



Technical Review

To:	Shay McDonald	Date:	7 th September, 2026
Authority:	Otago Regional Council	Ref:	25080B
Consent:	Fast-Track Bendigo Ophir Mine		
From	Role in Audit		
Alexandra Badenhop	Surface water modelling, Groundwater & Geochemistry		

1 Overview

Matakanui Gold Limited (MGL) and its advisors have compiled responses to the Expert Panel's Request for Information (RFI 11) Questions 1 to 9, which relate to water quality, hydrogeology, groundwater modelling, and contaminant transport. This review pertains to specific questions regarding the following documents:

- 2(a) BOGP Groundwater Site Investigation Memorandum - Ryan Burgess, Hydro Geochem Group
- 2(b) (c) 4 (a) (b) Updated Groundwater Modelling for Bendigo Ophir Gold Deposit - Matt Dumont, Kōmanawa Solutions Ltd
- 3(a) (b) (c) 4(a) (b) Operational Phase Site Wide Water and Load Balance Model - Ryan Burgess and Paul Weber, Mine Waste Management Ltd
- 6 Report on Compliant Aquifer Test at BOGP Water Supply Bore Field - Jens Rekker, Kōmanawa Solutions Ltd

This memo is provided in response to Minute 46 in which the Panel grants leave for any party/invitee to file comments in response to that filed by MGL on 17 August 2026. Due to the limited timeframe available and illness, I have been unable to do a complete review of all of the documents provided in response to RFI11. The points raised are those that I consider worth drawing to the Panel's attention based on the limited review I have been able to complete.

2 Changes to Understanding

2.1 Aquifer Properties

Ten new monitoring wells were installed with some screened in the valley alluvium, underlying weathered bedrock and fresh bedrock. Slug testing was completed to obtain conductivity values, and vibrating wire piezometer strings were installed in five bores. Alluvium and weathered bedrock conductivity was found to be an order of magnitude higher than assumed in original seepage assessment. Weathered bedrock had higher K than modelled, but was relatively thin (1-3 m) in the valley (GW02, GW03, GW06), overlain by 5-6 m alluvium/colluvium at GW03-GW06 and thickening to 15-16 m at GW02. Weathered bedrock is quite thick close to valley bottom (up to 37 m with $K = 6 \times 10^{-5}$ m/s at GW04 & 5). Whilst there is an upwards hydraulic gradient along most of the valley, there is a downwards hydraulic gradient at GW02 (the location of SC01) and there was also no clear gradient at GW06 (Shepherds ELF). The gradient was downwards in the valley sides at GW04, GW05, GW13, GW14, GW23, however groundwater was also artesian in 3 of the VWP throughout profile (GW04, GW13, GW23) in the areas of RAS pit, WELF and Shepherds ELF.

GW02 bores were installed adjacent to the location of SC01. GW02A was screened in alluvium/colluvium (10.2 – 13.2 m.b.g.). The groundwater level was 10.69 m.b.g on 11/08/2026 and the depth of alluvium/colluvium above the weathered bedrock was 15 m. The hydraulic conductivity at this location was 1×10^{-4} m/s. This was underlain by 3 m of weathered bedrock. Fresh bedrock at this location was also measured to have a higher conductivity than expected of 1×10^{-5} m/s.

This data does improve understanding of the three hydrostratigraphic units, and groundwater quality (though only one sample event), however there are no storage values from these investigations. The investigations were focussed on the Shepherds Valley, with only one additional bore in Rise & Shine. No comparison was made with the data previously collected. No data was collected in the Ardour Aquifer or in the Bendigo Alluvium.

This data changes the conceptual understanding of the valley particularly at SC01, and the potential for seepage loss and containment at this location. This information was not included in the groundwater modelling.

2.2 Baseline Conditions

Whilst one groundwater quality sample has now been taken from the valley alluvium, this only provides a snapshot of water quality conditions, and it is unknown how these conditions change seasonally. A baseline dataset would be expected to be collected over all seasons. Note that phosphorus was also high in the two samples analysed (>0.4 mg/L). This data raises questions about the ability to detect seepage within the valley, and also further questions regarding the possible effects on aquifers.

Table 1: Groundwater Monitoring Dataⁱ.

				Major Ions	Nutrients	Metals		Metals	Metals	Metals
				Sulfate (filtered)	Nitrate (as N) (filtered)	Aluminium	Arsenic	Iron	Molybdenum	Zinc
				mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L
EQL				0.15	0.002	3	0.5	5	0.2	1
NZ Drinking Water MAV				250	11.3	1000	10	1500		3
ANZECC Irrigation Water (2003)				---		5000	100	5000	10	2000
ANZECC Livestock Drinking Water (2003)				1000		5000	500		50	24000
Field ID	Area	Monitoring Zone	Date							
GW01	SC Valley Bottom	Alluvium/colluvium	16 Jul 2026	42.3	0.27	1,790	4.6	2,470	0.8	7
GW010	SC Valley Bottom	Alluvium/colluvium	18 Jun 2026	73.8	0.508	1,010	1.2	1,750	7.6	43
GW010	SC Valley Bottom	Alluvium/colluvium	27 Jul 2026	71.6	1.1	2,240	1.3	3,090	2.5	16
GW02A	SC Valley Bottom	Alluvium/colluvium	31 Jul 2026	42.7	0.333	11,700	32.1	19,900	1.3	46
GW03A	SC Valley Bottom	Alluvium/colluvium	22 Jul 2026	102	0.447	35	0.9	76	1.2	3
GW06A	SC Valley Bottom	Alluvium/colluvium	23 Jul 2026	26.7	1.32	1,100	1.6	1,760	1.3	5
GW19	RAS Valley Bottom	Alluvium/colluvium	05 Aug 2026	3.3	0.029	567	2.1	745	4.2	4
GW02C	SC Valley Bottom	Fresh bedrock	31 Jul 2026	44.9	0.226	321	4.2	473	40.7	5
GW03C	SC Valley Bottom	Fresh bedrock	22 Jul 2026	73.8	0.242	258	7	366	3.1	153
GW06C	SC Valley Bottom	Fresh bedrock	23 Jul 2026	33.8	0.098	673	7.5	931	46.8	6
GW02B	SC Valley Bottom	Weathered bedrock	31 Jul 2026	42.9	0.416	147	1.9	203	1.9	16
GW03B	SC Valley Bottom	Weathered bedrock	22 Jul 2026	77	0.595	767	1.9	1,080	0.4	10
GW06B	SC Valley Bottom	Weathered bedrock	23 Jul 2026	28.8	1.08	485	5	814	2.4	4
MDD500	SC Process Plant	Weathered bedrock	17 Jul 2026	148	0.124	12	<0.5	16	0.8	11
MDD015	RAS Pit	Fresh bedrock		10	0.0051	6.1	24	15	0.4	1.5

Data sourced from RFI Question 2a and 3a

ⁱ Note that given the samples were laboratory rather than field filtered, and no field parameters were measured, it is difficult to interpret the metal concentrations which may have been suspended with sediment or precipitated out of solution after oxidising.

3 Seepage Collection

Groundwater modelling was completed to assess:

1. The likelihood and magnitude of contaminated seepage from the mine site that may be lost to the shallow and the deep groundwater systems
2. The potential drivers for the loss of contaminated seepage to the shallow and deep groundwater systems and the sensitivity of lost seepage to model parameters.
3. The impacts of mining related dewatering to affect the likelihood and magnitude of lost contaminated seepage.

3.1 Summary

The modelling consisted of high resolution 3D groundwater model of the near surface alluvium/colluvium and weather bedrock (smaller model domain in Shepherds Creek catchment) coupled with optimised deep groundwater model of the schist system (larger domain). Sensitivity analysis was completed to determine the impact of varying parameters on the model outputs. Modelling broadly rejects the hypothesis that substantial seepage may be lost to the deep schist system without being detected by the proposed monitoring network. This report does not detail what it understands the proposed monitoring network to comprise.

The seepage model remains uncalibrated for near surface model, and is run in steady state for a stochastic suite of coupled models. The seepage model used the hydraulic conductivity and recharge from the optimised deep model, with additional parameters for the PROCESS features such as the TSF and SHELF. Whilst the parameters were varied for the seepage model, the conceptual model was not varied in terms of thickness of layers/structure i.e. it assumes a uniform thickness of 5 m for the valley alluvium and 20 m for weathered bedrock across the model domain. It is difficult to know how this would impact the results. For example, recent investigations found weathered bedrock to be thicker on the valley sides than the 25 m shallow zone modelled. Some of the parameters varied for the seepage model are provided in Table C1, but not all of them (e.g. bulk weathered rock K).

The model could not replicate both the observed heads and surface water fluxes, indicating oversimplification within the model that is acknowledged in the report.

The optimised model was able to replicate the observed fluxes in the upper Shepherds Creek and Rise and Shine Creek, but not the fluxes at SC01. This is stated not to affect the assessment of lost seepage which calculates the percentage lost to the environment compared to that captured by the drains, however it does seem that if more water is reporting to the surface water drains than actually occurs, then more water continues to travel within the alluvium/weathered rock than is predicted by the model. The model inversion resulted in lower hydraulic conductivity in the weathered rock and bedrock than the values obtained during the aquifer testing.

The model predicts two areas of discharge from the deep schist system into Shepherds Creek – one beneath the TSF/Shepherds ELF and one beneath the Shepherds Creek Valley Fill. Based on the goodness of fit of the models and coverage of likely values of the parameters, a subset of deep model realisations was selected to couple with the seepage model. As the creek is modelled using a DRAIN function, it cannot lose to groundwater, only gain from groundwater. It is therefore not attempting to realistically model the surface water-groundwater interactionsⁱⁱ, but is providing a mechanism for surface runoff and for loss of seepage to the environment. Additional seepage loss through deeper rock towards the Ardgour Aquifer is modelled using the OFFSHORE boundary condition.

In summary, key issues that reduce confidence in the results are as follows:

- The shallow seepage model has not been optimised or calibrated to current conditions
- Whilst the parameters were varied for the seepage model, the conceptual model was not varied in terms of thickness of layers/structure and does not reflect the results of additional investigations.
- It does not appear that the results of additional hydrogeological investigations were used in the parameter optimisation for the deeper model.
- Recharge has been calibrated in the deep ground water model, however no assessment of climate variability has been made. Models have been run in steady state over a long period assuming a constant source of contaminants.

ⁱⁱⁱ In its current state, it is likely that Shepherds Creek both loses and gains from groundwater, however the diversion channel is it expected to neither gain nor lose from groundwater due to the elevation of the low conductivity streambed channel. The creek is expected to lose to groundwater when it returns to its own channel downstream of the Shepherds Valley Fill.

- No presentation of final groundwater table
- The model architecture with the set up of the weathered drains/offshore boundary is likely to be biased towards the losses through the weathered drains rather than the offshore boundary.
- Note that drains are expected to block over time, and therefore additional seepage collection measures will need to be implemented into the future, even to achieve the seepage collection rates that have been modelled, particularly in key areas such as beneath the Shepherds Valley Fill.

3.2 Assumptions

The model assumes the key sources of contaminants are as follows:

- TSF
- Shepherds ELF
- Shepherds Creek Valley Fill

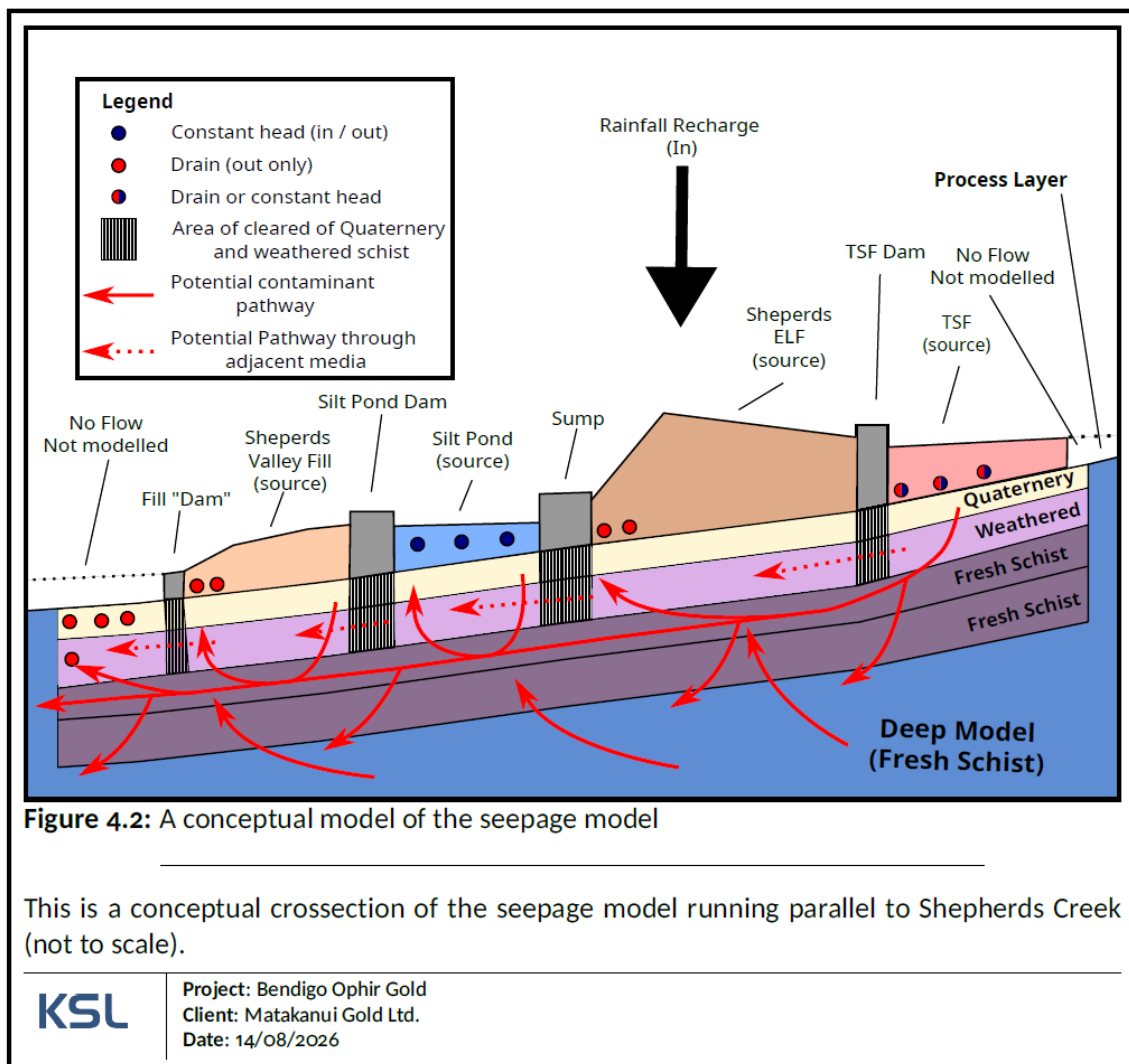
The silt pond and RAS pit and underground were originally included as contaminant sources, however initial model runs found that the RAS pit acted exclusively as a sink for contaminated water, and that the silt pond lost very little water, therefore these two sources were excluded from further model runs to reduce the processing time required. The Come In Time pit and backfill were not included in the modelling, nor any features in the Rise and Shine Creek Valley (Western ELF, SREX Pit and SREX ELF).

3.3 Modelled Primary Collection Systems

The conceptual model provided by KSL is reproduced below. The following assumptions in this model are important for transport:

1. There are dams which are areas cleared of alluvial materials and weathered schist in the following locations:
 - The TSF dam
 - The sump at the based of the Shepherds ELF
 - At the base of the Silt Pond
 - At the base of the Shepherds Valley Fill
2. There are drains installed to capture seepage in the following locations:
 - At the base of the TSF above the dam
 - At the base of the Shepherds ELF prior to the dam

- At the base of the Shepherds Valley Fill prior to the dam
- Within valley alluvium downgradient of the Shepherds Valley Fill dam
- With weathered rock downgradient of the Shepherds Valley Fill dam.



3.4 Seepage Loss

Modelling has identified the following elements being critical to minimising seepage loss:

- Removal of weathered bedrock below the Seepage Collection sump to reduce K to less than 1×10^{-6} m/s.
- Lateral and underdrains within the Shepherds Valley Fill.

With these features confirmed, 95th percentile upper limit for likely lost seepage was as follows:

- 4-8% for TSF, less than 9%.
- <7% for SHELFL, and

- <10% for the SHFILL

Most model realisations suggest lower values of lost seepage; less than 3% for the TSF, less than 5% for the SHELF, and less than 5% for the SHFILL.

Within the model, loss is calculated as the sum of:

- a) water that drains out of the surface of the shallow model,
- b) water that drains out of the surface of the deep model, and
- c) water that cross the offshore boundary into deeper groundwater outside of the model domain towards the Ardgour Aquifer

Sensitivity analysis was completed to determine the relative effect of dewatering the RAS pit to the filled level of 490 m RL. This indicated some difference to the amount of seepage lost down the valley, although it is unclear what 'lost' means as opposed to Offshore and which simulation is which in Figure 8.5. Whilst the text states that the loss is expected to be constrained to the shallow groundwater system within the valley, it is not clear how the percentage losses are partitioned between the deeper groundwater system and shallower groundwater system.

It should be noted that these estimates of seepage loss assume that drains are working. Within the JWS, the applicant's geotechnical engineers acknowledged that drains would fail over time. Drain failure will result in increased seepage loss.

3.5 Expected Flow Paths

The depth to groundwater at GW02A (>10 m) adjacent to SC01 confirms that surface water loses to groundwater at this location and therefore any uncaptured seepage will not be detected in surface water at this location. Given the extent of valley fill, it is not expected that groundwater will be in connection with Shepherds Creek at any location along the valley.

Note that the offshore area of the deep model is not active within the upper two layers (alluvium and weathered bedrock); instead there is a weathered drain conductivity boundary condition which traverses a long section of Shepherds Valley downgradient of the fill in Layer 2, and a small area at the end of the valley in Layer 3. This has the effect of increasing the groundwater draining out of the surface of the model into surface water and hence increases the flows at SC01, which is part of the calibration issue recognised within the modelling report (the model is poorly calibrated to flows at SC01). In reality, this water would travel as

groundwater. This model construction means that whilst an overall estimate of loss can be made, the partitioning is not clearly presented. From the additional groundwater information provided, I understand that all of the seepage loss would be transported in groundwater.

3.6 Travel Times

The additional baseline data collected indicates that travel times may be an order of magnitude faster than the predictions provided in HGG (2026) BOGP MWSF Seepage Risk Assessment. The conductivity of alluvium in Shepherds Creek was 5×10^{-5} m/s at GW06 and 1×10^{-4} m/s and 5×10^{-5} m/s at GW02A and GW03A respectively, whilst estimates of travel times used $K=1 \times 10^{-5}$ m/s. No additional measurements of effective porosity are available to test the assumed value, however it noted that the gradient may also be steeper in this area given the depth to groundwater. This would reduce the travel time from the Shepherds Valley Fill to SC01 to less than one year.

No further estimates of travel times have been provided within the modelling report, which referenced the travel times provided in HGG (2026). The uncalibrated model of the Ardgour Aquiferⁱⁱⁱ provided as supplementary material to the application indicated that contaminants travelling through the aquifer could reach the Lindis River within 5 years. No further information has been obtained to improve this model.

3.7 Effects on Aquifers

The effect of 3-8% of seepage loss on the downgradient aquifers has not been assessed, rather it is assumed that any uncaptured seepage will be detected and collected by secondary collection systems.

If the uncaptured seepage was transported into the aquifer, it is unclear what the effects would be as no further investigations have been completed in the Ardgour Aquifer.

ⁱⁱⁱ Dumont and Rekker, (2025). Post Closure Impacts of Bendigo Ophir Gold Deposit on the Ardgour Aquifer. Report: Z24002.m2 prepared by Kōmanawa Solutions Ltd for Matakanaui Gold Ltd.

The modelling completed by Rekker & Dumont (2025) indicated that limited dilution of Shepherds Creek water may occur across the Ardgour Aquifer prior to it joining the Lindis Alluvial Ribbon Aquifer, and that this could impact on existing bores. The current modelling assumes that if surface water compliance limits are met, then groundwater compliance limits will also be met.

However, recent groundwater sampling in the Shepherds Valley alluvium indicates that the groundwater discharging from the valley is poorer water quality than Shepherds Creek water, though no comparison has been provided in any recent assessments. It is therefore possible that water quality in the Ardgour Aquifer may be reliant on dilution from high-quality water from Shepherds Creek to improve water quality, and that compliance limits may be exceeded even without seepage escape and even if compliance limits are met in surface water. However, there is no data available from the Ardgour Aquifer to verify this. Sampling of GW010 at the location proposed for MW101 indicates that compliance limits are already exceeded at this location for zinc, iron, antimony and aluminium. It is therefore high likely that compliance limits would be exceeded due to additional seepage escape.

As discussed within the Joint Statement of Expert Witnesses Reconvened Geochemistry / Water Quality / Hydrology / Water Management / Freshwater Ecology 10th June 2026 (68), I considered that given the uncertainty in hydrogeological conditions indicated by the drilling in MW-101, further investigations are required in both the Shepherds Valley Alluvium and Ardgour Aquifer and the Bendigo alluvium upgradient of the Bendigo Aquifer which may identify the need for additional compliance locations.

3.8 Recommendations

Based on these findings, KSL suggest the following design criteria to minimise the potential seepage from the TSF, SHELF, and SHFILL:

1. Ensure that the SHFILL is adequately underdrained to prevent upward seepage from the deeper schist system. This has the additional benefit of creating a second capture zone for any lost seepage from the TSF and SHELF.
2. Ensure that the area of weathered schist under the SUMP is modified to ensure a conductivity of less than 10^{-6} m/s (geometric mean), ideally less than 10^{-7} . This is

consistent with the existing plans to remove much of the weathered schist, but the modelling results presented here highlight the importance of this design criterion.

3. Ensure that the monitoring network is implemented as planned, with particular attention to the monitoring of surface water at SCO1, groundwater near SCO1, and the silt pond.

4. Consider the extension of the underdrainage system in the TSF to the upper TSF deep discharge zone to ensure that heads in the TSF are primarily due to infiltration rather than deep groundwater discharge.

3.9 Secondary seepage collection infrastructure

The Groundwater JWS contains discussions regarding the possible locations and options for secondary (or contingency) seepage interception systems that can be installed at multiple locations within the valley if uncaptured seepage is detected. Given these contingency seepage interception systems were not included in the modelling, it is assumed that if installed these will reduce seepage loss below the modelled percentages. Previously, it was assumed that the location of SC01 would be an appropriate final cutoff point within the valley, however this seems less certain based on recent investigations. The lithology and depth to groundwater at GW02 (SC01) indicates deeper and more alluvium and fresh bedrock with a downwards hydraulic gradient. This means that seepage lost at this location is likely to migrate along deeper paths than previously considered. No further modelling has been completed specific to the potential interception of secondary seepage collection systems to confirm whether this location would be as effective as initially considered.

Detailed design of methods is outside of my area of expertise, however it would be assumed that pump and treat options would be possible within the valley, supported by grout curtains and seepage cutoffs. HGG (2026) *Bendigo-Ophir Gold Project Mine Waste Storage Facility Seepage Assessment. 17 April 2026*^{iv} recommended that the efficacy of contingency secondary seepage collection systems be tested by 3D groundwater modelling.

4 Monitoring and Detection

^{iv} Provided as Appendix A to Statement of Evidence of Ryan Oliver Burgess on behalf of Matakanui Gold Limited in response to Request for Information. 17th April 2026.

4.1 Locations

4.1.1 Compliance

Two bores have been offered as compliance monitoring wells:

1. GW01 located near Shepherds Creek in the Shepherds Creek alluvium, approximately 300 m downstream of SC01.
2. Base bore for water within the Bendigo Aquifer

No bore log or construction details have been provided for GW01 and therefore it is difficult to know if this bore is a good compliance monitoring location. Given the conditions at GW02, rather than a single well screened in the alluvium, a fence of monitoring wells should be installed. At each location, there should be a monitoring bore screened across the watertable in the alluvium, a monitoring well screened in the weathered bedrock and a monitoring bore screened within the fresh bedrock. In addition, compliance monitoring should be completed within the Ardour Aquifer.

A dedicated compliance monitoring bore should be installed within the Bendigo Aquifer, close to the outlet of Bendigo Creek. The production bore will be drawing in water from a wide radius of the aquifer, and therefore will not be representative of the water entering the aquifer. It is possible that bores pumping only a small amount of water for domestic purposes would draw in water of very different quality.

4.1.2 Performance

The updated information has not provided any additional clarity around the locations to detect seepage within the valley, as no final groundwater table has been provided to confirm groundwater flow directions. As previously discussed, it is expected that a fence of monitoring wells would be installed across the valley at SC01, not only one location. In the Groundwater JWS (58), all parties agreed that groundwater monitoring was required close to:

- (a) Shepherds ELF;
- (b) Western ELF;
- (c) SREX ELF;
- (d) Shepherds Service Corridor valley infill;

- (e) Pit lakes and underground mine portals and decline;
- (f) Process plant and ROM pad;
- (g) STSF.

At each location, monitoring should be in the alluvium, weathered bedrock and fractured rock, including grab samples, water levels and continuous EC.

4.2 Monitoring Parameters/Triggers

The assumption of previous seepage assessments was that sulfate and nitrate would be the first PCOCs to be detected from seepage migrating from MWSFs due to their conservative transport properties under most conditions. It was assumed that sulfate and nitrate concentrations in surface and groundwater would be 10 to 100 times less than that in seepage waters therefore providing a "strong signal to noise ratio allowing early detection". However, recent groundwater sampling indicates higher concentrations of sulfate and nitrate than expected which means that this approach will need to be reevaluated. Elevated parameters from this additional monitoring are shown in Table 1.

Further, given that the groundwater within the valley will no longer receive losses from Shepherds Creek, it is likely that groundwater quality within the valley will become more elevated in sulphate and nitrate even without seepage losses (as surface water losses are likely to have diluted/ improved groundwater quality in the past). The water quality dynamics within alluvial groundwater are currently poorly understood.

Given this information, I cannot, without further assessment, confidently provide an indication of appropriate triggers for the detection of seepage within the valley.

5 Water Load Balance Modelling

Additional transient water load balance modelling was completed for the operational phase of the project. Source terms were applied as constant concentration or constant load modelled on daily timestep for 200 climate realisations. The model conceptualises a small proportion of tailings and Shepherds ELF, Process Plant Pad and Shepherds Creek Valley Fill seepage being uncaptured (5%) and reporting to SC01, and uncaptured seepage from WELF reporting to RS03. The model does not provide groundwater quality outputs.

Results are monthly mean or medians which may mean acute toxicity issues are not identified. The key assumptions are as follows:

- Seepage recovery from ELFs assumed 95%,
- NP assumed 50% (this is less than assumed in original model).
- Seepage recovery from TSF assumed 95%, and seepage volumes were obtained from EGL (2025).
- Pit dewatering rates were those from the previous model with no safety factor, including dewatering of 4 L/s from underground^v.
- There are no clear assumptions around the water used for dust suppression.
- Assumes treatment of tailings water using Ferric chloride to remove arsenic, pH adjustment with lime and cyanide destruct.

Results provided indicate mine water surplus may occur from Year 7 and thus use of evaporative cannons was provided in the model, along with the suggestion that active water treatment may be required earlier. Surface water quality indicates some exceedances for antimony and nitrogen in particular.

5.1 Key Issues

The key issues with this modelling are as follows:

- WLBM has not been updated for the post-closure mining scenario, which means it does not include uncaptured seepage in the model, so doesn't include the findings of Q2a & b and doesn't fulfill Q3b or c. Outputs from Q2 are not explicitly incorporated into the water balance modelling completed, which is aiming to fulfil Q3a of RFI 11.
- Note that in reality uncaptured seepage won't report to SC01, rather will be transported in groundwater.
- Refers to pit sumps being pumped to a Seepage Pond - not clear what or where this is.
- Limited uncertainty analysis which means it doesn't really meet the intentions:
- Assumes large surface area of pit sumps being dewatered from which water can evaporate (unsure if this is realistic).
- Uses previous pit dewatering estimates with no safety factor.

^v Note that the updated groundwater modelling does not include any updated dewatering estimates.

- Net percolation rate of 50% (During the operational phase, net percolation rates are likely to be 60-80%).
- Does not document the ELF seepage source term.
- Assumes attenuation of some metals in uncaptured seepage by applying a reduction for As of 2 orders of magnitude and 1 order of magnitude for the other elements (Fe, Cu, and Mo). Given the concentrations of iron, arsenic, copper and molybdenum in recent groundwater sampling provided in the answer to Q2a, this might not be a valid assumption as there is clearly transport occurring within groundwater.
- Recent groundwater sampling suggests that the groundwater quality source term provided may not be representative when there is clearly a wide range of values. e.g. 2/3 groundwater samples taken wells screened in fresh bedrock contained Mo > 0.04 mg/L which is 2 orders of magnitude higher than that used in the source term. Similarly, zinc concentrations were higher in most of the groundwater samples.

6 Groundwater Take, Bendigo Aquifer

Consent is sought for a take of 110L/s from the Bendigo Aquifer, 6.5 km west of the proposed gold mining site for process water and dust suppression.

The aquifer test parameters determined by the original pumping test analysis were $T = 4500 \text{ m}^2/\text{day}$ and $S_y = 0.25$. A longer higher rate pumping test was completed at 97.1 L/s using combined pumping of two bores (80 L/s & 18.7 L/s) for six days. The maximum proposed pumping rate of 110 L/s could not be achieved. Transmissivity was indicated to be between 4100 and 5500 m^2/day with a specific yield of 0.12-0.14. Based on the range of values calculated, the value of transmissivity calculated from the Neuman analysis of the observation bore Obs-2 (75 m from the principal pumping bore) was used. Drawdown in this well was 0.59 m after 144 hours of pumping.

6.1 Drawdown

The revised transmissivity and storage parameters are lower than those previously used in the cumulative drawdown assessment. The report acknowledges that the revised aquifer parameters will result in increased drawdown effect on surrounding bores, but no updated assessment of drawdown effects has been provided. This should be rectified.

6.2 Conditions

Note that the Water Load Balance Modelling estimates bore water usage ranging from 80 L/s in summer to 30 L/s in winter, which calls into question the need for the higher rate of take.

The latest updated set of conditions allow for remedial actions for those bores that can provide information regarding their bore as per Condition 9 of the D.02 set of conditions. It should be noted that some older bores may not have the complete set of information and should not be precluded from remedial assistance. The assessment of cause should be completed within 40 days, which should be adequate if the drawdown assessment has been completed in advance of pumping commencing.