

24 October 2022

Stephen O'Donoghue
Director Resource Assessments
Department of Planning and Environment
Locked Bag 5022
Parramatta NSW 2124

**Re: SSD 10367 Mod 1 - Cowal Gold Operations Underground Development
Project Mod 1**

Dear Stephen

1 Introduction

I reference your letter to Evolution Mining (Cowal) Pty Limited (Evolution), dated 17 October 2022, relating to the modification application for the Cowal Gold Underground Development project (SSD 10367 Mod 1). Your letter attached comments from the Department's Water Group, and the relevant responses follow.

2 Comments received

The Department's Water Group has asked for information on the following matters:

- *confirm water requirements for the project including the modification. This should include groundwater inflows and any water take to meet site water demand.*
- *provide a volumetric comparison of maximum approved annual project external groundwater demands with those required for the modification (modification demand).*
- *explain the predicted increase in predicted maximum inflow by 148 ML/year in the Lachlan Fold Belt MDB due to the modification (Mod. 1).*
- *clarify that all equivalent annual take from mine inflow, Bland Creek Paleochannel bores, saline and eastern saline bore volumes presented in Section 6.4 & 6.5 and Appendix D matches with those presented elsewhere in the report, for example Appendix C, Site Water Balance (Table 2).*
- *demonstrate entitlements can be held to account for all water take or note which take is sourced from a third party.*

3 Responses

The potential water impacts and water requirements for the proposed modification are detailed in the following reports which were appended to the modification:

- *CGO Underground Development Project Modification 1 Groundwater impact assessment* (EMM 2022); and
- *Cowal Gold Operations Underground Development Project Modification 1 Surface Water Review* (ATC Williams, 2022).

An addendum to the ATC Williams report is attached in Appendix A. The addendum report has updated the site water balance for CGO and has provided information on external demand based on the proposed modification.

3.1 Volumetric demand

The maximum annual external groundwater demand based on the 90th percentile model predictions for each simulated year (i.e. the demand that was predicted not to be exceeded in 90% of the simulated 133 climatic sequences for each simulated year) is presented in Table 3.1. The maximum 90th percentile predicted demand represents a conservative yet realistic estimate of the maximum external annual groundwater demand. It is noted that Evolution Mining actively manages supply from external sources in order to ensure that license limits are met.

Table 3.1 External groundwater demand

Source	Approved SSD 10367 (ML/year)	Proposed SSD 10367 Mod 1 (ML/year)	Difference (ML/year)
Saline groundwater supply bores (within ML 1535)	216	193	-23
Bland Creek Palaeochannel bores	3,215	3,169	-46
Eastern saline bores	524	520	-4
Total	3,955	3,882	-73

3.2 Inflow increase

As detailed in Table 3.2, there is an increase in predicted maximum inflow by 148 ML/year in the Lachlan Fold Belt MDB due to the modification. This slight maximum increase is likely due to the proposed changes to the underground mine design.

Table 3.2 Predicted maximum groundwater inflows

Management Zone/Water Source	Approved SSD 10367 (ML/year)	Proposed SSD 10367 Mod 1 (ML/year)	Difference (ML/year)
Lachlan Fold Belt groundwater source	1,004	1,152	148
Upper Lachlan Alluvial Zone 7 Management Zone	37	29	-8

Although these mine plan alterations are minor in the context of the project and its overall scope, they will result in slight changes to the resulting hydrogeological system (drawdown and inflow volumes). Based on the underground heterogeneous hydrogeological setting, the modified mine geometry and timing/duration of the underground activities result in slight increase of the simulated inflows to that of the approved project.

Furthermore, the mine site groundwater model was updated for the proposed modification Groundwater Impact Assessment. In particular, there was some refinement of the model mesh required to model the new location of the proposed access tunnels. These changes to the model mesh allowed the groundwater model to simulate the modified underground activities relative to the modification and to simulate the change in inflow estimates.

Local scale drawdown changes were observed, especially due to the removal of the planned box-cut access to the underground mine plan, however in general the predicted regional scale impacts of the proposed modification are similar to the approved project, and Evolution mining has sufficient entitlements to account for the slight increase in predicted groundwater take from the various groundwater sources (refer Table 3.3).

3.3 Entitlements

Evolution holds water entitlements for the Cowal Gold Operations, as summarised in Table 3.3.

Table 3.3 Summary of water licensing requirements

Water source	Current entitlement held
Bogandillon and Manna Creeks Water Source	729 ML
Lachlan Regulated River Water Source	80 ML (high security) 1,430 ML (general security)
Lachlan Fold Belt MDB Groundwater Source	3,294 ML
Upper Lachlan Alluvial Groundwater Source	4,016 ML

Table 3.3 shows that the maximum annual take from the Lachlan Fold Belt groundwater source is predicted to be 1,152 ML/year including the proposed modification, which can be accounted for under the 3,294 units of entitlement currently held by Evolution in this groundwater source.

The combined maximum annual take from the Upper Lachlan Alluvial Zone 7 Management Zone is estimated to be 3,911 ML/yr (ie the total external groundwater demand presented in Table 3.1 plus the alluvial inflows presented in Table 3.2). This can be accounted for under the 4,016 units of entitlement currently held by Evolution in this management zone.

4 Closing

The above information assists in clarifying the water requirements from external sources relating to SSD 10367 Mod 1. The information confirms that Evolution holds sufficient licence entitlement for the maximum demand from external sources, including the demand from the proposed modification.

If further information is required, do not hesitate to contact me at pfreeman@emmconsulting.com.au or 0407 102 898.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Paul Freeman', is displayed within a light gray rectangular box.

Paul Freeman
Associate Director
pfreeman@emmconsulting.com.au

Appendix A

Surface water addendum

Document Ref: 121171-16.L01b

21 October 2022

Energy Sector Lead
EMM
Ground Floor, 20 Chandos St
St Leonards NSW 2065

ATTENTION: PAUL FREEMAN

Dear Paul,

**CGO UDP MODIFICATION 1 SURFACE WATER REVIEW – ADDITIONAL SITE WATER
BALANCE RESULTS**

1 INTRODUCTION

This letter report provides updated site water balance summary results pertaining to Modification 1 of the Cowal Gold Operations (CGO) Underground Development Project (UDP). In addition, a comparison of the predicted annual external groundwater demand for the approved UDP and Modification 1 are presented.

2 REVISION TO SITE WATER BALANCE RESULTS

Section 2.2.1 of ATCW (2022)¹ presents a summary of the site water balance results for the life of mine to 31 August 2039. The site water balance model has subsequently been re-run for the Modification life to 31 July 2035. Table 1 summarises the water balance model results of average system inflows and outflows for 133 model realizations (averaged over all realizations and the Modification life to 31 July 2035).

¹ ATCW (2022). *Cowal Gold Operations Underground Development Project Modification 1 Surface Water Review*. Prepared for Evolution Mining, July, 121155.16_R01 Rev 2.

**TABLE 1 SUMMARY SITE WATER BALANCE TO JULY 2035**

Water Balance Component	Average Rate (ML/year)
Inflows	
Catchment Runoff	1,338
Tailings Bleed	3,086
Open Pit and Underground Mine Groundwater	882
Saline Groundwater Supply Bores (within ML 1535)	54
Bland Creek Palaeochannel Bores	1,967
Eastern Saline Bores	448
Lachlan River Licensed Extraction*	773
Total Inflow	8,548
Outflows	
Evaporation	978
Haul Road Dust Suppression	223
Construction Water	92
Process Plant Supply	6,964
Overflow	0
Underground Mine Vent Loss	202
Total Outflow	8,459

ML/year = megalitres per year

* Modelled volume of water actually reaching CGO – excludes irrigation channel losses.

The results summarised in Table 1 show that the predicted total inflows average 8,548 ML/year while total outflows average 8,459 ML/year. The difference in average annual total inflow and total outflow is due to an increase in the simulated total site stored water volume over the model simulation period.

3 EXTERNAL SUPPLY PREDICTIONS

The Department of Planning and Environment (DPE) Water has requested that EMM provide a volumetric comparison of the maximum approved UDP annual external groundwater demand with that predicted for Modification 1.

The maximum annual external groundwater demand based on the 90th percentile model predictions for each simulated year (i.e. the demand that was predicted not to be exceeded in 90% of the simulated 133 climatic sequences for each simulated year) is presented in Table 2. The results presented in Table 2 are consistent with that presented in HEC (2020)² and ATCW (2022)¹. The maximum 90th percentile predicted demand represents a conservative yet realistic estimate of the maximum external annual groundwater demand. It is noted that Evolution Mining actively manage supply from external sources in order to ensure that license limits are met.

² HEC (2020). *Cowal Gold Operations Underground Mine Project Hydrological Assessment*. Prepared for Evolution Mining (Cowal) Pty Limited, October.



TABLE 2 PREDICTED EXTERNAL ANNUAL GROUNDWATER DEMAND

External Source	Maximum 90 th Percentile Predicted Demand		
	Approved UDP (ML/year)	Modification 1 (ML/year)	Modification 1 Difference (ML/year)
Saline groundwater supply bores (within ML 1535)	216	193	-23
Bland Creek Palaeochannel bores	3,215	3,169	-46
Eastern saline bores	524	520	-4
Total	3,955	3,882	-73

4 CLOSURE

Thank you for the opportunity to be of continued service. Please contact the undersigned if you have any queries.

Yours sincerely,

Camilla West
Associate Scientist
ATC Williams Pty Ltd