16 December 2022

Mr Stephen O'Donoghue
Director Resource Assessments
Energy, Resources and Compliance
Department of Planning and Environment
Locked Bag 5022
PARRAMATTA NSW 2124

Dear Stephen

Re: Bowdens Silver Project (SSD 5765) – Feasibility of Open Cut Pit Extension

Following review of the *Bowdens Silver Project Groundwater Assessment Review* prepared by HydroGeoLogic we note the following comment with regards the possible mitigation measures presented in the *Bowdens Silver Final Void Uncertainty Analysis Report* (the Uncertainty Analysis Report) to mitigate against through flow risk.

the suggested mitigation options (Corkery 2022b[1]) reduce but do not remove the risk of throughflow conditions developing

While it was acknowledged in the Uncertainty Analysis Report that further planning and analysis of these options would be needed, the following presents a more detailed analysis of the feasibility of an expanded open cut pit and its influence on final void behaviour.

The outcomes presented in the Uncertainty Analysis Report indicated a greater than 50% probability that final void lake water levels would exceed 579mAHD, the elevation at which the regional groundwater model presented in the *Groundwater Assessment* (Jacobs, 2022) had predicted that the final void would transition from a groundwater sink to a through flow system. The Uncertainty Analysis also identified a 65% probability (65th percentile) that peak water levels would not exceed 583.6mAHD and a 95% probability (95th percentile) of peak levels not exceeding 589.3mAHD. In accordance with Table 2 of *Uncertainty analysis—Guidance for groundwater modelling within a risk management framework* (Middlemiss and Peeters, 2018)[2] which is reproduced as **Attachment 1**, a water level in the final void of 583.6mAHD is "as likely as not" to occur and a water level in the final void of 589.3mAHD is "very unlikely" to occur. Through flow was predicted in the Uncertainty Analysis Report for both of these outcomes.

Based on the relationship presented in Figure 15 of the Uncertainty Analysis Report (reproduced below as **Figure 1**), the addition of 1ha to the final void lake's surface area would result in a water level reduction of 0.55m. This reduction is due to the increased evaporative loss from the lake that would occur from the larger water surface area. Importantly, to have this effect the increase must be to the lake surface area and not the total surface area at the top of the open cut pit.

[1] Corkery (2022b). Bowdens Silver Final Void Uncertainty Analysis Report.
[2] Middlemis H and Peeters LJM (2018) Uncertainty analysis—Guidance for groundwater modelling within a risk management framework. A report prepared for the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development through the Department of the Environment and Energy, Commonwealth of Australia 2018.

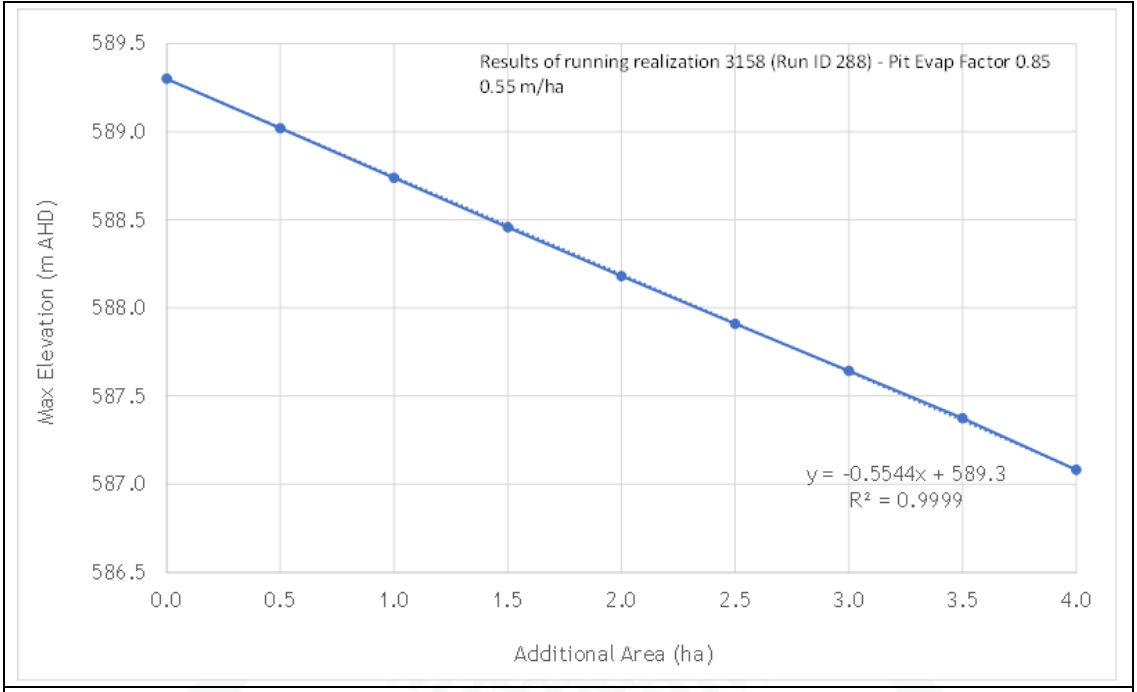

Figure 1
Relationship Between Maximum Pit Lake Water Level and Pit Lake Evaporative Surface Area (from Realisation 3,158)

It is estimated that there would be approximately 36ha of land that would be suitable for a possible open cut pit extension post-closure (after the removal of all infrastructure). This land lies within the approved disturbance envelope to the north and the southeast of the proposed open cut pit.

Table 2 of (Middlemiss and Peeters, 2018 – see **Attachment 1**) identifies a probability of exceedance of 33% to 67% as being "as likely as not" to occur. In order to reduce the assessed 65th percentile peak water level of the Uncertainty Analysis Report (583.6mAHD) to a level below the previously predicted through flow threshold of 579mAHD, a 4.6m reduction in water level would be required. A 6.6m reduction to 577mAHD, which would comfortably avoid the through flow threshold, would require an additional 12ha of final void pit lake surface area at equilibrium.

In order to analyse the economic feasibility of an open cut pit extension, the possible extension was tested under two scenarios. Indicative pit shells were prepared with the following general specifications and assumptions relevant to this review.

- A floor level of 575mAHD was assumed to allow for fluctuation of the equilibrium pit lake from a mean of 577mAHD.
- To ensure safety and stability of the final void walls, an average slope of 1:0.7 (v:h or 55 degrees) from the extended area's floor level of 575mAHD to its crest has been assumed. This average slope angle is consistent with that of the remaining final void.
- Blasting and moving this material would occur as a bulk mining process without the need for lengthy haul of material.

The two scenarios and the outcomes of the analysis are as follows.

1. Scenario 1 - Extension of the final void pit lake surface area by 12ha at an elevation of 577mAHD. Based on the relationship shown in **Figure 1**, this scenario would reduce the 65th percentile peak water level of the Uncertainty Analysis Report (583.6mAHD) to 577mAHD. A

pit lake water level of 583.6mAHD is described as "as likely as not" to occur in accordance with Table 2 of Middlemiss and Peeters (2018) (**Attachment 1**).

Extending the final void pit lake surface area at 577mAHD by 12ha would require a 16.6ha extension to the total surface area of the final void. This would require an estimated 8.6 million cubic metres of raw material to be blasted and placed in the floor of the open cut pit. It is estimated that this would take up to 12 months to complete.

2. Scenario 2 - Extension of the final void pit lake surface area by 20ha at an elevation of 577m AHD. Based on the relationship shown in **Figure 1**, this scenario would reduce the 95th percentile peak water level of the Uncertainty Analysis Report (589.3mAHD) to 578.3mAHD. This level is below the previously estimated through flow threshold of 579mAHD. A final void water level of 589.3m AHD is described as "very unlikely" to occur in accordance with Table 2 of Middlemiss and Peeters (2018) (**Attachment 1**) and therefore was assessed as a worst-case outcome. This scenario was included to demonstrate the largest required extension to ensure that pit void lake levels remain below the through flow threshold of 579mAHD.

   A 20ha extension to the final void pit lake surface area would require an extended open cut pit area of approximately 28ha and an estimated 16.3 million cubic metres of raw material to be blasted and placed in the floor of the open cut pit. Depending on the methods and equipment used this is estimated to take between 12 to 18 months to complete.

A final void lake level of 583.6mAHD is the upper bound of the Uncertainty Analysis Report outcomes described as "as likely as not". This analysis demonstrates that this outcome may be mitigated by an open cut pit extension of 16.6ha (12ha increase to the lake surface) which would reduce the peak water level to 577mAHD, comfortably below the previously predicted through flow threshold level of 579mAHD. In the very unlikely circumstance that the final void pit lake reaches an equilibrium lake level of 589.3m AHD, a 28ha extension to the open cut pit (20ha increase to the lake surface) would reduce the water level to 578.3m AHD, also below the previously predicted through flow threshold level. The total volume of material to be removed from the currently proposed open cut pit is approximately 32.5 million cubic metres[3] and this analysis indicates that between 8.6 million and 16.3 million cubic metres of additional material may need to be extracted and placed in the floor of the open cut pit to mitigate through flow risk.

Bowdens Silver has reviewed the proposed post-closure extension strategy and accepts that an open cut pit extension between 16.6ha and 28.0ha may be required to satisfy its commitment to construct a final void that would remain a groundwater sink. All efforts would be applied during development to remove this risk, however it is a feasible outcome for the Company given the circumstances. There is more than sufficient area within the existing disturbance envelope to extend the open cut pit post-closure and the above analysis demonstrates that this extension would depress the final void pit lake water level to an elevation at which through flow would be unlikely. Bowdens Silver has previously committed to updating the regional groundwater model during mining operations and would undertake further detailed assessment of final void behaviour and anticipated pit lake water levels during mining operations.

Since the initial Mineral Resource estimate of 2017, the Company has continued with an expansive exploration program. This work has discovered significant new mineralisation in the immediate proximity of the currently proposed open cut pit. This exploration program has also included an optimisation program for the currently proposed open cut pit and increasing success with metallurgical recoveries will allow more material to be converted to Ore Reserve and support

[3] Assuming an average density of 2.35t/m^3

extension of the open cut pit. From the Company's perspective a future application for expansion is likely given its exploration work has continued to demonstrate highly positive results.

Yours sincerely

Nick Warren
Principal Environmental Consultant

Attachment 1 - Example of a combined numeric, narrative and visual approach to describing likelihood in Uncertainty Analysis - Middlemiss and Peeters, 2018

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WRM Water and Environment

Attachment 1:
Example of a combined numeric, narrative and visual approach to describing likelihood in Uncertainty Analysis (Table 2 Middlemiss and Peeters, 2018)

Table 2—Example of a combined numeric, narrative and visual approach to describing likelihood

PERCENTILE (outcomes ranked from small to large)	COLOUR CODE	DESCRIPTION (in terms of likelihood of exceedance)	ALTERNATIVE DESCRIPTION OR FRAMING
<10%		It is **very likely** that the outcome is **larger** than this value	It is **very unlikely** that the outcome is **smaller** than this value
10–33%		It is **likely** that the outcome is **larger** than this value	It is **unlikely** that the outcome is **smaller** than this value
33–67%		It is as **likely as not** that the outcome is **larger** than this value	It is as **likely as not** that the outcome is **smaller** than this value
67–90%		It is **unlikely** that the outcome is **larger** than this value	It is **likely** that the outcome is **smaller** than this value
>90%		It is **very unlikely** that the outcome is **larger** than this value	It is **very likely** that the outcome is **smaller** than this value

Note: Some projects may justifiably use other values for the 'very likely' or 'unlikely' descriptors, such as 95 per cent or 5 per cent.