

**Before the Expert Panel appointed
under the Fast-track Approvals Act 2024**

Under the Fast-track Approvals Act 2024
(Act)

And

In the Matter of an application for approvals by
Matakanui Gold Limited to establish,
operate, rehabilitate and ultimately
close an open pit and underground
gold mining operation known as the
Bendigo-Ophir Gold Project

**Statement of Evidence of
Ryan Oliver Burgess on behalf of
Matakanui Gold Limited in response to
Section 53 Feedback
Mine Water Management**

Dated: 17 April 2026

Lane Neave
Level 1, 2 Memorial Street
PO Box 7348
Queenstown
Solicitors Acting: Joshua Leckie/Sarah Anderton/Mia Turner
Email: joshua.leckie@laneneave.co.nz/
sarah.anderton@laneneave.co.nz/mia.turner@laneneave.co.nz
Phone: 03 409 0321

lane neave.

INTRODUCTION

1. My name is Ryan Oliver Burgess.
2. I hold a B.Sc. in geology from the University of Canterbury and a M.Sc. in Hydrogeology from Simon Fraser University in Canada.
3. I have over 15 years' experience in the field of mining hydrogeology and water management and I am an active Member of the Australasian Institute of Mining and Metallurgy.
4. I am a Principal Consultant with Hydro Geochem Group Limited (**HGG**). HGG is part of the Green Road group of companies (~45 employees) that provides practical, innovative, and sustainable solutions to the international resources industry. Prior to this role, I have held international consulting roles in New Zealand, Canada and Australia.
5. My extensive experience covers many aspects of mine water management including hydrogeology and surface water hydrology, mine dewatering and pit slope management, mine water supply, environmental assessments, groundwater contamination, and closure aspects. I have undertaken various roles, from project manager to technical specialist, on multidisciplinary teams responsible for the development, operation and/or closure of mines in Australia, New Zealand, and North and South America. In total, I have contributed to mine water management at over 50 proposed, active, and closed mines around the world.
6. This statement is given as part of Matakauui Gold Limited's (**MGL**) response to comments on the BOGP made under Section 53 of the Fast-Track Approvals Act 2024 (**FTA**). This statement responds to specific comments raised by:
 - (a) Otago Regional Council;
 - (b) Environmental Defence Society Incorporated;
 - (c) Fish and Game New Zealand;
 - (d) Sustainable Tarras;
 - (e) Sharon Brodie;
 - (f) QWIL Investments (NZ Pty);
 - (g) Professor Geoffrey Kearsley and Dr Claire Fletcher-Flinn;
 - (h) Central Otago Winegrowers Association;

- (i) Parliamentary Commissioner for the Environment; and
- (j) Minister for the Environment.

7. My original findings are provided in full in the following reports:

- (a) Net Percolation Assessment. MWM Report Number: J-NZ0455-001-M-Rev3. Appendix K of Mine Impacted Water Overview Report (Substantive Application, Part B Technical Reports, B.06C);
- (b) Water and Load Balance Model Report – Bendigo-Ophir Gold Project. MWM Report Number: J-NZ0233-016-R-Rev1. Appendix N of Mine Impacted Water Overview Report (Substantive Application, Part B Technical Reports, B.06C);
- (c) Hydro Geochem Group BOGP Wetland Drawdown Assessment (Substantive Application, Part B Technical Reports, B.42);
- (d) Hydro Geochem Group BOGP Flow Augmentation Strategy (Substantive Application, Part B Technical Reports, B.43); and
- (e) Hydro Geochem Group - BOGP MWSF Seepage Risk Assessment (Substantive Application, Part K, K.05).

8. Other relevant reports that my findings rely on include:

- (a) Water Management Plan (Substantive Application, Part G Management Plans, G.01);
- (b) Kōmanawa Solutions Limited - Groundwater Existing Environment and Effects Assessment (Substantive Application, Part B Technical Reports, B.03);
- (c) Kōmanawa Solutions Limited Surface Water and Catchment Existing Environment Effects Assessment (Substantive Application, Part B Technical Reports, B.04);
- (d) Engineering Geology Limited Shepherds Tailings Storage Facility Technical Report (Substantive Application, Part B Technical Reports, B.21);
- (e) Engineering Geology Limited Site Geotechnical Factual Report Parts 1 through 3 (Substantive Application, Part B Technical Reports, B.22); and

- (f) Engineering Geology Limited Shepherds, Western and Srex Engineered Landforms, and Come In Time Pit Backfill Technical Report (Substantive Application, Part B Technical Reports, B.27).
9. I have prepared this statement in the limited time available for MGL to respond to comments under the Act. If the Panel requires elaboration on any of the matters raised in this statement, I am available to provide further information on request.
10. Although this is not an Environment Court proceeding my confirmation of compliance with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023 is included in Substantive Application Document A0.2B.

SPECIFIC RESPONSE TO COMMENTS

Administering Authorities and Relevant Local Authorities.

Otago Regional Council

Comment: ORC recommends that a consent condition capture the Applicant's commitment to commission contaminant transport modelling studies to support detailed design of the ELFs and TSF, validate predicted contaminant transport times, and ensure the most appropriate seepage collection elements are installed.

11. MGL agree to this consent condition (D.04 condition NEW 6B). I note that the results of early modelling studies are provided in **Appendix 1**.

Comment: Hydro Geochem Group in Application Report B.43 states that MWM estimated groundwater inflows to the RAS underground workings would be approximately 10 L/s. ORC is unable to reconcile this figure with the MWM report referenced by HGG. In KSL B.03 it is estimated that 30 L/s of active pumping would be required; it is not clear if this is operational pumping or a prediction of inflows.

12. As described in Table 7 of Appendix N of B.06C Mine Waste Management Application Report, the use of the Goodman et al. 1965 equation to estimate groundwater inflow to tunnel is widely known to significantly overestimate groundwater inflow. As such, the estimate of 30 L/s was scaled down based on Moon and Fernandez (2009) to 9 L/s. In the B.43 Hydro Geochem Application Report, HGG rounded that value up to 'approximately 10 L/s' for the purposes of estimating flow augmentation requirements.

Comment: Report B.42 assumes that swamp and marsh, hillslope, and gully fen wetlands could be impacted by drawdown. Augmentation water is proposed for swamp/marsh wetlands, but no mitigation is proposed for hillslope or gully fen

wetlands. Performance monitoring is recommended to establish whether there is a reduction in groundwater levels affecting wetland extent or values.

13. I agree that performance monitoring should be undertaken, as recommended in B.42 and included in G.01.

Comment: ORC supports the Applicant's proposal to commission a site-wide transient water balance model but also recommends that this water balance modelling, and the reconciliation of effects, be undertaken for each mine stage to ensure site water balance is well understood and water deficit is maintained.

14. I note the site-wide transient water balance model is currently underway and included as D.04 condition NEW 6A.

15. I support the recommendation to update this model regularly to keep it current as mine plans and water management evolve over time.

Comment: It is ORC's preference that groundwater performance monitoring requirements are specified in consent conditions to reflect the critical role they play in the effects management process.

16. I agree groundwater performance monitoring requirements are specified in consent conditions to maintain consistency with surface water performance monitoring also being included in consent conditions.

17. See D.04 condition NEW 5 for the proposed consent condition related to groundwater performance monitoring.

Comment: The RS03 matter remains unresolved; ORC invites the Applicant to provide further discussion in their s55 response to s53 comments.

18. The following response relevant to this matter was provided to ORC on 19 March 2026 by MGL (file titled: Water workshop tasks.pdf):

19. "The RS03 location was chosen as the surface water compliance site for the Clearwater Creek catchment it represents a location that has the following favourable characteristics:

- (a) Downstream of all mine influences. This site is downstream of the WELF, SREX Pit and SREX ELF. It is also downstream of the historic CIT Battery.
- (b) Ease of access and minimal additional disturbance needed. This site is relatively easy and safe to access along an existing farm track.

(c) A strong dataset exists with which to establish baseline conditions. This site was part of the baseline characterisation effort, with >25 samples collected since 2022.

20. Alternatives with a long baseline dataset, such as RS01, will be greatly influenced by the RAS Pit and would not capture any influence of the WELF. Other locations are typically more challenging to reach (steep valley sides) and would require additional track construction (i.e., more disturbance) to reach these locations. It is also noted that performance monitoring is proposed at all mine domain water sources to provide an early warning of potential water quality impacts”.
21. In addition to this previous response, I recommend an additional surface water performance monitoring site be included on Rise and Shine Creek as a solution to this issue. The logical sites would be RS02 which has a reasonable baseline water quality dataset and has flow gauging installed too, which is beneficial for understanding contaminant loads.

Comment: Neither the application nor the initial responses to ORC's requests sufficiently acknowledged or discussed the potential implications of uncaptured seepage for surface water, including the Lindis River, which is sustained by groundwater discharge from the Lindis Alluvial Aquifer. As the Ardgour Valley and Lindis Alluvial Ribbon aquifers are hydraulically connected, there is a plausible pathway by which untreated seepage could ultimately enter the Lindis River.

22. I refer to Paragraphs 217 and 353 of ORC s53 Comments (dated 10 April 2026), which conclude that with appropriate monitoring, consent conditions in place, and conventional engineering control options available as contingencies, the risk of seepage bypass is low.
23. I support the conclusion made in Paragraphs 217 and 353 which are consistent with my opinion of low residual risk.

In Appendix 19, MGL has committed to including a consent condition requiring installation of secondary/contingency seepage interception measures if monitoring identifies higher than expected contaminant levels. This will require appropriate trigger levels; ORC has suggested a framework for these conditions in Appendix 4.

24. Conditions 29 and 30 of D.04 are proposed to meet this commitment.

Comment: In the Lindis River, no impacts from mining are anticipated under normal conditions. ORC suggests monitoring results should be interrogated with a focus on identifying a contamination 'fingerprint' which, if present, would be indicative of mine-impacted water. Management actions including inspection of seepage collection infrastructure should be clearly identified in the Water Management Plan and in consent conditions.

25. If surface and groundwater quality at SC01 and RS03 are maintained below proposed compliance limits, I agree impacts to the Lindis River are not likely to occur. Monitoring of the Lindis River is proposed to confirm this expectation.
26. 'Fingerprinting' is difficult without empirical seepage water quality data. As such, I recommend 'fingerprinting' be determined once measured BOGP seepage water quality data are available to determine reliable 'fingerprints'.

Comment: ORC supports the additional monitoring proposed by the Applicant in the Lindis River and Bendigo Creek and recommends that this additional monitoring is captured in consent conditions and in the Water Management Plan.

27. Although impacts to the Lindis River and Bendigo Creek are not anticipated, the proposed additional monitoring on these waterways will provide empirical evidence to help reassure any concerned parties.

ORC's Supporting Technical Reviews

Alexandra Badenhop, e3 Environmental: (e3, 2026)

28. Alexandra Badenhop of e3 Environmental provided technical a review of groundwater, geochemistry and surface water modelling components of the substantive application (e3, 2026). Where relevant to my area of expertise, I respond below to her 'remaining issues' as outlined in Section 8.4 of her review report.
29. In her review, Ms Badenhop requested further details on groundwater monitoring were requested.
30. General locations for groundwater monitoring were provided in G.01.
31. Full details (e.g., nominal depths, screen targets, etc.) will be provided in an updated Water Management Plan, to be refined through expert conferencing and updated versions provided to the expert panel for certification.
32. In her review, Ms Badenhop also requested comparison of the pit lake discharge volumes with the expected contribution from the RAS underground workings.

33. Post-closure, the RAS underground workings will flood up to approximately the portal elevation (490 m RL). This rebound in water level will reduce the groundwater inflow from what is experienced under fully dewatered conditions during operations. Given the lower permeability of the rock mass, it is expected the amount of groundwater inflow to the flooded workings will be low relative to the pit lake water ingress.
34. Flooding will also provide an initial first flush of contaminants, which recedes as the flooded conditions significantly reduces the amount of oxygen available to react with exposed rock within the underground workings.
35. Portal discharge will be collected and conveyed to the treatment (active and passive) location. It follows that if groundwater inflows to the flooded underground workings post-closure were higher than expected, this could be managed with higher active treatment capacity.
36. It is also noted that higher groundwater inflows to the underground workings post-closure would likely provide dilution to portal discharge given the load generation will be limited by the flooded condition.

Dr Michael Greer, Torlesse Environmental (Torlesse, 2026)

37. Dr Michael Greer of Torlesse Environmental provided technical review of water quality and aquatic ecology components of the substantive application (Torlesse, 2026). Where relevant to my area of expertise, I respond below to his 'summary issues' as outlined in Table 1 of his review report.
38. In his review, Dr Greer requested further clarification of the appropriateness of RS03 as a compliance monitoring site.
39. See paragraph 18 through 2121 earlier in this Statement of Evidence.

Environmental Groups

Environmental Defence Society

Comment: Critical gaps in groundwater hydrology data, and inadequate conceptual modelling of groundwater flows leading to overall uncertainty in the assessment of groundwater effects.

40. This statement refers to paragraphs 19 through 37 of Dr Morgan's Statement of Evidence. I note in these referenced paragraphs, Dr Morgan is referring the work completed by Komanawa Solutions (e.g., pit dewatering models). I understand

relevant responses will be provided in the Statement of Evidence prepared by Jens Rekker.

Comment: Unproven use of augmentation of the Rise and Shine Creek using groundwater from the Bendigo aquifer to mitigate wetland loss.

41. The above statement refers to paragraphs 81 through 93 of Dr Morgan's Statement of Evidence.
42. B.42 concludes that based on available information, the planned augmentation approach holds promise in mitigating potential effects to swamp and marsh wetlands in the Rise and Shine Creek given the interpreted surface water dominated nature of these wetlands¹.
43. B.42 therefore recommends further studies be completed to confirm the augmentation approach will work as intended to mitigate potential effects. Dr Morgan supports these recommendations in paragraph 91 of her Statement of Evidence.
44. To this end, I recommend further studies include review of creek flow data, creek water levels, and installation of drive point piezometers to understand wetland groundwater-surface water interactions.
45. Ultimately, the augmentation approach will be necessarily adaptive as it will need to adapt to real work responses from pit dewatering and other hydrological changes. B.43 acknowledges this.

Comment: Lack of impermeable liners under mining infrastructure to capture seepage into groundwater systems.

46. For conventional slurry impoundment TSFs (as proposed for the BOGP), lining of their footprint is often of limited benefit in long term seepage recovery. This because as tailings material consolidates over time, the permeability decreases to a similar level that a liner can achieve (once construction defects are accounted for), for example $<10^{-8}$ m/s.
47. Lower permeability liners also have a finite design life, meaning they cannot be relied upon to perform for long durations post-closure. Rather, seepage collection systems have been designed (by Engineering Geology Limited) to manage seepage risks.

¹ Page 10.

48. Seepage bypass modelling documented in Appendix A suggests proposed seepage collection systems will collect high proportions of seepage (i.e., 90% or higher) for the Shepherds ELF, TSF, Western ELF, and Srex ELF. Collection may not be as high for the Shepherds Creek Valley Fill, but performance monitoring and industry standard contingency measures are available to manage seepage of this feature.
49. Additional hydrogeological characterisation is recommended to be completed as part of the performance groundwater monitoring installation program, including the development of a detailed conceptual model that ties all relevant hydrogeology aspects together.
50. Contingency seepage interception systems (HGG, 2026)² will be implemented if it is found through performance monitoring that unacceptable seepage bypass is occurring. D.04 condition 30 is proposed to develop trigger levels at which implementation of contingency seepage interception systems may occur (it is noted other remedial actions may be more appropriate). I recommend triggers be a combination of measured solute concentration levels (accounting for background concentration) and qualitative trend analysis.

Comment: Significant risk of contamination of the Ardgor Aquifer from mine impacted waters.

51. This risk would only eventuate if Mine Waste Storage Facility (**MWSF**) seepage was not appropriately collected upstream of SC01 within the Shepherds Creek valley.
52. For MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this Statement of Evidence and HGG (2026) for discussion on the effectiveness of proposed seepage collection systems and industry standard contingency options available to improve seepage collection performance if required.
53. In my opinion, with the combination of the BOGP hydrogeological setting, proposed forward works, proposed seepage collection systems, performance monitoring and contingency measures available, the residual risk of unacceptable offsite MWSF seepage migration is low.

Comment: No modelling of solute transport into the Bendigo Aquifer so unknown contamination risk.

54. This risk would only eventuate if MWSF seepage was not appropriately collected upstream of RS03 within the Clearwater and Rise and Shine valleys.

² Page 5

55. Water quality modelling results (Appendix K of B.06) suggest that on average, concentration of potential constituents of concern will remain below proposed water quality limits for surface and groundwater with treatment.
56. For MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this this Statement of Evidence for discussion on the effectiveness of proposed seepage collection systems and contingencies.
57. In my opinion, with the combination of the BOGP hydrogeological setting, proposed forward works, BOGP hydrogeological setting, proposed seepage collection systems, performance monitoring, contingency measures available, the risk of unacceptable offsite MWSF seepage migration seepage is low.

Comment: There are potential impacts on existing consent holders to continue to access water from bores and contamination of groundwater and surface water (including the Lindis River and potentially even the Mata au Clutha River) with contaminants such as arsenic, sulfate and trace metals.

58. This statement is acknowledged. I note that many mitigations and engineering controls are proposed to reduce the residual risk of potential contamination impacts eventuating. For example, Appendix A suggests relatively high levels of seepage collection will be achievable for most MWSFs, minimising the contaminant load that reports to downstream receptors (see paragraphs 46 through 50 for further discussion of Appendix A model results). Modelling documented in Appendix N of B.06 considers such mitigation and engineering controls, with results suggesting surface water quality will be below the proposed compliance limits.

Comment: There has been limited hydrological data collection, there is no robust conceptual model of groundwater flows near the pits and mine waste storage facilities and cumulative effects of drawdown from dewatering are not assessed and information relating to surface water/groundwater connection and transport of seepage is lacking.

59. HGG (2026) and Appendix A document available data and hydrogeological conceptual models for MWSFs.
60. Additional hydrogeological characterisation is proposed along with updates to conceptual models (refer to paragraph 49 in this Statement of Evidence).
61. Contingency seepage interception systems (HGG, 2026)³ will be implemented if it is found through performance monitoring that unacceptable seepage bypass is

³ Page 5

occurring. D.04 condition 30 is proposed to develop trigger levels at which implementation of contingency seepage interception systems may occur (it is noted other remedial actions may be more appropriate). I recommend triggers be a combination of measured solute concentration levels and qualitative trend analysis.

62. In my opinion, with the combination of the BOGP hydrogeological setting, proposed forward works, proposed seepage collection systems, performance monitoring, and contingency options, the residual risk of unacceptable offsite MWSF seepage migration seepage is low.

Comment: There are high levels of uncertainty in conceptualisation of groundwater flows, surface water / groundwater interaction and solute transport at the site, such that planning for monitoring and mitigation of effects is also uncertain.

63. Additional hydrogeological characterisation is proposed along with updates to conceptual models (refer to paragraph 49 in this Statement of Evidence).

64. In my opinion, with recommendations for forward works, any uncertainty in seepage containment can be managed appropriately through performance monitoring and contingency seepage interception systems.

Comment: there has been no assessment of hydrogeology in the vicinity of the wetlands, including those assessed as being of high value, and mitigations proposed are uncertain.

65. Further studies to improve characterisation of wetland-groundwater connectivity are proposed (refer to paragraph 44 in this Statement of Evidence) along with performance monitoring outlined in G.01.

Comment: There is minimal information relating to shallow hydrogeology at the site and limited assessment of seepage risk - those assessments are inappropriately proposed to be deferred to after mining commences.

66. Appendix A provides a quantitative assessment of seepage capture/bypass from the proposed MWSF seepage collection systems. Findings suggests proposed seepage collection systems will collect high proportions of seepage (i.e., 90% or higher) for the Shepherds ELF, TSF, Western ELF, and Srex ELF. Collection may not be as high for the Shepherds Creek Valley Fill, but performance monitoring and industry standard contingency measures are available to manage seepage of this feature.

67. Additional hydrogeological characterisation is proposed along with updates to conceptual models (refer to paragraph 49 in this Statement of Evidence).

68. In my opinion, with recommendations for forward works, any uncertainty in seepage containment can be managed appropriately through performance monitoring and contingency seepage interception systems.

Comment: It is likely that the impact on wetlands will be irreversible and result in their permanent loss.

69. In my opinion, based on available information, the proposed augmentation plan described in B.43 holds promise to mitigate potential wetland loss from pit dewatering associated drawdown.

70. However, I recommend further studies to improve characterisation of wetland-groundwater connectivity are completed (refer to paragraph 44 in this Statement of Evidence) along with performance monitoring outlined in G.01 the augmentation plan performs as expected.

Comment: There is a risk that dewatering will change groundwater levels and flow patterns such that contaminated groundwater will flow away from planned interception.

71. Dr Morgan's conceptualisation of the extent of drawdown from pit and underground dewatering (see paragraph 45 of her Statement of Evidence) is drawn from the example of Hope Downs described in Cook et al. (2017), where drawdown of 10's of meters was shown to extended kilometres away from the pit.

72. At Hope Downs, Cook et al., (2017) describe the main regional aquifer as the Wittenoom Formation, which is in direct hydraulic connection to the ore body mined, creating a significant 'high-yielding' aquifer. Indeed, an abstraction license was granted to abstract 100 ML/day, or >1,000 L/s to maintain the water table below the pit base with an arrangement of pumping wells as the Wittenoom Formation is known to be karstic (MWH, 2009)⁴.

73. The hydrogeological setting at Hope Downs differs significantly from that at BOGP. The BOGP pits and underground workings will dominantly intercept a relatively low permeability unweathered schist rock mass (Appendix A estimate unweathered schist have a permeability below 10^{-7} m/s)⁵. In these settings, it is typical for appreciable drawdown (i.e., 10's of meters) to be remain close to the pit wall or underground workings. Modelling results provided in B.03 support this interpretation, estimating only up to 10 L/s from groundwater inflows to RAS Pit.

⁴ Page 6.

⁵ Page 11

74. Thus, in my opinion, the risk that dewatering materially alters MWSF seepage collection is unlikely. In the event that it did and altered flow paths meant material seepage loads reported to pits and underground workings, dewatering and post-closure pit and underground water will be collected and managed, meaning that unacceptable migration of seepage off site would still be unlikely to occur.
75. To provide further confidence to decision makers, I recommend this risk be evaluated with a site wide 3D numerical groundwater flow model.

Comment: If unrecovered seepage of contaminants flow into Shepherds Creek and the Ardgour Aquifer, it is very likely to adversely impact groundwater users and the Lindis River.

76. This risk would only eventuate if MWSF seepage was not appropriately collected upstream of SC01 within the Shepherds Creek valley.
77. For MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this this Statement of Evidence for discussion on the effectiveness of proposed seepage collection systems and contingencies.
78. In my opinion, with the combination of the BOGP hydrogeological setting, proposed forward works, proposed seepage collection systems, performance monitoring, contingency measures available, the risk of unacceptable offsite MWSF seepage migration seepage is low.

Comment: Seepage through the base of the tailings storage facility, ELF's and waste rock stacks is likely, given that there are no liners proposed and the potential for contamination of shallow groundwater and spring-fed streams is high. Both seepage from the ELF's and water in the pit lakes are predicted to have higher contaminant concentrations that the water quality compliance limits for surface water and groundwater for a range of contaminants, including arsenic, iron and nitrate and, for some contaminants, will remain above those limits for over 100 years.

79. For MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this this Statement of Evidence for discussion on the effectiveness of proposed seepage collection systems and contingencies.

Comment: The potential for contamination of groundwater and surface water with contaminants such as arsenic, in a manner that is long-term and irreversible, is high.

80. For MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this this Statement of Evidence for discussion on the effectiveness of proposed seepage collection systems and contingencies.

81. In my opinion, with the combination of the BOGP hydrogeological setting, proposed forward works, proposed seepage collection systems, performance monitoring, contingency measures available, the risk of unacceptable offsite MWSF seepage migration seepage is low.

Comment: The potential for complete drainage and loss of high value wetlands is high.

82. See my response to similar comments in paragraphs 42 to 45 in this Statement of Evidence.

Comment: Inadequate information and uncertainty - For hydrology (including geochemistry) and terrestrial ecology matters, the inadequacies of information result in a cascade of uncertainties, where each uncertainty compounds in a snowball effect, resulting in the Panel being unable to properly quantify the Project's adverse impacts.

83. In my opinion:

- (a) With the combination of the BOGP hydrogeological setting, proposed forward works, proposed seepage collection systems, performance monitoring, contingency measures available, the risk of unacceptable offsite MWSF seepage migration seepage is low.
- (b) Any uncertainty in seepage containment can be managed appropriately through performance monitoring and contingency seepage interception systems.

84. For MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this this Statement of Evidence

EDS's Supporting Technical Reviews

Comment: In paragraph 26 of her statement of evidence, Dr Webster-Brown comments that the RAS and SRX pit lakes are connected to groundwater.

85. I do not disagree with this statement. However, the magnitude of groundwater loss from these pit lakes that is not collected for treatment is interpreted to be low. I provide examples below.

86. For both RAS and SRX pit lakes, the long-term hydrological condition will be a throughflow system, where upgradient groundwater enters the pit lake and groundwater outflow exits towards a downgradient lower hydraulic head. The fate and magnitude of groundwater loss are important for understanding contaminant loading risks.
87. Figure 1 presents a conceptual interpretation for the RAS Pit Lake. The flooded RAS Underground provides the downgradient lower hydraulic head of ~490 m RL, while the pit lake level will stabilise at around 495 m RL (MWM, 2026). The remainder of the pit perimeter is interpreted to have inward groundwater flow. Figure 10 of B.03 supports this interpretation with pre-mining groundwater levels well above 495 m RL near the RAS Pit. In conclusion, the risk of RAS Pit Lake water not being collected for treatment is low.
88. Figure 2 presents a conceptual interpretation for the SRX Pit Lake. Here, Rise and Shine Creek provides the downgradient lower hydraulic head of ~754 m RL, while the pit lake level will stabilise at around 755 m RL (MWM, 2026). Unlike the RAS Pit, the SRX Pit Lake will overflow with 755 m RL being the pit crest low point. Groundwater outflow from the SRX Pit Lake is estimated to be ~0.08 L/s⁶, which represents ~2% of the simulated 5th percentile SRX Pit Lake overflow (3.6 L/s). In conclusion, although groundwater leakage from the SRX Pit Lake may report untreated to Rise and Shine Creek, the quantum is this flow (and contaminant load) is estimated to be a very small proportion of the overall outflow from this pit lake.

⁶ Using Darcy's Law assuming flow through a vertical layered profile of alluvium ($K=1 \times 10^{-5}$ m/s, thickness [b] = 5 m based on nearby drillhole MDD327), weathered bedrock ($K=5 \times 10^{-6}$ m/s, b=5 m), and fresh bedrock ($K=5 \times 10^{-7}$ m/s, b=20 m): K (equivalent) = 3×10^{-6} m/s, hydraulic gradient=0.01, thickness (total)=30 m, width = 100 m.

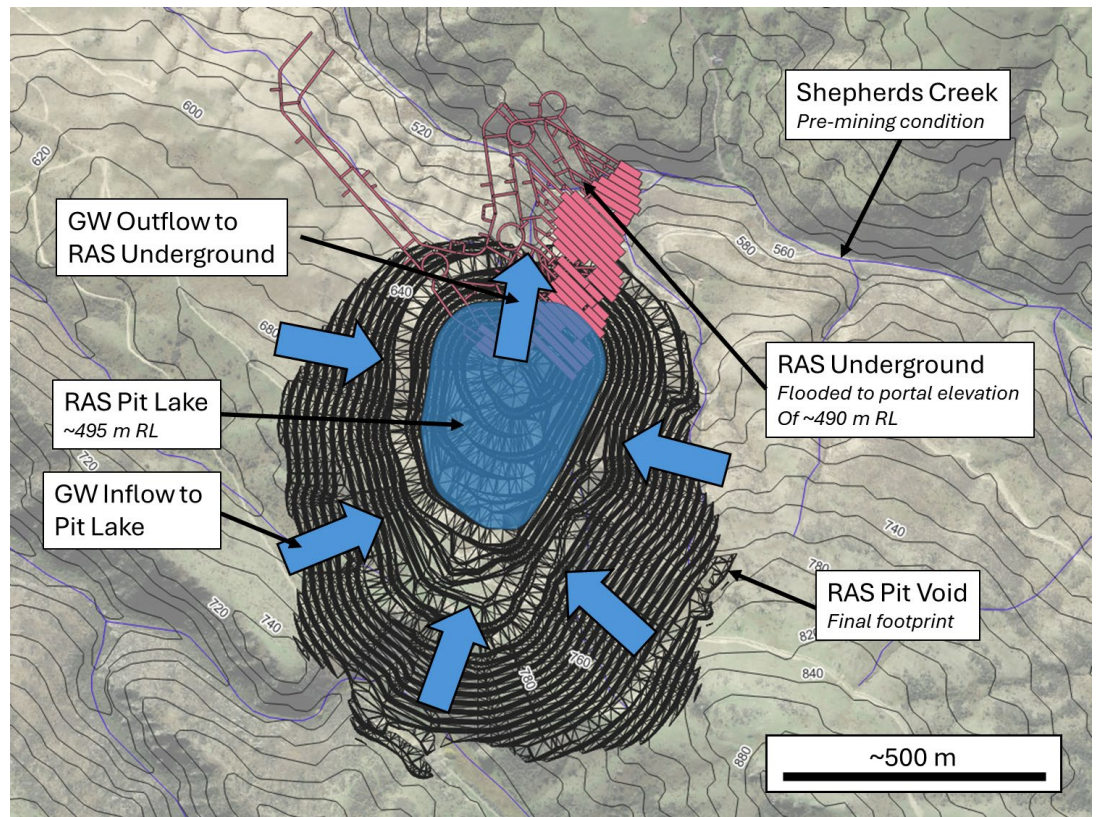


Figure 1: RAS Pit Lake conceptual groundwater model.

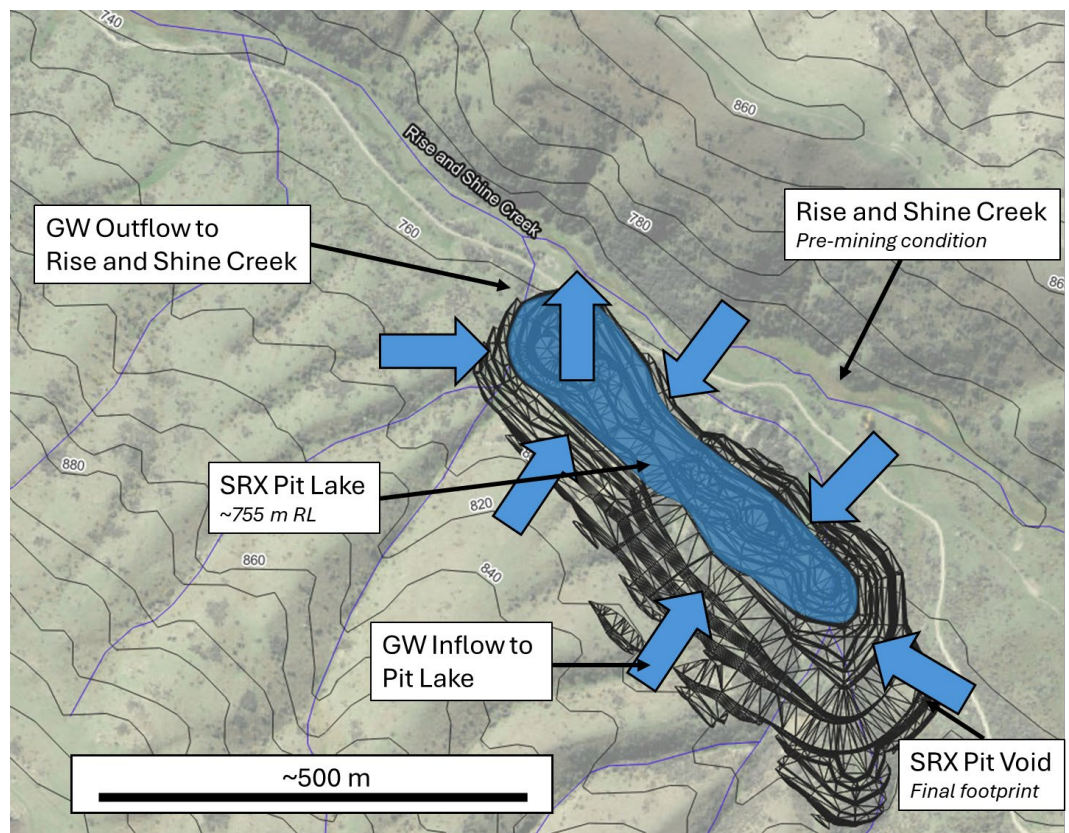


Figure 2: SRX Pit Lake conceptual groundwater model.

Fish and Game

Comment: There are uncertainties which compound the risks from those poorly derived limits, including missing compliance and performance monitoring sites, unvalidated modelling of contaminant movement through waterbodies, and assumptions about contaminant capture and treatment that are not borne out by other application materials.

89. In my opinion:

- (a) With the combination of the BOGP hydrogeological setting, proposed forward works, proposed seepage collection systems, performance monitoring, contingency measures available, the residual risk of unacceptable offsite MWSF seepage migration seepage is low.
- (b) Any uncertainty in seepage containment can be managed appropriately through performance monitoring and contingency seepage interception systems.

90. For MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this this Statement of Evidence.

Comment: RS03 monitoring site is positioned below the confluence with Clearwater Creek and does not allow for an understanding of surface water quality leaving the site via Rise and Shine Creek.

91. Refer to paragraph 21 as a proposed solution to the RS03 suitability question.

Comment: The applicant's understanding of the movement of water and contaminants through surface and groundwater systems is inadequate to predict potential effects.

92. In my opinion:

- (a) With the combination of the BOGP hydrogeological setting, proposed forward works, proposed seepage collection systems, performance monitoring, contingency measures available, the risk of unacceptable offsite MWSF seepage migration seepage is low.
- (b) Any uncertainty in seepage containment can be managed appropriately through performance monitoring and contingency seepage interception systems.

93. For MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this this Statement of Evidence.

Comment: The assessment assumes all seepage is captured and treated, which is unrealistic even when treatment systems are fully operational.

94. In my opinion:

- (a) With the combination of the BOGP hydrogeological setting, proposed forward works, proposed seepage collection systems, performance monitoring, contingency measures available, the risk of unacceptable offsite MWSF seepage migration seepage is low.
- (b) Any uncertainty in seepage containment can be managed appropriately through performance monitoring and contingency seepage interception systems.

95. For MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this this Statement of Evidence.

96. So, while it is impossible to collect 100% of seepage, the small portion that may bypass collection and contingency systems is unlikely to change the assessment findings made in Appendix K of B.06.

Comment: Not all seepage of mine impacted waters will be captured - some will enter the environment untreated.

97. In my opinion:

- (a) With the combination of the BOGP hydrogeological setting, proposed forward works, proposed seepage collection systems, performance monitoring, contingency measures available, the risk of unacceptable offsite MWSF seepage migration seepage is low.
- (b) Any uncertainty in seepage containment can be managed appropriately through performance monitoring and contingency seepage interception systems.

98. For MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this this Statement of Evidence.

99. So, while it is impossible to collect 100% of seepage, the small portion that may bypass collection and contingency systems is unlikely to change the assessment findings made in Appendix K of B.06.

Comment: Insufficient consideration has been given to how mass loads and pulses of contaminants in mine drainage will be affected by climate change projections, including predicted increases in rainfall intensity.

100. The closure water and load balance model used a stochastically generated daily rainfall and potential evapotranspiration (PET) timeseries over a 200-year period. Climate Change was applied as factors to rainfall and PET for the SSP2-4.5 projected for the 2028-2099 period, as described on page 31 of Appendix K of B.06. With this factor, daily rainfall was intensified in the modelling. This is a common approach applied to Water and Load Balance Models.

101. In my opinion, climate change has been adequately represented for the purposes of forecasting water quality with a Water and Load Balance Model.

Comment: MGL acknowledges that some seepage from the TSF and ELFs will bypass capture, but says that any seepage into the underlying groundwater will be minor. This assumes the applicant will be able to identify when an “inadequate” volume of seepage is being captured (triggering installation of a secondary system). MGL has not established what adequate or inadequate levels of capture are in this context.

102. For MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this this Statement of Evidence.

103. D.04 condition 30 is proposed to develop trigger levels at which implementation of contingency seepage interception systems may occur (it is noted other remedial actions may be more appropriate). I recommend triggers be a combination of measured solute concentration levels and qualitative trend analysis.

Comment: MGL has not assessed the effects on groundwater and downstream surface water of discharging the uncaptured and untreated portion of seepage, and places high reliance on water quality limits to mitigate adverse effects. There is insufficient information about ground conditions and groundwater movement, and over-reliance on modelling in the detailed design stage, which again defers a critical issue to the post-consent stage.

104. Appendix A provides a quantitative assessment of seepage capture/bypass from the proposed MWSF seepage collection systems. Findings suggests proposed seepage collection systems will collect high proportions of seepage (i.e., 90% or higher) for the Shepherds ELF, TSF, Western ELF, and Srex ELF. Collection may not be as high for the Shepherds Creek Valley Fill, but performance monitoring and industry standard contingency measures are available to manage seepage of this feature.

105. Additional hydrogeological characterisation is proposed along with updates to conceptual models (refer to paragraph 49 in this Statement of Evidence).
106. In my opinion, with recommendations for forward works, any uncertainty in seepage containment can be managed appropriately through performance monitoring and contingency seepage interception systems.

Comment: The information before the Panel does not establish that the condition requiring “no migration of untreated seepage beyond the boundary of the site” recommended by ORC’s Dr Greer is achievable or able to be effectively monitored and enforced.

107. The Water Management Plan (G.01) defines a carefully considered set of ground and surface water performance monitoring locations. They include locations immediately downstream and between contaminant sources and potential receptors. These will be able to effectively monitor for bypass of untreated seepage past seepage collection systems. Contingency measures have been identified (HGG, 2026) to improve seepage collection should they be required.
108. For further information on MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this Statement of Evidence for discussion on the effectiveness of proposed seepage collection systems and contingencies.

Comment: In a statement for the Environmental Defence Society, Dr Morgan raises concerns about the significant impacts of the BOGP on wetlands e.g., from the SREX pit and loss of wetlands from water table drawdown.

109. For wetland loss matters, refer to my response to similar comments in paragraphs 42 to 45 in this Statement of Evidence.

Sustainable Tarras

Comment: Project has high risks of groundwater contamination.

110. In my opinion, with the combination of the BOGP hydrogeological setting, proposed forward works, proposed seepage collection systems, performance monitoring and contingency measures available, the residual risk of unacceptable offsite MWSF seepage migration is low.
111. For further information on MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this Statement of Evidence for discussion on the effectiveness of proposed seepage collection systems and contingencies.

Sustainable Tarras's Supporting Technical Reviews

Comment: Dr Steven Emerman provides comment⁷ that the example mine sites (i.e., Faro Mine Complex, Myra Falls Mine, McArthur River Mine) provided in HGG (2026) of have a history of water contamination, suggesting that seepage control measures will not be effective.

112. I do not dispute contamination has occurred at the referenced mine sites. However, at the examples provided, seepage interception system (SIS) described in HGG (2026) were proposed and/or successfully installed and operated to remediate historic contamination. For example, the S-Wells SIS at the Faro Mine Complex, which included a shallow interceptor trench and deeper interception wells, was able to successfully intercept seepage from waste rock dump seepage, thereby improving downstream surface and groundwater quality.⁸ In my opinion, with the combination of the BOGP hydrogeological setting, proposed forward works, proposed seepage collection systems, performance monitoring and contingency measures available, the residual risk of unacceptable offsite MWSF seepage migration is low.

Owners and Occupiers of the Adjacent Land

Sharon Brodie

Comment: Ms Brodie also questions whether proposed clay and rock layers can reliably prevent leakage in schist, rocky, and silty soils, noting that water can move unpredictably through such geology.

113. At the BOGP, MWSFs will be placed within constrained valleys where groundwater flows from valley sides up into the valley bottom. Such hydrogeological settings act to concentrate seepage in the valley bottom creating favourable conditions seepage collection (HGG, 2026)⁹.

114. In my opinion, with the combination of the BOGP hydrogeological setting (constrained valleys), proposed forward works, proposed seepage collection systems, performance monitoring, contingency measures available, the risk of unacceptable offsite MWSF seepage migration seepage is low.

⁷ Expert statement #8 provided by Sustainable Tarras titled: Mine Waste Management at the Proposed Bendigo-Ophir Gold Project. Dated 23 March 2026.

⁸<https://emrlibrary.gov.yk.ca/aam/final-report-2012-2013-s-cluster-sis-performance-review.pdf>; see Figures 14 and 15.

⁹ Page 6.

115. For MWSF seepage bypass/collection matters refer to paragraphs 46 through 50 in this this Statement of Evidence for discussion on the effectiveness of proposed seepage collection systems and contingencies.

QWIL Investments (NZ Pty)

Comment: Requests conditions requiring: (i) Monitoring bores between the mine and vineyards, not solely on mine land....

116. The proposed groundwater monitoring locations (performance and compliance) are strategically located along potential groundwater pathways between potential contamination sources (e.g., mine waste storage facilities, MWSFs) and receptors (e.g., groundwater users), consistent with standard industry practise.
117. Upstream of the Bendigo Aquifer, there are a number of groundwater performance monitoring locations proposed, some close to MWSFs to provide early indication of potential issues, and some further down gradient to demonstrate potential effects at the site boundary. This data, alongside compliance monitoring data, will be included in MGL annual reports which will be publicly available.
118. Indeed, the Water Management Plan (G.01) proposes groundwater monitoring locations between potential contamination sources and downgradient users such as vineyards.

Professor Geoffrey Kearsley and Dr Claire Fletcher-Flinn

Comment: Concerns are expressed about longterm contamination of aquifers, Shepherds Creek, and the Lindis and Clutha Rivers - Citing mining evidence from comparable operations (e.g. Macraes) where groundwater leakage has persisted.... Climate change is expected to increase extreme rainfall, heightening contamination risk.

119. For MWSF seepage bypass/collection matters refer to my response to similar comments paragraphs 46 through 50 in this Statement of Evidence for discussion on the effectiveness of proposed seepage collection systems and contingencies.
120. For climate change matters refer to my response to similar comments paragraph 100.

Others

Central Otago Winegrowers Association

Comment: The drinking water standard for arsenic is 0.01 mg/L. The proposed groundwater compliance threshold is set at the maximum acceptable value — meaning any exceedance triggers action only after the drinking water standard has already been breached. There is no early-warning tier. WWLA recommends a two-step response procedure: a review level well below the maximum acceptable value, and a defined action level, with monitoring of upward trends as the primary alert mechanism.

121. D.04 condition 30 is proposed to develop trigger levels at which implementation of contingency seepage interception systems may occur (it is noted other remedial actions may be more appropriate). I recommend triggers be a combination of measured solute concentration levels and qualitative trend analysis. Arsenic is included in the proposed suite of solutes to monitor for in groundwater (see G.01).

Comment: Arsenic contaminated groundwater is already present at the site, and pit dewatering could mobilise it toward vineyard aquifers. While a closed loop system is proposed, the lack of a groundwater monitoring well at the base of Shepherds Creek means early detection and intervention for potential contamination are currently not ensured.

122. Groundwater monitoring is proposed at many locations along Shepherds Creek, including the 'base', see G.01. Proposed monitoring close to potential contamination sources (e.g., mine waste storage facilities) will allow for early detection and intervention (if required), as is leading practise.

Parliamentary Commissioner for the Environment

Comment: Concern is raised about the example of Macraes where seepage migration from the TSFs there has historically occurred.

123. The hydrogeological setting at BOGP is fundamentally different to Macraes and conditions are more favourable to high levels of seepage collection (see HGG, 2026). Coupled with the proposed primary seepage collection systems proposed, performance monitoring, and contingency options available, in my opinion the residual risk of offsite seepage migration is low.

124. For MWSF seepage bypass/collection matters refer to my response to similar comments paragraphs 46 through 50 in this Statement of Evidence for discussion on the effectiveness of proposed seepage collection systems and contingencies.

Crown Ministers

Minister for the Environment

Comment: The application does not address significant risks from natural hazards other than seismic hazards (eg, land instability), or the effects of climate change. As a result, the Panel has limited visibility of how non-seismic natural hazards and climate change could affect environmental outcomes and public safety, including tailings storage facility performance under extreme weather and long-term post closure risks. This constrains a forward-looking, risk-based approach to managing natural hazards, particularly given the long consent term sought and the permanent nature of many project components.

125. The Water and Load Balance Model (Appendix K of B.06) which estimates instream water quality as a result of the project includes representation of climate change.

126. For climate change matters refer to my response to similar comments paragraph 100.

127. Natural hazards are outside my area of practise and are covered by the evidence provided by other experts.



Ryan Oliver Burgess

17 April 2026

REFERENCES

- Cook P., Dogramaci S., McCallum J., and Headley J., 2017. Groundwater age, mixing and flow rates in the vicinity of large open pit mines, Pilbara region, northwestern Australia, *Hydrogeology Journal* 25, 39–53.
- e3 [Environmental], 2026. Technical Review: BOGP FTA Surface water modelling, Groundwater & Geochemistry. Ref 25080A3.0. Dated 20 March 2026.
- Goodman, R., Moye, D., Schalkwyk, A., and Javendel, I., 1965. Ground-water inflow during tunnel driving. *Eng. Geol.* 2 (2), 39–56.
- HGG, 2026. BOGP MWSF Seepage Risk Assessment. J-H-NZ0238-003-M-Rev0.
- Moon, J. and Fernandez, G, 2009. Effect of Excavation-Induced Groundwater Level Drawdown on Tunnel Inflow in a Jointed Rock Mass. *Engineering Geology.* (110) 33-42.
- MWH, 2009. Hope Downs 4 Hydrogeology Part of the Hope Downs 4, 5 and 6 BFS.
- Torlesse [Environmental], 2026. Matakanui Gold Limited (the applicant) substantive fast-track approval application for the Bendigo-Ophir Gold Project: Update to technical review on freshwater matters. Dated 16 March 2026.

APPENDIX A: Mine Waste Storage Facility Seepage Assessment

Bendigo-Ophir Gold Project

Mine Waste Storage Facility Seepage Assessment

17 April 2026

J-H-NZ0243-001-R-Rev0

Bendigo-Ophir Gold Project
Mine Waste Storage Facility Seepage Assessment

Document Number: J-H-NZ0243-001-R-Rev0

Document Date: 17 April 2026

Prepared for:

Matakanui Gold Limited

15a Chardonnay Street, Cromwell, 9310

Prepared by:

Hydro Geochem Group Limited

5 Sir William Pickering Drive, Burnside, Christchurch 8053 New Zealand

+64 3 242 0221

www.hydrogeochem.com.au

REVISION	DATE	AUTHOR	RECORD OF REVIEW
RevA	16/4/2026	LM	RB
Rev0	17/4/2026	RB	RB

EXECUTIVE SUMMARY

This report describes the seepage assessment undertaken for the Mine Waste Storage Facilities (MWSFs) proposed for the Bendigo-Ophir Gold Project (BOGP), to support consenting of the project through the Fast-track Approvals Act.

Objectives

Objectives of this assessment were to:

- Estimate the proportion of potential seepage bypass from each BOGP MWSF.
- Assess factors that control bypass proportion.
- Make recommendations for forward works to resolve any knowledge gaps important for estimating seepage bypass.

Modelling Approach

Assessment of seepage collection was completed for the following MWSFs:

- Shepherds Engineered Landform (ELF)
- Western ELF
- Srex ELF
- Tailings Storage Facility (TSF)
- Shepherds Creek Valley Fill, including the Run of Mine (ROM) Pad and Process Plant area.

Modelling was undertaken with GeoStudio 2024 version 2024.2.0.298, using the SEEP/w package. 2D were developed for a cross-sectional model through each of the MWSFs, typically through the centre line, and simulating material properties and boundary conditions.

Hydrostratigraphic units were modelled using hydraulic properties based on in-situ testing where data was available or based on best estimates from comparison of material (e.g., silt, sand, gravel) to literature values.

A Base Case scenario was developed for each MWSF model, representing the best estimate of model parameters. Scenarios were then developed to analyse model sensitivities, focussing on material property uncertainty and seepage system element performance (e.g., drain failure).

The TSF and Shepherds Creek Valley Fill were not explicitly simulated with 2D models. Rather, the potential for bypass was assess conceptually.

Assessment Findings

Conclusions on seepage collection for the BOGP MWSFs are as follows:

Shepherds ELF

- 2D Model results suggest high levels of seepage collection (~90% or higher) may occur under normal operating conditions. As intended, the low hydraulic conductivity (K) toe bund effectively restricts shallow groundwater flow such that it builds up and is collected in the underdrainage system.
- A grout curtain did not materially change the simulated proportion of seepage collected.
- Basal drain failure may decrease the proportion of seepage collected to ~20% if emerging at the toe bund surface was collected. It is noted drain failure would likely occur many years post-closure where the ELF and TSF contaminant loads will have naturally decayed to a certain degree.

Model results were sensitive to the depth of the toe bund to cut off seepage pathways. For example, if the toe bund only extended 50% of the weathered bedrock thickness, the simulated proportion of seepage collected decreased to ~25%, highlighting the importance of installing the bund to an appropriate depth. Understating the depth of the transition from higher K weathered bedrock to lower K fresh bedrock is crucial.

Western ELF

- Model results suggest high levels of seepage collection (~90% or higher) may occur under normal operating conditions. Like with the Shepherds ELF, the low K toe bund effectively restricts shallow groundwater flow such that it builds up and is collected in the underdrainage system.
- The proportion of seepage collected may be higher than the Shepherds ELF due to the steeper grade of the valley floor (and inferred steeper hydraulic gradient) that would underlie the Western ELF.
- A grout curtain did not materially change the simulated proportion of seepage collected.
- Basal drain failure did not materially change the simulated proportion of seepage collected, again due to the steeper grade of the valley floor.
- Model results were sensitive to the depth of the toe bund to cut off seepage pathways. For example, if the toe bund only extended 50% of the weathered bedrock thickness, the simulated proportion of seepage collected decreased to ~25%, highlighting the importance of installing the bund to an appropriate depth. Understating the depth of the transition from higher K weathered bedrock to lower K fresh bedrock is crucial.

Srex ELF

Seepage collection was very sensitive to the depth to the water table relative to the drain depth as one would expect.

- Where the water table was sufficiently intercepted, very high level of seepage collection were simulated for the perimeter drain. Conversely, where the water table was either insufficiently intercepted or not at all, moderate to low levels of seepage recovery were simulated.
- Detailed characterisation of the depth to water table along the perimeter drain alignment will be important ensuring the drain design achieve high levels of seepage collection.

TSF

Although not explicitly simulated with 2D models, based on conceptual understanding of the BOGP hydrogeological setting, any bypass of TSF seepage collection systems would naturally report to the Shepherds ELF toe, to be collected along with ELF seepage at the toe bund. As such, an overall high degree of seepage collection simulated for the Shepherds ELF is relevant for the TSF.

Shepherds Creek Valley Fill

Based on available data, the hydrogeological setting proposed for the Shepherds Creek Valley Fill may not achieve high level of seepage collection. However, proposed performance monitoring (MGL, 2025) will allow for assessment of seepage bypass portions. If it is the case that bypass proportions pose a risk to the downgradient receptors, contingency seepage interceptions systems (e.g., interceptor wells) can be installed to increase seepage capture portions to satisfactory levels.

Recommendations

The following recommendations are made to close identified knowledge gaps and support detailed design of seepage collection systems:

- Complete hydrogeological investigations in the vicinity of each MWS to confirm:
 - Shallow groundwater levels.
 - Thicknesses of each hydrostratigraphic units (HSU).
 - Hydraulic properties (e.g., K), particularly for (i) alluvium (no site specific data exists) and (ii) the depth at which K of weathered bedrock decreases to that of fresh bedrock to inform toe berm depth requirements.
- Complete 3D groundwater modelling of seepage collections systems to confirm complex valley geometry absent from 2D models does not materially influence simulated seepage collection. In addition, such a model could account for potential changes to the groundwater flow regime from dewatering activities. It would also allow the representation of contingency seepage interception systems (SIS) components such as interception wells (e.g., for the Shepherds Creek Valley Fill) to test the efficacy.

TABLE OF CONTENTS

1	Introduction	8
1.1	Background.....	8
1.2	Objectives and Scope.....	8
1.2.1	Objectives.....	8
1.2.2	Scope	9
2	Environmental Setting.....	10
2.1	Topography and Drainage	10
2.2	Hydrogeology.....	10
2.3	Groundwater Flow Regime.....	11
3	Proposed Seepage Collection Systems	13
3.1.1	Shepherds ELF.....	14
3.1.2	Shepherds TSF	14
3.1.3	Western ELF.....	14
3.1.4	Srex ELF.....	14
3.1.5	Shepherds Valley Fill.....	14
3.1.6	Performance monitoring and Contingency Options	15
4	Conceptual Model	16
5	Numerical Model Build	18
5.1	Modelling Approach	18
5.2	Mesh	18
5.3	Geometry and Materials	18
5.4	Boundary Conditions	19
5.5	Scenarios.....	20
6	Model Results	22
6.1	Shepherds ELF.....	22
6.2	Western ELF.....	23
6.3	Srex ELF.....	24
7	Model Limitations.....	28
8	Conclusions	29
9	Recommendations.....	31
10	References	32
11	Limitations	33
Appendix A	Model Setup.....	34
Appendix B	Limitations.....	35

LIST OF TABLES

Table 1: HSU details.	10
Table 2: MWSF primary seepage collection system elements.	13
Table 3: Lithological unit thicknesses.	19
Table 4: Material properties.	19
Table 5: Model boundary conditions.	20
Table 6: Sensitivity scenarios.	21
Table 7: Model results – Shepherds ELF.	25
Table 8: Model results – Western ELF.	26
Table 9: Model results - Srex ELF.	27

LIST OF FIGURES

Figure 1: Site overview.	9
Figure 2: Hydraulic conductivity estimates compared with test depth.	11

1 INTRODUCTION

Hydro Geochem Group Limited (HGG) has developed this report detailing the seepage assessment undertaken for the Mine Waste Storage Facilities (MWSFs) proposed for the Bendigo-Ophir Gold Project (BOGP). This report was completed in accordance with the proposal J-H-NZ0243-001-P-Rev0, dated 18 February 2026.

1.1 Background

Matakanui Gold Limited are currently in the process of consenting the proposed BOGP through the Fast-track Approvals Act (FTAA). The Project will involve both opencast and underground mining methods, with waste rock materials to be stored in several purpose built MWSFs. MWSFs include a Tailings Storage Facility (TSF) numerous Engineered Landforms (ELFs), and a valley fill MWSF. The MWSFs proposed for the site are listed below and indicated on Figure 1.

- Shepherd TSF: Storage of tailings and located immediately upstream of the Shepherds ELF.
- Shepherds ELF: Located immediately downstream of the Shepherds TSF.
- Western ELF: Located adjacent to the Rise and Shine (RAS) Pit within an unnamed tributary to Clearwater Creek.
- Srex ELF: Located near the top of the RAS Creek catchment adjacent to the Srex Pit.
- Shepherds Valley Fill: A portion of Shepherds Creek will be infilled with waste rock and the existing creek diverted around the MWSF. This includes the Process Plant, and Run of Mine (ROM) Pad.

Each MWSF will have a seepage collection system to collect seepage for management of mine impacted water. Seepage collection systems vary for each MWSF and include basal drains, toe drains, toe bunds, and collection sumps.

1.2 Objectives and Scope

1.2.1 Objectives

Conceptually, the placement of MWSFs within topographical depressions facilitates high levels of seepage capture within the proposed seepage collection systems, and minimal bypass/release to the environment via the groundwater system (HGG, 2026). However, the proportion of seepage capture/bypass has yet to be quantified. This report presents the assessment aimed at quantifying seepage bypass capture/bypass proportions for the MWSFs.

Objectives of the project are to:

- Estimate the proportion of potential seepage bypass from each BOGP MWSF.
- Assess factors that control bypass proportion.
- Make recommendations for forward works to resolve any knowledge gaps important for estimating seepage bypass.

1.2.2 Scope

2D numerical modelling focuses on the Shepherds ELF, Western ELF and Srex ELF. Assessment of seepage collection for the TSF and Shepherds Valley Fill were assessed conceptually (see Section 5 for justification).

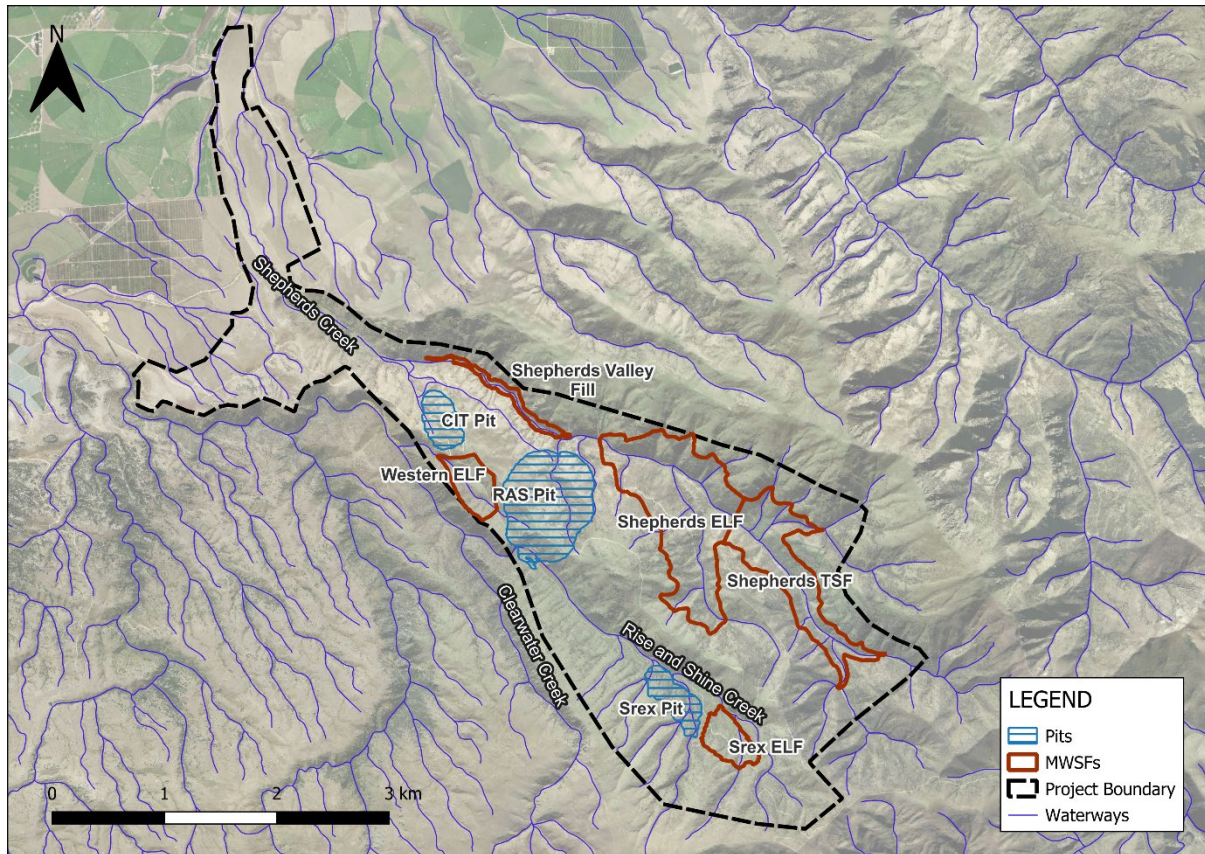


Figure 1: Site overview.

2 ENVIRONMENTAL SETTING

2.1 Topography and Drainage

The BOGP is situated within the Shepherds and Clearwater Creek catchments of the Dunstan Mountains. The valley bottom creek channels are deeply incised into the schist bedrock terrain. Both creeks drain to the Clutha River system. All MWSFs are positioned within the creek catchments.

2.2 Hydrogeology

Three main hydrostratigraphic units (HSU) are present at the BOGP:

- Valley bottom alluvium.
- Weathered bedrock.
- Fresh bedrock.

HSU details are summarised in Table 1 including hydraulic conductivity (K) estimates derived from on-site testing.

Table 1: HSU details.

UNIT	DESCRIPTION ^b	PERMEABILITY	THICKNESS ^b AND DISTRIBUTION
Valley bottom alluvium	Typically unconsolidated, variable weathered gravels with interbeds of sands, silts and clays. This unit was generally observed in the site-specific geotechnical investigations as being located in the valley floor and comprising clays, silts, sands and gravels derived from parent materials upstream of the deposition location.	Primary porosity (pore space). Range between 10^{-6} to 10^{-5} m/s based on material description ^a .	Typically <5 m depth. Constrained to valley bottom floor.
Weathered bedrock	Underlies alluvium where present. Weathering profile of schist bedrock. Locally weathered to a silty gravel, consisting of fines from weathered micas with more competent schist blocks from less micaceous zones of the original rock.	Primary (where extensively weathered) and secondary porosity (fracture flow). Geometric mean of site-specific testing (n=7): 5×10^{-6} m/s ^b	Varies by landscape position. Thinnest in valley floors (2-10 m), thickest on valley flanks (up to 20 m thick). Project wide.
Fresh bedrock	Underlies weathered bedrock. Permian to Triassic era undifferentiated pelitic and psammitic schist and greenschist sequences.	Secondary porosity (fracture flow). Geometric mean of site-specific testing (n=29): 10^{-7} m/s ^{b,c} Permeability reduces with depth.	>100 m thick. Project wide.

Sources:

- Freeze and Cherry (1979).*
- EGL (2025a).*
- KSL (2025).*

Hydraulic conductivity estimates (indicated in Table 1) from on-site testing in weathered and fresh bedrock (TZ3 and TZ4 Schist) were derived from packer test data (KSL, 2025; EGL, 2025a). Falling head tests were undertaken as an alternative test method in shallow weathered bedrock zones where geological conditions were not favourable for packer testing (EGL, 2025a). Hydraulic conductivity estimates compared to depth of the test zone are shown in Figure 2. The available data suggests:

- Falling head tests in weathered bedrock were higher K on average (geometric mean of 5×10^{-6} m/s).
- A general decrease in K with depth, with results variable above approximately 60 m below ground level (m bgl). Above 60 m bgl, the geometric mean of fresh bedrock was 2×10^{-7} m/s.
- Below approximately 60 m bgl, K is noted to decrease below 10^{-7} m/s.

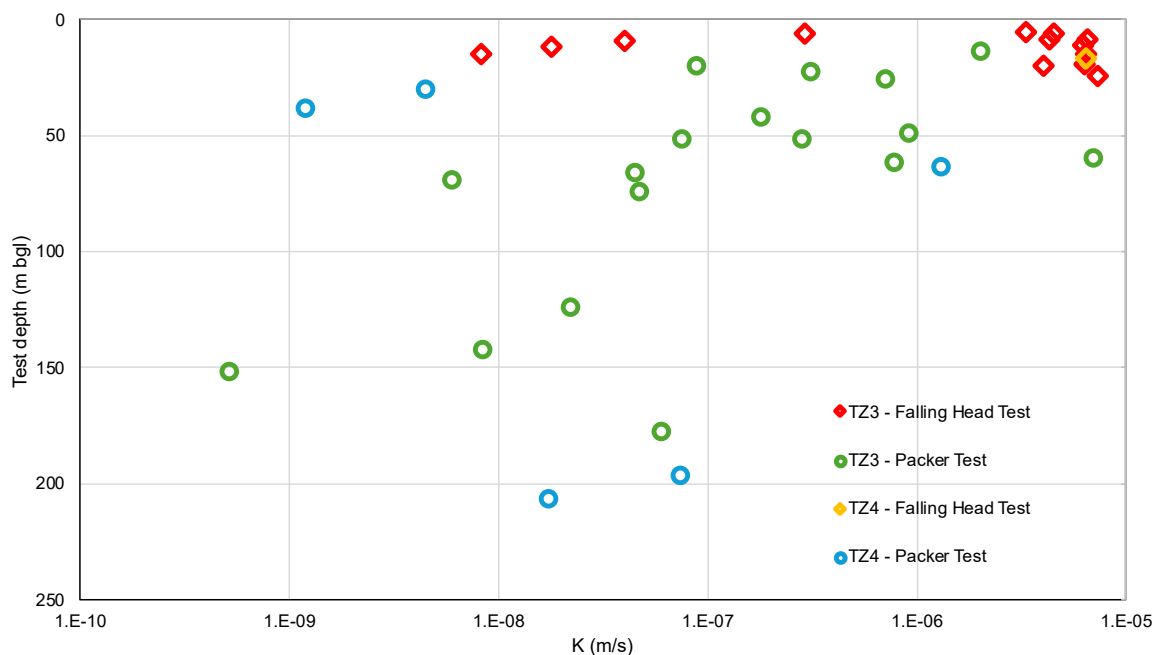


Figure 2: Hydraulic conductivity estimates compared with test depth.

Data source: KSL (2025) and EGL (2025a).

2.3 Groundwater Flow Regime

Based on available data reported in KSL (2025) and EGL (2025a), the following observations are made, typical of valley settings:

- Groundwater levels are deepest on the valley flanks (approximately 25 m below ground level[bgl]) and shallowest in the valley bottoms (<2 m bgl). At the valley bottom near the Shepherds Creek Valley fill available data indicates a deeper groundwater level, typically over 3 m bgl.
- Lateral hydraulic gradients in fresh bedrock are relatively steep, ranging between 0.2 and 0.5 m/m. This suggests a relatively low hydraulic conductivity setting.
- Vertical hydraulic gradients are typically downwards on the valley flanks indicating downwards flow. At the valley bottoms, strong vertical upwards gradients are typically observed, which would act to promote seepage collection.

Based on these observations, it can be interpreted that at the BOGP, pre-mining groundwater generally flows from topographic highs (e.g., valley flanks) to topographic lows (e.g., local creeks); termed topographically driven flow. During mining and post-closure, pit and underground dewatering may alter

this flow pattern locally, but at the scale of the BOGP, topographically driven flow will remain the dominant condition.

3 PROPOSED SEEPAGE COLLECTION SYSTEMS

Seepage collection systems are included in the designs of the MWSFs to manage seepage. Table 2 summarises the elements of these systems with further details provided in the following subsections. Further details and engineering schematics can be found in EGL, 2025b and 2025c.

Table 2: MWSF primary seepage collection system elements.

MWSF	MAX FOOTPRINT (ha)	PRIMARY SEEPAGE COLLECTION SYSTEM
Shepherds ELF	111	<ul style="list-style-type: none"> • Toe underdrainage system. • Low permeability toe bund (termed Zone A by EGL). • Seepage collection sump.
TSF	61	<ul style="list-style-type: none"> • Tailings Underdrainage. • Embankment Chimney drain. • Upstream Cutoff drain. • Low permeability core (termed Zone A by EGL). • Collected water piped to Shepherds ELF seepage collection sump.
Shepherds Valley Fill	11	Subsurface drains collect seepage at Run of Mine Pad and Process Plant. Water conveyed to collection point for management.
Western ELF	17	<ul style="list-style-type: none"> • Underdrainage system. • Collection sump.
SREX ELF	16	Seepage collection at toe of ELF via perimeter drain cut to rock to be directed to collection point management.

3.1.1 *Shepherds ELF*

From an offsite seepage migration potential risk, the Shepherds ELF seepage collection sump is the most important collection system given it is down valley of the largest MWSFs at the BOGP (Shepherds ELF and TSF) which will contribute the highest load for most potential constituents of concern (MWM, 2025a). The combination of the low permeability toe bund and underdrain are anticipated to collect the majority of seepage.

Shepherds ELF has a design height of approximately 200 m. The ELF will have basal drains directing water to the toe of the ELF and into a collection sump within an engineered toe bund. The foundation for the bund will be prepared by excavating down into the weathered bedrock until competent rock is reached. For the purpose of the modelling, this depth is assumed to be the base of weathering.

3.1.2 *Shepherds TSF*

The Shepherds TSF will be placed immediately against the upstream shoulder of the ELF and will have its own seepage collection system. Any seepage bypassing the TSF seepage collection system will migrate along the Shepherds Valley bottom towards the Shepherds ELF seepage collection system.

For the purposes of the modelling for the Shepherds ELF, shallow groundwater flowing beneath the upstream boundary of the ELF (encompassing water within the alluvium and weathered bedrock) is assumed to be contaminated, thereby representing potential bypass of TSF seepage collection systems.

3.1.3 *Western ELF*

The Western ELF has a design height of approximately 85 m. The ELF has a similar design philosophy to the Shepherds ELF and will include a basal drain with a collection sump within an engineered toe bund. Similarly to the Shepherds ELF, for the purpose of the modelling, the depth of the toe bund is assumed to be at the base of weathering in bedrock.

3.1.4 *Srex ELF*

The Srex ELF has a design height of approximately 45 m and is proposed to be placed on the southern slope of the RAS Creek valley. As indicated in Table 2, seepage will be collected at the toe of the ELF via a perimeter drain. For the purpose of the modelling, a perimeter drain of 3 m depth and 3 m width is assumed (i.e., thickness of adopted depth to weathered bedrock, see Section 5.3).

At the ELF's lowest point, it is at a similar elevation to the adjacent creek and therefore a 3 m deep sump would likely be below the groundwater elevation. This would result in the sump becoming a hydraulic sink preventing bypass of water to the groundwater system. Provided that the majority of the ELF will be at higher elevations, a lower groundwater level is assumed to prevent the groundwater sink from occurring in the model and allowing estimation of bypass.

3.1.5 *Shepherds Valley Fill*

MGL currently propose to include subsurface drains at the ROM Pad and the Processing Plant to collect seepage, with water conveyed to a collection point for management.

3.1.6 *Performance monitoring and Contingency Options*

Performance monitoring is proposed to monitor for potential bypass of seepage collection systems (MGL. 2025). If an unacceptable level of bypass does occur, contingency seepage interception systems (SIS) can be employed increase seepage collection. Further details are provided by HGG (2026).

4 CONCEPTUAL MODEL

The conceptual model forms the basis of the numerical model build. The environmental setting describes the existing hydrogeological conditions of the site, whilst the conceptual model below describes how the MWSFs will interact with the groundwater system, particularly focusing on seepage management. This is described below for each MWSF:

- Recharge within ELF is driven by net percolation rates equal to 50% of average annual rainfall for an unrehabilitated ELF. Upon installation of proposed cover systems (rehabilitated), net percolation is estimated to reduce to 20% (MWM, 2025b).
- The conceptual model for the Shepherds and Western ELFs (bund-underdrain seepage collection system) is as follows:
 - Seepage migrates to the base of ELFs and is collected in the basal drain. Some seepage may enter alluvium or underlying weathered bedrock and migrate down valley. The majority of the seepage is expected to flow through the alluvium and weathered bedrock given the higher hydraulic conductivity. Water flowing through these shallow HSUs is anticipated to be a mixture of ELF seepage and natural groundwater flow.
 - Seepage flowing through shallow HSUs will primarily migrate into the basal drainage system near the toe of the ELF as the toe bund will provide a low permeability barrier resulting in upward flow into basal drain.
 - Some seepage may flow through the toe bund or through the foundation comprising competent (unweathered) bedrock, however is expected to be a small proportion of total seepage.
- The conceptual model for the TSF is as follows:
 - Seepage is collected in the multiple drainage elements, which is piped to the Shepherds ELF seepage collection sump.
 - Some seepage may flow through the foundation comprising competent (unweathered) bedrock, where it then flows along the Shepherds Creek valley bottom shallow HSU (overlain by the Shepherds ELF), where it then would become part of the Shepherds ELF seepage.
- The conceptual model for the Srex ELF (perimeter drain seepage collection system) is as follows:
 - Depth to groundwater table increases with elevation up the valley slope. Near the valley bottom, the groundwater table likely intercepts alluvium and weathered bedrock HSUs.
 - The majority of seepage migrates through base of ELF and toward valley bottom via alluvium and weathered bedrock HSUs. Seepage is expected to be intercepted by the perimeter drain at the base of the ELF.
 - Some seepage may flow beneath the perimeter drain via the weathered bedrock (or alluvium depending on depth of the drain), and discharge to Rise and Shine Creek.

- The low point of the ELF is near the creek elevation, and installation of a perimeter drain below the creek elevation is likely to become a groundwater sink and prevent seepage migrating beyond that location. This would also draw in groundwater from the alluvium HSU on the creek side.
- The conceptual model for the Shepherds Valley Fill (subsurface drainage system) is as follows:
 - Alluvium is relatively thick (>5 m) compared to upstream locations whilst weathered bedrock is approximately 5 m thick. Groundwater levels are also relatively deep (>3 m bgl), typically near the base of the alluvium.
 - Some seepage may migrate along the pre-mining ground surface in the valley bottom and collected with the planned subsurface drainage system.
 - Some seepage may migrate deeper into the shallow groundwater system given the interpreted deeper water table.

5 NUMERICAL MODEL BUILD

Numerical models were developed for Shepherds ELF, Western ELF, and Srex ELF to evaluate the potential for seepage bypass. The potential for seepage bypass to migrate past TSF collection systems was accounted for in the Shepherds ELF.

A numerical model for Shepherds Valley Fill seepage collection was not developed since the planned system will be above the interpreted water table. Performance monitoring and contingency SIS can monitor and manage this potential pathway. Contingency SIS, such as an interception well(s) cannot be well represented in a 2D model; 3D models are required. Recommendations for assessment of this mine domain at made in Section 9.

5.1 Modelling Approach

Modelling was undertaken with GeoStudio 2024 version 2024.2.0.298, using the SEEP/w package. SEEP/w is a finite element modelling module used to simulate groundwater flow and pore-water pressure conditions in porous media, solving the governing equations for fluid flow (Darcy, 1856) under both saturated and unsaturated conditions. The software facilitates 2D flow modelling, which was utilised by building a cross-sectional model through each of the MWSFs, typically through the centre line, and simulating material properties and boundary conditions.

Details regarding model construction are included in the following sections. Each model is illustrated in Appendix A.

5.2 Mesh

SEEP/w is a finite element model and requires definition of a mesh grid to define the location of model nodes. The mesh grid was defined using a global element size of 2 m, with refinements down to a minimum 0.5 m in areas of interest. These areas include anticipated preferential flow such as the alluvium and weathered bedrock units, and within the vicinity of drainage features.

5.3 Geometry and Materials

Model geometry was defined using a cross-sectional area through the centre of each MWSF, aligning with the general direction of water flow. A geometric region was defined for each of the following materials:

- ELF bulk fill
- Alluvium
- Weathered bedrock
- Fresh bedrock
- Toe bund

HSU thicknesses were based on available geological information (e.g., borehole logs and test pits). Geological information in the vicinity of each MWSF was reviewed individually, and therefore geological thicknesses of lithological units differ between MWSF models. The base of the model was set to 50 m below the base of weathering to avoid any boundary effects. The thickness of each lithological unit between models is indicated in Table 3.

Table 3: Lithological unit thicknesses.

	ALLUVIUM	WEATHERED BEDROCK	FRESH BEDROCK
SHEPHERDS ELF	2	10	50
WESTERN ELF	2	10	50
SREX ELF	3	5	50

Material properties were assigned for each of the materials listed above. The properties include saturated hydraulic conductivity, anisotropy, and functions to estimate volumetric water content and unsaturated hydraulic conductivity.

Material properties utilised for the Base Case model are provided in Table 4.

Table 4: Material properties.

MATERIAL	SATURATED HYDRAULIC CONDUCTIVITY (Kx)	ANISOTROPY (Ky/Kx RATIO)	COMMENT
ELF Bulk Fill	1×10^{-5} m/s	1	Saturated Kx based on best estimate.
Alluvium	1×10^{-5} m/s	1	Saturated Kx based on best estimate considering test pit logs (EGL, 2025a) and K ranges provided in Freeze and Cherry (1979).
Weathered Bedrock	5×10^{-6} m/s	1	Saturated Kx based on falling head test results (EGL, 2025a).
Fresh Bedrock	2×10^{-7} m/s	1	Saturated Kx based on packer test results (EGL, 2025a).
ELF Toe Bund	1×10^{-7} m/s	1	Saturated Kx based on Zone A design specification (EGL, 2025b).

5.4 Boundary Conditions

Boundary conditions were defined within the model to simulate water sources (recharge, groundwater inflow) and water sinks (drains). Boundary conditions are detailed in Table 5.

Table 5: Model boundary conditions.

BOUNDARY CONDITION	TYPE	VALUE	COMMENT
Recharge / Net Percolation	Water flux	225 mm/year (50% of average annual rainfall)	Simulate recharge to MWSF using a net percolation of 50% average annual rainfall. This assumes the MWSF is unrehabilitated.
Upstream groundwater level	Constant water head	Variable between models	Boundary condition assumed to be at or near ground level for models within the valley bottom. For Srex ELF, the cross section extends up the valley slope where groundwater depths (below ground level) are known to be lower. Therefore, 25 m below ground level is assumed for the Srex ELF model.
Downstream groundwater level	Constant water head	Variable between models/	Boundary condition assumed to be at or near ground level.
Seepage face	Water rate (with potential seepage face review)	0 m ³ /s	Used to remove water from the model where it intercepts a seepage face and basal and perimeter drainage features.

5.5 Scenarios

A base case scenario was developed for each individual MWSF seepage model, representing the anticipated on-site conditions. Adopted material properties are provided in Table 4. The following assumptions are made for the Base Case models:

- Saturated hydraulic conductivity values based on field testing or best estimates where data is unavailable.
- Isotropic conditions (i.e., hydraulic conductivity for each material property is identical in all directions).
- Net percolation of 50%, representing an unrehabilitated surface.
- Best estimate of groundwater levels.

Sensitivity scenarios are summarised in Table 6. The scenarios assessed:

- Uncertainty in material properties such as hydraulic conductivity and anisotropy (#1 to #4 and #6 to #10).
- The effect of a lower net percolation rate following rehabilitation (#5).
- Installation of a grout curtain at the upstream face of the toe bund where applicable (#11).
- Failure of the basal drainage system under post-closure conditions (#12).
- Repercussions of only installing the toe bund to 50% of the Weathered Bedrock HSU thickness (#13).

Table 6: Sensitivity scenarios.

SCENARIO #	DESCRIPTION	VALUE	BASE CASE VALUE	RATIONALE
1	Alluvium – higher K	1x10 ⁻⁴ m/s	1x10 ⁻⁵ m/s	Uncertainty around alluvial K (unmeasured). Conceptually a preferential pathway.
2	Alluvium – lower K	1x10 ⁻⁶ m/s	1x10 ⁻⁵ m/s	Uncertainty around alluvial K (unmeasured). Conceptually a preferential pathway.
3	Weathered bedrock – higher K	5x10 ⁻⁵ m/s	5x10 ⁻⁶ m/s	Uncertainty around K value. Conceptually a preferential pathway.
4	Weathered bedrock – lower K	5x10 ⁻⁷ m/s	5x10 ⁻⁶ m/s	Uncertainty around K value. Conceptually a preferential pathway.
5	Lower NP (rehabilitated)	20%	50%	50% represents worst case scenario (unrehabilitated ELF). 20% is expected closure NP.
6	ELF anisotropy	ky/kx = 0.1. 20 deg dip angle	ky/kx = 1	Test effect of anisotropy on the model.
7	Alluvium anisotropy	ky/kx = 0.1	ky/kx = 1	Anisotropy can alter seepage collection.
8	Weathered bedrock anisotropy	ky/kx = 0.1	ky/kx = 1	Anisotropy can alter seepage collection.
9	Fresh bedrock – higher K	5x10 ⁻⁷ m/s	2x10 ⁻⁷ m/s	Fresh Bedrock K may alter amount of seepage reporting to drain (greater potential for bypass).
10	Fresh bedrock – lower K	5x10 ⁻⁸ m/s	2x10 ⁻⁷ m/s	Fresh Bedrock K may alter amount of seepage reporting to drain (greater potential for bypass).
11	Grout curtain beneath toe bund ^{1,2}	1x10 ⁻⁹ m/s	-	Test efficacy of grout curtain to improve Base Case seepage collection.
12	Basal drain failure ¹	-	Basal drain active	Test impact of basal drain failure on water capture / bypass rates.
13	Shallow toe bund ¹	5 m above base of weathering	Installed at base of weathering (10 m thick.)	Test impact of toe bund installed 5 m above base of weathering instead of at base of weathering.

Note: ¹Scenario applies to Shepherds ELF and Western ELF only.

²Basal drain failure scenario uses 20% net percolation rate, as it is assumed to occur post-closure (after rehabilitation). Drain failure occurring during operations could be remediated.

6 MODEL RESULTS

Within the models, water bypassing the seepage collection includes a mixture of contaminated water (from ELF seepage and shallow groundwater) and clean groundwater from deeper down in the fresh bedrock. Therefore, bypass proportions were estimated by first calculating the proportion of water from net percolation and shallow groundwater (from alluvium and weathered bedrock) that is captured by the seepage collection system. The bypass proportion is then defined as the remaining fraction of this inflow that is not captured. This is described by the following equation:

$$Bypass = 100 \times \frac{(Q_{Shallow\ GW} + Q_{NP})}{Q_{drain}}$$

Where:

- $Q_{Shallow\ GW}$ is the inflow into the model from Alluvium and Weathered Bedrock HSUs. Although it is possible for Fresh Bedrock to also transport some seepage, the mass load will be an order of magnitude less given the differences in K between the units.
- Q_{NP} is the inflow to the model from net percolation into the ELF.
- Q_{drain} is the outflow from the model simulated at the basal or perimeter drain.

A mass balance check was also undertaken as a QA/QC¹ step to ensure source water rates equated to outflows from the model. In addition, flow paths were evaluated to confirm bypass figures were consistent with the simulated flow field.

Model results are discussed below for each ELF.

6.1 Shepherds ELF

The Shepherds ELF model results are summarised in Table 7 and suggest the following:

- As intended, the low K toe bund effectively restricts shallow groundwater flow such that it builds up and is collected in the underdrainage system.
- Under planned operating conditions, bypass could range between <1% to 12%, with the Base Case suggesting 8%.
- If the shallow HSUs were higher K than expected (Scenario 1 and 3), seepage collection would be enhanced.
- Anisotropy scenarios (Scenario 6 through 8) did not change the bypass proportion materially.
- Scenario 9 with higher fresh bedrock K has the highest simulated bypass (12%) but is only marginally higher than the Base Case and likely within the uncertainty of the simplified 2D modelling.
- Inclusion of a grout curtain (Scenario 11) did not materially change the estimated bypass proportion.

¹ Quality Assurance / Quality Control

- Basal drain failure simulation (Scenario 12) suggested bypass could increase to 22% if seepage emerging at the toe bund surface was collected.
- If the toe bund were to only intercept 50% of the weathered bedrock thickness bypass could increase to 23% (Scenario 13), highlighting the importance of installing the bund to an appropriate depth.

Overall, model results suggest relatively high proportions of seepage collection (90% or greater) at the Shepherds ELF (and any bypass from the TSF) under normal operating conditions. If the drain were to fail, seepage collection may decrease to approximately 80%.

6.2 Western ELF

The Western ELF model results are summarised in Table 8 and suggest the following:

- Like with the Shepherds ELF, the low K toe bund effectively restricts shallow groundwater flow such that it builds up and is collected in the underdrainage system.
- Under planned operating conditions, bypass could range between <1% to 10%, with the Base Case suggesting 2%. The improved collection is interpreted to be due to the valley flow gradient, where the steeper floor (and steeper hydraulic gradient) under the Western ELF enhances seepage collection.
- If the shallow HSUs were higher K than expected (Scenario 1 and 3), seepage collection would be enhanced.
- Anisotropy scenarios (Scenario 6 through 8) did not change the bypass proportion materially.
- Scenario 4 with lower weathered bedrock K has the highest simulated bypass (10%). This result is unexpected. Interpretation of the resultant flow field is that the lower K increase the head gradient in this HSU, leading to a higher component of deeper flow paths that bypass the seepage collection system.
- Inclusion of a grout curtain (Scenario 11) did not materially change the estimated bypass proportion.
- Basal drain failure simulation (Scenario 12) did not materially change the simulated bypass seepage emerging at the toe bund surface was collected.
- If the toe bund were to only intercept 50% of the weathered bedrock thickness bypass could increase to 26% (Scenario 13), highlighting the importance of installing the bund to an appropriate depth.

Overall, model results suggest relatively high proportions of seepage collection (90% or greater) at the Western ELF under normal operating conditions. If the drain were to fail, model results suggest high levels of seepage collection would be maintained.

6.3 Srex ELF

The Srex ELF model results are summarised in Table 9 and suggest the following:

- The seepage collection will be efficient where the perimeter drain sufficiently intercepts the water table. This occurred in the Base Case and Scenarios 2, 4, 5, 6, 7, 8, and 9 with very little bypass simulated (<1%).
- Conversely, when the drain does not sufficiently intercept the water table, much higher bypass rates are simulated ranging between 30% (partial interception) to 100% (no interception) bypass (Scenarios 1, 3, and 10).
- Logically, a deeper perimeter drain would improve seepage collection.

Overall, the model results suggest the Srex perimeter drain performance will be sensitive to the depth to the water table relative to the drain depth as one would expect. Further investigations are recommended to confirm the depth to water table along the Srex ELF toe to inform the required design depth.

Table 7: Model results – Shepherds ELF.

SCENARIO	DESCRIPTION	WATER BALANCE (WATER RATE [m ³ /s])					BYPASS (%) ¹ [Δ] ²
		RECHARGE	SHALLOW GW (ALLUVIUM + W. BEDROCK)	DEEP GW (F. BEDROCK)	DRAIN	BYPASS ³	
0	Base Case	8.92×10^{-6}	7.58×10^{-7}	1.08×10^{-7}	8.93×10^{-6}	8.46×10^{-7}	8% [-]
1	Alluvium – higher K	8.92×10^{-6}	5.84×10^{-6}	3.82×10^{-7}	1.43×10^{-5}	8.53×10^{-7}	3% [5%]
2	Alluvium – lower K	8.92×10^{-6}	3.19×10^{-7}	1.31×10^{-7}	8.53×10^{-6}	8.37×10^{-7}	8% [0%]
3	Weathered bedrock – higher K	8.92×10^{-6}	1.38×10^{-5}	1.88×10^{-6}	2.35×10^{-5}	1.05×10^{-6}	<1% ⁴ [12%]
4	Weathered bedrock – lower K	8.92×10^{-6}	-1.06×10^{-7}	1.78×10^{-8}	8.14×10^{-6}	6.92×10^{-7}	8% [0%]
5	Lower NP (rehabilitated)	4.70×10^{-6}	1.18×10^{-6}	2.97×10^{-7}	5.35×10^{-6}	8.22×10^{-7}	9% [1%]
6	ELF anisotropy	8.92×10^{-6}	1.24×10^{-6}	2.92×10^{-7}	9.58×10^{-6}	8.72×10^{-7}	6% [2%]
7	Alluvial anisotropy	8.92×10^{-6}	6.76×10^{-7}	1.83×10^{-7}	8.93×10^{-6}	8.42×10^{-7}	7% [1%]
8	Weathered bedrock anisotropy	8.92×10^{-6}	6.83×10^{-7}	1.82×10^{-7}	8.94×10^{-6}	8.41×10^{-7}	7% [1%]
9	Fresh bedrock – higher K	8.92×10^{-6}	8.12×10^{-7}	4.26×10^{-7}	8.56×10^{-6}	1.60×10^{-6}	12% [4%]
10	Fresh bedrock – lower K	8.92×10^{-6}	6.09×10^{-7}	8.04×10^{-8}	9.24×10^{-6}	3.62×10^{-7}	3% [5%]
11	Grout curtain beneath toe bund	8.92×10^{-6}	6.01×10^{-7}	2.66×10^{-7}	8.95×10^{-6}	8.29×10^{-7}	6% [2%]
12	Basal drain failure	3.63×10^{-6}	1.53×10^{-6}	3.64×10^{-7}	4.03×10^{-6}	1.41×10^{-6}	22% [14%]
13	Shallow toe bund	8.92×10^{-6}	7.11×10^{-7}	1.54×10^{-7}	7.43×10^{-6}	2.34×10^{-6}	23% [15%]

Notes: GW = Groundwater

W. Bedrock = Weathered Bedrock

F. Bedrock = Fresh Bedrock

¹Bypass proportion calculated as fraction of incoming flow from recharge and shallow groundwater that is not captured by the drain.

²Delta (Δ) indicates the change in percentage points relative to the Base Case.

³Bypass water rate includes flows from deep groundwater, which is assumed to be uncontaminated and therefore not included in calculation of bypass proportion. See note 1.

⁴Negative value indicates drain capture exceeds flows from recharge and shallow groundwater, indicating drain captures some deep groundwater.

Table 8: Model results – Western ELF.

SCENARIO	DESCRIPTION	WATER BALANCE (WATER RATE [m ³ /s])				BYPASS ³	BYPASS (%) ¹ [Δ] ²
		RECHARGE	SHALLOW GW (ALLUVIUM + W. BEDROCK)	DEEP GW (F. BEDROCK)	DRAIN		
0	Base Case	4.90 × 10 ⁻⁶	6.08 × 10 ⁻⁶	1.11 × 10 ⁻⁶	1.07 × 10 ⁻⁵	1.35 × 10 ⁻⁶	2% [-]
1	Alluvium – higher K	4.90 × 10 ⁻⁶	2.74 × 10 ⁻⁵	1.52 × 10 ⁻⁶	3.23 × 10 ⁻⁵	1.55 × 10 ⁻⁶	0% [0%]
2	Alluvium – lower K	4.90 × 10 ⁻⁶	4.08 × 10 ⁻⁶	1.16 × 10 ⁻⁶	8.55 × 10 ⁻⁶	1.59 × 10 ⁻⁶	5% [3%]
3	Weathered bedrock – higher K	4.90 × 10 ⁻⁶	5.71 × 10 ⁻⁵	4.51 × 10 ⁻⁶	6.49 × 10 ⁻⁵	1.58 × 10 ⁻⁶	<1% ⁴
4	Weathered bedrock – lower K	4.90 × 10 ⁻⁶	1.76 × 10 ⁻⁶	8.68 × 10 ⁻⁷	5.98 × 10 ⁻⁶	1.55 × 10 ⁻⁶	10% [8%]
5	Lower NP (rehabilitated)	1.96 × 10 ⁻⁶	7.33 × 10 ⁻⁶	1.49 × 10 ⁻⁶	9.24 × 10 ⁻⁶	1.55 × 10 ⁻⁶	1% [1%]
6	ELF anisotropy	4.90 × 10 ⁻⁶	6.89 × 10 ⁻⁶	1.39 × 10 ⁻⁶	1.16 × 10 ⁻⁵	1.57 × 10 ⁻⁶	2% [0%]
7	Alluvial anisotropy	4.90 × 10 ⁻⁶	5.87 × 10 ⁻⁶	1.23 × 10 ⁻⁶	1.04 × 10 ⁻⁵	1.57 × 10 ⁻⁶	3% [1%]
8	Weathered bedrock anisotropy	4.90 × 10 ⁻⁶	6.11 × 10 ⁻⁶	1.26 × 10 ⁻⁶	1.07 × 10 ⁻⁵	1.56 × 10 ⁻⁶	3% [1%]
9	Fresh bedrock – higher K	4.90 × 10 ⁻⁶	6.34 × 10 ⁻⁶	2.86 × 10 ⁻⁶	1.05 × 10 ⁻⁵	3.61 × 10 ⁻⁶	7% [5%]
10	Fresh bedrock – lower K	4.90 × 10 ⁻⁶	5.95 × 10 ⁻⁶	4.96 × 10 ⁻⁷	1.08 × 10 ⁻⁵	5.32 × 10 ⁻⁷	<1% [2%]
11	Grout curtain beneath toe bund	4.90 × 10 ⁻⁶	6.11 × 10 ⁻⁶	1.26 × 10 ⁻⁶	1.08 × 10 ⁻⁵	1.51 × 10 ⁻⁶	2% [0%]
12	Basal drain failure	1.95 × 10 ⁻⁶	7.14 × 10 ⁻⁶	1.45 × 10 ⁻⁶	8.80 × 10 ⁻⁶	1.56 × 10 ⁻⁶	3% [1%]
13	Shallow toe bund	4.90 × 10 ⁻⁶	5.01 × 10 ⁻⁶	2.37 × 10 ⁻⁶	7.36 × 10 ⁻⁶	4.91 × 10 ⁻⁶	26% [24%]

Notes: GW = Groundwater

W. Bedrock = Weathered Bedrock

F. Bedrock = Fresh Bedrock

¹Bypass proportion calculated as fraction of incoming flow from recharge and shallow groundwater that is not captured by the drain.

²Delta (Δ) indicates the change in percentage points relative to the Base Case.

³Bypass water rate includes flows from deep groundwater, which is assumed to be uncontaminated and therefore not included in calculation of bypass proportion. See note 1.

⁴Water balance suggests drain capture exceeds flows from recharge and shallow groundwater, suggesting the drain captures some deep groundwater, resulting in a very low bypass quantum. <1% shown to represent this low value, but is unlikely to be that effective in the real world setting.

Table 9: Model results - Srex ELF.

SCENARIO	DESCRIPTION	WATER BALANCE (WATER RATE [m ³ /s])				BYPASS ³	BYPASS (%) ¹ [Δ] ²
		RECHARGE	SHALLOW GW (ALLUVIUM + W. BEDROCK)	DEEP GW (F. BEDROCK)	DRAIN		
0	Base Case	2.68×10^{-6}	0	1.65×10^{-6}	2.94×10^{-6}	1.39×10^{-6}	<1% ⁴ [-]
1	Alluvium – higher K	2.68×10^{-6}	0	1.65×10^{-6}	1.75×10^{-6}	2.58×10^{-6}	35% [35%]
2	Alluvium – lower K	2.68×10^{-6}	0	1.64×10^{-6}	3.28×10^{-6}	1.04×10^{-6}	<1% ⁴
3	Weathered bedrock – higher K	2.68×10^{-6}	0	2.14×10^{-6}	1.12×10^{-20}	4.82×10^{-6}	100% [100%]
4	Weathered bedrock – lower K	2.68×10^{-6}	0	1.36×10^{-6}	3.25×10^{-6}	7.86×10^{-7}	<1% ⁴
5	Lower NP (rehabilitated)	1.08×10^{-6}	0	1.95×10^{-6}	1.74×10^{-6}	1.29×10^{-6}	-<1% ⁴
6	ELF anisotropy	2.68×10^{-6}	0	2.24×10^{-6}	3.49×10^{-6}	1.43×10^{-6}	<1% ⁴
7	Alluvial anisotropy	2.68×10^{-6}	0	1.62×10^{-6}	2.91×10^{-6}	1.39×10^{-6}	<1% ⁴
8	Weathered bedrock anisotropy	2.68×10^{-6}	0	1.58×10^{-6}	2.80×10^{-6}	1.46×10^{-6}	<1% ⁴
9	Fresh bedrock – higher K	2.68×10^{-6}	0	4.45×10^{-6}	5.12×10^{-6}	2.00×10^{-6}	<1% ⁴
10	Fresh bedrock – lower K	2.68×10^{-6}	0	3.04×10^{-7}	1.86×10^{-6}	1.12×10^{-6}	31% [41%]

Notes: GW = Groundwater

W. Bedrock = Weathered Bedrock

F. Bedrock = Fresh Bedrock

¹Bypass proportion calculated as fraction of incoming flow from recharge and shallow groundwater that is not captured by the drain.

²Delta (Δ) indicates the change in percentage points relative to the Base Case.

³Bypass water rate includes flows from deep groundwater, which is assumed to be uncontaminated and therefore not included in calculation of bypass proportion. See note 1.

⁴Water balance suggests drain capture exceeds flows from recharge and shallow groundwater, suggesting the drain captures some deep groundwater, resulting in a very low bypass quantum. <1% shown to represent this low value, but is unlikely to be that effective in the real world setting

7 MODEL LIMITATIONS

The following modelling limitations are noted:

- For the Shepherds EFL and Western ELF, the approximate centre line of the landform was simulated. 3D lateral flow around the toe bund via weather bedrock could theoretically occur but could not be simulated in a 2D model.
- Furthermore, complex valley geometry, and it's potential influence on seepage collection could not be represented with 2D models.
- Modelling assumed the pre-mining groundwater flow regime was generally maintained. Dewatering of mine features, such as pits and underground workings may alter the flow regime and potentially include seepage collection.
- HSU unit thicknesses were based on available, but limited data. This is particularly true for the Western ELF and Srex ELF.
- Available hydraulic property data was limited, particularly for the alluvium and to a lesser degree Weathered Bedrock.
- Groundwater levels specific to model transects were not available, so were inferred based on professional judgement.

8 CONCLUSIONS

Conclusions on seepage collection for the BOGP MWSFs are as follows:

Shepherds ELF

- 2D Model results suggest high levels of seepage collection (~90% or higher) may occur under normal operating conditions. As intended, the low K toe bund effectively restricts shallow groundwater flow such that it builds up and is collected in the underdrainage system.
- A grout curtain did not materially change the simulated proportion of seepage collected.
- Basal drain failure may decrease the proportion of seepage collected to ~20% if emerging at the toe bund surface was collected. It is noted drain failure would likely occur many years post-closure where the ELF and TSF contaminant loads will have naturally decayed to a certain degree.
- Model results were sensitive to the depth of the toe bund to cut off seepage pathways. For example, if the toe bund only extended 50% of the weathered bedrock thickness, the simulated proportion of seepage collected decreased to ~25%, highlighting the importance of installing the bund to an appropriate depth. Understating the depth of the transition from higher K weathered bedrock to lower K fresh bedrock is crucial.

Western ELF

- Model results suggest high levels of seepage collection (~90% or higher) may occur under normal operating conditions. Like with the Shepherds ELF, the low K toe bund effectively restricts shallow groundwater flow such that it builds up and is collected in the underdrainage system.
- The proportion of seepage collected may be higher than the Shepherds ELF due to the steeper grade of the valley floor (and inferred steeper hydraulic gradient) that would underlie the Western ELF.
- A grout curtain did not materially change the simulated proportion of seepage collected.
- Basal drain failure did not materially change the simulated proportion of seepage collected, again due to the steeper grade of the valley floor.
- Model results were sensitive to the depth of the toe bund to cut off seepage pathways. For example, if the toe bund only extended 50% of the weathered bedrock thickness, the simulated proportion of seepage collected decreased to ~25%, highlighting the importance of installing the bund to an appropriate depth. Understating the depth of the transition from higher K weathered bedrock to lower K fresh bedrock is crucial.

Srex ELF

- Seepage collection was very sensitive to the sensitive to the depth to the water table relative to the drain depth as one would expect.
- Where the water table was sufficiently intercepted, very high level of seepage collection were simulated for the perimeter drain. Conversely, where the water table was either insufficiently intercepted or not at all, moderate to low levels of seepage recovery were simulated.
- Detailed characterisation of the depth to water table along the perimeter drain alignment will be important ensuring the drain design achieve high levels of seepage collection.

TSF

Although not explicitly simulated with 2D models, based on conceptual understanding of the BOGP hydrogeological setting, any bypass of TSF seepage collection systems would naturally report to the Shepherds ELF toe, to be collected along with ELF seepage at the toe bund. As such, an overall high degree of seepage collection simulated for the Shepherds ELF is relevant for the TSF.

Shepherds Creek Valley Fill

Based on available data, the hydrogeological setting proposed for the Shepherds Creek Valley Fill (including ROM Pad and Process Plan) may not achieve high level of seepage collection. However, proposed performance monitoring (MGL, 2025) will allow for assessment of seepage bypass portions. If it is the case that bypass proportions pose a risk to the downgradient receptors, contingency seepage interceptions systems (e.g., interceptor wells) can be installed to increase seepage capture portions to satisfactory levels.

9 RECOMMENDATIONS

The following recommendations are made to close identified knowledge gaps and support detailed design of seepage collection systems:

- Complete hydrogeological investigations in the vicinity of each MWS to confirm:
 - Shallow groundwater levels.
 - Thicknesses of each HSU.
 - Hydraulic properties (e.g., K), particularly for (i) alluvium (no site specific data exists) and (ii) the depth at which K of weathered bedrock decreases to that of fresh bedrock to inform toe berm depth requirements.
- Complete 3D groundwater modelling of seepage collection systems to confirm complex valley geometry absent from 2D models does not materially influence simulated seepage collection. In addition, such a model could account for potential changes to the groundwater flow regime from dewatering activities. It would also allow the representation of contingency SIS components such as interception wells (e.g., for the Shepherds Creek Valley Fill) to test the efficacy.

10 REFERENCES

Darcy, H., 1856. Les fontaines publiques de la ville de Dijon. Victor Dalmont (Paris) 647p.

Engineering Geology Ltd (EGL), 2025a. Bendigo-Ophir Gold Project Site Geotechnical Factual Report. Prepared for Matakanui Gold Limited. Document reference: 9702. Dated 8 August 2025.

Engineering Geology Ltd (EGL), 2025b. Bendigo-Ophir Gold Project Shepherds Tailings Storage Facility Technical Report. Prepared for Matakanui Gold Limited. Document reference: 9702. Dated 15 July 2025.

Engineering Geology Ltd (EGL), 2025c. Bendigo-Ophir Gold Project Shepherds, Western, and SREX Engineered Landform, and Come in Time Pit Backfill Technical Report. Prepared for Matakanui Gold Limited. Document reference: 9702. Dated 25 September 2025.

Freeze, R. A. and Cherry J. A., 1979. Groundwater. Prentice-Hall (USA) 604p.

Hydrogeochem Group (HGG), 2026. BOGP MWSF Seepage Risk Assessment. Document J-H-NZ0238-003-M-Rev0. Dated 5 March 2026.

Kōmanawa Solutions Ltd (KSL), 2025. Bendigo Ophir Gold Mine Project – Groundwater Existing Environment & Effects Assessment. Report for Matakanui Gold Limited. RN: Z24002BOG-Rev2. Dated 14 February 2025.

Matakanui Gold Ltd (MGL), 2025. Bendigo Ophir Gold Mine Project Water Management Plan. Dated 23 October 2025.

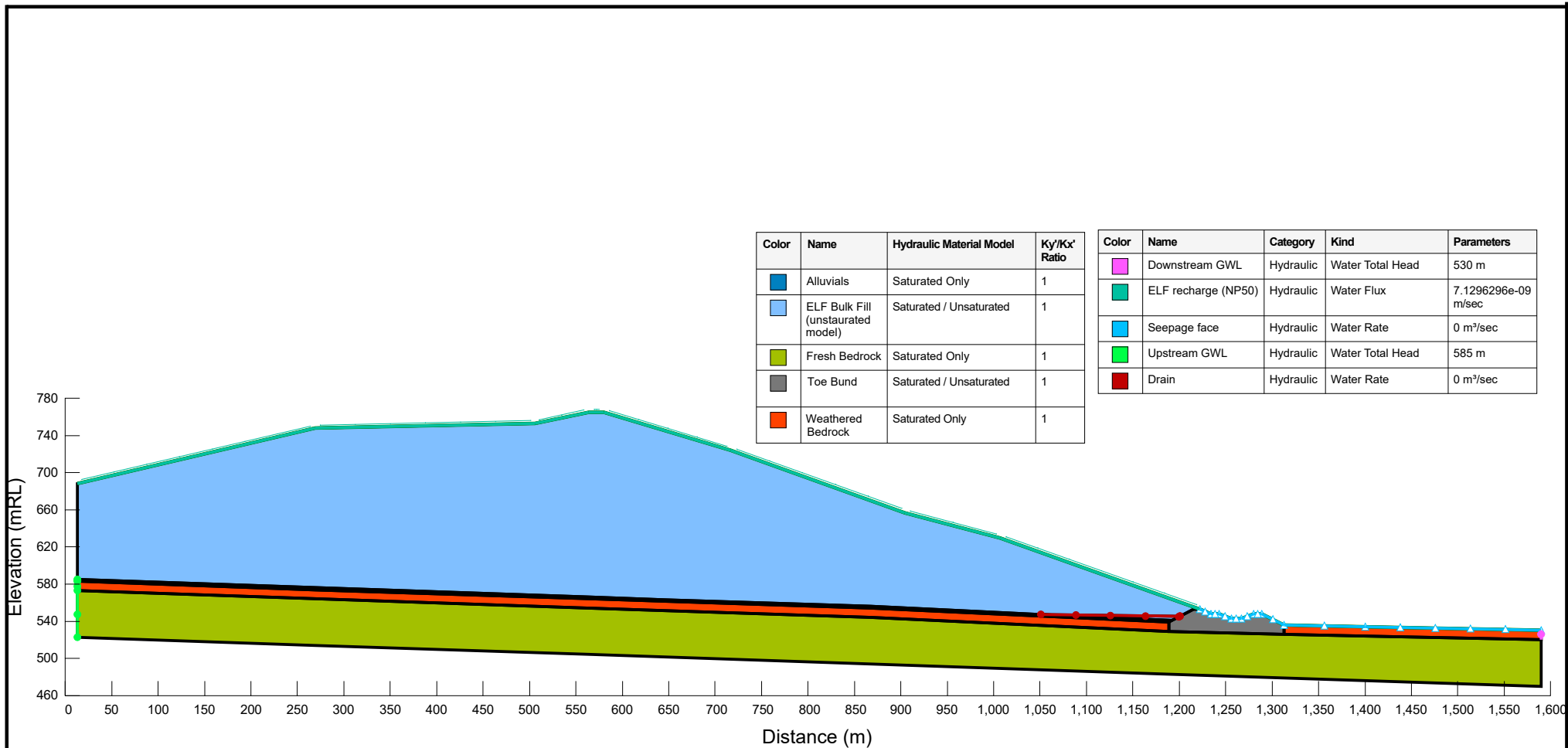
Mine Waste Management (MWM), 2025a. Water and Load Balance Model Report – Bendigo-Ophir Gold Project. MWM Report Number: J-NZ0233-016-R-Rev1.

Mine Waste Management (MWM), 2025b. Net Percolation Assessment for the Proposed Bendigo-Ophir Gold Project Mine Waste Storage Facilities. MWM Report Number: J-NZ0455-001-M-Rev3.

11 LIMITATIONS

Attention is drawn to the document “Limitations”, which is included in Appendix B of this report. The statements presented in this document are intended to provide advice on what the realistic expectations of this report should be, and to present recommendations on how to minimise the risks associated with this project. The document is not intended to reduce the level of responsibility accepted by Hydro Geochem Group Limited, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in doing so.

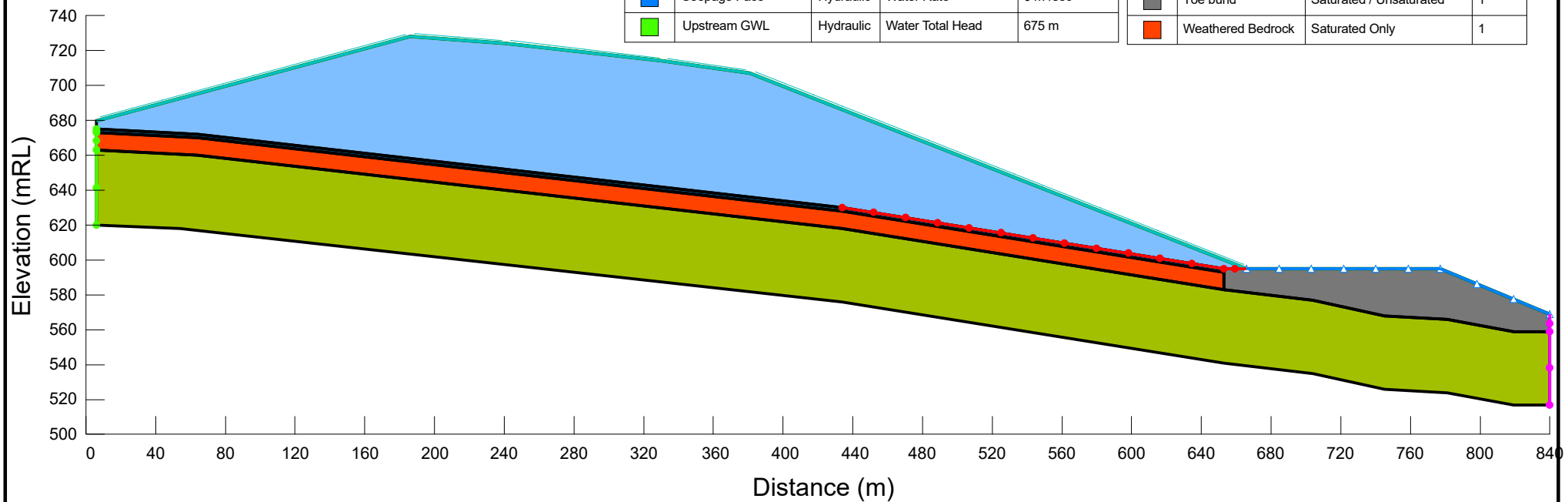
APPENDIX A MODEL SETUP



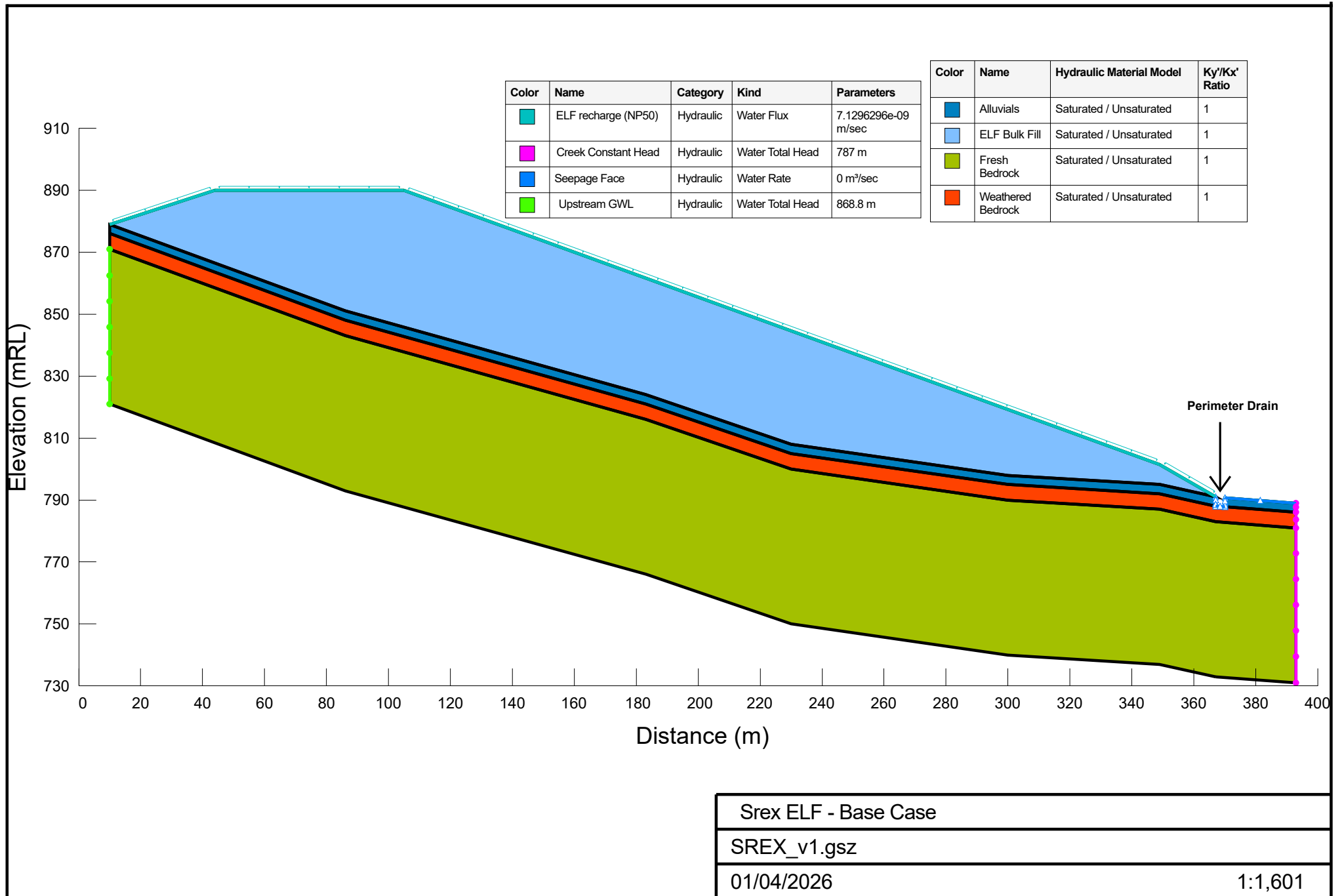
Shepherds ELF - Base Case	
Shepherds ELF_ver3.gsz	
02/04/2026	1:6,294

Color	Name	Category	Kind	Parameters
█	Downstream GWL	Hydraulic	Water Total Head	569 m
█	Drain	Hydraulic	Water Rate	0 m³/sec
█	ELF recharge (NP50)	Hydraulic	Water Flux	7.1296296e-09 m/sec
█	Seepage Face	Hydraulic	Water Rate	0 m³/sec
█	Upstream GWL	Hydraulic	Water Total Head	675 m

Color	Name	Hydraulic Material Model	Ky/Kx' Ratio
█	Alluvials	Saturated Only	1
█	ELF Bulk Fill	Saturated / Unsaturated	1
█	Fresh Bedrock	Saturated Only	1
█	Toe bund	Saturated / Unsaturated	1
█	Weathered Bedrock	Saturated Only	1



Western ELF - Base Case	
WELF_v1.gsz	
02/04/2026	1:3,338



APPENDIX B LIMITATIONS

This Document has been provided by Hydro Geochem Group Limited (HGG) subject to the following limitations:

This Document has been prepared for the particular purpose outlined in HGG's proposal and no responsibility is accepted for the use of this Document, in whole or in part, in other contexts or for any other purpose.

The scope and the period of HGG's services are as described in HGG's proposal, and are subject to restrictions and limitations. HGG did not perform a complete assessment of all possible conditions or circumstances that may exist at the site referenced in this Document. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by HGG in regards to it.

Conditions may exist which were undetectable given the limited nature of the enquiry HGG was retained to undertake with respect to the site. Variations in conditions may occur between investigatory locations, and there may be special conditions pertaining to the site which have not been revealed by the investigation and which have not therefore been taken into account in the Document. Accordingly, additional studies and actions may be required.

In addition, it is recognised that the passage of time affects the information and assessment provided in this Document. HGG's opinions are based upon information that existed at the time of the production of this Document. It is understood that the services provided allowed HGG to form no more than an opinion of the actual conditions of the site at the time the site was reviewed and cannot be used to assess the effect of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.

Any assessments made in this Document are based on the conditions indicated from published sources and the investigation described. No warranty is included, either express or implied, that the actual conditions will conform exactly to the assessments contained in this Document.

Where data supplied by the client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by HGG for incomplete or inaccurate data supplied by others.

HGG may have retained subconsultants affiliated with HGG to provide services for the benefit of HGG. To the maximum extent allowed by law, the Client acknowledges and agrees it will not have any direct legal recourse to, and waives any claim, demand, or cause of action against, HGG's affiliated companies, and their employees, officers and directors.

This Document is provided for sole use by the Client and is confidential to it and its professional advisers. No responsibility whatsoever for the contents of this Document will be accepted to any person other than the Client. Any use which a third party makes of this Document, or any reliance on or decisions to be made based on it, is the responsibility of such third parties. HGG accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this Document.