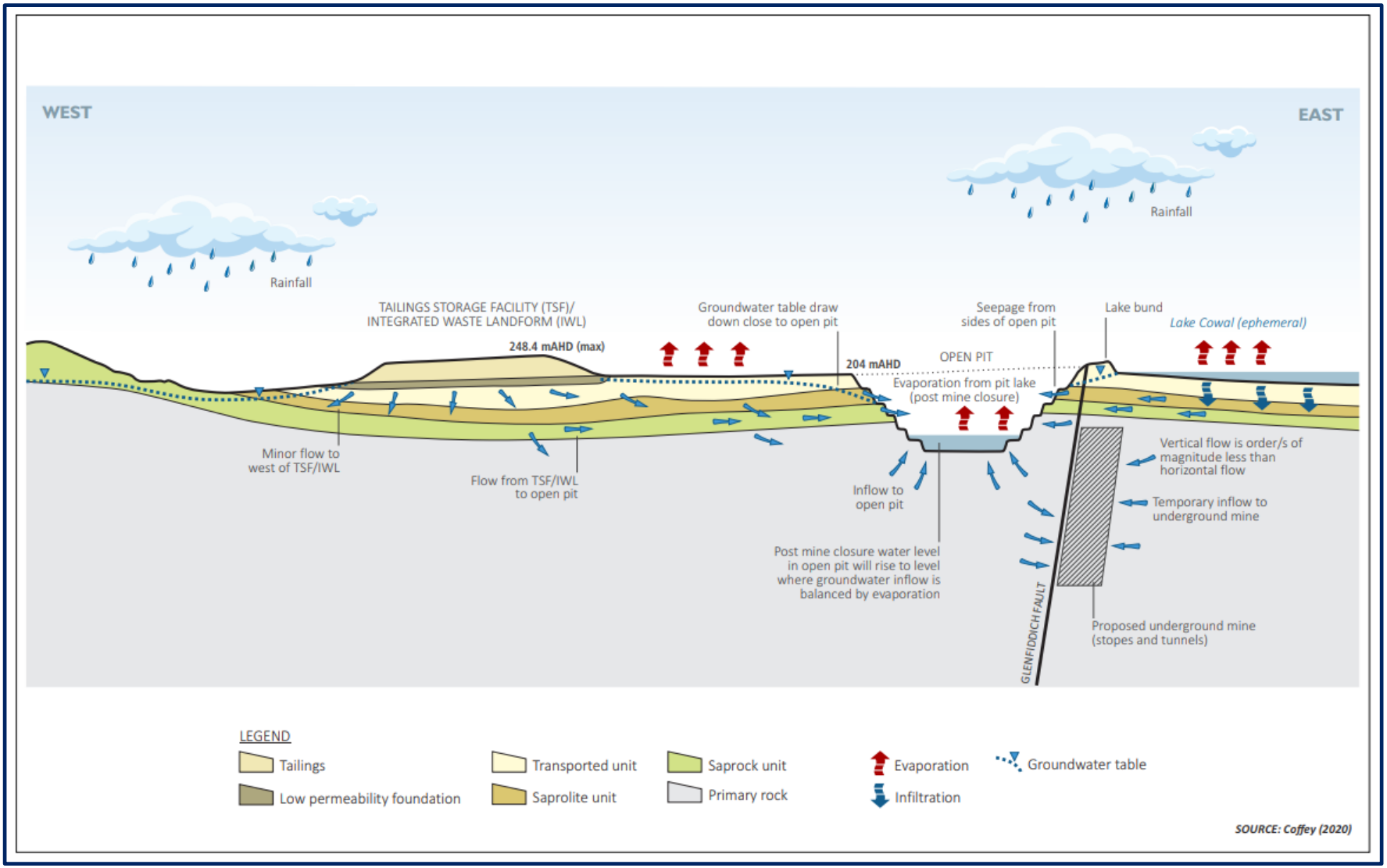


Figure 8: Hydrogeological Context

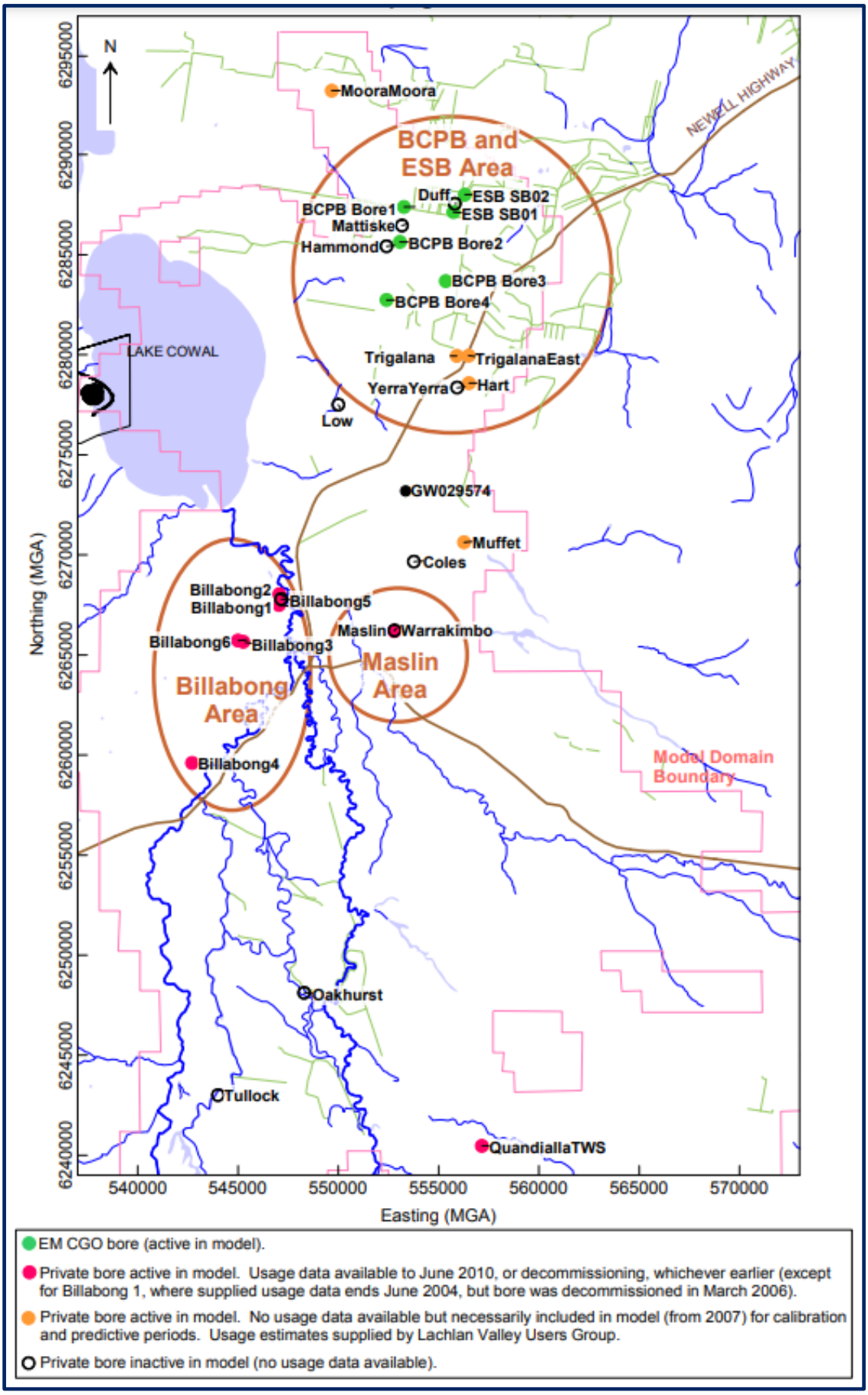


Figure 9: ESB and BCPB Borefields

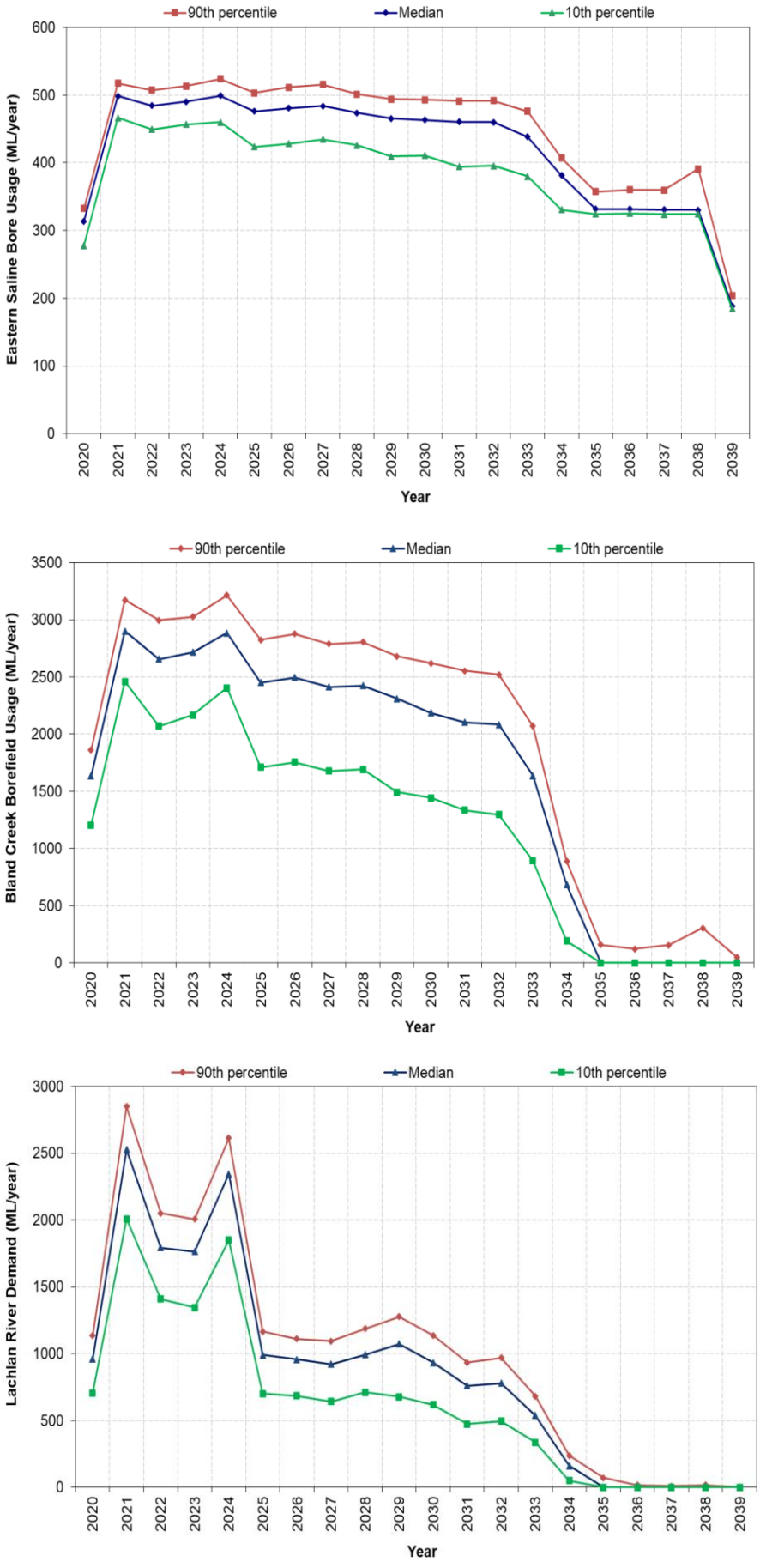


Figure 10: Predicted Peak Annual Water Demands – ESB (top), BCPB (middle) and Lachlan River (bottom)

In terms of water licencing for this water use, water take in the mine area is regulated under two water sharing plans:

- *Water Sharing Plan for the Lachlan Unregulated and Alluvial Water Sources 2012*, for alluvial groundwater and surface water (the Lachlan Unregulated Plan); and
- Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources 2012, for the deeper groundwater in the fractured rock (the Fractured Rock Plan).

The mine is located within the 'Upper Lachlan Alluvial Zone 7' management zone under the Lachlan Unregulated Plan. Evolution currently holds the following water access licences (WALs) in Zone 7:

- saline water bores in the mining lease – 366 ML/yr (WAL 36615);
- ESB – 750 ML/yr (WAL 36569);
- BCPB – 3,650 ML/yr (WAL 31864); and
- Lachlan River – allocations purchased as required from the Lachlan River trading market (high security WALs 14981 and 13743, and general security WAL 13748).

Evolution holds a further 3,294 ML/yr in the fractured rock groundwater source under the Fractured Rock Plan (WAL 36617).

The existing water licences are adequate to supply the modelled demands from the ESB and BCPB in all meteorological scenarios. However, it is noted that the extraction from the borefields is proposed to be limited by Evolution in accordance with a contingency strategy to ensure the sustainable and equitable use of these resources for all groundwater users (see below). This contingency strategy limits the maximum long-term average groundwater extraction rate over the life of the project to 4 ML/day (1,460 ML/yr) at the BCPB and 1.5 ML/day (547.5 ML/yr) at the ESB.

With regard to pit/void inflows, Evolution's assessment indicates that approximately 90% of the current inflows are attributed to the fractured rock water source, with the remaining 10% attributed to the overlying alluvial water source. The percentage attributed to the alluvial water source would gradually reduce (to around 3%) during the life of the underground project, as more water flows from the Primary Rock Unit.

Peak inflow from the project is predicted to be 1,022 ML/yr (based on peak daily inflows of 2.8 ML/day), with worst case inflows from the fractured rock water source of approximately of approximately 1,004 ML/yr (towards the end of the project), and inflows from the alluvial water source of approximately 37 ML/yr (towards the start of the project).

Evolution's existing licence in the fractured rock groundwater source (i.e. 3,294 ML/yr) is adequate to account for these inflows, and its existing entitlements for the alluvial water source (i.e. 366 ML/yr for the saline water bores within the mining lease) also cater for the predicted inflows from the alluvial water source.

Following clarification of some issues regarding the water balance, DPIE Water accepts that Evolution's existing WALs are sufficient to cover the predicted water take associated with the project.

However, while DPIE Water is satisfied that historical trading volumes for water take from the Lachlan River indicate that adequate supplies from this source should be available (volumes of more than 3,160 ML have been traded in 14 of the last 16 years, with 9 years exceeding 50,000 ML), it does note that these supplies may not be available in drought years. Consequently, DPIE Water cautions that this is a commercial risk for the SSD Project, and that prioritisation of water sources and on-site storage would be critical to managing this risk.

The Department accepts that Evolution's assessment indicates that it has sufficient water licences to account for all water take associated with the project, and that the water take is relatively small compared to the total long term average annual extraction limits (LTAAELs) in both of the water sources.

In this regard, the Upper Lachlan alluvial water source has a LTAAEL of 94,196 ML/yr under the Lachlan Unregulated Plan, and the fractured rock water source has a LTAAEL of 875,652 ML/yr.

Consequently, the Department is satisfied that the water use associated with the project is unlikely to have a significant impact on water availability and water supply in the applicable water sources. As outlined by DPIE Water, access to adequate water supplies is a commercial risk for Evolution, and like any other significant water user in the State, if Evolution is not able to secure enough water to meet its demands (e.g. if existing allocations are reduced due to drought), its operations may need to be curtailed, or it may need to investigate additional water efficiency measures. This is consistent with the water sharing and water efficiency principles established under the WM Act.

To ensure the effective and sustainable management of water resources, the Department has recommended conditions requiring Evolution to:

- preferentially source water from the internal and saline supplies;
- ensure it has adequate water licences for all stages of the project; and
- maintain a detailed water balance for the project, including measures to minimise water use and maximise water use efficiency.

Impacts on Local Groundwater Resources

In addition to impacts on regional water supplies, the project has the potential to impact local groundwater flows and resources in a number of ways, through groundwater drawdown associated with inflows into the underground voids and open cut pit, drawdown associated with pumping from the borefields, and groundwater mounding associated with seepages from the IWL and TSFs.

Groundwater Inflows, Drawdown and Lake Cowal Impacts

As outlined above, groundwater aquifers in the area surrounding the open cut have already been depressurised by inflows into the open cut pit. Groundwater inflows into the project are predicted to increase from the existing 1 ML/day, to a peak of 2.8 ML/day in the year 2031, and continue at this rate until the end of mining in 2038/39.

Approximately 1 ML/day would be attributed to the open cut, and up to 1.8 ML/day would be attributed to the stopes in the underground mine**.** Inflows to the underground mine would be limited by paste filling of the stopes, with total inflows gradually reducing back to open cut only inflow levels about 30 years after mining (see **Figure 11**).

The groundwater modelling indicates that the maximum cumulative drawdown associated with the open cut and underground development would be confined within the existing mining lease, apart from small areas to the north and south where the 1 m drawdown contour extends just outside the lease area.

No privately-owned groundwater bores are predicted to be affected, which are all located well beyond the mining lease boundary (see **Figures 12** and **13**). No exceedances of the minimal impact considerations in the *NSW Aquifer Interference Policy* are predicted.

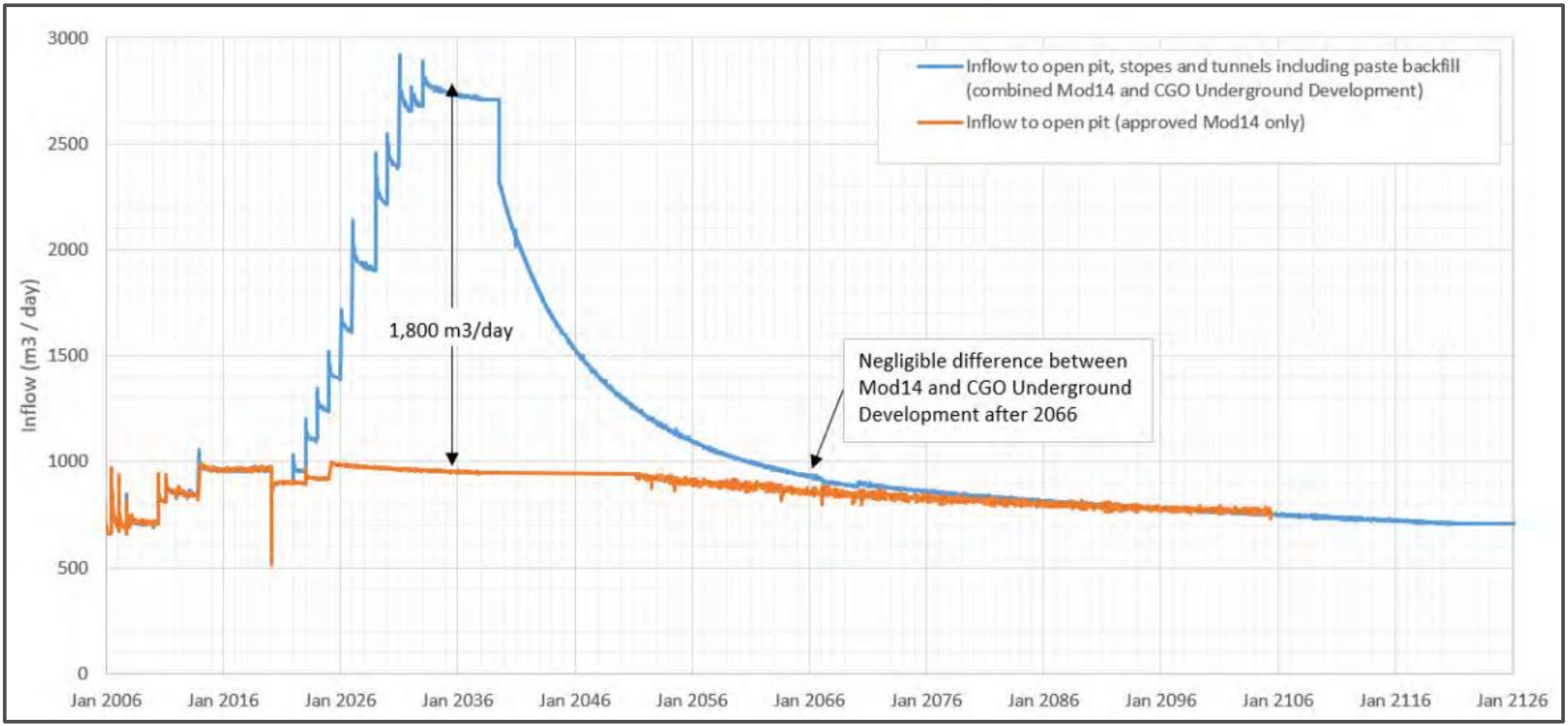


Figure 11: Predicted Inflows

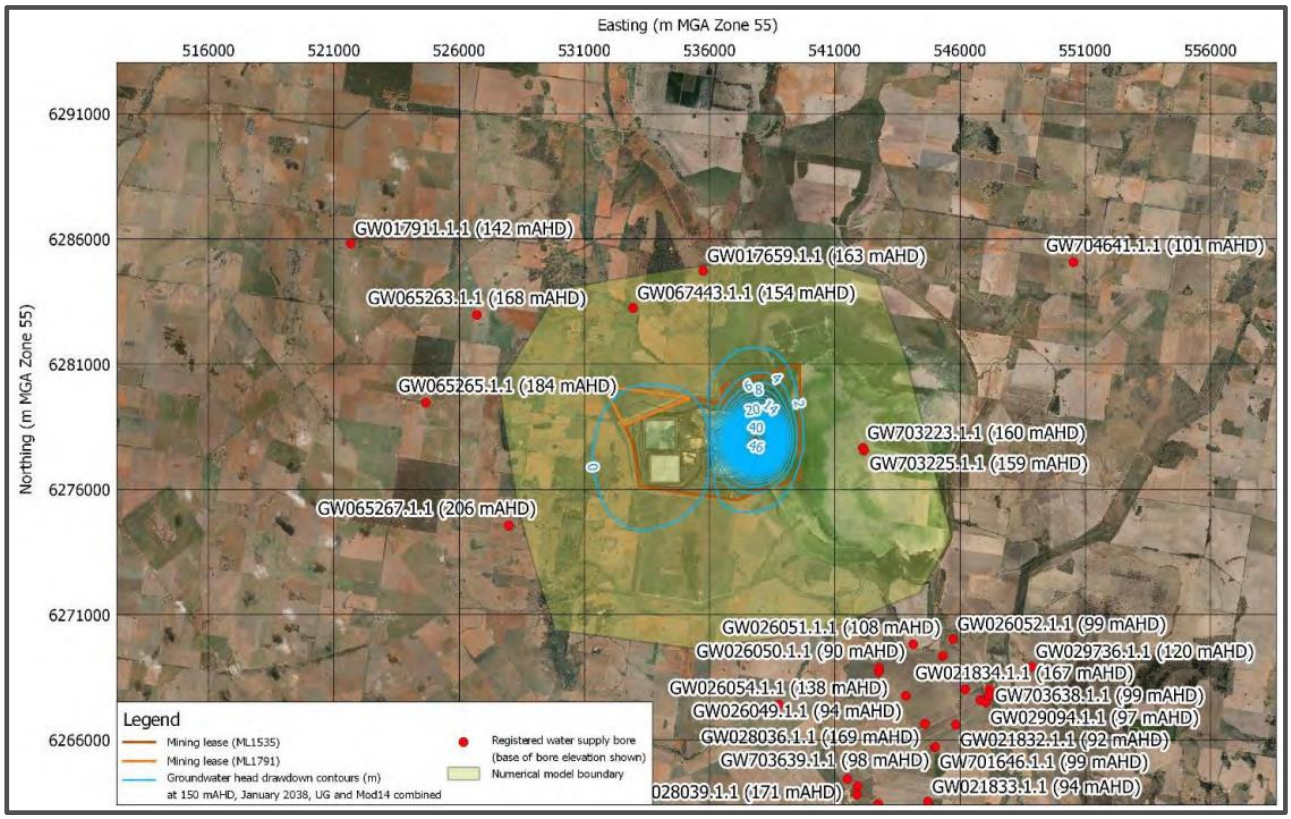


Figure 12: Predicted Cumulative Groundwater Drawdown for Shallow Bores (drawdown at 150mAHD, year 2038)

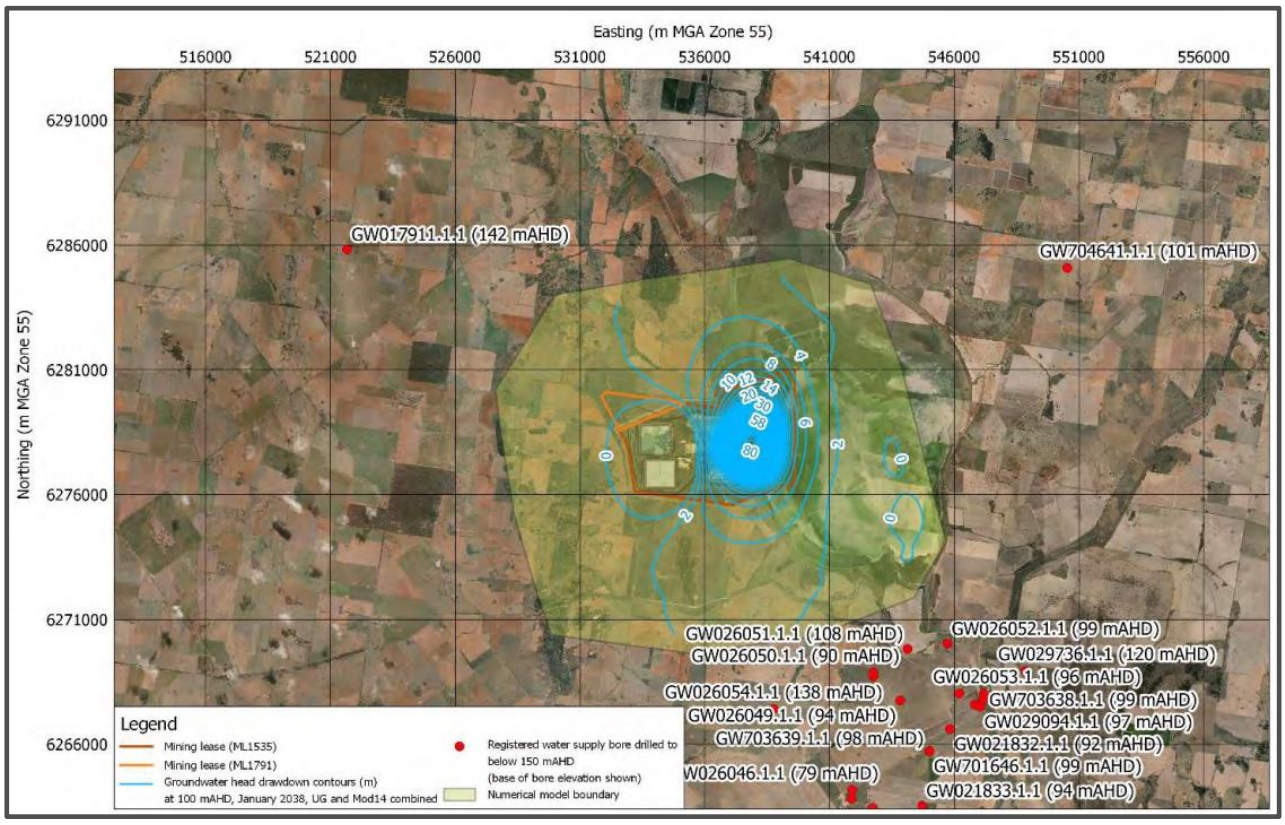


Figure 13: Predicted Cumulative Groundwater Drawdown for Deeper Bores (drawdown at 100mAHD, year 2038)

To assess the potential for increased flows associated with fracturing and faults, particularly the potential for connectivity between the mine and Lake Cowal, the groundwater modelling in the EIS included uncertainty analyses, which was undertaken by increasing the vertical and horizontal hydraulic conductivity in the model for the Primary Rock Unit and Transported Unit by a factor of 10. The results showed minimal change to inflows (i.e. less than 2%), due to the low conductivities in the Transported, Saprolite and Saprock units overlying the stopes (which have a combined thickness of 50 to 100 metres above the stopes).

Despite this modelling, DPIE Water initially raised some concerns about the potential for connectivity between the mine and Lake Cowal.

To address DPIE Water's concerns, Evolution provided additional data and information demonstrating that there is no material connection between the lake and the existing open cut, as there is no observed change to dewatering rates whether the lake is full or empty. As shown on **Figure 14**, pit dewatering correlates well with rainfall, rather than lake water levels.

Water loss from the lake also correlates well with evaporation for comparable inland lakes in NSW (i.e. approximately 80% of pan evaporation). In this regard, when it is full, Lake Cowal loses approximately 200 ML/day due to evaporation. The total predicted inflow to the underground mine (i.e. approximately 1.8 ML/day), most of which is from the Primary Rock Unit, is minor compared to this evaporation.

Evolution also provided additional uncertainty analysis modelling as part of its Submissions Report, which included increasing the horizontal and vertical hydraulic conductivity by a factor of 10 in all of the Primary Rock, Saprock, Saprolite and Transported units. The results continue to show minimal change to inflows (less than 5%) compared to the base case.

Evolution did note that the Glenfiddich Fault may result in moderate localised increased flows, and that this would be monitored during the life of the SSD Project. If necessary, these localised areas could be grouted if flows were found to be of sufficiently high magnitude.

Based on this work, both DPIE Water and Mr Hugh Middlemis are satisfied that the SSD Project is unlikely to have any significant impact on groundwater resources and groundwater users surrounding the mine, or to Lake Cowal.

DPIE Water recommended that additional monitoring bores are located in the bed of Lake Cowal to monitor potential impacts on the lake, comprising a minimum of two nested bore sites screened in the Transported Unit and underlying Saprolite/Saprock Unit.

Mr Middlemis supports this recommendation, and suggests that the bores should be located on the eastern side of the Glenfiddich Fault.

The Department agrees, and has recommended conditions requiring Evolution to include these monitoring bores as part of its Water Management Plan and water monitoring program.

The Department has also recommended other conditions consistent with DPIE Water's and Mr Middlemis' recommendations, including requirements for Evolution to periodically validate the groundwater model.

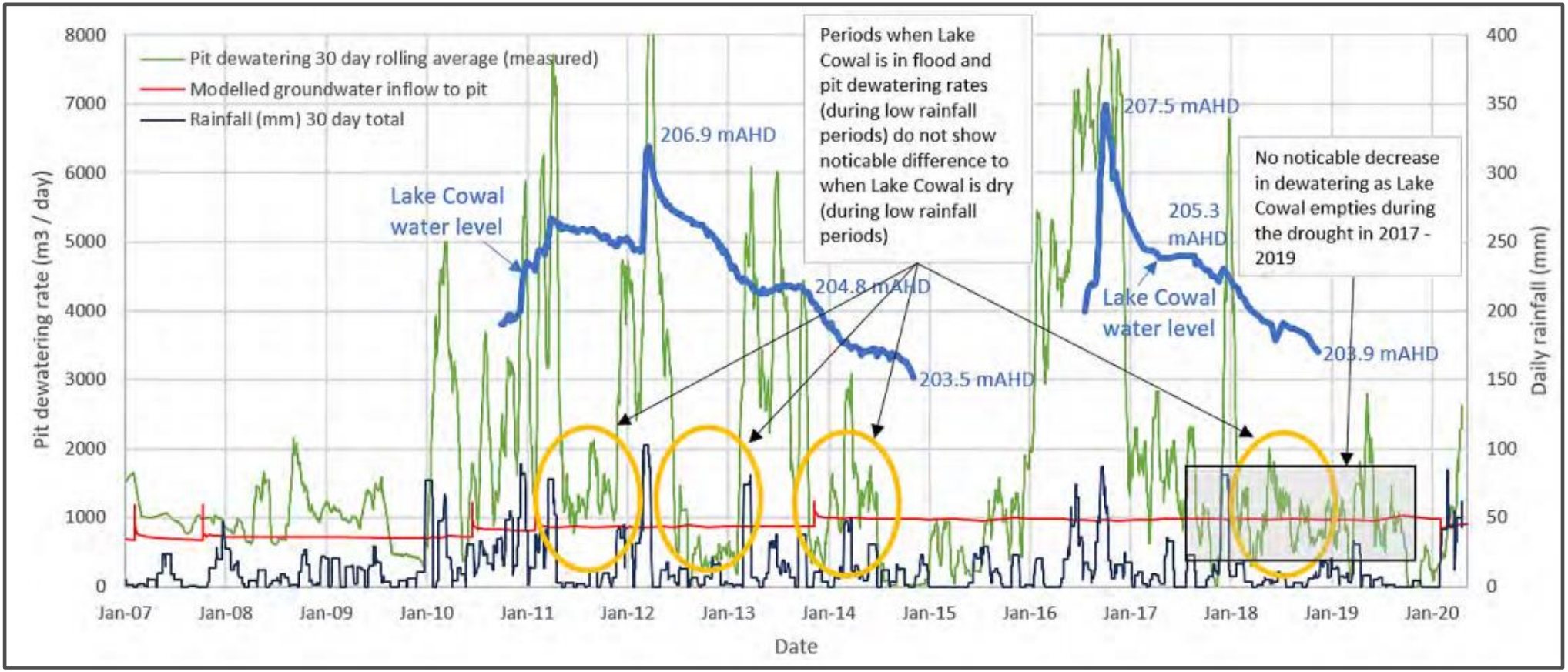


Figure 14: Pit Dewatering and Lake Cowal Levels

Borefields Impacts

With regard to the borefields, analysis indicates that the ESB can sustainably supply approximately 1.5 ML/day of saline water, and the bores within the mining lease can supply up to 1 ML/day of saline water.

The BCPB is used extensively by agricultural irrigators in the area in addition to Evolution. To ensure the sustainable use of this resource, the NSW government monitors groundwater levels in the area and has established trigger levels for protecting the groundwater resource from overuse.

Although the BCPB is able to supply Evolution with up to 15 ML/day and 3,650 ML/year under its existing licence, the modelling undertaken for the SSD Project indicates that this would result in the trigger levels being exceeded over the long term. To ensure the trigger levels are not exceeded, Evolution's assessment indicates that its use of the borefield would need to be limited to a daily maximum of 4 ML/day (1,460 ML/yr), averaged over the life of the SSD Project. This is less than that predicted for the existing operations at the mine (ie. 4.4 ML/day averaged over the life of the existing mine).

To this end, DPIE Water has recommended that the mine's Water Management Plan outlines the strategy to maintain extraction at an average rate of 4 ML/day for the BCPB and 1.5 ML/day for the ESB, to ensure annual groundwater take remains within licenced and sustainable use limits. The Department has recommended conditions in this regard.

Integrated Waste Landform Impacts

With regard to the IWL, the groundwater assessment indicates that some continued mounding of the groundwater table would occur below the IWL due to seepages, but that groundwater would be drawn towards the open cut pit, and no surface salinisation risks are predicted. Evolution would continue to monitor these seepages and implement additional mitigation measures in the event that any issues are identified (see further discussion on groundwater quality under separate heading below).

The Department is satisfied that groundwater levels associated with the IWL/TSFs are able to be effectively managed.

Long Term Groundwater Flow Impacts

At the end of mining, the paste-filled stopes in the underground mine would fill with water, with inflows gradually reducing to negligible levels over about 30 years after the completion of mining (see **Figure 15**).

The open cut would continue to act as a permanent groundwater sink, with a pit lake forming at the base of the pit, rising to a level where net evaporation is balanced by groundwater and surface water inflows. This equilibrium level would remain more than 60 m below the spill level of the open cut pit.

The ongoing inflows (i.e. approximately 0.75 ML/day to 1 ML/day, mostly from the saline fractured rock water source) are not predicted to affect any groundwater users in the region.

Mr Hugh Middlemis suggested that reduced long term risks to water resources could be achieved by backfilling the pit to the pre-mining groundwater level, to minimise final void lake evaporation and salinisation impacts, subject to careful evaluation of potential leachate risks.

The Department acknowledges this suggestion, but notes that the open cut mine was approved following detailed consideration as retaining a final void with no requirement for backfilling. As the subject proposal does not involve any changes to the open cut pit, the Department does not believe that it would be reasonable (or within power) to require Evolution to re-consider this issue for the open cut mine.

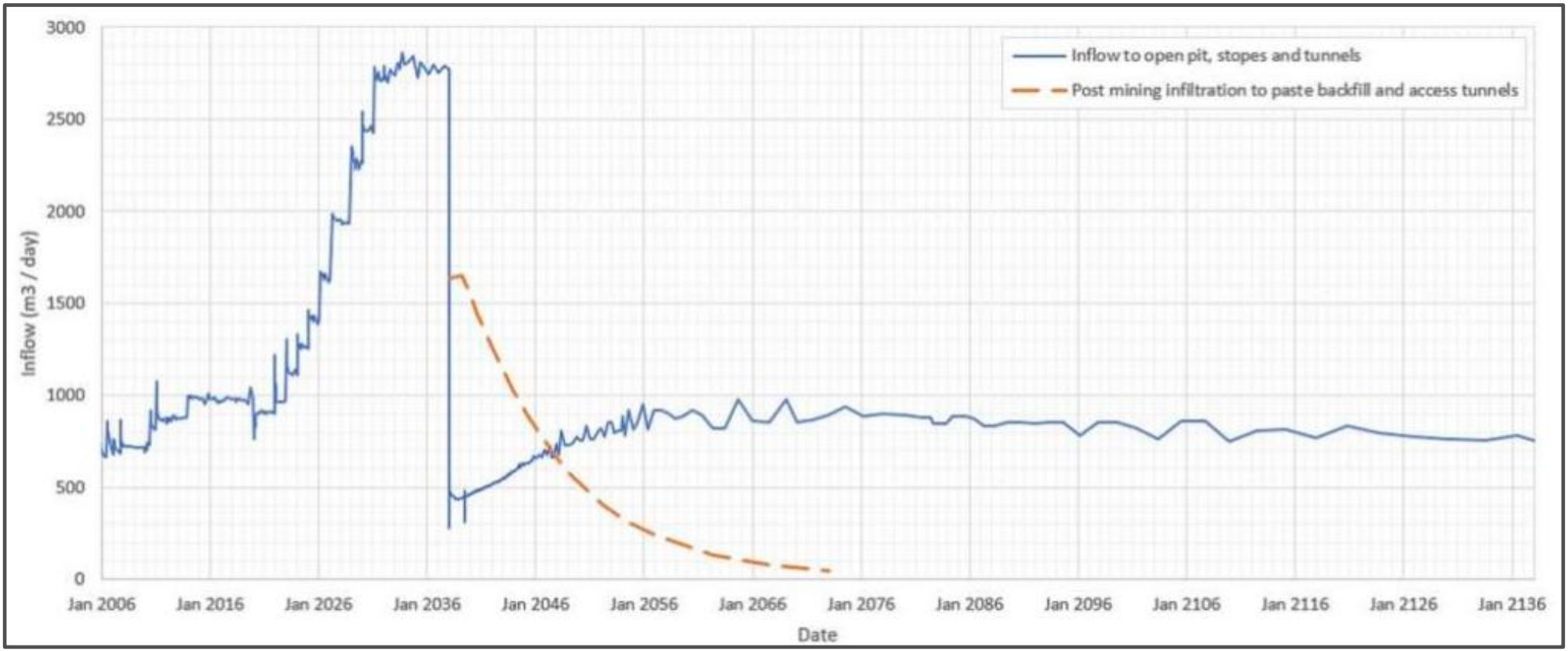


Figure 15: Predicted Inflows and Post-Mining Recovery

Nonetheless, the conditions of consent for the open cut mine include requirements for Evolution to minimise to the greatest extent possible the size and depth of the final void, the drainage catchment into the final void, risk of flood interaction, and to permanently separate the void from Lake Cowal.

Impacts on Groundwater Quality

The key risk to groundwater quality associated with the SSD Project is the potential for solute/contaminant migration from the IWL, and other infrastructure and processing areas.

Monitoring for the existing mine indicates that groundwater quality has remained relatively stable during mining – including electrical conductivity (EC), pH, major ions and metals, and cyanide. There has been some localised lowering of pH and increasing EC and ions in the vicinity of the TSFs, however this has not resulted in any significant environmental impacts.

No significant cyanide-related issues have been identified to date, with cyanide (which is used in ore processing) managed in accordance with a Cyanide Management Plan required under the existing consent for the open cut mine.

To address seepage, Evolution is proposing to develop a groundwater control plan, which would include the following measures:

- augmenting the existing monitoring network; and if required
- pumping groundwater from the nearby bores back to the TSFs; and/or
- installing trench drains and sumps to collect groundwater and suppress further rise in groundwater levels.

The groundwater assessment includes consideration of long-term impacts associated with continued seepage from the IWL/TSFs, with contaminant transport modelling undertaken for a period of 200 years after mining.

Based on worst case predictions, the modelling indicates that potential contaminants would not affect any off-site groundwater users (see **Figure 16**). The open cut pit would continue to act as a groundwater sink, draining groundwater to it from all directions including from below the western part of the lake. This would prevent any possibility of groundwater from the IWL/TSFs reaching Lake Cowal.

Cyanide levels are predicted to fall well below detection limits prior to seeping outside the mine area (within 1 km), as cyanide is subject to natural decay. With a half-life in the order of 300 days (worst case), any cyanide from the mining operations is expected to fall well below detection limits within 12 years.

The Department considers that the SSD Project can be managed such that it would not significantly affect groundwater quality in the locality. To ensure this occurs, the Department has recommended conditions requiring Evolution to implement best practice measures to minimise groundwater seepage from the IWL/TSFs, and to prepare and implement a detailed groundwater monitoring program and groundwater contingency strategy as part of the Water Management Plan.

Surface Water Impacts

Potential surface water impacts associated with the mine are managed through the UCDS, and particularly the ICDS, which contains and manages all surface water within the mine's disturbance area, with any discharge into the open cut pit. The storage capacity in the open cut pit ensures that no dirty water from surface runoff is required to be discharged from the site. The surface facilities for the underground mine development would all be located within the ICDS and would be managed in a similar manner as the existing mine.

Water quality monitoring indicates the existing mine has not resulted in any changes to off-site water quality, including in Lake Cowal, and the SSD Project is not expected to change this.

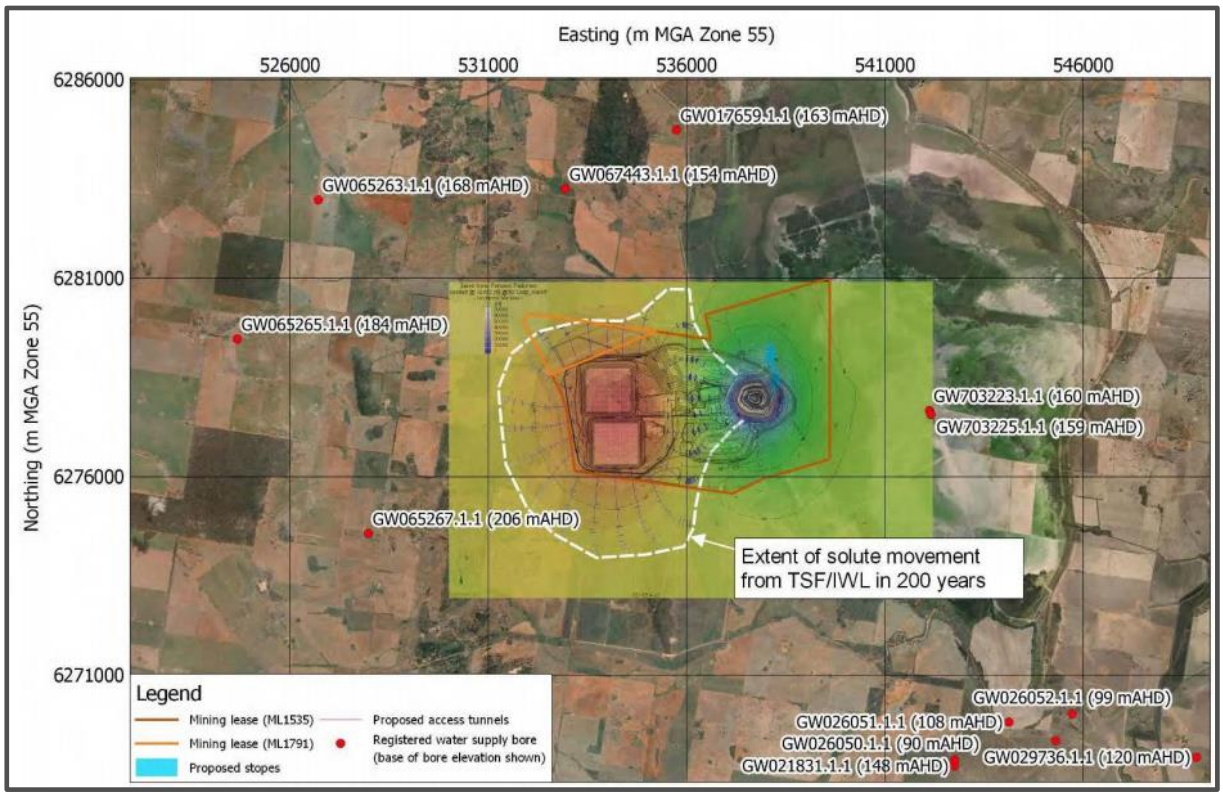


Figure 16: Predicted Solute Movement (after 200 years)

The EPA did not raise any issues regarding surface water quality, and the Department is satisfied that surface water issues can be appropriately managed in a similar manner as the existing mine. To ensure this occurs, the Department has recommended conditions requiring Evolution to prepare and implement a detailed surface water management plan and salt balance as part of the Water Management Plan, including a detailed monitoring program.

Conclusion

The Department considers that Evolution has designed the SSD Project to avoid significant impacts on key water resources, particularly through managing water use on a preferential basis that prioritises reclaimed and poorer quality water over higher quality water resources, and by limiting water use from the BCPB to ensure the sustainable long term use of this resource for relevant groundwater users.

Following comprehensive groundwater and surface water assessment – including assessment by DPIE Water and independent peer review by Hugh Middlemis on behalf of the Department – the Department is satisfied that the SSD Project is unlikely to significantly affect groundwater and surface water resources, water users or the environment. The proposed underground mine is located within the Primary Rock Unit with very low hydraulic conductivity, and groundwater assessment, including extensive worst-case uncertainty analysis, indicates that the mine would not have any significant impacts on overlying groundwater aquifers or Lake Cowal.

However, the Department recognises the importance of the region's water resources to the people of the Lachlan Catchment, and has recommended a broad suite of conditions to protect these resources. These include conditions requiring Evolution to:

- ensure it has sufficient water for all stages of the SSD Project, and if necessary, adjust the scale of mining operations on site to match its available water supply;
- preferentially use available water supplies, with priority given to reclaimed water and saline water supplies;
- ensure it has adequate water access licences to account for all water used by the SSD Project;

- limit water supply from the BCPB and ESB to an average of 4 ML/day and 1.5 ML/day;
- not discharge any mine water from the site under any circumstances;
- provide compensatory water supplies to any private landowner whose supply is found to be adversely impacted by the SSD Project (including the borefields);
- comply with a range of water management performance measures and rehabilitation objectives;
- prepare and implement a comprehensive Water Management Plan for the SSD Project, including :
  - water balance;
  - surface water management plan and monitoring program;
  - groundwater management plan and monitoring program, including a contingency strategy for IWL/TSFs; and
  - program to regularly validate the water balance, salt balance and groundwater model.

6.2 Subsidence

Subsidence impacts and potential environmental consequences on Lake Cowal was a key concern raised by government agencies, particularly from potential piping or chimneying failure which would provide a direct connection from Lake Cowal into the underground workings.

Underground Mining Environment

The regional geological setting of the mine is dominated by the Gilmore Fault Zone, also known as the Gilmore Suture, a structurally and lithologically complex feature that trends north-south approximately 500m west of the open cut pit. The targeted gold orebody mined by Evolution is located within a volcanoclastic sequence known as the Lake Cowal volcanic complex. Alluvial sediments overlay the volcanic sequences.

The Gilmore Suture separates the Lake Cowal volcanic complex and the Devonian sedimentary basement to the west (see **Figure 17**). Several north-south oriented, near vertically dipping faults and fractured dykes occur in the area of the underground mine or within the ore body, including the Glenfiddich Fault, a key fault that intersects the underground mining area with a north-south strike.

Evolution has developed a comprehensive understanding of the local geology through its continued mining of the open cut mining precinct and more recently (early 2019), the development of an exploration decline to collect additional geological data to further inform the underground mine design (see **Figure 18**).

Subsidence Assessment and Predicted Impacts

The EIS includes a Subsidence Impact Assessment (SubIA), prepared by Beck Engineering, to predict the surface subsidence impacts of the SSD Project over the life of the mine. The SubIA is based on three-dimensional numerical modelling of the proposed SLOS mining and includes an analysis of potential interactions with the existing open cut pit.

The term ‘subsidence’ describes the deformation of the ground mass due to mining, being all mining-induced ground movements including both vertical and horizontal displacement, tilt, strain and curvature. Important aspects that can influence subsidence effects relate to depth of cover, geological structures such as faults and dykes, and the chosen mining method.

The proposal involves underground mining adjacent to and beneath Lake Cowal to extract ore from the GRE46 mineral deposit using a SLOS mining method to mine 1,106 stopes, ranging from a depth of around of -80 m AHD to -850 m AHD. The SLOS mining method was specifically chosen given the mine’s geological setting with Lake Cowal situated above, as it would provide flexibility for adaptive mine design and enable a range of subsidence mitigation measures to be incorporated as mining progresses (see **Figure 19**).

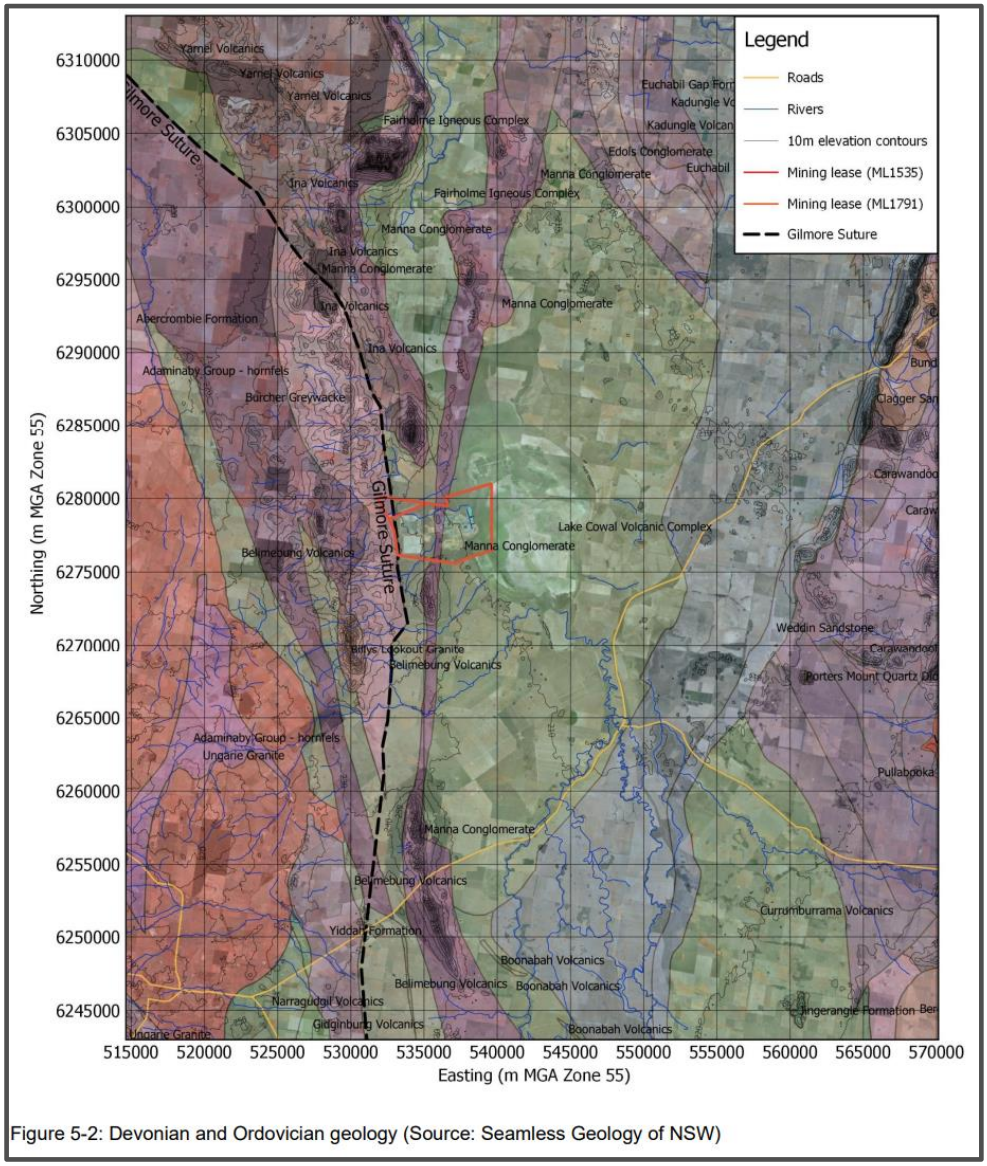


Figure 5-2: Devonian and Ordovician geology (Source: Seamless Geology of NSW)

Figure 17 | Regional Geology and Surrounds

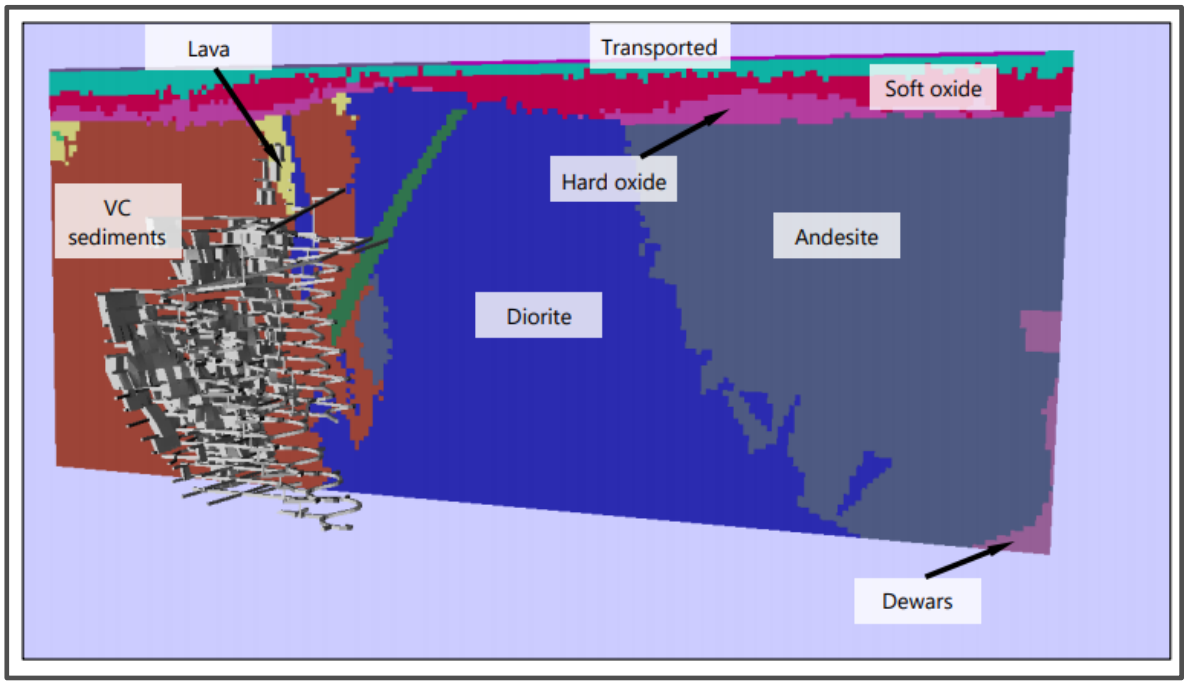


Figure 18 | Cross section showing lithology domains

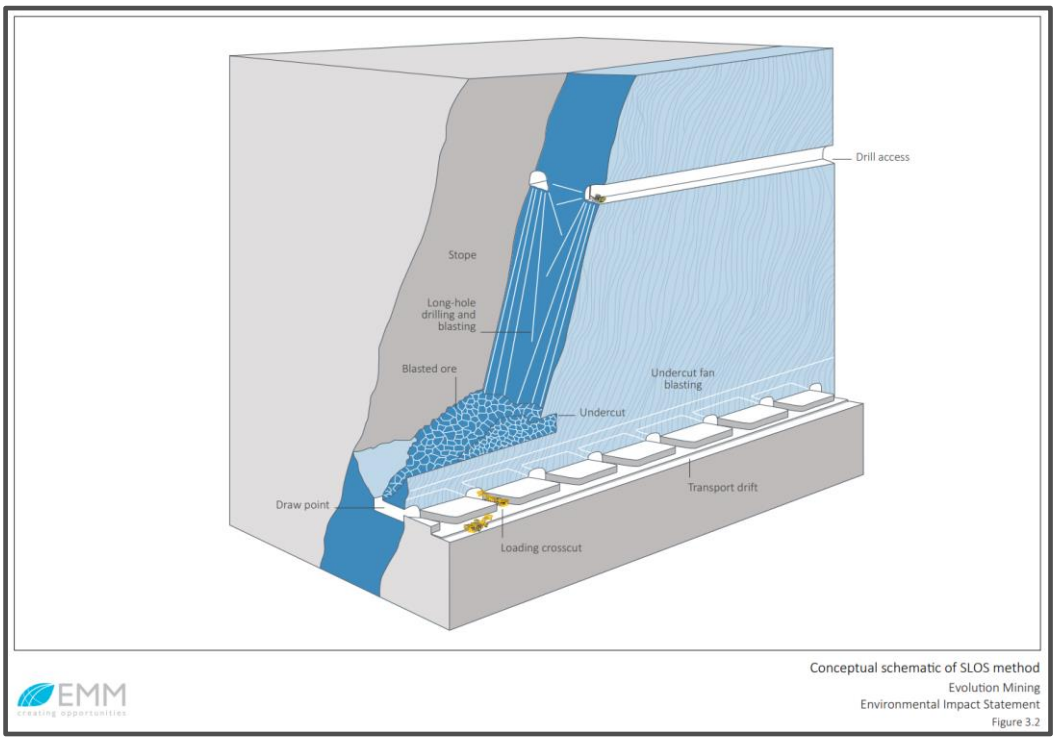


Figure 19 | Conceptual illustration of SLOS mining

The EIS notes that the mine design was developed iteratively, with revisions informed by ongoing assessments of potential subsidence impacts. To improve mine stability and reduce potential surface subsidence, the final mine plan presented in the EIS includes the removal of 19 stopes located in weaker rock layers (see **Figure 20**); the implementation of a minimum stope width to crown pillar thickness ratio of 1:2; and locating crown pillars in more stable fresh rock.

The SubIA predicts vertical subsidence at the surface would be less than 15 millimetres (mm) and uplift (or upsidence) would be no more than 25 mm, in isolated areas (see **Figure 21**). The SubIA notes that this is within the range expected for stope mining operations targeting near vertical and thin gold orebodies, as is the case for the proposed underground development. Localised surface subsidence near the box-cut is expected to occur but this is isolated to a small area of the mine that is already disturbed and would not result in any subsequent material impact.

As outlined in Section 6.1, the SSD Project is highly unlikely to impact the hydrological processes of Lake Cowal, which is hydraulically separated from the underlying aquifers and groundwater system. The SubIA acknowledges that while there is a potential for water inflow into underground workings along major faults (ie. Glenfiddich and Galway Splay faults), further understanding of fault strength properties and hydraulic conductivity would be acquired through ongoing monitoring of potential water inflows as mining progresses.

With regard to the assessment of potential connections between the underground mine and the existing open cut pit, the SubIA predicts displacement of the underground mine would occur inwards and slightly upwards due to removal of material from the open cut pit and the small footprint of the underground mining area. It is therefore considered that any interaction would be negligible. Nevertheless, the EIS proposes to undertake further crown pillar stability assessments and ongoing monitoring, particularly during development and mining of the upper stopes.

However, as with all stope mining operations, the potential for ‘chimneying’ (stope failure resulting in a chimney like formation up to the surface above the mine) is a risk which requires ongoing analysis and mitigation as mining progresses into areas of potentially unknown geological conditions.

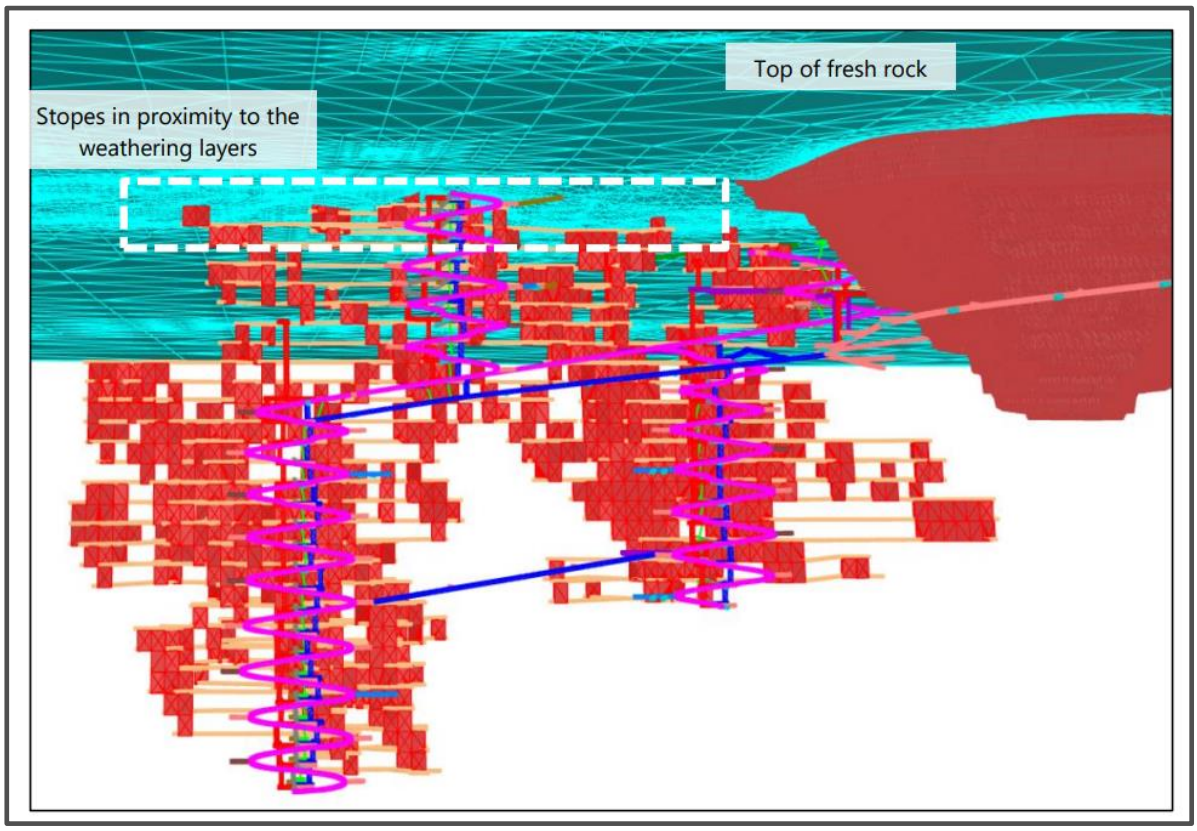


Figure 20 | Stopes located in close proximity to weathered cover and removed from mine plan

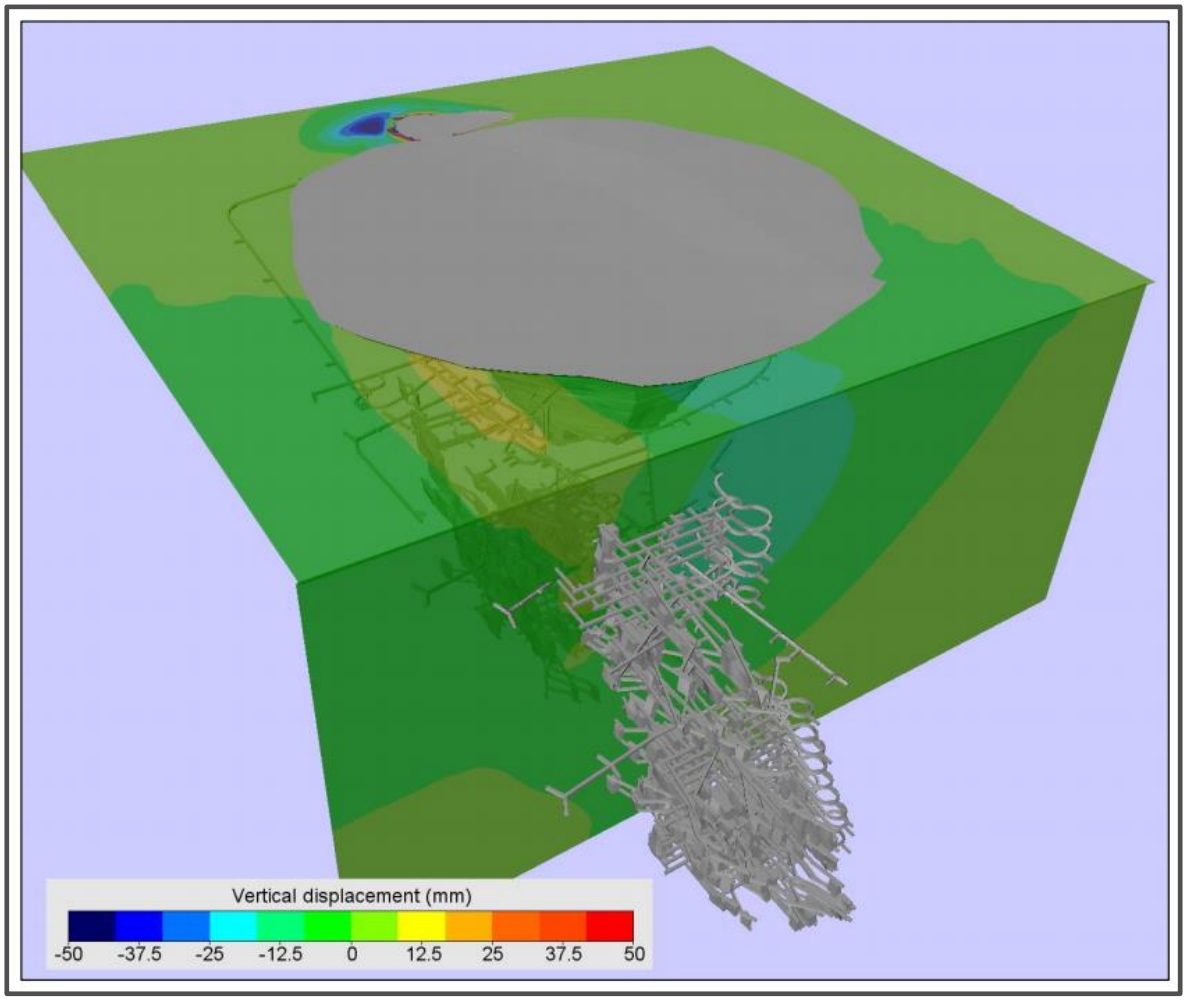


Figure 21 | Forecast vertical displacement (horizontal and vertical cross sections)

BCD raised concerns in relation to subsidence risks and the potential for impacts on Lake Cowal and its biodiversity should a catastrophic stope failure occur in the underground mine when Lake Cowal is holding water. Nonetheless, BCD advised that it is reliant on the advice of other experts and/or agencies with proficiency in this field (ie. the Resources Regulator), to better understand the adequacy of the proposed mine design and mitigation measures.

Evolution acknowledge the risk of chimneying and that a failure to the surface (when the lake is inundated) would not only cause potential harm to the natural ecology of Lake Cowal but could also be life threatening for its workers, as well as potentially sterilising the resource if flooding in the mining precinct were to occur. Accordingly, Evolution has made significant commitments to further limit any possible risks by implementing a comprehensive range of management and mitigation measures. These measures would be applied at every stage of the proposal, including the initial planning and detailed mine design stage as the mine is developed.

Further, a key component of the SSD Project involves the rapid backfilling of stopes with paste material made from waste rock and tailings in the proposed on-site paste fill plant. Stopes would be completely filled with the cemented paste shortly following extraction. This would provide increased structural integrity to the underground precinct and further limit any subsidence or risk of chimneying. Evolution is also proposing additional monitoring, measurement and risk mitigation measures as detailed below.

The Department requested a further technical review of the subsidence assessment from the Resources Regulator (RR) to address BCD's concerns. The RR review found that the proposed mitigation and controls would be appropriate and acceptable.

Following the provision of the additional subsidence assessment review by the RR, BCD accepts that there is a negligible risk of any impacts to Lake Cowal's wetland habitat and associated threatened species.

Subsidence Monitoring and Management

The potential subsidence risks and associated impacts to Lake Cowal are proposed be managed through early detection via monitoring and early response through implementation of a trigger action response plan (TARP).

The SubIA provides key recommendations to ensure that any potential risk of subsidence is mitigated as far as possible. The recommendations include:

- delayed mining of the upper most row of stopes, at least until further geological knowledge is obtained and stope performance is better understood (including hydraulic properties of faults);
- ongoing geotechnical characterisation and refinement of the mine's geotechnical and structural model;
- targeting stopes in the deeper fresh rock layers and avoiding mining stopes in shallower softer oxide layers and lake sediments;
- implementing a suite of control measures (dependent on geological conditions), including:
  - backfilling stopes in a timely manner;
  - ensuring paste lines and backfill infrastructure are in place prior to firing stopes;
  - crown and pillar stability assessments;
  - strategically sequencing stopes, particularly near faults;
  - cable bolting stopes when appropriate; and
  - mining stopes in upper levels when Lake Cowal is dry.
- in situ stress measurement;
- additional laboratory strength testing of rock types;
- groundwater characterisation, flow paths and hydraulic conductivity;
- development of a TARP and detailed progressive risk assessment; and
- subsidence monitoring above the underground mining precinct.

Importantly, the SubIA notes that while the current forecast predictions provide a moderate level of reliability to progress the mine plan, ongoing data collection and analysis of stope performance will provide improved calibration and increased confidence in future modelling, as is the case for any underground mine in its early planning stages.

The SubIA indicates that with appropriate mitigation measures in place, the SSD Project would be highly unlikely to impact the integrity or the hydraulic processes of the lake.

While the risk of subsidence associated with the proposal is very low, the Department has recommended that a subsidence baseline survey be undertaken, with periodic subsidence monitoring above the underground mining precinct. The Department has included this in the recommended conditions.

Conclusion

The Department notes that Evolution has not observed any subsidence at the mine since commencement of the exploration decline in early 2019.

The Department considers that the SubIA contains an adequate prediction of subsidence effects and assessment of likely impacts and consequences anticipated to be associated with the proposal. Subsequent advice from the RR confirms that with the appropriate range of subsidence management and mitigation measures, the subsidence impacts would be negligible.

The potential risk of stope failure is an inherent risk associated with of any stope mining operation, and the proposal would require careful monitoring and management to mitigate these risks over the life of the mine.

The Department considers that the proposal has sought to incorporate all the recommendations of previous subsidence assessments to improve the mine design and reduce subsidence impacts, including any risk of chimneying. Further, alternative underground mining methods have been explored but ruled out, in part due to feasibility, but essentially due to the increased potential for subsidence and subsequent impacts on Lake Cowal.

The Department accepts that Evolution has extensive experience in managing any potential risks that may arise due to the mine's close proximity to Lake Cowal and that sufficient consideration has been given to possible impacts.

To address residual risks, the Department has recommended conditions requiring among other things, an adaptive management approach with the development of TARPs and detailed risk assessments to progressively inform of any potential stope instability in areas deemed to have an elevated risk.

The Department is therefore satisfied that the proposal would result in a very low risk of chimneying occurring and impacting Lake Cowal. However, the Department considers it important that potential impacts are monitored, reported and validated via a comprehensive Subsidence Monitoring Program, and has recommended conditions accordingly.

6.3 Traffic and Transport

The EIS includes a specialist traffic assessment undertaken by EMM, which considers traffic impacts associated with both the underground project and the proposed modification to the existing mine. Most of the traffic generation would be associated with the additional operational workforce travel for the underground mine, as well as construction-related traffic.

The assessment included site/route inspection; assessment of baseline traffic volumes and conditions based on data collated from Bland, Forbes and Lachlan Shire Councils; surveys of key intersections; and modelling of the performance of the road network with the predicted cumulative traffic volumes generated by the project. The assessment was undertaken in accordance with relevant guidelines, including TfNSW's *Guide to Traffic Generating Development* and Austroads Guides.

In response to issues raised by TfNSW and Forbes Shire Council in relation to the road transport route between Forbes and the mine, including the intersection of Newell Highway and West Plains Road, Evolution prepared a supplementary traffic assessment as part of its Submissions Report, which provided a further audit and assessment of project-related impacts on this intersection and transport route.

Transport Setting

The mine is accessed via a number of preferred routes from surrounding urban centres, including West Wyalong, Forbes and Condobolin (see **Figure 22**). Alternative routes are used when these preferred routes are closed due to adverse weather and flooding (see **Figure 23**).

The majority of project-related traffic occurs along the West Wyalong route, given that it is the closest urban centre to the mine. This route is approximately 57.5 km in total length, of which 45 km are local roads. The roads, comprising Newell Highway, Ungarie Road, Wamboyne Road, Blow Clear Road, Bonehams Lane and the Mine Access Road, are fully sealed.

The route from Condobolin is approximately 92 km in length and is mostly sealed. It comprises The Gipps Way, Burcher Road, Bena Street, Lake Cowal Road East-West, Fitzgerald Road (0.5 km unsealed), Lake Cowal Road North-South (18.4 km mostly unsealed), and the Mine Access Road.

The route from Forbes is approximately 97 km in length and is partly sealed. It comprises Newell Highway (41.5 km fully sealed), West Plains Road (20.7 km mostly sealed), Bogies Island Road (6.2 km unsealed), Lake Cowal Road East-West (5 km unsealed), Fitzgerald Road (0.5 km unsealed), Lake Cowal Road North-South (18.4 km mostly unsealed) and the Mine Access Road (4.6 km fully sealed).

Evolution operates a shuttle bus service between the mine and the towns of West Wyalong, Condobolin and Forbes, which transports most mine workers to and from the mine. The shuttle bus service would be continued and expanded to service the continued operations of the mine.

All of the roads used by the project carry relatively low traffic volumes, well below their design capacities. The roads do carry a relatively high proportion of heavy vehicle traffic, with the Newell Highway having an average proportion of 37%-44% heavy vehicles, and local rural roads having averages of around 20%-35% heavy vehicles.

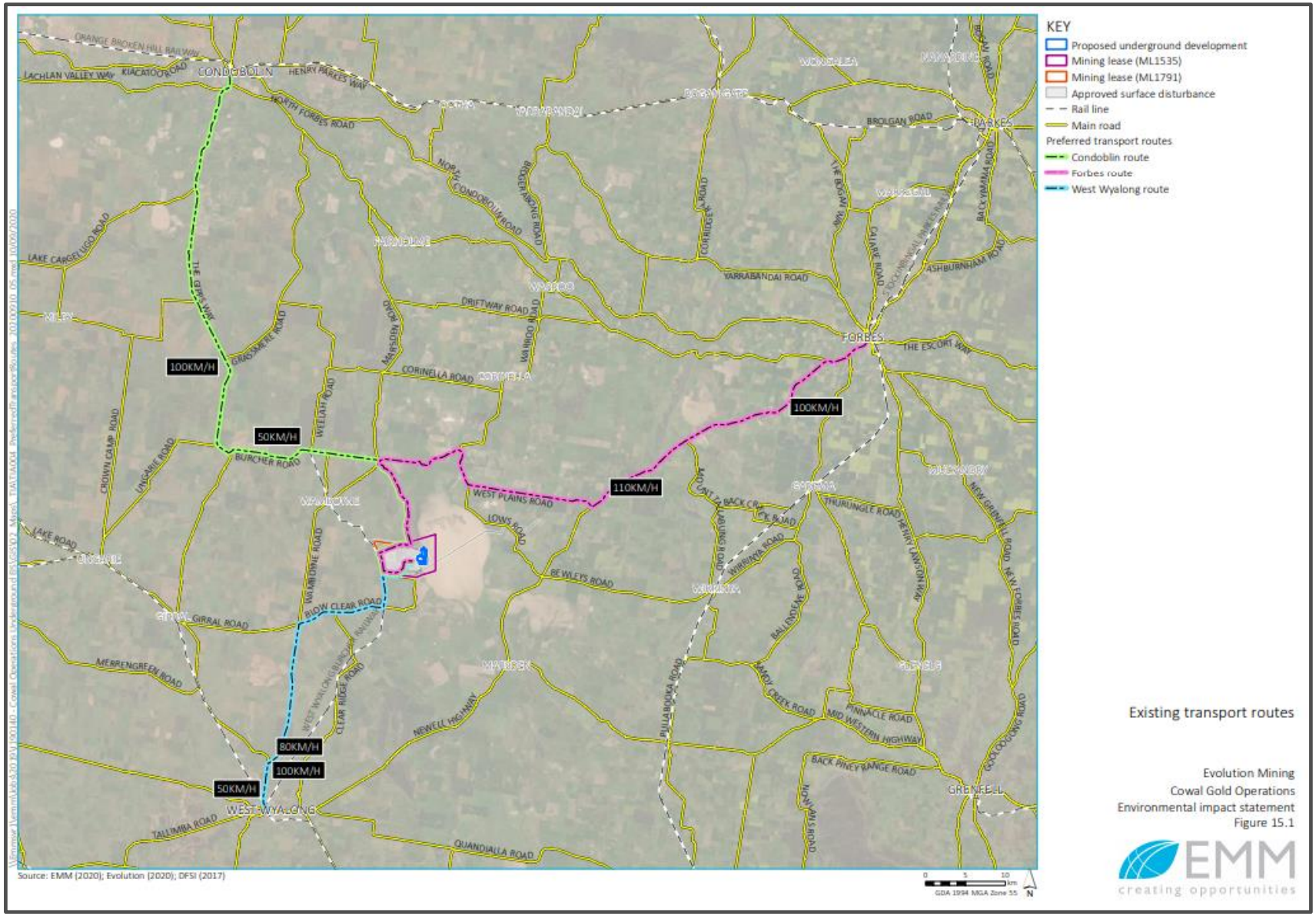


Figure 22 | Preferred Transport Routes

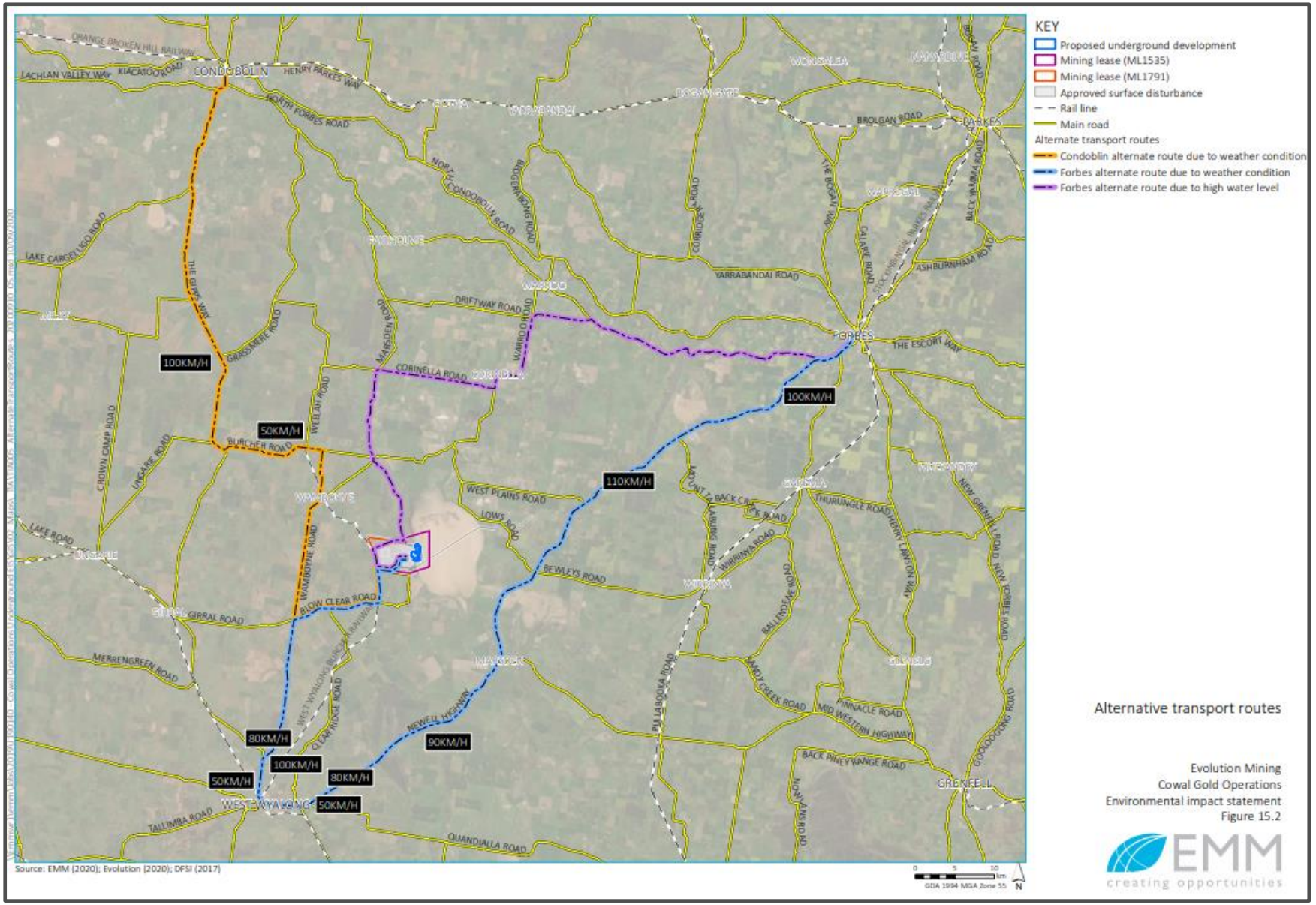


Figure 23 | Alternative Transport Routes

Traffic Impacts

Consistent with the existing mine, the traffic assessment assumes that 75% of the additional workforce during construction and operation of the project would use the shuttle bus service to travel to and from the mine, with the other 25% travelling by light vehicle. Approximately 80% of the additional workforce is predicted to be based in the West Wyalong area, with approximately 10% based in Condobolin and 10% based in Forbes.

With these assumptions, the assessment predicts that the peak construction phase of the project would generate an additional 210 daily traffic movements on the road network (ie. 105 in, 105 out), comprising approximately 10 truck, 32 bus and 168 light vehicle movements. This would result in an additional:

- 168 daily traffic movements travelling to/from West Wyalong;
- 21 daily traffic movements travelling to/from Condobolin; and
- 21 daily traffic movements travelling to/from Forbes.

During the operational phase, the number of additional vehicle movements on the road network would be around 110 per day (ie. 55 in, 55 out), comprising 10 truck, 16 bus and 84 light vehicle movements. This would result in an additional:

- 76 daily traffic movements travelling to/from West Wyalong;
- 17 daily traffic movements travelling to/from Condobolin; and
- 17 daily traffic movements travelling to/from Forbes.

The additional traffic generated by the project would result in a negligible increase in total traffic volumes on arterial roads in the region (including Newell Highway and Gipps Way) during both the construction and operational phases. The increase on local rural roads would be more significant, with increases of up to around 75%, however these roads generally have very low existing background traffic volumes.

The assessment indicates that total traffic levels would remain within the relevant Austroads design guidelines for each route and all roads, as shown in **Table 4** (below).

Table 4: Daily Traffic Volume Increases

Road	Existing Daily Traffic Volume	Future Daily Traffic Volume		Austroads Threshold Band	Road within threshold?
		Construction	*Operation*		
Ungarie Road	1,221	1,389	1,297	1,000-3,000	Yes
Wamboyne Road	303	471	379	150-500	Yes
Blow Clear Road	254	422	330	150-500	Yes
Bonehams Lane	254	422	330	150-500	Yes
Mine Access Road	280	490	390	150-500	Yes
Lake Cowal Road	55	97	89	1-150	Yes
West Plains Road	42	63	59	1-150	Yes
Burcher Road	43	64	60	1-150	Yes
The Gipps Way	478	489	487	150-500	Yes

The intersection modelling in the traffic assessment confirmed that all intersections would continue to operate with good levels of service (ie. LoS of 'A'), with minimal delays, and no significant increased safety risk.

TfNSW and the three Councils did not contest the broad findings of the traffic assessment. However, both TfNSW and Forbes Shire Council recommended that the intersection of the Newell Highway with West Plains Road should be upgraded to account for the additional mine related traffic travelling from Forbes, given the high speed environment of this intersection and resulting road safety risks.

The roads authorities initially recommended that this intersection be upgraded to provide to a Basic Right Turn (BAR) and Basic Left Turn (BAL) intersection treatment on the highway, although this was later amended to a Basic Right Turn only, given that minimal mine-related traffic turns from the highway into West Plains Road.

Evolution initially argued that it should not be required to upgrade this intersection given the minor increase in project-related traffic but has since agreed to undertake the upgrade. The Department has recommended conditions requiring Evolution to undertake the upgrade prior to the commencement of mining operations, to the satisfaction of TfNSW.

Forbes Shire Council also noted that West Plains Road has deteriorated due to its use by Evolution employees, and recommended that the Evolution be required to upgrade the entire length of both West Plains Road and Bogies Island Road to a two-way bitumen sealed standard (a total distance of approximately 27km).

Evolution does not agree that it should be required to upgrade these roads. It notes that the project would only result in a small number of heavy vehicle movements on these roads (ie. approximately 5 daily bus movements, and 17 total movements), which would not result in any substantial road damage that would warrant Evolution fully upgrading the roads as recommended by Forbes Shire Council. Evolution argues that the upgrades would cost in the order of $60 million (at an estimated cost of $1 million per kilometre) and that this would have significant impacts on the economic viability of the project. Upon further review, the Department confirms that the total combined length of West Plains Road and Bogies Island Road is about 27 km and therefore, the estimated cost of upgrade would be closer to $27 million.

Evolution also notes that Forbes Shire Council has obtained state Government funding to upgrade about 4km of West Plains Road, and that Evolution already has a roads maintenance agreement with Council to maintain local roads affected by the project.

Conclusion

The Department accepts that the increased traffic associated with the project does not warrant an upgrade to West Plains Road and Bogies Island Road to a two-way bitumen standard. The traffic assessment demonstrates that total traffic levels on these roads would remain low in absolute terms (ie. approximately 59 vehicles per day on West Plains Road, including 17 project-related vehicles), and well within the relevant capacity for these types of roads under the Austroads guidelines (ie. up to 150 vehicles per day).

As such, and in the absence of any significant rationale for the requested upgrade from Council, the Department does not consider that this upgrade is warranted or reasonable.

However, the Department believes that Evolution should be required to contribute to the ongoing maintenance of these and other local rural roads used by project-related traffic.

In this regard, Evolution already has existing road maintenance funding agreements with Bland, Lachlan and Forbes Shire Councils, which includes the allocation of $150,000 every 3 years to each Council on

a rotating and ongoing basis. The three councils and Evolution have recently executed a Deed of Variation to the existing MOU to reflect the change in ownership of the mine and to index the payments to the CPI (see **Appendix A**).

In addition, the Department notes that the primary heavy vehicle route to the mine on local roads is all within Bland Shire Council from West Wyalong to the mine. In its negotiations on the VPA, Bland Shire Council undertook further assessment of the contribution from the Cowal Gold Mine on ongoing local road maintenance over the life of the mine. Evolution and Bland Shire Council have agreed to an additional annual contribution of $60,000 to supplement the existing $50,000 per year ($150,000 every 3 years), which will form part of the VPA.

The Department has also recommended conditions requiring Evolution to update the Transport Management Plan for the mine, in consultation with TfNSW and the Councils, including requirements for (amongst other things):

- undertaking dilapidation surveys and repairing any damage associated with project construction;
- restricting project-related traffic to the designated routes;
- keeping the community informed about project-related traffic issues;
- minimising potential conflicts with local traffic and school buses;
- managing driver fatigue and drivers code of conduct; and
- monitoring and reporting.

With these measures, the Department is satisfied that the cumulative traffic associated with the Cowal open cut and underground mine can be managed in a manner that would not result in any significant traffic-related impacts on the local and regional road network.

6.4 Other Issues

The Department has summarised its assessment of a range of other matters in **Table 5** below.

Table 5 | Other Issues

Issue	Findings and Recommendation
Noise and Blasting	The existing development consent includes noise limits for surrounding sensitive receivers with two significantly impacted noise residences entitled to acquisition rights upon request. EMM undertook a noise and vibration impact assessment in accordance with the *Noise Policy for Industry* (NPfI), which considered the incremental increase in noise from the modification alone, and the cumulative noise from the combination of the Mod 16 and the SSD Project. There would be no increase in processing rates or waste rock handling, and therefore incremental noise from the modification would be primarily associated with the operation of existing and new surface infrastructure. Noise from the SSD Project would be primarily generated by underground operations (including blasting) and from ore haulage, operation of the paste fill plant, and construction of the box cut. The noise modelling predicted that cumulative mine generated noise levels at all residential receivers would be similar to existing noise levels, and that the cumulative operational noise (i.e. the combined noise from the SSD Project and from Mod 16) could comply with the day, evening and night-time noise limits set in the existing development consent at all nearby residences, even under the worst-case noise enhancing meteorological conditions.

Issue	Findings and Recommendation
	Maximum night-time noise levels are also predicted to be below the sleep disturbance criteria set out in the NPfI at all residential receptors. Blasting required for the SSD Project is also predicted to meet the airblast overpressure and ground vibration limits set in the existing development consent based on the mine's current approach to blast design and blast emissions management. The Department is satisfied that neither the SSD Project nor Mod 16 would increase noise and blasting impacts at nearby residences, and has recommended some minor changes to the existing development consent to ensure the noise and blasting limits apply to all activities from the underground and existing mine. The increase in road traffic noise from traffic associated with Mod 16 (during construction of surface infrastructure and operational traffic) is predicted to be less than the 2 dB deemed to be acceptable under the *Road Noise Policy* at the nearest residences along Ungarie Road, Wamboyne Road and Newell Highway. The Department considers this would be a very minor increase in impacts, noting that increases of up to 2 dB are generally not discernible to most people. *Recommendations* The Department has recommended changes to the wording of the existing development consent to include night time criteria and clarify that the noise and blasting overpressure and vibration limits apply to all noise and blasting activities generated at the Cowal Mine Complex, which in turn has been defined to mean the underground mine and the existing mine.
Air Quality	The EIS included an air quality impact assessment undertaken in accordance with the EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*. *Particulate emissions* Trucking of waste and ore to the surface would be the primary contributor of particulate emissions from the proposed underground operations, while waste haulage from the box cut to the waste dump would be the primary contributor to air emissions from Mod 16. However, emissions from these activities are a very small proportion (around 4%) of total predicted emissions from the site. Dispersion modelling indicates that incremental concentrations of Total Suspended Particulates (TSP) and particulate matter (PM_{10}, $PM_{2.5}$) would not exceed the impact assessment criteria at nearby residences. The predicted cumulative 24-hour average PM_{10} concentration would exceed the impact assessment criterion of 50 µg/m^3 at a number of receivers if background concentrations are also considered. However, the air quality impact assessment predicts there would be no additional days of exceedance compared to the approved project at any receiver. The Department considers that the cumulative impacts from the SSD Project and Mod 16 are unlikely to increase the air quality impacts at any nearby residences. The

Issue	Findings and Recommendation
	Department has recommended some minor changes to the existing development consent to ensure the limits on particulate matter apply to all activities from the underground and existing mine (see below). *Greenhouse gas emissions* The SSD Project and Mod 16 would generate around 13,651 t CO_2-^{e}/year of combined Scope 1 greenhouse gas (GHG) emissions and around 37,925 t CO_2-^{e}/year of combined Scope 2 emissions. This is around 19% more than the existing mine generated in 2019, and accounts for around 0.04% of total annual GHG emissions for NSW and 0.01% of Australia's annual GHG emissions. Evolution is already required to minimise GHG emissions from the mine and has committed to continuing to investigate options for improving energy efficiency in accordance with its Air Quality Management Plan. The Department notes that Evolution would be required to update the Air Quality Management Plan following any approval of Mod 16. *Recommendations* The Department has amended the wording of the existing development consent to clarify that greenhouse gas management and limits on dust and particulate matter apply to air emissions from the Cowal Mine Complex, including the underground mine and the existing mine.
Visual	The paste fill plant, which includes a concrete batching plant, industrial sheds, mix tanks and storage areas, would reach a height of up to 10 m. Some components would be visible from six private residences, tourist areas and sections of some roads. However, the plant would be located close to the Lake Cowal perimeter bund and would be slightly lower than the bund ridge, which would reduce the magnitude of any visual impacts. The increase in height of the IWL would mean this would also be a more prominent feature within the mine site. However, the additional height would represent a very small proportion of the total landform and therefore, the visual impact assessment considered the magnitude of the impacts to be very minor. The closest residence visually impacted by the paste fill plant is 3.5 km away. The closest residence impacted by views of the IWL is 2.2 km away, with light spill being the key impact. Other residences further away could also be sensitive to the change in views. However, the distance to these receivers, as well as intervening vegetation and topography that would partially obscure the infrastructure, mean the incremental visual impacts are considered likely to be negligible to minor for all residences. Similarly, Lake Cowal Public Reserve is located 5 km away, Billys Lookout is approximately 7 km away, and two state forests are more than 8 km away and hence any views of site infrastructure would be obscured.

Issue	Findings and Recommendation
	Travellers using the local roads would potentially be able to see some of the infrastructure. However, the glimpses would generally be brief and partially obscured by vegetation lining the roads. Proposed mitigation measures include the use of muted colours, vegetation screening and light shielding. The Department considers that any incremental visual impacts from the SSD Project or Mod 16 infrastructure would be minor. *Recommendations* The existing conditions of consent require visual and off-site lighting impacts to be minimised and that external lighting complies with the relevant Australian standards designed to control obtrusive lighting effects. The Department has amended these conditions to ensure they apply to the whole Cowal mine complex.
Biodiversity	The proposal would not require any new ground disturbance or vegetation to be cleared as the SSD Project area would be wholly underground and all infrastructure proposed for both the SSD Project and Mod 16 would be constructed on land already disturbed by mining activities. A number of threated flora and fauna species may be associated with plant community types present within Lake Cowal, and there are some low to medium priority groundwater dependent ecosystems near the mine site. These could be impacted indirectly through changes to surface or groundwater conditions. The potential for groundwater and surface water impacts are considered in Sections 6.1 (Water Resources) and 6.2 (Subsidence) above. In summary, there would be no material changes to the surface water management systems; no changes predicted to groundwater or surface water; negligible seepage from Lake Cowal into the mine pit, stopes or access tunnels; and the mine would be designed to avoid the potential for any significant subsidence or stope failure. Consequently, indirect impacts on threatened fauna and flora habitats, wetlands and groundwater dependent ecosystems are not considered likely. DPI Fisheries advised that Lake Cowal and Bland Creek are considered key fish habitats under the *Fisheries Management Act 1994* and that any impacts to these habitats and/or EECs would need to be offset. The Department notes that no impacts are predicted and that therefore additional offsets are not required for the development. Noise and blasting also have the potential to impact water birds using nearby breeding areas. Noise is predicted to increase by 2 dB in water bird breeding areas during construction of the box cut. However, the EIS notes that monitoring of bird behaviour has not detected any changes in bird behaviour due to noise or blasting to date. *Recommendations* The Department considers Evolution can continue to monitor and manage impacts on biodiversity in accordance with the existing Flora and Fauna Management Plan.

Issue	Findings and Recommendation
Aboriginal and Historic Heritage	There are no known items of heritage significance or Aboriginal objects or sites on the area overlying the proposed underground development. It is also considered unlikely that there would be any based on extensive previous archaeological investigations and the fact that the area is within the bed of Lake Cowal, which has been extensively cropped and periodically inundated by floodwater. The surface infrastructure would be located in areas already disturbed by mining. The Department is satisfied that additional heritage impacts associated with the SSD Project or the Mod 16 are unlikely, and that any unexpected heritage finds could be managed in accordance with the Indigenous Archaeology and Cultural Heritage Management Plan for the existing mine.
Social and Economic	The EIS included a Social Impact Assessment (SIA) that found the proposal would likely result in a number of social impacts on local communities. Many of the impacts relate to an increase in fly-in-fly-out workers and opportunities to increase local socio-economic benefits. The SIA considered the most significant social impacts would be positive impacts associated with employment and economic stimulus (which the SIA rated as likely to have a high social impact). The SIA considered the key negative social impacts would be associated with increased demand for housing that could potentially affect housing affordability and marginalise existing renters, and pressure on infrastructure and services. The SIA rated these as likely to have a moderate social impact. To reduce pressure on existing housing, Evolution received conditional approval from Bland Shire Council to construct a purpose-built workers accommodation facility in West Wyalong. As the timing for construction and commissioning is unclear, the Department has recommended a condition requiring Evolution to prepare a Construction Workforce Accommodation Plan that outlines how its workforce would be accommodated through all stages of construction. In relation to impacts on other infrastructure and services, as discussed in Section 6.3 above, Evolution provides direct funding for road maintenance, and the Department notes that Evolution has agreed to the terms of a VPA with Bland Shire Council, which includes an additional annual contribution of $60,000 to be used for improving road infrastructure in the area. The VPA offer has been accepted by Bland Shire Council, subject to final drafting and execution (see **Appendix A**). Over an indicative 20 year mine life, Evolution would contribute a total of around $8.5 million, which includes a: • $250,000 initial sign on payment; • $200,000 annual contribution; • $60,000 annual contribution to road maintenance costs; • $150,000 minimum annual contribution for targeted community initiatives; and • $25,000 one off contribution to the Bland Shire Housing Strategy

Issue	Findings and Recommendation
	Furthermore, continued economic development in the area would likely contribute to improved or expanded provision of infrastructure and services. The SIA concluded that all negative impacts could be reasonably mitigated by a strategic and collaborative approach to planning and development, and that positive impacts could be enhanced through a similar approach so that communities realise the advantages and opportunities that the SSD Project offers. The proposal would provide a range of economic benefits, including employment for up to an additional 160 FTE people during construction and up to 230 FTE people during operations. Based on current gold prices, the proposal would also be expected to generate a net present value of around $314.4 million over the life of the mine and total present value benefits of approximately $2,107.9 million. The proposal would also contribute around $175 million to the NSW Government through payroll taxes and royalties, and around $556 million to Australia in taxation *Recommendations* The Department has recommended a condition requiring Evolution to prepare and implement a Construction Workforce Accommodation Plan, and to execute the VPA.
Hazards	A Preliminary Hazards Analysis (PHA) was prepared as part of the original EIS for the Cowal Gold Mine. The PHA concluded that the highest risks to the environment, public safety and property, were from spillage of materials during transport or from on-site storage tanks, release of hazardous materials in the event of a fire, and risks to animals from the IWP/ TSF (either from entering it or from accidental cyanide releases). The mine operates under a range of approved management plans and studies that were prepared to address these and other risks, including a Transport of Hazardous Materials Study, a Hazardous Waste and Chemical Management Plan, a Fire Safety Study, a Cyanide Management Plan, a Fauna and Flora Management Plan, and a Blast Management Plan. Neither Mod 16 nor the SSD Project would significantly change the hazards and risks of the mine, which would continue to operate in accordance with these plans.
Waste Management	The SSD Project would not introduce any new waste streams to the mine. The Department is satisfied that waste from the SSD Project and Mod 16 could be handled and disposed of in accordance with the existing on-site waste management system, and that any hazardous waste generated would be managed in accordance with the approved Hazardous Waste and Chemical Management Plan required by existing conditions of DA14/98.

7 Evaluation

The Department has carried out a detailed assessment of the merits of the SSD Project and Mod 16, having regard to all of Evolution's documentation (EIS, Submissions Report, independent expert reports and additional information) and submissions from the NSW government agencies, and members of the public. The Department has also considered the potential environmental, social and economic impacts and the relevant requirements of the EP&A Act.

The Department has considered the objectives of the EP&A Act, including ESD principles, and relevant considerations under section 4.15 of the EP&A Act.

Based on this assessment, the Department considers that Evolution has designed the SSD Project and Mod 16 in a manner that achieves a reasonable balance between maximising the recovery of a gold resource and minimising the potential impacts on surrounding land users and the environment as far as possible, particularly through:

- avoiding disturbance to Lake Cowal, its hydrology and biodiversity values;
- avoiding any disturbance to native vegetation;
- avoiding impacts to Aboriginal and non-Aboriginal heritage items;
- avoiding increased noise, air and visual impacts through careful design and implementing ongoing mitigation and monitoring measures to minimise the amenity impacts of the Project on surrounding private landowners;
- designing its water management system to maximise the reuse of water, minimise reliance on external supplies of water and minimise the risk of water pollution impacts;
- using existing infrastructure to minimise impacts and for economic efficiency; and
- progressively improving the mine design to reduce subsidence impacts, including any risk of chimneying, and optimising rehabilitation objectives.

The Department has recommended a comprehensive and precautionary suite of conditions to ensure that the project complies with relevant criteria and standards, that the impacts are consistent with those predicted in the EIS, and that residual impacts are effectively minimised, managed and/or at least compensated for. The recommended conditions have been reviewed and accepted by the key NSW Government authorities, and the Department believes that the conditions reflect current best practice for the regulation of gold mining projects.

The Department recognises that the SSD Project and Mod 16 would provide major economic and social benefits to the Bland, Forbes, Lachlan and Central West Region and to the State of NSW, including:

- a direct capital investment in the SSD Project of $276 million;
- a direct capital investment in the Mod 16 of $40 million;
- up to an additional 230 FTE direct jobs at the mine and up to 160 construction jobs;
- a net present value (NPV) of around $314.4 million;
- a net economic benefit of $175 million worth of revenue for the State over its lifetime, mainly from royalties; and
- additional estimated taxation revenue of around $557 million, some of which will be returned to NSW

The Department has carefully weighed the impacts of the SSD Project and Mod 16 against the significance of the resource and the socio-economic impacts and benefits. On balance, the Department considers that the benefits of the proposal outweigh its residual costs, and that is in the public interest and is approvable, subject to stringent conditions.

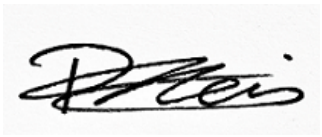
The Department has drafted recommended conditions of consent for the SSD Project and recommended Notice of Modification for Mod 16 (see **Appendix C**). The Department has also prepared a consolidated version of the project approval for Mod 16 (see **Appendix D**).

8 Recommendation

It is recommended that the Director Resource Assessments as delegate of the Minister for Planning and Public Spaces:

- **considers** the findings and recommendations of this report;
- **determines** that the proposed Mod 16 application falls within the scope of section 4.55(2) of the EP&A Act;
- **accepts and adopts** all of the findings and recommendations in this report as the reasons for making the decision to grant approval to the SSD Project and Mod 16 applications;
- **agrees** to modify the project approval for Cowal Gold Mine (DA14/98);
- **approves** the State Significant development application for the Cowal Gold Operations Underground Development (SSD 10367);
- **signs** the attached SSD Project recommended conditions of consent (**Appendix C);** and
- **signs** the attached Mod 16 Notice of Modification (**Appendix C).**

Recommended by:



23 September 2021

Philip Nevill
Senior Environmental Assessment Officer
Resource Assessments

23 September 2021

Rose-Anne Hawkeswood
Team Leader
Resource Assessments

9 Determination

The recommendation is **Adopted / Not adopted** by:

Steve O'Donoghue
Director
Resource Assessments
as delegate of the Minister for Planning and Public Spaces

Appendices

Appendix A – List of Documents

A1 - Environmental Impact Statement & Modification Report: Refer to folder "EIS" on the Department's website at
Cowal Gold Operations Underground Development | Major Projects (nsw.gov.au)
MOD 16 - Surface changes to support the underground development | Major Projects (nsw.gov.au)

A2 - Submissions: Refer to folder "Submissions" on the Department's website at
Cowal Gold Operations Underground Development | Major Projects (nsw.gov.au)
MOD 16 - Surface changes to support the underground development | Major Projects (nsw.gov.au)

A3 - Expert Advice Groundwater: Refer to folder "Additional Information" on the Department's website at
Cowal Gold Operations Underground Development | Major Projects (nsw.gov.au)
MOD 16 - Surface changes to support the underground development | Major Projects (nsw.gov.au)

A4 - Submissions Report: Refer to folder "Response to Submissions" on the Department's website at
Cowal Gold Operations Underground Development | Major Projects (nsw.gov.au)
MOD 16 - Surface changes to support the underground development | Major Projects (nsw.gov.au)

A5 - Additional Agency Advice: Refer to folder "Agency Advice" on the Department's website at
Cowal Gold Operations Underground Development | Major Projects (nsw.gov.au)
MOD 16 - Surface changes to support the underground development | Major Projects (nsw.gov.au)

A6 - Additional Information from Applicant: Refer to folder "Additional Information" on the Department's website at
Cowal Gold Operations Underground Development | Major Projects (nsw.gov.au)
MOD 16 - Surface changes to support the underground development | Major Projects (nsw.gov.au)

Appendix B – Statutory Considerations

The Department's assessment has given detailed consideration to a number of statutory requirements (see **Section 4** - Statutory Context and **Section 6** – Assessment). These include:

- the objects found in Section 1.3 of the EP&A Act; and
- the matters listed under Section 4.15(1) of the EP&A Act, including applicable environmental planning instruments and regulations.

The Department has considered all of these matters in its assessment of the SSD Project and Mod 16. A summary of these considerations is provided below. Reference should also be made to Section 5 of the EIS for the SSD Project and Section 4 of the Modification Report for Mod 16, where Evolution has considered applicable legislation and environmental planning instruments in detail.

B1 Objects of the EP&A Act

A summary of the Department's assessment against the current relevant objects (found in section 1.3 of the EP&A Act) are provided in **Table G1** (below).

Table G1 | Consideration of the SSD Project and Mod 16 against relevant objects of the EP&A Act

Objects of the EP&A Act		Consideration
(a)	*to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources*;	The SSD Project and Mod 16 meets this object because it would: • represent a continuation of a long-standing historical land use; • involve the ongoing use and improvement to the surface facilities and operations; • provide substantial royalties of up an additional $129.5 million NPV; and • provide considerable employment and economic benefits to the State and region. While the Project has the potential to result in both positive and negative social impacts, overall, the Department considers that any negative social impacts can be appropriately managed under recommended conditions.
(b)	*to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment*;	The Department's assessment has sought to integrate all significant environmental, social and economic considerations. The Department considers that the SSD Project and Mod 16 can be carried out in a manner that is consistent with the principles of ecologically sustainable development.
(c)	*to promote the orderly and economic use and development of land*;	The surface components of Mod 16 represent a continuation of a long-standing historical land use. The SSD Project would facilitate the ongoing production of gold and utilise existing surface facilities, operated within the currently approved boundaries. The Department considers this represents an orderly and economic use of the land.
(e)	*to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats*;	The Department has assessed the biodiversity impacts of the Project in accordance with relevant State and Commonwealth legislation, policies and guidelines. Mod 16 would be wholly located within the existing disturbance area and would not impact biodiversity. The SSD Project is primarily underground and predicted to have negligible surface impacts. As such, impacts on threatened species and communities and key habitats are not predicted. Both the precautionary principle and the conservation of biological diversity and ecological integrity has been applied in the assessment to avoid serious or irreversible damage to the environment wherever possible
(f)	*to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage)*;	The Department has assessed the likely impacts of the SSD Project and Mod 16 on Aboriginal cultural heritage and historic heritage. The SSD Project is primarily underground and not predicted to impact Aboriginal cultural heritage or historic heritage objects. Proposed mitigation and management measures would ensure that both the SSD Project and more specifically Mod 16 would

Objects of the EP&A Act		Consideration
		appropriately manage any potential impacts, subject to conditions of consent.
(i)	*to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State; and*	The Department notified and consulted with three affected Councils and other NSW government authorities. The Department has given consideration to the issues raised by these agencies in its assessment.
(j)	*to provide increased opportunity for community participation in environmental planning and assessment*.	The Department publicly exhibited the SSD Project and Mod 16 applications and considered all submissions in its assessment.

B2 Ecological Sustainable Development

The EP&A Act adopts the definition of ESD found in the Protection of the Environment Administration Act 1991, as follows:

"ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:
(a) the precautionary principle;

(b) inter-generational equity;

(c) conservation of biological diversity and ecological integrity; and

(d) improved valuation, pricing and incentive mechanisms."

The Department has considered the principles and programs of ESD, as follows:

Precautionary Principle

The Department has assessed the SSD Project and Mod 16's threat of irreversible environmental damage and considers that there is sufficient scientific certainty to enable the determination of the application. The Department has considered all the available information presented and consulted closely with independent experts and key Government agencies to obtain advice on various aspects of the proposal.

While it is acknowledged that the SSD Project and Mod 16 would result in a number of environmental impacts of varying significance, the key matters that could result in serious or irreversible damage relate to unmitigated impacts on water resources and subsequent indirect impacts to biodiversity values.

The EIS, Modification Report and Department's assessment has identified management and mitigation measures to address potential environmental impacts, and includes commitments and requirements to implement monitoring, auditing and reporting mechanisms.

Overall, the Department has assessed these matters in detail (see **Section 6**) and considers that the recommended risk-based conditions and performance measures would provide appropriate protection for the environment and minimise the potential for any serious or irreversible environmental damage.

Intergenerational equity

Intergenerational equity has been addressed through maximising efficiency and gold resource recovery and developing environmental management measures which are aimed at ensuring the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

The Department acknowledges that emissions generated from mining operations are a contributor to climate change, which has the potential to impact future generations. However, the Department also recognises that there remains a clear need to develop gold deposits to meet society's basic requirements for the foreseeable future. The proposal includes measures to mitigate potential greenhouse gas emissions, which would be recommended as a requirement of the SSD Project and Mod 16 operating conditions and detailed in an updated Air Quality Management Plan.

The Department's assessment of direct energy use and associated greenhouse gas emissions (ie Scope 1 and Scope 2 emissions) has found that these emissions would be low and comprise a very small contribution towards climate change at both the national and global scale (see **Section 6.4**).

The Department considers that the SSD Project and Mod 16's socio-economic and positive downstream benefits generated by the production of gold would benefit future generations in the short to medium term, particularly through the provision of gold as a rare and valuable metal, currency and commodity.

Conservation of Biological Diversity and Ecological Integrity

The Project's potential impacts on biodiversity have been outlined in the Department's assessment of the Project (**Section 6.4**). The Department considers that the conservation of biological diversity and ecological integrity has been applied through avoiding and minimising biodiversity impacts. The Department considers that the SSD Project and Mod 16 would avoid potential impacts and any residual impacts would be reasonably mitigated and/or offset to enable the long-term biodiversity outcomes to be achieved for the region.

Improved Valuation, Pricing and Incentive Mechanisms

Valuation and pricing of resource has been considered through economic, social and cost-benefit analyses which have been completed as part of the EIS. The cost benefit analyses sought to weigh up the SSD Project and Mod 16's costs and benefits based on its full range of environmental, social and economic impacts. The Department has carefully considered the costs and economic benefits of the proposal and support the conclusion that it would deliver a significant net benefit to the local region and the State of NSW (see **Section 6.4**).

B3 Environmental Planning Instruments

Under Section 4.15 of the EP&A Act, the consent authority is required to consider, amongst other things, the provisions of the relevant EPI's, including any exhibited draft EPI[4]. **Section 4** provides a summary of the Department's consideration of the relevant EPI's and notes Evolutions consideration of applicable provisions of relevant EPIs in its EIS. Further consideration is provided in the Department's assessment (see **Section 6**) and below.

Applicable Local Environment Plans

The Department has considered the permissibility of the proposed development under the Bland LEP (see **Section 4.1**).

SEPP No. 33 – Hazardous and Offensive Development (SEPP 33)

The key aims of SEPP 33 are to ensure that, in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse

[4] Note that due to the effect of clause 11 of the SRD SEPP, development control plans do not apply to SSD.

impacts and that any measures proposed to be employed to reduce the impact of the development are taken into account.

Clause 12 of SEPP 33 requires persons proposing to carry out development for the purposes of potentially hazardous industry to prepare a Preliminary Hazard Analysis (PHA) and to submit this with the development application. The EIS has considered the potential hazards and risks associated with the SSD Project and Mod 16, including the storage of hazardous goods, potential for fire and/or explosion and contamination of land, water and air (see Section 9 of the EIS). The original application and EIS for DA14/98 included a PHA informing of the potential risks associated with the mine and relevant requirements for ongoing risk management and mitigation.

The Department has considered Evolution's assessment of these matters and commitments to maintain existing controls and mitigation measures under DA14/98 and if necessary, updating the mine's current management plans.

The Department considers that suitable mitigation measures could be incorporated into the design of the SSD Project and Mod 16 to ensure that it would meet relevant standards and be compatible with the existing or likely future use of land surrounding the mine. With the proposed measures in place, the Department considers that the potential hazards associated with the SSD Project and Mod 16 can be managed.

The Department considers that the SSD Project and Mod 16 would not increase risks to public safety and would not alter the consequences or likelihood of a hazardous event on the site or during materials transport. As such, the Department considers that the SSD Project and Mod 16 is consistent with the provisions of SEPP 33.

SEPP No. 55 – Remediation of Land (SEPP 55)

SEPP 55 relates to the remediation of contaminated land. Evolution has considered the potential land contamination matters associated with the Project in its EIS. The majority of proposed disturbance area is comprised of rural land, located within the already approved disturbance boundary. The Department considers that the SSD Project and Mod 16 would not have a significant risk of existing contamination and that the proposal is generally consistent with the aims, objectives, and provisions of SEPP 55.

SEPP (State and Regional Development) 2011 (the SRD SEPP)

Under Section 4.36 of the EP&A Act the SSD Project is considered a State Significant Development, because it is development for the purposes of gold mining and mining-related works that has a capital investment value of more than $30 million, which is specified in clause 5 of Schedule 1 to the SRD SEPP.

SEPP (Infrastructure) 2007 (the Infrastructure SEPP)

The Infrastructure SEPP requires the consent authority to notify relevant public authorities about the development that may affect public infrastructure or land, including electricity transmission and distribution networks, gas pipeline corridors, railways and rail corridors.

The Department notified all relevant public authorities including Bland Shire, Forbes Shire and Lachlan Shire Councils, TfNSW and Crown Lands.

The Department has consulted with public authorities and considered the matters raised in its assessment of the SSD Project and Mod 16 (see **Section 5**). Where appropriate, the Department has also developed conditions of consent to address the recommendations and advice of these public authorities. The Department considers that such conditions would provide appropriate protection for public infrastructure. As such, the Department considers that the requirements of the Infrastructure SEPP have been satisfied.

SEPP (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP)

Permissibility

Clause 7(1)(a) of the Mining SEPP identifies that underground mining is permissible with consent on any land. Clause 7(1)(d) provides that 'facilities for the processing or transportation of minerals or mineral bearing ores' are permissible with consent on land 'on which mining may be carried out (with or without development consent), but only if they were mined from that land or adjoining land'. Consequently, the proposed development is permissible with consent under the Mining SEPP.

Matters for Consideration

Part 3 of the Mining SEPP lists a number of matters that a consent authority must consider before determining an application for consent for development for the purposes of mining. These matters were considered in Evolution's EIS (see Section 5.2.5 of the EIS). The Department has considered these matters in its assessment of the SSD Project and Mod 16 and has included a brief outline of the key considerations below.

Non-discretionary development standards (clause 12AB)

Clause 12AB identifies non-discretionary development standards for the purposes of section 4.15(2) of the EP&A Act in relation to the carrying out of development for the purposes of mining. Section 5.5.1a in the EIS sets out Evolution's consideration of the applicable standards and whether or not the SSD Project meets them. The Department agrees with this assessment.

Compatibility with other land uses (clause 12)

The Department's assessment has considered the potential impacts of the SSD Project on other land uses in the area, including land use for water catchment purposes, conservation purposes, residential purposes, industrial and agricultural purposes. The Department has considered the potential noise, air quality and visual impacts at nearby receivers, as well as the potential impacts on the communities dependent on the water catchment. This consideration has been undertaken in consideration of the public benefits of the SSD Project and Mod 16 and measures to avoid, mitigate and minimise any land use incompatibility.

Overall, the Department considers that, subject to appropriate conditions, the SSD Project and Mod 16 could be managed to minimise any potential land use conflicts and meet the aims, objectives and provisions of clause 12.

Voluntary Land Acquisition and Mitigation Policy (clause 12A)

The Department's assessment has considered the NSW Government's Voluntary Land Acquisition and Mitigation Policy. Noise and air quality impacts of the mine are regulated under the existing development consent (DA14/98) and negotiated agreements. The SSD Project and Mod 16 would not trigger the voluntary mitigation or acquisition rights established under the policy.

Compatibility of proposed development with mining, petroleum production or extractive industry (Clause 13)

The Department considers that the SSD Project and Mod 16 represents a logical use of existing mine infrastructure, including the continued use of the surface facilities site and IWL. The Department considers that the Project has been designed to be long term stable and that it is compatible with, and would not adversely affect, adjacent or future mining-related activities.

Natural Resource Management and Environmental Management (clause 14)

Clause 14(1) requires that, before granting consent for development for the purposes of mining, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure that impacts on water resources, threatened species and biodiversity are avoided or minimised to the greatest extent practicable and that greenhouse gas emissions are minimised to the greatest extent practicable. Potential impacts are comprehensively addressed in the Department's assessment of these matters in **Section 6**.

The Department has recommended a detailed suite of conditions to ensure that the SSD Project and Mod 16 is undertaken in an environmentally responsible manner, including but not limited to, new and existing conditions in relation to water resources, threatened species and biodiversity and greenhouse gas emissions.

Resource Recovery (clause 15)

The Department has considered the efficiency of the SSD Project and Mod 16 with respect to resource recovery, in consultation with MEG and RR. The Department considers that the SSD Project and Mod 16 can be carried out in an efficient manner that optimises resource recovery while giving appropriate recognition and protection for the environmental values that may be affected.

Transport (clause 16)

While the framing of clause 16 is quite broad, its particular purpose is to limit the transport of coal, other minerals and their ores, and extractive materials on public roads. All ore extracted from the mine would be processed on site. As such, the transport of materials in connection with the SSD Project and Mod 16 would be limited to the delivery of reagents and goods required at the mine.

The Department has consulted with the applicable road authorities in relation to the SSD Project and Mod 16 and taken these submissions into consideration in its assessment (see **Section 6.3**). The Department has also recommended conditions in relation to limit traffic impacts from the SSD Project and Mod 16.

Rehabilitation (clause 17)

Clause 17 outlines particular requirements relating to consideration of whether any consent granted should be subject to conditions aimed at ensuring rehabilitation of land disturbed by mining and, in particular, whether conditions should require preparation of a rehabilitation management plan, appropriate treatment of waste, remediation of soil contamination and the avoidance of public safety risks.

The Department has recommended strict conditions to ensure the SSD Project and Mod 16 sites are rehabilitated in a timely and integrated manner and that the final landforms are made safe, stable and non-polluting. The proposed rehabilitation objectives include a landform which is re-establishing with native vegetation.

Summary of Mining SEPP

Based on its assessment of the development, the Department considers that the SSD Project and Mod 16 can be managed in a manner that is generally consistent with the aims, objectives and provisions of the Mining SEPP.

Appendix C – Instrument of Consent and Notice of Modification

C1 – Instrument of Consent

C2 – Notice of Modification (MOD 16)

Refer to folder “Recommendation” on the Department’s website at

Cowal Gold Operations Underground Development | Major Projects (nsw.gov.au)

MOD 16 - Surface changes to support the underground development | Major Projects (nsw.gov.au)

Appendix D – Consolidated Consent

Refer to folder “Recommendation” on the Department’s website at

MOD 16 - Surface changes to support the underground development | Major Projects (nsw.gov.au)