Memo

To:	Bendigo-Ophir Gold Project Expert Panel	**Cc:**	Environmental Protection Authority
From:	Eric Torvelainen, Paul Weber, Peter O'Bryan, Trevor Matuschka, Ryan Burgess and Jens Rekker	**Date:**	3 June 2026

Subject: Joint Response to Panel Request for Information 4 – Geology, Geotech, Engineering

Introduction

1. This memorandum is provided as part of Matakanui Gold Limited's (**MGL** or **Applicant**) response to the Panel's Request for Information #4 (**RFI**) relating to geology, geotechnical and engineering matters made under Section 67 of the Fast Track Approvals Act on 19 May 2026.

2. The following expert witnesses have jointly prepared this response on behalf of MGL:

   (a) Eric Torvelainen;

   (b) Paul Weber;

   (c) Peter O'Bryan;

   (d) Dr Trevor Matuschka;

   (e) Jens Rekker; and

   (f) Ryan Burgess.

3. Each expert witness's qualifications are detailed in their evidence submitted on 17 April 2026 as part of MGL's response to comments made under Section 53 of the Act.

Summary of Panel's Request for Information

4. We have summarised our understanding of the RFI as follows for clarity. The Panel summarised their request in four items.

5. The first three items in the RFI are interrelated. In summary the Panel request information on: the ability for the proposed site to deal with changes in geotechnical and environmental conditions; how the Applicant intends to approach and manage these changes (from a risk perspective); and how this

can be ensured through the conditions and associated management plans. The first three items are repeated below in paragraph 5a), 5b), and 5c):

(a) The Panel has noted from the Joint Witness Statement (**JWS**) the discussion regarding the robustness of the design and the level of flexibility to deal with changes in geology and measured effects which exceed those currently anticipated.

(b) It requests that the Applicant provides information on how they intend to approach and manage these changes from a risk perspective. This Panel has indicated the response should outline how the acceptability or otherwise of design changes, which may be necessary as the project advances to ensure that potential effects are adequately responded to, can be determined, and then implemented through the proposed management plans.

(c) The Panel requests that the Applicant then address each of the areas of uncertainty identified in the JWS and advise what provision there is or should be within the proposed conditions or management plans (consistent with the risk approach provided in response to [2 *i.e. 5b*]) to ensure adequate adaptation to changes which may be considered necessary at the detailed design stage or which respond to events not yet modelled e.g. stress redistribution resulting from removal of overburden pressure, weakening/exposure/removal of fault, fluid pressure changes, micro seismic activity/blast vibrations or unforeseen geology/ground conditions. The Panel is particularly focused on the risk of uncaptured groundwater seepage from the open pits, Tailings Storage Facility (**TSF**), Engineered Landforms (**ELFs**) and/or underground workings and the potential transport of contaminants in the underlying fractured schist.

6. The final item relates to the comparison of the process and practices in New Zealand for Tailings Storage Facilities in comparison with Global Industry Standard in Tailings Management. It is repeated below in paragraph 6a):

(a) It further requests a comparison between the NZDSG and the GISTM (paragraphs [46] to [49] of the JWS). It is particularly focused on differences in so far as they relate to dam safety. However, other differences e.g., requirement for formal written options analysis, social engagement, governance of tailings storage facilities as referenced in the JWS should also be identified.

7. As part of our response to item in (6a) we have provided a description of the alternatives options for tailings storage for understanding of [109 and 110] of this response.

Specific Response to Request for Information

8. We address the first three Panel items together. Our responses are grouped under topics of key potential uncertainties that may be required to be managed. These are the key potential uncertainties that we as experts have identified, that we understand the Panel are likely looking for clarification on. These have been identified through the expert conferencing and the Geology, Geotech, Engineering JWS dated 12 May 2026.

9. In summary the key topics of uncertainty addressed in this Joint Response are:

   (a) Potential Changes in the Geotechnical Pit and Underground Design.

   The ability of the Applicant to adapt and accommodate changes in pit and underground design requirements during operations.

   (b) Potential Variability in the Geochemistry of the Mined Materials.

   The ability of the Applicant to adapt and accommodate variability in geochemistry in the stored overburden rock and tailings.

   (c) Potential Changes in Groundwater Seepage Pathways in Operation.

   The ability of the Applicant to adapt and accommodate changes in seepage pathways and quantities in operation.

   (d) Potential Changes in Groundwater Seepage Pathways in Closure.

   The ability of the Applicant to adapt and accommodate changes in seepage pathways and quantities closure.

10. We have provided an overview for each topic of uncertainty, and have outlined:

   (a) Relevant assessment, summary information and the potential risks.

   (b) How the Applicant intends to approach and manage these potential risks and changes.

   (c) How the potential risks and changes can be ensured in conditions and management plans.

RISK MANAGEMENT OF UNCERTAINTIES AND CHANGES AS THE PROJECT PROGRESSES

Overview

11. In our collective experience, it is normal for reasonable uncertainties to be carried into a project provided there is sufficient information on the nature, scale and significance of effects to enable the impacts of a project to be fully understood and give confidence that any potential uncertainties can be adequately managed. Uncertainties are managed and controlled through appropriate performance monitoring, conditions, and management plans that are enacted through practical changes in detailed design, construction, operation, and closure of the site within the project description, or by seeking additional consents. The management and control of uncertainties will follow commonly adopted adaptive management principles.

12. We consider that the technical uncertainties associated with the ground conditions are reasonable and can be effectively managed for this project because of the fundamental physical characteristics of the topography, geology, and layout of the site. These physical characteristics have been presented in both the Substantive Application technical reports and supporting evidence. However, we have highlighted upfront the key physical characteristics in overview (before elaborating in more detail under each topic of uncertainty) to why, in our opinion, the risks and changes can be managed technically through the life cycle of the project:

    (a) Constrained valley environment: The mining is located within two constrained valley systems in the Dunstan Mountains, primarily Shepherds valley and Rise and Shine valley. A small area (Western ELF) is within a side tributary gully of Clearwater Creek. The constrained nature of these valleys is generally favourable for managing surface water and groundwater as natural flows of surface water and groundwater report to the floor of the valley downstream allowing good opportunity to manage water quality before discharging offsite.

    (b) Rock foundation: The project is located within the Otago Schist rock foundation of the Dunstan Mountains. The schist rock is the fundamental ground conditions in which the pits and underground will be mined and which the ELFs and TSF will be founded. The schist rock is primarily intact rock at depth with sheared (clay altered) and crushed planes or zones at spaced variable intervals. These sheared and crushed zones are paleo (ancient) features from paleo tectonic regional scale deformations. The combination of intact rock zones and intersecting shear zones throughout the mass (over the scale of kilometres), the high groundwater level in the valley slopes (given the low rainfall), and artesian (above ground) pressures in the floor of the valley in rock, indicates that the mass permeability of the foundation at depth are low. Permeabilities near to the surface are higher due to weathering, however, are still relatively low. Fracturing of the rock locally around open pit and underground mining will occur. Management of variations in ground conditions and fracturing of rock around mining due to relaxation and subsidence is a normal part of the design of mines and storage facilities, and engineering controls are readily available. This is discussed further in the detailed responses below.

(c) Site layout: The site layout allows for effective management of surface water and groundwater in operation and closure. The majority of the water flowing off site is surface water flows. Long seepage paths through the foundation schist will be insignificant comparatively. This is important as the site layout benefits from this physical characteristic of the site to manage seepage. Most of the mining and overburden rock and tailings storage are to be stored in the Shepherds valley. These main mining and storage areas are over 2 km from the point where waters leave the schist rock as surface water flows (or seepage through shallow alluvial soils) and enters the less constrained geological environment of the gravel terraces and the Ardgour Aquifer. This point is approximately compliance point SC01 and is within the project site. This allows ample distance for collecting and managing seepage through the schist rock foundation, either by diverting flows to the mine processing circuit (containment onsite), or water treatment and mixing with surface water flows. Importantly clean upstream surface water flows are diverted around the site. The smaller Come in Time Pit Backfill and the Shepherds Service Corridor (both constructed out of overburden rock from pit mining) are closer to the surface water exit from the site than Shepherds ELF. However, they are still ample distance (1.4 km from the edge of the schist) to manage seepage. The Western ELF is 300 m distance from its toe to Clearwater Creek. The Western ELF is much smaller than Shepherds ELF and the gully is ephemeral i.e. mostly dry. Seepage will be low from this stack and can be collected beneath this ELF and gravity feed to the Process Plant or Water Treatment Plant in closure. We consider 300 m is ample distance to collect and manage seepage from this ELF. SRX ELF is much smaller than Shepherds ELF. It is different than the other ELFs as it is immediately adjacent to Rise and Shine Creek. The SRX ELF and Rise and Shine Creek are both within the project site. Clean water is diverted around this area and a surface water perimeter diversion channel cut into rock is required to divert mine impacted surface water runoff and seepage to the pit where it will be managed. The pit acts as a sump for the management of mine impacted water in this area and there is the ability to implement additional engineering controls (seepage collection wells, grouting etc) along the perimeter of the ELF to ensure surface water quality in this area if required. In summary it is our opinion that the proposed site layout within the constrained valleys on a schist rock foundation allows ample ability to manage the collection of seepage, before entering clean surface water channels, streams or stream diversions, and ultimately meet the water compliance quality limits set by conditions to protect downstream watercourses and aquifers.

13. Specifically, the Panel raised the potential for stress redistribution resulting from removal of overburden pressure, weakening/exposure/removal of fault, fluid pressure changes, micro seismic activity/blast vibrations or unforeseen geology/ground conditions, was discussed. It is our experience that these are all normal and anticipated effects of mining and can be expected and effectively managed within the management actions that are proposed. Primarily these are related to the open pit and underground mining, for which the resulting effect is deformation of the ground local to the areas immediately behind the pit walls and subsidence above the underground.

14. Specially the Panel raised the risk of uncaptured groundwater seepage from the open pits, TSF, ELFs and/or underground workings and the potential transport of contaminants in the underlying fractured schist. We consider that there will be fracturing of the rock around the pit and the underground. However, due to the layout of the site this is not problematic as the main areas of fracturing around Rise and Shine Pit and Underground introduces a favourable situation hydrogeological situation in operation and closure allowing the collection of seepage in the schist rock mass at depth via the portal. We note beneath the TSF and ELF, away from the mining fracturing, the schist is of a low fractured bedrock permeability which declines with depth. The effects of this on groundwater seepage pathways is discussed in the responses below.

15. We have recommended to MGL that this project would benefit from a Peer Review Panel on selected key topics of groundwater and rehabilitation. This is common on other landfill and mining sites. MGL has accepted this recommendation, and we understand this will be reflected in the updated consent conditions. The purpose of the Peer Review Panel would be to review performance monitoring results and check compliance with consent conditions and provide recommendations on measures that can be taken to achieve the ultimate closure outcomes. The Peer Review Panel can be set up to report to the councils and be paid for by the company. The topics that we recommend are covered are to drive effective closure outcomes are:

(a) Geochemistry and mine-impacted waters.

(b) Hydrogeology.

(c) Rehabilitation.

16. We note that the TSF is covered by dam safety reviews required under the Building Act (2004) and the Building (Dam Safety) Regulations 2022, and Senior Independent Review as included the Tailings Management Plan and this is not required to be duplicated in a Peer Review Panel.

17. The topics of key uncertainties, including potential risks, risk management, and conditions and management plans are discussed in more detail below.

Potential Changes in the Geotechnical Pit and Underground Design

The following statements provided in Paragraph 18 to Paragraph 64 are provided by Peter O'Bryan (Open Pit and Underground Mines) and Eric Torvelainen (ELFs and Silt Ponds).

Background and Risks

18. Rock mass characteristics are dependent on the combination of influences of rock types, rock intact strengths (which are in turn dependent on mineralogy, weathering and alteration), rock structures (folds, faults, shears joints, fabric), structure orientation, shape, thickness and persistence, structure shear strength, groundwater (pressures and flow characteristics and storage capacity of the rock mass) and the rock stress regime. Local variation in rock mass competence can result due to the inherent spatial variability of one or more of these factors. The BOGP geology model is well-defined by extensive drilling investigation and is relatively simple in terms of rock type and rock type distribution and location and range of characteristics of major geologic structures. There are, nevertheless, variations in character and strength at local scale.

19. The potential risks to the open pit mining from changes in ground conditions is that flatten pit slopes are required, and this results in:

    (a) A greater pit extent is to achieve the same depth. This would require greater storage volume within the ELFs, requiring greater footprint and height of the ELFs, and a greater contaminant load primarily through seepage: or

    (b) A shallower pit with the same extents with underground mining as replacement at the bottom of the pit. This would reduce the storage volume requirement within the ELFs and reduce the contaminant load from the ELFs.

20. The risk to underground mining from changes in ground condition is that subsidence causes settlement of the area of Shepherds Silt Pond, Shepherds Seepage Collection Sump, and Shepherd Creek Stream Diversion. The risks are low as Shepherds Silt Pond can be buttressed by the Shepherds Service Corridor valley infill (potentially up to crest if required, making it not a large dam as defined under the Building Act, 2004), Shepherds Creek Stream diversion gradients can be reset over a localised length to maintain flows and repair lining and erosion and protection, and Shepherds Seepage Collection Sump is HDPE lined and can take notable deformation and still perform adequately. Any effect on the seepage cutoff at the toe of Shepherds ELF can be managed with grouting or seepage collection wells or sumps in this location.

21. We have not commented on financial risks due to changes in ground conditions. This is a company matter for the Applicant and falls outside our area of expertise.

Risk Management Approach

22. Potential changes in the geotechnical pit and underground design due to changes in ground conditions can be managed within the proposed site.

23. A need for change or changes must first be identified. For open pits identification of such a need would be via one or more of the following avenues: ongoing investigation of ground conditions (a key geotechnical requirement); monitored evidence of unexpected behaviour; mining exposing an area containing adverse ground conditions; or development of batter or slope instability.

24. Assessing acceptability of change requires identification of: the risks/ hazards arising due to the variation in ground conditions; the nature of ground conditions, slope design components and/ or mechanisms necessitating the change; the consequences of not changing design; the location and extent of the presence of adverse conditions; and limitations on the manner in which the problem can be redressed, which may relate to safety of implementation; geometric constraints of the physical configuration of the mining environment; or physical limitation of available equipment.

25. Measurable criteria indicating need for change include unacceptable wall movement via excessive displacement or differential displacements, excessive strain or increasing acceleration of wall displacement. Wall displacement monitoring systems are designed to provide early indication of potential development of unacceptable wall deformation.

26. Visually observable criteria include unexpected variation in rock character/ strength and/ or change from expected structural geological conditions. Planned approaches to ongoing geotechnical and structural geological mapping and re-assessment of wall stability conditions are designed to pre-emptively detect development of such variations.

27. Risk assessment procedures are applied to assist identification of potentially hazardous issues and the means by which such hazards may be precluded/ mitigated/ managed. If the hazard is or will be realised, information obtained from monitoring and assessment are used to identify possible safe and effective approaches to recovery.

28. In general terms, the issue first to be resolved where a meaningful change in ground conditions is encountered or identified, is assessing the viability of continuing without change or confirmation that some adjustment or change to design is necessary.

29. Changes could involve excavation of debris, re-excavation or partial re-excavation of the slope, inclusion of a wide berm (step-out) at/ near the base of the problematic zone and possibly moderation of the design of the underlying or adjacent walls. In other cases, it may be possible to bury or buttress and thus constrain the problem area. In some instances, it may be necessary to improve wall drainage and depressurisation to achieve an acceptable level of stability.

30. Limitations on making change could, for example, be related to location of the problem and ability of available equipment to enable safe implementation of corrective action.

31. Potential for loss of or limitation of access to ore in the deeper portion of the pit can also impose restraints or requirements on the manner and extent of change of wall design.

32. The processes described in the previous points will have identified suitable and adequate change(s) to mining plans. Protocols for change of design will be listed in the Ground Control Management Plan (**GCMP**) and will be aligned with the MGL Management of Change procedures.

33. The Panel request specific comment on the ability to address each area of uncertainty identified within the JWS and advise what provisions are, or should be, incorporated into the proposed conditions and/or management plans (consistent with the risk management framework outlined in response to the previous request) to ensure adequate adaptation. A summary is provided for the open pit and underground areas, and the Shepherds ELF.

34. No needs for major change to pit wall design have been identified at present. Changes at the detailed design stage, if required, will be to improve mining efficiency.

35. Three-dimensional modelling (3D modelling) (using FLAC3D a continuum finite difference model) of proposed open pit mining is planned as part of normal mine design processes. Modelling will follow sequential excavation of the RAS open pit (and other pits if necessary) and interaction with Thomson Gorge Fault (**TGF**) and other identified 'significant' faults. In time 3D modelling will be performed for proposed underground stoping and backfilling. Modelling results will identify mining geometries that present potential for any adverse interaction with open pit slopes and enable timely change to design. Modelling will also enable further, more detailed assessment of potential for surface subsidence due to underground mining. Detailed 3D modelling is used iteratively as pit and undergrounds are developed, to assist with design decisions based on interpreted geology and monitored pit and underground performance.

36. Load realignment and development of stress concentrations around mining excavations will be evident in FLAC3D results. The influence of mining-induced changes to stress magnitudes and/ or alignment will be dependent on the initial stress condition and the alignment of Principal Stresses

relative to the geometry of planned mining excavations. The zones likely to be influenced are those where weaker units or weaker or more fractured rock materials are exposed, for example, around the TGF and Rise and Shine Shear Zone (RSSZ). The major influence on open pit wall stability is expected to be due to removal/ reduction of confinement by excavation.

37. Influence and effects of mining-induced stress changes can be derived from modelling output. Mining of the RAS open pit will remove all rock locally above the TGF and part of the TGF. Mining will thus locally unload the TGF. The focus of influence of changed loading conditions is expected to be around (mainly above) exposures of the TGF and RSSZ in open pit walls.

38. It is inferred that if pre-mining loading is body force only (where stresses relate directly to the depth of overburden), the as-mined situation will be benign. The influence of an active tectonic stress on wall stability will be dependent on its magnitude and orientation of the stress field.

39. Changes to and the influence of mining-induced changes to groundwater pressures can be modelled by FLAC3D and known in advance of mining. Groundwater pressures will be monitored by an array of piezometers conditions behind and beneath open pit walls.

40. Zones which may be prone to mining-induced seismicity can also be identified in modelling results. Findings can inform needs for further, more detailed examination and assessment and inform the manner of changes to design where necessary.

41. Ground conditions at the BOGP do not warrant use of high explosive energy for fragmentation, and blast sizes will be designed to limit the rate of reduction/ removal of confinement such that stability is maintained. Blast vibration effects will not cause damage outside the areas immediately surrounding blasts. Near-field areas/ features that are in a metastable state could experience local disturbance. Blast parameters used in patterns adjacent to pit wall positions will be modified to reduce disturbance to wall rocks.

42. Geological drilling and mapping investigations have been comprehensive. The geological model based on investigation findings is straightforward. Issues yet to be resolved are limited to identification of locations and alignments/ traces and characterisation of detected/ inferred faults.

43. Atypical conditions identified during mining will be assessed within an ongoing geotechnical feedback system.

44. If pit walls are required to be laid back and the consent conditions provide for a degree of operational flexibility on the pit dimensions (subject to compliance with other relevant conditions), Shepherds ELF has capacity to accommodate approx. 10% increase in overburden material from open pit operations with changes to the footprint within the existing gullies occupied i.e. Shepherd's Valley

and Jean Creek, and within existing engineering seepage controls, with no adverse impact on stability. Consent changes may be required to allow for this alteration to Shepherds ELF. Changes in effects are primarily visual, as stability is unlikely to be an issue and seepage is already collected with the constrained valley and toe drainage reporting to the Shepherds Seepage Collection Sump.

Risk Management Required by Conditions and Management Plans

45. The proposed updated conditions (April 2026) and management plans as part of the Section 53 evidence cover the management of the risks associated with open pit and underground mining and potential changes to the design. There is a range of conditions proposed. Selected conditions are summarised below to highlight that the proposed activities and uncertainties will be controlled. Refer to the proposed updated consent conditions for actual wording.

46. The proposed condition NEW 11 (Schedule 2) covers the requirement for a GCMP for the open pits. In summary the GCMP ensures appropriate geotechnical engineering practice is applied to the pit designs. This deals with the process and assessments for pit design and any changes that may arise due to uncertainties in ground conditions. The key parts of the GCMP are summarised below to highlight what is covered:

    (a) Introduction, including Roles & Responsibilities.

    (b) Geology Overview.

    (c) Groundwater model.

    (d) Geotechnical model.

    (e) Potential pit wall instability/failure modes & controls.

    (f) Data collection and monitoring.

    (g) Mining overview plan.

    (h) Implementation of slope design.

    (i) Review and reconciliation.

    (j) Geotechnical risk management.

    (k) Training.

47. The GCMP must also include all of the recommendations for pre-mining and during-mining monitoring and modelling (that are relevant to underground mining) set out in Application Report B.28 Geotechnical Assessment Open Pit & Underground Mining Rise & Shine Deposit, by Peter O'Bryan & Associates, dated June 2025. This includes:

(a) Additional hydrogeological assessment (for geotechnical stability assessment).

(b) Three-dimensional numerical analysis (geotechnical stability assessment).

(c) Installation of piezometers.

(d) Stability monitoring.

(e) Regular geotechnical review.

48. Proposed condition NEW 12 (Schedule 2) ensures a minimum stability condition outside the project site which is suitable for typical land uses. Any pit design, including potential design changes, will need to observe this condition.

49. Proposed condition NEW 13 (Schedule 2) ensures a minimum stability condition outside the project site is assessed and certified.

50. Proposed condition NEW 14 (Schedule 2) ensures within the project site an appropriate exclusion zone is designated and an Exclusion Zone and Public Safety Management Plan is developed 12 months prior to the cessation of mining operations. This condition is adaptable to potential changes in pit design.

51. Proposed condition NEW 15 (Schedule 2) ensures the Exclusion Zone and Public Safety Management Plan is implemented.

52. Proposed condition NEW 16 (Schedule 2) ensures that subsidence due to the underground mining is assessed and monitored. This ensures there is information available to all stakeholders to manage subsidence related effects including managing the effective function and safety of Shepherds Silt Pond, Shepherd Seepage Collection Sump and seepage cutoff, and Shepherd Creek Stream Diversion.

53. Proposed condition NEW 17 (Schedule 2) covers the requirement for a GCMP for the underground mining. In summary the GCMP ensures appropriate geotechnical engineering practice is applied to underground mining. This deals with the process and assessments for underground design and any changes that may arise due to uncertainties in ground conditions. The key parts of the GCMP as the same as the open pit GCMP and are summarised in [46].

54. The GCMP must also include all of the recommendations for pre-mining and during-mining monitoring and modelling (that are relevant to underground mining) set out in Application Report B.28 Geotechnical Assessment Open Pit & Underground Mining Rise & Shine Deposit, by Peter O'Bryan & Associates, dated June 2025. These are the same recommendations summarised in paragraph [47].

55. Proposed condition NEW 17A (Schedule 2) covers the requirement for investigation and analysis of the geotechnical conditions controlling subsidence in the area of the underground prior to commencement to ensure that assessments are informed with site specific information.

56. Proposed condition 47 (Schedule 2) requires that the ELFs are located in general accordance with the project site layout. This ensures the proposed site layout for storage of overburden rock is maintained and if there is a need to change the layout further consent will be sort.

57. Proposed condition 48 (Schedule 2) requires that the requirements of the ELF Management Plan (**ELFMP**) be implemented. The design will need to meet the ELFMP (and therefore the objectives in condition 49). If that wasn't the case, we understand variation would be required to the consents or additional resource consent will be required.

58. Proposed condition 49 (Schedule 2) sets out the key objectives of the ELFMP, controlling what must be covered in any updates. While the ELFMP can be updated and re-certified by Otago Regional Council the key objectives remain. This allows practical flexibility between the Applicant and Otago Regional Council to adjust the ELFMP if something is not practical, without needing to apply to vary consent conditions.

59. Proposed condition 50 (Schedule 2) sets out the key outcomes of the ELFMP, controlling what outcomes must be achieved in any updates. While the ELFMP can be updated and re-certified by Otago Regional Council the key outcomes remain. This allows practical flexibility between the Applicant and Otago Regional Council to adjust the ELFMP if something is not practical, without needing to apply to vary consent conditions.

60. Proposed condition 51 (Schedule 2) requires a specific detailed design documentation to be prepared for each ELF, including Detailed Design Report, Construction Drawings, Specification, and Construction Monitoring and Inspections. The detailed design and documentation for each individual ELF must be reviewed and approved by a Chartered Professional Engineer experience in geotechnical and civil engineering. This ensures detailed design and construction practices are followed which is important for any underdrainage, seepage cutoffs, diversion channels etc.

61. Proposed condition 52 (Schedule 2) requires construction monitoring records are kept for the ELFs. This ensures there is a record of any changes to the design.

62. Proposed condition 53 (Schedule 2) requires a summary of works on each individual ELF is included in the Annual Monitoring and Compliance Report. As part of this condition there is a requirement for: Review of construction versus design for each individual ELF by a Chartered Professional Engineer,

noting any non-compliance items and recommendations. This ensures that potential changes are reviewed and potential non-compliances are identified as the site is developed.

63. Proposed condition 53 (Schedule 2) requires that the final construction is reviewed by a Chartered Professional Engineer experienced in geotechnical and civil engineering and any remedial measures are recommended. This ensures that any remedial measures are identified and these can be included in any bond requirements.

64. The proposed conditions are comprehensive, and we consider that they provide adequate requirements for geotechnical assessment to manage variation in ground conditions.

Potential Variability in the Geochemistry of the Mined Materials

The following statements provided in Paragraph 65 to Paragraph 85 are provided by Dr Paul Weber of Mine Waste Management Limited (MWM).

Background and Risks

65. In Expert Conferencing, dated 12 May 2026[1] it was stated by:

(a) Steven Emerman (**SE**) and Professor Bernd Lottermoser (**BL)** that they "consider the knowledge of the tailings to be insufficient and inconsistent with industry standards. The industry standard at the pre-feasibility stage should be bench-scale samples with basic laboratory testing".

(b) Alex McAlpine (**AM**) noted that he "not had sufficient time to determine whether all the required information in the documentation that has been provided as part of the substantive application. Particularly, mineralogical characteristics of the tailings with regards to toxic and/or critical minerals, and whether testing has been done to examine the feasibility of their removal prior to tailings being discarded"

(c) Dr Paul Weber (**PW**) stated that he "considers the assessment of the geoenvironmental hazards to be appropriate to understand the risks for acid and metalliferous drainage for project including the risks associated with nitrogenous compound. Bench-scale testing of metallurgical samples has been undertaken for geochemistry purposes: refer B.06B and B.06C and PW's statement of evidence dated 17 April 2026."

[1] Joint Statement of Expert Witnesses: Geology / Geotech / Engineering for the Bendigo-Ophir Gold Project (FTAA-2507-1089) dated 12 May 2026.

(d) To address the uncertainties held by SE, BL, and AM, that may be a function of the limited time available to review the substantiative application, the following background information is provided to inform the FTAA Panel of the information available on geoenvironmental hazards for the tailings.

66. The metallurgical processing of ore only involves the physical recovery of free gold. Pressure oxidation is not proposed.

(a) As noted in the MWM Geoenvironmental Hazards Report[2] (Page 7) – "Gold occurs as free gold particles, typically up to 400 µm but with some coarser visible gold. A minor gold component occurs associated with the arsenopyrite grains, but typically not in solid solution, giving rise to the free milling and highly gravity recoverable components expressed by metallurgical testing".

(b) MGL state that "Metallurgical test work completed on the BOGP ores has not identified significant quantities of refractory gold. As a consequence, the BOGP processing flowsheet uses the most common industrial gold processing flowsheet where coarse (typically >75 µm) gold is recovered using gravity, and fine microscopic gold is recovered by leaching using a sodium cyanide. The BOGP flowsheet does not incorporate any processing steps, such as oxidation, to treat or recover any refractory gold. Therefore, the process does not change the mineralogy of the host rock and tailings are expected to be similar mineralogy to the ore minus the gold fraction. Further details are provided in Appendix A.

(c) Hence, mineralogy and mineral risks for the proposed tailings can be determined from an assessment of waste rock and ore to understand the source hazard (i.e., the mineralogy is preserved through ore processing with minor oxidation).

67. A comprehensive assessment of waste rock and ore samples was undertaken as part of the assessment of environmental effects. The studies are summarised in the MWM Overview Report[3] and includes the following assessments:

(a) Acid base accounting (**ABA**) studies that included total sulfur (wt%) and maximum potential acidity (**MPA**) calculations; acid neutralisation capacity (**ANC**); net acid producing potential (**NAPP**) calculations; net acid generation (**NAG**) pH and NAG acidity; and paste pH.

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[2] B.06A Mine Waste Management Limited - Mine Impacted Water Overview Report - Appendix F: Geoenvironmental Hazards Factual Report. MWM Report Number: J-NZ0233-008-R-Rev3.

[3] B.06 Mine Impacted Water (MIW) Overview Report – Bendigo-Ophir Gold Mine. MWM Report Number: J-NZ0488-001-R-Rev0.

(b) ABA data were used to confirm the project materials, including the tailings, will not generate acid rock drainage. This included classification by the Price (2009); AMIRA (2002); and Weber et al. (2006) classification processes (as shown in Appendix B).

(c) Geochemistry data (total sulfur (S) and total arsenic (As)) was also used to assess the risks for waste rock including TZ3[4], TZ4[5], RSSZ[6], and ore samples. Data demonstrates that ore is elevated in S and As compared to other materials (Appendix C). This will report to the TSF as tailings with minor mineralogical changes.

(d) XRD was undertaken to confirm typical mineralogy of materials. Samples included RSSZ, TZ4, and ore samples. Results indicate that:

(i) The rocks are dominated by plagioclase feldspar, quartz, and illite/mica, which is characteristic of the Otago Schist.

(ii) Arsenopyrite was 2.7 wt% in the ore sample with a measured sulfur content of 0.46 wt%.

(iii) Dolomite was 7.6 wt% and measured ANC was 73.4 kg H_2SO_4/t in the ore sample.

(iv) Siderite was identified, which does not neutralise acidity, but can contribute to a higher Fe load.

(e) Additional XRD studies were undertaken by MGL on ore as part of its ongoing metallurgical studies (Appendix A):

(i) Arsenopyrite content was up to 2 wt%.

(ii) Chlorite was identified (< 1 wt%).

(iii) Average sulfur content of these samples was 0.24 wt% (i.e., an MPA of 7.5 kg H2SO4/t) and an ANC of 91 kg H2SO4/t demonstrating that the material will not generate acid rock drainage.

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[4] Textural Zone 3 of the Otago Schist rock.

[5] Textural Zone 4 of the Otago Schist rock.

[6] Rise and Shine Shear Zone Otago Schist rock.

(f) Elemental composition of the rock was provided in the MWM Geohazards Report[7] and included:

(i) 4-acid digestion with analysis by ICP-MS of TZ4 and RSSZ rock (n = 317 samples). 84 samples were classified as ore.

(ii) Portable X-ray Fluorescence (pXRF) of TZ3, TZ4, and RSSZ rock (n = 853 samples).

(iii) Samples are significantly elevated above crustal abundances for As, S, and Sb.

(g) Static leach testing (ASLP[8]) was undertaken on 8 samples from TZ4 and RSSZ, and 1 sample of ore.

(h) SEM EDS[9] was undertaken of waste rock samples from TZ4/RSSZ and TZ3 to identify sulfide mineralogy[10]. This also included grab samples from historic mullock piles and a road cutting. Results indicated a variety of minerals (Appendix D).

68. Metallurgical test data are available and were used to support the development of source terms. This includes the derivation of process water and analysis of solutes (Appendix E).

69. These data demonstrate that bench testing of ore and tailings has been undertaken to support an informed understanding of source hazards for the BOGP.

70. Other geoenvironmental hazards for the tailings have been considered:

(a) The assessment of nitrogenous compounds and the risk to receiving environments due to the use of ANFO[11] is difficult for projects that have not commenced as bench scale testing is based on drillcore samples that have not been blasted. Analogue data and geoenvironmental experience (based on analogue models[12]) was used to confirm that

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[7] B.06A Mine Waste Management Limited - Mine Impacted Water Overview Report - Appendix F: Geoenvironmental Hazards Factual Report. MWM Report Number: J-NZ0233-008-R-Rev3.

[8] Australian Synthetic Leaching Procedure

[9] Scanning electron microscopy with energy-dispersive X-ray spectroscopy.

[10] B.06A - Appendix G: SPLP and SEM EDS Analysis, MWM Report Number: J-NZ0233-014-M-Rev1

[11] Ammonium nitrate fuel oil (ANFO) based explosives.

[12] Weber, P., Reid, N., Robson, T., 2021. Nitrate and AMD: An opportunity to innovate. Virtual ICARD 2021, 21 – 23 September 2021.

elevated (reduced) nitrogen is expected in mine impacted waters from the TSF. A value of 2 mg/L ammoniacal nitrogen is used in the source term for tailings seepage.

(b) Unionised hydrogen sulfide may be generated in the TSF to report as seepage from the facility. Treatment may be required at closure.

Risk Management Approach

71. Unionised hydrogen sulfide may be elevated in TSF seepage and from any passive treatment system that uses reducing conditions. This is a risk at closure that will require monitoring once water treatment processes are confirmed. The BOGP Water Management Plan (Section 7.5) identifies that future monitoring programs should include sulfide.

72. Cyanide in tailings process water will be managed by conventional cyanide detoxification processes at the BOGP once the project commences. Test work provided by MGL indicates that the detoxification process reduced cyanide from 66 - 85 mg/L to 0.21 – 1.25 mg/L (Appendix A). This complies with the International Cyanide Management Code (ICMC) guidelines that WAD[13] cyanide in tailings be reduced to < 50 mg/L for the protection of wildlife and meets MGL's water quality targets of < 20 mg/L WAD cyanide in the tailings discharged to the TSF (Appendix A).

73. The Process Plant will include an arsenic treatment step that uses ferric chloride ($FeCl_3$). Results indicate that influent As concentrations can be 6 mg/L, which is reduced to < 1 mg/L after treatment (Appendix A). The iron will significantly reduce the dissolved arsenic in the TSF decant pond.

74. Nitrogenous compounds (e.g., nitrate and ammoniacal nitrogen) have been identified as a risk for the project. Water treatment systems are proposed (active and passive treatment).

75. TSF seepage will not be released from the BOGP mine water circuit during the operational phase of the project. At closure there will be a transition from storage of mine circuit waters to the treatment of waters through an active water treatment plant (WTP) and eventually a transition to passive treatment once the performance of the passive treatment system (PTS) is confirmed.

76. The effects of any variance in process water quality to the TSF or geochemical properties of the ore/tailings can be managed by the process plant (i.e., treatment of cyanide and arsenic); by retaining TSF seepage waters within the mine water circuit during operations; and by treatment of TSF seepage at closure through the proposed active (and thence passive) water treatment systems.

[13] Weak acid dissociable.

77. In the JWS dated 12 May 2026 the question (D3) was raised: "Can the experts agree if a similar leachate mix and potential for contamination source (to both surface and groundwater) exist for the CIT backfill, Western ELF and SREK Backfill (given the dominance of TZ4 waste rock in these ELF sites) and can these be managed by the central treatment leachate sump system or will they require separated treatment." This question was not addressed in the JWS due to time constraints and will be addressed at the reconvened conferencing. However further explanation is provided here as clarification:

(a) As per the Water and Load Balance Model (MWM, 2025[14]) seepage from these mine domains will also produce mine-impacted water and will not be released during the Operational Phase. ELF seepage from the CIT, Western ELF, and SRX will be directed to the mine water circuit for reuse.

(b) As per the Water and Load Balance Model (MWM, 2025) at closure all ELF seepage from CIT Backfill and the Western ELF will be directed to the water treatment plant. Seepage from the SRX ELF and Pit will be partially treated by a passive treatment system.

78. In the JWS dated 12 May 2026 the question (D4) was raised: "Not a civil or geotechnical engineering question, but it is important that the treatment options selected are effective and enduring. Do the experts have additional information on treatment options etc. (Cross over questions for treatment rates, reliability and capacity on closure). This question was not addressed in the JWS due to time constraints. However further explanation is provided here as clarification:

(a) An Order of Magnitude (OoM) study was completed by Process Flow Limited[15] that was provided as part of the substantive application.

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[14] B.06C - Appendix N: Water and Load Balance Model Report – Bendigo-Ophir Gold Project. MWM Report Number: J-NZ0233-016- R-Rev1.

[15] Process Flow, 2025. BOGP Post Closure Active Water Treatment Plant (WTP) Order of Magnitude (Oom) Study. Process Flow Report PFL-2426-PRJ-RPT-00001 for Matakanui Gold Limited.

(b) It is expected the proposed water treatment plant design could include the following potential processes:

(i) Cyanide destruct on the Shepherds TSF influent stream to the WTP can be incorporated if required. This is the only stream that requires treatment of cyanide.

(ii) Metal hydroxide / gypsum precipitation and settling.

(iii) Ettringite precipitation and settling.

(iv) Carbonation and pH trimming.

(v) Treated water sump.

(vi) Sludge management.

(vii) Treatment of nitrogenous compounds.

(c) Other options could include the use of ferric chloride addition to remove arsenic prior to metal hydroxide precipitation. The arsenic treatment system for the tailings could be repurposed for this.

(d) Process Flow indicate that other engineering solutions may also be suitable but require further study (e.g., reverse osmosis).

(e) Flow rates are the dominant driver for WTP capacity. Flow rates and water quality are based on the water and load balance model that was developed for the project. A modular design could allow flexibility in sizing of the WTP.

<u>Risk management required by conditions and management plans</u>

79. The proposed conditions and management plans, provided as part of the Substantive Application cover the management of the risks associated with the geochemistry of the tailings that will be produced. However, the following comments and recommendations are provided.

80. Water Management Plan (Section 7.5) indicates that future monitoring should include sulfide for any discharge from the proposed passive treatment system. This should be expanded to include the treatment of TSF seepage once those waters are to be discharged from site via a water treatment process.

81. Water Management Plan (Section 9.4) states that cyanide destruction may be required at closure for the Water Treatment Plant. Cyanide detoxification on process waters sent to the TSF during the

Operational Phase is also planned. The Water Management Plan should be updated with this commitment and that the design objective meets the 50 mg/L that is the industry standard for the protection of wildlife (Appendix A).

82. Water Management Plan: MGL have committed to the treatment of arsenic in tailings process waters using ferric chloride or similar to reduce arsenic concentrations. The Water Management Plan should be updated to reflect this commitment.

83. TSF Management Plan: In the evidence of Paul Weber Part 2-12 dated 17 April Paragraph 40, it is recommended that weekly samples of the tailings solid fraction are collected and tested by traditional acid-base accounting (**ABA**) techniques to validate the geochemical nature as being non-acid forming once the TSF is operational.

(a) It is recommended the TSF Management Plan will be updated to reflect this sampling program.

(i) The ABA testing should include total S, ANC[16], and NAG pH[17]. The monitoring program should be weekly in the initial instance, decreasing to monthly after 3 months to reflect confidence in the data set as it evolves.

(ii) The sample should also be tested for total arsenic to quantify the source hazard for this contaminant. The frequency of this monitoring could also decrease with increased knowledge and confidence in the material properties.

84. Further studies are proposed for the Water Treatment Plant. This is typical for many projects as studies advance into a detailed design phase and further site-specific data becomes available. MGL have proposed conditions in place to ensure they are undertaken in a timely manner:

(a) Proposed Consent Condition New 6 (Document D.02): Water treatability trials are proposed to ensure the right technology is available for the BOGP before it is required (21-month lead time). This will include:

(i) Bench testing.

(ii) Scaled-up testing / pilot plant.

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[16] Acid neutralisation capacity

[17] Net acid generation test

(iii) Studies will be informed by the cover system trials (which drives flow rates) and water and load balance models. Which are covered by Proposed Consent Condition New 20 (Document D.04) and NEW 6A (Document D.04) respectively.

(b) Proposed Consent Condition NEW 8 (Document D.02) states that the Consent Holder must construct and commission the active water treatment plant no less than 12 months prior to the earlier of: a). Cessation of active mining; or b). Development of a water surplus condition, as predicted by water balancing monitoring.

(i) This condition could also be updated to include: c). Poor water quality due to run-off from mine infrastructure areas outside of the mine water circuit that could cause non-compliance with water quality limits. The addition of proposed clause (c) to Condition NEW8 will be included in the updated consent conditions on 22 June 2026.

85. Water Management Plan: The plan should be updated to explain that one option to manage potential adverse effects of the project on water quality is the construction of the Water Treatment Plant. Triggers for this adaptive management process would include:

(a) Poor water quality due to run-off from mine infrastructure areas outside of the mine water circuit.

(b) The development of surplus mine impacted water in the mine circuit water that cannot be stored in the tailings storage facility (TSF).

(c) Mine closure and the requirement to have the WTP commissioned to transition from internal water management processes to treat and release

(d) Further details of these triggers were provided in the Evidence of Paul Weber Part 1-13 Dated 17 April 2026, Paragraph 13 to 17.

Potential Changes in Groundwater Seepage Pathways due to Mining

Background and risks

86. The baseline hydrogeological data[18,19] support a conceptualisation typical for a mountainous valley system where relatively low fractured bedrock permeability declines with depth, producing topographic driven flow (HGG[20] synthesise available data with respect to seepage collection potential). Conceptualisation are presented in Appendix F. Recharge occurs in higher elevation areas and discharge occurs at valley bottoms and other localised topographic low points. Shallow, intermediate, and deep regional flow systems develop in these settings. This is conceptualised visually in Figure F2. Due to the decline in permeability with depth, the quantum of groundwater flow decreases with deep also. Permeability data are generally consistent with those reported at Macraes Mine indicating they provide a reasonable representation of conditions at the BOGP.

87. Such conditions are favourable for collection of seepage from the BOGP Mine Waste Storage Facilities (MWSFs) positioned within the constrained valleys. 2D modelling[21] to evaluate seepage collection supports this conceptualisation and expectation.

88. The relatively tight and low hydraulic conductivity schist bedrock can be expected to restrict the propagation of drawdown relatively close to the pits. This conceptualisation is consistent with the 3D groundwater modelling completed by KSL[22] where results suggest a local flow divide is maintained between the RAS Pit and Shepherds Creek at the life of mine pit void. This condition for operations is presented conceptually in Figure F3, termed the Expected Case.

89. If, in the unlikely event, drawdown associated mine void dewatering (either open pit or underground) were to alter the proportion MWSF seepage collection, with or without localised changes in the schist rock mass hydraulic properties due to relaxation of the schist rock mass, these voids, the RAS Pit and Underground will act as groundwater sinks, effectively intercepting any uncaptured seepage migrating in deeper schist bedrock past primary seepage collections systems (e.g., the Shepherds ELF toe bund and underdrain). This is conceptualised in Figure F4 for Operations, termed here as

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[18] https://www.fasttrack.govt.nz/__data/assets/pdf_file/0026/15596/5ce461b523f6cbba0e4836117f75cc374504d008.pdf

[19] https://www.fasttrack.govt.nz/__data/assets/pdf_file/0022/15583/B.22-Engineering-Geology-Limited-Site-Geotechnical-Factual-Report-EGL-2025c_Part1_Redacted.pdf

[20] https://www.fasttrack.govt.nz/__data/assets/pdf_file/0007/22201/K.05-Hydro-Geochem-Group-BOGP-MWSF-Seepage-Risk-Assessment-10-March-2026.pdf

[21] See Attachment A of Statement of Evidence of Ryan Burgess dated 17 April 2026.

[22] https://www.fasttrack.govt.nz/__data/assets/pdf_file/0020/15554/82a15ee6a64d8c65939f20d67e185ac7132b9e2c.pdf

Unlikely Case (the term unlikely is given here due to the higher magnitude of permeability needed to produce this condition. In other words, available data do not support this conceptualisation).

90. For example, the anticipated groundwater level of the Shepherds ELF seepage collections system can be approximated by level of Shepherds Creek valley bottom at that location (~545 m RL), while the base of the RAS Pit sits at ~385 m RL. The Underground workings are less likely to intercept any seepage in the schist bedrock given they are even deeper again beneath the Shepherds Creek valley bottom (~250 to 300 m RL). By comparison the Shepherds Creek level at SC01 is approximately 400 m RL. It follows that the RAS Pit during operations would act to collect any seepage in the schist bedrock migrating past the Shepherds ELF and TSF primary seepage collections systems

91. At closure, the RAS Pit void will fill with water to approximately 490 m RL[23]. Still below the position of the Shepherds ELF seepage collection system, implying that would still be the local hydraulic low point for both Cases.

92. For the Expected Case, under Post-closure conditions, the shallow flow system important for seepage collection would be maintained consistent with the Operational Conditions (Figure F5).

93. For the Unlikely Case, under Post-closure Conditions, interception of seepage bypass within the schist bedrock if bypass were to occur similarly to under Operational Conditions (Figure F6).

94. The vast majority of the RAS Pit void water at closure would discharge to the Underground workings through the fractured rock mass above the crown pillar (now removed under post-closure conditions). All other quadrants surrounding the pit lake would have a hydraulic head higher than the pit lake level implying inflow (Figure F7).

95. The vast majority of water reporting to the underground would discharge via the portal for collection and treatment. For example, based on Darcy's law[24] groundwater flow out of the flooded underground via the Schist Bedrock would be less than 0.01 L/s, or <0.2% of the estimated portal discharge of 6 L/s[23].

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[23] https://www.fasttrack.govt.nz/__data/assets/pdf_file/0018/22626/AttachN_J-NZ0233-016-R-Rev1-BOGP-WLBM-Report.pdf

[24] $Q=K*/L\ (h_1-h_2)*W*b$, where K=10-8 m/s, h_1=490 m RL (head in underground workings), h^2=400 m RL (head at SC01, edge of Shepherds Creek valley edge), L=2,800 m (lateral distance between h_1 and h_2), W=500 m (width of workings across valley), and b=50 m (vertical thickness of underground workings).

96. In summary:

(a) The currently available baseline data provide a reasonable basis to understand potential groundwater related effects for the BOGP.

(b) Under expected conditions based on this data and first principles, the conceptualisation for the Expected Case suggests little to no influence of dewatering activities and drawdown on planned primary seepage collection systems.

(c) Under the Unlikely Case, where dewatering activities and drawdown do influence planned primary seepage collection systems (due to geotechnical uncertainties or not): (i) this seepage would be collected and managed/treated as part of dewatering within the mine water circuit, and (ii) any seepage from the flooded Underground workings would be an extremely low proportion of the overall flow (and load), with screening level calculations suggesting >99% of flow would still report to the portal for collection and treatment.

Risk management approach

97. Seepage collection uncertainties can be managed within the proposed site through adaptive management.

98. Performance monitoring is proposed in the Water Management Plan (Section 7.4) that will allow for early detection of uncaptured seepage. Monitoring will include a combination of water quantity (e.g., collected seepage flows, groundwater levels) and water quality (surface and groundwater quality).

99. Based on performance monitoring data collected, uncaptured seepage events can be (i) identified, (ii) their level of risk evaluated, and (iii) remedial actions implemented as required. Remedial actions relevant to fractured schist could include installation of contingency seepage interactions systems with interceptor wells and possibly cutoff walls if required; such systems would be as close as practicable to seepage sources. Alternatively, it may be the case that the most practicable remedial action is to maintain hydraulic control of uncaptured seepage by actively maintaining low water levels within pit and/or underground voids.

Risk management required by conditions and management plans

100. The proposed conditions and management plans as part of the Substantive Application cover the management of the risks associated with potential changes to open pit and underground mining:

(a) Water Management Plan, particularly performance monitoring.

(b) Consent condition 19 (D.04) requires MGL provide Otago Regional Council (ORC) a Annual Surface Water and Groundwater Monitoring Report that present the results of performance monitoring set out in the Water Management Plan. This will allow external transparency of how seepage collection systems are performing.

(c) Consent condition NEW 6B (D.04) requires the applicant to commission 3D contaminant transport modelling studies to support detailed design of seepage collection elements. Such a model will validate interpretations made in paragraphs 86 through 96 of how the mine voids will interact with seepage collection systems and associated uncaptured seepage risks.

(d) Consent condition 30 (D.04) allows for determination of triggers and actions associated with uncaptured seepage from MWSF. The intention of MGL is to further discuss and refine specifics of this condition in workshopping with ORC.

101. Following the expert conferencing process we recommend the following changes to the conditions and management plans (for the Panel to consider) to cover the management of these risks associated with potential changes to open pit and underground mining:

(a) Additional groundwater performance monitoring locations to manage risks of mining influence on ELF seepage control.

(b) Review and update of the 3D groundwater model (see Paragraph 100(c)) during operations, nominally every 3 years following the start of operations.

(c) Commissioning a Peer Review Panel that includes expertise in mining hydrogeology and ELF seepage migration and management.

TAILINGS MANAGEMENT

102. The final item from the Panel Request for Information relates to the comparison of the process and practices in New Zealand for Tailings Storage Facilities in comparison with Global Industry Standard in Tailings Management.

103. In terms of dam safety, the New Zealand Dam Safety Guidelines (NZDSG) complies with most requirements of the GISTM. NZDSG covers:

(a) Design, construction, and dam safety management requirements that are dependent on the consequence classification of the dam. In New Zealand the classification is referred to as Potential Impact Classification (PIC). There are three classes (Low, Medium and High). The Shepherds TSF is classified as High. GISTM has five consequence classifications (Low, Significant, High, Very High, and Extreme). The Shepherds Creek TSF classifies as High according to GISTM.

(b) Design criteria for earthquake and flood that are more stringent than GISTM for the equivalent consequence classification (e.g., the seismic design criteria in NZDSG requires consideration of ground motion with an average return period of 10,000 years compared to 2,475 years by GISTM. The flood design criteria in NZDSG is a probable maximum flood (PMF) compared to 2,475 years by GISTM).

(c) Requirements for governance, design, construction, dam safety management throughout the lifecycle, and closure.

(d) Requirement for emergency action preparedness and response plans.

(e) Annual safety reviews and 5 yearly comprehensive dam safety reviews.

(f) Requirement for change management during the lifecycle of the dam (design, construction and operation).

104. The Building Act (2004). The structural integrity and durability are assessed as part of the Building Consent process (Building Code requirement which is contained in Regulations of Building Act). For dams, including tailings dams, the NZDSG are generally used to support compliance with the Building Code. For High PIC dams the NZDSG recommend formal independent design review by suitably skilled and experienced peer reviewers and the Building Consent Authorities normally require the peer reviewer to provide a Producer Statement PS2 Design Review that is an independent statement of opinion that the building works will comply with the requirements of the Building Code and the recommendations in the NZDSG.

105. The Building (Dam Safety) Regulations 2022 are the statutory requirements for ensuring post construction dam safety. They essentially embody in law the recommendations in the NZDSG. There are requirements for assessing the PIC of a dam every 5 years and have it certified by a Recognised Engineer. If it is High PIC, like the Shepherds TSF, a Dam Safety Assurance Program (**DSAP**) must be prepared and be certified by a Recognised Engineer. Intermediate dam safety inspections must be undertaken annually, and comprehensive dam safety reviews every 5 years. The dam owner must also submit an annual compliance certificate, prepared by a Recognised Engineer, that certifies compliance with the DSAP. The DSAP must be reviewed every 5 years.

106. In terms of Environmental impacts and management of effects are covered under the Resource Management Act 1991. Environmental effects associated with this project are covered in the substantive application under the Fast-track Approvals Act 2024.

107. The items not addressed under New Zealand Practices are:

(a) GISTM recommends a multi-criteria alternatives analysis of all feasible sites, technologies and strategies for tailings management. This is not required by the NZDSG or the Resource Management Act 1991. This is covered in detail under paragraph [109] Alternative options assessment.

(b) Accountable Executive. GISTM formalises the role of a senior person in the company as the Accountable Executive (**AE**). The AE is accountable for the safety of the tailings facility and for environmental and social performance, approval of design criteria, tailings management training, emergency preparedness and response, selection of the Responsible Tailings Facility Engineer (**RTFE**), appointment of the Senior Independent Technical Reviewer, and establishment of a process for addressing concerns. The company will appoint an AE and this is included in the Tailings Management Plan. It is noted that the General Manager role in the Tailings Management Plan covers most of the responsibilities of the AE. The responsibilities can be amended to cover all GISTM requirements for an AE.

(c) Responsible Tailings Facility Engineer. GISTM formalises the role of a person in the company with experience in the design, construction and operation of tailings facilities as the Responsible Tailings Facility Engineer (RTFE). GISTM recommends that the RTFE is accountable for the integrity of the tailings facility, responsible for liaising with the Engineer of Record (EOR), operations, planning, regulatory affairs, social performance and environment teams, responsible for implementation of the design, accountable for the establishment of a change management system, responsible for the monitoring system and communication of the results to the EOR, including performance reviews, responsible with the EOR, for the Construction Records Report, and responsible for the OMS Manual. The Tailings Management Plan already includes a role for a RTFE. The role covers most of the responsibilities required by GISTM. The Tailings Management Plan also includes roles for an Environmental Manager and a Technical Services Manager. The combined roles of the RTFE, Environmental Manager and Technical Services cover all the responsibilities required by a RTFE in GISTM.

(d) Engineer of Record. GISTM formalises the role of the Designer of the TSF as the Engineer of Record (**EOR**). GISTM recommends that the EOR is responsible for the Design Basis Report, design, design report, construction and performance reviews, Deviance Accountability Report, Construction Records Report, along with the RTFE, and to support the RTFE with the OMS Manual. The Tailings Management Plan already has a role for an EOR. The responsibilities in the Management Plan for the EOR will be amended to include any responsibilities required for an EOR by GISTM that are not already covered.

(e) Senior Independent Technical Reviewer. GISTM recommends the appointment of a Senior Independent Technical Reviewer for High consequence (as defined by GISTM) tailings facilities. Their responsibilities include review of the planning, siting, design, construction, operation, maintenance, monitoring, performance, risk management at appropriate intervals across all phases of the tailings facility lifecycle. The Tailings Management Plan already has a role for a Senior Independent Technical Reviewer. The responsibilities in the Management Plan for the Senior Independent Technical Reviewer will be amended to include any responsibilities required for a Senior Independent Technical Reviewer by GISTM that are not already covered.

(f) Deviance Accountability Report. GISTM requires as part of the change management system that the EOR prepare a periodic Deviance Accountability Report (**DAR**) that provides an assessment of the cumulative impact of the changes on the risk level of the constructed facility. The company will include this requirement in the Tailings Management Plan.

(g) Public Disclosure. GISTM has requirements for public disclosure. Most of the information recommended to be published by GISTM is available in reports required by the Tailings Management Plan. The Tailings Management Plan will be amended to cover information that will be disclosed publicly by MGL.

108. Alternative options assessment for new tailings facilities GISTM recommends a multi-criteria alternatives analysis of all feasible sites, technologies and strategies for tailings management. Consideration of alternatives were undertaken but was not formally reported. A summary of this follows.

(a) Sites that were considered for storage of tailings and waste rock included Shepherds Creek, Rise and Shine Creek, and gravel terraces located further downstream. The gravel terraces site was ruled out due to higher risks of groundwater contamination and less secure long-term containment.

(b) The Rise and Shine Creek can provide similar storage for tailings and waste rock as Shepherds Creek. Both locations can securely contain the tailings with the waste rock placed in an ELF to provide a large buttress to ensure long-term safe containment of the tailings. However, placement of tailings and waste rock in the Rise and Shine Creek potentially sterilises ore reserves at SRE and SRX.

(c) Different tailings disposal technologies (conventional wet slurry, thickened slurry, paste, co-disposal with waste rock, and filter) were reviewed.

(i) Conventional wet slurry tailings is the most common technology, well proven and reliable. It has the advantage of placing the tailings saturated which is beneficial for dust control compared to other options. It also has benefits geochemically by keeping the tailings in a higher saturated state while placing, which limits oxygen ingress.

(ii) Thickened tailings have some advantages where there is a water deficit (arid areas) as they can limit evaporation losses and have a higher return of water for processing.

(iii) Higher tailings density and smaller tailings volume are possible with thickened tailings. However, beach slopes are steeper, and this can impact on the storage efficiency for a given height embankment unless a separate water reclaim pond is provided which would be difficult at the site. Thickened tailings also have a higher dust risk as the tailings beach can dry out much faster. The capital cost for thickened tailings is greater due to cost of thickeners and associated pumps. Paste tailings have a lower water content than thickened tailings and are often mixed with cement and used to backfill underground workings to ensure long-term stability of the ground. A small proportion of the tailings at BOGP will be utilised for this purpose.

(iv) Co-disposal of tailings with the waste rock is a possible technology but there is limited precedence for it. It complicates construction because it requires careful control of the ratio of tailings to waste rock otherwise this can lead to weak zones that compromise stability. This is a limitation given the potential for strong earthquake ground shaking. It also places the tailings within the overburden rock mass which can have higher permeability and a greater risk for oxidation. This can increase tailings leaching potential. To mitigate this additional engineering controls are likely required to manage oxygen ingress and capture seepage. It also mixes the overburden rock and tailings together which limits future options for reprocessing of the tailings as commodity prices change.

(v) Filtered tailings are being used more but they are not common, nor do they always represent the best option. They offer some advantages in some situations (e.g. where the source of ore is from underground mining and there are limited materials available for constructing a conventional tailings dam or where there are higher environmental risks due to the toxicity of the tailings or the natural ground has high permeability). Filtered tailings are often referred to as dry tailings. This is misleading because they are more often placed moist or even wet and under increasing weight can become saturated, soften and become unstable. There have been recent failures of filtered tailings due to instability which has affected the confidence in this technology. The technology is not 100% reliable in operation and it is normally necessary to have a small conventional tailings dam to take wet slurry when the filtered tailing plant is not working due to breakdown or scheduled maintenance or in periods of wet weather when the filtered tailings cannot be transported and placed. The technology has very high capital and operating expenses compared to conventional tailing disposal.

109. For this project the choice of conventional wet slurry was preferred. This is because the tailings can be safely contained with the buttress provided by the ELF and the confinement of seepage provided by the high groundwater levels in the surrounding sides of the valley. It also has less operational risk which is important for the feasibility and success of the project.

110. Uncertainty around seepage collection from the TSF was raise by the Panel. There are several factors that provide confidence that seepage from the TSF can be managed. They include a combination of natural features of the site and design features that limit the direction and quantity of seepage from the TSF. Seepage from the TSF is hydraulically contained by the groundwater levels in the hill slopes to the north, south and east of the TSF. This is because the groundwater levels are above the level of the tailings. The only direction seepage from the TSF can flow is to the west down the valley. Any seepage not collected could flow downstream to the west but the artesian conditions in the valley floor will result in some seepage discharging into the surface water beneath the Shepherds ELF where it will be collected and directed to the Seepage Collection Sump. The narrow width of the valley means it will be relatively easy to monitor seepage in the bedrock and implement a seepage control system. This will include wells to monitor any changes in groundwater quality and if necessary, the construction of barriers to seepage (e.g., grout curtain, seepage cutoff wall) or seepage interception and recovery (e.g., seepage interception drains, or seepage recovery wells). Seepage from the TSF will reduce significantly post-closure. This occurs for different reasons. Firstly, following cessation of tailings deposition there is a significant reduction in the quantity of water being deposited and the area of ponded water will reduce. This has a direct influence on the seepage from the tailings. Secondly, closure works will involve reshaping and capping the surface and formation of a wetland. The area of ponded water will be much smaller than the pond during operation of the TSF. The closure works will reduce the amount of rainfall infiltration into the tailings and result in a reduction in seepage from the tailings. Thirdly, the tailings will continue to consolidate for a period of many years post closure. Consolidation is a process that involves pore water being squeezed out from the voids in a soil under a sustained loading. The tailings will become denser with lower permeability which

results in a reduction in seepage, and a gain in strength of the tailings. Also, over time it is expected there to be a reduction in the degree of saturation due to drain down of the upper parts of the tailings and desiccation (drying) of the tailings at shallow depth which will result in further increase in strength of the tailings.

111. The detailed design of the TSF is covered under a building consent processes with peer review, required under the Building Act, 2004.

112. Condition 28 (Schedule 2) requires construction of the TSF primary seepage collection system in general accordance with the Subsurface Drain Layout Plan (Attachment Y in Schedule 2). This ensures that the TSF primary seepage collection system is installed including:

(a) Tailings underdrains;

(b) Embankment chimney drain;

(c) Upstream cutoff drain;

(d) Low permeability core; and

(e) Pipes to convey collected seepage to the Shepherds ELF seepage collection sump.

Appendix A

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Processing and Tailings Characteristics at the Bendigo-Ophir Gold Project

Metallurgical test work completed on the Bendigo-Ophir Gold Project (BOGP) ores has not identified significant quantities of refractory gold. As a consequence, the BOGP processing flowsheet uses the most common industrial gold processing flowsheet where coarse (typically >75µm) gold is recovered using gravity concentration methods and fine, microscopic gold is recovered by leaching using a sodium cyanide. The BOGP flowsheet does not incorporate any specific processing steps, such as oxidation, to treat or recover refractory gold. Therefore, the process does not change the mineralogy of the host rock and tailings are expected to be similar mineralogy to the ore, minus the gold fraction.

The BOGP flowsheet is a 4-stage process comprising of:

- Comminution – a crushing and grinding step to reduce the particle size of gold containing rock to P_{80} (80% passing size) of 106 µm. This process is a physical process and therefore does not change the mineralogy of the host rock. The product of this stage is a slurry with a particle size P_{80} of 106µm.
- Gravity concentration – heavy gold particles are separated from the lighter rock using centrifugal concentrators. This process is a physical process and therefore does not change the mineralogy of the host rock.
- Leaching and adsorption (CIL)- sodium cyanide is added to the mineral slurry to dissolve the microscopic gold. The dissolved gold is then adsorbed onto activated carbon which can be separated from the slurry. While this process dissolves the gold it is not a chemical process which can alter the mineralogical composition of the host rock.
- Recovery (elution and smelting) – the gold is recovered from the carbon in the elution circuit. The carbon is recycled back to the leaching tanks and the gold is precipitated out via electrowinning prior to been melted and poured into gold bars. This process does not involve the host rock so has no impact on the mineralogy of the rock slurry.

As there are no processing steps in the BOGP flowsheet that chemically change the mineralogy of the host rock, the steps are purely physical (i.e. comminution and separation) followed by leaching of an element (i.e. the available gold), there is no mineralogical change to the host rock.

Test work has been completed on the treatment of the BOGP tails material through the cyanide destruct and arsenic precipitation stages of the proposed BOGP flowsheet by ALS in Balcatta, Western Australia. The test work used ore samples from the BOGP.

The samples were first treated through the BOGP comminution-gravity-leaching flowsheet to remove the recoverable gold. The residue or tailings from this process was treated through the INCO (SO_2/O_2) cyanide and $FeCl_3$ arsenic precipitation processes under the same operating conditions that will be used in the BOGP processing plant. The test work successfully showed that the CN_{WAD} was destroyed through the INCO process and that any solubilized arsenic was precipitated with the addition of $FeCl_3$. Test work achieved CN_{WAD} concentrations of well below the 50ppm industry standard for the protection of wildlife. The design cyanide destruction discharge concentration from the process plant is 20ppm CN_{WAD} although test work achieved levels well below this. Solubilised arsenic levels below the laboratory detectable limit of 1ppm in the arsenic precipitation test work were achieved. The XRD analysis of the feed samples used for this test work and the test work results are shown in the attachment.

Matakanui Gold Ltd (MGL) is currently repeating this test work on a different composite sample from the BOGP to increase the data set. The current test work will also incorporate XRD analysis of the tails material to definitively demonstrate that the combination of physical separation and gold leaching does not change the mineralogy of the host rock.

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30 May 2026

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Attachment 1: Chemical and XRD Analysis BOGP feed material

Analyte	MASTER	RAS-S1-01	RAS-S1-02	RAS-S1-03	RAS-S1-04	RAS-S1-05	RAS-S1-06	RAS-S1-07	RAS-S1-08	RAS-S1-09	RAS-S1-10	RAS-S1-11	RAS-S1-12
dl.db assay Aug/t wt	1.33	1.77	2.15	0.72	1.31	1.02	1.16	1.27	2.26	0.96	1.43	1.89	0.82
Ag (ppm)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
As (%)	0.27	0.72	0.94	0.19	0.63	0.18	0.12	0.24	0.06	0.05	0.23	0.26	0.24
FA Au (ppm)	0.64 / 1.51	0.92	2.65	2.65	1.03	1.01	1.92	0.46	0.63	1.19	0.74	0.80	1.55
Photon Au (ppm)	0.95	2.99	2.45	0.46	0.84	0.63	0.80	1.34	0.41	1.31	0.70	0.91	1.26
C (%)	1.20	0.90	1.26	1.32	1.08	1.20	1.41	1.17	1.23	1.29	1.20	1.23	1.26
C org (%)	0.12	0.06	0.12	0.12	0.09	0.12	0.15	0.09	0.12	0.15	0.12	0.15	0.12
Cu (ppm)	24	24	22	20	24	32	34	28	30	24	26	42	28
Hg (ppm)		0.2	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fe (%)	3.03	2.19	3.21	3.02	2.60	2.88	3.54	3.01	3.33	3.28	3.08	3.18	3.23
Pb (ppm)	25	30	25	25	15	30	30	15	25	20	25	20	25
S (%)	0.23	0.39	0.53	0.18	0.40	0.23	0.16	0.22	0.10	0.09	0.25	0.21	0.19
S-2 (%)	0.22	0.30	0.44	0.14	0.34	0.18	0.16	0.20	0.08	0.08	0.22	0.18	0.16
Sb (ppm)	2.8	5.6	8.3	2.8	4.6	2.8	2.8	2.4	2.4	2.1	2.6	2.7	2.9
Te (ppm)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Zn (ppm)	78	64	70	68	64	74	96	72	84	80	70	86	80
SO4 (%)	0.03	0.06	0.04	0.03	0.05	0.03	0.04	0.04	0.03	0.03	0.04	0.04	0.02

Mineral group		mass %											
		RAS-S1-01	RAS-S1-02	RAS-S1-03	RAS-S1-04	RAS-S1-05	RAS-S1-06	RAS-S1-07	RAS-S1-08	RAS-S1-09	RAS-S1-10	RAS-S1-11	RAS-S1-12
Arsenopyrite		2	2	< 1	1	1	-	-	-	-	-	-	-
Kandite group		< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	1	< 1	< 1	< 1
Chlorite		-	< 1	< 1	-	-	< 1	< 1	1	< 1	< 1	-	< 1
Annite - biotite - phlogopite		< 1	1	< 1	< 1	< 1	1	1	1	1	< 1	1	< 1
Muscovite - illite		17	24	26	19	29	31	28	31	32	32	29	27
Plagioclase		33	31	26	32	26	25	30	27	25	29	31	30
K-feldspar and/or rutile		1	< 1	2	1	1	< 1	< 1	1	< 1	< 1	< 1	< 1
Quartz		41	34	35	40	35	33	34	32	32	29	31	34
Siderite type carbonates		1	2	2	< 1	2	3	2	4	4	2	3	2
Dolomite - ankerite		5	6	8	6	6	6	6	3	4	7	5	6
Calcite		-	-	-	-	-	-	-	-	< 1	< 1	-	-

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Attachment 2: Cyanide destruction and arsenic precipitation test results

SO_2/AIR CYANIDE DETOXIFICATION TESTWORK: SUMMARY OF RESULTS							
Test ID	Test Conditions					Solution Assays	
	pH	Retention Time (minutes)	Actual Reagents Used			Feed Effluent CN_P (mg/L)	Treated Effluent CN_P (mg/L)
			SO_2 (g/g CN_{WAD})	$CuSO_4.5H_2O$ (mg/L)	Lime (g/g SO_2)		
D1	7.91	60	4.4	66.4	1.14	85.3	0.21
D2	8.00	60	2.7	62.3	1.28	72.5	0.56
D3	8.22	60	2.6	28.5	1.92	72.5	0.28
B1	9.12	120	2.2	23.8	0.64	66.1	1.25

Notes: 1) CN_P denotes weak acid dissociable cyanide determination using Picric Acid method
2) CN_{TOTAL} calculated as equal to CN_P+ 2.80 x Fe

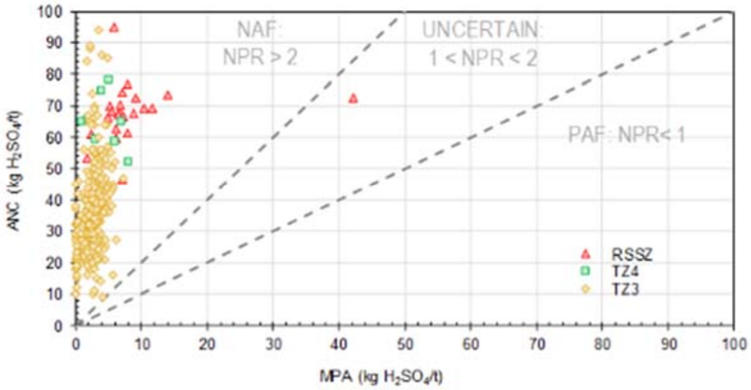
ARSENIC PRECIPITATION RESULTS SUMMARY					
Test No.	Fe Addition (mol/mol As)	Final pH	Retention Time/ Stage (min)	Feed Effluent As (mg/L)	Treated Effluent As (mg/L)
Combined Cu Precipitation Reserve					
Trial 1	20	4.73	60	6.00	<1
Trial 2	10	7.51		6.00	<1

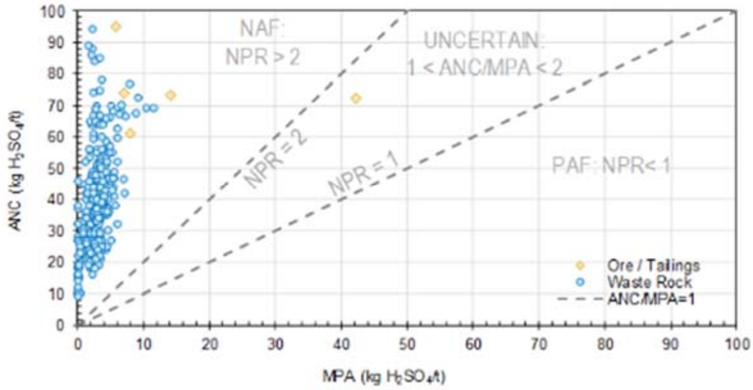
(source: ALS Report No. A26420)

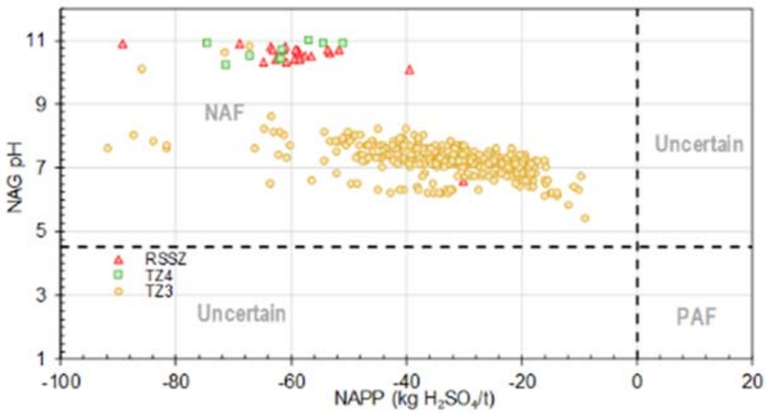
Appendix B

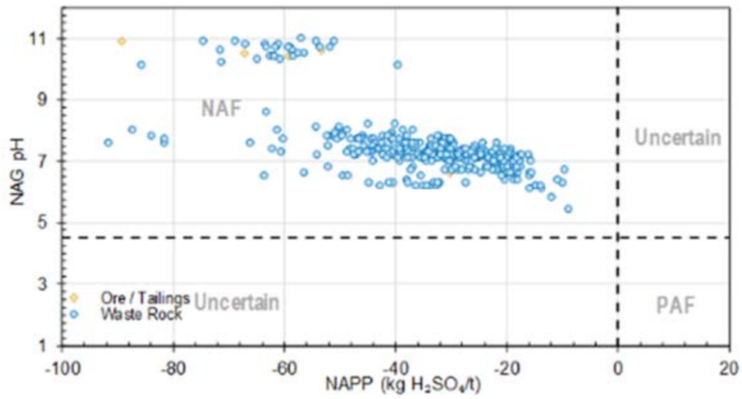
Waste Rock, Ore (and Tailings) ABA Data:

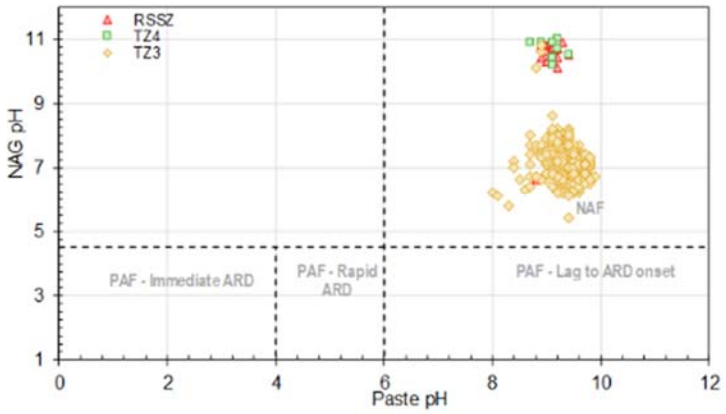
Source: MWM Geohazards Report (2025).

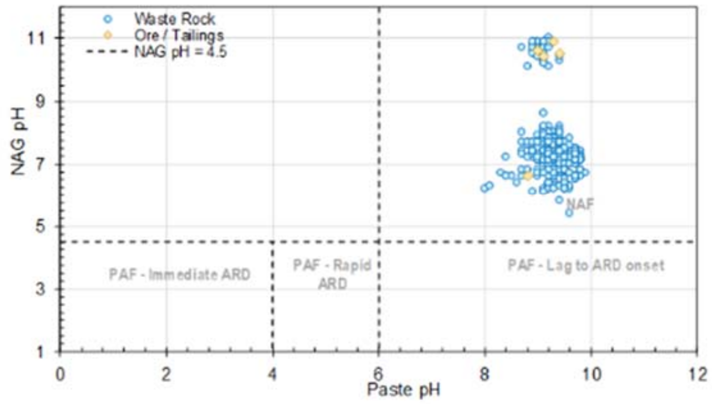






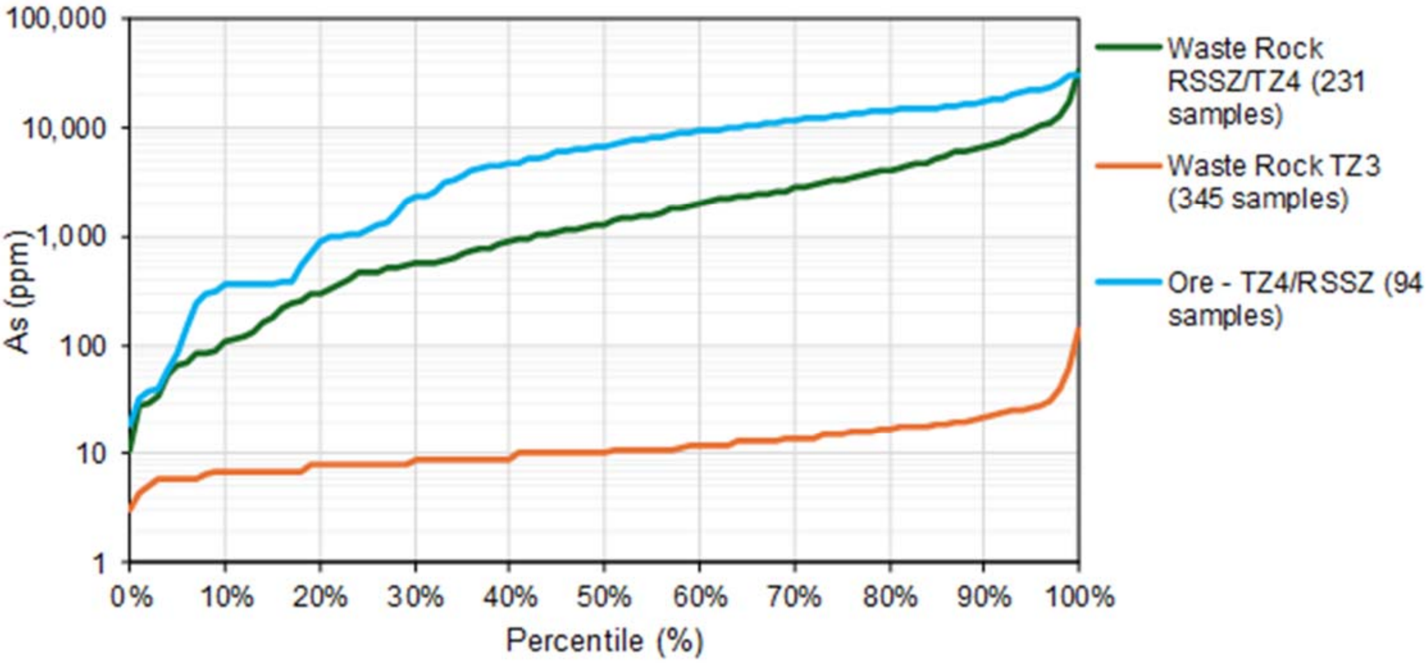






Appendix C

Source: MWM Geohazards Report (2025).



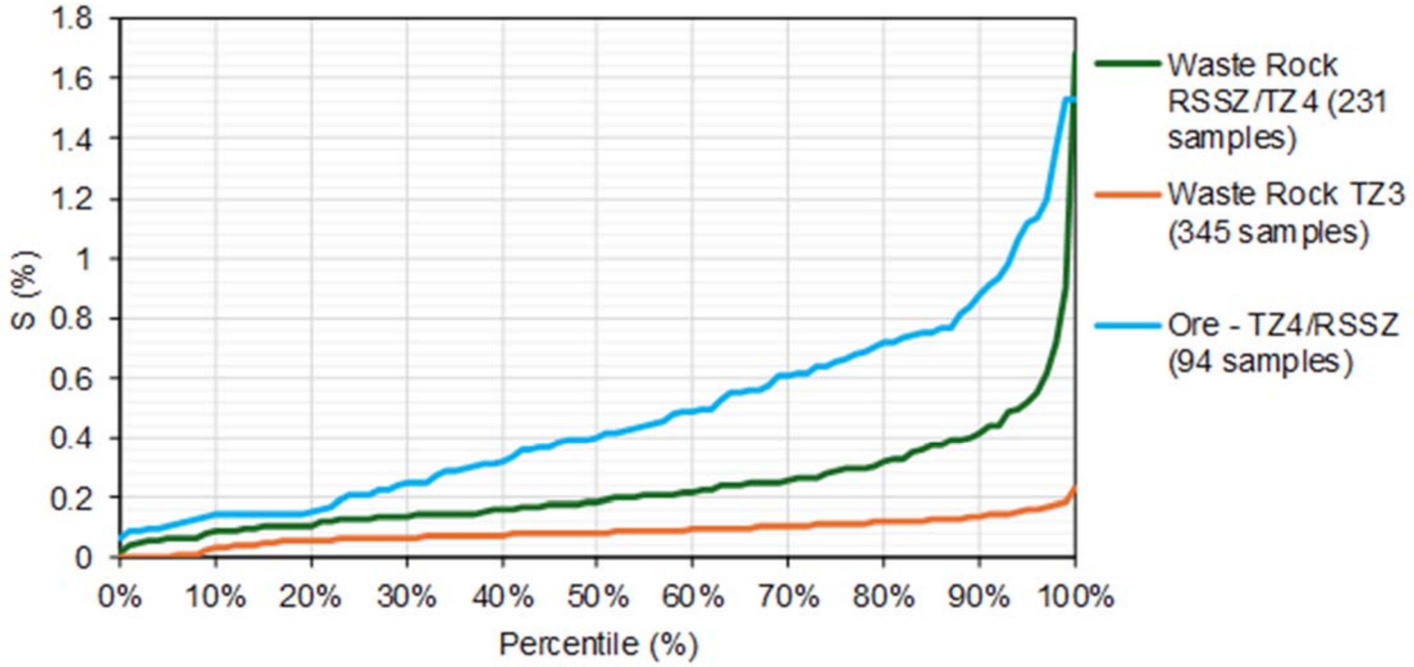


Table E3. Summary of estimated loads for arsenic and sulfur at the facilities.

DEPOSIT	ORE (kt)	WASTE ROCK TZ3 (kt)	WASTE ROCK TZ4 (AND RSSZ) (kt)	SOIL (kt)	TOTAL WASTE ROCK (NO SOIL) (kt)
Ras	12,976	179,886	18,089	3,021	197,975
SRX	1,428	4,377	606	625	4,983
cit	700	2,550	850	700	3,400
Total	15,104	186,813	19,545	4,346	206,358
Waste Rock Distribution (%)		88.7	9.3	2.1	100
Arsenic					
As (mg/kg)	8065	13.5	2,618	-	260.2
As (tonnes)	121,814	2,522	51,169	-	175,505
Waste Rock As Distribution (%)	-	4.7	95.3	-	100
Total As Distribution (%)	69.4	1.4	29.2	-	30.6
Sulfur					
S (%)	0.472	0.088	0.236	-	0.137*
S (tonnes)	71,291	164,395	46,126	-	281,813
Waste Rock S Distribution (%)	-	78.1	21.9	-	100
Total S Distribution (%)	25.3	58.3	16.4	-	74.7

Calculated as a weighted average by dividing the total tonnes of As or S by the total tonnes of waste rock.

Appendix D

Waste Rock, Ore (and Tailings) Sulfur and Arsenic Data:

SEM EDS mineralogical summary of observed sulfur-based particles

Source: MWM SPLP and SEM EDS Analysis Memo (2025).

ZONE	SAMPLE	ASSUMED COMPOUND	ASSUMED PHASE
TZ4/RSSZ	MG55790	Arsenic-iron sulfide Zinc sulfide Iron sulfide	Arsenopyrite Sphalerite Pyrite
	MG55795	Arsenic-iron sulfide Zinc sulfide Iron sulfide Iron-copper sulfide	Arsenopyrite Sphalerite Pyrite/pyrrhotite Chalcopyrite
	MG55796	Arsenic-iron sulfide Zinc sulfide Iron sulfide	Arsenopyrite Sphalerite Pyrite/pyrrhotite
TZ3	MG54045	Arsenic-cobalt sulfide Lead sulfide Copper sulfide	Cobaltite Galena Chalcocite
	MG55789	Iron sulfide Zinc sulfide Lead sulfide Arsenic-cobalt sulfide	Pyrite/pyrrhotite Sphalerite Galena Cobaltite
	MG54046	Iron sulfide Arsenic-iron sulfide Copper-iron sulfide Arsenic-cobalt sulfide Lead sulfate	Pyrite/pyrrhotite Arsenopyrite Chalcopyrite Cobaltite Anglesite
	MG54047	Copper-iron sulfide Lead sulfate	Chalcopyrite Anglesite

Appendix E

Process Water Quality.

Source: Evidence of Dr Paul Weber: Part 1-13 dated 17 April 2026.

Client:	Santana Minerals Limited
Project:	Bendigo-Ophir Gold Project
Client ID:	6680
Description:	Round 2.3 Bulk Leach Test, Detox & As Removal - Final Liquor Analysis

Final Liquor Analysis - Following Bulk Leach, Detox & As Removal

Element	Unit	Detection Limit	Method	Final Liquor
CN_Free	mg/L	5	iCNF1WATI	11
CN_WAD	mg/L	0.01	iCNW1WAAA	47
CN_total	mg/L	0.01	iCNT1WTAA	50
CNO	mg/L	0.1	iCNO1WAIC	120
SCN	mg/L	0.1	iCNSP1WSLC	5.9
Ag_CN	mg/L	1	iCNSP1WSLC	<10
Au_CN	mg/L	0.5	iCNSP1WSLC	<0.5
Co_CN	mg/L	0.1	iCNSP1WSLC	<0.1
Cr_CN	mg/L	0.5	iCNSP1WSLC	<0.5
Cu_CN	mg/L	0.1	iCNSP1WSLC	48
Fe^{2+}_CN	mg/L	0.1	iCNSP1WSLC	<1.0
Fe^{3+}_CN	mg/L	0.1	iCNSP1WSLC	<1.0
Ni_CN	mg/L	0.2	iCNSP1WSLC	0.3
As	mg/L	0.001	iMET1WCMS	0.28
Au 1/2	mg/L	0.0001	iMET1WCMS	0.076
Au 2/2	mg/L	0.0001	iMET1WCMS	0.076
Cu	mg/L	0.002	iMET1WCICP	75
Fe	mg/L	0.005	iMET1WCICP	3.2
Sb	mg/L	0.0001	iMET1WCMS	0.085
Total Cyanide	mg/L	0.0040	INORG-014	36
Aluminium	µg/L	10	METALS-022	720
Arsenic	µg/L	1.0	METALS-022	120
Cadmium	µg/L	0.10	METALS-022	0.10
Calcium	mg/L	0.50	METALS-020	140
Chloride	mg/L	1.0	INORG-081	380
Chromium	µg/L	1.0	METALS-022	6.8
Copper	µg/L	1.0	METALS-022	75,000
Fluoride	mg/L	0.10	INORG-026	0.913
Iron	µg/L	10	METALS-022	2,100
Lead	µg/L	1.0	METALS-022	13
Magnesium	mg/L	0.50	METALS-020	19
Manganese	µg/L	1.0	METALS-022	280
Mercury	µg/L	0.050	METALS-021	<0.050
Nickel	µg/L	1.0	METALS-022	320
Potassium	mg/L	0.50	METALS-020	24
Selenium	µg/L	1.0	METALS-022	1.4
Silica	mg/L	0.20	METALS-020	21
Silver	µg/L	1.0	METALS-022	3.4
Sodium	mg/L	0.50	METALS-020	400
Sulfate	mg/L	1.0	INORG-081	450
Zinc	µg/L	1.0	METALS-022	14
Ammonia as N	mg/L	0.0050	INORG-057	2.0
Nitrate as N	mg/L	0.0050	INORG-055	<0.0050
Nitrate as NO_3 by calculation	mg/L	0.020	INORG-055	<0.020
Nitrite as N	mg/L	0.0050	INORG-055	0.0057
Nitrite as NO_2 by calculation	mg/L	0.020	INORG-055	<0.020
Total Nitrogen	mg/L	0.10	INORG-127	64
Phosphate as P	mg/L	0.0050	INORG-060	0.041
Carbonate Alkalinity as $CaCO_3$	mg/L as $CaCO_3$	5.0	INORG-006	25
Hydroxide OH- as $CaCO_3$	mg/L as $CaCO_3$	5.0	INORG-006	<5.0
Total Alkalinity as $CaCO_3$	mg/L as $CaCO_3$	5.0	INORG-006	310
Hardness (calc) equivalent $CaCO_3$	mg/L	3.0	METALS-020	430
Acidity	mg/L	5.0	INORG-005	<5.0
Hexavalent Chromium	mg/L	0.0050	INORG-118	<0.025
Electrical Conductivity	µS/cm	2.0	INORG-002	2,500
Total Dissolved Solids	mg/L	5.0	INORG-018	1,400
Total Suspended Solids	mg/L	5.0	INORG-019	27
Turbidity	NTU	0.10	INORG-022	100
Colour (Apparent)	PCU	5.0	INORG-028	550
Colour (True)	PCU	5.0	INORG-028	<5.0
Bicarbonate Alkalinity as $CaCO_3$	mg/L as $CaCO_3$	5.0	INORG-006	280
pH				7.86
B	µg/L	20	METALS-022	390
Co	µg/L	1.0	METALS-022	25
Mo	µg/L	1.0	METALS-022	120
Sr	µg/L	1.0	METALS-022	2100
Tl	µg/L	1.0	METALS-022	<1.0
U	µg/L	1.0	METALS-022	13
V	µg/L	1.0	METALS-022	1.8

Appendix F

Hydrogeological Conceptualisation

Figure F1: Section overview

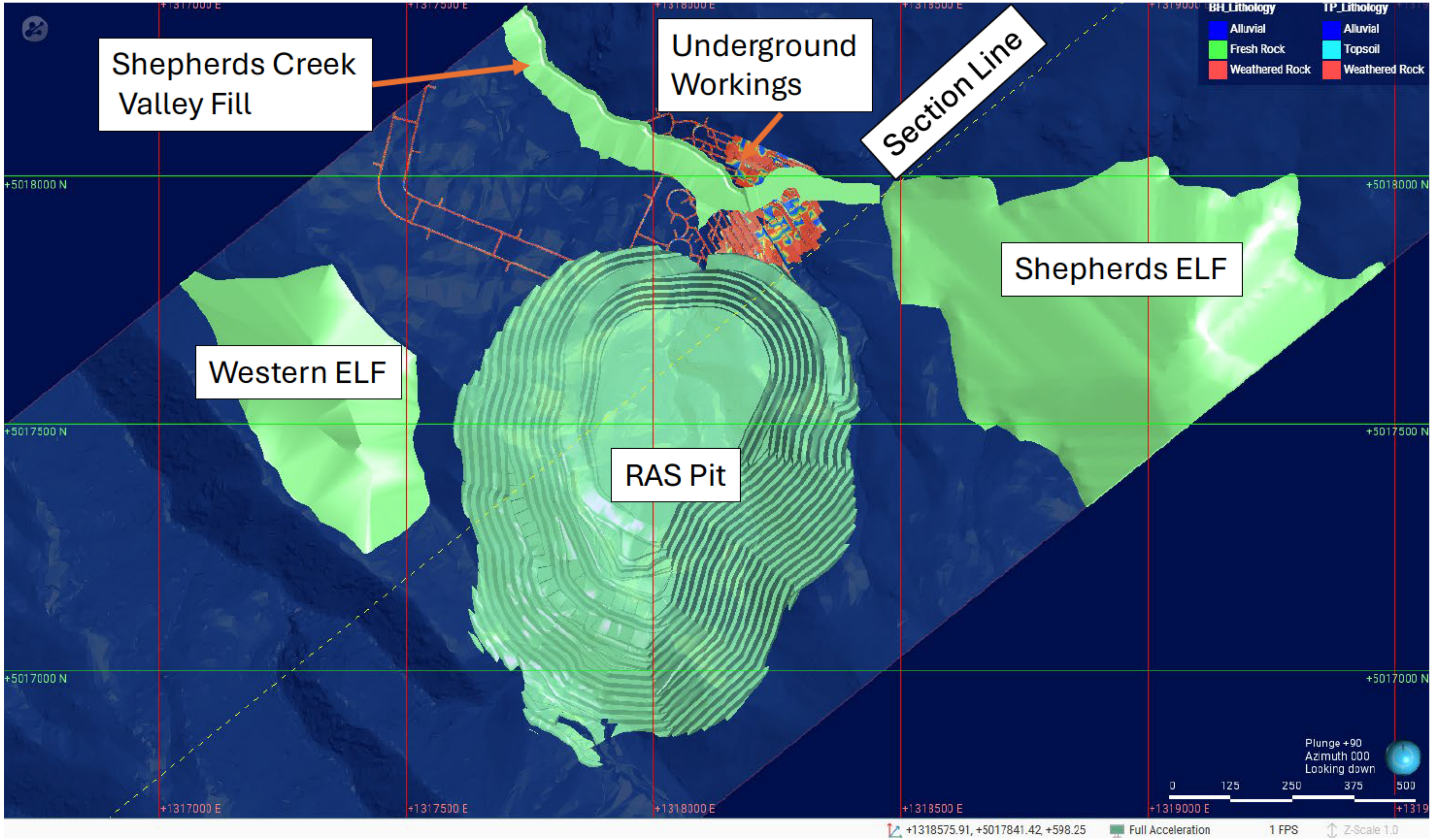
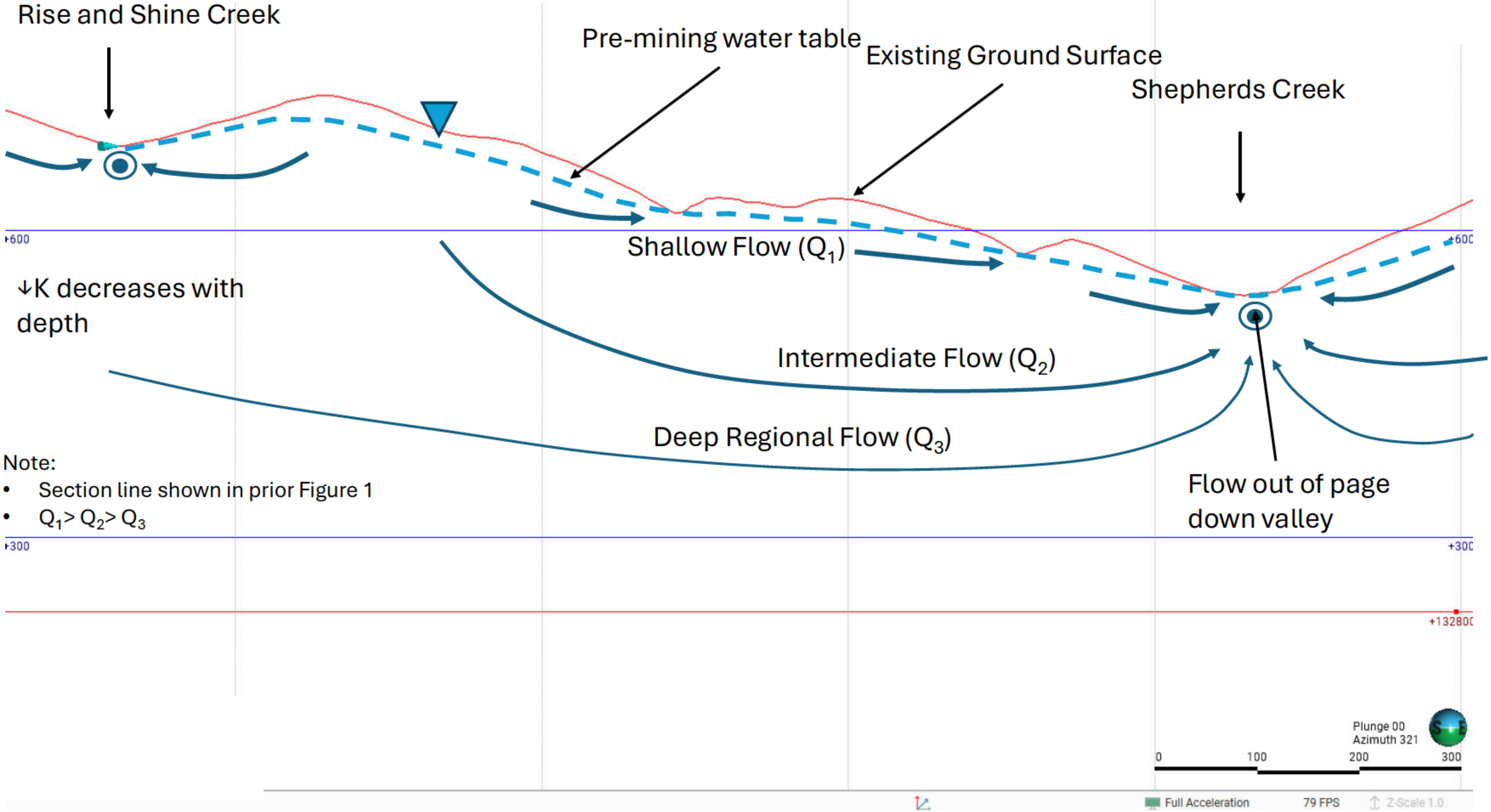


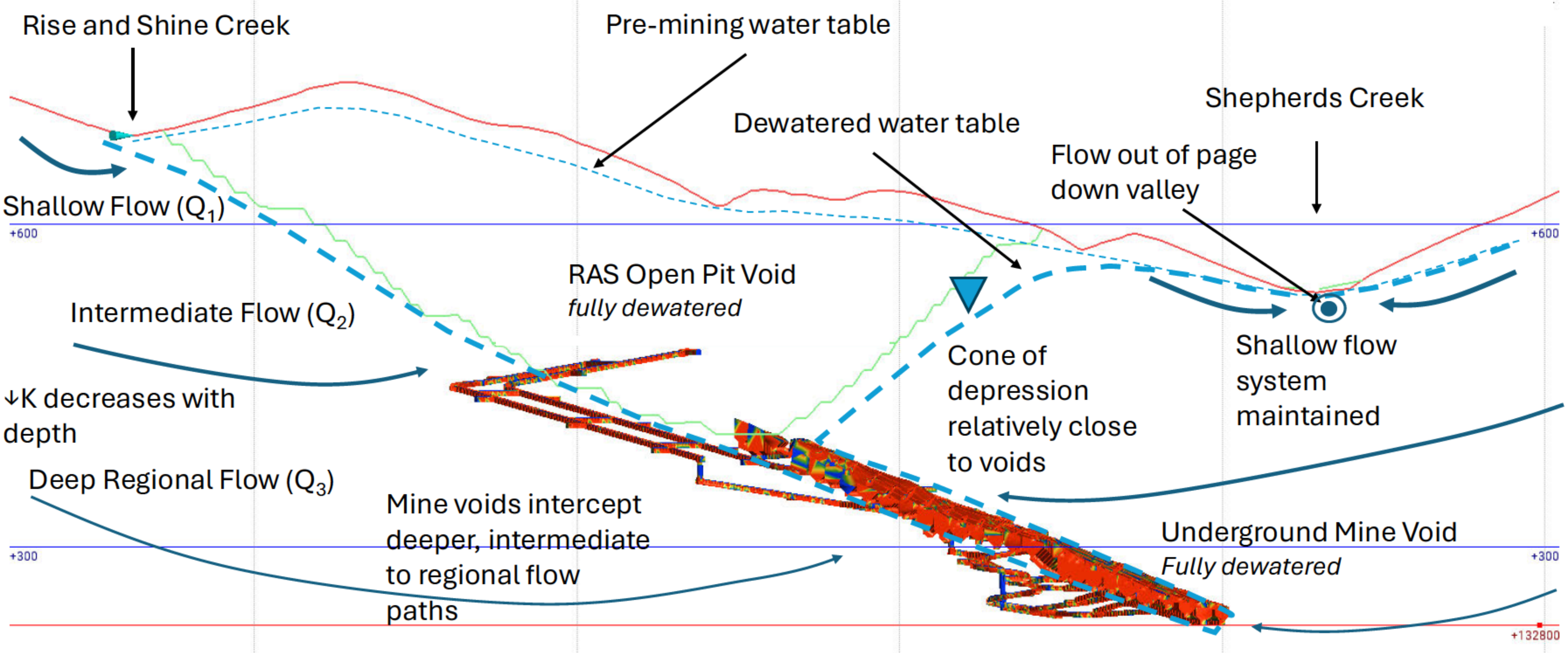
Figure F2: Expected Case – Pre-mining Conditions



Note:

- Section line shown in prior Figure 1
- $Q_1 > Q_2 > Q_3$

Figure F3: Expected Case – Operational Conditions



Note: $Q_1 > Q_2 > Q_3$

Figure F4: Unlikely Case – Operational Conditions

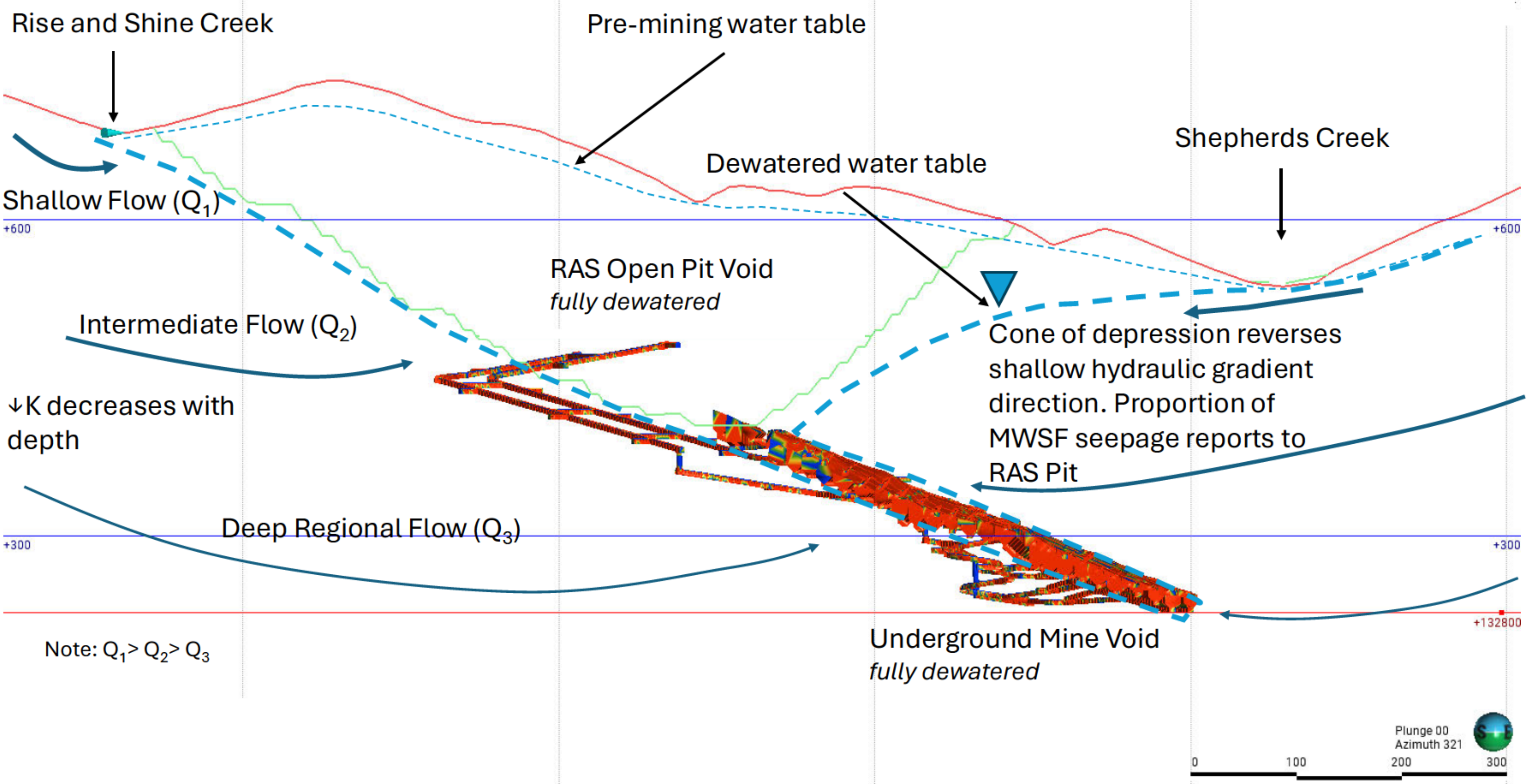


Figure F5: Expected Case– Post-closure Conditions

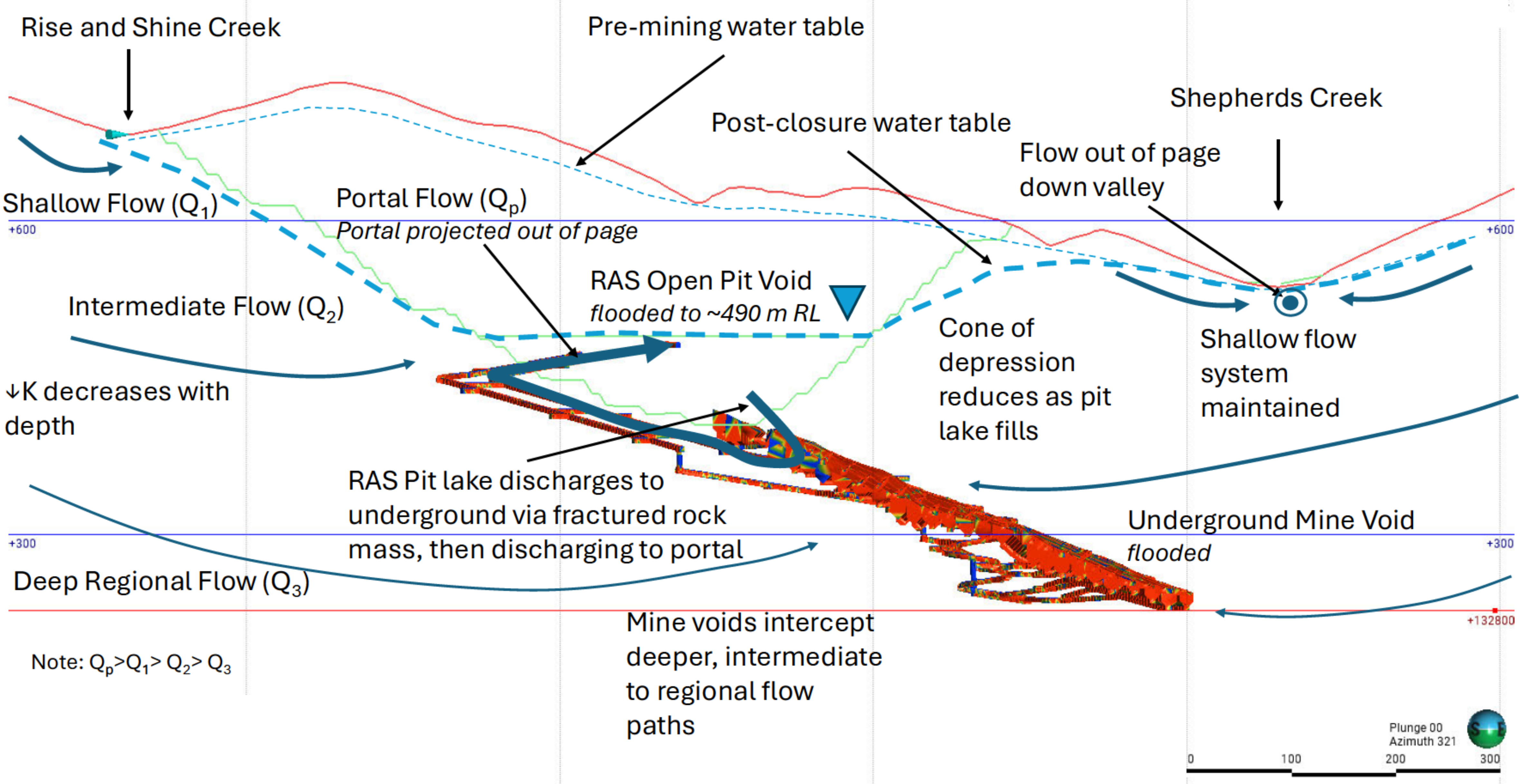


Figure F6: Unlikely Case – Post-closure Conditions

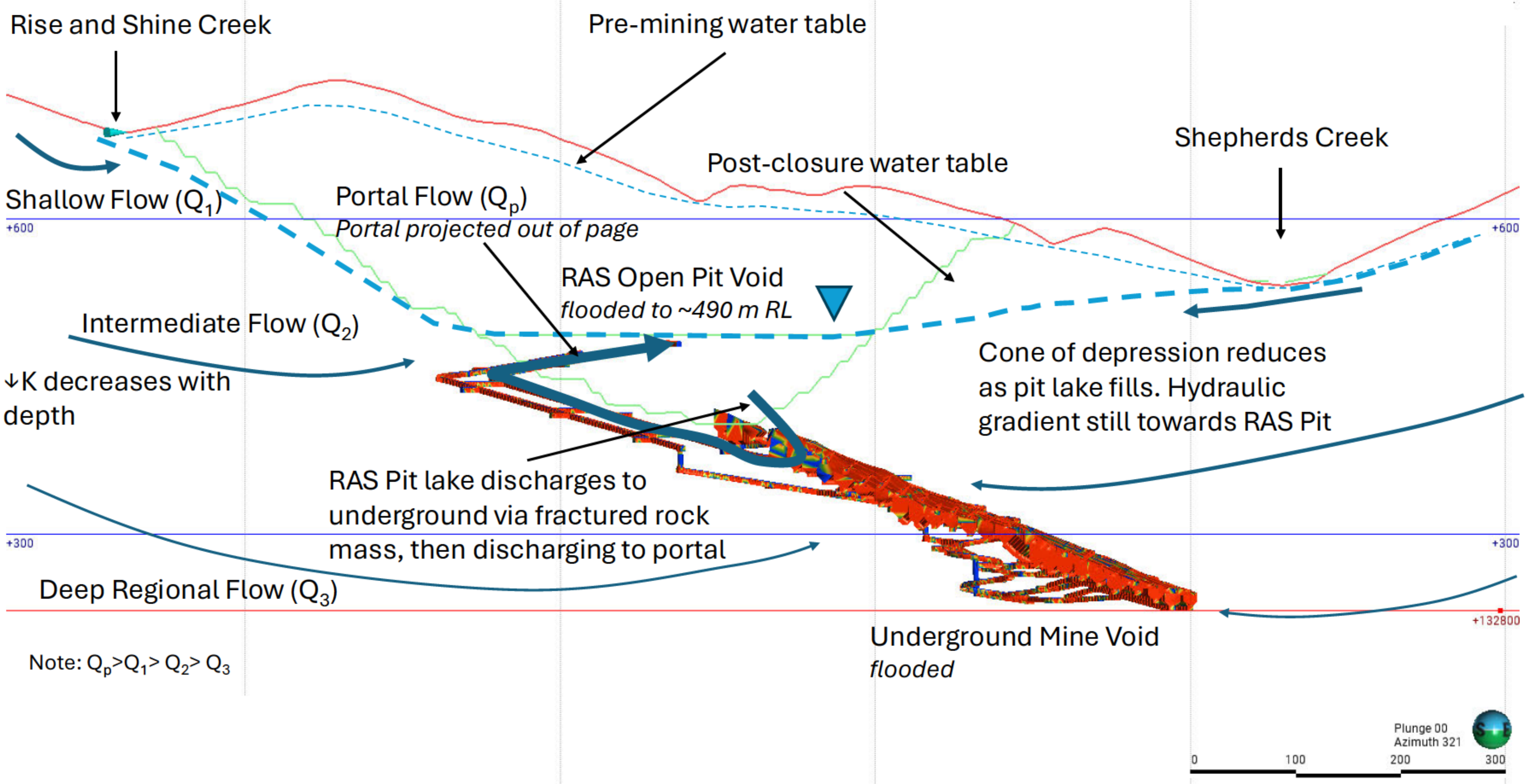
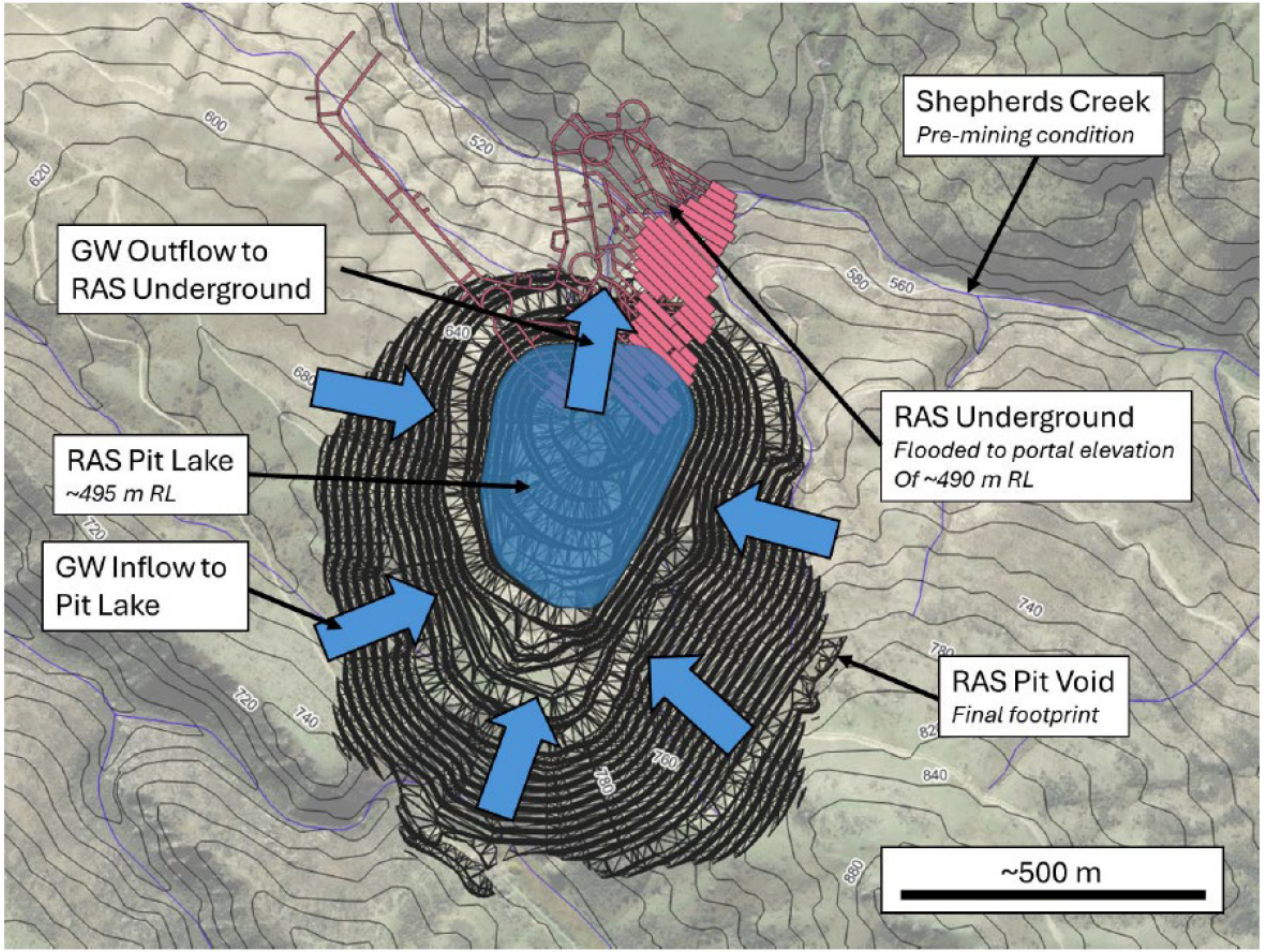


Figure F7: RAS Pit Lake groundwater conceptual model



Source: s53 Statement of Evidence of Ryan Oliver Burgess dated 17 April 2026