

**MATAKANUI**

GOLD LIMITED





# Engineered Landform Management Plan

DOCUMENT CONTROL

Revision	Authors	Organisation	Date	Approved
0	E. Torvelainen	Engineering Geology Ltd	13/06/2025	
1	E. Torvelainen	Engineering Geology Ltd	24/07/2025	M. Mitchell
2	E. Torvelainen P. Weber	Engineering Geology Ltd Mine Waste Management Ltd	08/10/2025	M. Mitchell
3			28/05/2026	M. Mitchell
4	D. Terry P. Weber	Mine Waste Management Ltd Mine Waste Management Ltd	17/6/2026	

1. INTRODUCTION .....	716
1.1. Purpose.....	716
1.2. Key Environmental Factors .....	817
1.3. Project Description .....	918
1.4. Relationship with other Management Plans .....	1322
2. MANAGEMENT OBJECTIVES .....	1322
2.1. Key Objectives .....	1322
2.2. Key Outcomes .....	1423
2.3. Legal Framework.....	1423
3. ROLES AND RESPONSIBILITIES .....	1524
4. TRAINING AND INDUCTIONS.....	1726
5. MATERIAL CLASSIFICATION AND SCHEDULING .....	1827
5.1. Objective.....	1827
5.2. Materials Summary .....	1827
5.2.1. Top Soil .....	1928
5.2.2. Brown Rock .....	2029
5.2.3. Schist.....	2029
5.2.4. Threshold Value Review.....	2332
5.3. Classification of Waste Rock during Mining.....	2332
5.3.1. Classification of Waste Rock prior to Excavation .....	2332
5.3.2. Classification of Waste Rock during Excavation.....	2433
5.3.3. Material Recording during Excavation .....	2433
5.4. Materials Schedule .....	2635
6. ELF CONSTRUCTION ELEMENTS .....	2635
6.1. Objectives .....	2635
6.2. Foundation Preparation.....	2837
6.3. Base Layer.....	2837
6.4. Bulk Fill Zones.....	2938
6.5. Outer Fill Zones.....	3039

6.6.	Final Slopes .....	<del>3039</del>
6.7.	Underdrainage .....	<del>3039</del>
6.8.	Clean Water Diversion Channels .....	<del>3040</del>
6.9.	Erosion & Sediment Control Structures .....	<del>3140</del>
6.10.	Material Classification versus ELF Construction Element .....	<del>3141</del>
7.	ELF DESIGN CRITERIA .....	<del>3241</del>
7.1.	Objective .....	<del>3241</del>
7.2.	Long term Geotechnical stability .....	<del>3645</del>
7.3.	Specific Detail Design of each ELF .....	<del>3645</del>
7.3.1.	Detailed Design Report: .....	<del>3646</del>
7.3.2.	Construction Drawings: .....	<del>3746</del>
7.3.3.	Specification: .....	<del>3746</del>
7.3.4.	Construction monitoring and inspection schedule: .....	<del>3746</del>
7.3.5.	Site-Specific Erosion and Sediment Control Plan (SSESCP) .....	<del>3746</del>
7.3.6.	Landslide Risk Management .....	<del>3746</del>
8.	CONSTRUCTION MANAGEMENT .....	<del>3847</del>
8.1.	Objective .....	<del>3847</del>
8.2.	Construction Sequencing .....	<del>3847</del>
9.	MONITORING .....	<del>3948</del>
9.1.	Objective .....	<del>3948</del>
9.2.	Construction Monitoring .....	<del>3948</del>
9.2.1.	Remedial Actions .....	<del>4049</del>
9.3.	Performance Monitoring .....	<del>4049</del>
9.3.1.	Geochemistry .....	<del>4049</del>
9.3.2.	Erosion and Sediment Control .....	<del>4150</del>
9.3.3.	Mine Influenced Water .....	<del>4150</del>
9.3.4.	Oxygen Ingress .....	<del>4251</del>
	Net Percolation .....	<del>4251</del>
9.3.5.	.....	<del>4251</del>

9.3.6.	Particle Size Segregation.....	<del>4352</del>
9.3.7.	Geotechnical Stability .....	<del>4352</del>
10.	REPORTING AND DATA MANAGEMENT .....	<del>4353</del>
10.1.	Record Keeping and Data Management.....	<del>4353</del>
10.2.	Internal Reporting and Auditing.....	<del>4453</del>
10.3.	External Interim Reporting .....	<del>4453</del>
10.3.1.	Ground Control Management Plan (GCMP) .....	<del>4453</del>
10.4.	External Annual Reporting .....	<del>4453</del>
10.4.1.	Annual Compliance Report .....	<del>4454</del>
10.4.2.	Annual Work Plan .....	<del>4554</del>
10.5.	Completion Report .....	<del>4554</del>
11.	RISK MANAGEMENT.....	<del>4655</del>
11.1.	Objective .....	<del>4655</del>
11.2.	ELF Risk Assessment .....	<del>4655</del>
12.	CHANGE MANAGEMENT .....	<del>5766</del>
12.1.	Review Requirements .....	<del>5766</del>
13.	REFERENCES .....	<del>6069</del>
14.	ACRONYMNS .....	<del>6170</del>

## 1. INTRODUCTION

### 1.1. Purpose

The purpose of the Bendigo-Ophir Gold Project (BOGP) Engineered Landform Management Plan (ELFMP also referred to as This Plan) is to guide the development of safe, stable, and sustainable Engineered Landforms (ELFs) that protect both people and the environment.

~~This plan~~This Plan is a living document, evolving throughout the life of the BOGP to reflect changes in ELF risk, design assumptions, and operational knowledge. It incorporates adaptive management, supported by performance monitoring and regular reviews by Matakanui Gold Limited (MGL), the Otago Regional Council (ORC), and an independent Peer Review Panel (PRP).

~~This plan~~This Plan outlines key elements of the ELF management system at the BOGP including:

- ELF engineering design, construction, final slope preparation and closure of these facilities.
- ELF geochemical controls to minimise effects on receiving waters due to mine impacted waters (MIW) from these facilities.

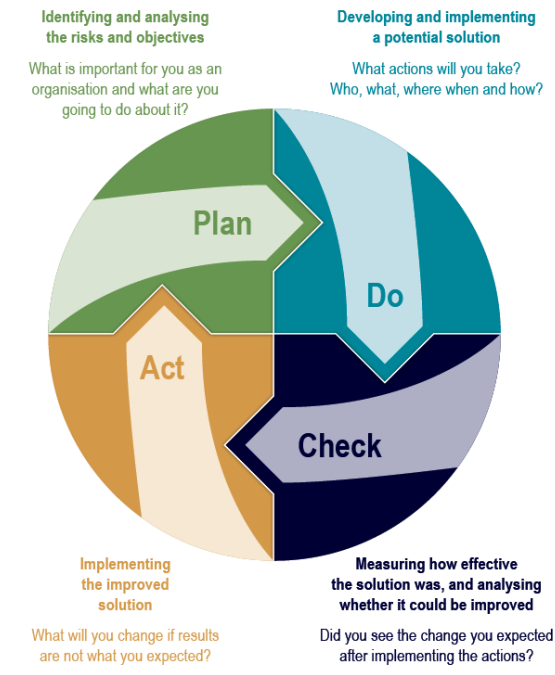
~~Matakanui Gold Limited's (MGL's) commitment to continual improvement through adaptive management of environmental performance has been embodied by and is implemented through the AS/NZS ISO 14001:2016 recognised approach, referred to as the Plan-Do-Check-Act (PDCA) cycle as indicated in Figure 1~~Figure 1. This Plan has aligned the PDCA cycle with the International Financial Corporation/ World Bank Group Environmental Health and Safety Guidelines for Mining (2007) as it is a strong wayrobust approach to operationalise compliance, as the IFC framework explicitly uses an environmental and social management-system approach based on continuous improvement.

- PLAN → Risk Assessment & Management Planning.
- DO → Implementation & Operational Controls.
- CHECK → Monitoring, Measurement, and Audit to test the efficacy of those controls.
- ACT → Corrective Action, & Continuous Improvement and Plan Review

Under the Resource Management Act (RMA), adaptive management is a recognised management option (e.g., Leckie, 2017; Weber, 2020). Effective adaptive management can be achieved by understanding the nature and duration of possible events, monitoring the

events, and having management options in place to overcome variance from the expected case.

The PDCA cycle is considered an ongoing internal audit cycle and a recognised tool for adaptive management.



**Figure 112: Plan-Do-Check-Act Process**

Source: AS/NZS ISO 14001:2016



## 1.2. Key Environmental Factors

Key environmental factors that have been identified through various technical studies are the protection of people and the environment from potential adverse water quality effects, long term landform stability, and ecological rehabilitation outcomes associated with ELF construction and closure.

ELF construction activity also involves aspects of noise, air quality, lighting, water, and erosion and sediment control management.

### **1.3. Project Description**

The BOGP site is located approximately 20 km northeast of Cromwell in the Dunstan Mountains of Central Otago New Zealand, within the [lands managed by the](#) Central Otago District Council (CODC) and [the](#) Otago Regional Council (ORC).

Gold mineralization is associated with the Rise and Shine Shear Zone (RSSZ), a late metamorphic deformation zone developed within Textural Zone 4 (TZ4) Schist. The upper part of the RSSZ is truncated by a shallow northeast dipping normal fault, the Thomson Gorge Fault (TGF), which juxtaposes RSSZ and TZ4 Schist against overlying unmineralized Textural Zone 3 (TZ3) Schist. In mining terminology, the TGF separates unmineralized TZ3 Schist of the Bulk Waste Zone from RSSZ and TZ4 Schist of the underlying Ore Zone.

Four gold deposits have been identified within the project area. The Rise and Shine (RAS) and Come in Time (CIT) gold deposits are located within a ridge between Shepherds Creek to the northeast and Rise and Shine Creek to the southwest. The Srex (SRX) and Srex East (SRXE) gold deposits are located on the southern slopes of Rise and Shine Valley. Water courses flow from a divide in the southeast to outlets in the northwest.

The BOGP involves mining the four identified gold deposits utilising both open pit and underground mining methods. Infrastructure to support the project will be constructed in the lower Shepherds Creek Valley with non-operational infrastructure located on the adjoining Ardgour Terrace. The BOGP also involves taking groundwater from the Bendigo Aquifer for use in mining-related activities and the realignment of Thomson Gorge Road via Ardgour Station.

Four ELFs are proposed [with locations as shown in Figure 2](#)~~Figure 1~~:

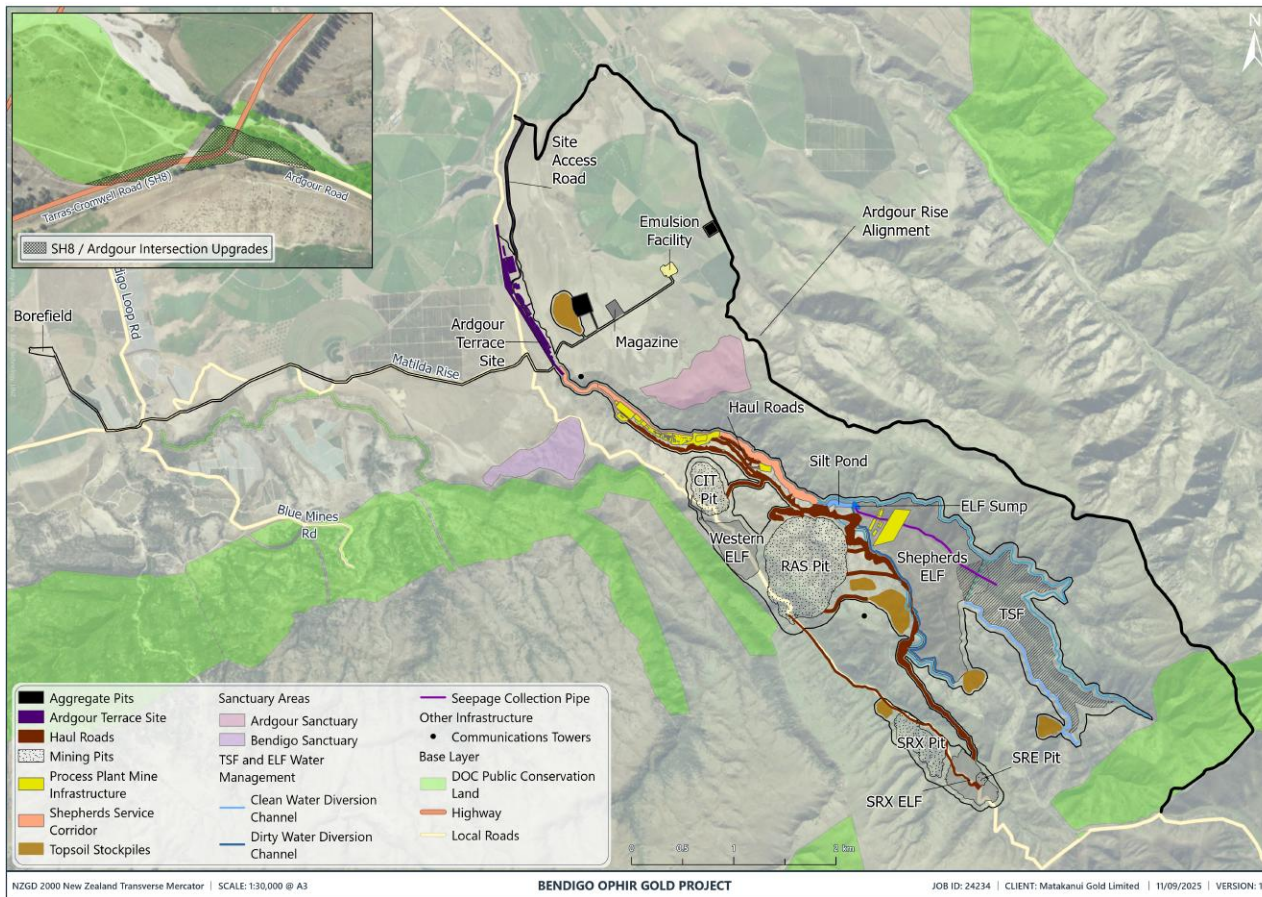
- Shepherds Engineered Landform (Shepherds ELF);
- Srex Engineered Landform (SRX ELF);
- Come in Time Pit Backfill (CITBF); and
- Western Engineered Landform (WELF).

The CITBF and ELFs are formed from waste rock and are managed under [this plan](#)~~This Plan~~. For simplicity where ELF is referred to in this management plan, this also refers to the CITBF.



The ELFs will have associated infrastructure and stockpiles including topsoil stockpiles, water diversion channels, sumps, silt ponds, and access tracks. This management plan includes these items where they relate to the ELFs.

The ELFs shall be designed, constructed, monitored, and rehabilitated in accordance with all the approved management plans within the environmental management system.



**Figure 2: Bendigo-Ophir Gold Project and Supporting Infrastructure**

Figure 1: Plan-Do-Check-Act Process

#### 1.4. Relationship with other Management Plans

Within the ELF Management Plan (ELFMP), specific reference is made to the following management plans:

- ~~Erosion and Sediment Control Management Plan (ESCMP)~~
- ~~Site Specific Erosion and Sediment Control Plan (SSESCP)~~
- ~~Water Management Plan (WMP)~~
- ~~Soil Management Plan (SMP)~~
- ~~Landscape and Ecological Rehabilitation Plan (LERMP)~~
- ~~Landslide Monitoring and Management Plan (LMMP)~~~~Erosion and Sediment Control Management Plan (ESCMP)~~
- ~~Ground Control Management Plan (GCMP)~~
- ~~Water Management Plan (WMP)~~

- ~~Soil Management Plan (SMP)~~
- ~~Landscape and Ecological Rehabilitation Plan (LERMP)~~
- 

• The ELFs shall be designed, constructed, monitored, and rehabilitated in accordance with all BOGP approved management plans and Consent Conditions.

•

## 2. MANAGEMENT OBJECTIVES

### 2.1. Key Objectives

The ELFMP for the BOGP sets out the framework to ensure ELFs are designed, constructed, and closed in a manner that is safe, stable, and environmentally responsible.

The key objectives of the ELFMP are to:

- Define roles and responsibilities for ~~Matakanui Gold Limited (MGL)~~ personnel to ensure effective implementation.
- Define the requirements to classify waste rock material used in ELF construction.
- Define various construction elements of ELF design.
- Define ELF design criteria and design documentation.
- Define ELF construction sequencing.
- Provide details of required ELF construction and performance monitoring.
- Define ELF reporting requirements.

- Provide a high-level risk assessment of environmental and geotechnical aspects associated with ELF construction and successful closure of the ELF.
- Establish a change management process for ELFMP updates and recertification.

## **2.2. Key Outcomes**

Implementation of the ELFMP will result in the following outcomes:

- Identification and management of key risks associated with ELF construction and MIW that could impact water quality objectives during operation and closure.
- Development of a material classification and management process to ensure correct placement of all materials during ELF construction.
- Implementation of engineering design principles which minimise long-term geochemical risks and support closure water quality goals.
- Implementation of engineering design criteria which ensure long-term geotechnical stability.
- Establishment of performance monitoring to validate ELF design and construction effectiveness.
- Facilitation of a successful transition to closure, including meeting BOGP ecological rehabilitation and water quality compliance objectives for completed ELFs.

## **2.3. Legal Framework**

MGL is committed to undertaking all Project activities in full compliance with New Zealand legislation, including but not limited to local legislation, policies, and regulations relevant to water management. Land disturbing activities in New Zealand are controlled under the Resource Management Act 1991 (RMA) New Zealand Government, 2018). Its purpose is to promote the sustainable management of natural and physical resources thus placing a general duty on every person to avoid, remedy or mitigate any adverse effects of activities on the environment.

The environmental effects associated with the materials that will be disturbed and the potential effects on water quality for the Project will be regulated by consents approved under the Fast-track Approvals Act (FTAA) 2024 and the RMA.

In New Zealand, the process flow for approval pathway for a mining project can be summarised as follows:

- The Crown Minerals Act 1991 provides the right to mine
- The RMA (or EEZ Act) provides the environmental permission

- [The Conservation Act 1987 controls access to protected land](#)
- [The Fast track Approvals Act 2024 can streamline all approvals into one coordinated decision process](#)

### 3. ROLES AND RESPONSIBILITIES

The key roles and responsibilities required to ensure the ELF's are designed, constructed, operated, and closed in accordance with the objectives of the ELFMP are summarised in Table 1.

**Table 1: Roles and Responsibilities**

Role	Responsibilities
General Manager	<ul style="list-style-type: none"> <li>• Ensure protection of people and the environment</li> <li>• Oversee safe and stable ELF's during construction and closure</li> <li>• Ensure risks are managed</li> </ul>
Environmental Manager	<ul style="list-style-type: none"> <li>• Ensure compliance with ELF consent conditions</li> <li>• Ensure compliance <del>to</del> with ELFMP requirements</li> <li>• Review and update of ELF Risk Register</li> <li>• Complete environmental monitoring</li> <li>• Complete Annual Work Plan reporting</li> <li>• Complete Annual Compliance reporting</li> <li>• Prepare individual ELF ecological rehabilitation plan</li> </ul>
Technical Services Manager	<ul style="list-style-type: none"> <li>• Review and update of ELF Risk Register</li> <li>• Classify gold (Au), arsenic (As) and sulfur (S) content within TZ3 and TZ4 Schist, and As content within Topsoil</li> <li>• Ensure full and accurate records are collected for all individual truckloads tipped within ELF footprints</li> <li>• Ensure individual ELF design achieves criteria documented in Table 6</li> <li>• Prior to individual ELF construction, prepare design report, construction drawings, construction specifications, and construction inspection and monitoring requirements. Engage appropriate engineering expertise as required. Ensure approval by CPEng.</li> <li>• Prior to individual ELF construction, prepare Site Specific Erosion &amp; Sediment Control Plan (SSESCP)</li> <li>• Implement periodic investigation and measurement of ELF construction performance associated with material classification, particle size segregation, oxygen ingress to ELF's and water ingress to ELF's</li> <li>• Implement ELF construction monitoring recordkeeping system</li> <li>• Ensure ELF final slope earthwork design is consistent with individual ELF ecological rehabilitation plans</li> </ul>

Role	Responsibilities
	<ul style="list-style-type: none"> <li>• Prepare individual ELF volume and tonnage for annual reporting</li> <li>• Prepare balance of Topsoil and Brown rock requirements and availability for final slope preparation to be summarised in annual reporting</li> <li>• Prepare individual ELF Completion Reports. Engage appropriate engineering expertise as required. Ensure approval by <a href="#">certified practicing engineer</a> (CPEng) and suitability qualified and experienced practitioner (SQEP): geochemical specialist.</li> <li>• Implement mitigation strategies if ELF construction does not conform to design or where MIW performance monitoring does not conform to geochemical modelling predictions</li> </ul>
Mining Manager	<ul style="list-style-type: none"> <li>• Ensure individual ELF construction is completed in accordance with design drawings, specifications, inspection and monitoring schedules</li> <li>• Implement SSESOP associated with individual ELFs</li> <li>• Ensure ELF construction inspection and monitoring is completed</li> <li>• Ensure Topsoil recovery and stockpiling is implemented during stripping activities</li> <li>• Ensure Brown Rock recovery and stockpiling is implemented during excavation activities</li> <li>• Inspect and maintain ELF water diversion channels and sediment retention structures</li> <li>• Inspect and stabilise areas of erosion on ELF final surfaces</li> <li>• Ensure all ELF construction activities are performed in accordance with all relevant BOGP Health &amp; Safety procedures and BOGP site management plans.</li> </ul>
Suitably qualified and experienced practitioner (SQEP): geochemical specialist	<ul style="list-style-type: none"> <li>• Review and approve As and S threshold values for material classification</li> <li>• Review and approve changes to maximum lift height within Bulk Fill Zones</li> <li>• Review and approve ELF design objectives associated with oxygen ingress, water ingress, and ELF derived MIW management</li> <li>• Annually review ELF derived MIW performance monitoring trends</li> <li>• Annually review ELF downgradient groundwater performance monitoring trends</li> <li>• Review and approve ELF Completion Reports for aspects associated with oxygen ingress, water ingress and ELF derived MIW management</li> <li>• Review and approve mitigation strategies for oxygen ingress, water ingress and ELF derived MIW management where construction does not conform to design, or where performance monitoring does not conform to geochemical modelling predictions</li> </ul>
Chartered Professional Engineer	<ul style="list-style-type: none"> <li>• Review and approve individual ELF design report, construction drawings, specifications, and construction inspection and monitoring requirements.</li> </ul>

Role	Responsibilities
(CPEng) experienced in geotechnical and civil engineering	<ul style="list-style-type: none"> <li>● Review and approve SSESCP</li> <li>● Review and approve changes to maximum lift height within Bulk Fill Zones</li> <li>● Review and approve ELF design criteria</li> <li>● Annually review individual ELF construction monitoring records</li> <li>● Review and approve ELF Completion Reports</li> <li>● Review and approve mitigation strategies where construction does not conform to design, or where performance monitoring does not conform to geochemical modelling predictions</li> <li>● <a href="#">Development of the Landslide Monitoring and Management Plan (LMMP)</a></li> <li>● <a href="#">Development of the Ground Control Management Plan (GCMP)</a></li> </ul>
Independent Peer Review Panel	<ul style="list-style-type: none"> <li>● <u>The purpose of the Peer Review Panel (PRP) is to review performance monitoring results (environmental) and check compliance with consent conditions and provide recommendations on measures that can be taken to achieve the ultimate closure outcomes.</u></li> <li>● <u>There will be an annual meeting with the PRP, ORC, and MGL after the provision of annual reports.</u></li> <li>● <u>The Peer Review Panel will report to the ORC.</u></li> </ul>

#### 4. TRAINING AND INDUCTIONS

The training that is anticipated to be required to prepare staff to deliver the monitoring and reporting requirements of This Plan is summarised in Table 2. In addition to the standard document review process discussed in Section 12, all training materials and deliverables will be reviewed where there has been defined outcome of an investigation due to an incident or accident occurring. In addition to the formal training provided to meet the objectives of This Plan, ongoing operational training will occur and include, though not limited to:

- Environmental issues are included within the Mine Induction Package and induction process and regular environmental awareness training through toolbox talks.
- Inclusion of ELF on the job hazard analysis (JHA) template.
- Regular topic for toolbox talks, including waste rock classification and MIW management. All monitoring results will be assessed, and significant results or events will be raised for discussion via toolbox talks to encourage and remind staff about appropriate activities.
- Incidents related to ELF construction and operation will be raised for discussion via toolbox talks to encourage and remind staff of appropriate management measures.

- Training of staff involved in management and treatment of mine impacted waters including water management, active treatment and passive treatment.

**Table 42: Training**

TRAINING ASPECT & REQUIREMENT	FREQUENCY	PEOPLE TO BE TRAINED
<u>General ELF awareness and risk management and terminology:</u>	<u>Induction and refreshers</u>	<u>All Personnel</u>
<u>Hazards, near miss, and incidents reporting</u>	<u>Induction and yearly</u>	<u>All Personnel</u>
<u>Classification of waste rock materials in relation to ELF design and construction.</u>	<u>Yearly review and training</u> <u>Job specific</u>	<u>Technical Services Manager, Environmental Manager, Supervisors, Operators, Contractors</u>
<u>Water treatment systems</u>	<u>Yearly review and competent person</u>	<u>Technical Services Manager, SQEP</u>
<u>Water infrastructure design</u>	<u>Yearly review and competent person</u>	<u>Technical Services Manager, Environmental Manager, SQEP</u>
<u>Mine influenced water monitoring</u>	<u>Yearly review and competent person</u>	<u>Environmental Manager</u>

#### **4.5. MATERIAL CLASSIFICATION and SCHEDULING**

##### **4.1.5.1. Objective**

Waste rock materials need to be classified at the point of excavation and managed within ELF construction to minimise the geochemical risks associated with MIW, ensure ELFs are constructed to be geotechnically stable, and to ensure final slopes are prepared to minimise erosion and are suitable for progressive rehabilitation and revegetation.

Materials are classified according to physical appearance, stratigraphic position, and chemical composition. Geochemical risk is predominantly associated with the presence and volume of sulphide minerals (e.g., pyrite, arsenopyrite) present within unoxidised waste rock, which can be assessed by analysis of arsenic (As) and sulphur (S) content.

##### **4.2.5.2. Materials Summary**

Waste materials extracted from open pit and underground mining will be classified to ensure correct placement within ELFs and / or associated stockpiles. In summary, material classification shall define:

- Topsoil
  - Topsoil
  - As-Rich Topsoil
- Brown Rock
- Schist – Low Geochemical Risk
- Schist – Elevated Geochemical Risk

**4.2.1.5.2.1. Top Soil**

Topsoil is the uppermost layer of soil, rich in organic matter and nutrients essential for supporting plant growth and maintaining healthy ecosystems. During clearing and stripping activities, topsoil recovery shall be maximised.

Some areas of topsoil within the BOGP contain elevated concentrations of arsenic (As) (GRM, 2025) and recovered topsoil shall be classified according to As content (Table 23). Arsenics present within topsoil occurs as adsorbed As(V) on iron oxyhydroxide or as ferric arsenate minerals (Blake et al., 2019).

**Table 32: Topsoil classification: Geochemical Threshold Values**

Element	Threshold Value	
Arsenic (As)	<70 ppm	>70 ppm
	Topsoil	As-rich Topsoil

Systematic delineation of the location of As-rich soils shall be completed prior to clearing and stripping activities. Areas of As-rich topsoil will be defined within polygons set out in the field prior to, and during excavation.

Topsoil (but not As-rich Topsoil) is classified as a material type within the BOGP resource Block model.

Topsoil will be taken directly from areas of stripping for placement on prepared final ELF slopes. Where prepared final ELF surfaces are not available at the time of stripping, Topsoil will be placed in clearly identified Topsoil stockpiles for later use.

~~As-rich topsoil will be separated from topsoil below the As threshold value in clearly demarcated stockpiles. As-rich topsoil will be used to rehabilitate areas from which it was stripped i.e. soil placement during rehabilitation does not result in a larger footprint of As-rich topsoil compared to original undisturbed footprint.~~

For further details of Topsoil and As-rich Topsoil management, refer to the SMP.

#### 4.2.2.5.2.2. **Brown Rock**

Brown Rock is weathered ~~material rock~~ that lies immediately below topsoil. Within the BOGP, brown rock is predominantly weathered Schist but may include alluvium, colluvium, and loess. Brown rock is characterised by the absence of sulphide minerals – any sulphide minerals present in the host lithology have been oxidized to ~~oxide minerals~~. Brown Rock is of ~~very~~ low geochemical risk.

Brown Rock is classified as a material type within the BOGP Resource block model.

Brown Rock will be taken directly from areas of excavation to designated locations within ELFs. Where designated locations within ELFs are not available at the time of excavation, Brown rock will be placed in clearly designated Brown Rock stockpiles for later use.

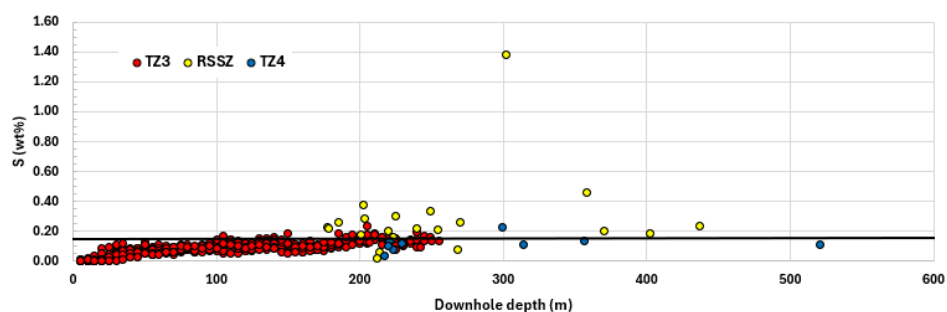
#### 4.2.3.5.2.3. **Schist**

Schist (TZ3 Schist & TZ4 Schist) is slightly weathered or unweathered rock that lies below brown rock and contains unoxidised sulphide minerals.

Data indicates the oxidation of sulphide minerals from Schist rock will generate neutral metalliferous drainage (“NMD”) which has potential to result in water with elevated potential constituents of concern (PCOC), including sulphate and arsenic (MWM, 2025b). Some Schist rock is elevated in As and / or S compared to background levels and threshold values have been proposed to classify Schist with regard to geochemical risk ([Figure 3](#)~~Figures 3~~, [Figures 2](#) and [Figure 4](#)~~Figure 4~~; [Table 4](#)~~3~~).

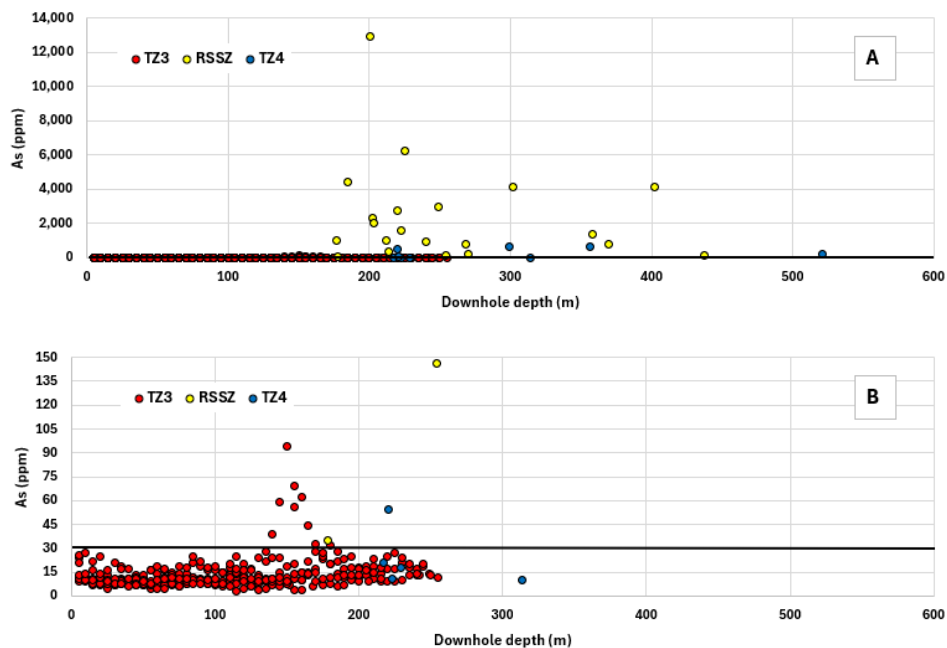
**Table 49: Schist classification: Geochemical Threshold Values**

Element	Threshold Value		
	Arsenic (As)	<30 ppm As	>30 ppm As
	Schist – Low As	Schist – High As	
Sulfur (S)	<0.02 wt% S	0.2 to 0.15 wt% S	>0.15 wt% S
	Schist – Very Low S	Schist - Low S	Schist – High S



**Figure 332: Sulphur value versus drill hole depth for selected schist lithologies. Sulphur threshold value for material of elevated geochemical risk represented solid black line. Red = TZ3 Schist (Bulk Waste Zone); yellow and blue = variously mineralised TZ4 Schist (Ore Zone).**

**Figure 2: Sulphur value versus drill hole depth for selected schist lithologies. Sulphur threshold value for material of elevated geochemical risk represented solid black line. Red = TZ3 Schist (Bulk Waste Zone); yellow and blue = variously mineralised TZ4 Schist (Ore Zone).**



**Figure 443:** Arsenic value versus drill hole depth for selected schist lithologies. Arsenic threshold value for material of elevated geochemical risk represented solid black line. A All data; B Data below 150 ppm As. Red = TZ3 Schist (Bulk Waste Zone); yellow and blue = variously mineralised TZ4 Schist (Ore Zone). ~~Figure 3: Arsenic value versus drill hole depth for selected schist lithologies. Arsenic threshold value for material of elevated geochemical risk represented solid black line. A All data; B Data below 150 ppm As. Red = TZ3 Schist (Bulk Waste Zone); yellow and blue = variously mineralised TZ4 Schist (Ore Zone).~~

TZ3 Schist with High As and / or High S has elevated geochemical risk. TZ3 Schist of Low As and Very Low or Low S content has low geochemical risk. Data indicates the most volumetrically significant waste rock material classification is TZ3 Schist of Low As and Low S content (~~Figures Figure 3 and Figure 4~~Figure 4B2 & 3B).

TZ4 Schist lies beneath the TGF and is variably deformed and mineralised within the RSSZ. TZ4 Schist material with Au content above the economic cut-off is defined as Ore, will be treated within the Processing Plant and deposited within the Shepherds Tailings Storage Facility (TSF). TZ4 Schist with Au content below the economic cut-off (i.e. waste rock) will be placed within ELFs.

Data indicates the majority of TZ4 Schist within, or in close proximity to, the RSSZ is elevated in As and / or S content compared to background levels within TZ3 Schist (MWM, 2025b; [Figure 3 and Figure 4](#)~~Figure 4A~~ [Figures 2 & 3A](#)). All TZ4 Schist waste rock shall be considered material of elevated geochemical risk unless measured As and S contents are below threshold values of Table [43](#).

TZ3 Schist (but not the As and S content within TZ3 Schist) is classified as a material type within the BOGP Resource block model. TZ4 Schist (including Au and As content, but not S content) is classified as a material type within the BOGP Resource block model.

#### [4.2.4.5.2.4.](#) **Threshold Value Review**

Periodic review of threshold values for As and S for waste material classification ~~may~~[will](#) be undertaken in response to the results of performance monitoring of ELF derived MIW. Performance monitoring sampling locations are provided in the WMP.

Proposed changes to As and S threshold values for waste material classification shall be reviewed and approved by a SQEP geochemical specialist before implementation.

#### [4.3.5.3.](#) **Classification of ~~Wwaste Rock~~material during Mining**

##### [4.3.1.5.3.1.](#) **Classification of ~~Wwaste Rock~~material prior to Excavation**

A systematic method of determining the As and S content of TZ3 Schist within the Bulk Waste Zone, and the Au, As and S content of TZ4 Schist within the Ore Zone shall be undertaken prior to excavation.

As and S content will be determined by [onsite](#) laboratory analysis of rock chip samples collected during drilling activities (grade control or blast hole drilling).

As content may also be determined by portable X-ray Florescence (pXRF) analysis of the same samples. Individual samples from within TZ3 of the Bulk Waste Zone may represent a larger volume of rock than individual samples within the Ore Zone, where increased sampling volumes are required to define areas of Au mineralisation.

S and As content will be geostatistically modelled from analytical results of samples, with the results of modelling used to define areas of waste rock with elevated geochemical risk.

Within the Bulk Waste Zone (TZ3 Schist) the default waste rock classification will be low geochemical risk, with areas of elevated geochemical risk demarcated by polygons set out in the field prior to, and during, excavation.

Within the Ore Zone (TZ4 Schist) the default waste rock classification will be elevated geochemical risk, with areas of low geochemical risk demarcated by polygons set out in the field prior to, and during, excavation.

**4.3.2.5.3.2. Classification of Waste Rock material during Excavation**

Some waste material may be classified by Excavator operators during loading of individual truck units. Classification of waste material by Excavator operators is based on the physical properties of waste material and construction needs of specific material (e.g. maximizing recovery of Brown Rock; material meeting the specification for TSF construction - Zone A, Zone B, Zone C construction materials; etc.).

Waste materials classified by Excavator operators can only be taken from areas defined as low geochemical risk.

**4.3.3.5.3.3. Material Recording during Excavation**

All individual truckloads of waste material loaded from mining faces and dumped within ELF's will record details to identify (at a minimum): location of loading, waste material classification, tonnage, and location of tipping.

Loading location and material type can be identified using a combination of letters and numbers. An example of 3 letter combination is presented in Table 54.

**Table 45: Example of material identification for individual truck records**

Identifier	Example	Options	Notes
Loading Area		R = RAS Open Pit	

Identifier	Example	Options	Notes
	<b>R</b>	C = Come-In-Time Open Pit	
		S = Srex-SRX Open Pit	
		D = Development Areas	
		U = Underground	
		Z = Stockpile	
Ore Classification	<b>W</b>	W = Waste	
		T = TSF Zone	<u>Defined by Mining Supervisor</u>
Material Classification	<b>L</b>	A = TSF Zone A	<u>Defined by Excavator operator</u>
		B = TSF Zone B	<u>Defined by Excavator operator</u>
		C = TSF Zone C	<u>Defined by Excavator operator</u>
		T = Topsoil	<u>Default material for topsoil</u>
		X = As-rich Topsoil	<u>Defined within polygons</u>
		B = Brown Rock	<u>Defined by Excavator operator</u>
		L = Low Geochemical Risk	<u>Bulk Waste Zone = default material</u> <u>Ore Zone = defined within polygons</u>
		G = Elevated Geochemical Risk	<u>Bulk Waste Zone = defined within polygons</u> <u>Ore Zone = default material</u>
		M = Mineralised	<u>Ore Zone only – defined within polygons</u>

#### 4.4.5.4. Materials Schedule

As part of the BOGP mine plan waste materials shall be scheduled to the appropriate location in the ELF's and/or associated stockpiles.

Topsoil and Brown Rock are required for the rehabilitated surfaces of the ELF's. This requires sources to be identified in advance of mining and ELF developments. A balance of rehabilitation materials available and required upon closure shall be kept and reported annually.

### 5.6. ELF CONSTRUCTION ELEMENTS

#### 5.1.6.1. Objectives

ELFs are ~~to be~~ designed and constructed to be geochemically and geotechnically stable. Various construction elements of ELF design and construction are illustrated in [Figure 5](#) ~~Figure 4~~. [Figure 6](#) through to [Figure 9](#) provides conceptual and schematic water balance and material distribution ~~and described below~~ for each of the ELF's for which This Plan was developed.

[As part of the PDCA cycle, the ELF construction elements will be reviewed prior to the commencement of each ELF to ensure that improvements are incorporated into This Plan and the relevant SSESCP as adaptive management and in accordance with Section 12.](#) Design details are aligned with the following technical reports in support of This Plan:

- [Net Percolation Assessment for the Proposed Bendigo-Ophir Gold Project Mine Waste Storage facilities. \(MWM, 2025a\)](#)
- [Factual Report: Geoenvironmental Hazards. \(MWM, 2025b\)](#)
- [Engineered Landform Water Quality Forecast Report. \(MWM, 2025c\).](#)
- [Mine Impacted Water Report. \(MWM, 2025d\).](#)

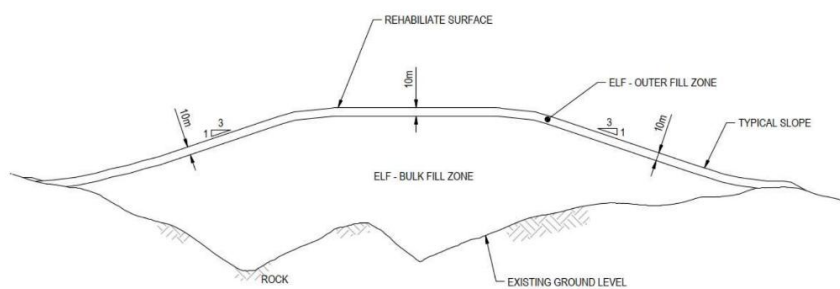


Figure 554: ELF general construction elements

Figure 4: ELF construction elements

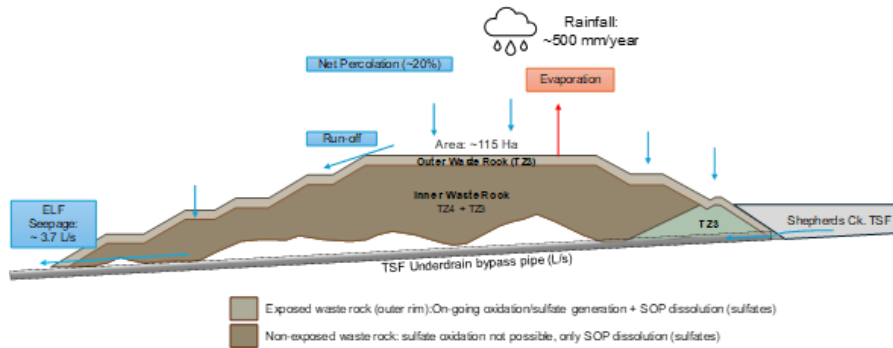


Figure 665: Conceptual (and schematic) water balance and material distribution for the Shepherds ELF.

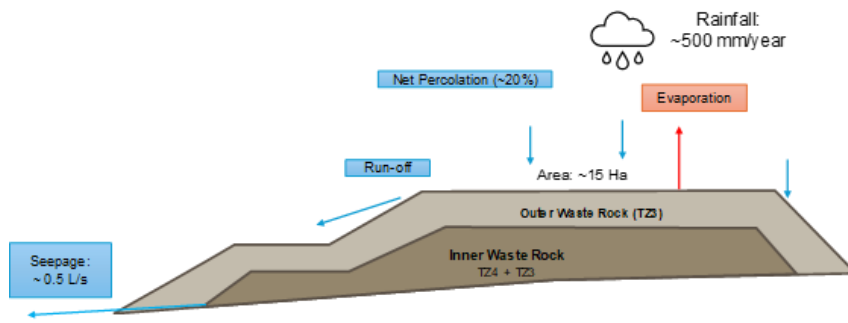
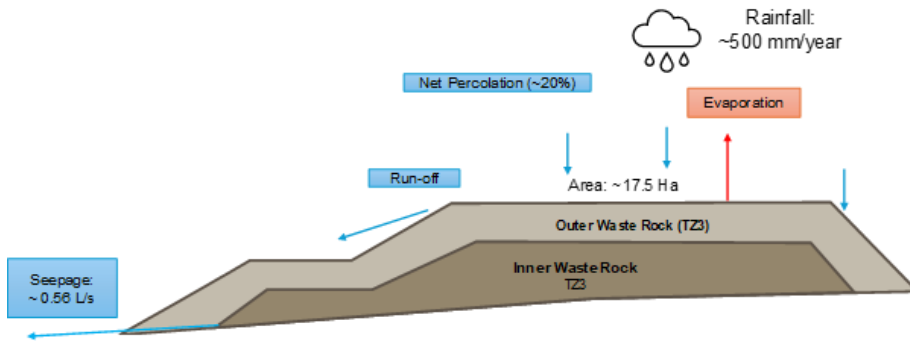
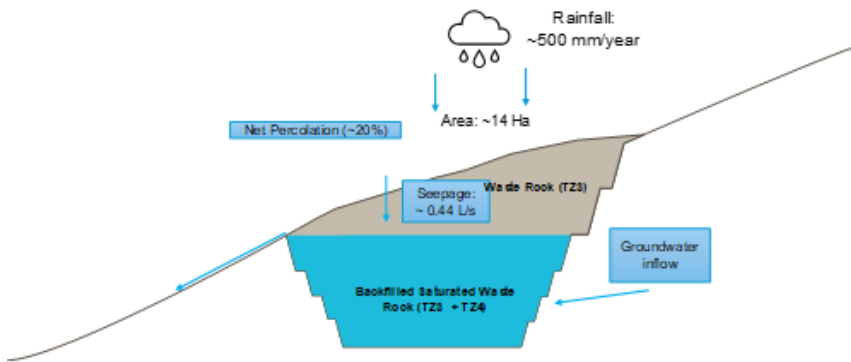


Figure 776: Conceptual (and schematic) water balance and material distribution for the SRX ELF



**Figure 886: Conceptual (and schematic) water balance and material distribution for the WELF.**



**Figure 996: Conceptual (and schematic) water balance and material distribution for the Come in Time backfilled pit.**

### 5-2-6.2. Foundation Preparations

ELF foundations shall have vegetation removed, topsoil stripped and stockpiled, and rock features suitable for rehabilitation structures recovered prior to waste material placement.

### 5-3-6.3. Base Layer

Where practicable, mMaterial of low geochemical risk should will be placed immediately above foundations in a single layer up to 3 m thick to minimise PCOC mobilization due to

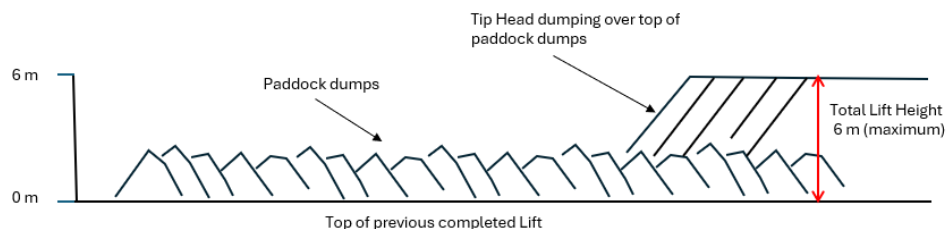
basal ~~seepage~~ seepage through the ELF from natural springs, etc. or interaction of the base layer with groundwater.

Where material cannot be directly placed on flat foundations, e.g., at the base of narrow gullies, and where particle size segregation during construction cannot be adequately controlled, a low permeability toe bund may be used to reduce advective oxygen ingress along the base layer.

Tipping of rock into valley areas to establish running surfaces is a key design risk that requires management to prevent pathways for advective oxygen ingress. Identification of these areas is required prior to construction of that aspect of the ELF and a detailed design plan is required to ensure the risk of creating advective oxygen pathways is prevented.

#### 5.4.6.4. Bulk Fill Zones

The Bulk Fill Zone is the dominant element within ELF design and ~~construction,~~ and construction and contains the bulk of material placed within an ELF. Material placed in Bulk Fill Zones ~~should be~~ is placed to minimise the amount of particle size segregation during construction, achieved by using paddock tipping and dumping from tip heads with a total lift height of 6 m (~~Figure 10~~ Figure 10 ~~Figure 5~~ Figure 5).



**Figure 10** ~~109~~ 9: Lift height within Bulk Fill Zone

#### Figure 5: Lift height within Bulk Fill Zone

Maximum lift heights may be increased provided continued trials confirm suitable geochemical control is achieved through ~~if~~ positive results from field-based trials measuring the amount of particle size segregation and oxygen content within completed Bulk Fill Zones.

Compaction in this zone is important to assist in reducing oxygen and water ingress and compaction levels will be achieved using standard heavy vehicle equipment. Compaction and lift heights will be reviewed through the PDCA cycle and in accordance with the adaptive management process described in Section 12 to ensure geotechnical and geochemical stability is maintained. Compaction measurements will be undertaken using a nuclear

density meter and permeability testing to support ongoing learning, planning and design of the ELF construction process.

#### **5-5-6.5. Outer Fill Zones**

Where material is placed within 10 vertical m of the final surface, a reduced tiphead thickness is required to limit oxygen ingress ~~in the Elf via to diffusion only into the ELF.~~ Outer Fill Zones ~~should~~ will be paddock tipped, spread in layers and systematically truck compacted during subsequent layer construction. This will minimize the risks associated with horizontal ingress of oxygen by advective airflow.

Compaction measurements will be undertaken using a nuclear density meter and permeability testing to support ongoing learning, planning and design of the ELF construction process.

#### **5-6-6.6. Final Slopes**

Final slopes will be shaped with a maximum slope of 1V:3H (or 18.4 degrees).

Placement of rehabilitation material (Topsoil, Brown Rock) on final ELF slopes will be consistent with Root Zone and Soil requirements of the LERMP.

A progressive rehabilitation approach will be undertaken to ensure that final surfaces are rehabilitated as soon as practicable to minimize the loss of sediment and water from these final slopes. Progress rehabilitation will reduce risks for oxygen and water ingress.

The detailed design plan for each ELF will focus on developing final rehabilitated slopes as soon as practicable. These designs will be provided in the annual report and 'success' will be measured against this plan on an annual basis.

#### **5-7-6.7. Underdrainage**

Subsurface drainage shall be installed beneath the ELF to deliver seepage to the ELF toe(~~t. This is required typically at the ELF toe~~) where required to adequately separate ELF seepage from surface water. Seepage drain outlets shall be constructed to avoid oxygen ingress into the ELF via seepage collection pipes (i.e., a u-bend or similar) through a compacted zone designed to prevent advective flow of oxygen into the drain. Underdrains will be monitored in accordance with the WMP and include adaptive management in line with the PDCA cycle.

#### **5-8-6.8. Clean Water Diversion Channels**

Clean water diversion channels minimise the amount of water interacting with ELF's by diverting upslope surface water run-off during precipitation events around the margins of the ELF. Diversion channels are listed in Table 7 and will be reviewed prior to construction in line with This Plan update and the SSES CP.

#### **5-9-6.9. Erosion & Sediment Control Structures**

Surface water run-off from disturbed areas during ELF construction and ELF final slopes will be collected by dirty water channels and diverted to appropriately sized sediment retention structures (including silt ponds) consistent with the requirements of the ESCMP and SSES CP.

Sediment retention structures on ELF surfaces during the Operational Phase shall be earth lined with  $1 \times 10^{-7}$  m/s permeability material to minimise seepage into the ELF. Preference will be given to not having these structures on the ELF. If they are a necessary for sediment management, then they will not be placed above elevated geochemical risk materials. Sediment retention structures will be removed at closure to minimize infiltration of water into the ELF's.

All earthworks undertaken in the ELF areas must be done in accordance with a Site-Specific Erosion and Sediment Control Plan (SSES CP) developed for that area (D.04#NEW1) and must contain as a minimum the following (D.04#NEW2):

- Administrative Requirements including inspections, reporting, auditing and notifications.
- Operational requirements including planned layouts, diversion channel, bund, retention pond detailed designs, dust control, water quality monitoring and hazardous materials management.
- Baseline data to include soil characteristics, catchments, construction methods and timing, contingency for snow, earthwork controls measures, contaminated land contingency and adaptive management process.

The SSES CP must be prepared by a suitably qualified and experienced environmental practitioner and must be submitted to ORC for certification no less than 20 working days prior to the proposed commencement of the activities in the area subject to that SSES CP (D.04#NEW1). MGL must undertake earthworks (D.04#3) and establish and maintain erosion and sediment control measures (D.04#3) in accordance with any relevant certified SSES CP.

#### **5-10-6.10. Material Classification versus ELF Construction Element**

Waste material selection and placement within various ELF construction elements will be managed based on physical and geochemical characteristics. Material classification versus ELF construction element is detailed in Table 56.

**Table 56: Material Classification versus ELF Construction Element**

Material Classification	ELF Construction Element				
	Final Slope		Outer Fill Zone	Bulk Fill Zone	Base layer
	Topsoil	Root Zone			
Topsoil	XXX				
As-Rich Topsoil	XXX				
Brown Rock		XXX			X
Schist – Very Low S, Low As			X		XXX
Schist – Low Geochemical Risk			XXX	X	X
Schist – Elevated Geochemical Risk				XXX	

XXX indicates priority placement position; X indicates secondary placement position where material supply exceeds requirements; blank space indicates material classification not suitable for construction element.

## 6.7. ELF DESIGN CRITERIA

### 6.1-7.1. Objective

ELF designs shall achieve the design objectives are listed in of Table 67. Annual review of the design criteria is undertaken in accordance with the PDCA cycle and Section 12 of This Plan. Changes to the ~~unless the risk can be demonstrated to be accepted, and~~ design objective reviewed and objectives are required to be approved by a CPEng and SQEP geochemical specialist. ~~As per D.04#51, all individual ELFs must be subject to a specific detailed design documented within Detailed Design Report, Construction Drawings, Specifications, and Construction Monitoring and Inspection schedule. The detailed design and documentation for each individual ELF must be reviewed and approved by a Chartered Professional Engineer experienced in geotechnical and civil engineering.~~

**Table 67: ELF Design Criteria**

Aspect	Criteria	Attribute
Geotechnical Stability	Static Factor of Safety (FOS) – interim slopes	FOS ≥ 1.3
	Static FOS – Final Slopes	FOS ≥ 1.5

Aspect	Criteria	Attribute
	Post Earthquake FOS following: 1 in 2,500 year Severe Earthquake	FOS ≥ 1.2
	Earthquake Performance Criteria – 1 in 150 year Moderate Earthquake	Damage being minor & readily repairable following event
	Earthquake Performance Criteria – 1 in 2,500 year Severe Earthquake	No catastrophic failure. Damage being moderate & repairable following event.
	Seismic Hazard	Site Specific Seismic Hazard Assessment based on National Seismic Hazard Model 2022
<b>Oxygen Ingress</b>	Segregated rockfill – Base layer in gullies	Toe Bund – site specific design to extend at least 5 m above the level of segregated rock fill base layer.
	Seepage underdrainage	Outlets designed to avoid oxygen ingress via seepage collection pipes
	Bulk Fill Zone	Lift height ≤ 6 m to limit amount of particle size segregation during tipping
	<u>Bulk Fill Zone</u>	<u>Compaction rated via heavy equipment.</u>
	Outer Zone	Paddock tipping only within 10 vertical m of final slope position
	<u>Shepherds Engineered Landform toe</u>	<u>The toe of Shepherds ELF shall be detailed to limit oxygen ingress into the core of the ELF, in general accordance with Figure 9, BOGP Engineered Landform Technical Report, Engineering Geology Limited, 25 September 2025. (D.04#58)</u>
	<u>Shepherds Engineered Landform cover</u> <u>Western Engineered Landform</u> <u>Srex Engineered Landform</u>	<u>Construct and rehabilitate the ELF to ensure that oxygen ingress into the ELF is &lt; 5 % at ~20 horizontal metres into the ELF with a clear diffusion profile and no advective oxygen ingress, where:</u> <u>a. The diffusion profile is measured by oxygen probes installed up to depths of 50 horizontal metres into the ELF;</u> <u>b. Advective oxygen ingress is prevented (i.e., no significant oxygen concentration spikes); c. Oxygen profiles are reviewed by a suitably experienced and qualified person (SQEP) to confirm that the design objective has</u>

Aspect	Criteria	Attribute
		been achieved (i.e., no advective oxygen ingress): d. If oxygen depth is greater than ~20 horizontal metres, then adaptive management processes need to be implemented to understand the effects and any risks for water quality objectives. (D.04#NEW21, 23, 23a)
Water Ingress	Clean water diversion channels – operation phase	Sized for 1 in 10 yr peak flows
	Clean water diversion channels – closure phase	Sized for 1 in 100 yr peak flow
	Final slope cover system	Designed to limit net percolation to <20% of annual rainfall.
MIW Management	Basal seepage	Material of low geochemical risk placed immediately on stripped foundations in layer up to 3 m thick
	Seepage underdrainage	Subsurface drainage shall be installed where required to adequately separate ELF seepage from surface water
	Water Quality	Regular water quality performance monitoring is undertaken and non-compliances actioned for ELF seepage.
	Shepherds Engineered Landform underdrainage	Install subsurface drainage beneath the downstream toe of Shepherds ELF to collect seepage water and discharge it to the Shepherds Seepage Collection Sump (D.04#57)
	Shepherds Engineered Landform surface drainage	Surface water run-off from the Shepherds ELF must be collected and diverted to the Shepherds Creek Silt Pond. (D.04#59)
	Shepherds Engineered Landform surface drainage	Construct a diversion channel around the hills surrounding the northern margins of the ELF to intercept and divert run-on water to Shepherds Creek. The diversion channel must be sized to allow passage of a 1 in 20 year Annual Return Interval event, for all storm durations for the operational life of the ELF and 1 in 100 year ARI event for closure. (D.04#NEW 21A)

Aspect	Criteria	Attribute
	<a href="#">Western Engineered Landform underdrainage</a>	<a href="#">Install subsurface drainage beneath the downstream toe of the Western ELF and divert and discharge seepage water collected from the Western ELF for use within the processing plant during mine operations and the water treatment plant (or passive treatment system) during mine closure. (D.04#NEW 61)</a>
	<a href="#">Western Engineered Landform surface drainage</a>	<a href="#">Surface water run-off from the Western ELF must be collected and diverted to the Western ELF Silt Pond. (D.04#NEW 62)</a>
	<a href="#">Come-In-Time Backfill surface drainage</a>	<a href="#">Upon the completion of mining the Come-in-Time (“CIT”) Open Pit, backfill the pit void to establish a free draining surface that allows the rehabilitation of slopes similar to the pre-mining landform. (D.04#67)</a>
	<a href="#">Come-In-Time Backfill surface drainage</a>	<a href="#">Seepage water and surface water run-off collected from the CIT Backfill must be diverted for use within the processing plant during mining operations and the water treatment plant (or passive treatment system) during mine closure. (D.04#68)</a>
	<a href="#">Come-In-Time Backfill surface drainage</a>	<a href="#">Upslope diversion bunds or clean water diversion channels must be constructed during operation to prevent surface water run-on to the CIT Backfill. (D.04# 69)</a>
<b>Erosion &amp; Sediment Control</b>	Dirty water diversion channels	Sized in accordance with the ESCMP
	Sediment retention structures (including Silt Ponds)	Sized in accordance with the ESCMP
	Final slopes	Maximum slope gradient of 1V:3H
	Progressive revegetation	Progressive revegetation of completed final slopes in accordance with LERP
<a href="#">Height</a>	<a href="#">Shepherds Engineered Landform</a>	<a href="#">The Shepherds ELF must not exceed a height of 775 masl. (D.04#56)</a>
	<a href="#">Western Engineered Landform</a>	<a href="#">The Western ELF must not exceed a height of 725 masl or capacity of 5.2 million cubic metres. (D.04# 60)</a>
	<a href="#">Srex Engineered Landform</a>	<a href="#">The SRX ELF must not exceed a height of 887.5 masl or capacity of 5.2 million cubic metres. (D.04# 63)</a>

6.2. —

### 6-3-7.2. Long term Geotechnical stability

Two static geotechnical Factors of Safety (FOS), interim and closure, are set to manage the different risks that exist during operation and closure. While operating, interim slopes ~~can~~ are planned to be designed to a lower FOS than in closure where slopes remain in perpetuity. These factors of safety are typical industry values (EGL, 2025b).

Geotechnical post-earthquake FOS and earthquake performance criteria are set to achieve an acceptable level of performance over a range of earthquakes in operation and closure. Displacement and settlements of the ELF's rockfill can be expected in earthquakes due to shake down settlement (due to particle rearrangement) and internal shear mechanisms in the rockfill. ~~No catastrophic failure should result, risk is minimised, and this is to be tested by considering the~~ by designing the ELF for a FOS ~~rating of meeting~~ 1.2 for material strength conditions post a severe 1 in 2,500 year earthquake. This post earthquake case is to consider any material strength loss due to shaking i.e., due to phenomena such as contractive behaviour of loose materials leading to softening or liquefaction.

Earthquake loadings shall be based on site specific seismic hazard assessment best representing the current knowledge of seismic hazard in the area. The current best knowledge is using the National Seismic Hazard Model 2022. Refer the BOGP Site Specific Seismic Hazard Report (EGL, 2025a).

### 6-4-7.3. Specific Detail Design of each ELF

All ELFs shall be subject to a specific detailed design and review prior to construction commencing by the SQEP for geochemistry and geotechnical elements and accordance with Section 12. This is required as the foundations, catchments, profile, materials, and groundwater conditions, and specific controls will be different for each ELF. The design and documentation shall be reviewed and approved by a CPEng experienced in geotechnical and civil engineering.

The specific detailed design for each ELF shall be documented in:

#### 6-4-1-7.3.1. Detailed Design Report:

This report shall be concise and summarise the design basis and criteria, assessments, calculations, stability, sizing, and detailing requirements, and controls required for safe and stable design and construction.

**6.4.2-7.3.2. Construction Drawings:**

Construction drawings are required of all the civil items (diversions, drainage, sumps, toe embankments, silt ponds) and the maximum final slope profiles, internal zoning and final slope details for the ELFs.

**6.4.3-7.3.3. Specification:**

Specifies the requirements for civil items including concrete work, pipe work, earthworks, sump lining, drainage materials, etc. It may be possible to combine the ELF and TSF specification requirements. A common specification can be developed to cover all ELFs.

**6.4.4-7.3.4. Construction monitoring and inspection schedule:**

For quality control and assurance for the construction and operation of the ELFs monitoring and inspections are required to be planned and undertaken. This includes hold points for key civil and operational items. A construction monitoring schedule sets out these requirements at the design stage.

**7.3.5. Site-Specific Erosion and Sediment Control Plan (SSESCP)**

As discussed in Section 6.9, a SSESCP is required to be prepared by a suitably qualified and experienced environmental practitioner for all earthworks undertaken in the ELF areas and must be submitted to Otago Regional Council for certification. Additional water quality monitoring requirements are discussed further in the WMP and ESCMP.

**7.3.6. Landslide Risk Management**

In accordance with Consent Condition D.04#NEW9, no less than two months prior to the commencement of construction of any open pit, underground mine, ELF, TSF, large dam, or processing plant (hereafter referred to in this condition as “infrastructure”), the Consent Holder must:

- a. engage a suitably qualified and experienced geotechnical engineer to investigate and identify active or potentially active landslides within in and around the proposed site of any infrastructure and assess the landslide risk to that infrastructure; and
- b. develop and implement a Landslide Monitoring and Management Plan (LMMP) the objective of which is to ensure that landslides are monitored and managed in a way that protects people and the environment throughout mine operations, active closure, and passive closure of the BOGP;

c. engage a suitably qualified and experienced independent engineer to undertake a peer review of the LMMP;

d. include the findings of the (a), the LMMP required by (b) and the peer-review required by (c) of this condition into any detailed design of any infrastructure; and

e. Specifically for the Shepherds TSF, include the LMMP within the Dam Safety Management System required for compliance with the New Zealand Society on Large Dams Dam Safety Guidelines 2024.

Incorporate any relevant modifications to ELF design based on the outcomes of the Consent Condition D.04#NEW11, Ground Control Management Plan (GCMP) prepared by suitably qualified and experienced geotechnical engineer with the objective to provide for the systematic management of geotechnical risks associated with open pit mining, through monitoring, identification, modelling, assessment, and mitigation of hazards, to prevent ground related injuries and damage to infrastructure, and to ensure continuity of mining.

The design and documentation shall be reviewed and approved by a CPEng experienced in geotechnical and civil engineering.

## **7-8. CONSTRUCTION MANAGEMENT**

### **7-1-8.1. Objective**

Construction ~~to take place~~is in accordance with approved design to achieve geotechnically safe, geochemically stable, water quality compliant, and sustainably rehabilitated ELFs. During construction the PDCA cycle is implemented, and any modification changes are in accordance with Section 12 of This Plan.

### **7-2-8.2. Construction Sequencing**

Construction to take place in the following sequence:

- Establishment of clean water diversion channels;
- Establishment of approved SSESMP measures;
- Foundation clearing and topsoil stripping. Recovered topsoil to be placed directly on prepared final slopes where available, or within designated topsoil stockpile(s);
- Establishment of underdrainage (where required) and placement of base layer of material with low geochemical risk;

- Bulk Fill Zone placement;
- Outer Fill Zone placement;
- Final slope shaping and preparation in accordance with LERMP; and
- Revegetation of Final slopes in accordance with LERMP.

Sequencing various activities may be progressively undertaken. Several activities (e.g., foundation preparation, Bulk Fill placement, Outer Fill placement, Final Slope shaping and preparation, revegetation) may be ongoing within different areas of one ELF at any point in time during construction.

Where practicable, construction sequencing should be undertaken to limit the area of ground disturbance associated with ELF construction at any point in time as well as ensure rock is progressively rehabilitated to limit oxygen and water ingress.

Construction activities should take place in accordance with relevant BOGP management plans (Noise, Lighting, Air Quality, etc.) and documented operating procedures.

## **8.9. MONITORING**

### **8.1.9.1. Objective**

Undertake inspection and monitoring of ELF construction and performance to ensure ELFs are constructed and perform to design or identify deviations from design such that additional mitigation measures can be identified and implemented put in place in accordance with the PDCA and Section 12 of This Plan.

### **8.2.9.2. Construction Monitoring**

Inspection and monitoring during ELF construction shall be undertaken in accordance with the schedule defined during the design phase (Section ~~6.3.4~~) and to fulfill reporting requirements as listed in Section 10 of This Plan. Records of all construction monitoring and inspections shall be held on file for review. Monitoring during construction includes:-

- Records of all construction monitoring and inspections shall be held on file for review. Important items include dDiversion drainage channels, sediment retention structures, foundation stripping, underdrainage, toe bund, stage surfaces of Bulk Fill Zone, Outer Fill Zone, Final Slope shape and profile.
- Construction records should include gGeoreferenced test results (geochemical and geotechnical), surveyed surfaces, visual inspection notes, site photographs, aerial photographs and mapping.

- ~~Records of m~~Material type volume, tonnage, and placement locations using the material classification of Section 4 ~~shall be collected and held on file for review.~~ Survey of stockpiles or surfaces shall be undertaken periodically (monthly) to support record keeping.
- Seepage water quality monitoring will be undertaken in accordance with the requirements of the This Plan and the WMP.
- Erosion monitoring will be undertaken in accordance with the requirements of the ESCMP and specific SSES CPs.
- Compaction measurements will be undertaken using a nuclear density meter and permeability testing to support ongoing learning, planning and design of the ELF construction process
- Progressive rehabilitation will be undertaken in accordance with the ELFMP design schedule, SMP and LERMP.

#### 8.2.1-9.2.1. Remedial Actions

Where construction inspection and monitoring identify deviations from the approved construction design, remedial actions ~~should be developed~~will be implemented. Remedial actions ~~should will~~ be reviewed and approved by a CPEng experienced in geotechnical and civil engineering before undertaken and recorded as per Section 12 of This Plan.

#### 9.3. Performance Monitoring

The following performance monitoring activities are required to validate model inputs, design criteria and construction to meet the objectives of stable ELFs in accordance with the PDCA cycle and adaptive management as described in Section 12 of This Plan:

#### 8.3.—

##### 9.3.1. Geochemistry

- Photographic records of ELF running surfaces and tipheads on a monthly basis.
- ~~Compare, validate and update the geochemical model with field data.~~
- Undertake shake-flask testing to validate the quantity of sulfate and nitrogenous compounds present in blasted rock to validate model inputs on a monthly basis.
- Undertake periodic sampling of ELF runoff from -running surfaces (during rainfall events) on a monthly basis.
- Confirm the sulfur content of materials placed in the ELF ensuring that lower sulfur TZ3 materials are placed on the outside of the ELF.

- Confirm water quality for ELF seepage aligns with geochemical models including sulfate and nitrate and update models where significant differences are observed.
- Monitor and review the selective placement of waste rock on a weekly basis, recording and actioning non-compliances with relocation of materials where required.
- Update mine scheduling to ensure adequate quantities of material types are available in a timely manner for selective ELF placement.
- Compare, validate and update the geochemical model with field data.

#### **8.3.1-9.3.2. Erosion and Sediment Control**

- Inspect and monitor in accordance with the ESCMP and SSES CPs the clean and dirty water diversion channels, surface drains, and sediment retentions structures (including silt ponds) associated with ELF construction. ~~should be inspected and monitored in accordance with the ESCMP.~~
- Inspect surfaces after heavy rainfall on both outer and internal surfaces to ensure integrity of compaction and slope profile as per the SSES CP.
- Inspect and clear Blockages within diversion channels. ~~be cleared as soon as practicable.~~
- Inspect and stabilise identified areas of erosion within diversion channels. ~~or final slopes should be stabilized as soon as practicable.~~
- Inspect and clear Sediment build-up within ESC retention structures. ~~should be cleared on a regular basis.~~
- Undertake monthly erosion monitoring and implement rectification works of the ELF edge surfaces in accordance with the ESCMP.
- Undertake progressive rehabilitation to stabilise surfaces and establish native vegetation to minimize erosion.

#### **8.3.2-9.3.3. Mine Influenced Water**

- Undertake Performance monitoring of ELF derived MIW and groundwater quantity and quality monitoring downgradient of ELFs ~~should be undertaken~~ in accordance with the WMP.
- Report all MIW and groundwater monitoring results ~~should be reported~~ to the Mine Manager and Technical Services Manager on a monthly basis and include non-compliances.

- ~~Review and update the conceptual geochemical model for each ELF~~ ~~ELF-derived MIW seepage and surface runoff quantity and quality monitoring results should be reviewed based on field data~~ on an annual basis by a SQEP geochemical specialist and assessed against modelled MIW evolution for individual ELFs (MWM, 2025c).
- ~~Assess non-compliances or Any~~ ~~deviations~~ from the expected model case ~~and should be assessed by a risk assessment process to ensure what implement corrective actions management processes are required~~ to achieve operational and closure water quality objectives.
- ~~Monitor and review~~ ~~Groundwater monitoring quality~~ results downgradient of individual ELFs ~~should be reviewed~~ on an annual basis by a SQEP geochemical specialist.

#### **8.3.3-9.3.4. Oxygen Ingress**

- ~~Oxygen probe monitoring locations should be planned in advance to ensure spatial distribution is achieved. A plan showing the location of these oxygen probes will be provided to the ORC as part of annual reporting.~~
- ~~Install and monitor~~ ~~Oxygen probes (or similar: e.g., oxygen sensors) should be into each lift during construction and used to~~ confirm that the design objectives ~~are met to~~ exclude oxygen into the core of the ELF (e.g., < 5% oxygen beyond ~20 m horizontally) with a clear oxygen diffusion profile.
- ~~Report m~~ ~~Monitor oxygen probes on a monthly basis~~ ~~monthly of oxygen probe levels and implement corrective actions as required.~~
- ~~Undertake monthly compaction testing on surfaces across the ELF.~~
- The design specification for oxygen probes, oxygen probe installation, monitoring, and reporting of the oxygen data will be managed by an appropriate management process.

~~—Net Percolation~~ ~~Inspect surfaces after heavy rainfall on both outer and internal surfaces to ensure integrity of compaction and slope profile as per the SSESCP.~~

#### **9.3.5.**

~~Within 12-18 months of commencing bulk earthworks initiate ELF cover system field trials for the purpose of validating the net percolation rate of 20% that was assumed in the application. The trial must include / must be undertaken in the following way (D.04#NEW20):~~

- ~~A field trial methodology will be provided within 3-6 months of the project being approved.~~
- ~~An annual monitoring report, prepared by a SQEP will be provided.~~

- o Following completion of trials the Consent Holder must ensure sufficient materials are available to construct the proposed cover system.
- Monitor during trials and throughout the closure phases net percolation (i.e., % of rainfall) rates into the various engineered landform covers to compare to the expected range of 20-50% (MWM, 2025c) and update the 20% value in the geochemical model if required.

#### **8.3.4-9.3.6. Particle Size Segregation**

- Undertake Assessment of grainsize segregation during ELF construction ~~should be periodically on a monthly undertaken to~~ basis to validate that the lift height is appropriate.
- Inspect surfaces after heavy rainfall on both outer and internal surfaces to ensure integrity of compaction and slope profile.

#### **9.3.7. Geotechnical Stability**

- Develop and implement a Landslide Monitoring and Management Plan (LMMP) in accordance with Consent Condition D.04#NEW9.
- Undertake monthly geotechnical assessments against the design criteria for water diversions, drainage, sumps, toe embankments, silt ponds, slope profiles, internal zoning and final slope details for each of the ELFs.
- Undertake earthquake analysis and determine the Peak Ground Acceleration (PGA) to calculate the FOS rating for ELF stability. Determine the minimum FOS level for which all ELFs will require inspection.
- In accordance with Consent Condition D.04#NEW12 a minimum Factor of Safety of 1.5 must be maintained under static loading for all ground outside the project site as shown on Plan 2 of Common Conditions which apply to all of the resource consents within the jurisdiction of the CODC and ORC.

### **9-10. REPORTING AND DATA MANAGEMENT**

#### **10.1. Record Keeping and Data Management**

A copy of This Plan will be stored electronically in the Environment folder on SharePoint with access available to all workers.

Printed versions are considered uncontrolled. Relevant databases and models supporting This Plan will be located on SharePoint. MGL will retain construction monitoring and as-built records on file and provide them to ORC on request (D.04#52).

### **10.2. Internal Reporting and Auditing**

Integration with life of mine and closure planning is an inherent mechanism including financial resources to address monitoring, maintenance, inspection, and adaptation of the ELF MP.

An internal audit of the ELFs against this ELFMP and SSESCPs will occur on an annual basis during the operational phase and then on closure in accordance with the Closure Management Plan and consent conditions. The internal audit will be undertaken by a SQEP for both geochemistry and CPEng for geotechnical aspects with a report that can fulfil the input requirements for the annual compliance report.

### **10.3. External Interim Reporting**

The following interim reporting requirements have been specified in the Consent Conditions for provision to the CODC and ORC.

#### **10.3.1. Ground Control Management Plan (GCMP)**

In accordance with D.04#NEW11 a **Ground Control Management Plan (GCMP)** will be prepared by suitably qualified and experienced geotechnical engineer no less than two months prior to the excavation of each open pit and provide to the ORC for certification

In accordance with D.04#NEW13 a **Geotechnical Stability Assessment** prepared by a suitably qualified and experienced geotechnical or mining engineer will be provide to the ORC no less than two months prior to the excavation of each open pit

### **9-1-10.4. External Annual Reporting**

#### **9-1-1-10.4.1. Annual Compliance Report**

Work completed on individual ELFs shall be summarized within the Annual Compliance Report. Reporting details include:

- A description of works completed within previous 12 month period;
- The actual material in volume and tonnage contained within each ELF at the end of the reporting period;

- The location, volume and tonnage of topsoil and brown rock stockpiles at the end of the reporting period;
- Review of completed construction versus design by a CPEng, noting any non-compliance items and recommendations;
- Review of MIW performance monitoring trends by a SQEP geochemical specialist, noting any deviation from predicted trends and recommendations; and
- A balance of volume and tonnage of required and available for earthworks rehabilitation of the site and final slope material (Topsoil, As-rich Topsoil & Brown Rock) for the site at the end of the reporting period.
- Progressive rehabilitation performance indicators.
- In accordance with D.04#NEW20 an ELF Cover System Trial Report prepared by a SQEP will be included in the annual reporting suite.

Commented [DT1]: To match D.04#53

#### **9.1-2-10.4.2. Annual Work Plan**

For the 12 period ahead, proposed work on individual ELF's shall be summarised within the Annual Work Plan. Reporting details include:

- A description of works proposed within the next 12 month period;
- The predicted volume and tonnage contained within each ELF at the end of the Work Plan period; and
- The predicted volume and tonnage of required and available final slope material (Topsoil, As-rich Topsoil & Brown Rock) for the site at the end of the Work Plan period.

#### **9.2-10.5. Completion Report**

At the completion of all earthworks (operational closure) of an individual ELF, the final construction is to be reviewed against detailed design by:

- a CPEng experienced in geotechnical and civil engineering.
- a SQEP geochemical specialist

Any remedial measures shall be recommended and actioned. The Completion Report shall be submitted to the Otago Regional Council.

**10-11. RISK MANAGEMENT**

**10-1-11.1. Objective**

The object of the risk management framework is to identify, assess, manage, and monitor risks associated with the design, construction, and closure of the ELF.

**10-2-11.2. ELF Risk Assessment**

A high-level risk assessment has been conducted for ELF design and construction. Key risks, cause, consequence, uncontrolled risk classification (e.g. High, Moderate, Low), mitigation controls and controlled risk classification are presented in Table 86.

Table 87: ELF Risk Register

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
ELF01	Inappropriate Material Classification	<ul style="list-style-type: none"> <li>Incorrect geochemical classification criteria applied (i.e., As and S threshold limits are not suitable)</li> </ul>	<ul style="list-style-type: none"> <li>Material with higher geochemical risk placed in inappropriate location during ELF construction, topsoil stockpiling or topsoil placement, resulting in increased risk of NMD and / or PCOC mobilisation</li> </ul>	Moderate	<ul style="list-style-type: none"> <li>Threshold set for separation of high As from low As material (Schist and soils)</li> <li>Threshold set for separation of very low, low and High S material (Schist)</li> <li>Validate data against ongoing column leach tests</li> <li>Validate results from large scale field trial data.</li> <li><a href="#">Update geochemical model and mine scheduling for materials placement.</a></li> </ul>	Low
ELF02	Inappropriate Material Classification	<ul style="list-style-type: none"> <li>Inappropriate sampling and assay management leading to incorrect geochemical material classification</li> </ul>	<ul style="list-style-type: none"> <li>Material with higher geochemical risk placed in inappropriate location during ELF construction topsoil stockpiles or topsoil placement, resulting in increased risk of NMD and / or PCOC mobilisation</li> </ul>	Moderate	<ul style="list-style-type: none"> <li>Investigate natural As and S variability within Schist, and As variability in soils</li> <li>Develop appropriate sampling protocol for As and S content analysis (spacing, sample splitting, sample preparation)</li> <li>Ensure appropriate As and S analytical method is employed</li> <li>Implement effective QA/QC procedures (sampling</li> </ul>	Low

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
					<p>procedure, duplicates, data management, internal lab QA/QC)</p> <ul style="list-style-type: none"> <li>Develop management actions for unacceptable QA/QC outcomes</li> <li><a href="#">Update geochemical model and mine scheduling for materials placement.</a></li> </ul>	
ELF03	Incorrect Material classification leads to inappropriate placement of waste rock.	<ul style="list-style-type: none"> <li>Incorrect classification of materials</li> </ul>	<ul style="list-style-type: none"> <li>Material with higher geochemical risk placed in inappropriate location during ELF construction, resulting in increased risk of NMD and PCOC mobilisation</li> <li>Material with lower geochemical risk placed in inappropriate location during ELF construction, resulting in insufficient material available for Outer Fill Zone and Final Slope preparation</li> </ul>	Moderate	<ul style="list-style-type: none"> <li>Develop geostatistical model of As and S distribution in Schist, and As distribution in soils</li> <li>Ensure waste material which differ from default classification are identified within polygons prior to excavation (i.e. As-rich topsoil, areas of elevated geochemical risk within Bulk Waste, areas of low geochemical risk in Ore Zone)</li> <li>Implement a system of record collection for individual truck loads tipped within ELF footprints</li> </ul>	Low

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
					<ul style="list-style-type: none"> <li>• Train excavator operators on brown rock visual selection criteria</li> <li>• Plan Topsoil and Brock Rock stockpile locations</li> <li>• <u>Implement the ELF MP training programme.</u></li> <li>• <u>Update geochemical model and mine scheduling for materials placement.</u></li> <li>• </li> </ul>	
ELF04	Materials are placed in the wrong location.	<ul style="list-style-type: none"> <li>• Material management errors</li> </ul>	<ul style="list-style-type: none"> <li>• Material with higher geochemical risk placed in inappropriate location during ELF construction, resulting in increased risk of NMD and PCOC mobilisation</li> <li>• </li> <li>• Material with lower geochemical risk placed in inappropriate location during ELF construction, resulting in insufficient material available for Outer Fill</li> </ul>	Moderate	<ul style="list-style-type: none"> <li>• <u>Develop and implement supervisor and operator training for materials management.</u></li> <li>• Schedule material placement in ELF based on material classification.</li> <li>• Implement a vehicle tracking system for ensuring materials are placed <u>and recorded</u> in the right location.</li> <li>• <u>Operator education of material sources and ELF zones</u><u>Develop a non-compliance contingency plan for higher risk materials.</u></li> <li>• Audits / spot checks</li> </ul>	Low

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
			Zone and Final Slope preparation		<ul style="list-style-type: none"> <li>Task observations to be completed</li> <li>Implement the ELF MP training programme.</li> <li></li> </ul>	
ELF05	Elevated oxygen ingress into the ELF	<ul style="list-style-type: none"> <li>ELF not constructed according to design</li> <li>Particle size segregation leading to advective oxygen ingress</li> <li>Toe Bund or underdrains allow oxygen into ELF core.</li> <li>Cover system not effective at reducing oxygen ingress.</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>Increased risk of NMD and PCOC mobilisation</li> <li>Elevation of PCOC present in MIW compared to geochemical modelling</li> <li>Elevated PCOC in MIW persists longer than geochemical modelling</li> <li>Failure to meet site WMP compliance limits</li> </ul>	High	<ul style="list-style-type: none"> <li>Review and update This Plan at each Phase and in accordance with Section 12 to ensure PDCA cycle is embedded and adaptive management measures are incorporated.</li> <li>Design, implement and monitor engineering controls for ELF gully areas to prevent oxygen ingress.</li> <li>Implement the ELF MP training programme.</li> <li>Monitor <del>M</del>material types placement in correct ELF zones according to design.</li> <li>Construction inspection and monitoringCompaction testing monitoring on bench lifts to meet minimum compaction levels.</li> <li>Investigate roller/ high energy impact compaction to</li> </ul>	Low

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
					<p>improve compaction if required.</p> <ul style="list-style-type: none"> <li>• Undertake an annual review of inspection, monitoring and as-built survey versus design by CPEng.</li> <li>• Undertake an annual review of geochemical stability against Plan objectives.</li> <li>• Install Oxygen probes per bench to confirm depth of oxygen ingress.</li> <li>• Assessment of grainsize segregation during ELF construction to validate the lift height is appropriate.</li> <li>• Performance monitoring of PCOC in ELF derived MIW</li> <li>• Install and operate site water treatment methods until PCOC levels meet WMP compliance levels.</li> <li>• Incorporate active and passive water treatment costs into LOM.</li> </ul>	

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
					<ul style="list-style-type: none"> <li>• <a href="#">Undertake NP cover trials to guide final closure cover design criteria.</a></li> </ul>	
ELF06	Elevated water ingress into ELF	<ul style="list-style-type: none"> <li>• ELF not constructed according to design objectives</li> <li>• Water diversion (clean and dirty water) not effectively managed</li> <li>• Final slope preparation and revegetation sequences do not achieve net percolation targets (NP 20)</li> <li>• Progressive rehabilitation not undertaken in</li> </ul>	<ul style="list-style-type: none"> <li>• Increased risk of NMD and PCOC mobilisation</li> <li>• Elevation of PCOC present in MIW compared to geochemical modelling</li> <li>• Elevated PCOC in MIW persists longer than geochemical modelling</li> <li>• Failure to meet site WMP compliance limits</li> </ul>	High	<ul style="list-style-type: none"> <li>• <a href="#">Review and update This Plan at each Phase and in accordance with Section 12 to ensure PDCA cycle is embedded and adaptive management measures are incorporated.</a></li> <li>• <a href="#">Update designs to include additional clean water diversion structures.</a></li> <li>• Materials placed in correct ELF zones according to design</li> <li>• <a href="#">Monitoring ELF surface compaction and water ingress.</a></li> <li>• <a href="#">Develop, implement and monitor against the SSSCP for ELF areas for during Construction.</a></li> <li>• <a href="#">Undertake monitoring in accordance with This Plan.</a></li> <li>• <a href="#">Construction inspection and monitoring</a></li> </ul>	Low

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
		a timely manner			<ul style="list-style-type: none"> <li>Annual review of inspection, monitoring an <del>as-built</del>as-built survey versus design by CPEng</li> <li>Diversion of clean run on water</li> <li>Routine monitoring and maintenance of water diversion channels</li> <li>Field trials and modelling to confirm NP are <del>achieved</del>achieved</li> <li>Performance monitoring of PCOC in ELF derived MIW</li> <li>Collect and treat seepage water until PCOC levels meet WMP compliance levels.</li> <li>Provide annual budget estimate updates for active and passive water treatment through LOM.</li> </ul>	
ELF07	Erosion of ELF Final Slopes	<ul style="list-style-type: none"> <li>ELF not constructed according to design objectives</li> </ul>	<ul style="list-style-type: none"> <li>Increased water ingress into ELF</li> <li>Increased sediment run off</li> </ul>	Moderate	<ul style="list-style-type: none"> <li>Develop, implement and monitor against the SSESCP for ELF areas for during Construction.</li> </ul>	Low

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
		<ul style="list-style-type: none"> <li>Inadequate or unsuitable cover system installed.</li> <li>Progressive rehabilitation is not undertaken in a timely manner.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>		<ul style="list-style-type: none"> <li>Construction inspection, monitoring and annual review of as built versus design by CPEng.</li> <li>Progressive Final Slope preparation, shaping and revegetation in accordance with LERMP.</li> <li>Routine monitoring and maintenance of Final Slope surfaces</li> <li></li> </ul>	
ELF08	ELF Slope Instability	<ul style="list-style-type: none"> <li>Inappropriate ELF design criteria</li> <li>ELF not constructed according to design objectives</li> <li>Instability due to seismic event</li> <li>Instability due to weakness in foundation</li> </ul>	<ul style="list-style-type: none"> <li>Collapse of ELF slopes</li> <li>Development of large tension cracks in Outer Fill Zones</li> <li>Increased Oxygen ingress into ELF</li> <li>Increased water ingress into ELF</li> <li>Increased sediment run off</li> </ul>	Moderate	<ul style="list-style-type: none"> <li>Undertake slope stability assessment of ELF design</li> <li>Follow FOS design criteria</li> <li>Undertake Site Specific Seismic Hazard Assessment</li> <li>Assess seismic deformation against proposed design earthquake performance criteria.</li> <li><a href="#">Develop, implement and monitor against the SSES CP for ELF areas for during Construction.</a></li> <li><a href="#">Undertake monitoring in accordance with This Plan.</a></li> </ul>	Low

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
					<ul style="list-style-type: none"> <li>• <del>Construction inspection and monitoring</del></li> <li>• Annual review of inspection, monitoring an as built survey versus design by CPEng.</li> <li>• <del>Undertake Ffoundation clearing, topsoil stripping and inspection.</del></li> <li>• <del>Develop and Implement LMMP</del></li> <li>• <del>Develop and implement GCMP</del></li> </ul>	
ELF09	Failure to meet ELF revegetation objectives	<ul style="list-style-type: none"> <li>• Insufficient volumes of Topsoil and Brown Rock for Final Slope preparations</li> <li>• Insufficient variety of root zone depths created during Final Slope preparation</li> <li>• Insufficient number of landscape features</li> </ul>	<ul style="list-style-type: none"> <li>• Failure to meet LERMP revegetation objectives</li> <li>• Failure to meet LERMP fauna objectives</li> </ul>	Moderate	<ul style="list-style-type: none"> <li>• Integrate LERMP objectives to ELF final slope cover design</li> <li>• Plan and schedule Topsoil stripping, stockpiling and placement</li> <li>• Plan and schedule natural rock features recovery during stripping activities</li> <li>• Plan and schedule Brown Rock separation during excavation, stockpiling and placement</li> <li>• Monitor and annual report balance of Topsoil and Brown</li> </ul>	Low

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
		created on ELF final slopes			Rock volume required and available	

A Risk Register shall be developed for each individual ELF prior to construction.

Risk Registers shall be reviewed and updated:

- Following investigation of any significant Health & Safety and / or Environmental incidents associated with ELF design, construction or monitoring
- Following any design change or mitigation measures
- Following review of monitoring
- Annually

ELF Risk management processes shall be integrated into the BOGP and corporate risk management framework

#### **11.12. CHANGE MANAGEMENT**

Review of this ELF Management Plan will be undertaken by SQEP's that have experience in the assessment and management of both geotechnical and geochemical aspects of ELFs. A review of ELF design will occur in conjunction with the development of the GCMP prior to the excavation of each open pit (D.04#NEW11a). The SQEPs will be part of a Peer Review Panel (PRP) that will be appointed by the Otago Regional Council (ORC). The members of the PRP must be fully independent of the planning, design, and operations of BOGP. Such independence will be confirmed by the ORC.

##### **1.1 Peer Review Panel Purpose**

The purpose of the PRP is to:

- Ensure that work is being undertaken in accordance with industry's best practice.
- Provide independent advice to the ORC, as to whether the approved resource consent conditions relating to the design, construction, operation, maintenance, rehabilitation and closure of ELFs are being satisfied.
- Identify ELF risks and make recommendations on how those risks will be addressed for the ELFs.
- Provide peer review of key reports prepared for MGL for the ORC on ELFs.
- Attend an annual meeting at site to discuss progress and understand project developments.

##### **12.1. Review Requirements**

This Plan and all associated training materials and deliverables will be reviewed where there has been a defined outcome of an investigation due to an incident or significant non-compliance occurring.

The Plan and associated procedures will be periodically reviewed and revised to reflect updated operational data, modelling predictions, monitoring data, through the PDCA cycle or investigations due to incidents or at the request of a relevant regulatory authority.

The timing of This Plan review and approval will occur within three months of the following:

- The planned date for the internal annual review.
- The submission of an incident report relating to ELF construction or MIW from ELF constructions where an investigation outcome dictates a change to management practices.
- The submission of an external audit with additional or changed management measures.
- Any direction by a relevant regulatory authority to update This Plan or the Peer Review Panel (PRP).
- A change to either the outputs for the Annual Work Plan or the Annual Monitoring Report that necessitates changes herein or vice versa.
- A change in the following interrelated management plans that may impact on This Plan and vice versa:
  - Erosion and Sediment Control Management Plan (ESCMP)
  - Site Specific Erosion and Sediment Control Plan (SSESCP)
  - Water Management Plan (WMP)
  - Soil Management Plan (SMP)
  - Landscape and Ecological Rehabilitation Plan (LERMP)
  - Landslide Monitoring and Management Plan (LMMP)
  - Ground Control Management Plan (GCMP)

A formal Change Management Process is required to ensure that any modifications to the ELF design, construction, or monitoring systems:

- Are properly evaluated by MGL and the CPEng and/or SQEP geochemical specialist as necessary.
- Do not compromise the integrity, safety, or environmental performance of the ELFs.
- Remain compliant with resource consent conditions.

#### **Key Requirements**



- All proposed changes must be assessed against the resource consents granted for the BOGP.
- Significant update to the ELFMP must be submitted for recertification by the ORC.
- If a change affects consent conditions, an amendment to the consent may be required.
- Changes must be documented and tracked within the ELFMP.

#### **Change Management Record**

All changes must be recorded in the ELFMP Change Management Record (Table 89).

**Table 89: Change Management Record**

Item	Section	Summary of change	Reason for change	Complexity of change	Date
<a href="#">1.</a>				<input type="checkbox"/> Minor <input type="checkbox"/> Moderate <input type="checkbox"/> Major	
<a href="#">2.</a>				<input type="checkbox"/> Minor <input type="checkbox"/> Moderate <input type="checkbox"/> Major	
<a href="#">3.</a>				<input type="checkbox"/> Minor <input type="checkbox"/> Moderate <input type="checkbox"/> Major	
<a href="#">4.</a>				<input type="checkbox"/> Minor <input type="checkbox"/> Moderate <input type="checkbox"/> Major	

**12-13. REFERENCES**

Blake et al., 2019. Surficial arsenic redistribution above gold-mineralised zones in East Otago, New Zealand. *New Zealand Journal of Geology and Geophysics*, Vol. 62 (4), pg. 573-587

EGL, 2025(a). Site-Specific Seismic Hazard Study Report. Bendigo-Ophir Gold Project. Engineering Geology Limited Ref 9702 for Matakanui Gold Limited.

EGL, 2025(b). Shepherds, Western, and Srex Engineered Landforms, and Come In Time Pit Backfill; Technical Report. Bendigo-Ophir Gold Project. Engineering Geology Limited Ref 9702 for Matakanui Gold Limited.

GRM, 2025. Preliminary Site Investigation. Bendigo-Ophir Gold Project. Geocontam Risk Management Report J-NZ0005-001-R-Rev3 for Matakanui Gold Limited.

MWM, 2025(a). Net Percolation Assessment for the Proposed Bendigo-Ophir Gold Project Mine Waste Storage facilities. Mine Waste Management Document J-NZ0455-001-M-Rev3 for Matakanui Gold Limited.

MWM, 2025(b). Factual Report: Geoenvironmental Hazards. Bendigo-Ophir Gold Project. Mine Waste Management Report J-NZ0233-008-R-Rev3 for Matakanui Gold Limited.

MWM, 2025(c). Engineered Landform Water Quality Forecast Report. Bendigo-Ophir Gold Project. Mine Waste Management Report J-NZ0457-002-Rev1 for Matakanui Gold Limited.

MWM, 2025(d). Mine Impacted Water Report. Bendigo-Ophir Gold Project. Mine Waste Management Report J-NZ0488-001-R-Rev1 for Matakanui Gold Limited.

#### 14. ACRONYMS

<u>ABBREVIATION</u>	<u>DEFINITION</u>
<u>ABA</u>	<u>Acid base accounting</u>
<u>AMD</u>	<u>Acid and metalliferous drainage, which can also include low metal saline drainage</u>
<u>ANFO</u>	<u>Ammonium nitrate fuel oil (explosive)</u>
<u>BOGP</u>	<u>Bendigo-Ophir Gold Project</u>
<u>CIT</u>	<u>Come in Time</u>
<u>CSM</u>	<u>Conceptual site model</u>
<u>CODC</u>	<u>Central Otago District Council</u>
<u>CPEng</u>	<u>Certified Practicing Engineer</u>
<u>ELF</u>	<u>Engineered Landform</u>
<u>ESCMP</u>	<u>Erosion and Sediment Control Management Plan</u>
<u>FOS</u>	<u>Factors of Safety</u>
<u>GCMP</u>	<u>Ground Control Management Plan</u>
<u>LERMP</u>	<u>Landscape and Ecological Rehabilitation Plan</u>
<u>LMMP</u>	<u>Landslip Movement Management Plan</u>
<u>LOM</u>	<u>Life of mine</u>
<u>masl</u>	<u>Meters above sea level</u>
<u>MIW</u>	<u>Mine impacted water</u>
<u>MGL</u>	<u>Matakanui Gold Limited</u>
<u>Mt</u>	<u>Million tonnes</u>
<u>MWM</u>	<u>Mine Waste Management Limited</u>
<u>NP</u>	<u>Net percolation</u>
<u>ORC</u>	<u>Otago Regional Council</u>
<u>PCOC</u>	<u>Potential constituents of concern</u>
<u>PDCA</u>	<u>Plan Do Check Act</u>
<u>PFS</u>	<u>Pre-feasibility study</u>
<u>pXRF</u>	<u>portable X-ray Florescence</u>
<u>QA/QC</u>	<u>Quality assurance and quality control</u>
<u>RAS</u>	<u>Rise and Shine</u>
<u>RMA</u>	<u>Resource Management Act</u>

<u>ABBREVIATION</u>	<u>DEFINITION</u>
<u>ROM</u>	<u>Run of mine</u>
<u>RSSZ</u>	<u>Rise and Shine Shear Zone</u>
<u>SCK Fill</u>	<u>Shepherds Creek Fill</u>
<u>SMP</u>	<u>Soil Management Plan</u>
<u>SOP</u>	<u>Stored Oxidation Products</u>
<u>SRX</u>	<u>Srex</u>
<u>SRXE</u>	<u>Srex East</u>
<u>SSESCP</u>	<u>Site Specific Erosion and Sediment Control</u>
<u>SQEP</u>	<u>Suitability Qualified And Experienced Practitioner</u>
<u>TGF</u>	<u>Thomson Gorge Fault</u>
<u>TSF</u>	<u>Tailings storage facility</u>
<u>TSS</u>	<u>Total suspended solids</u>
<u>TZ3</u>	<u>Textural Zone 4 of the Otago Schist</u>
<u>TZ4</u>	<u>Textural Zone 4 of the Otago Schist</u>
<u>WELF</u>	<u>West ELF</u>
<u>WRS</u>	<u>Waste Rock Stack</u>