Before an Expert Consenting Panel

Under the	Fast-track Approvals Act 2024
And	
In the Matter of	an application for approvals by Matakanui Gold Limited to establish, operate, rehabilitate and ultimately close an open pit and underground gold mining operation known as the Bendigo-Ophir Gold Project

Memorandum of Counsel on behalf of **Matakanui Gold Limited responding to Request for Information on Hazardous Installations**

Dated: 22 June 2026

Lane Neave
Level 1, 2 Memorial Street
PO Box 7348
Queenstown
Solicitor Acting: Joshua Leckie/Charlotte Coyle/Mia Turner
Email: joshua.leckie@laneneave.co.nz/
charlotte.coyle@laneneave.co.nz/mia.turner@laneneave.co.nz
Phone: 03 409 0321

lane neave.

MAY IT PLEASE THE EXPERT PANEL

Introduction

1. This Memorandum of Counsel is filed on behalf of Matakanui Gold Limited (**Matakanui Gold**) in response to the request for information issued by the Expert Panel on 26 May 2026 (**RFI Request**) seeking information on hazardous installations.

2. The RFI Request seeks:

> *A site-specific assessment of the risks to the environment from the proposed use of hazardous installations on the site, and in particular, the potential risks arising from natural hazards and activities proposed on the site.*

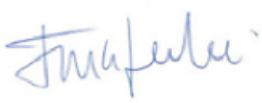
Response to Request for Information

3. Please find attached to this memorandum at **Appendix A** an Environmental Risk Assessment of the Bendigo-Ophir Gold Project hazardous substances storage area, prepared by Richard Justice and Lotta Liddell of ENGEO in response to the RFI Request.

4. The RFI Request requested a response by 10 June 2026. To prepare a thorough and robust response, Matakanui Gold engaged additional technical expertise, and the expert was unable to undertake a site visit until 10 June. On that basis, on 29 May 2026 Counsel requested an extension of time to 22 June 2026.

5. In Minute 32 the Panel indicated it would exercise its discretion to accept a later response.

Dated 22 June 2026



Joshua Leckie / Charlotte Coyle / Mia Turner
Counsel for Matakanui Gold Limited

APPENDIX A: ENGEO Environmental Risk Assessment

22 June 2026

Matakanui Gold Ltd
Attn: Cheryl Low
51 Tancred St
Hokitika

Dear Cheryl,

Environmental Risk Assessment – Process Plant, Bendigo Ophir Gold Project, Central Otago

(Our Reference: 31357.000.001_03)

1 Introduction

ENGEO Ltd was requested by Matakanui Gold Ltd (MGL) to undertake an Environmental Risk Assessment of the hazardous substances storage in the Process Plant areas of the proposed Bendigo Ophir Gold Project, Central Otago (BOGP). This work has been carried out in accordance with our signed agreement dated 5 June 2026.

The purpose of the services is to support MGL with their response to an RFI posed by the Environmental Protection Authority (EPA) as part of the Fast-Track Resource Consenting process. The RFI addressed in this assessment is quoted below:

A site-specific assessment of the risks to the environment from the proposed use of hazardous installations on the site, and in particular, the potential risks arising from natural hazards and activities proposed on the site.

Even though this is not an Environment Court hearing, we confirm that we have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023. The report we have prepared is within our area of expertise, except where we state that we are relying on material produced by another person. We have not omitted to consider material facts known to us that might alter or detract from the opinions expressed in this report.

1.1 Scope of Assessment

As discussed in Section 3.2, the areas where significant quantities of hazardous substances are proposed to be stored are the Process Plant area in Shepherds Valley and the explosives magazine and emulsion mixing facility located on the Ardgour Terrace.

However, the hazardous substances risk assessment presented herein only addresses the Process Plant area in Shepherds Valley for the following reasons:

- The Reagent Area in this location is where the largest volumes of hazardous substances will be stored.

- This area is at highest risk with respect to geohazards.
- We understand that the explosives magazine and emulsion mixing facility will be managed in accordance with the stringent regulations relating to design and location of such facilities, as well as controls over the substances themselves.
- The explosives magazine and emulsion mixing facility are located on Ardgour Terrace, approximately 1.2 km from the Process Plant area; therefore, cumulative effects from the two storage locations are very unlikely. We note that under the Health and Safety at Work (Hazardous Substances) Regulations 2017 require minimum distances between locations where explosive substances are stored and public traffic routes and places where people may occasionally be present. WorkSafe has prepared a tool that can be used to assist in calculating these distances, and we assume that these calculations have been done as a part of the site layout planning.
- We have assumed that any risk assessment required with respect to the explosives magazine and emulsion mixing facilities will be carried out as a separate exercise during detailed design.
- The additional hazardous substances used and stored in Ardgour Terrace and the Shepherds engineered landform will mainly relate to diesel storage, refuelling, and maintenance of vehicles. The scale and nature of these activities will be similar to vehicle maintenance workshops and contractor's yards across the country and will be managed in accordance with the site-specific Hazardous Substances Management Plan.
- As above, due to the distance between Ardgour Terrace / Shepherds engineered landform and the Process Plant area, cumulative effects from the two storage locations are considered to be very unlikely.

Under a separate scope of work, ENGEO has prepared a draft Hazardous Substances Management Plan (HSMP) for the Matakanui Gold site. This document should be read in conjunction with the HSMP.

1.2 Scenarios Considered

To address the RFI, we have assessed risks based on two scenarios:

1. Environmental risk associated with the storage and handling of hazardous materials in the Process Plant area. This has involved identifying potential receptors, pathways, and consequences to identified receptors for each potential contaminant. This form of risk assessment typically considers human actions that may lead to contamination such as vandalism, traffic accidents, etc.
2. Environmental risk associated with an uncontrolled release of hazardous substances in the Process Plant area in the event of the storage facilities being breached because of a geohazard (e.g. landslide, earthquake fault rupture, or rockfall).

2 Works Undertaken

To assess environmental risks associated with the two scenarios described above, we have undertaken the following:

- Desktop review of background / fast-track approval (FTA) application documents supplied by MGL.
- Environmental risk assessment for storage and handling of hazardous materials in the Process Plant area, which comprised:
    - Identification of relevant site hazards, on- and off-site potential sensitive receptors and exposure pathways;
    - Assessment of the mitigation measures to be implemented at the site; and
    - Qualitative assessment of environmental risks associated with hazardous substance storage and use with and without mitigation measures.
- Geohazard Risk Assessment, which comprised:
    - Review of historical aerial imagery for the site.
    - A half-day site visit, focusing on the area around where hazardous materials are proposed to be stored and the activities that will be undertaken in these area.
    - Development of a geohazard model for the site, focusing on the areas where hazardous material installations are proposed.
    - Assessment of geohazards that may impact areas of hazardous material storage, including an assessment of their likelihood of occurrence, and characteristics.
    - Qualitative Risk Assessment using the National Policy Statement – Natural Hazards (NPS-NH), which came into effect in January 2026.
    - Recommendations for additional mitigation measures to be implemented in the areas of hazardous materials storage and use based on the identified geohazards.

3 Background

3.1 Supplied Documents

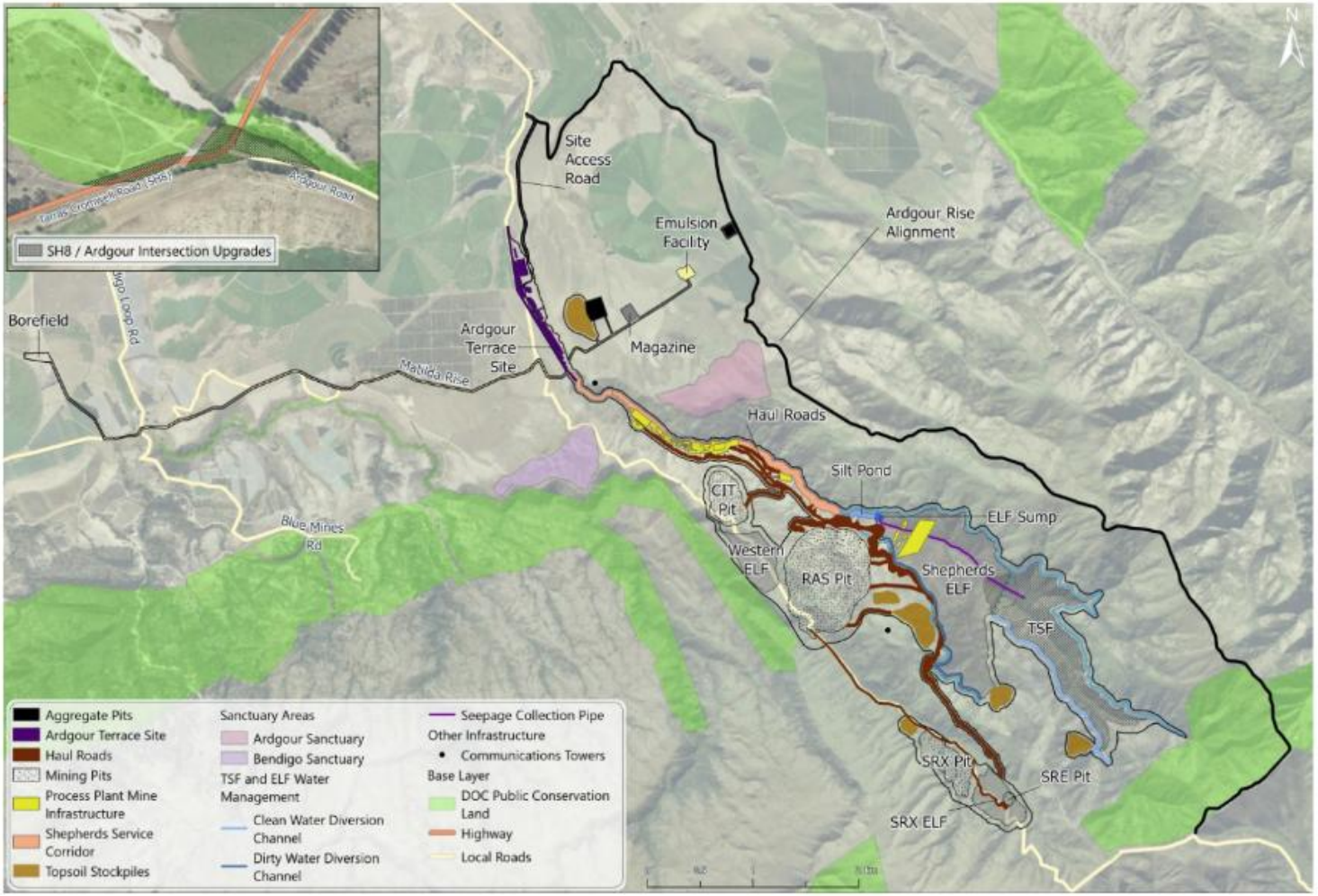
In preparing this assessment, we have been provided with the following documents by MGL:

- BOGP Site Process Plant, Infrastructure and Infrastructure Geotechnical Report (Engineering Geology 2025).
- Joint Witness Statement (Planning no 1) which at paragraph 12 talks to the storage of hazardous substances at the site.
- The following excerpts from MGL's Substantive Application for FTA:
    - Part A – Section 1, which provides an overview of the project;
    - Part A – Section 2 which outlines the key characteristics of the Project Site for the BOGP and the area surrounding it; and
    - Part A – Section 3, which provides a description of the activities associated with the proposed construction, operation, maintenance, and the eventual closure of the BOGP. Of particular relevance is Section 3.9 which describes the processing facilities, locations and activities.

3.2 Site Description and Layout

The majority of the mining activities, ancillary facilities and associated infrastructure will be located in Shepherds Valley, with an additional area located on the adjoining Bendigo / Ardgour terraces. as shown on Figure 1. The site can be considered to consist of three parts as discussed in the following sections.

Figure 1: Site Layout Plan (Figure 3-1 extracted from Part A – Bendigo-Ophir Gold Project – Substantive Application)



3.2.1 Upper Shepherds Valley

This part of the site contains the mine operations (Rise and Shine (RAS) pit, Come-In-Time (CIT) pit, SRX pit and SRE pit), engineered landforms (ELFs) and the tailings storage facility (TSF). We understand that as the project progresses supporting infrastructure including a heavy vehicle workshop, temporary equipment servicing infrastructure and a refuelling facility, established on the Shepherds ELF.

3.2.2 Shepherds Valley Site

The Shepherds Valley Site will comprise two distinct areas: the “Shepherds Service Corridor” and the “Process Plant Area”.

The Shepherds Service Corridor will be established along an approximately 3.1 km length of the Shepherds Creek and comprise up to 20 m of compacted earth fill on the valley floor to provide for the safe routing of services and materials through Shepherds Valley.

The Process Plant Area will be sited within the wider Shepherds Service Corridor and contain:

- A Reagent Area. Individual reagents will be stored separately in dedicated bunded areas. The bunds will be designed to contain 110% of the largest tank volume within that area and designed to comply with the crest locus limits (shown by the pink shadows on Figure 2). The area also includes a dry reagents storage shed.
- A hard rock gold processing plant using gravity and Carbon-in-Leach (“CIL”) technology. Processing of ore material in the processing plant will be undertaken in stages and the CIL tailings will pass through cyanide destruction and soluble arsenic removal before being pumped as slurry to the tailings storage facility (TSF). The CIL tanks, cyanide destruction tanks, flocculant mixing plant, tailings thickening tank, tailings hopper and pumps will be sited within a concrete bunded area with sumps to contain potential spills and surface water runoff. Any spillage and runoff captured in the sumps will be recycled and reused within the processing plant with no discharges to land or water.
- A Run-of-Mine (ROM) pad, sized to contain up to one month of stockpiled ore to provide a buffer between the mines and the processing plant.
- Supporting infrastructure including offices and staff amenity areas.

We understand that as the project progresses the following operations will be added at a yet undecided location (possibly alongside the processing plant but likely closer to the mine entrance):

- A cement paste plant to support the cement paste backfill operations at the RAS Underground. The paste plant may be sited within the same bunded concrete pad as the processing plant, with associated sediment and spillage sumps.
- A mobile concrete batching plant to create shotcrete for use as part of the portal establishment, drive development and cement paste backfill operations at the RAS Underground. The concrete batching plant will be sited within a bunded concrete pad which will direct runoff to a sump to catch all spillage and water.

Surface water runoff at the processing plant site from outside the bunded area will be captured by sediment retention pond(s) located immediately downstream of the received goods warehouse.

To accommodate the processing plant and supporting infrastructure and buildings, a site platform will be established covering an area approximately 1,000 m long and 120 m wide. We understand that the platform will comprise an earthfill of up to approximately 20 m in height.

The general arrangement of the processing plant, ROM pad and other associated infrastructure is illustrated in Figure 2 below.

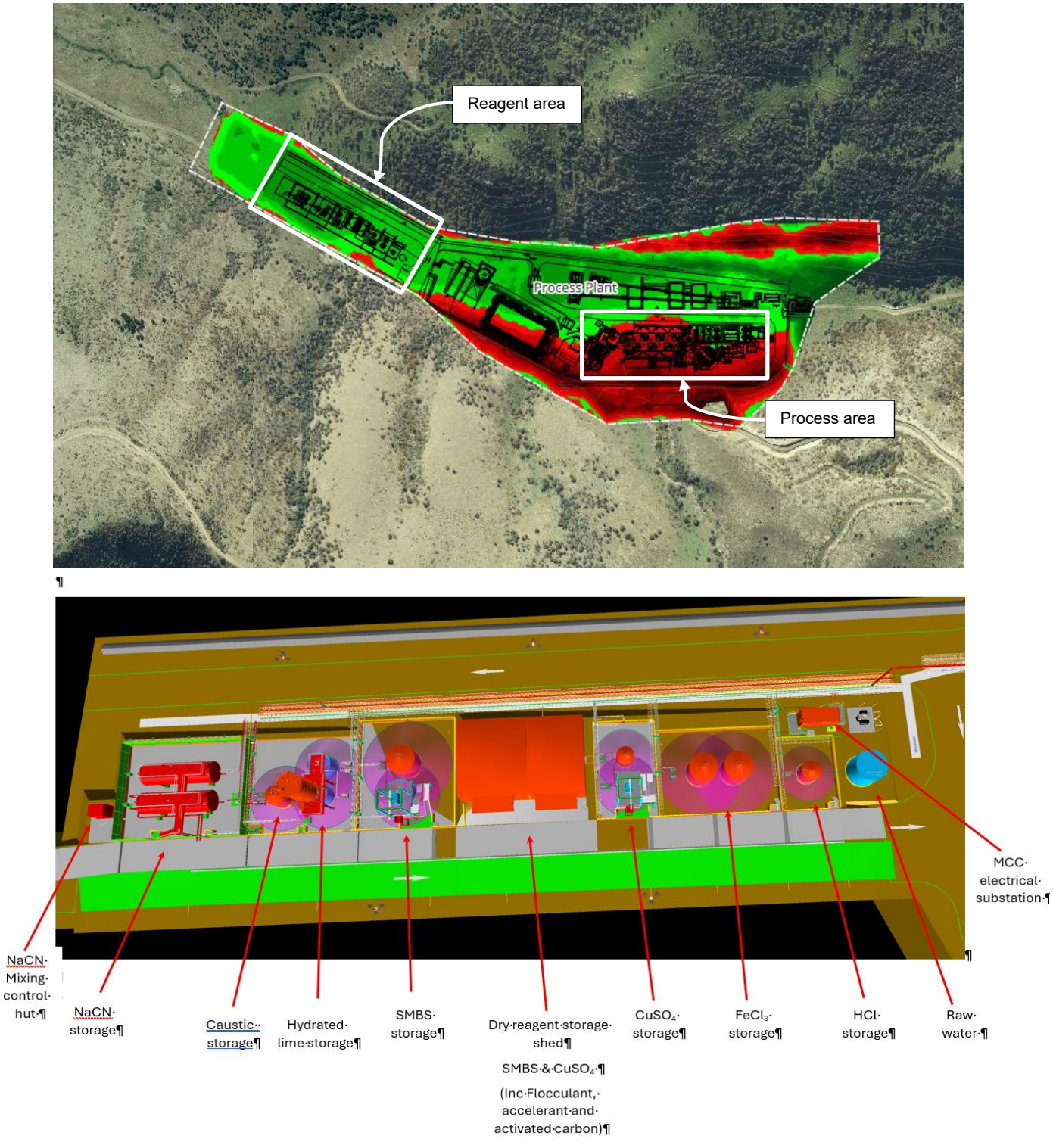


Figure 2: Process Plant Layout (as of June 2026). Images provided by MGL

3.2.3 Ardgour Terrace Site

This is an approximately 27-hectare area parcel of land located on agricultural land outside the the Shepherds Valley which will contain supporting infrastructure for the project, including a double skinned self-contained fuel storage and refuelling facility (i.e. fuel farm).

Also on the Ardgour Terrace but at some distance (approximately 0.7 km) from the facilities described above will be a fenced and secured explosives magazine and separate explosive emulsion mixing facility.

4 Process Plant Area Hazardous Substances Risk Assessment

4.1 Hazards and Potential Exposure Pathways

The following hazardous substances will be stored in the Process Plant Area:

Reagent Area

- Storage of large volumes of liquid hazardous substances:
    - Sodium cyanide solution (30%)
    - Caustic soda (Sodium hydroxide)
    - Hydrated lime solution (20%)
    - Sodium metabisulphite solution (15%)
    - Copper sulphate solution (12%)
    - Ferric chloride
    - Hydrochloric acid
- Storage of hazardous substances in solid form:
    - Hydrated lime
    - Sodium metabisulphite
    - Copper sulphate
    - Magnafloc338 (flocculation agent)

Process Area

- Polyaluminium chloride (flocculant)

Hazards

The following potential hazards have been identified which may impact on the hazardous substances storage on-site:

- Vehicle movements (e.g. delivery trucks, forklifts, general site traffic). Incidents associated with this hazard include vehicles hitting tanks or pipework, and accidents during transport of hazardous substances (e.g. due to unsafe loads).
- Unsafe actions (e.g. people smoking near flammable substances, operator error during hazardous material handling, errors associated with medical issues / illness or use of recreational or prescribed drugs, vandalism, accidents associated with poor packaging or faulty products).
- Ground instability (rockfalls, landslides etc.) – refer to Section 5 of this report for a detailed geohazards assessment.
- Natural Disaster (e.g. earthquake or volcanic eruption) - the New Zealand Regulations relating to hazardous substances management were written in cognisance that natural disasters happen within New Zealand and hence include more stringent requirements in some instances to mitigate this. For the purposes of this assessment, it is assumed that all plant, equipment, and site structures have been appropriately designed for seismic loading and in accordance with appropriate seismic design standards. On this basis natural disasters are not considered further in the risk assessment. As noted above, risks from geohazards are considered in Section 5.

Exposure Pathways

The identified exposure pathways comprise spills and leaks, which in turn may result in hazardous substances being transported to the wider environment through surface water runoff. It is possible that spills of solid hazardous substances, if they occur outside the dry reagents storage shed, may be mobilised as windblown dust, however as the volume handled at a given time (1.2T bulk bags) is relatively small this pathway is likely to be limited to the local area around the storage shed.

Several of the ways in which spills or leaks can occur are mentioned above in the list of hazards (e.g. spillage of hazardous substances during delivery, leaks due to damaged containers or pipework, spills during manual handling [relevant to solid substances only as the liquid substances will be pumped from storage the process area]).

4.2 Potential Sensitive Receptors

The potential sensitive receptors that have been identified are:

- Site workers - Neighbouring residents are not considered to be a sensitive receptor due to the remoteness of the site.
- Shepherds Creek and tributaries - In the Shepherds Service Corridor, the 3.1 km length of Shepherds Creek will be permanently realigned against the northern true right valley wall during construction of the service corridor. This relocation of the stream will likely help protect the stream and related ecosystems as the stream will be located further from the Process Plant area.

- Surrounding DOC public conservation land - It is recognised that the DOC land around the site may contain sensitive flora and fauna; however, as the Process Plant is located in a valley, it is unlikely that significant effects will occur upgradient. Down-gradient effects could occur in the case of hazardous substances spills or leaks.

We understand from the substantive application for FTA documents reviewed that the site is underlain by the Bendigo Aquifer. We also understand from these documents that '…*the hydrological conductivity of the schist rock in the Project Site is also very low*'. On this basis groundwater has not been considered as a sensitive receptor for this assessment.

4.3 Mitigation Measures Implemented On-Site

4.3.1 Site Design

As the location of the mine is dependent on the presence of gold-bearing rock, the site location is fixed; however, effort has been made in the design and location of the various components of the gold mining operations within the site boundary, to mitigate the potential risks associated with storage of hazardous substances.

The site layout has been designed so that the Process Plant is located at a significant distance from locations where explosives are stored and used. Within the Process Plant area itself, the Reagent Area, has been located at the 'downstream end', with the gold processing plant and ROM pad upstream, closer to the mining activities. This means the trucks delivering chemicals enter as small a part of the Process Plant area as possible whilst vehicles carrying ROM generally don't need to pass the Reagent Area. This reduces both the risk of vehicle-on-vehicle collisions and the potential for vehicle damage to hazardous substances storage tanks.

Hazardous substance unloading areas are located away from the main transport routes on-site to further reduce the likelihood of vehicle interactions.

The reagent storage is located on a concrete slab with individual bunds for all substances except caustic soda and hydrated lime, which will be together as they are compatible substances. All the bunds have been sized so that they can contain a volume of at least 110% of the volume of the largest tank contained. All bunds are fitted with a level monitor which triggers an alarm if the level of liquid in the bund reaches a certain height. An operator will visit the relevant bund and assess if the liquid in the bund is rainwater or spilled chemical and manage it accordingly. All bunds have a sump pump to enable the removal of spills or stormwater.

The concrete ground surface of the unloading access road is contoured to direct overland flow to channel drains, which in turn discharge to the bund surrounding the tank for the substance being unloaded in each area. Therefore, if spills occur during unloading, hazardous materials will be captured in bunds and not be allowed to mix with other substances.

Safety showers are provided at each bunded tank location to allow rapid decontamination of persons exposed to a toxic or corrosive substance.

All tanks in the Reagent Area are individually bunded (except caustic soda and hydrated lime which can be stored together as they are compatible substances). The tank bunds have a volume of at least 110% of the volume of the largest tank contained.

The CIL tanks, cyanide destruction tanks, flocculant mixing plant, tailings thickening tank, tailings hopper and pumps forming the main operational part of the Process Plant will be sited within a concrete bunded area with sumps to contain potential spills and surface water runoff. Any spillage and runoff captured in the sumps will be recycled and reused within the processing plant with no discharges to land or water.

Surface water runoff at the Process Plant from outside the bunded area will be captured by sediment retention ponds located immediately downstream of the received goods warehouse.

4.3.2 Hazardous Substances Management

A draft site-specific Hazardous Substances Management Plan (HSMP) has been prepared for the site. This is a working document that will be reviewed and updated through the design and operation of the gold mine. The HSMP includes a hazardous substances inventory for the site and documents the structural and procedural measures that will be implemented at the site to address New Zealand Regulations relating to the management of hazardous substances. The objectives of these measures are to reduce, as far as practicable, the risk of incidents associated with hazardous substances occurring at the site. These measures include:

- Storage, management and monitoring requirements for the hazardous substances present.
- Certification requirements for stationary tanks and hazardous substance locations (as defined in the regulations).
- Requirements for routine inspections of areas where hazardous substances are stored.
- A spill procedure for managing smaller spills.
- Training of staff in:
    - Management and handling of hazardous substances and associated potential health effects.
    - Emergency procedures, including the spill response procedure and emergency response plan.
    - Use and care of personal protection equipment (PPE) required to safely handle the hazardous substances at the site.

4.3.3 Emergency Management Planning

A site-specific Emergency Response Plan (ERP) will be prepared for the site, which will cover emergency management requirements. This document will be prepared closer to commencement of work at the facility and will likely be based on the WorkSafe New Zealand Emergency Response Flip Chart[1].

[1] Available at: https://hazardoussubstances.govt.nz/media/nz2j1cz3/wsnz_2510-emergency-response-a4-digital-v4-0-fa-lr.pdf

4.4 Hazardous Substances Risk Assessment

The risk assessment framework included in Attachment 2 was used to qualitatively assess the hazards and risks associated with the use and storage of hazardous substances in the Process Plant. The results of the risk assessment, including a description of mitigation measures, is provided in Attachment 3. As shown in Attachment 3, the assessed risk with mitigation measures in place is “Low” for all identified hazards.

Our assessment assumes that the following issues will have been addressed in the design of the facility and hence are not considered in this risk assessment:

- Damage to hazardous substances containers or control measures as a result of insufficient structural or geotechnical design. It is assumed that the structural and geotechnical design works carried out by third parties have adequately mitigated such risks.
- Structural integrity of bunds / storage containers. It is assumed that these will have been designed and constructed in accordance with the requirements of the Health and Safety at Work (Hazardous Substances) Regulations 2017 and relevant New Zealand standards.
- Hazards and risk associated with the proposed mining operations (e.g. use of explosives, heavy plant etc.) occurring away from the process area.

5 Geohazard Assessment

5.1 Regional Geology and Seismicity

5.1.1 Geology

As indicated on Figure 3, the bedrock geology at the site generally comprises Permian to Triassic era Haast Schist (Rakaia Terrane). The inactive Thompsons Gorge Fault is mapped by GNS (GNS Science, 2020) along the lower part of Shepherds Creek separates Textural Zone (TZ) units TZ3 and TZ4. TZ3 schist is found to the northeast of the fault and comprises undifferentiated pelitic and psammitic schist and greenschist sequences. TZ4 schist is found to the southwest of the fault and has similar geology to TZ3. In broad terms, form a geotechnical perspective, stability in TZ3 is typically foliation controlled, which TZ4 has more complex behaviours.

The terraces to the west of the Dunstan Range which form Bendigo and Ardgour Terrace comprise Early Pleistocene (2.58 to 0.77 million years) glacial outwash gravels (Q16). Recent alluvial deposits are found within the Shepherds Valley floor, typically unconsolidated, variable weathered gravels with interbeds of sands, silts and clays.

Colluvium is found along the base of the valley slopes with material ranging from shattered rock to clay and boulder breccias depending on the source material (EGL, 2025).

A large scale landslide is indicated by GNS on the slopes to the north and west of the proposed process plant. We consider that this is a dormant / relict feature and provide further comment in Section 5.5.2.

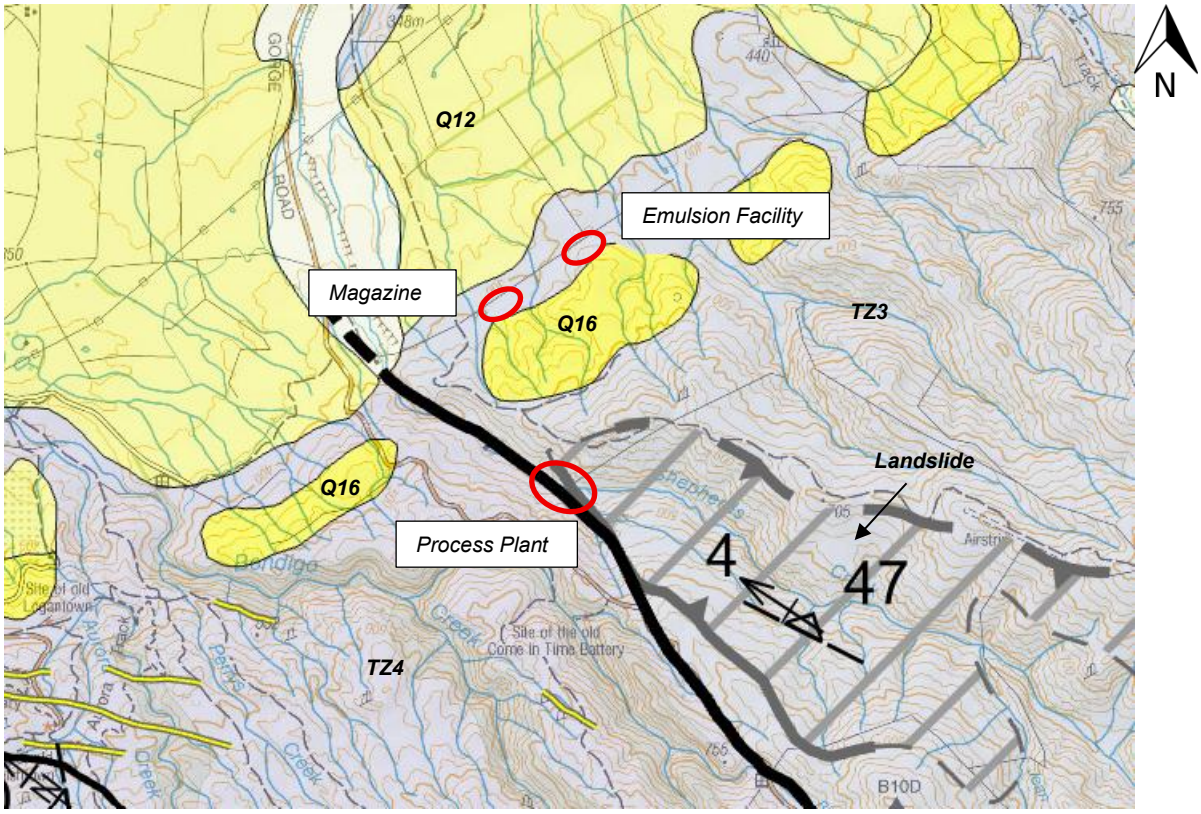


Figure 3: Regional Geological Setting (GNS webmaps)

5.1.2 Seismicity

The GNS active faults database suggests that the closest active fault to the site is the Pisa Fault approximately 8 km to the west which has a recurrence interval between 10,000 and 20,000 years as indicated by GNS[2]. The Dunstan Fault is located approximately 12 – 13 km southeast and is indicated by GNS to have a return period between 5,000 and 10,000 years.

5.2 Aerial Photography Review

Selected historical aerial photographs of the site have been reviewed from 1958 (the earliest available photograph) to present day. These photographs were viewed under the context of identifying changes to landforms and land use within the site.

The aerial photography shows the Shepherds Valley has remained largely unchanged as dry pastural land. There are notable vegetation cover fluctuations, especially within the valley base during these dates. Between 2021 and 2023 there is the development of two small ponds in the northwest section of the valley beneath a small tree grove where surface water accumulates due to the construction of a small dam downstream from the area of the proposed Process Plant. The photography shows the Ardgour Terrace Site has been generally used for agriculture and pastural purposes.

We note in the latest Google Earth imagery, a series of small, avulsed flows from the gully to the southwest of the Process Plant. This is discussed further below and in Section 5.5.2.

[2] GNS Science - Active Faults Database, accessed June 2026.

5.3 Site Reconnaissance

ENGEO visited the site on 9 June 2026 and made the following observations (see attached photos):

- The Process Plant site is located at the base of the Shepherds Vally, which ranges in width between 45 and 75 m in this location. The base of the valley is relatively level.
- Hill slopes on the northern side of the valley are typically up to 30° and steeper than the hill slopes on the southern side of the valley, which appear to average at around 15°.
- The entrance to Shepherds Valley is steep slopes with exposed rock and evidence of rockfall. Multiple rockfall source locations were observed along the valley walls. Figures 4 & 5 show loose rock on the hill slopes at the entrance to the valley.
- Isolated fallen rocks of up to approximately 1 m diameter can be observed in the area of the Process Plant. However, boulders are typically located within a few metres of the toe of the northern valley slope, suggesting that they have low kinetic energy.
- Multiple landslides were noted on the northern valley slope (Figure 6). These features appear to be deep seated, and it is likely that they are structurally controlled by defects within the TZ3 rockmass. The geomorphology of these landslides is subdued, suggesting that they are inactive - relict features (Refer Figure 2.15 of NZGS Slope Stability Guidance Unit 1).
- A potential debris flow catchment was observed in the upper valley area (Figures 8 & 9). Evidence of some recent sedimentation is apparent in the lower parts of the channel, suggesting relatively recent (but small) debris flow, consistent with what can be observed in the Google Earth imagery (refer Section 5.2)
- Ardgour Terrace to the west of Shepherds Valley has a gently sloping to flat morphology and is currently being used as pastural land (Figure 10).

Figure 4: View of Shepherds Valley from Ardgour Terrace. Rockfall sources areas are apparent on both slopes at the entrance to the valley.

Figure 5: Rockfall source area on true left of Shepherd Gully Creek (approximate extent outlined in dashed blue line)

Figure 6: Dormant / relict landslides on the northern flank of Shepherds Valley above area of the proposed Process Plan

Figure 7: Fallen boulders at the toe of the northern valley slope

Figure 8: Debris flow catchment to west of the CIT Pit

Figure 9: Lower debris flow catchment at southern end of Process Plant

Figure 10: Ardgour Terrace site (approximate location arrowed).

5.4 Subsurface Materials

5.4.1 Ardgour Terrace

While no specific investigations are understood to have been undertaken at the site of the proposed emulsion facility, we anticipate that it is either underlain by a considerable thickness (many 10's of metres) of terrace gravels or underlain by rock. Furthermore, a considerable depth to groundwater is anticipated (10's of metres).

5.4.2 Process Plant

The EGL (2025) investigations in the proposed process plant area indicate that the valley floor is generally underlain by stream-derived alluvial deposits, with alluvial fan material and colluvium present near the valley margins. The surrounding slopes typically comprise a thin veneer of loess over weathered schist.

Boreholes at the Process Plant and downstream Infrastructure area encountered between approximately 6 m and 10 m and of alluvium, overlying TZ3 schist. Piezometers installed by EGL indicating 'artesian' groundwater pressures in the schist, ranging from slight downstream pressures to more notable pressures, (but still in rock) at the Process Plant.

5.5 Geohazard Model

The preliminary natural hazards assessment presented below is based on EGL (2026) report and site observations described in Section 5.3. An interpreted Geohazard model is provided in Attachment 2.

5.5.1 Ardgour Terrace

No significant geohazards are identified at the location of the proposed emulsion area. Flooding is the only hazard identified, however the emulsion facility is located at the crest of a broad erosion gully, and as such is not likely to be subject to concentrated water flow. We have therefore not considered natural hazard risks at the emulsion facility in any further detail.

5.5.2 Process Plant

We make the following considerations in regard to natural hazards that could affect the area of the Process Plant.

Flood Inundation

Flooding in Shepherds Gully Creek will need to be allowed for in the hydrological design of the Shepherds Valley Site where the Process Plant is located. We understand that suitable hydrologic considerations have, or will be, incorporated into the civil engineering design.

Similar considerations will need to be made for the catchment adjacent to the CIT pit on the southern side of the Process Plant – we assume that this is allowed for in the design of the Process Plant Engineering Fill.

Slope Stability

As outlined in Section 5.3, the Process Plant is in relatively close proximity to a number of slope instabilities, outlined as follows:

1. **Deep – seated landslides from the Northern Slopes**. Whilst relatively large scale, these landslides appear to be inactive – relict, and it is likely that they have an age range on the order of thousands to 10s of thousands of years. They therefore have very likely experienced several large magnitude earthquakes (such as Alpine Fault movement), with no evidence of significant movement observed.

2. **Rockfall**. Isolated rockfall sources were identified on the northern slopes above the Process Plant. However, field observations suggest (a) these rocks are released infrequently and (b) have low kinetic energy, such that they do not travel far across the valley floor. As the Reagent and Process areas are located on the distal (southern) side of the Process Plant from the identified areas of rockfall, and that the plant will also be raised from current topography, it is considered very unlikely that rocks would reach either of these areas, and more unlikely again that they would have significant energy to rupture any tanks present.

3. **Debris Flow from the gully adjacent to the CIT Pit:** A notable alluvial fan extends from the prominent side gully to the west of the proposed CIT pits into the main gully of Shepherds Valley. In addition, evidence of small-scale debris flow is apparent in recent aerial photography and during our site reconnaissance. We consider that the catchment is not large enough to generate sizeable debris flows, and in addition, the CIT Pit will redirect some of the runoff from this catchment. However, for risk assessment purposes, we have conservatively assumed that a debris flow large enough to cause significant inundation into the area of the Process Plant may have a return period of between 50 and 100 years.

Earthquake Effects

Earthquake effects that may affect the Process Plant may include the following:

- **Liquefaction induced subsidence.** Soils most susceptible to liquefaction are clean, loose, saturated, uniformly graded fine-grained cohesionless materials, which is not apparent in the area according to the investigations undertaken by EGL. However, EGL consider that up to 90 mm of liquefaction induced settlement could occur under ULS earthquake loads in the central part of the valley. EGL recommend that foundation design should account for liquefaction effects, which we consider is prudent[3]. We have therefore not considered risks associated with this hazard in greater detail.

- **Fault Rupture.** The nearest active fault (Pisa Fault) is located approximately 8 km northwest of the site. Therefore, the likelihood of fault rupture at the site is considered negligible and therefore risks associated with this hazard has not been considered further.

5.5.3 Shepherds Service Corridor

Several rockfall source areas were identified at the entrance to Shepherds Valley. However, this area is downstream of the proposed Process Plant, and rockfall here would only affect trucks resupplying reagents to site. We understand that there will be up to one supply truck per week per reagent, so exposure time below these rockfall zones is very short (less than a few minutes), hence risks are likely to be very low.

5.6 Risk Assessment

We have undertaken an assessment of geohazard risks using the framework provided in the National Policy Statement for Natural Hazards (NPS-NH), which came into effect in January 2026.

We understand that the NPS-NH is not considered to strictly apply to the BOGP as mining (and ancillary activities) are captured by the definition of primary production under the NPS-NH and National Planning Standards, and the NPS-NH does not apply to primary production activities. However, whilst other frameworks are available, we consider that the NPS-NH provides a consistent and familiar framework for planning considerations. As the NPS-NH considers longer duration activities than the proposed mine, the results of assessment are likely to be conservative to some extent.

We have slightly amended considerations of consequence in the NPS-NH framework as discussed in the following section.

5.6.1 Assessment of Consequence

The NPS-NH Statement does not specifically consider environmental consequences associated with uncontrolled spillage of hazardous chemicals. Therefore, we have included some considerations of consequences in the event of spill, ranging from widespread environmental damage (catastrophic') to 'negligible', where any on-site release is fully contained by bunds etc. The amended NPS-NH framework is provided in Attachment 3.

[3] It could alternatively be addressed as part of the earthworks design.

5.6.2 Results

The results of risk assessment are provided in Attachment 3 for the natural hazards identified in Section 5.5.2. In summary, without mitigation natural hazard risks are considered to be Low for all assessed hazards other than debris flow from the gully to the west of the proposed CIT Pit. A Medium risk is assessed for debris flow from this catchment.

5.7 Risk Evaluation

In accordance with the NPS- NH framework, risks of:

- **Medium** must be avoided or mitigated proportionate to the level of risk. In this case, we consider that the expected relatively small debris flows that may occur down the catchment to the west of the CIT Pit can be readily dealt with in the civil design that will be required for the Shepherds Gully Service Corridor. Appropriate mitigations could include:

  i. Increasing the design capacity of clear water structures to allow for sediment laden flow, or

  ii. Construct a catch fence or grizzly screen upstream of the Process Plant to catch coarser particulate.

- **Low** can be accepted without risk mitigation.

6 Recommendations

We recommend that the following additional mitigations could be considered:

- To avoid potentially exceeding the bund capacity for sodium cyanide (and the resulting discharge of diluted sodium chloride) in the unlikely event that both the water and sodium cyanide tanks fail simultaneously, it is recommended that the water tank is generally kept empty. We recommend it is only filled when a sodium cyanide delivery is imminent. This could be offered as a condition of consent.

- Undertaking modest engineering works as part of the design of the Shepherds Valley Corridor to reduce the consequence of future debris flows from the catchment to the west of the CIT Pit. Possible mitigation options are described above.

7 Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Matakanui Gold Ltd, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the Client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.

iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

iv. This Limitation should be read in conjunction with the Engineering NZ / ACENZ Standard Terms of Engagement.

v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (03) 328 9012 if you require any further information.

Report prepared by

Richard Justice, CMEngNZ (PEngGeol)

Principal Engineering Geologist

Lotta Liddell, CEng CEnv MICE

Associate Environmental Engineer

Report reviewed by

Neil Charters, CMEngNZ (CPEng)

Principal Geotechnical Engineer

Erika McDonald, CMEngNZ

Principal Environmental Engineer

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Attachment 1:

Process Plant Area - Hazardous Substances Risk Assessment

Table 1: Process Plant Area - Hazardous Substances Risk Assessment

Hazard	Potential Contaminant	Risk To? (Potential Receptor)	How? (Potential Exposure Pathway)	Likelihood (Assuming no mitigation measures are in place)	Consequence (Assuming no mitigation measures are in place)	Assessed Risk (Assuming no mitigation measures are in place)	Mitigation	Likelihood Following Mitigation	Consequence Following Mitigation	Residual Risk Following Mitigation
Process Plant Area - Reagents Storage Area										
Spills of sodium cyanide during delivery	Sodium cyanide	Site Workers On-site Drainage Systems Shepherds Creek Flora and Fauna on-site	Operator error Equipment failure	Very Likely	Catastrophic	Very High	• Tanks are purpose designed and constructed and comply with New Zealand Regulations. • The sodium cyanide is delivered to site in pellet form by Orica. • Automated mixing process to avoid manual handling of the sodium cyanide pellets or liquid solution. Once the tanker has been parked in the delivery area and the hoses are connected, the operator manages the delivery from the Sodium Cyanide Mixing Shed. Water is flushed from the mixing tank, into the tanker, thereby dissolving the pellets. The resultant liquid sodium cyanide is pumped to the storage tank at the rear (away from the access road) of the bund. • The sodium cyanide tank and water supply tanks are contained in a bund. The bund has a volume of at least 110% of the volume of the largest tank contained. • The access road along the side of the bund is profiled so that runoff from the area where the tanker parks during the unloading process is collected in one or more strip drains but runoff from other areas are diverted away from these drains. The strip drains intercept potential spills that occur during unloading and convey the spilled material to the bund around the sodium cyanide tank. • Truck drivers (working for the chemical supplier) are trained in the handling of sodium cyanide and how to safely operate the delivery system. • A site-specific Hazardous Substances Management Plan (HSMP), which includes a spill response procedure and Emergency Response Plan (ERP) will be in place. Workers will be trained in their responsibilities under these plans. • Workers using and handling hazardous substances will be trained in their use, appropriate PPE, and potential health issues. • Hydrogen cyanide monitoring stations will be provided in various locations at the site.	Rare	Minor	Low

Hazard	Potential Contaminant	Risk To? (Potential Receptor)	How? (Potential Exposure Pathway)	Likelihood (Assuming no mitigation measures are in place)	Consequence (Assuming no mitigation measures are in place)	Assessed Risk (Assuming no mitigation measures are in place)	Mitigation	Likelihood Following Mitigation	Consequence Following Mitigation	Residual Risk Following Mitigation
Spills of liquid hazardous substances during attachment of delivery hoses and pumping from delivery vehicles	Caustic soda Ferric chloride Hydrochloric acid	Site Workers On-site Drainage Systems Shepherds Creek Flora and Fauna on-site	Operator error Equipment failure	Likely	Moderate	High	• Tanks are purpose designed and constructed and comply with New Zealand Regulations. • The access road along the side of the reagents storage bunds area has been profiled so that the area outside each of the chemical bunds falls towards one or more strip drains but runoff from other areas are diverted away from these drains. The delivery vehicle parks in the area discharging to the strip drains before the delivery hoses are connected. This ensures that if a spill/ leak occurs during unloading it is intercepted by the drains which discharge to the bund of the relevant hazardous substance's storage tank. • Caustic soda, ferric chloride and hydrochloric acid are brought to site in liquid form in iso-containers. Delivery hoses on the vehicle are connected to the tank fill points by the delivery drivers (working for the chemical supplier). • Delivery drivers (working for the chemical supplier) are trained in the handling of the hazardous substance they are delivering, the features of their delivery vehicle and the delivery process. • Spill kits will be available in easily visible, or sign posted places and workers are trained in their use. • A site-specific Hazardous Substances Management Plan (HSMP), which includes a spill response procedure and Emergency Response Plan (ERP) will be in place. Workers will be trained in their responsibilities under these plans. • Workers using and handling hazardous substances will be trained in their use, appropriate PPE, and potential health issues.	Unlikely	Negligible	Low
Spills of solid hazardous substances during unloading and transportation to the dry reagent storage shed and from the storage shed to the mixing plants	Hydrated Lime Sodium metabisulphite Copper sulphate Flocculant Activated Carbon Accelerant	Site Workers On-site Drainage Systems Shepherds Creek Flora and Fauna on-site	Operator error Equipment failure	Almost certain	Minor	Medium	• Solid hazardous substances are stored and transported in the as-supplied 1.2 tonne dry bulk bags, until the substance is loaded into the mixing tank i.e. there is no decanting or handling of the substance before this point. • The mixing equipment for sodium metabisulphite and copper sulphate is in the same bund as the storage tank for that substance so that once the substance is in solution (i.e. it is 'flowable') bunding is provided. • Hydrated lime is pneumatically conveyed from the delivery vehicle to the lime silo. This process is carried out by the delivery drivers (working for the chemical supplier). • The hydrated lime silo is in the bunded area containing the hydrated lime mixing and distribution tank, which avoids the need for manual handling of this material. • Delivery drivers (working for the chemical supplier) are trained in the handling of the hazardous substance they are delivering, the features of their delivery vehicle and the delivery process. • Spill kits will be available in easily visible, or sign posted places and workers are trained in their use. • A site-specific Hazardous Substances Management Plan (HSMP), which includes a spill response procedure and Emergency Response Plan (ERP) will be in place. Workers will be trained in their responsibilities under these plans. • Workers using and handling hazardous substances will be trained in their use, appropriate PPE usage, potential health issues. • Trained and experienced drivers operate the forklifts used to move the dry reagents.	Possible	Negligible	Low

Hazard	Potential Contaminant	Risk To? (Potential Receptor)	How? (Potential Exposure Pathway)	Likelihood (Assuming no mitigation measures are in place)	Consequence (Assuming no mitigation measures are in place)	Assessed Risk (Assuming no mitigation measures are in place)	Mitigation	Likelihood Following Mitigation	Consequence Following Mitigation	Residual Risk Following Mitigation
Leakage of hazardous substances from storage tanks	Sodium cyanide Caustic soda Hydrated lime Sodium metabisulphite Copper sulphate Ferric chloride Hydrochloric acid	Site Workers On-site drainage Systems Shepherds Creek Flora and Fauna on-site	Leakage due to damage to storage containers Vandalism	Possible	Major	High	• Purpose designed and constructed tanks which comply with New Zealand Regulations. • All stationary containment systems (including tanks, their associated pipework and integrated secondary containment, if relevant) over a certain volume are required to be certified by an independent certifier. After a certain timeframe, specified by the certifier depending on the standards to which the system is designed, the tank must be re-certified. • All tanks are bunded. The tank bunds have a volume of at least 110% of the volume of the largest tank contained. • All bunds are fitted with a level monitor which triggers an alarm if the level of liquid reaches a certain height. An operator will visit the relevant bund and assess if the liquid in the bund is rainwater or spilled chemical and manage it accordingly. All bunds have a sump pump to enable the removal of spills or stormwater. • All bunds have two points of egress and a safety shower located close by. • The site will be secured so as to prevent access by unauthorised people (general public, trespassers, hikers etc) as far as practicable. • A site-specific Hazardous Substances Management Plan (HSMP), which includes a spill response procedure and Emergency Response Plan (ERP) will be in place. Workers will be trained in their responsibilities under these plans. • Spill kits will be available in easily visible, or sign posted places and workers are trained in their use. • Provision and use of appropriate personal protection equipment (PPE) for the hazardous substances encountered in the employee's role. • Appropriate signage, as required in the Health and Safety at Work (Hazardous Substances) Regulations 2017, will be installed and maintained.	Unlikely	Negligible	Low
Storage of dry reagents in the reagents shed	Sodium metabisulphite Copper sulphate Flocculant Activated Carbon Accelerant	Site Workers	Damage to storage bags due to forklift impact Mixing of incompatible substances Vandalism	Possible	Minor	Medium	• Hazardous substances are stored in the as-supplied 1.2 tonne dry bulk bags so are not decanted or handled within the storage shed. • Nib walls in the shed separate the different substances stored. • The site will be secured so as to prevent access by unauthorised people (general public, trespassers, hikers etc) as far as practicable. • A site-specific Hazardous Substances Management Plan (HSMP), which includes a spill response procedure and Emergency Response Plan (ERP) will be in place. Workers will be trained in their responsibilities under these plans. • Spill kits will be available in easily visible, or sign posted places and workers are trained in their use. • Provision and use of appropriate personal protection equipment (PPE) for the hazardous substances encountered in the employee's role. • Appropriate signage, as required in the Health and Safety at Work (Hazardous Substances) Regulations 2017, will be installed and maintained.	Rara	Minor	Low

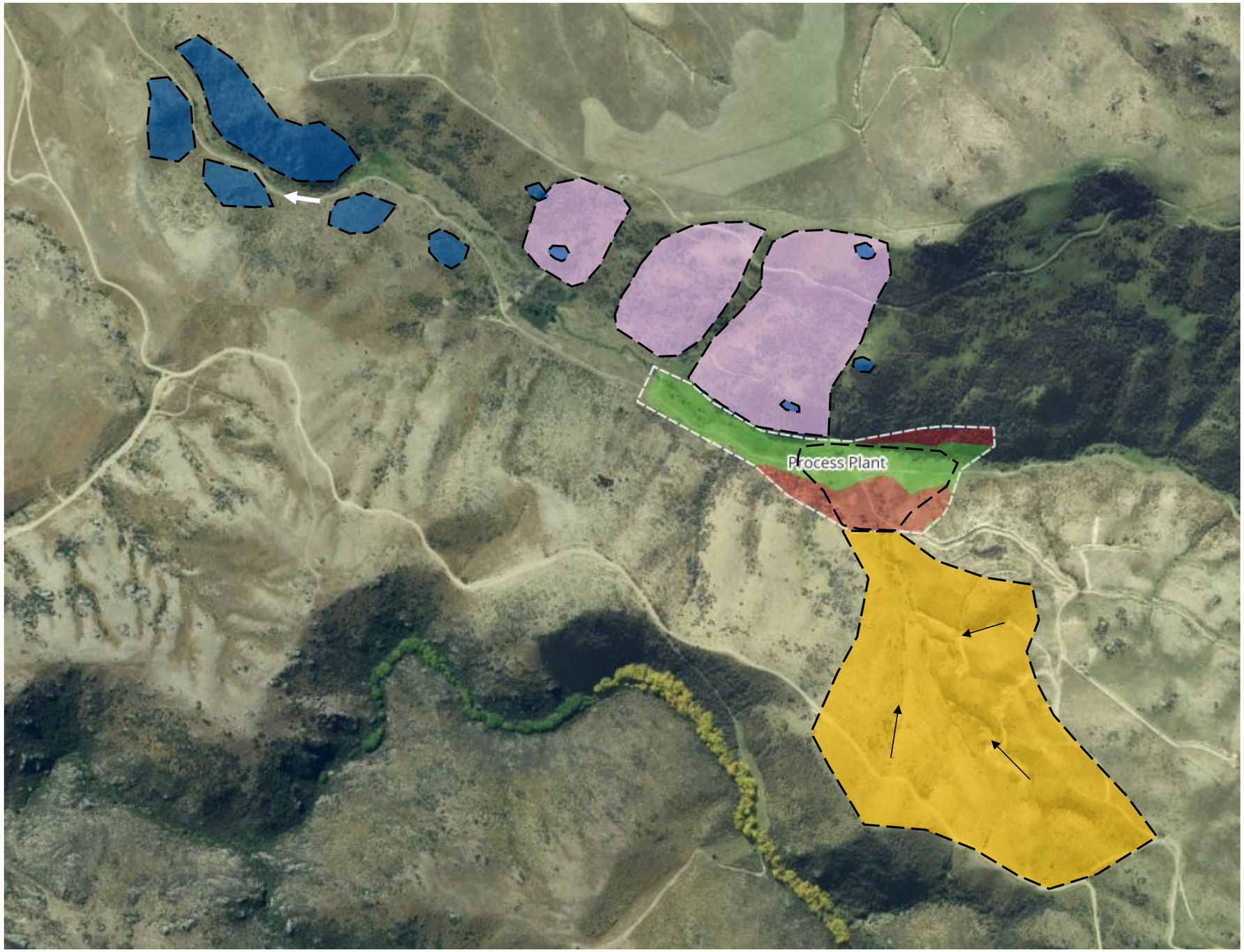
Hazard	Potential Contaminant	Risk To? (Potential Receptor)	How? (Potential Exposure Pathway)	Likelihood (Assuming no mitigation measures are in place)	Consequence (Assuming no mitigation measures are in place)	Assessed Risk (Assuming no mitigation measures are in place)	Mitigation	Likelihood Following Mitigation	Consequence Following Mitigation	Residual Risk Following Mitigation
Vehicle movements	Sodium cyanide Caustic soda Hydrated lime Sodium metabisulphite Copper sulphate Ferric chloride Hydrochloric acid Oils, hydrocarbons, battery fluid	Site Workers Site equipment and storage tanks On-site Drainage Systems Shepherds Creek Flora and Fauna on-site	Damage to storage tanks due to vehicle impact/ driver error. Vehicle collision Leakage of hazardous substances from the vehicle itself.	Possible	Moderate	Medium	• The bunds have been sized so as to provide separation between the storage tanks and the access road. • The access road used for the delivery of hazardous substances is located away from the main transport routes on site to minimize the risk of vehicle collisions. • In the case of the sodium cyanide, the storage tank is located behind the tank used to supply water for the unloading system, which would act as a buffer if a vehicle were able to enter the bund. • Delivery drivers (working for the chemical supplier) are trained in the handling of the hazardous substances and the hazards associated with these substances. • The site will be secured so as to prevent access by unauthorised people (general public, trespassers, hikers etc) as far as practicable. • Speed limits and warning signs. • Spill kits will be available in easily visible, or sign posted places and workers are trained in their use. • A site-specific Hazardous Substances Management Plan (HSMP), which includes a spill response procedure and Emergency Response Plan (ERP) will be in place. Workers will be trained in their responsibilities under these plans.	Unlikely	Minor	Low
Mixing of incompatible substances	Various contaminants	Site Workers On-site Drainage Systems Shepherds Creek Flora and Fauna on-site	Incompatible substances coming into contact.	Possible	Major	High	• Separation of acidic and alkaline substances. The reagents storage area has been designed so that acidic substances are stored on one side of the dry reagent shed and alkaline substances on the other site. • All substances, except caustic soda and hydrated lime are stored in individual bunds. Caustic soda and hydrated lime are stored together as they are compatible substances. • The access road use for hazardous substances deliveries has been profiled so that the area where the delivery vehicle parks during delivery if a particular substance is separated from the areas where the delivery vehicles for other hazardous substances are parked during delivery. Any spills during delivery are diverted to one or more channel drains, which only collect runoff from a single delivery area, which discharge the spill to the bunded area for that substance's storage tank. • From the storage tanks the hazardous substances are piped to the Process Plant in individual pipework. • Spill kits will be available in easily visible, or sign posted places and workers are trained in their use. • A site-specific Hazardous Substances Management Plan (HSMP), which includes a spill response procedure and Emergency Response Plan (ERP) will be in place. Workers will be trained in their responsibilities under these plans.	Rare	Moderate	Low

Hazard	Potential Contaminant	Risk To? (Potential Receptor)	How? (Potential Exposure Pathway)	Likelihood (Assuming no mitigation measures are in place)	Consequence (Assuming no mitigation measures are in place)	Assessed Risk (Assuming no mitigation measures are in place)	Mitigation	Likelihood Following Mitigation	Consequence Following Mitigation	Residual Risk Following Mitigation
Leakage of chemicals from pipework	Various contaminants	Site Workers On-site Drainage Systems Shepherds Creek Flora and Fauna on-site	Accidental damage to pipework Vandalism	Very Likely	Moderate	High	• Pipework on site has been designed and installed in accordance with New Zealand regulations. • All stationary containment systems (including tanks, their associated pipework and integrated secondary containment (if relevant) over a certain volume are required to be certified by an independent certifier. After a certain timeframe (specified by the certifier depending on the standards to which the system is designed, the tank must be re-certified. • Pipe work will be inspected regularly to identify potential spills or leaks. • Spill kits will be available in easily visible, or sign posted places and workers are trained in their use. • Speed limits and warning signs. • The site will be secured so as to prevent access by unauthorised people (general public, trespassers, hikers etc) as far as practicable. • A site-specific Hazardous Substances Management Plan (HSMP), which includes a spill response procedure and Emergency Response Plan (ERP) will be in place. Workers will be trained in their responsibilities under these plans.	Unlikely	Minor	Low
Process Plant Area – General										
Spills / leaks of hazardous substances during processing of ore	Various contaminants	Site Workers On-site drainage Systems Shepherds Creek Flora and Fauna on the site	Operator error Equipment failure	Likely	Major	High	• Hazardous substances are conveyed from the storage tanks to the Process Plant via pipework, thereby eliminating the need for manual handling of the hazardous substances. • The Process Plant will run 24 hours a day, thereby eliminating potential human error during shutdown and start-up. The Process Plant will be manned at all times it is operating. • Scheduled maintenance will be undertaken on the plant and equipment in the Process Plant area. Ad hoc maintenance will also be undertaken as soon as issues are identified. • The Process Plant will be inspected regularly to identify potential spills or leaks. • The CIL tanks, cyanide destruction tanks, flocculant mixing plant, tailings thickening tank, tailings hopper and pumps will be sited within a concrete bunded area with sumps to contain potential spills and surface water runoff. Spillage and runoff captured in the sumps will be recycled and reused within the processing plant with no discharges to land or water. • Spill kits will be available in easily visible, or sign posted places and workers are trained in their use. • A site-specific Hazardous Substances Management Plan (HSMP), which includes a spill response procedure and Emergency Response Plan (ERP) will be in place. Workers will be trained in their responsibilities under these plans. • Workers using and handling hazardous substances will be trained in their use, appropriate PPE, and potential health issues.	Unlikely	Minor	Low

Hazard	Potential Contaminant	Risk To? (Potential Receptor)	How? (Potential Exposure Pathway)	Likelihood (Assuming no mitigation measures are in place)	Consequence (Assuming no mitigation measures are in place)	Assessed Risk (Assuming no mitigation measures are in place)	Mitigation	Likelihood (Following Mitigation)	Consequence (Following Mitigation)	Residual Risk (Following Mitigation)
Discharge of flocculant	Flocculant	On-site Drainage Systems Shepherds Creek	Operator error Equipment failure	Likely	Moderate	High	• The processing plant will be inspected regularly to identify potential spills or leaks. • The flocculant mixing plant, tailings thickening tank, tailings hopper and pumps will be sited within a concrete bunded area with sumps to contain potential spills and surface water runoff. Spillage and runoff captured in the sumps will be recycled and reused within the processing plant with no discharges to land or water. • Scheduled maintenance will be undertaken on the plant and equipment in the Process Plant area. Ad hoc maintenance will also be undertaken as soon as issues are identified. • Spill kits will be available in easily visible, or sign posted places and workers are trained in their use. • A site-specific Hazardous Substances Management Plan (HSMP), which includes a spill response procedure and Emergency Response Plan (ERP) will be in place. Workers will be trained in their responsibilities under these plans. • Workers using and handling hazardous substances will be trained in their use, appropriate PPE, and potential health issues.	Unlikely	Minor	Low
Discharge of hazardous substances to tailings	Cyanide, arsenic	Site Workers On-site Drainage Systems Shepherds Creek Flora and Fauna on-site	Direct discharge	Almost certain	Catastrophic	Very High	• CIL tailings will pass through cyanide destruction and soluble arsenic removal before being pumped to the tailings storage facility. • Scheduled maintenance will be undertaken on the plant and equipment in the Process Plant area. Ad hoc maintenance will also be undertaken as soon as issues are identified. • A site-specific Hazardous Substances Management Plan (HSMP), which includes a spill response procedure and Emergency Response Plan (ERP) will be in place. Workers will be trained in their responsibilities under these plans. • Workers using and handling hazardous substances will be trained in their use, appropriate PPE, and potential health issues.	Rare	Moderate	Low
Fire (both on-site and from off-site sources)	Smoke, vapour and particulates as a result of uncontrolled burning	Site Workers, Flora and Fauna on and surrounding the site	Poor housekeeping (presence of rubbish, lack of signage etc. Smoking Vandalism	Unlikely	Major	Medium	• The site is located in a remote area. • Stationary tanks will be constructed from fire resistant materials. • Flammable substances will not be stored in the Reagent Area or Process Plant area. • A water tank is located close to the reagents area, the contents of which can be used for firefighting purposes. • A site-specific Hazardous Substances Management Plan (HSMP), which includes a spill response procedure and Emergency Response Plan (ERP) will be in place. Workers will be trained in their responsibilities under these plans. • No smoking signs.	Rare	Moderate	Low

Attachment 2:

Interpreted Geohazard Model



LEGEND

Debris Flow Catchment Extent (note extent of fan in Process plant has for clarity)

Dormant/Relict-Landslide

Rockfall Source Area (approximate extent)

Photograph location and Direction

N

NOTES:

1. Only geohazards that may potentially affect the Process Plant or access to it are shown
2. Not to Scale

FIGURE A1.1 – INTERPRETED GEOHAZRD MODEL

Attachment 3

NPS-NH Modified Risk Framework

Table 11: Risk matrix

	Almost Certain	Very Likely	Likely	Possible	Unlikely	Rare	Very Rare
ARI (years)	up to 10	10 - 20	20 - 50	50 - 100	100 - 500	500 - 5000	> 5000
AEP	10% or more	10% to 5%	5% to 2%	2% to 1%	1% to 0.2%	0.2% to 0.02%	< 0.02%
Catastrophic	Very High	Very High	Very High	High	Medium	Medium	Medium
Major	Very High	Very High	High	High	Medium	Medium	Medium
Moderate	High	High	High	Medium	Medium	Low	Low
Minor	Medium	Medium	Medium	Medium	Low	Low	Low
Negligible	Low	Low	Low	Low	Low	Low	Low

Note: The top end of the likelihood range includes the top end year, that is: Likely = over 20 years and up to and including 50 years.

Table 2: Likelihood table

Likelihood level	Annual exceedance probability (AEP)	Average recurrence interval (ARI) or 'return period'	Hazardous Substances Incident (based on AS/NZ4360:1999e
Almost certain	10% or more	Up to and including 10 years	The event is expected to occur in most circumstances
Very likely	10% to 5%	Over 10 and up to and including 20 years	
Likely	5% to 2%	Over 20 and up to and including 50 years	The event will probably occur in most circumstances
Possible	2% to 1%	Over 50 and up to and including 100 years	
Unlikely	1% to 0.2%	Over 100 and up to and including 500 years	The event could occur at some time
Rare	0.2% to 0.02%	Over 500 and up to and including 5,000 years	The event may occur only in exceptional circumstance
Very rare	less than 0.02%	More than 5,000 years	

Table 3: Consequence table

Consequence level	Damage to property	Potential for injury or fatalities	Environmental
Catastrophic	Severe damage to land and building(s), potential for collapse or total destruction of structures. Building(s) need to be demolished, rebuilt or relocated.	High threat to life safety, with probable fatalities and/or critical injuries.	Widespread environmental damage, exposure to *toxic* release by numerous people, etc.
Major	Major damage to land and building(s), including structural damage. Loss of use and substantial repair required.	Unsafe for people, with potential for many injuries, or critical injuries and/or fatalities.	Significant environmental damage, moderate damage to off-site property.
Moderate	Some damage to land and non-structural damage to building(s). Limited loss of use, repairs required.	Unsafe for people, with potential for injuries, although expected to be minor.	On-site release contained with outside assistance, moderate damage to on-site property, minor damage to off-site property, etc.
Minor	Minor damage to land and building(s). No loss of use, minimal repairs required.	Isolated minor injuries possible.	On-site release can be contained using a spill kit, minor damage to property, etc.
Negligible	No loss of use, no building repairs required.	No injuries.	Negligible environmental damage, on-site release contained within bund etc.

Key:

Debris Flow

Rockfall

Deep-Seated Landslide