

3. PROJECT DESCRIPTION

In accordance with Schedule 5 (clause 5 (1)(a)), Schedule 6 (clause 3 (1)(a)), Schedule 7 (clause 2 (1)(a)) and Schedule 8 (clause 2 (1)(f)) of the Act, this section of the report provides a description of the activities associated with the proposed construction, operation, maintenance, and the eventual closure of the BOGP.

A list of the key activities of the proposed BOGP has been provided in Section 1.2 of this report, with further details of those activities provided in the following sections.

It is acknowledged that some of the technical reports provided as part of these application documents refer to additional activities that are no longer proposed as part of the BOGP. For completeness, it is confirmed that all components of the project that MGL are seeking approvals for under the Act are described in this section of this report, with any components described in technical reports (and not this substantive application) to be disregarded.

In addition, it is noted that the activities described in this section represent a 'greatest extent' scenario including the maximum disturbance footprint for the BOGP. MGL has, and will continue to, refine and reduce the footprint of the key mine components during detailed design to reduce environmental impacts and improve the efficiency and effectiveness of the mining operations.

3.1 PROJECT BENEFITS

As outlined in Section 1.3 of this report, MGL has completed extensive exploration work at the Project Site, which has identified orebodies with gold deposits that are estimated to contain approximately 1.25 million ounces of recoverable gold and a total of 2.34 million ounces of gold in mineral resources to date.

A broad range of activities are required to be undertaken to enable the development of the RAS, SRX, SRE and CIT orebody deposits. These activities, and the infrastructure required to undertake them, are described in detail in this section. The gaining of approval for the BOGP will realise significant regional and national economic benefits as a result of foreign investment, New Zealand exports, employment opportunities, and contribution to the Inland Otago (Queenstown Lakes and Central Otago) economy. While this is discussed further in Section 6.2 of this report, the initial BOGP mine operations will:



- > Have an anticipated annual gold production rate of 91,000 ounces,³⁵ with a mine revenue of approximately \$5.8 billion dollars over the initial mine life of approximately 14 years based on current prevailing gold prices and cost estimates when the Updated PFS was published;
- > Provide significant employment opportunities (average job creation of approximately 351 jobs with a peak of approximately 506 jobs directly created) with a broad range of skilled and unskilled jobs created. The jobs will be highly productive and highly paid, with the BOGP estimated to contribute \$133,811 of GDP per worker, which is 7.7 times the current average productivity across Inland Otago;
- > Have multiple flow on benefits for jobs in local businesses across the Otago Region and the South Island more widely (an additional approximately 463 indirect jobs will be created);
- > Be a catalyst for infrastructure growth regionally;
- > Be a significant source of foreign investment to New Zealand in the construction phase;
- > Contribute significantly to the revenue of the New Zealand government through royalties, corporate tax and PAYE (through increased spending on operational input costs, gold royalties etc.) in the order of \$1.8 billion dollars at a gold price of \$5,445 per ounce,³⁶ and
- > Directly add an average of \$360 million of GDP per year across the approximately 14 year initial mine life, peaking at over \$535 million of GDP in year 5 of mine life, with the cumulative GDP effects totalling approximately \$5.8 billion. The average annual GDP contribution of the BOGP is estimated to equate to 5.4% of the current size of the Inland Otago economy.

As set out in Section 1.4 of this report, this application seeks to make use of the Act's "one-stop-shop" approvals process that supports and provides for the timely and integrated processing of large and complex projects which would otherwise require sequential approvals under different statutes.

3.2 PROJECT OVERVIEW

The BOGP comprises a new gold mine, ancillary facilities and environmental mitigation measures on Bendigo and Ardgour Stations in the Dunstan Mountains of Central Otago.

³⁵ In accordance with the *Bendigo-Ophir Gold Project Pre-Feasibility Study*, dated 15 November 2024, which was released by Santana Minerals to the Australian Stock Exchange in November 2024.

³⁶ The equivalent gold price of USD \$3,138 per ounce.



As introduced in Section 1.2 of this report, the BOGP involves mining four identified gold deposits named RAS, CIT, SRX and SRE. The resources will be mined by open pit methods at each deposit within the Project Site, with underground mining methods also proposed to be utilised at RAS to access the deeper gold deposits. The majority of the mining activities, ancillary facilities and associated infrastructure will be located in Shepherds Valley, with an additional general and administration area located on the adjoining Bendigo / Ardgour terraces.

Figure 3-1 below provides an overview of the Project Site for the establishment, operation and rehabilitation of the BOGP, which includes a footprint of 568 hectares.



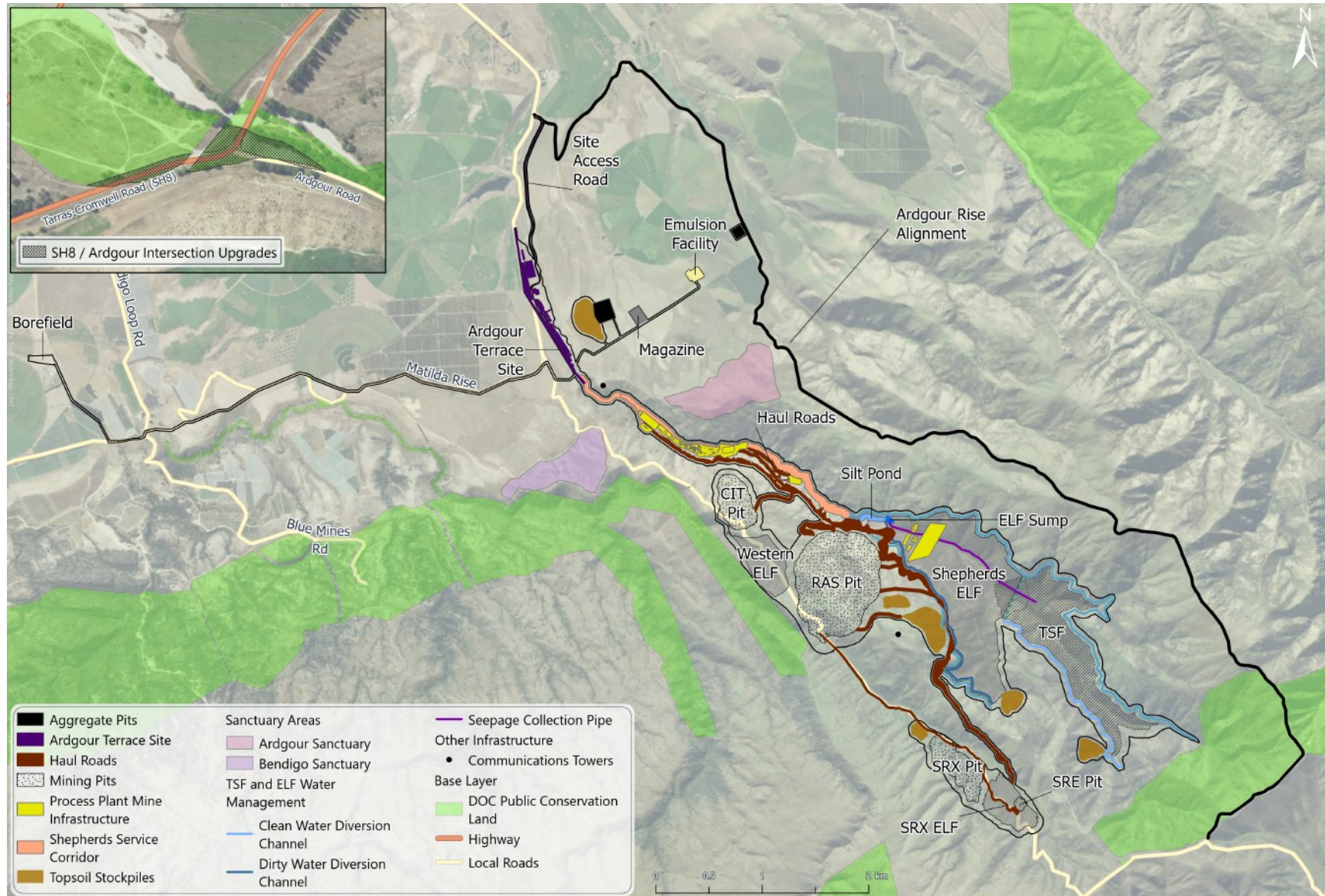


Figure 3-1: Overview Site Layout of the Bendigo-Ophir Gold Project



The BOGP is made up of the following key activities:

- > The staged establishment of the RAS Open Pit and Underground Mine and SRX Open Pit, which will remain as pit lakes at closure;
- > The establishment of the CIT Open Pit, which will be eventually backfilled with waste rock from the RAS Open Pit and rehabilitated at the completion of mining activities;
- > The establishment of the SRE Open Pit, which will be progressively backfilled with waste rock before becoming an engineered landform for the adjoining SRX Open Pit;
- > The establishment of an engineered TSF in the upper reach of Shepherds Valley (including a seepage collection sump), which will utilise overburden waste rock from the development of the RAS Open Pit and be buttressed by the Shepherds ELF described below;
- > The establishment of three ELF's to permanently store overburden waste rock, being the Shepherds ELF, SRX ELF and Western ELF;
- > A conventional hard-rock gold processing plant in the lower reach of Shepherds Valley, along with associated infrastructure and ancillary activities. This includes the establishment of the all-purpose Shepherds Service Corridor and the realignment of Shepherds Creek to form the Shepherds Stream Diversion (as part of wider stream diversion activities);
- > The establishment of temporary topsoil, vegetation and brown rock stockpiles around the Project Site;
- > The taking of groundwater from the Bendigo Aquifer via a lawfully established bore and a proposed new bore for use in mining-related activities (and to supplement flows in Shepherds Creek). Water will be conveyed to the processing plant via a pipeline over a distance of approximately 6.5 km;
- > The establishment of the Shepherds Silt Pond at the base of the Shepherds ELF and water storage tank(s) for use at the processing plant and dust suppression;
- > The establishment of supporting infrastructure within the Project Site, such as the upgrade of Ardgour Road and the upgrade and realignment of Thomson Gorge Road to provide improved access to the BOGP, internal mine access and haul roads, water pipelines and underground utilities, and electricity supply to the Project Site from Lindis Crossing and Matilda Rise;
- > The proposed closure of parts of Thomson Gorge Road, and the closure of the paper road in the lower Shepherds Valley for mining operations and rehabilitation activities;



- > Fenced and secured explosives magazines and explosive emulsion mixing facilities (located outside the mining operations area on the Bendigo / Ardgour terrace);
- > The establishment of supporting infrastructure associated with the BOGP on the Bendigo / Ardgour terraces, including temporary construction workers accommodation, administration offices, general security buildings, first aid, a geology complex (including a core and sample storage area, offices and analytical laboratory), carparks, waste management areas, contractor laydown yards and a substation;
- > The establishment of workshops and temporary equipment servicing infrastructure within the lower Shepherds Valley and on the Shepherds ELF;
- > The establishment of two aggregate pits on agricultural land on the Bendigo / Ardgour terraces to be operated intermittently over the life of the project to provide construction and road sheeting materials for onsite use only;
- > While there are no proposed mining activities on the adjoining public conservation land, the following activities will be undertaken to maintain and / or improve public access and amenity:
 - > The establishment of Ardgour Rise across the Ardgour Station to provide public access between the Bendigo / Ardgour terraces and Thomsons Saddle;
 - > The establishment of a replacement walking route to provide access to the historic Come-in-Time Battery;
 - > Upgrades to the intersection of SH8 and Ardgour Road to provide safe and appropriate access to the Project Site whilst appropriately managing effects on the wider transport network;
 - > Crack willow management activities along the Bendigo and Clearwater Creeks; and
 - > All necessary activities that are ancillary to those listed above;
- > The damming, diverting and reclamation of watercourses and the establishment of various clean water and dirty water (i.e. sediment laden) diversion channels around mine components. Some of these diversion channels will be temporary and disestablished at mine closure whilst others will be permanently rehabilitated stream diversions;
- > The salvage of lizards and terrestrial invertebrates from the project site and their release into areas within the surrounding BOGP Area;
- > Ecological restoration and habitat enhancement activities within the Project Site and surrounding BOGP Area, including the establishment of two predator-exclusion fenced sanctuary areas; and



- > The undertaking of mine remediation and closure activities.

In addition to the above, mineral exploration activities are proposed to be undertaken within the Project Site and the surrounding BOGP Area.

A more detailed description of each of these components is provided in the following sections.

It is noted that a summary of the proposed rehabilitation and closure approach for the various mine components is provided at the end of many sub-sections, with a summary of the overall approach to rehabilitation, closure and environmental enhancement activities provided in Sections 3.21 and 3.22 of this report.

3.3 SITE RATIONALE AND FUNCTIONAL NEEDS

With respect to functional needs, mining can only occur in the specific environment where the gold resource is located. As noted in Section 1 of this report, the BOGP has a total mineral resource estimate of 2.3 million ounces of gold to date that includes a recoverable reserve of 1.25 million ounces over an approximately 14 year mine life.

The gold deposits are located within the Otago Schist and are associated with the Rise and Shine Shear Zone (“**RSSZ**”), a mineralised structure developed within mid to upper greenschist facies TZ4 schist. The RSSZ is truncated by the Thomson Gorge Fault (“**TGF**”) which juxtaposes lower greenschist facies unmineralized TZ3 against mineralised and unmineralized TZ4 schists. This specific geology dictates the location of the BOGP. Further assessment in respect of the functional need to locate the components of the BOGP in locations that result in loss of river and wetland extent and values, or affect biodiversity, is provided in Section 8.7.3.7 of this report.

The BOGP is easily accessible from nearby towns, being just a 20 minute drive from Cromwell, 30 minutes from Wānaka and a one hour drive from Queenstown. Due to its location close to major towns, there is no need for fly-in fly-out (“**FIFO**”) staffing and no need for permanent major camps. As further discussed in Section 3.9.2 of this report, a temporary construction workers camp for up to 80 people will be required for up to two years to accommodate specialised, skilled workers during construction. This may also include a temporary caravan park (up to 20 caravans). Workers will be accommodated for the duration of their work packages, ranging from several weeks to several months depending on the stage of construction. The temporary camp will be located alongside the administrative offices and other non-operational components on the Ardgour Terrace.



Although sourcing hundreds of workers locally in a short space of time will be a complex recruitment exercise, the Inland Otago job market has previously demonstrated it can absorb such a lift in employment opportunities. While the BOGP induced increase in average jobs would be equivalent to 0.8% of the current total jobs in Inland Otago, Inland Otago has experienced a sustained increase in employment – averaging an increase in filled jobs of 4.4% per year across the last decade, and an increase of 4.8% in 2023 alone. Refer to Benje Patterson (2025) provided in **Part B** to these application documents for further details.

As discussed further in Section 3.16 of this report, water for the BOGP will be supplied from a combination of a consented and proposed new bore located at the Bendigo Aquifer, located approximately 6 km west of the Project Site. The high permeability and strong connection of the Bendigo Aquifer to the sources of recharge, such as Clutha River / Mata-Au, Bendigo Creek and irrigation losses to ground, will result in any drawdown effect being restricted to a narrow radius surrounding the borefield. The proposed groundwater take will fall within the bands of sustainable allocation for the Bendigo Aquifer and likely future limits for the Clutha River / Mata-Au. There is adequate natural water in the aquifer that can be allocated to the proposed water take within allocation limits specified for the Bendigo Aquifer and the Clutha River / Mata-Au, in terms of projected surface water depletion. Refer to Kōmanawa (2025a) provided in **Part B** of these application documents for further details.

The site is close to the Clyde Dam Hydro Power Scheme. As outlined in Section 3.17 of this report, supply of power to the Project Site will bring forward a major distribution network infrastructure upgrade by Aurora Power that will increase power supply and reliability to Central Otago.

The Shepherds Creek Valley and broader Bendigo area has hosted gold mining activities since the mid to late 1800s, including both sluicing and underground mining. As noted, the BOGP will cover a footprint of approximately 568 hectares of land, including areas which have been previously mined or disturbed by mining activities (including the CIT Open Pit, SRX Open Pit and SRX ELF). The Project Site is located on Ardgour and Bendigo Stations where grazing sheep and cattle would directly generate approximately \$33,400 of GDP per year. In comparison, the BOGP will generate an average of approximately \$360 million of GDP per year across the 14 year initial mine life, peaking at over \$534 million of GDP in year 5 of the mine life (refer to Benje Patterson (2025) for further details).



3.4 EARLY WORKS

As noted, MGL has submitted two resource consent applications to CODC prior to the lodgement of this fast-track application for land use consents for several components of the BOGP.³⁷

These early works applications seek to enable the early construction of support facilities and enable the timely initiation of the project once all necessary approvals and authorisations are granted through this substantive application. These early works activities include:

- > The establishment of an exploration geology compound within the Ardgour Terrace Site, carparking areas and construction laydown areas;
- > Earthworks associated with the installation of services at the Ardgour Terrace Site including water, wastewater, power, communications and internal access road;
- > Earthworks associated with the realignment of a section of Thomson Gorge Road to facilitate access to the Ardgour Terrace Site described above;
- > Earthworks associated with the construction of Ardgour Rise; and
- > Minerals exploration activities and associated earthworks to construct drill sites and access tracks.

The initial Ardgour Terrace Site facilities are described in Section 3.9 of this report, while the realignment of Thomson Gorge Road and establishment of Ardgour Rise is described in Section 3.18.

For clarity, the activities of the BOGP which are covered by the early works applications (listed above) are also sought to be authorised through this substantive application. As required by section 94 of the Act, if the early works applications have not been granted by the date of lodgement, the early works applications will be withdrawn within five working days of EPA confirmation that this substantive application is complete and within scope.

The assessment documents provided for the early works applications remain relevant for this substantive application and include an Assessment of Environmental Effects prepared by Town Planning Group and a Landscape Report prepared by Boffa Miskell. Copies of these reports are provided in **Part J** to this application.

³⁷ Resource Consent Numbers RC250126 and RC250248.



3.5 OPEN PIT MINING

Open pit mining will occur at the RAS, CIT, SRX and SRE gold deposits. The open pit lifespan for the BOGP is expected to be approximately 14 years.³⁸

Open pit blasting will occur during day shift only. The open pit mines will initially deliver ore to the processing plant at an expected processing rate of up to 1.2 million tonnes per year, with this processing rate able to be expanded up to 1.8 million tonnes per year.

The key geotechnical design parameters and recommendations that have informed the proposed open pit (and underground) mining for the BOGP are set out in detail in the Geotechnical Assessment prepared by Peter O' Bryan & Associates (POB (2025)).

Further details on each open pit are provided in the following sub-sections.

3.5.1 Rise and Shine Open Pit

The RAS deposit is planned to be mined by staged open pit and underground methods. The two operations will be independent and can be developed in parallel, as the topography allows a low elevation underground portal position that does not require the RAS Open Pit to reach a similar location. Further details on the proposed underground mining operations at the RAS deposit are provided below in Section 3.6 of this report.

The RAS Open Pit will have a disturbance area of approximately 64.3 hectares. The final pit design will be approximately 200 m deep at the highwall, approximately 1,000 m long (when measured in a north-south direction) and approximately 800 m wide.

The crest elevation of the RAS Open Pit at its highest point will be approximately 700 mRL, while the base of the pit will have an elevation of approximately 395 mRL. The indicative approximate design parameters for the RAS Open Pit include:

- > Haul roads initially be 23 m wide with passing bays provided as necessary;
- > Haul road gradients at a maximum of 12.5%;
- > Bench heights of 15 m high; and
- > Flitch heights of 2.5 m high.

³⁸ In accordance with the *Bendigo-Ophir Gold Project Updated Pre-Feasibility Study*, dated 1 July 2025, which was released by Santana Minerals to the Australian Stock Exchange in July 2025. This study is not included in the documents supporting this substantive application. While many of the indicative inventories, metrics and designs throughout this section have been derived from this study, these may be subject to change as mine design progresses.



Figure 3-2 provides an illustration of the final RAS Open Pit, while Table 3-1 below shows the indicative inventory for the RAS Open Pit.

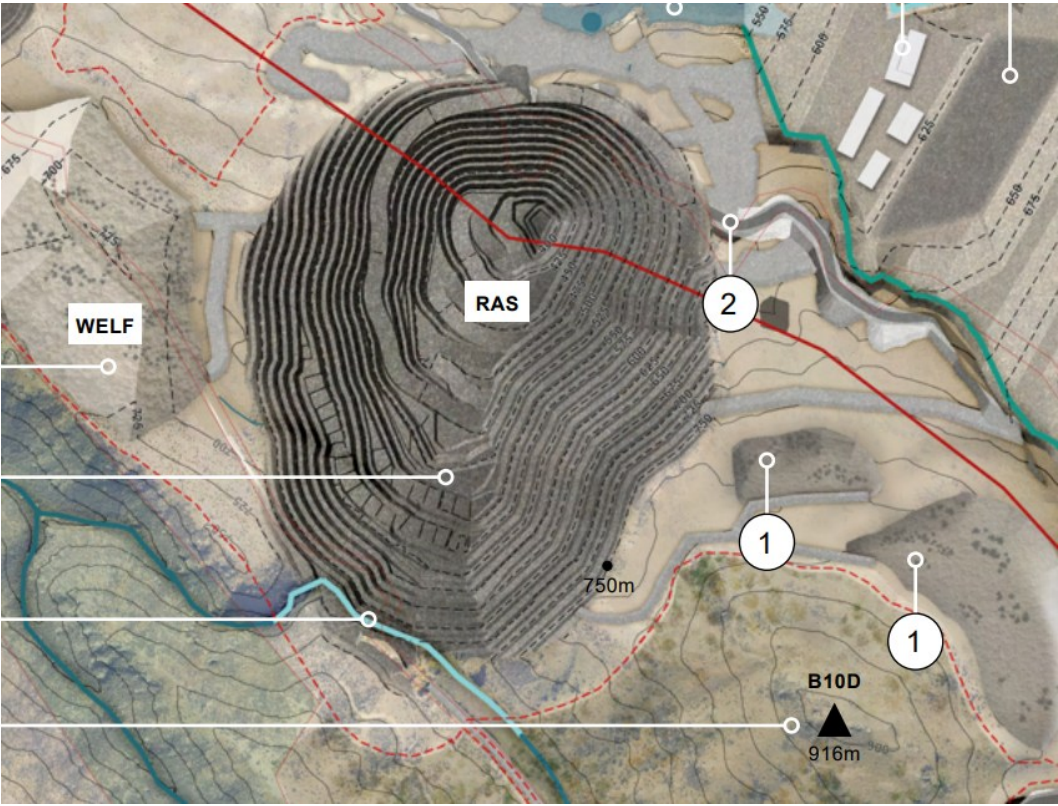


Figure 3-2: Illustration of the Rise and Shine Open Pit

Table 3-1: Rise and Shine Open Pit Inventory³⁹

	Quantity	Unit
Total Rock Mined	213,972	(kt)
Total Waste	200,996	(kt)
> TZ3 Tonnes	179,886	(kt)
> TZ4 Tonnes	18,089	(kt)
> Soil	3,021	(kt)
Ore	12,976	(kt)

³⁹ In accordance with the *Bendigo-Ophir Gold Project Pre-Feasibility Study*, dated 15 November 2024.

	Quantity	Unit
> Gold Grade	2.36	(Au g/t)
> Contained Gold	982,832	(oz Au)

Table 3-2 below provides a summary of the indicative pit stage inventories for the RAS Open Pit.

Table 3-2: Indicative Pit Stage Inventories at the Rise and Shine Open Pit⁴⁰

RAS Open Pit Stage	Total Tonnes (Mt)	Ore Tonnes (Mt)	Waste Tonnes (Mt)
Stage 1	46.8	1.4	45.4
Stage 2	29.2	3	26.2
Stage 3	40.4	3	37.4
Stage 4	57.6	2.4	55.2
Stage 5	40	2.1	37.9
Total	214	11.9	202.1

During the first 11 months of the RAS Open Pit mining schedule, initial pre-strip mining will be undertaken to remove sufficient overburden waste and start providing a sustainable supply of ore for the processing plant.

With respect to hydrogeology, the excavation of the RAS Open Pit (and RAS Underground) will induce the seepage of small volumes of groundwater from the surrounding rock, requiring it to be pumped from a sump at the pit base. The maximum groundwater inflows to the RAS Open Pit are estimated to be between 14 and 28 l/s, with corresponding groundwater seepage rates at the RAS Underground of approximately 24 l/s at peak. As discussed in MWM (2025) and Section 3.16 of this Report, pit sump water may be used as dust suppression early in the mine life provided that it meets the relevant compliance limits from monitoring sites in Shepherds and Rise and Shine Creeks.

⁴⁰ In accordance with the *Bendigo-Ophir Gold Project Pre-Feasibility Study*, dated 15 November 2024.



If pit sump water quality is too poor for use as dust suppression water this water will be used at the processing plant or pumped to the TSF.

The RAS Open Pit will remain as an open pit in closure, with a pit lake forming over time achieving a stable condition within 25 years. Vegetation cover will be established where pit benches intersect the natural land surface to soften the intersection between the natural land and pit wall.

3.5.2 Srex and Srex East Open Pits

The SRX Open Pit will be a shallow open pit and have a disturbance area of approximately 15 hectares. The final pit design is approximately 88 m deep, 650 m long and 250 m wide. The SRX Open Pit will operate for approximately 12 to 15 months as the RAS Open Pit is nearing completion and be dewatered during mining operations.

The SRE Open Pit is a small pit located in the footprint of the SRX ELF. The SRE Open Pit will have a disturbance area of approximately 1 hectare, with a final pit design of approximately 100 m long and 100 m wide. The SRE Open Pit will be mined before being backfilled with overburden from the adjoining SRX Open Pit and then covered by the SRX ELF.

Figure 3-3 below illustrates the SRX Open Pit design and SRX ELF design (which is described in Section 3.12.3 of this report), with the SRE Open Pit illustrated as the small red outline in the SRX ELF.



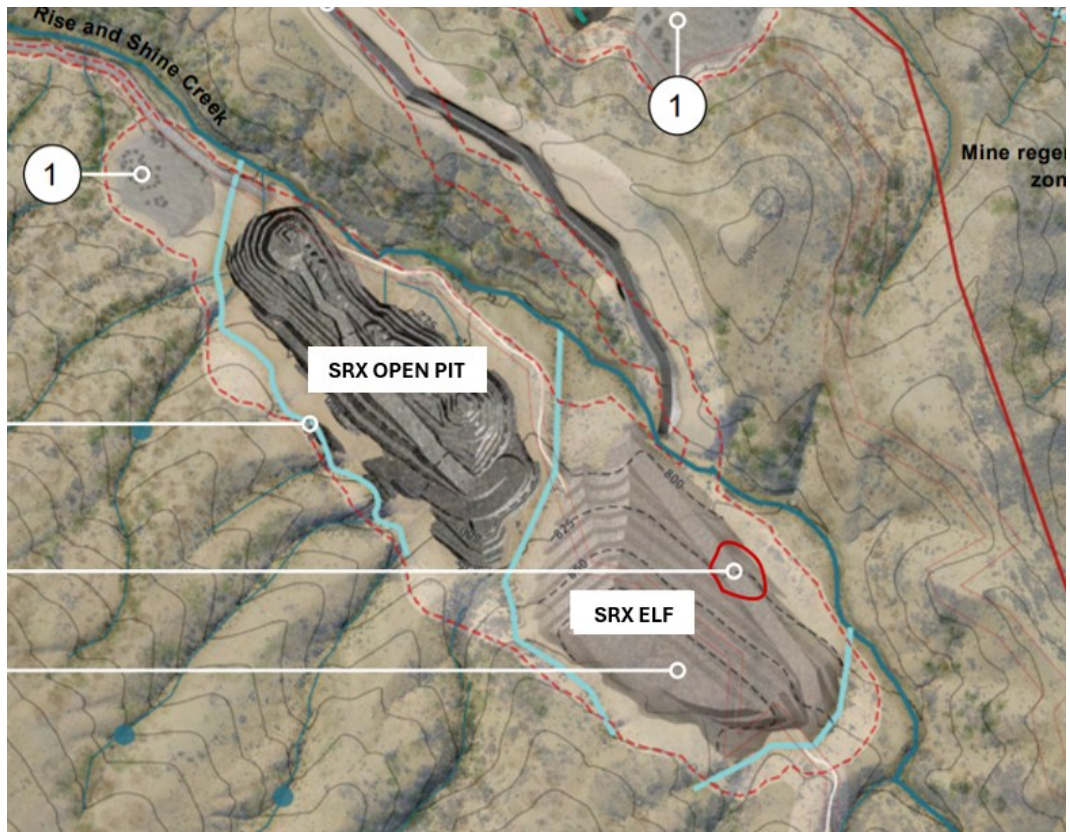


Figure 3-3: Indicative Srex and Srex East Open Pits and Srex Engineered Landform Design

Table 3-3 below shows the indicative inventory for the SRX and SRX East Open Pits.

Table 3-3: Combined Srex and Srex East Open Pit Inventories⁴¹

	Quantity	Unit
Total Rock Mined	7,344	(kt)
Total Waste	5,916	(kt)
> TZ3 Tonnes	4,376	(kt)
> TZ4 Tonnes	710	(kt)
> Soil	626	(kt)
> Transition Mineralisation (> 0.3 g/t Au)	204	(kt)

⁴¹ In accordance with the *Bendigo-Ophir Gold Project Pre-Feasibility Study*, dated 15 November 2024.



	Quantity	Unit
Ore	1,428	(kt)
> Gold Grade	0.68	(Au g/t)
> Contained Gold	30,674	(oz Au)
> Stripping Ratio	4.1	(waste t: ore t)

Surface water from mining areas in the Rise and Shine Valley (i.e. the SRX and SRE Open Pits) will discharge into Rise and Shine Creek, which then flows into Clearwater Creek and then Bendigo Creek.⁴² The RAS Open Pit intercepts the Rise and Shine Creek and an engineered diversion channel will be constructed to maintain the base flow of the creek and minimise water entering the RAS Open Pit during flood conditions. The diversion channel will be in the form of an open lined channel excavated into a wide bench within the RAS Open Pit design.⁴³

At the completion of mining, the SRX Open Pit will remain as a void in closure, with a pit lake forming over time surrounding by rehabilitated surfaces.

Vegetation cover will be established where pit benches intersect the natural land surface to soften the intersection between the natural landform and pit walls. Modelling indicates the pit lake will form within 5 years and eventually overflow to Rise and Shine Creek at its north-western extent.

3.5.3 Come-In-Time Open Pit

The CIT Open Pit will be a shallow pit and have a disturbance area of approximately 23 hectares (shown in Figure 3-4). The final pit design will be approximately 300 m long and 535 m wide.

⁴² As noted in Section 2 of this report, while Bendigo Creek is a tributary of the Clutha River / Mata-Au, there is no connection to the Clutha River under normal flows.

⁴³ Note that EGL (2025e) presents two options for this diversion channel around the RAS Open Pit with the wide, open channel option proposed by MGL as part of this substantive application.



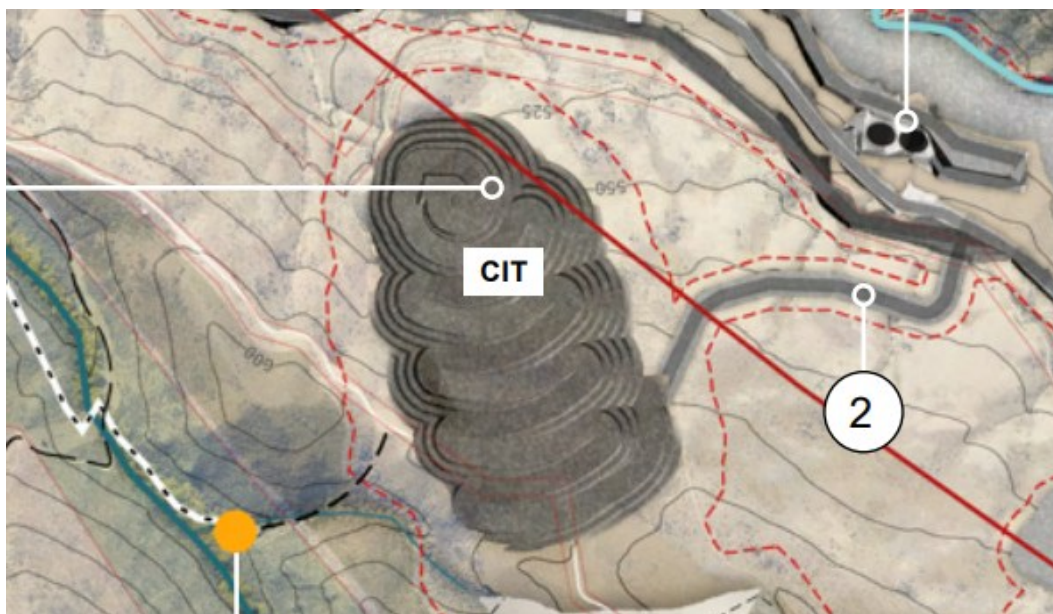


Figure 3-4: Indicative Come in Time Open Pit Design

As identified by the various baseline terrestrial ecology assessments prepared as part of this application, areas of the CIT Open Pit footprint contains cushionfield habitat with high abundances of Threatened spring annual plants.⁴⁴ As such, mining of the majority of the CIT Open Pit that has the highest densities of cushionfields is only proposed to occur if sufficient numbers of cushionfield vegetation is discovered in the wider Dunstan Ecological District such that either net gain outcomes can be demonstrably achieved, and/or the population of the two spring annuals within the CIT Open Pit footprint is equal to or less than 1% of the known population of these spring annuals plants in the wider Dunstan Ecological District. This can be demonstrated by either one or a combination of the following methods:

- > The propagation and / or species recovery in the surrounding offsetting and compensation sites as informed by the Cushionfield ARP; and/or
- > The discovery of further spring annual populations within the wider Dunstan Ecological District. These discoveries can be evidenced by either identifying and documenting further spring annual populations, and/or surveying a representative sample of the Dunstan Ecological District and extrapolating the abundance of spring annual populations over the wider Dunstan Ecological District.

However, an approximately 2.7 hectare area of the CIT Open Pit footprint contains relatively low levels of spring annuals within cushionfield vegetation and may therefore be mined early

⁴⁴ Including *Ceratocephala pungens* and *Myosotis brevis* spring annuals which are classified as Threatened (nationally critical) and Threatened (nationally vulnerable), respectively.



in the mine life. The overburden waste rock proposed to be deposited within the nearby Western ELF (refer to Section 3.11.2). This will provide sufficient source material to test the propagation of cushionfield vegetation sourced from mining areas onto the various ELF's and the success of establishing Threatened vegetation species on final rehabilitated and revegetated ELF slopes. This early disturbance area for the CIT Open Pit is shown in Figure 3-5 below.

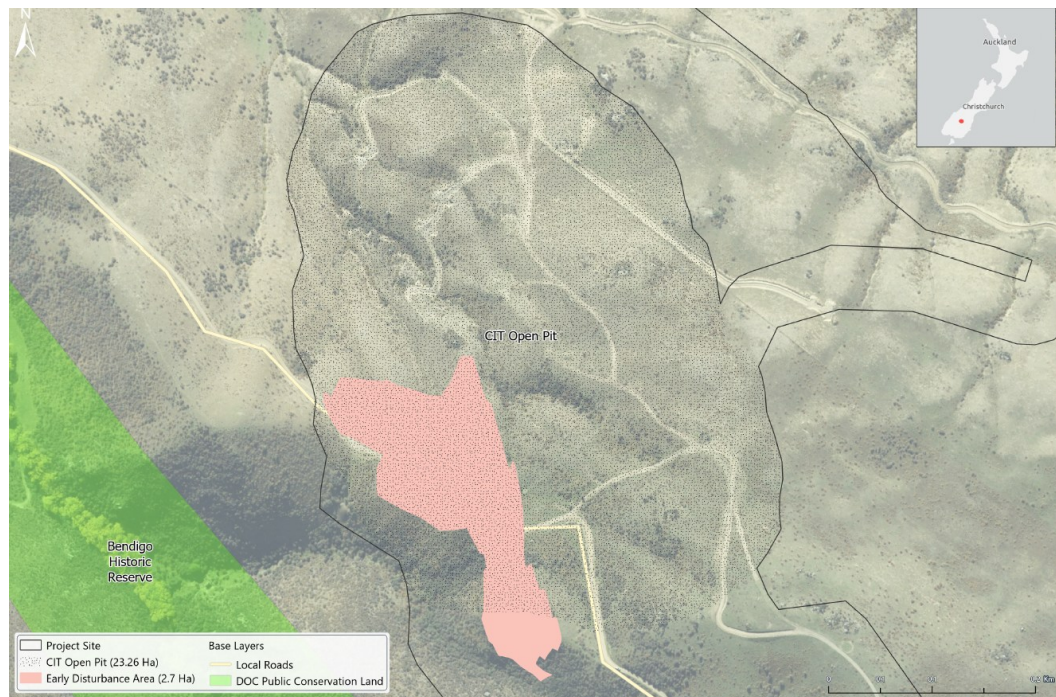


Figure 3-5: Come-in-Time Open Pit Early Disturbance Area

Further details on the nature of the cushionfield vegetation is provided in Sections 2.16.4 of this report and the approach to managing cushionfields in the CIT Open Pit is provided in Section 6.7 of this report, and the Cushionfield ARP prepared by Landcare (2025) which is provided in **Part B** of these application documents.

Following the completion of mining activities, the CIT Open Pit will be backfilled with overburden directly transferred from the RAS Open Pit or one of the ELF's. Backfilling of the CIT Open Pit will be consistent with the methodology employed to construct the ELF's outlined in Section 3.12 below.

Rehabilitation of the final profile of the backfilled CIT Open Pit will be directed by the Cushionfield ARP in Landcare (2025) which seeks to deliver rehabilitation outcomes that include Threatened spring annuals. This rehabilitation program is likely to include surface profiling with brown rock and sheeting with topsoil. Overall, the final profile of the backfilled surface will be contiguous with the surrounding landform and gently rounded to shed water.

3.5.4 Open Pit Mining Methodology

Mining within the open pits of the BOGP will be divided into two distinct zones, being the bulk waste zone (consisting of unmineralised TZ3 schist) and the ore zone (comprised of mineralised and unmineralised TZ4 schist) with the boundary between the two mining zones defined by the TGF.

Drill and blast activities within the bulk waste zone are planned to take place over a bench height of 7.5 m, with blasted material mined in several flitches.

Open pit mining activities within the ore zone will be conducted to minimise ore dilution and maximise ore recovery. Blast activities within the ore zone are planned to take place over maximum bench heights of 7.5 m using drill patterns with smaller diameter holes and closer spacing compared to the bulk waste one, and blasted material subsequently taking place over three flitches.

Blasting will generally occur at a regular, nominated time 4 to 5 days per week (however may be up to 7 days per week). No surface blasting at open pits will be undertaken before 10 am or after 9 pm. Daily blast times and locations will be posted on blast boards near the entrance to the Project Site. Individual blasts scheduled to fire outside regular times will be communicated to local community stakeholders on a by exception basis.

No surface blasting in open pits shall occur before 10 am and no later than 9 pm.

3.5.5 Open Pit Mining Fleet

The BOGP will require a range of mining equipment during its operating life. While the number and size of units will vary depending on the staging of mining activities within the open pits, this will likely include:

- > Excavators;
- > Trucks;
- > Production drills;
- > Explosives charge up units / Mine Manufacturing Units (“**MMUs**”);
- > Service vehicles;
- > Water carts;
- > Wheel loaders;
- > Dozers;
- > Graders; and



> Light vehicles.

Small vehicles / equipment will also be used intermittently around the BOGP for a variety of purposes (e.g. environmental monitoring, erosion and sediment control, rehabilitation earthworks and revegetation and heavy equipment maintenance) and will include small excavators, articulated dump trucks, rock breakers, compactors, tyre handlers, yard cranes, forklifts, mobile light towers and explosive cartage.

3.6 RISE AND SHINE UNDERGROUND MINING

3.6.1 Overview

As noted, underground mining will occur at the RAS gold deposit. The RAS Underground targets the continuation of the orebody down plunge (i.e. generally north, northwest) beneath the RAS Open Pit.

Once the underground mining operations commence, blasting will occur as required on a 24-hour basis. Blast volumes will be smaller compared to the open pits and will not be heard or felt outside of the Project Site once the underground access is established.

The underground portals will be located in Shepherds Valley, situated upstream of the main processing plant and downstream of the RAS Open Pit, TSF and Shepherds ELF. The workshops and associated offices for the RAS Underground will be located on the Shepherds Service Corridor within the lower Shepherds Valley (refer to Section 3.8.1.1).

Twin portals will access a twin ramp development – comprised of a decline drive and ventilation drive – which will be approximately 5.5 m wide and 5.5 m high and advance down together until the ore is reached. The ventilation drive will also act as a secondary escape path. The mining will then branch out into Panel 1 where ore stoping development will commence, with the decline and ventilation drives continuing down.

The full decline drive will be approximately 1,800 m long, while the ventilation drive will be approximately 900 m long. The underground stope workings will extend from an elevation of approximately 50 m below the base of the RAS Open Pit and follow the down-dip extension of the RSSZ.

The proposed underground extraction method is via longitudinal open stoping and cement paste backfill. The stoping will continue downdip, following the orebody which dips at an approximately 23 degree angle in a north, northwest direction. The stoping drives will be up to 350 m long. Cross cuts will be developed at regular intervals to enable single heading drive lengths of less than 200 m for the first year of development. The stope drives and paste drives will be approximately 5 m wide and 4.5 m high.



The stopes will be approximately 15 m wide, have a strike length of 20 m and range between 10 to 25 m high.

Cement paste backfill is proposed to allow the safe extraction of material from the stopes and to progressively backfill the mined-out voids. It will enable the optimisation of the extracted ore, control stope stability, minimise ore dilution and allow subsequent mining either below or via secondary stopes. The cement paste fill support will comprise a wall of steel mesh and shotcrete. Paste will be created from the processing plant tailings and cement, which will be pumped into the stope and left to cure and harden before mining is undertaken. A paste plant will be established near the processing plant to dewater tailings and combine with cement to create a pumpable paste. A concrete batching plant will also be established to create shotcrete on demand to support the development drives during operations (refer to Section 3.9 of this report for further details).

Material haulage will be undertaken by 50 tonne underground dumping trucks which will be loaded by 17 tonne bucket loader (or bogger) units.

Ore production is anticipated to peak at 767,000 tonnes per year. However, as the end of underground operating mine life approaches, stoping constraints are likely to affect the production rate due to restricted production areas, with ore production reducing to less than 600,000 tonnes per year.

Figure 3-6 provides a section view of the proposed stope layout for the RAS Underground, with the RAS Open Pit in grey and the RAS Underground in green, while Figures 3-7 and 3-8 provide an overview of the proposed RAS Underground layout.

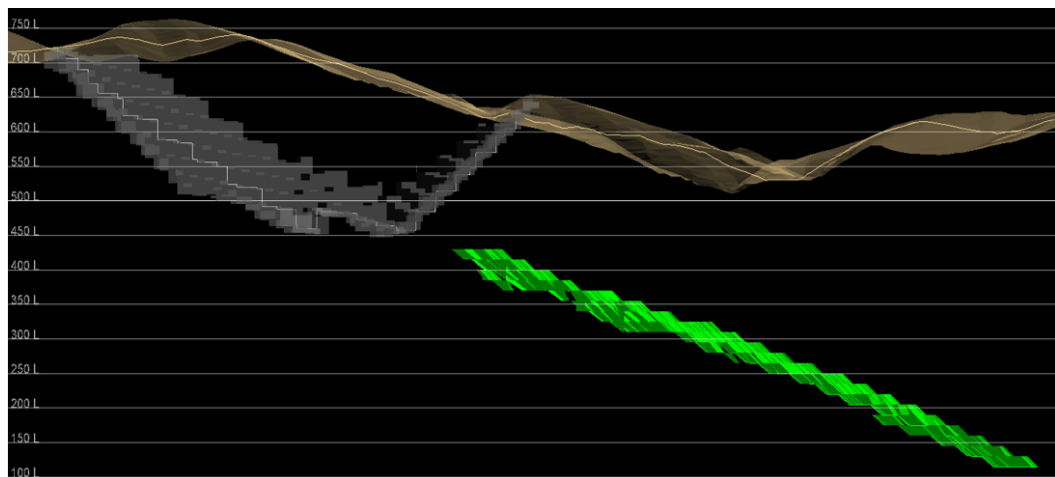


Figure 3-6: Section View of Proposed Stopping Layout for Rise and Shine Underground

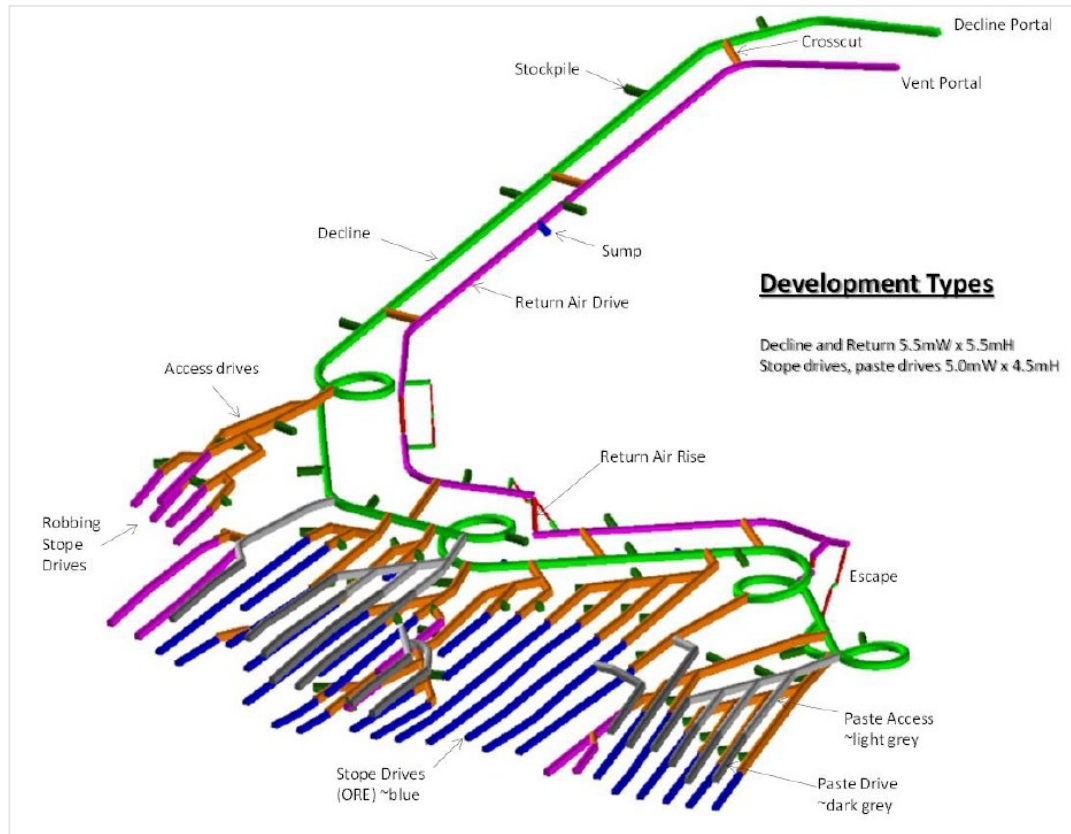


Figure 3-7: Mine Design Layout for Rise and Shine Underground



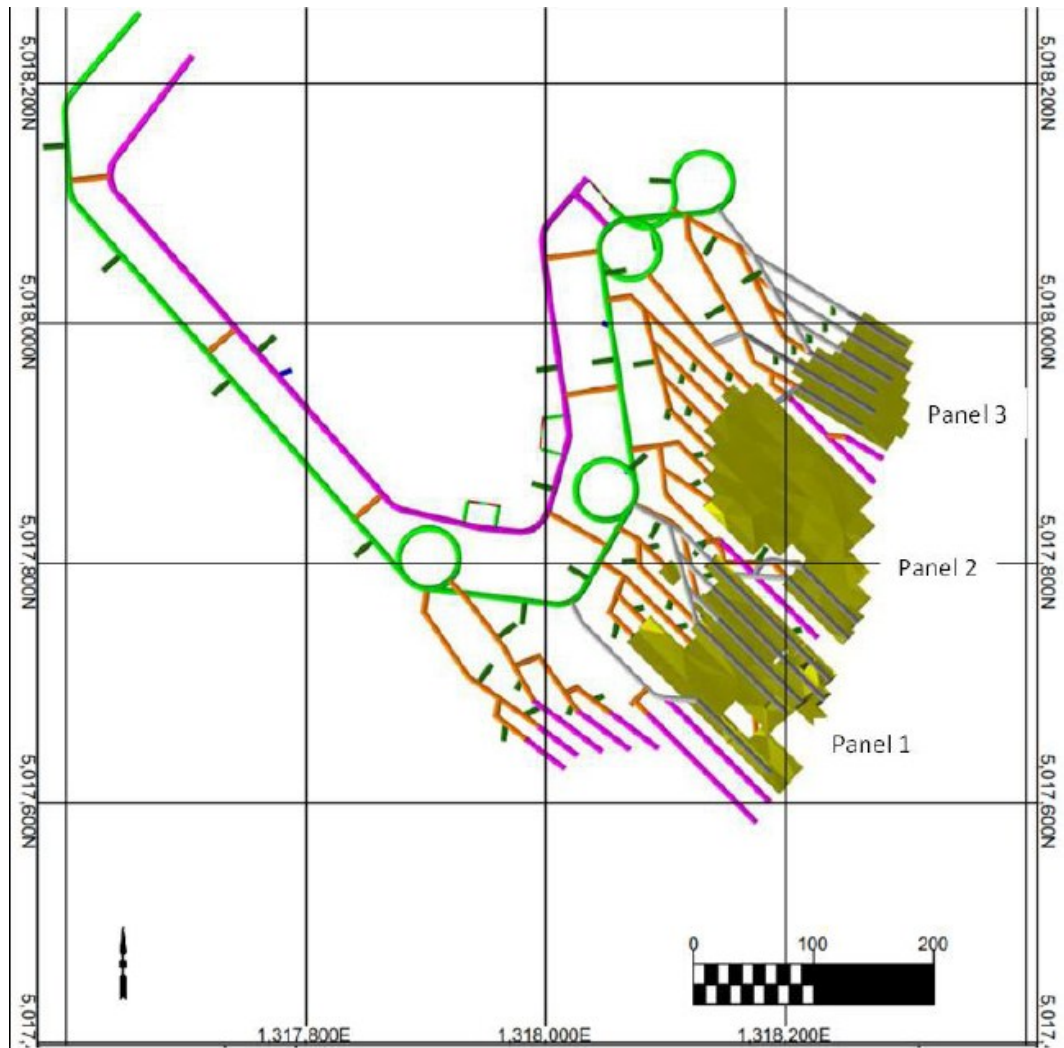


Figure 3-8: Mine Panel Layout for Rise and Shine Underground

3.6.2 Access

The RAS Underground is designed as a mechanised operation with ramp haulage. As noted, twin portals will service a twin ramp development, which leads to a simple haulage intake and egress / return network system. A 50 m separation is proposed between the two portals, with a wall of in-situ rock remaining between the portals to prevent recirculation.

The twin portals will be sited within relatively soft weathered schist rock (i.e. TZ3 rock) and are located to minimise the length of development and avoid the RAS Open Pit. The first 200 m of both portal cuts will run perpendicular to the rock foliation to improve the structural integrity of the portals and minimise ground issues during mining. The portal face will be 20 m high and set at 80 degrees.

The twin portal access layout is illustrated in Figure 3-9 below.



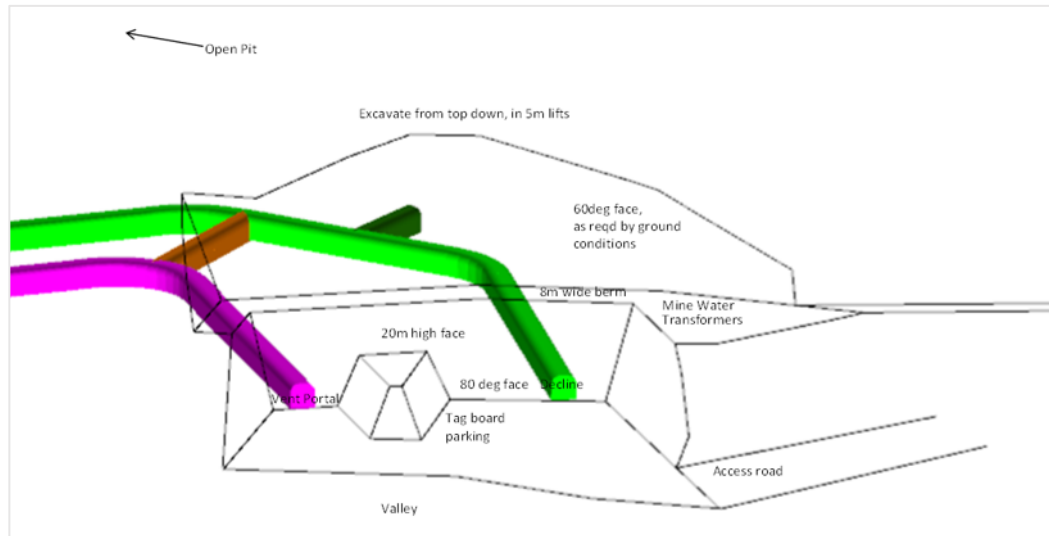


Figure 3-9: Twin Portal Access Layout

3.6.3 Ventilation

The twin portals will initially be ventilated by two 110 kW secondary fans which can each deliver approximately 50 m³/s of air.

The primary ventilation circuit will be established once the decline reaches approximately 500 m in length. The final primary ventilation circuit will be comprised of four 110 kW ventilation fans which can draw up to 200 m³/s of air, which will satisfy the ventilation air requirements for the entire life of the mine.

The ventilation decline will be designed to provide heavy vehicle access, with access potentially required in the service tunnel and for paste pipe installations, pump line installations, cable work or communications cabling. A set of three large doors will be installed in each stretch of the ventilation access drives between two parallel drives.

3.6.4 Underground Mining Fleet

The RAS Underground will require a range of mining equipment during its operating life. This includes:

- > 50 tonne haulage trucks;
- > Loader (or Bogger) units;
- > Development drill jumbos;
- > Production drills;
- > Shotcrete mixers;



- > Graders;
- > Integrated tool carriers; and
- > Light vehicles.

3.6.5 Dewatering

The Bendigo area is very dry and a low rainfall area, and the hydrological conductivity of the schist rock in the Project Site is also very low. As such, groundwater is not expected to pose an issue for the RAS Underground.

Nevertheless, the RAS Underground will contain a dewatering system comprised of staged mono pumps spaced every 100 m vertically (or every 700 m of decline length) with one located at the bottom of the decline. The mono pumps and pipelines will be installed along the main decline for ease of access during regular daily maintenance.

Water removed from the RAS Underground will be pumped to the surface and recycled for use as make up water at the processing plant.

3.7 EXPLORATION DRILLING

As noted above, the RAS Underground targets the continuation of the orebody down plunge beneath the RAS Open Pit. However, only the 'Indicated Mineral Resource' category has been evaluated by the initial underground mining plan, and as such, there remains extensive lower class inferred mineralisation down-dip that – if converted after infill drilling – would potentially extend the life of the RAS Underground.

In addition, the ore system at the RAS Underground remains open at depth and deeper extensions are considered likely to eventuate with additional resource drilling.

While MGL will continue to undertake surface exploration drilling as part of MEP60311, the company is seeking to authorise additional exploration activities within the Project Site and the wider BOGP Consent Area as part of this substantive application. These activities will be limited to the Ardgour and Bendigo Stations and may include the formation of access tracks, small-scale drilling pads and sumps, and minor earthworks and vegetation clearance activities.

However, if any new mining activities are proposed to be undertaken outside the Project Site, MGL will apply for any further resource consents and authorisations required under the RMA from the CODC and ORC (and Department of Conservation under other legislation if necessary) separate to this fast-track approvals process.



3.8 EROSION AND SEDIMENT CONTROL

EGL (2025g) outlines the proposed erosion and sediment control approach and mitigation measures that will be implemented for the Project Site, a copy of which is provided in **Part B** of these application documents. It informs the Erosion and Sediment Control Management Plan (provided in **Part G** to these application documents), with Site-Specific Erosion and Sediment Control Plans (“**ESCP**”) proposed be developed for key earthworks or mining areas during the detailed design stage as each work area is unique and requires a detailed plan for the location and sizing of elements.

The relevant erosion and sediment control guidance documents that have been adopted by EGL (2025g) to inform the erosion and sediment control measures include:

- > Auckland Council (2016), *Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region*, June 2016, Guideline Document 2016/005, Incorporating Amendment 1;⁴⁵
- > ICEA (2018), *Best Practice Erosion and Sediment Control*, International Erosion Control Association (Australasia Chapter), Picton NSW; and
- > NZTA (2014) “*Erosion and Sediment Control guidelines for State Highway Infrastructure.*”

By way of summary, the erosion and sediment control measures for the various work areas (that will be further detailed in the site-specific ESCPs) will include:

- > Clean water diversion channels and bunds to divert clean water from disturbed areas;
- > Dirty water diversion channels and bunds to manage sediment-laden water from disturbed areas;
- > Sediment retention ponds and decanting earth bunds to allow time for settlement of suspended solids associated with dirty water runoff from disturbed areas. Sediment retention ponds and bunds will be sized for site-specific design criteria in accordance with the proposed duration of land disturbance activities (as outlined below) and clean water will be routinely pumped out to maintain design capacities;
- > Staged stripping of ELF and TSF footprints to minimise disturbed areas;
- > Placement of stockpiles at the top of catchments or with appropriate diversions and progressive stabilisation;

⁴⁵ This guideline is referenced by the Otago Regional Council for earthworks in the Otago Region.



- > Management of water on the working surface of the ELF's to specific diversion channels and bunds to shed runoff to sediment retention ponds or pits;
- > Dust suppression using water on un-stabilised surfaces;
- > Progressive rehabilitation and revegetation of the ELF embankments with final ELF slopes to minimise erosion of the rehabilitation layer;
- > Monitoring of water quality and turbidity of inflows and outflows from sediment retention ponds to confirm effectiveness at dropping sediments out of suspension; and
- > Regular inspections of measures above to check condition and undertake maintenance if required.

Where controls are required for less than 12 months, clean and dirty water diversions and sediment retention ponds or bunds will be sized for a 1 in 2 year rainfall event (with retention ponds and bunds having an emergency spillway sized for a 10 year average reoccurrence interval (“**ARI**”) event as a minimum). Where controls are only required for 12 to 24 months, the clean and dirty water diversions and sediment retention ponds or bunds will be sized for a 1 in 5 year rainfall event (with retention ponds and bunds having an emergency spillway sized for a 50 year ARI event as a minimum).

For the mining operation stage where controls are semi-permanent and will be in place until mine closure (i.e. required for greater than 24 months), the clean and dirty water diversions and sediment retention ponds or bunds will be sized for a 1 in 10 year rainfall event (retention ponds and bunds having an emergency spillway sized for a 100 year ARI event as a minimum).

Culverts and ford crossings shall be designed for 1 in 2 year rainfall event.

Erosion and sediment controls will work together in a ‘treatment train’ to minimise erosion and sediment and minimise effects on the receiving environment.

Further details on erosion and sediment control measures are discussed throughout the subsequent sections – particularly where relevant to key mine components such as the processing plant, TSF and ELF– and in Section 6.6 of this report.

3.9 PROCESSING FACILITIES AND SUPPORTING INFRASTRUCTURE

The processing plant, supporting infrastructure and ancillary activities will be positioned across the following two areas:

- > The Shepherds Valley Site – which will involve the reclamation of a section of Shepherds Creek to establish an all-purpose service corridor, located within a visually screened location within the lower Shepherds Valley. This will include an approximately 6.2



hectare area to accommodate the processing plant and supporting infrastructure. The total area of the Shepherds Valley Site, including the processing plant site, will cover approximately 23.3 hectares; and

- > The Ardgour Terrace Site – comprised of an approximately 27 hectare area located outside the Shepherds Valley on agricultural land, which contains the non-operational infrastructure for the BOGP. This includes the administration building, security and medical facilities, warehousing, a geology complex (including a core storage area, offices and an analytical laboratory), waste management areas, contractor laydown yards, a high voltage substation and the temporary construction workers accommodation and caravan park.

Separate explosive magazine and emulsion mixing facilities, a topsoil stockpile and two aggregate pits are also located on the Ardgour Terrace to the north of the main facilities at the Ardgour Terrace Site.

An overview of the extents of the Shepherds Valley and Ardgour Terrace Sites is provided in Figure 3-11 below.



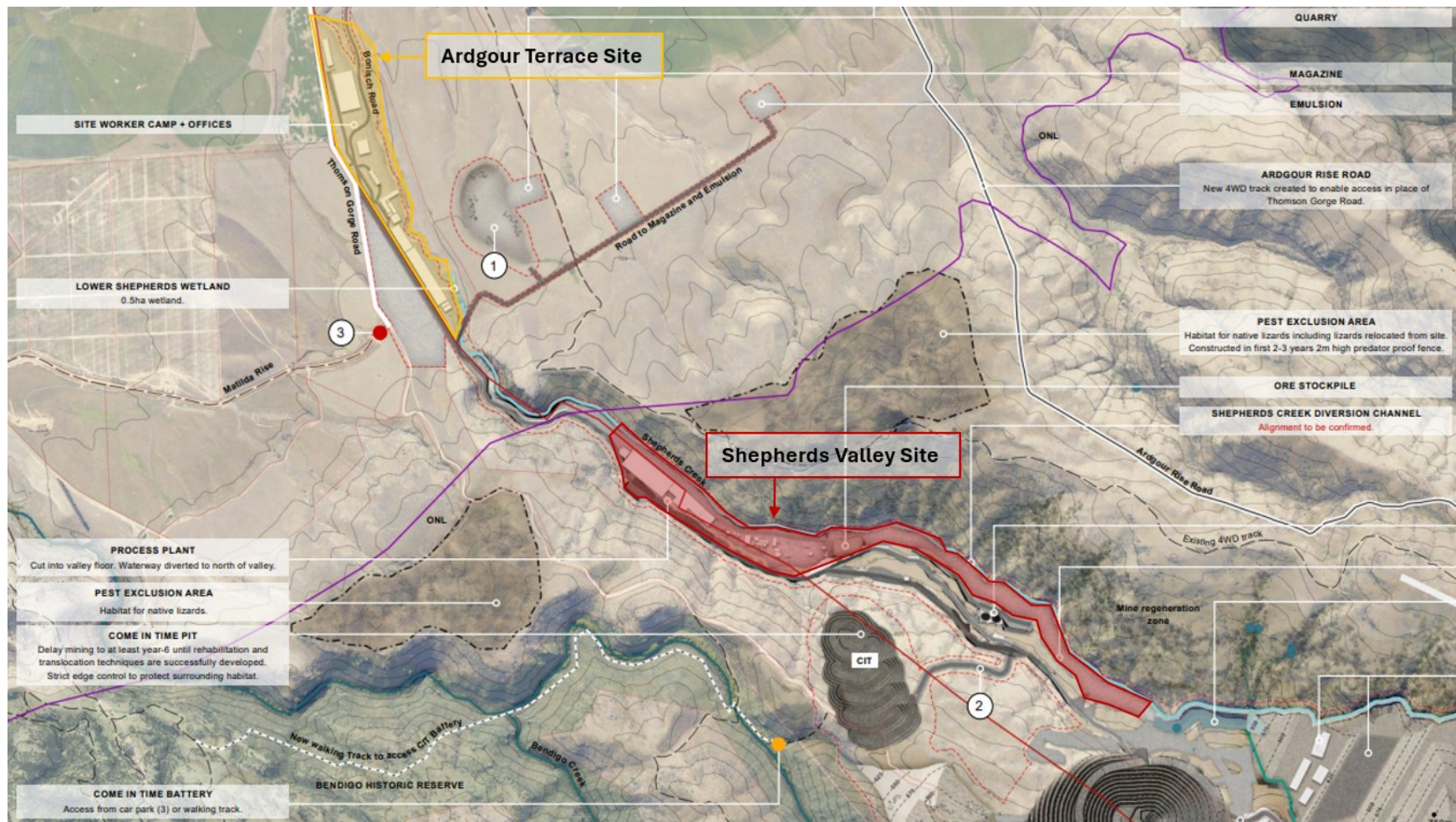


Figure 3-10: Overview of the Shepherds Valley Site and Ardgour Terrace Site for the Bendigo-Ophir Gold Project



3.9.1 Shepherds Valley Site – Processing Plant and Supporting Infrastructure

As noted above, the Shepherds Valley Site is comprised of two distinct areas – referred to as the “**Shepherds Service Corridor**” and the “**Processing Plant Area**”. The Shepherds Service Corridor will be established along an approximately 3.1 km length of the Shepherds Creek and comprise of compacted earthen fill on the valley floor to provide for the safe routing of services and materials throughout Shepherds Valley. The Processing Plant Area will be sited within the wider Shepherds Service Corridor and contain the processing plant, ROM pad and additional facilities / supporting infrastructure including workshops, offices and plant.

It is noted that the Shepherds Valley Site is generally located to be visually screened from the Bendigo / Ardour terraces to the north and west.

Further details on the activities undertaken in Processing Plant Area and the Shepherds Service Corridor are provided in sections below.

3.9.1.1 Shepherds Service Corridor

As noted, approximately 3.1 km of the Shepherds Creek is proposed to be reclaimed / infilled to establish the Shepherds Service Corridor using overburden from the RAS Open Pit. The reformed valley floor will provide a corridor to enable the safe routing of power, raw water, potable water, communications, wastewater, tailings, TSF decant water, seepage, mining equipment and light vehicles throughout the mining areas in a relatively small cross-section.

The service corridor will be constructed in the early part of the project development phase and will extend from the Shepherds Silt Pond in the east to the entrance of the Shepherds Creek gorge in the west. Initially, a cut-off coffer dam for the Shepherds Silt Pond will be constructed prior to the infilling and formation of the service corridor. The corridor will then be formed in 400 m lengths downstream of the toe of the Shepherds Silt Pond, with the overburden from the RAS Open Pit placed in compacted layers in the Shepherds Creek bed until the design height and width is achieved.

The 3.1 km length of Shepherds Creek will be permanently realigned against the northern (true right) valley wall during construction of the service corridor in the form of a rehabilitated diversion channel – referred to as the Shepherds Stream Diversion - with the channel design to achieve natural flow features including the placement of rocks, soil and salvaged plants. The diversion channel will be bunded to prevent infill runoff or sediment-laden water entering the channel. Refer to Boffa Miskell (2025a) for further details.



Surface water runoff from the Shepherds Service Corridor area will be similarly captured in sediment retention pond(s) that are suitably sized for site-specific design criteria in accordance with the proposed duration of land disturbance activities (refer to the EGL (2025g) for further details).

Refer to Boffa Miskell (2025a) and Section 8.7.3.7 of this report for an assessment of the functional need to reclaim sections of Shepherds Creek (and associated tributaries) to establish the Shepherds Service Corridor, including the application of the effects management hierarchy to manage the effects of the loss of river extent and values by the proposed reclamation.

3.9.1.2 Processing Plant Area

Processing Plant and ROM Pad

To accommodate the processing plant and supporting infrastructure and buildings, a site platform will be established covering an area approximately 1,000 m long and 120 m wide. The site establishment works and land disturbance activities in the lower Shepherds Valley are estimated to take around 7 months.

The processing plant will be a conventional hard rock gold processing plant using Carbon-in-Leach (“**CIL**”) technology. The processing rate will initially be 1.2 million tonnes per year but is expandable to 1.8 million tonnes per year if required. The annual processing rate may be increased when the RAS Underground is brought into production in parallel with the ongoing open pit feed sources or for a variety of other operational reasons.

The ROM pad will be positioned immediately east of the processing plant. It will serve as the central stockpile area for ore to be temporarily stored after being extracted from the mines before being introduced to the processing plant. The ROM pad will contain up to one month of stockpiled ore to provide a buffer between the mines and the processing plant.

Haul trucks will deliver mined ore material from the open pits to the ROM pad, where it will be dumped into temporary stockpiles and arranged in accordance with ore grades (i.e. grams per tonne of gold).

Ore from the RAS Underground will be re-handled from a stockpile near the underground portal and be hauled to the ROM pad by a secondary fleet.

Low grade ore will be stockpiled in a dedicated area within the Shepherds ELF footprint, immediately east of the permanent workshops (further details provided below). Surface runoff from this stockpile will be used in the process water circuit.



The ROM pad will be positioned at approximately 450 mRL and elevated around 20 m above natural ground level to allow transfer of ore into the crusher. Material will be fed from the ROM pad to the processing plant by a front-end loader into the primary jaw-crusher.

The ROM pad will be sloped to ensure all surface water runoff is captured in a dedicated sediment retention pond(s).

Processing of the ore material will be undertaken in several stages – comprising a three-stage crush, single stage grind via a ball mill, gravity concentrate, CIL, elution and smelting. CIL tailings will pass through cyanide destruction and soluble arsenic removal before being pumped as slurry to the TSF. Doré⁴⁶ will be the final product produced on site.

Figure 3-12 below provides a high-level illustration of the proposed processing stages.



Figure 3-11: Proposed Ore Material Processing Stages

The processing plant will operate 24 hours a day. Lighting will be designed to minimise night glow and light spill, while providing for the safe operation of the processing plant.

Gold recovery will occur in a dedicated building that includes electrowinning and smelting. The smelting furnace will be diesel powered and will not exceed a heat generation capacity of 5MW. The CIL tanks, cyanide destruction tanks, flocculant mixing plant, tailings thickening tank, tailings hopper and pumps will be sited within a concrete bunded area with

⁴⁶ Doré is a semi-pure alloy of gold and silver produced during the mining process, typically consisting of 85-90% precious metals, that is sold to refineries for further processing into commercial-grade gold bullion.



sumps to contain potential spills and surface water runoff. Any spillage and runoff captured in the sumps will be recycled and reused within the processing plant with no discharges to land or water.

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

The processing plant site platform will also contain a dedicated office and an associated workshop, goods warehouse and bagged (dry) reagents storage area. Individual reagents will be stored separately in dedicated bunded areas as required by health and safety regulations.

The tailings will be pumped to the TSF using pumps. Initially, the tailings generated during processing will not undergo a thickening process. However, the plant design allows for thickening to be undertaken as part of future upgrades to reduce the volume of water in the tailings being pumped to the TSF (and the volume of decant requiring return).

The general arrangement of the processing plant, ROM pad and other associated infrastructure is illustrated in Figure 3-13 below.



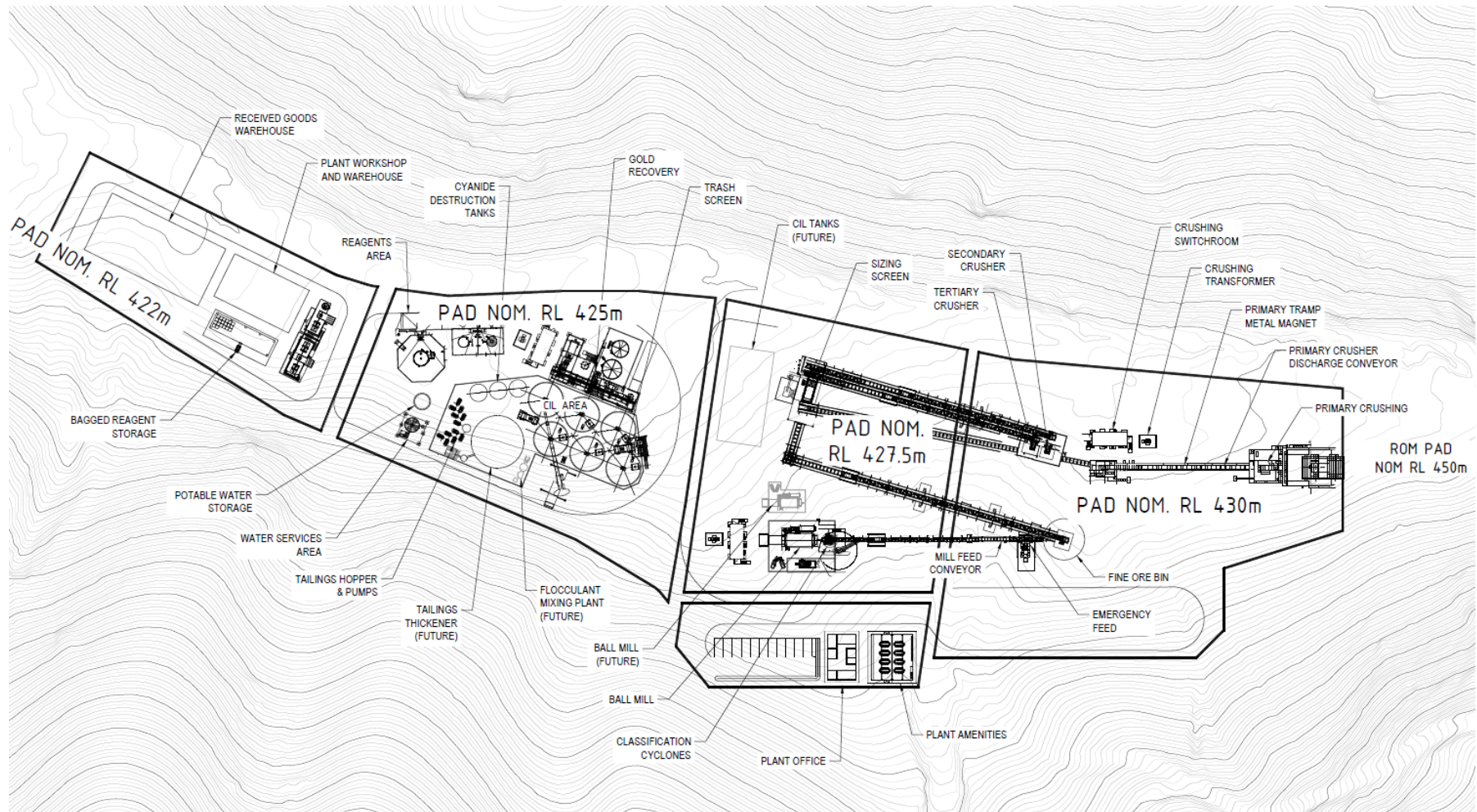


Figure 3-12: General Arrangement of the Processing Plant, ROM Pad and Other Site Infrastructure at the Shepherds Valley Site



Additional Facilities / Supporting Infrastructure

In addition to the processing plant and ROM pad components described above, the Shepherds Valley Site will also include the establishment of various other facilities downstream / to the west of the processing plant. These include:

- > Temporary facilities (e.g. portacombs) to provide worker break areas and changing facilities, with larger facilities located on the Ardgour Terrace Site;
- > Two goods warehouses to provide a storage facility for goods associated with the mine operations and processing plant (such as spare parts, replacement equipment and consumables) which will cover a combined area of approximately 600 m², and an associated laydown area covering approximately 3,200 m²;
- > Temporary light and heavy vehicle workshops for surface / open pit mining vehicle fleets. However, after approximately one year, the heavy vehicle workshop will be permanently relocated to a platform within the western extent of the Shepherds ELF after a suitable platform has been established (refer to Figure 3-14 below). The workshops in the lower Shepherds Valley will remain to service the underground mining fleet. The permanent heavy vehicle workshop for open pit mining on the Shepherds ELF will be at an approximate elevation of 590 mRL. Both temporary and permanent vehicle workshops will include vehicle washdown bays, with associated water treatment (e.g. sediment traps and oily water separators), vehicle parking areas and crib rooms;
- > A double skinned self-contained fuel storage and refuelling facility (i.e. fuel farm) located on the Shepherds Service Corridor upstream of the ROM Pad. Refuelling will occur on a bunded concrete pad serviced by a sediment sump and hydrocarbon treatment. A second refuelling facility will also be established at the permanent heavy vehicle workshop on the Shepherds ELF;
- > A cement paste plant to support the cement paste backfill operations at the RAS Underground. The paste plant will be located alongside the processing plant and will be sited within the same bunded concrete pad with associated sediment and spillage sumps; and
- > A mobile concrete batching plant to create shotcrete for use as part of the portal establishment, drive development and cement paste backfill operations at the RAS Underground. The concrete batching plant will also be located alongside the processing plant and sited within a bunded concrete pad which will direct runoff to a sump to catch all spillage and water. The BOGP will require approximately 40 tonnes of aggregate, sand and cement per day to create the shotcrete and these materials will be



transported to the Project Site via trucks. All stockpiles of aggregate / sand will be covered to minimise any adverse effects associated with frost.

Figure 3-14 shows the location of the heavy vehicle workshop on the western end of the Shepherds ELF (outlined in orange).

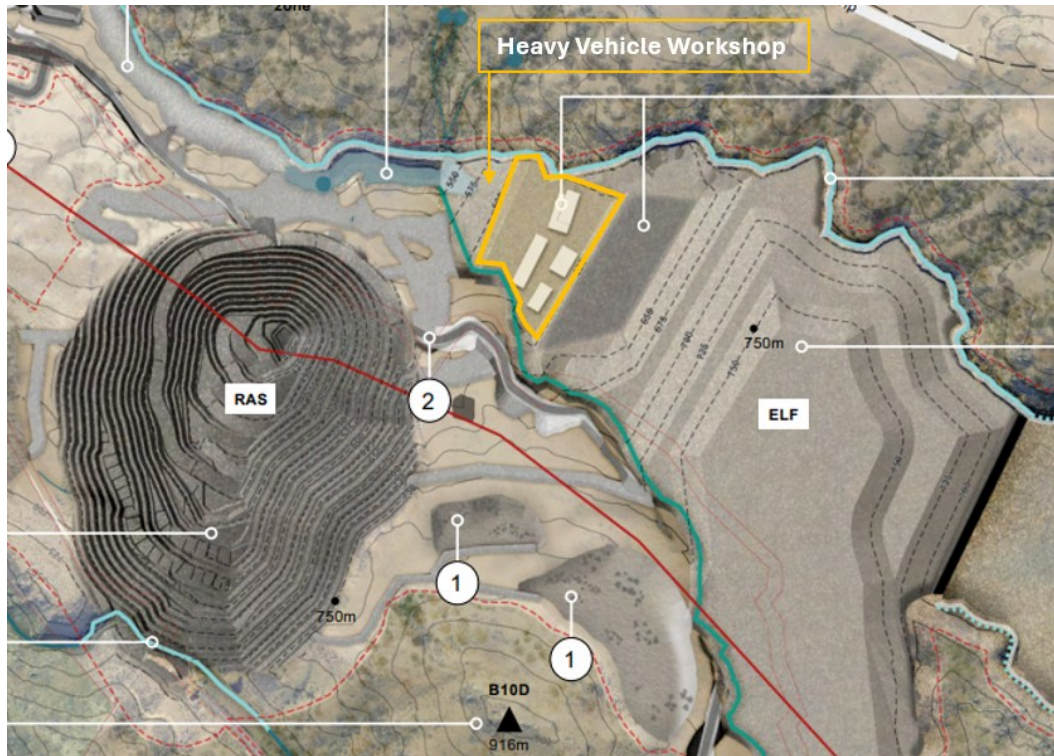


Figure 3-13: Heavy Vehicle Workshop on Shepherds Engineered Landform

A typical mobile concrete batching plant of the type proposed, and an example layout, is shown in Figures 3-15 and 3-16 below.





Figure 3-14: Typical Concrete Batching Plant



Figure 3-15: Example Concrete Batching Plant Layout

The Shepherds Valley Site will also contain a range of other supporting infrastructure, including power reticulation, wastewater treatment, potable water treatment and storage and telecommunications.



3.9.1.3 Closure and Rehabilitation

In closure, the processing plant and all associated infrastructure, including any concrete platforms and services, will be removed. Some infrastructure and services (e.g. power, water or any minor structures such as sheds) which may be of use to the owners of Bendigo and Ardgour Stations maybe retained under agreement. A PSI will be undertaken to identify areas of potential contamination, with further detailed site investigations undertaken as required and any affected areas appropriately remediated.

An active Water Treatment Plant (“**WTP**”) will also be established towards the end of mine life and be located within the processing plant footprint where there is access to power, water and storage for reagents. Refer to Section 3.15.3 of this report for further details.

The Shepherds Service Corridor platform will be retained. Surface features such as pipelines and sediment retention ponds will be removed, while buried services will remain underground. The corridor will be reprofiled to facilitate surface runoff from the surrounding area into the Shepherds Stream Diversion. Compacted surfaces would be ripped to alleviate restrictions to groundwater infiltration caused by compaction, with the areas sheeted with topsoil and seeded.

3.9.2 Ardgour Terrace Site

As previously noted, the Ardgour Terrace Site will contain the non-operational infrastructure associated with the BOGP, including an administration office, geology office and core storage area, an analytical laboratory, security and medical office, wastewater treatment plant, high voltage substation, truck stop and car parking area, construction laydown area and construction camp and support activities.

The general arrangement of the Ardgour Terrace Site is illustrated in Figure 3-17 below.



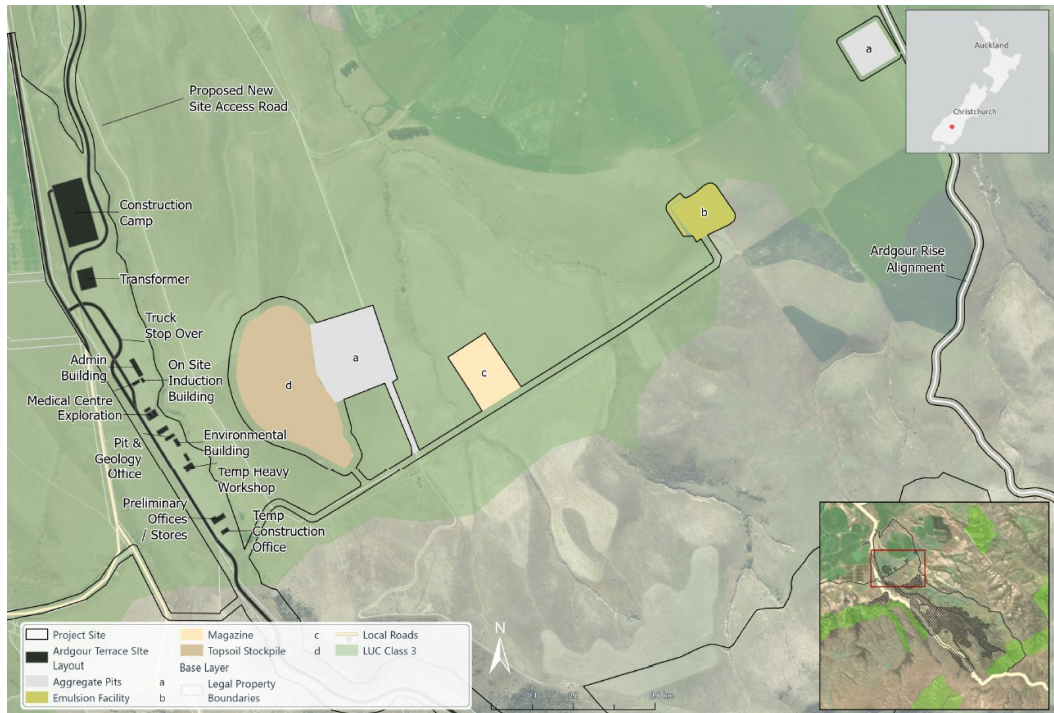


Figure 3-16: General Arrangement of the Ardgour Terrace Site

The administration office will be located at the gateway to the processing plant area in the Shepherds Valley, and will provide office workspace, formal meeting facilities, areas for training, along with carparking for 60 light vehicles. The building will have a footprint of approximately 550 m². An additional mine office building will provide a base for shift workers and operational staff. It will also have office workspaces, meeting rooms, a crew line up and changing facilities, along with light vehicle parking which will cover approximately 290 m².

The Ardgour Terrace Site also provides for a small temporary construction camp (50 persons but expandable to 80 persons) for two years during the construction period. The camp will comprise transportable en-suite bedrooms supported by a commercial kitchen and dining room, recreation room, gym and laundry area. Consistent with the Rural Resource Area design requirements, buildings will be constructed to a maximum height of 4.5 m and will feature neutral-toned colour steel cladding. A small caravan park (20 caravans) will also be established for regional construction workers who do not live close enough to the Project Site to commute each day. The caravan park will be provided alongside various associated facilities including an ablution block, laundry, BBQ area and covered eating area.

The construction camp and caravan park will also contain a fenced waste management area which will comprise of sheds and skip bin bays for recyclable materials.



The construction camp and administration office will share the same services, which will include a potable water treatment plant, a wastewater treatment plant and disposal system, power and telecommunications, and a stormwater soakage pit.

The potable water treatment and wastewater treatment plants will be established at the Ardgour Terrace Site and will be sized to service the BOGP from construction through to mine operations and eventual closure. With respect to potable water, water will be supplied from the Bendigo Aquifer borefield and reticulated around the site via a series of pipelines and tanks. Water will be sent to the potable water treatment plant for use at the construction camp and offices at the Ardgour Terrace Site and sent via pipeline for use at the processing plant at the Shepherds Valley Site. Non-potable water from the borefield will also be sent to the processing plant via a separate pipeline.

Wastewater from the various ablution facilities and offices throughout the Project Site, and the temporary construction camp, will be gravity fed to a wastewater treatment plant for treatment, and discharged to an effluent disposal field. MGL holds the necessary discharge permits from ORC to discharge treated wastewater to land,⁴⁷ with the plant consented to treat 34 m³ per day with disposal to an approximately 4,000 m² effluent field at a rate of 8.5 mm per day. No industrial waste will be processed. The consented wastewater treatment plant is shown in Figure 3-18 below.



Figure 3-17: Wastewater Treatment Plant

The temporary construction workers accommodation will be present for the duration of the construction / start-up phase, which is approximately two years.

⁴⁷ Refer to Discharge Permit RM25.259.01 which authorises the discharge of treated wastewater to land.



Once disestablished, any foundations and impervious surfaces will be excavated and removed, the stored topsoil replaced, soils cultivated and fertilised, and returned to non-native pasture with temporary irrigation to ensure soils are rehabilitated for agricultural purposes.

3.10 SHEPHERDS CREEK STREAM DIVERSION

As noted above, the establishment of the Shepherds Service Corridor will require the reclamation of approximately 3.1 km of Shepherds Creek. To enable the continued capture and conveyance of surface flows throughout the Shepherds Creek catchment, Shepherds Creek will be diverted along the northern extent of the Shepherds Service Corridor and into a rehabilitated stream diversion – referred to as the Shepherds Stream Diversion.

The Shepherds Stream Diversion will be an extension of the upstream clean water diversion channels established to divert clean water around the Shepherds ELF and TSF (discussed further in Section 3.11 below) and will manage clean water for the full length of Shepherds Creek, until the creek exits the lower Shepherds Creek gorge and enters the Ardgour Terrace. It will also take water from various sediment retention ponds that will be located throughout the mining areas (including the Shepherds Silt Pond) after the settlement of solids and take overflows from these ponds during high rainfall events.

In closure, the Shepherds Stream Diversion will remain with rehabilitation and ecological uplift actions being undertaken. It is also noted that various other rehabilitated stream diversions and enhancements are proposed to be undertaken within the Shepherds Creek and Rise and Shine catchments as described in Section 3.22 of this report. Refer to Boffa Miskell (2025a) for further details.

Further details on the various other upstream clean and dirty water diversion channels that will be established during mining operations are provided throughout the following sections.

3.11 TAILINGS STORAGE FACILITY

3.11.1 Overview

The tailings generated from the processing plant will be pumped to a conventional wet tailing storage facility located in the upper reaches of Shepherds Valley – being the TSF - located immediately upstream of the Shepherds ELF and approximately 3.3 km upstream of the Shepherds Valley Site. A tailings storage facility is an engineered containment structure that is used to store the mineral waste (i.e. tailings) that remains after the ore is processed to extract the gold. Design for the construction of the TSF is in accordance with the recommendations and guidelines of the New Zealand Society on Large Dams (NZSOLD) ‘New Zealand Dam Safety Guidelines’ (NZDSG - Ref.2).



The total disturbance area of the TSF will be approximately 61 hectares. The proposed TSF final embankment crest is 690 mRL. The total tailings storage volume of the TSF is 18,000,000 m³ which equates to a capacity of approximately 22.6 million tonnes (at a deposited tailings density of 1.25 t/m³).

The location of the TSF is illustrated in Figure 3-19 below.

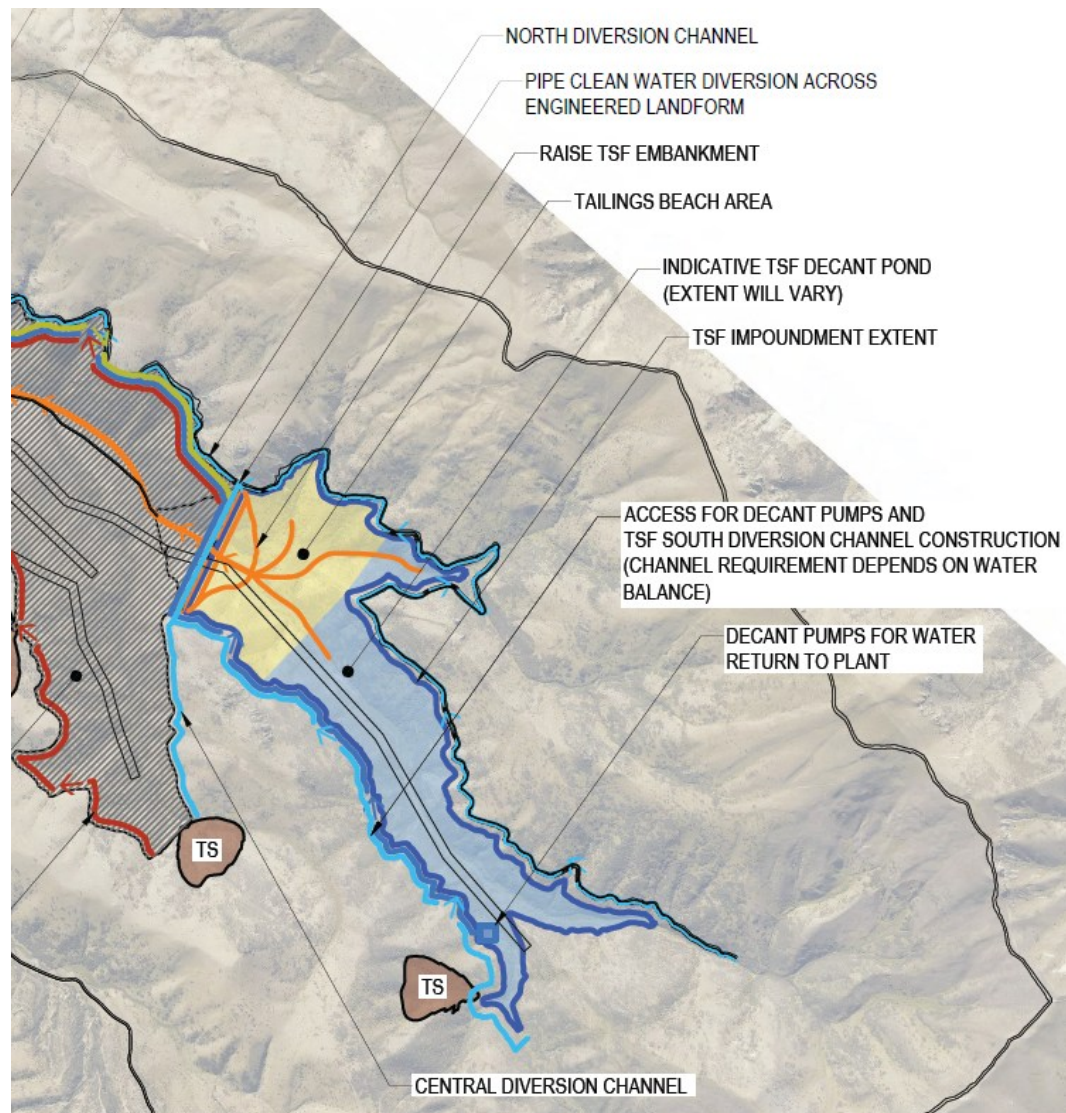


Figure 3-18: Key Features of the Shepherds Tailing Storage Facility

The TSF will be formed using a downstream construction embankment using an estimated 7.1 million tonnes of overburden material / rockfill from the RAS Open Pit. The starter embankment also requires approximately 1.4 million tonnes of overburden material for construction. Surplus TZ3 schist material suitable for embankment construction will also be available from the RAS Open Pit.



The TSF will be a zoned earth / rockfill structure comprised of the following zones:

- > Zone A – a low permeability structural fill with the primary function to limit seepage and provide sufficient structural strength to prevent instability, particularly when subject to seismic loads. Fill will be placed in 0.35 m loose layers and subject to heavy compaction to achieve material specification;
- > Zone B – a structural fill zone placed in 0.6 m loose layers and subject to compaction; and
- > Zone C – a bulk fill zone placed in layers no higher than 2.5 m and subject to compaction.

Structural fill from Zone A and Zone B will be compacted, inspected and tested to achieve specified gradation, density and permeability requirements.

The downstream construction embankment is proposed to have a 1 vertical to 2 horizontal downstream slope and a 1 vertical to 1.5 horizontal upstream slope. As noted, the tailings are proposed to be delivered as a conventional slurry from the processing plant and discharged using a combination of spigots and end pipe methods. The tailings will be contained behind the downstream rockfill embankment. While not required by NZDSG, the TSF is strengthened by downstream buttressing by the Shepherds ELF, with the height of the ELF designed to exceed the TSF embankment.

Further details on the construction of the TSF are provided in EGL (2025b), a copy of which is provided in **Part B** of these application documents.

A cross-section of the TSF and Shepherds ELF which illustrates the effect of this buttressing is provided in EGL (2025b) and is reproduced in Figure 3-20 below.

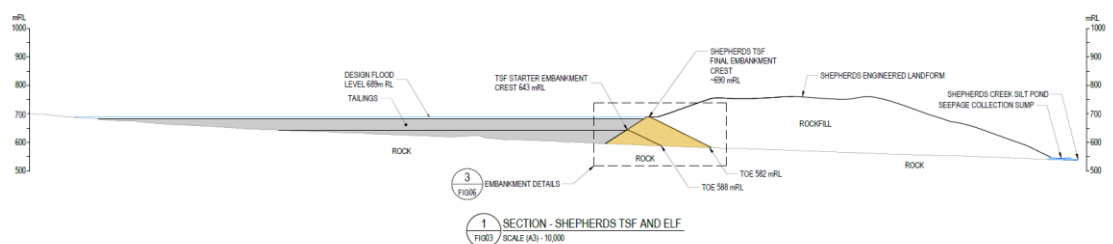


Figure 3-19: Tailings Storage Facility and Shepherds Engineered Landform Cross-Section



In addition, a typical cross-section of the TSF embankment is provided in EGL (2025b) and is reproduced in Figure 3-21.

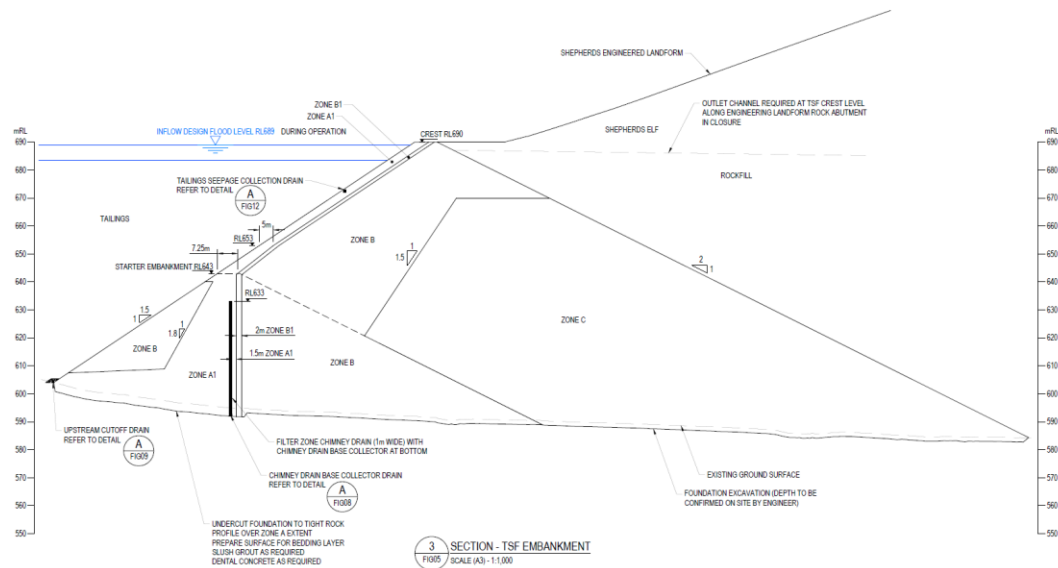


Figure 3-20: Tailings Storage Facility Embankment Cross-Section

The foundation of the TSF comprises a schist rock mass which will form a low permeability foundation at depth; however, the schist rock may have variable permeability near the surface. Due to the high slopes of the Shepherds Valley leading down into Shepherds Creek, the valley provides a natural hydraulic containment for the control and capture of seepage (refer to Section 3.11.2 below). A moderate thickness of soils in the valley floor and on some slopes will be stripped for embankment construction.

The TSF is designed to meet the New Zealand Society of Large Dams (SOLD) Dam Safety Guidelines. During operations the proposed final crest level allows for the TSF to be managed as a full containment facility without a dedicated spillway, with supernatant water managed onsite. The TSF is designed to ensure that there always remains least 3,200,000 m³ of spare capacity (with 1 m freeboard to account for wave action) as tailings are deposited. This includes allowance to manage inflows from a 72-hour Probable Maximum Precipitation (“PMP”) event.⁴⁸ The initial starter embankment (with a crest height of 643 mRL) meets these minimum criteria and tailings will only be deposited into the impoundment area when the embankment crest exceeds this height.

The TSF will also safely contain tailings when subject to potential extreme earthquakes and be designed to withstand a 1 in 10,000 year earthquake, including aftershocks.

⁴⁸ Which equates to a 748 mm depth across a 640-hectare catchment area.



This includes withstanding a potential rupture on the Alpine Fault or any other active faults in the region. By locating the tailings behind the downstream rockfill embankment, which are also buttressed by the large volume of rockfill placed in the Shepherds ELF, this will remove potential failure modes which could result in the release of tailings.

For further details refer to the Site-Specific Seismic Hazard Assessment provided in EGL (2025a) and the summary of geotechnical effects provided in Section 6.10 of this report.

3.11.2 Water Management

The proposed TSF will retain all tailings for the BOGP (other than those used for cement paste backfill). As noted above, supernatant water will be managed on top of the tailings within the decant pond. During operations, the TSF will operate as a 'zero-release' facility with sufficient freeboard to manage both operational water and the expected inflows during a PMP flood event without discharge. Water on the TSF will be lost via evapotranspiration or reused by being pumped to the processing plant.

The TSF design includes several drains to control / intercept seepage into the embankment wall – collectively referred to as TSF underdrainage. This includes a base collector drain, chimney drain, and upstream cut-off drain. Additional drains extend upstream of the embankment beneath the tailings impoundment area and are designed drain water from deposited tailings.

During operation, seepage from the TSF and Shepherds ELF underdrainage will be collected in an HDPE lined seepage collection sump located at the toe of the Shepherds ELF – referred to as the Shepherds Seepage Collection Sump. The sump will have a volume of approximately 4,500 m³. It will release seepage waters from the TSF and Shepherds ELF to the processing plant or TSF impoundment area for reuse during the operational phase.

A silt pond – referred to as the “Shepherds Silt Pond” - is proposed to be located immediately downstream of the Shepherds Seepage Collection Sump. The Shepherds Silt Pond has a final crest height of 543 mRL and will collect dirty water associated with surface runoff from an approximately 179 hectare catchment area disturbed by mining operations, including the construction footprint of the Shepherds ELF.

Water that is directed to the Shepherds Silt Pond will undergo sediment retention and then be discharged to Shepherds Stream Diversion.

Under normal operation conditions, the Shepherds Silt Pond will have a total impounded volume of approximately 35,500 m³. Approximately 30,000 m³ of this storage is for contingency water (to allow mining operations to continue if water supply from the Bendigo Aquifer borefield is interrupted) while the remaining 5,500 m³ of volume is for sediment



retention purposes. However, the Shepherds Silt Pond will provide approximately 40,000 m³ of additional attenuated capacity during a flood event.

The silt pond will be designed like a water storage earth embankment dam with a decant tower at 538.5 mRL to control outflow rates from the pond. The decant tower is sized to pass a 1 in 10 year ARI event across the 179 hectare catchment area. Flows that exceed a 1 in 10 year ARI event will rise above the decant tower and be released into the Shepherds Stream Diversion via an auxiliary spillway. The auxiliary spillway is designed to pass a 1 in 10,000 year ARI event.⁴⁹

Refer to the Shepherds Silt Pond Technical Report provided in EGL (2025d) for further details.

Clean water diversion channels are proposed to be located along the northern extent of the TSF (and Shepherds ELF) and along the southern extent of the TSF – referred to as the northern and TSF southern diversion channels. The northern diversion channel will be approximately 6.2 km long and will minimise clean water inflows into the TSF and Shepherds ELF from the undisturbed areas of the catchment above during mining operations. The TSF southern diversion channel will convey clean water via a pipe to the northern diversion channel.

The diversion channels proposed within the vicinity of the TSF and Shepherds ELF are shown in Figures 3-22 and 3-23 below, with further details provided in EGL (2025g) provided in **Part B** to these application documents.

⁴⁹ Even under conditions where the primary decant tower is blocked and the catchment area increases to 634 hectares.



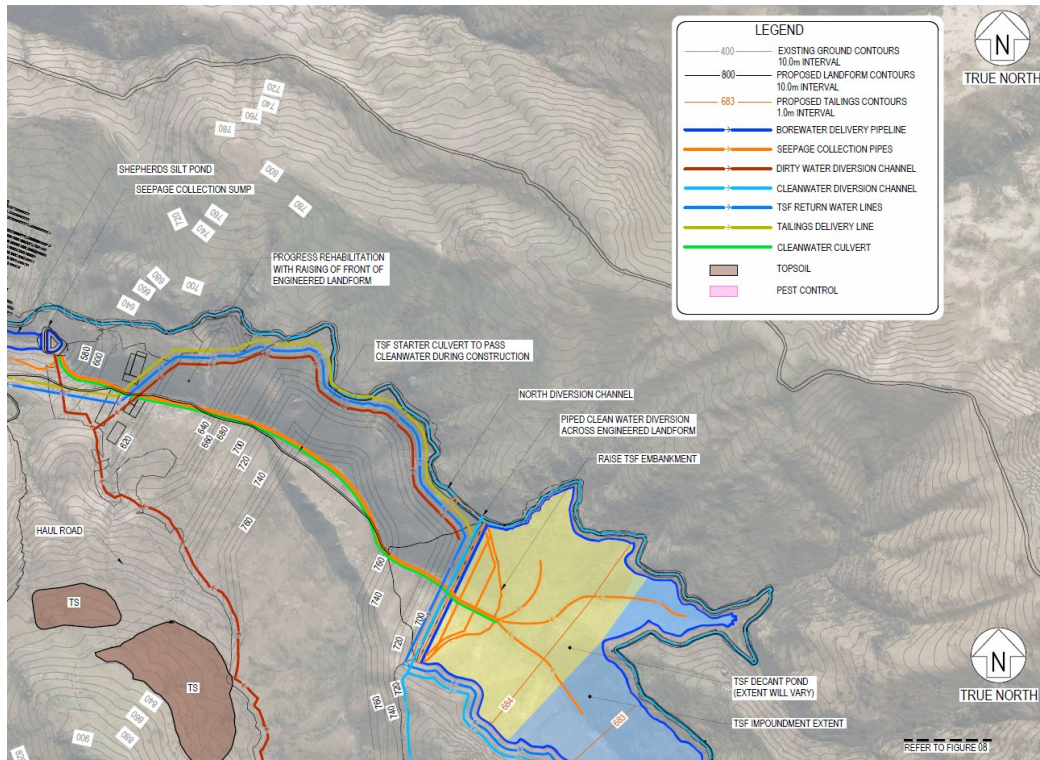


Figure 3-21: Diversion Channel Layout for TSF and Shepherds ELF

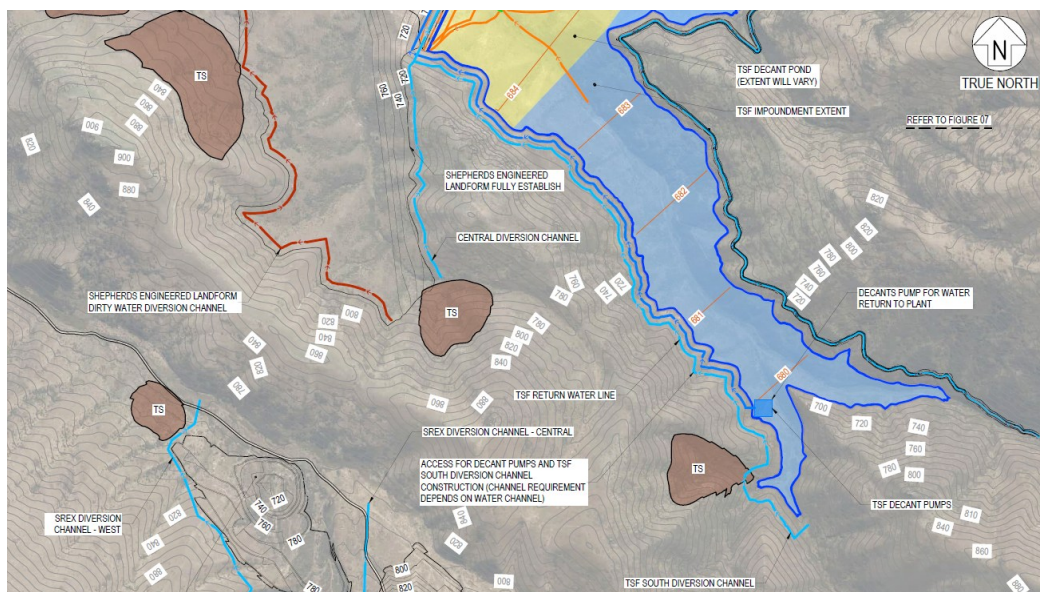


Figure 3-22: Diversion Channel Layout for TSF and Shepherds ELF (2)

The diversion channels will be constructed at their final elevation in the landform during the project development stage of the BOGP (years 1 and 2), with further details in Section 3.22 of this report.



3.11.3 Closure and Rehabilitation

In closure, the surface of the TSF will be fully dry capped with brown rock, topsoil, and revegetated, with the tailings contoured to enable water to flow to the northwest corner of the TSF. The portions of diversion channels upstream of the TSF embankment crest will be reprofiled, and their footprint rehabilitated, to allow surface water runoff from the catchment to drain towards the rehabilitated TSF surface. A shallow amount of water will be allowed to pond on the dry capping at the northwest corner of the TSF to attenuate flood flows and form a wetland (refer to Section 3.22 for further details). Water will flow from the wetland into the northern diversion channel and then into the Shepherds Stream Diversion below the Shepherds ELF.

Seepage from the TSF and Shepherds ELF will continue to collect in the underdrainage and the Shepherds Seepage Collection Sump at the toe of the Shepherds ELF. As discussed in Section 3.9.1.3 above, during mine closure the seepage will be conveyed to an active WTP (or passive treatment ponds) before being discharged into Shepherds Creek.

Overall, the proposed design of the TSF will provide safe and robust tailings storage solution for both operation and post closure of the site.

3.12 ENGINEERED LANDFORMS

An engineered landform is a man-made landform that permanently stores waste rock material to ensure long-term geotechnical and geochemical stability.

During the project life, overburden waste rock from the RAS Open Pit and RAS Underground will be utilised in embankment construction for the TSF and during the construction of various other project elements, including the Shepherds Silt Pond, Shepherds Seepage Collection Sump and the infilling activities to form the Shepherds Service Corridor. This overburden waste rock will also be used for the backfilling of the CIT and SRE Open Pits. All remaining overburden waste rock will be permanently stored in the Shepherds ELF and Western ELF.

All overburden waste rock from the SRX Open Pit will be permanently stored in the SRX ELF.

The design and construction of the three ELFs for the project and the CIT Backfill will generally be undertaken in accordance with the following construction methodology:

- > Preparation of foundations (including the removal of vegetation, stripping and stockpiling of topsoil and removal of any other unsuitable material);
- > Installation of subsurface drainage on prepared foundations where water infiltration to the constructed ELF may result in seepage water of reduced water quality;



- > Classification of construction material (waste rock) according to long term geochemical risk and placement within defined areas of the ELF (or backfill) during construction;
- > The placement of overburden material by haul trucks approaching at various elevation levels, with track dozers utilised to push the material to form the landform slopes. The ELF's and CIT Backfill will be constructed in layers (4 – 6 m lifts), with final slope profiles capped, to minimise the potential for oxygen and water ingress which will in turn reduce the potential for rock oxidation and the generation of mine-impacted water;
- > An assessment of ELF design for long-term seismic stability;
- > The construction of various clean water diversion channels to reduce volumes of surface water run-on to ELF's (and CIT Backfill); and
- > The collection and passage of surface water runoff from disturbed areas associated with ELF construction through sediment retention pond(s) before release.

With respect to closure and rehabilitation, the final ELF surfaces will have a maximum final slope of 1 vertical to 3 horizontal (approximately 19 degrees) to provide a stable storage of overburden rock, however, much of the ELF surface will be significantly flatter. Progressive rehabilitation and revegetation of completed sections of final ELF surfaces will be undertaken where possible to ensure final ELF surfaces are sympathetic to the surrounding landscape.

Further details on the design and construction methodologies above are set out in MWM (2025) and EGL (2025h), copies of which are provided in **Part B** of this application.

A summary of the key details for each ELF and the CIT Backfill is provided in the sub-sections below.

3.12.1 **Shepherds Creek Engineered Landform**

As noted, the Shepherds ELF is located immediately downstream of the TSF, improving the stability of the TSF dam and providing sufficient storage capacity to store all the planned overburden waste from the RAS Open Pit. The Shepherds ELF has a total storage volume of up to 85,000,000 m³, which equates to a capacity of approximately 187 million tonnes of rock (at a density of 2.2 t/m³).

The overburden material placed in the Shepherds ELF will be predominantly comprised of TZ3 and TZ4 waste rock, however, to manage the higher background levels of arsenic in the TZ4 waste rock, the TZ4 rock is proposed to be encapsulated and capped with:

- > A 3 m deep base layer of the low / non-arsenic TZ3 waste rock to mimic its natural occurrence; and



- > A 20 m thick capping layer solely comprised of the low / non-arsenic TZ3 waste rock. This layer will include an outer fill zone of 10m subject to a higher compactive effort to reduce any oxygen advection.

The layout plan and associated cross-sections for the Shepherds ELF are provided in EGL (2025h) and are reproduced in Figure 3-24 to Figure 3-27 below.

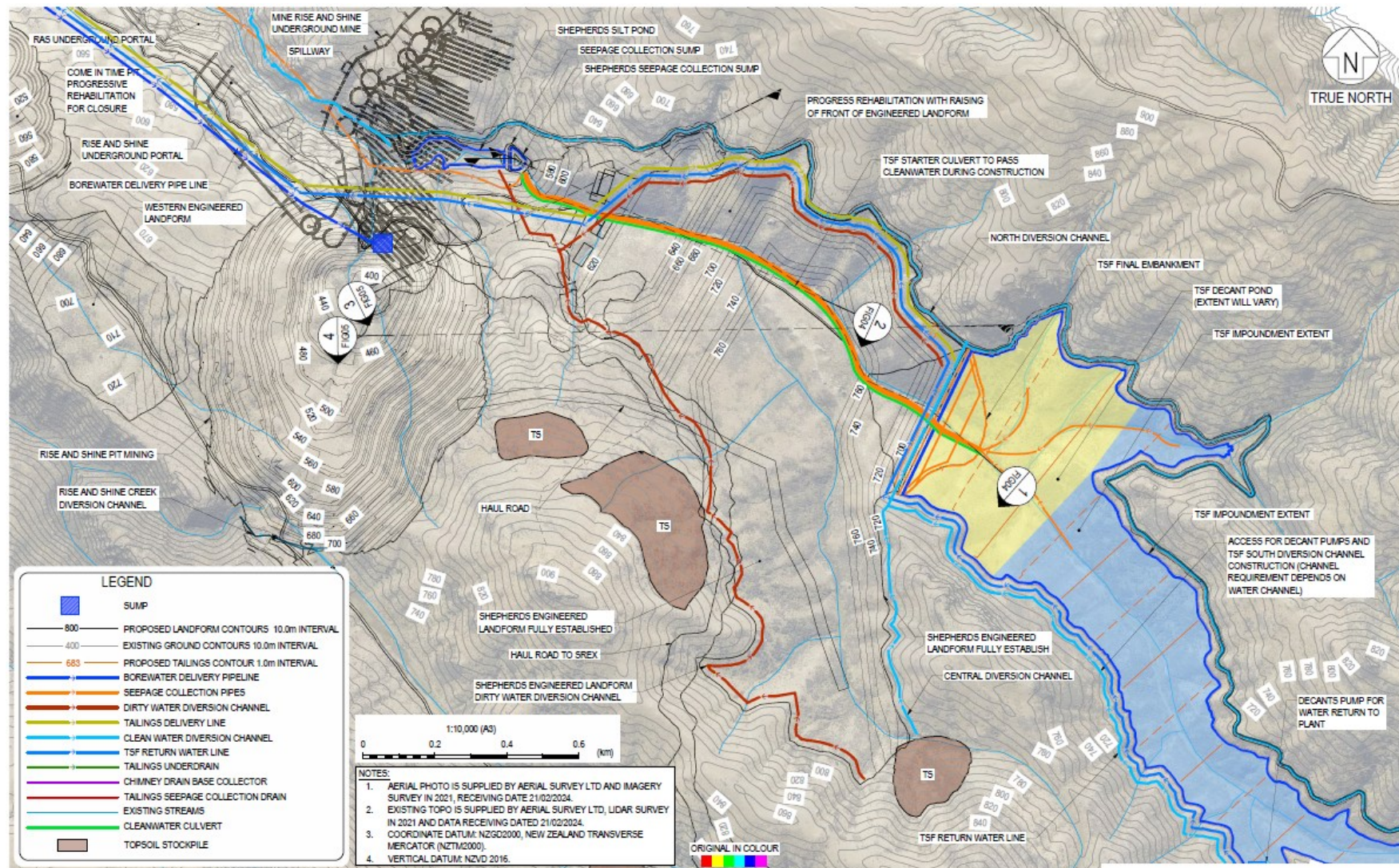


Figure 3-23: Layout Plan of the Shepherds Engineered Landform

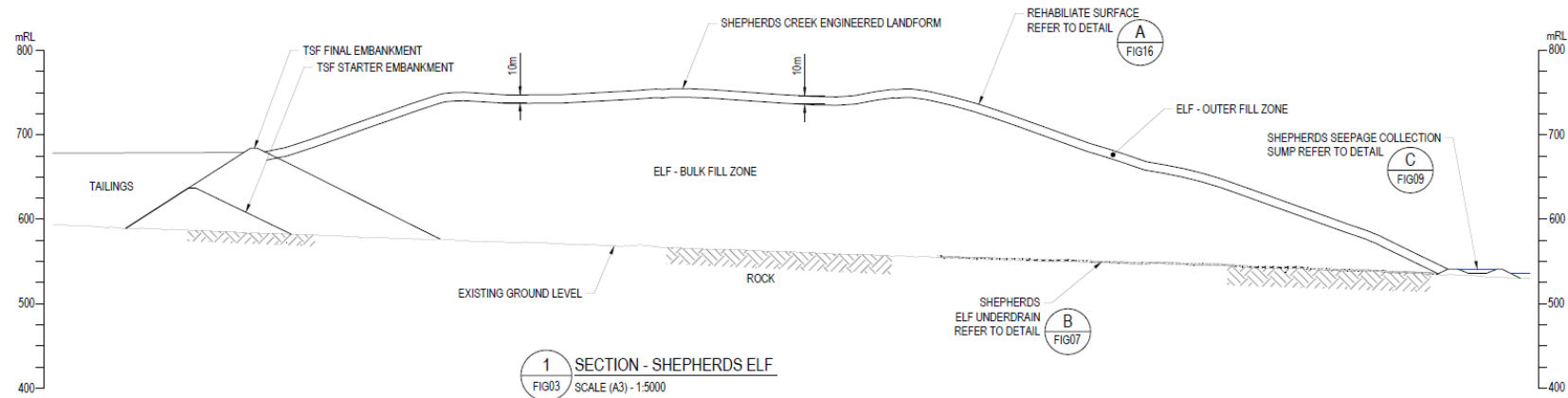


Figure 3-24: Cross-Section Profile 1 of the Shepherds Engineered Landform

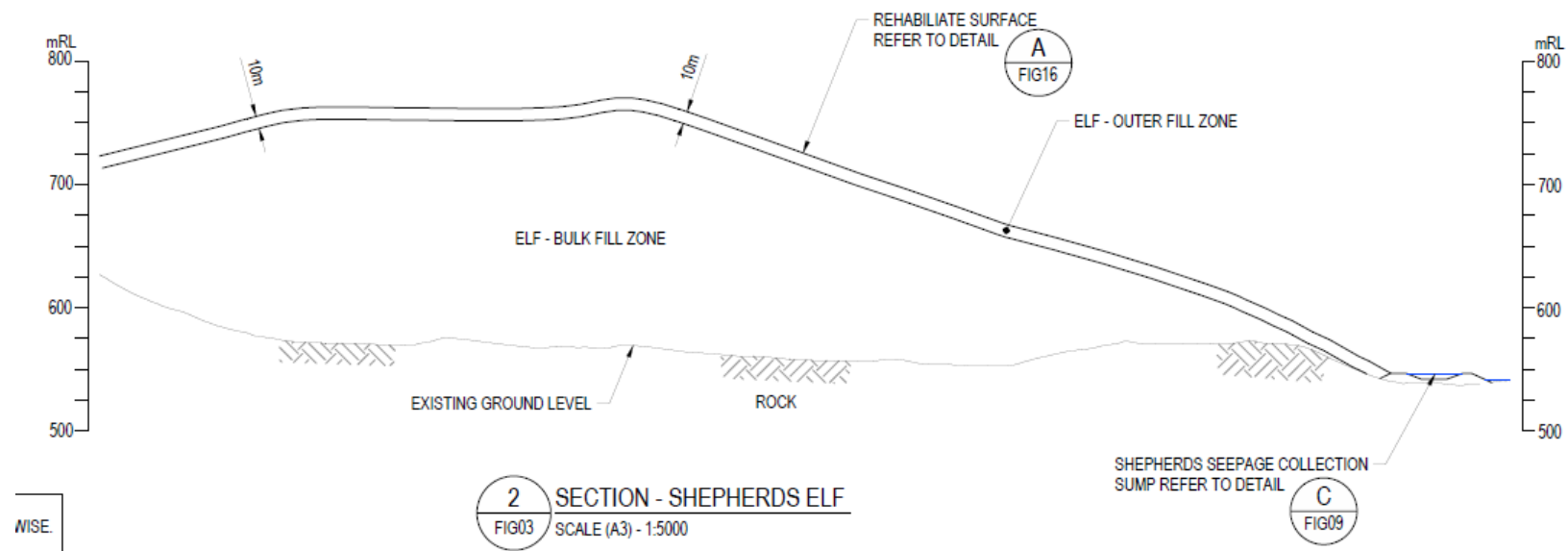


Figure 3-25: Cross-Section Profile 2 of the Shepherds Engineered Landform



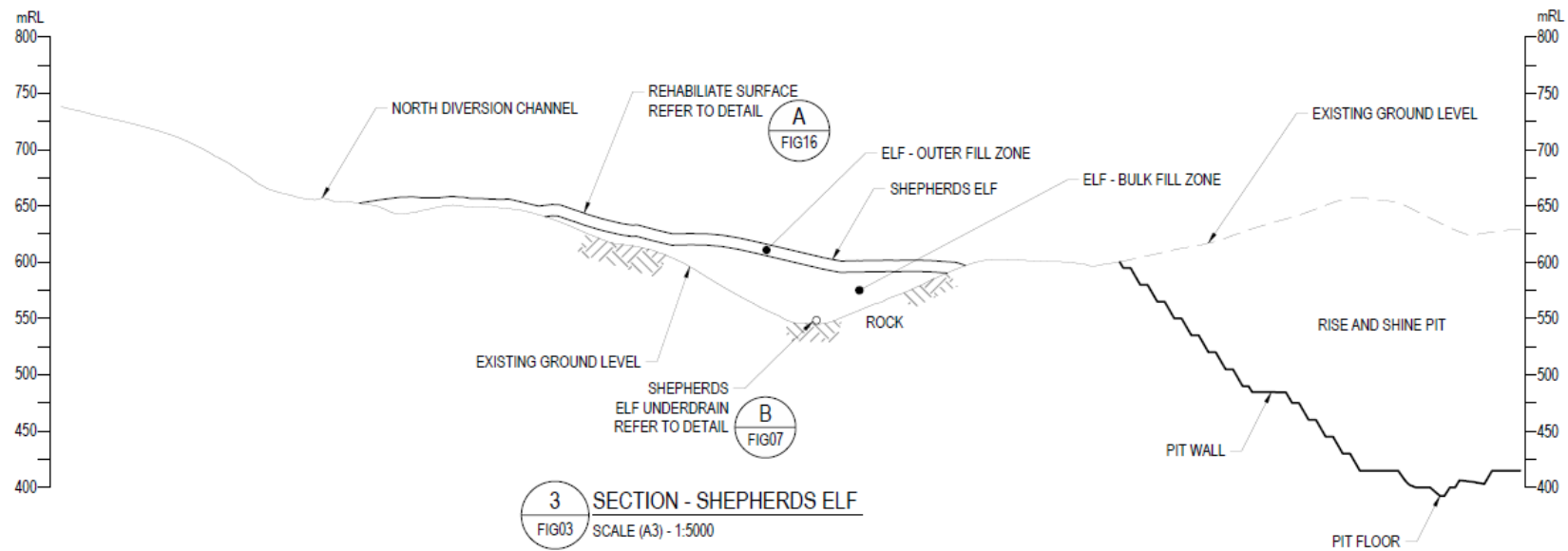


Figure 3-26: Cross-Section Profile 3 of the Shepherds Engineered Landform



As discussed above, clean water diversion channels are proposed to be constructed at final elevation along the northern and southern extents of the TSF (the northern and TSF southern diversion channels). The northern diversion channel extends along the northern extent of both the TSF and the Shepherds ELF. In addition, a further clean water diversion channel is proposed to be constructed at final elevation along the southwestern extent of the Shepherds ELF – referred to as the central diversion channel. This channel will report to a pipe that will convey clean surface water from the catchment across the Shepherds Valley, along the base of the TSF and into the northern diversion channel (which then conveys flows to the downstream Shepherds Stream Diversion).

A dirty water diversion channel will also be established along the southwestern extent of the Shepherds ELF. It will collect dirty water from the surface of the ELF, haul roads and wider catchment area and convey flows to the Shepherds Silt Pond.

As previously noted, underground drainage will also be established in the Shepherds Valley beneath the Shepherds ELF and TSF. This drainage will collect seepage and transfer it to the Shepherds Seepage collection Sump to be reused within the processing plant (during operations) or the active WTP (during closure).

3.12.2 Western Engineered Landform

The Western ELF is located northwest of the RAS Open Pit and will cover the bed of a small unnamed ephemeral tributary of the Rise and Shine Creek. The Western ELF is significantly smaller than the Shepherds ELF and has a total storage volume of up to 5,200,000 m³, which equates to a capacity of approximately 11.4 million tonnes (at a density of 2.2 t/m³). It will be constructed using pre-strip waste rock from the RAS Open Pit and may also receive overburden waste rock from the early disturbance area within the CIT Open Pit footprint (refer to Section 3.5.3 of this Report for further details).

The Western ELF material will be comprised solely of TZ3 waste rock and will be constructed early in the mine life. Final slopes suitable for capping with brown rock and topsoil and rehabilitation will be generated within the first 24 months of mine operations.

The early completion of the Western ELF will also support the Cushionfield ARP (refer to Landcare (2025)) by providing surfaces for cushionfield regeneration trials (refer to Section 6.7 of this report for further details).

As noted, refer to Boffa Miskell (2025a) and Section 8.7.3.7 of this report for an assessment of the functional need to reclaim sections of Rise and Shine Creek (and associated tributaries) to establish mining activities, including the application of the effects management hierarchy to manage the effects of the loss of river extent and values by the proposed reclamation.



A silt pond will be located in the ephemeral creek downstream of the Western ELF to prevent silt from entering Clearwater Creek (“**Western Silt Pond**”). A seepage collection sump will also be established at the toe of the Western ELF, with a pipeline installed to gravity feed seepage to the processing plant.

3.12.3 Srex Engineered Landform

The SRX ELF is located in the upper Rise and Shine Valley, immediately adjacent to the SRX Open Pit. The SRX ELF has a total storage volume of up to 4,200,000 m³, which equates to a capacity of approximately 9.2 million tonnes of rock (at a density of 2.2 t/m³).

The SRX ELF will contain clean water diversion channels which divert upstream runoff around the ELF and downstream into Rise and Shine Creek. The SRX ELF will be accompanied by a comparatively smaller sediment retention pond than the Shepherds ELF, with any overflow during a high rainfall event directed into the SRX Open Pit located immediately downstream during both mining operations and in closure.

At the completion of mining operations at the SRX Open Pit, the SRX ELF clean water diversion channels will remain in place and continue to divert upstream runoff around the ELF and into Rise and Shine Creek. Runoff from the SRX ELF surface will drain into the SRX pit lake, with any excess flows overtopping at the northwestern corner of the pit lake and flowing into Rise and Shine Creek. Modelling of geochemistry and ground and surface water flows indicates that the quality of water overflowing from the SRX pit lake into Rise and Shine Creek will meet water quality discharge criteria with partial passive treatment (refer to MWM (2025k) provided in **Part B** to this application).

3.12.4 Come-in-Time Backfill

Overburden waste rock from the RAS Open Pit will be used to backfill the CIT Open Pit to a level at or below the original ground surface. The CIT Backfill has a total storage volume of up to 3,900,000 m³, which equates to a capacity of approximately 8.6 million tonnes of rock (at a density of 2.2 t/m³).

The CIT Backfill final slope profile will be shaped to allow for long-term surface drainage to fall away from the pit or will have a perimeter bund to avoid water flowing across the backfilled surface. Where topographic constraints require surface water to pass across the backfill surface, these drainage channels will require armouring with riprap to prevent scour.



3.13 TOPSOIL STOCKPILES

As noted, the establishment of mining operations across the Project Site – including haul roads, mine infrastructure and open pit excavations – will necessitate the removal of vegetation, topsoil and brown rock across the Project Site.

This material will be stored for use in rehabilitation in the form of temporary topsoil, vegetation and brown rock stockpiles across the Project Site. The stockpile areas will cover a total area of approximately 30 hectares, with the stockpile locations shown in the project overview in Figure 3-1.

The topsoil and brown rock stockpiles will be up to 30 m high and will follow the underlying land profile to minimise potential visual effects. The stockpile heights will be balanced against the overall project footprint and terrain to minimise the amount of disturbed area. Surface erosion will be managed by revegetation of the stockpile outer surfaces.

The clearing of vegetation, topsoil and brown rock salvage will generally be undertaken progressively as areas are required for mine development, with some areas of the Project Site (e.g. the haul road to the SRX Open Pit) not required until halfway through the mine life. Elevated areas of the TSF and ELF's will only be cleared just before the expansion of the facilities to minimise exposed areas that could generate dust, maintain viability of the topsoil and maximise opportunities for direct transfer of soil and brown rock to other areas prepared for rehabilitation.

The full soil profile of the topsoil (and weathered subsoils) will generally be stripped together with vegetation and smaller rocks within the profile. While most vegetation will be removed with the topsoil and transferred directly to rehabilitation areas or stockpiled for future use, some vegetation (e.g. dense stands of matagouri) will be removed separately from topsoil with segregated vegetation to be used in rehabilitation. In addition, some soils will be segregated for stockpiling and use in specific areas (e.g. the organic-rich clays in Shepherds Creek will be deliberately stored for use as part of wetland rehabilitation at closure).

As discussed in Section 2.10 of this Report, some areas of topsoil within the Project Site are known to contain elevated levels of arsenic as a result of historic gold mining activities or natural processes (i.e. surface expression of the RSSZ). All arsenic-rich soils removed from soil disturbance areas will be segregated from other non-arsenic bearing soils within stockpile areas. These arsenic-rich soils will be temporarily stockpiled for later reuse in the rehabilitation of areas where the soils originated (or other areas with naturally elevated levels of arsenic).



3.14 STORAGE AND USE OF HAZARDOUS SUBSTANCES

3.14.1 Overview

The BOGP will involve the storage and use of various hazardous substances across the Project Site under the categories of general mining operations, explosives magazines and emulsion facilities, and the processing plant area. These categories, and the general approach to managing hazardous substances within the Project Site, are detailed in the Hazardous Substances Management Plan (provided in **Part G** to these application documents) and summarised below.

All hazardous substances will be stored in approved bunded containment in accordance with the relevant New Zealand Standards and Codes of Practice and the Hazardous Substances and New Organisms Act 1996 (“**HSNO Act**”) and Regulations.

All fuel will be stored in secure tanks or packages that have secondary containment. Where substances are stored within secondary containment, the bunding capacity will be a minimum 110% of the largest container and constructed of material impervious to the substance stored. Chemicals will be stored such that incompatible substances are segregated.

External specialised suppliers (with all relevant training and authorisations) will be utilised to deliver and change over the substances outlined above. Signage will be maintained at all entrances to the Project Site as per the requirements of the HSNO Act and Regulations.

3.14.2 General Mining Operations

A range of hazardous substances will be stored and used across the wider Project Site during mining operations, including diesel and petrol, LPG, maintenance chemicals (including oils and greases), transformer oil, flocculant poly aluminium chloride and sewage. The nature and approximate quantities of substances stored and use across the Project Site broadly are set out in Table 3-5 below.

Table 3-4: Hazardous Substances – General Mine Site

Substance	Hazard Classification	Predicted Max Volume	Storage Location
Diesel	> 3.1D – flammable liquids Category 4.	300,000 litres	Various double skin storage containers located throughout the Project Site (including the Ardgour Terrace Site and
	> 6.1E – aspiration hazard Category 1.		



Substance	Hazard Classification	Predicted Max Volume	Storage Location
	> 6.7B – carcinogenicity Category 2. > 9.1B - hazardous to the aquatic environment chronic Category 2.		Shepherds Valley Site) in accordance with CODC standards and WorkSafe NZ Regulations⁵⁰. Mobile trailers in accordance with <i>Land Transport Rule: Dangerous Goods 2005</i> and <i>NZS 5433:2012</i>.
LPG	> 2.1.1A – flammable gas Category 1.	900 kg	LPG will be stored in 45 kg cylinders connected to the service (predominantly at the processing plant area)
Oils and Greases (Including Waste Oils)	> 6.1D - acute dermal toxicity Category 4. > 6.1E - aspiration hazard Category 1. > 6.3A – skin irritation Category 2. > 6.4A - serious eye damage Category 1. > 6.5B - skin sensation Category 1. > 6.9B - specific target organ toxicity – single or repeated exposure Category 2 and 3. > 6.9B1 - hazardous to the aquatic environment chronic Category 2 or 3.	No limits required. Bulk tanks for oil and grease with consumption over 100 litres per day and 200 litre drums for smaller volumes.	Bulk tanks and drums within bunded areas with oil traps and signage located at workshops across the Project Site.
Transformer Oil	> 6.1E – aspiration hazard Category 1.	20,000 litres	Substation within the Ardour Terrace Site (fully stored within the transformer casing).

⁵⁰ Health and Safety at Work (Hazardous Substances) Regulations 2017.



Substance		Hazard Classification	Predicted Max Volume	Storage Location
Flocculant poly aluminium chloride	>	Acute toxicity - Oral Category 4.	5,000 litres	Dependent on water treatment plant location.
	>	Skin corrosion / irritation Category 2.		
Sewage	>	6.6A – germ cell mutagenicity Category 1.	40,000 litres	Underground tanks prior to treatment (biohazard area signs installed in the area).

3.14.3 Explosives Magazines and Emulsion Facilities

As previously noted, explosives magazines and a separate emulsion mixing facility will be located outside the main mining operations area on the Ardgour Terrace. The proposed location of the magazines and emulsion facility is sufficiently separated from other buildings, roads and publicly accessible locations. All emulsion explosives and initiating explosives (detonators, detonator boosters etc) will be stored, secured and separated in approved storage facilities in accordance with the Health & Safety at Work (Hazardous Substances) Regulations 2017.

The nature and approximate quantities of hazardous substances that are stored at the explosives magazine and emulsion mixing facility are set out in Table 3-6 below.

Table 3-5: Hazardous Substance – Pit Mining

Substance		Hazard Classification	Predicted Max Volume	Storage Location
Emulsion Explosive	>	1.1D - substances and articles that have a mass explosion hazard.	50,000 kg	Emulsion Facility. Specific storage plant, temperature regulated, and access controlled.
	>	6.1D - acute toxicity Category 4 (oral route).		
	>	6.3D – skin irritant Category 1.		
	>	6.4A – eye irritant Category 2.		
	>	6.8C – reproductive toxicant Category 3.		
	>	6.9A - specific target organ toxicity – repeated exposure Category 1.		



Substance	Hazard Classification	Predicted Max Volume	Storage Location
	> 9.1A - hazardous to the aquatic environment Category 1. > 9.3C – harmful to terrestrial vertebrates.		
Detonators	> 1.1B - substances and articles that have a mass explosion hazard.	10,000 kg	WDA Class 1 Storage Area (in one magazine).
Detonator Boosters	> 1.1D - substances and articles that have a mass explosion hazard. > 6.1C - acute toxicity Category 3 (oral, dermal and inhalation route). > 6.9B - specific target organ toxicity – single exposure Category 2. > 9.1B - hazardous to the aquatic environment chronic Category 2.	10,000 kg	WDA Class 1 Storage Area (in one magazine).

3.14.4 Processing Plant Area

The nature and approximate quantities of hazardous substances that could be deployed at the processing plant area are set out in Table 3-7 below.

Table 3-6: Hazardous Substances – Processing Plant Area

Substance	Hazard Classification	Predicted Max Volume	Storage Location
Sodium Cyanide	> 6.1A – fatal if swallowed, inhaled, or absorbed through skin. > 6.5B – may cause allergic skin reactions. > 6.9A – causes organ damage from prolonged exposure. > 8.1A – may corrode metals. > 8.2C – causes skin burns or irritation. > 9.3A – very toxic to animals.	44,000 kg	Tank (22 tonne isotainers)



Substance	Hazard Classification	Predicted Max Volume	Storage Location
	> 9.1A – very toxic to aquatic life.		
Leach Aid	> 6.1A – acute toxicity – fatal. > 9.1A – toxic to aquatic life. > 9.3A – toxic to animals.	500 kg	Reagents Shed (25 kg bags)
Quicklime (90% CaO avail)	> 8.2A – causes skin burns and eye damage. > 8.3A – causes serious eye damage. > 9.1D – harmful to aquatic life.	60,000 kg	Silo(s) (30 tonne)
Hydrated Lime	> 6.1D – harmful if swallowed. > 6.3A – causes skin irritation. > 6.4A – causes serious eye irritation. > 8.2C – causes mild burns or irritation to skin. > 9.1D – harmful to aquatic life.	35,000 kg	Reagents Shed (1,000 kg bags)
Sodium Metabisulphite	> 6.1D – harmful if swallowed. > 6.3A – causes skin irritation. > 6.4A – causes serious eye irritation. > 6.5B – may cause allergic skin reactions. > 9.1D – harmful to aquatic life.	50,000 kg	Reagents Shed (1,000 kg bags)
Copper Sulphate	> 6.1D – harmful if swallowed. > 6.3B – causes mild skin irritation. > 6.4A – causes serious eye irritation. > 9.1A – very toxic to aquatic life, long lasting effects. > 9.2C – harmful to soil environment. > 9.3C – harmful to terrestrial animals.	25,000 kg	Reagents Shed (1,000 kg bags)



Substance	Hazard Classification	Predicted Max Volume	Storage Location
Ferric Chloride	> 6.1D – harmful if swallowed. > 6.3A – causes skin irritation. > 6.4A – causes serious eye irritation. > 8.2C – can cause mild skin burns / irritations. > 9.1D – harmful to aquatic life.	30,000 kg	Reagents Shed (1,000 kg bags)
Activated Carbon	> Not classified as hazardous under HSNO.	25,000 kg	Reagents Shed (800 kg bags)
Sodium Hydroxide	> 6.1D – harmful if swallowed. > 8.1A – corrodes certain metals. > 8.2B – causes serious skin burns. > 8.3A – causes serious eye damage. > 9.1D – harmful to aquatic life in large amounts.	44,000 kg	Tank (22 tonne bulk tanks)
Hydrochloric Acid	> 6.1D – harmful if swallowed. > 8.1A – corrodes certain metals. > 8.2B – causes serious skin burns. > 8.3A – causes serious eye damage. > 9.1D – harmful to aquatic life.	44,000 kg	Tank (22 tonne bulk tanks)
Flocculant	> TBC once type confirmed.	3,000 kg	Reagents Shed (25 kg bags)
Borax	> 6.1D – harmful if swallowed. > 6.3B – causes mild skin irritation. > 6.4A – eye irritation Category 2. > 6.8B – suspected of causing developmental effects. > 9.1D – harmful to aquatic life.	700 kg	Gold room (25 kg bags)



Substance		Hazard Classification	Predicted Max Volume	Storage Location
Silica	>	Not classified as hazardous under HSNO.	700 kg	Gold room (25 kg bags)
Potassium Nitrate	>	6.1D – acute toxicity Category 4 (oral route).	700 kg	Gold room (25 kg bags)
	>	6.3B – causes mild skin irritation.		
	>	6.4A – eye irritation Category 2.		
	>	9.1D – harmful to aquatic life.		
Soda Ash	>	6.3B – causes mild skin irritation.	700 kg	Gold room (25 kg bags)
	>	6.4A – eye irritation Category 2.		
	>	9.1D – harmful to aquatic life.		

3.15 AGGREGATE PITS

The BOGP will require a suitable aggregate source to establish and service the haul roads and infrastructure for the Project Site. MGL therefore proposes to establish and operate two temporary aggregate pits within the vicinity of the Ardour Terrace Site. The location of these pits is shown in the project overview in Figure 3-1.

The pit locations have been selected due to the suitable properties of the identified aggregates, and to provide an aggregate source close to the project to allow for the efficient establishment and maintenance of the project haul roads and infrastructure. The pits are also located in a rural environment such that they are suitably set back from any neighbours or other sensitive receptors.

Each aggregate pit will be approximately 3 hectares in size and excavated to a depth of approximately 6 m. The finished ground level will reflect this depth.

The proposed pits will utilise an excavator and a mobile crushing and screening plant (refer to Figure 3-28 below for a typical example). Material will be extracted from the extraction face by an excavator and loaded directly into the mobile plant. Blasting may be required within the western aggregate pit due to the source material hardness. Aggregates will then be screened according to size and stockpiled for later use.



The aggregate pits will operate up to six days per week, typically Monday to Saturday, from 7.30 am to 6.30 pm. Aggregate processing will not occur on Sundays or public holidays. However, MGL propose to include an allowance for operations to occur outside of these times during exceptional circumstances to respond to any emergency situations or undertake any emergency works within the Project Site.



Figure 3-27: Typical Mobile Crushing and Screening Plant

When in use, the plant is anticipated to process approximately 150 tonnes of aggregate per hour. The plant will only operate at certain times dictated by the requirements of the project. During the construction phase, the plant is expected to operate approximately 50% of normal operating hours while haul roads and infrastructure are being established. However, once the project is fully established aggregate demand will decrease significantly, and the plant will only run intermittently as required for project maintenance.

Extraction rates will fluctuate according to the demands of each project stage (i.e. construction vs. operation and maintenance). While there will be short intensive aggregate processing campaigns during the construction phase, extraction volumes are expected to not exceed 50,000 m³ per year. The construction phase is expected to take 2 to 3 years. After this phase, the average annual extraction volumes are expected to reduce to approximately 12,000 m³ per year during operations and post-closure phases.



3.16 WATER FACILITIES

3.16.1 Water Supply and Use

Water supply is required to support the proposed mining operations. The water supply for the BOGP will be from a dedicated borefield in the Bendigo Aquifer, via a combination of:

- > One consented groundwater bore⁵¹ near the Bendigo Creek; and
- > A proposed new groundwater bore which will be located within 150 m of the consented bores.

Groundwater pumping is proposed to be split across the two production bores to provide a total abstraction rate of 110 l/s from the Bendigo Aquifer. The water will be conveyed via a dedicated 355 mm HDPE pipeline using in-bore pumps, and a booster pump station, to lift the water approximately 200 m vertically and across approximately 6.5 km to storage tanks (or similar) above the processing plant at the Shepherds Valley Site. A branch connection will be provided to feed the mine administration office and construction activities.

The proposed water supply pipeline alignment will generally follow the road reserve of Matilda Rise and the boundary of the Bendigo Station boundary – traversing up Matilda Rise, along Thomson Gorge Road and then through the lower Shepherds Creek gorge and into the Shepherds Valley Site. MGL has easements with Bendigo Station for where it traverses its land. The proposed alignment is shown in Figures 3-28 to 3-30 below.

⁵¹ Refer to Land Use Consent RM24.272.01 which authorises the drilling of a production bore and observation bore.



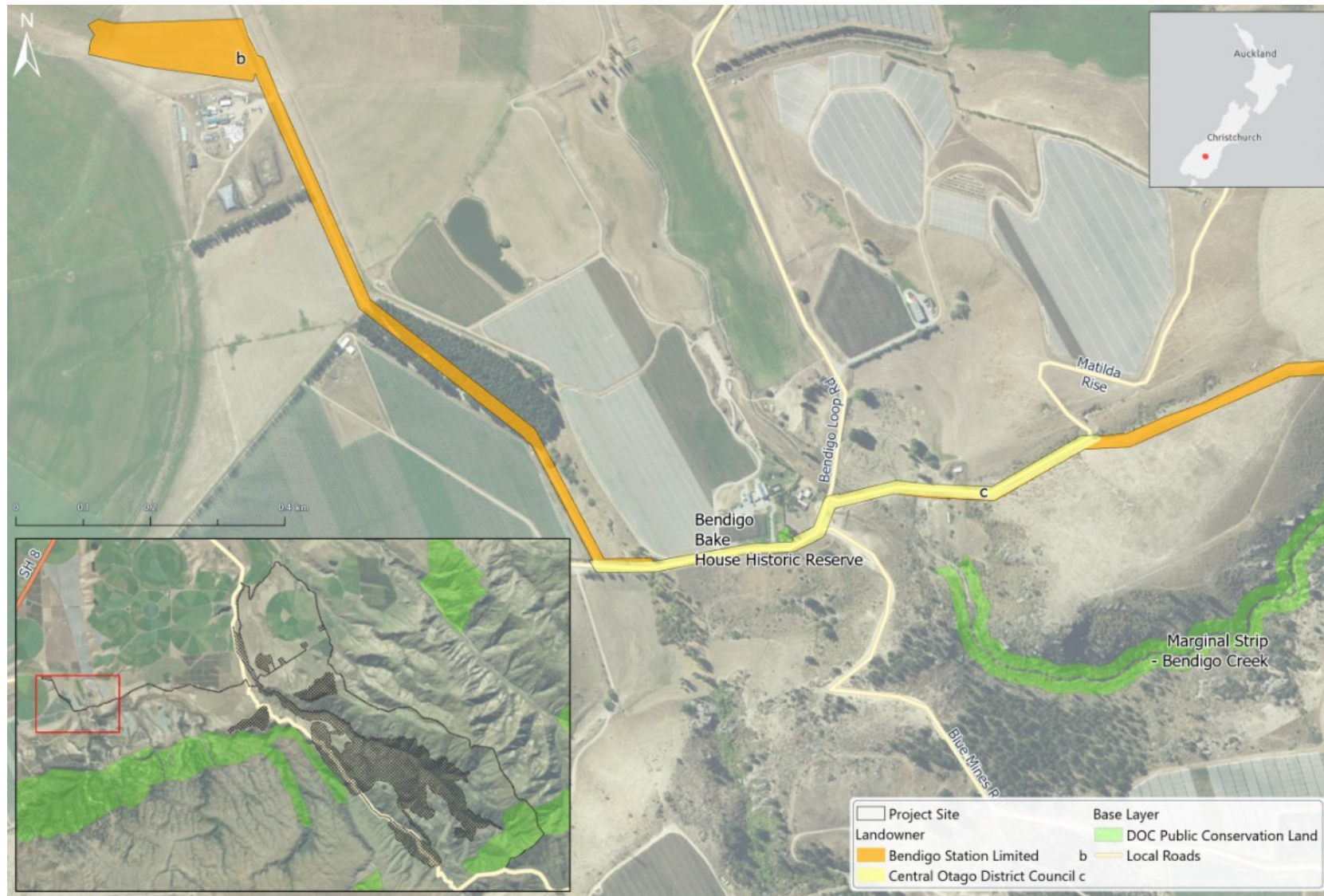


Figure 3-28: Proposed Water Supply Borefield Pipeline Alignment (Part 1)



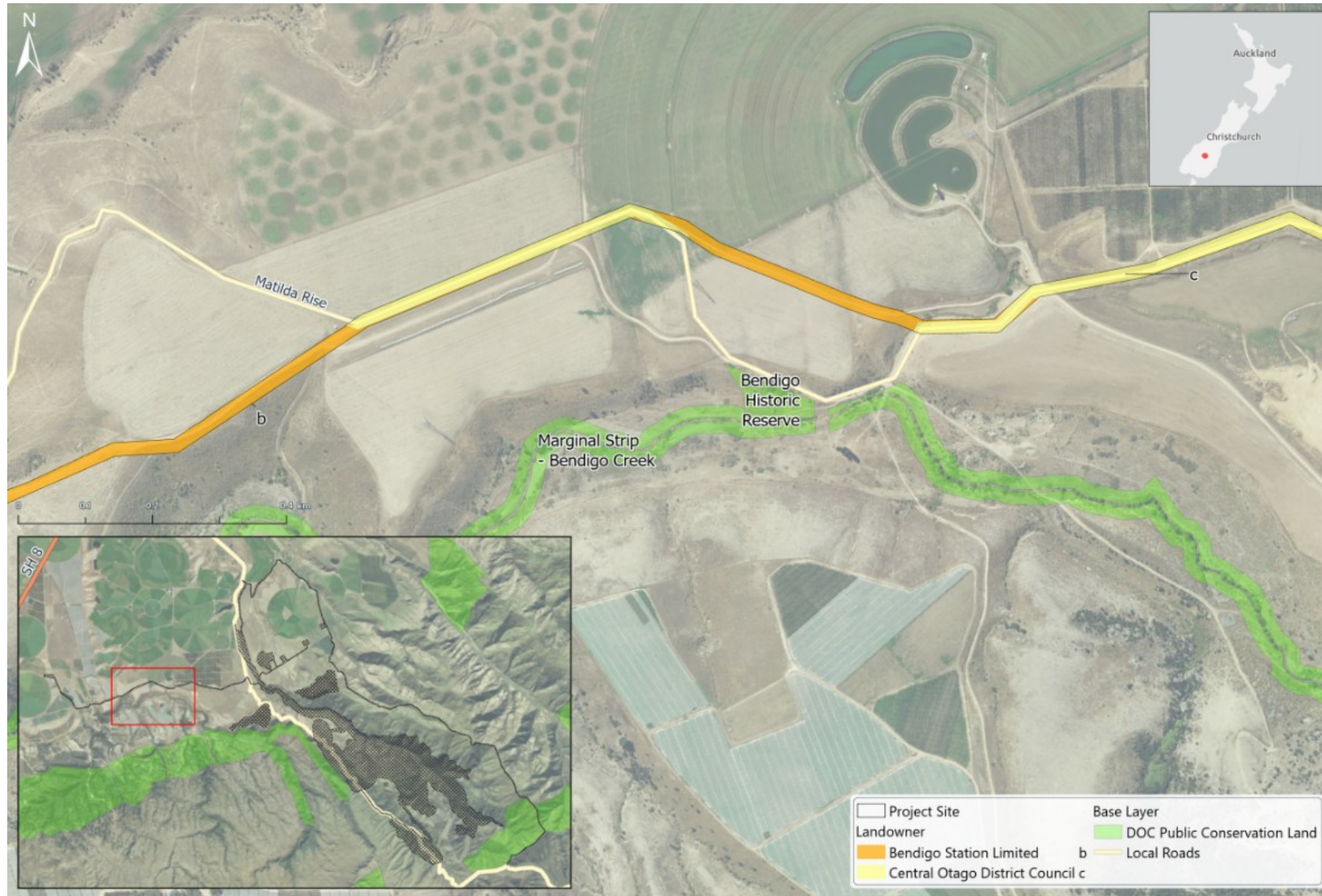


Figure 3-29: Proposed Water Supply Borefield Pipeline Alignment (Part 2)



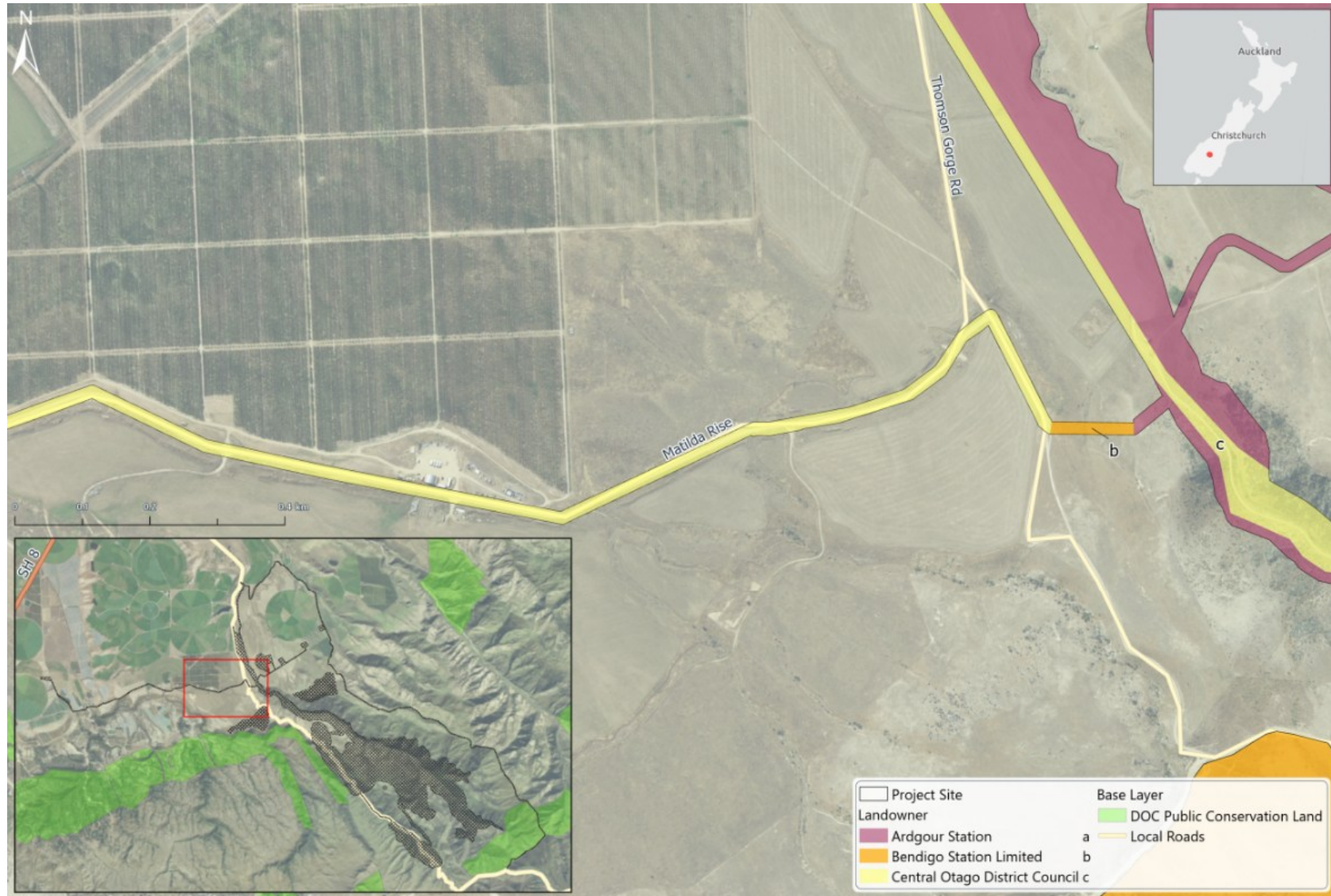


Figure 3-30: Proposed Water Supply Borefield Pipeline Alignment (Part 3)



The estimated peak water consumption at the commencement of processing operations (during the peak dust suppression period) is 110 l/s, comprising:

- > 53 l/s for processing plant water;
- > 34 l/s for peak dust suppression for the haul roads and the three ELF; and
- > 23 l/s for other uses.

The proposed water abstraction from the Bendigo Aquifer will also be used to augment flows as required in Shepherds Creek and Rise and Shine Creek at points upstream of the Project Site. This augmentation of flows will ensure that existing downstream permit holders are able to access their full consented surface water allocations throughout the life of the BOGP (refer to Section 6.4 of this report for further details). Water abstracted from the Bendigo Aquifer may also be used ecological rehabilitation and enhancement activities and to supplement natural inland wetlands within the Project Site.

The augmentation is proposed prior to abstraction and the strategy set out in HGG (2025b) in **Part B** of these application documents. The strategy provides further details how and where augmentation will occur, flow augmentation rates, proposed monitoring and adaptive management methods.

The flow augmentation sites are shown in Figure 3-31 below and the proposed augmentation rates are based on the estimated creek flow reductions as set out in HGG (2025b).



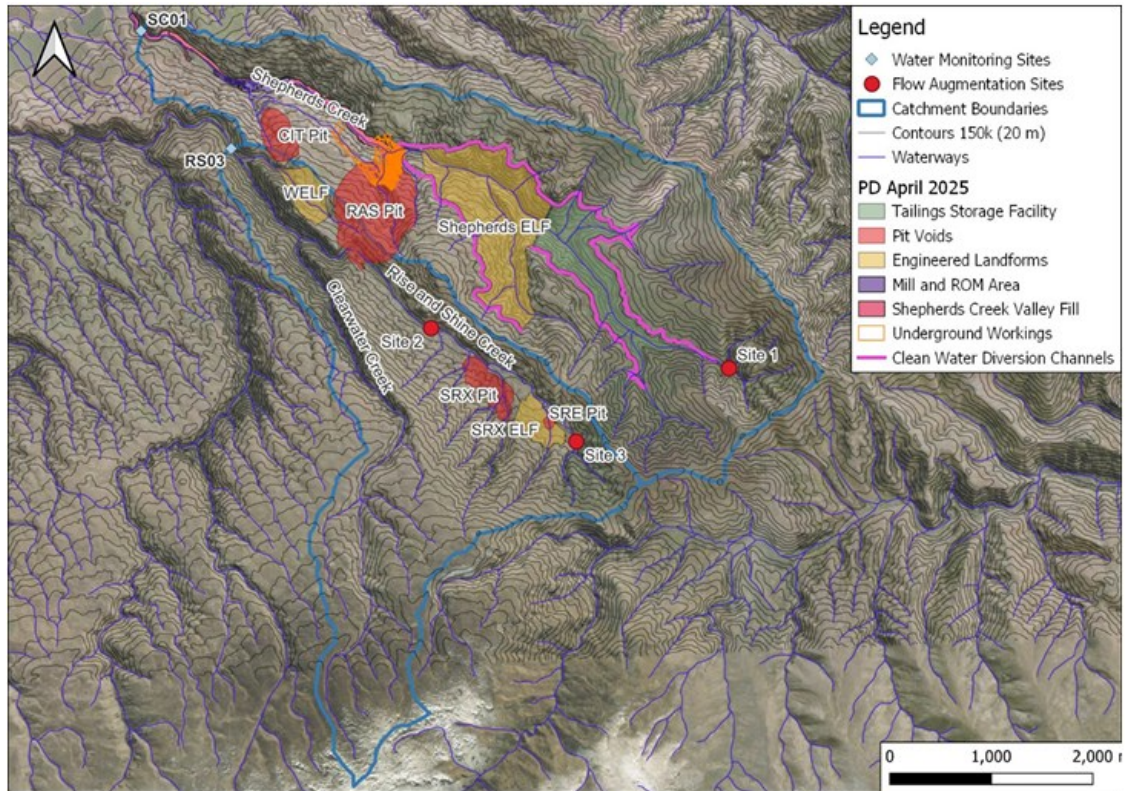


Figure 3-31: Flow Augmentation Sites

Once in operation, water demand is expected to decline to a range of 50 to 70 l/s as more recycled water becomes available from the processing and mining operations. Eventually, pit and underground dewatering and the collection of mine impacted water may result in borefield make-up water requirements being reduced. As discussed in MWM (2025), pit sump water may be used for mining operations such as dust suppression early in mine life provided that it meets the relevant compliance limits from monitoring sites in Shepherds and Rise and Shine Creeks. If pit sump water quality is too poor for use as dust suppression water this water will be used at the processing plant or pumped to the TSF.

Peak water consumption will occur during the first 12 to 18 months of the BOGP operations during project development and startup. This period will include the development of haul roads, the processing plant site, TSF starter embankment, the Shepherds Silt Pond embankment, the Shepherds Service Corridor and pre-stripping of the RAS orebody. Water will be required for dust suppression, construction of engineered infrastructure platforms and embankments.

Once the processing plant is commissioned and an impoundment pond is developed on the TSF, almost all the water demand for the processing plant (approximately 46 l/s) is expected to be provided by pumping water from the TSF for reuse in the plant.



This includes supernatant water from the tailings discharge and rainfall within the TSF catchment area (i.e. below clean water diversion channels). Seepage from the Shepherds Seepage Collection Sump will also be sent to the processing plant for reuse.

Water recovered from the various sediment retention ponds that will be installed across the site may also be used for a range of purposes. This includes dust suppression, transfer to the TSF for reuse at the processing plant or otherwise discharged to the Shepherds Stream Diversion provided it meets the relevant water quality criteria.

3.16.2 Mine-Impacted Water

Mining activities within the BOGP are expected to influence water quality across the Project Site. These impacts will result in the generation of Mine-Impacted Water (“**MIW**”) - a term used to describe water that has been affected by mining processes and infrastructure. MIW includes several distinct types of water, each with specific characteristics and environmental considerations:

- > Surface water runoff with elevated Total Suspended Solids (“**TSS**”), primarily resulting from earthworks and disturbed land surfaces;
- > Neutral Metalliferous Drainage (“**NMD**”), which may contain elevated concentrations of Potential Constituents of Concern (“**PCOCs**”) such as arsenic, sulfate and trace metals due to interaction with waste rock and tailings; and
- > Nitrate-rich drainage, associated with the use of ammonium nitrate fuel oil (“**ANFO**”) explosives and cyanide in gold recovery processes, which may also include ammoniacal nitrogen.

These water types originate from different sources - surface runoff, seepage from engineered landforms, and process-related discharge - but collectively these waters are referred to as MIW to acknowledge the different contributions to potential reductions in water quality within the Project Site.

Elevated TSS and nitrates will primarily be presented in surface water runoff that will be captured by erosion and sediment control measures described earlier in Section 3.8 of this report. NMD will present as seepage from various mine components including the Shepherds ELF, SRX ELF, Western ELF, CIT backfill and TSF.

The key methods for how mine-impacted waters are proposed to be managed during operations and treated post-closure are presented in Section 6.6 of this report and set out in detail in various technical reports provided in **Part B** of these application documents, including MWM (2025), EGL (2025h) and Process Flow (2025). A summary is provided below.



The management of mine-impacted water will involve several engineering controls to minimise the effects on the downstream environment. This includes materials management and the design and construction of the three ELF's and CIT Backfill to minimise contaminant loads from waste rock.

These design features relate to foundation earthworks, clean water management, materials management, lift heights, encapsulation, cover systems, progressive rehabilitation and performance monitoring. Further details are provided in Section 6.6.

Mine-impacted water will also be collected close to source at the Shepherds Seepage Collection Sump (at the toe of the Shepherds ELF) and will be transferred to the TSF to maintain design capacities for ongoing seepage and rainfall events. Mine-impacted water will be used in a supplemental role at the processing plant along with supernatant water from the TSF.

Following mine closure, mine impacted water will be treated through both active and passive water treatment systems.

An active WTP is proposed to be located within the processing plant area footprint where there is access to power, water and storage for reagents. Through its location at the bottom of the Shepherds Creek catchment, mine-impacted water (i.e. seepage from the TSF, Shepherds ELF, Western ELF and CIT Backfill and underground mine workings) will drain to the WTP by gravity to be treated, thereby reducing long-term management requirements. The WTP will likely operate for several decades until passive treatment systems can be installed to successfully treat mine-impacted water. On completion of the WTP, the plant and associated infrastructure will be removed.

Passive treatment systems (“**PTS**”) will also be constructed in the same area and will likely consist of a series of water treatment ponds to ensure water quality meets the appropriate freshwater quality guidelines before being discharged into Shepherds Creek. This may include:

- > Sediment management to mitigate any residue sediment and prevent the PTS from being overwhelmed with sediment;
- > Oxidation to encourage ferric oxyhydroxide precipitation and adsorption of metals such as arsenic and vanadium;
- > Anaerobic treatment to remove nitrate, reduce sulphate concentrations, and precipitate metals as sulphides; and
- > A polishing pond to remove secondary contaminants generated in the anaerobic treatment stage.



Refer to MWM (2025) and Process Flow (2025) provided in **Part B** of these application documents for further details, including the various water treatment processes that will likely be required through both the WTP and PTS.

3.17 ANCILLARY INFRASTRUCTURE

3.17.1 Electrical Supply

High voltage power needs to be brought to the Project Site. The electrical load requirements for the BOGP have been modelled based on the known loads of the mine for the initial stages of operation – being nominally 14 MVA – and the expected future loads for the underground phases of the mine lifecycle, to a total of nominally 20 MVA.

To provide power to the site, a new 66 kV overhead powerline is proposed to be installed from the Upper Clutha Network - owned by Aurora Energy - via the existing Lindis Crossing Substation located approximately 10 km north of the Project Site. The overhead powerline will generally follow the existing road reserve along Ardgour Road and Thomson Gorge Road until the proposed site access road, at which point the powerline will deviate into adjoining agricultural land (on Ardgour Station) via a combination of overhead and underground networks and connect to a single 66 / 11 kV (24 MVA) substation located at the Ardgour Terrace Site. The substation and associated buildings / structures to convey electricity will be located within a fenced area (2.5 m perimeter fence) of approximately 40 m by 40 m.

In addition, the existing Aurora Energy 11 kV distribution network on Matilda Rise will be developed to support early power demands for the construction phase activities and the construction accommodation camp, with the permanent mine supply - via the new 66 kV distribution network - planned for commissioning in 2027.

Both the new 66 kV overhead powerlines from the Lindis Crossing Substation and the extension of existing 11 kV powerlines from Matilda Rise will be consented, owned and operated by Aurora Energy and do not form part of this substantive application.

While the proposed new substation located at the Ardgour Terrace Site will be constructed and owned by Aurora Energy, MGL is seeking all necessary approvals for the substation through this substantive application.

MGL proposes to connect the wider Project Site through multiple 11 kV underground networks within the part of the site located within the Dunstan Mountains ONL.

With respect to non-electrical power supply, MGL are also planning to install various portable generator sets for a range of activities to support mining operations, with a cumulative total of approximately 5 MW of generated output power.



3.17.2 Communication Towers

Two 6.5 m high antenna structures are proposed to be located at Ardgour / Booster Hill and Battery Hill (as shown in the project overview in Figure 3-1). The purpose of these towers is to support VHF radio repeater antennas, CCTV and site Wi-Fi which is critical in ensuring communications across the Project Site are not compromised for health and safety purposes. Licences have been granted for all radio channels to be used on site and the towers are compliant with the Radio Spectrum Management requirements.

The communications tower located on Ardgour Station requires consent under the District Plan whereas the tower located on Bendigo Station is a permitted activity as Bendigo Station has become freehold land under the Crown Pastoral Land Act 1998.⁵²

3.17.3 Culvert

MGL proposes to install a culvert in the bed of Rise and Shine Creek within the Project Site within close proximity to the SRX Open Pit and ELF (refer to Figure 3-30).



Figure 3-32: Indicative Culvert Location

Because the specific location, size and design of this culvert cannot be determined until detailed design, the relevant culvert information requirements under the National Environmental Standards for Freshwater (“**NES Freshwater**”) will be provided following the

⁵² In accordance with Rule 4.7.6.L.1 of the District Plan.



installation of the culvert to ensure the continued provision of sufficient baseline flows in the Rise and Shine Creek. Refer to Sections 4.7 and 8.7.3.2 of this report for further details.

3.18 SITE ACCESS AND ROADING

3.18.1 Site Access

New and upgraded road access to the Project Site is required to provide for personnel and visitor access and delivery of construction and mine operation equipment, plant, consumables and vehicles.

Access to the Project Site will initially be gained from SH8 at the intersection of Ardgour Road - approximately 24 km north of Cromwell. Access is then proposed via Ardgour Road (over a length of 2.4 km) and Thomson Gorge Road (over a length of 1.6 km). This route was determined through a feasibility assessment as it is achievable within existing road corridors, is safest for road users and is comparably efficient from a distance perspective. Access to the Project Site itself will then be gained from a proposed new vehicle crossing off Thomson Gorge Road, and onto a new site access road (located on private land within Ardgour Station), which will run mostly parallel to the existing Thomson Gorge Road for approximately 2.7 km until it reaches the administration and services area at the Ardgour Terrace Site.

Overall, this represents a 6.8 km route from SH8 to the Project Site.

As the BOGP will increase traffic volumes along these routes described above, the project includes the following improvements to the existing public road network that are sought to be authorised as part of this substantive application:

- > Safety improvements at the SH8 / Ardgour Road intersection. This includes the formation of a north-bound right turn bay on SH8 and minor realignment of safety barriers to improve sightlines and associated construction laydown areas on adjacent land administered by the Department of Conservation;
- > Widening and sealing of Thomson Gorge Road between Ardgour Road and the proposed new site access road to provide a 6.5 m wide sealed carriageway within the existing road reserve;
- > The relocation of an approximately 800 m section of Thomson Gorge Road (south of the proposed new site access intersection) that is located outside the road corridor back into the legal road reserve. The relocated section of Thomson Gorge road will be a 'like for like' gravel road;



- > The upgrade of the Ardgour Road / Thomson Gorge Road intersection into a sealed T-intersection (giving priority to Thomson Gorge Road); and
- > The formation of a new sealed intersection of Thomson Gorge Road and the proposed new site access road.

The 2.4 km length of Ardgour Road will not be upgraded as it is already sealed and considered fit for purpose.

The proposed access route from SH8 to the Project Site is illustrated in Figure 3-31 below.





Figure 3-32: Proposed Access Route to the Project Site



3.18.2 Haul Roads

A haul road network is required to be created to serve the mining operations of the BOGP as they expand. This haul road network includes:

- > A haul road from the processing plant to the RAS Open Pit and Shepherds ELF;
- > A haul road to the CIT Open Pit;
- > An upper haul road from the RAS Open Pit to the upper part of Shepherds ELF;
- > A haul road from the Shepherds ELF to the SRX Open Pit;
- > A haul road from the RAS Underground portal to the ROM pad; and
- > Smaller haul and site access roads to topsoil stacks, refuelling areas and the processing plant.

The haul road corridors will be between 18 - 35 m wide depending on equipment size, with the disturbance footprint width varying according to cut and fill depths which will be designed to achieve a maximum grade of 12.5%. Heavy and light vehicles will operate in the same corridor.

Various sediment retention ponds will be constructed alongside haul roads to contain runoff and sediment.

In terms of sequencing, haul roads will be initially established off the RAS pre-strip, traversing Jean Creek and extending up the Shepherds Valley to the TSF embankment. Haul roads will then be established from the RAS Open Pit in two directions - towards the Western ELF and various topsoil stockpiles and towards the processing plant, ROM pad and associated infrastructure area.

Haul roads will also be established from the processing plant site in the Shepherds Valley to the topsoil stockpiles at the Ardgour Terrace Site, which will receive topsoil and silt (unsuitable material) from the lower part of the Shepherds Creek Service Corridor.

The haul road to SRX Open Pit will be established later in mine life to balance ore supply to the processing plant towards the end of the mine life.

Haul roads to the CIT Open Pit will be established following confirmation from the Cushionfield ARP that the remainder of the CIT Open Pit outside the early disturbance area can be mined (refer to Landcare (2025)).

At closure, haul roads will be reduced to 3- 4 m wide light vehicle access tracks. Any culverts will be removed and replaced with fords to minimise ongoing maintenance



requirements. At disestablishment, roads surfaces will be rehabilitated with soil, rock and vegetation to break up the linear shape.

3.18.3 Realignment of Thomson Gorge Road – Ardgour Rise

The proposed mining activities of the BOGP will disrupt the current use of Thomson Gorge Road, which as discussed in Section 2.22 of this report, is a single lane unsealed road.

A portion of the Thomson Gorge Road is therefore proposed to be closed from east of the intersection with Matilda Rise to Thomsons Saddle. It is noted this section of Thomson Gorge Road in the Project Site is generally a 4WD access track not suitable for general vehicles. The realigned Thomson Gorge Road – referred to as “Ardgour Rise” – will run parallel to or along the Ardgour Station ridgeline to an existing easement through the Ardgour Conservation Area, which is administered by the Department of Conservation, and then in a southward direction along the boundary of the reserve to re-join Thomson Gorge Road at Thomsons Saddle. The last 15m of the existing track prior to joining the Thomson Gorge Road crosses land administered by LINZ and leased by Matakau Station Limited. An easement with LINZ is being negotiated by MGL to upgrade this portion of the track.

Ardgour Rise will be accessible before the road stopping of the section of Thomson Gorge Road and public access across the Dunstan Mountains will therefore be maintained at all times except for any temporary closure due to public safety.

Ardgour Rise will be a 4WD gravel track approximately 4 m wide and with grades generally less than 25%, and as such, will generally represent a ‘like-for-like’ replacement of Thomson Gorge Road to continue to provide access across the Dunstan Mountains. The width of the cut and fill corridor required to establish the track will vary along the route according to the terrain, with any final gradients selected to minimise cut and fill requirements in the conservation area. The track will also include safety embankments along fill sections where required. The track will be the equivalent of a ski field access track and may be closed at times during winter. Overall, any flatter gradient alternative will increase land disturbance and potential visual effects. The final design and gradients of Ardgour Rise will be confirmed in collaboration with the CODC.

Ardgour Rise is proposed to be vested with CODC to operate and maintain upon completion.

The Chorus telecommunication network has a fibre optic cable located in the Thomson Gorge Road. This cable will be realigned to the south of its current alignment, along a fence line on Bendigo Station, to maintain connectivity through to Thomsons Saddle.

The proposed alignment of Ardgour Rise and the Chorus fibre optic cable is shown in Figure 3-32.



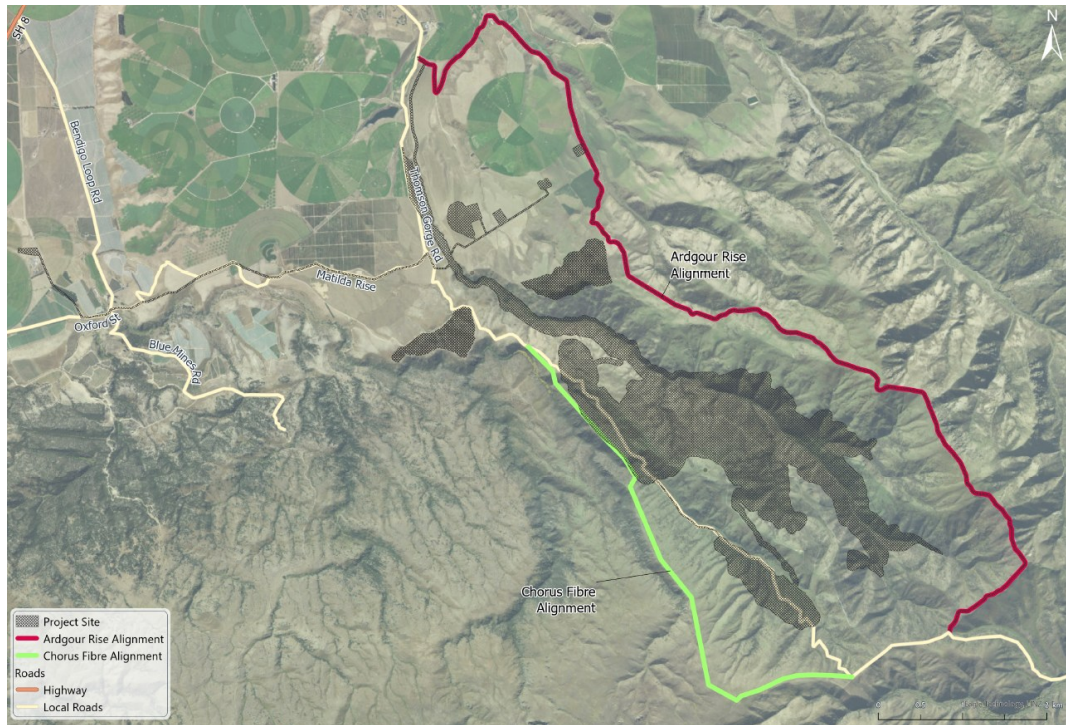


Figure 3-33: Ardour Rise and Chorus Fibre Alignment

3.18.4 Closure of Paper Road

As noted in Section 2.4 of this report, an existing paper road administered by the CODC traverses through the lower Shepherds Valley. As the proposed mining activities of the BOGP will disrupt any potential use of this road, MGL proposes that the paper road be closed, at least whilst mining operations and rehabilitation activities are undertaken. CODC has provided its written approval in its capacity as a land owner to this occurring (presented in **Part F**).

3.19 ALTERNATIVE ACCESS TO COME-IN-TIME BATTERY

The proposed mining activities associated with the BOGP will disrupt the accessibility of the current walking track to the Come-in-Time Battery, which is an approximately 15 minute walk to an old mine entrance and restored battery within the Bendigo Historic Reserve. The walking track is currently accessed from the Bendigo end of Thomson Gorge Road.

MGL therefore proposes to relocate access to the Come-in-Time Battery via a new marked walking route west of the battery location that is accessed via Blue Mines Road. The current walking track will be sought to be closed to restrict access to the Project Site for health and safety reasons. The proposed alignment of this route is shown in Figure 3-33 below, noting this is indicative and subject to refinement through ongoing discussions with the Department of Conservation.



As outlined in the detailed RMA rules assessment provided in **Part H** of these application documents, the establishment of this route is a permitted activity under the District Plan.

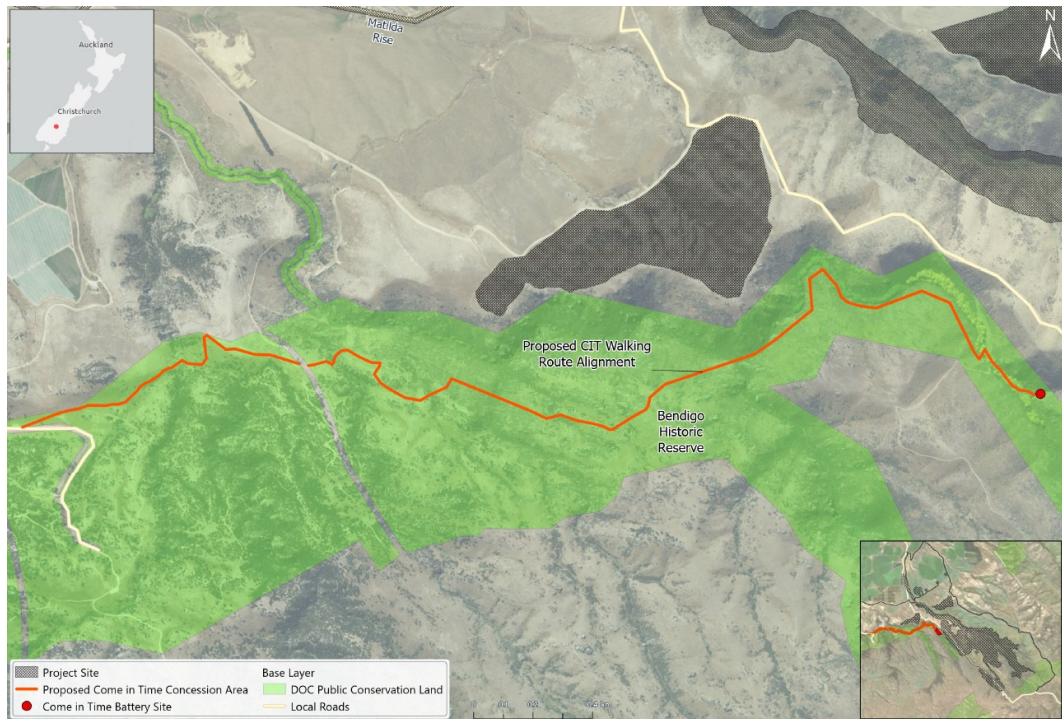


Figure 3-34: Proposed New Marked Route to Come-in-Time Battery

3.20 CONSTRUCTION AND MINING WORKFORCE

The BOGP will require a construction workforce of approximately 150 full time employees spread over the indicative 12-18 month construction period, with all 150 people working on site each day during peak construction. Construction activities will generally be during the day, however, mine pre-strip operations may be undertaken 24 hours per day across two 12-hour shifts.

Construction workers will generally be sourced locally, except for a small number of specifically skilled / experienced workers who will be required for short periods (6-8 weeks) during the construction of the processing plant. These workers may be sourced nationally or internationally as required and may include equipment-specific project managers and installation technicians, control system engineers and commissioning engineers.

Once operational, the BOGP will require an average of approximately 357 full-time employees across the mine life, the majority of which will be shift workers. Peak work force will be approximately 529 full-time employees.

While most workers will be skilled shift workers (largely machine, equipment and processing plant operators and supervisors) a proportion will comprise of professional roles including



geological, metallurgical, surveying, environmental, safety, financial and management. A portion of these professional roles will be part of an operational support team, including a general manager, commercial and administration manager, accountants, payroll, environmental, human resources, a nurse and an occupational health and safety consultants. In addition, it is noted that:

- > Jobs will be highly productive and highly paid. The BOGP is estimated to contribute \$1,000,000 of GDP per worker, which is 7.5 times the current average productivity across Inland Otago;
- > The average wage for workers employed by the BOGP is estimated to be \$140,300 a year, which is 104% higher than the average wage in Inland Otago of approximately \$68,904 in 2024; and
- > A further approximately 497 jobs are expected to be generated in the region due to employment multiplier effects which will include indirect employment amongst suppliers and induced employment amongst service providers such as supermarkets, health and education sectors.

Refer to Benje Patterson (2025) provided in **Part B** of the application for further details.

The BOGP will be a 'residential mine', with employees residing in the nearby townships of Cromwell, Tarras, Alexandra, Queenstown, Wānaka, Clyde and Omakau as opposed to FIFO staffing arrangements. Other than Tarras, which is located within close proximity to the Project Site, transport will be provided to take workers to and from these regional centres as rosters and numbers warrant.

3.21 REHABILITATION AND CLOSURE ACTIVITIES

The proposed rehabilitation and closure activities for the key operational areas and components of the BOGP have been detailed throughout this chapter. This has been informed by an overarching Landscape and Ecological Rehabilitation Management Plan ("LERMP") prepared by Boffa Miskell, Landcare and Habitat NZ - provided in **Part G** of these application documents. The LERMP provides the framework for rehabilitation activities and seeks to achieve the following long-term landscape and ecology vision:

- > Enable the modified mined landscape to be effectively re-integrated into the Dunstan Mountains ONL;
- > Create geotechnically and natural-appearing stable landforms to support the long-term ecological development except for highwalls;
- > Diversify habitats to create resilient vegetation mosaics of native-dominated Central Otago ecosystems that include threatened and palatable plants;



- > Enhance ecology for improved habitat for native tussock and shrubland, including threatened and culturally significant taxa, with resilience to drought and fire; and
- > Provide regional benefits through a landscape that strengthens biodiversity conservation and maintains important cultural values and heritage associations.

In addition, the overall landscape objectives of the LERMP are to:

- > Recognise and protect backdrop and skyline integrity;
- > Ensure rehabilitated and closure landforms remain responsive to the underlying ONL context;
- > Create safe, stable engineered landforms with high erosion resistance;
- > Address the loss of heritage sites through maintaining public vehicle access during and following mining;
- > Identify and respond to cultural values including mana whenua;
- > Provide for the ecological and instream values of watercourses; and
- > Reinstatement public recreation access to Rise and Shine Creek valley and through the natural low point of Thomson Saddle at closure for walking.

An overview of the proposed closure and rehabilitation approach is summarised in the sub-sections below, with further details provided in the LERMP and Section 6 of this report.

3.21.1 Post-Mining Land Use

The LERMP provides the framework for rehabilitation activities and the transition to a post-mining land use of predominantly ecological conservation, with a return to pastoral sheep grazing land limited to that required to support ecological values (particularly cushionfield areas).

With respect to access, public vehicle access over the Dunstan Mountains during mining operations and post-mining will be provided by via Ardgor Rise which replaces the existing Thomson Gorge Road. At closure, public access to the Rise and Shine Valley will be reintroduced through walking, cycling and equestrian access.

Some built infrastructure within the Project Site may be retained / repurposed post-mining (e.g. parts of gravel pits and / or plant areas). Light-vehicle tracks will be retained or created for ongoing landscape and ecological management. Truck access, storage and turn-around areas may be required for several decades until the water treatment plant and/or passive wetlands are disestablished.



3.21.2 Landscape Rehabilitation Approach

As previously noted, the mine design and schedule allows for progressive clearing and rehabilitation, keeping disturbed areas to the minimum necessary for efficient working of the mine and to minimise potential dust and water management effects.

To minimise visual impacts of constructed landforms, high public visibility areas will be prioritised for backfill and the creation of natural landforms (e.g. the CIT Open Pit and ELF's). High naturalness on the ELF's, the TSF and decommissioned haul roads / stockpile sites will be achieved by disrupting extensive linear features, minimising uniform slope areas and establishing varied aspects and root zone depths. These measures will generate coarse, heterogeneous mosaics of native vegetation at different heights. The key exceptions to this are the permanent pit lakes and benched pit landforms, with the highly engineered, unnatural landscape features within these areas needing to remain in perpetuity. While in the mine closure phase the north and west-facing walls of the RAS Open Pit will be slowest to develop vegetation cover, the specific placement of root zones on benches contacting natural ground will enhance their ecological value and increase stability.

Management of highwall risks near public access and risks to stock and farm vehicles on potentially grazed areas will be required.

3.21.3 Ecological Rehabilitation Approach

Landforms and landcover will reflect coarse, heterogeneous mosaics typical of native-dominated Central Otago ecosystems. Ecological rehabilitation aims to provide for ecological values and resilience across the Project Site / DDF⁵³ and surrounding area for native plants, invertebrates and lizards, including species classified as nationally Threatened (or equivalent) or At-Risk, or socially / culturally important species.

The site-wide approach involves gradually replacing non-native pasture grasses with native vegetation across the entire DDF. In targeted areas, other non-native plants will be removed or reduced (e.g. brier removal from cushionfields). As part of offset and compensation measures, Mine Regeneration Zones ("MRZ") in surrounding areas (refer to Section 3.22) will enhance existing native vegetation with historic 'pre-degradation' ecosystem components that can be sustained using management practices prioritising indigenous ecological outcomes and building resilience to future fire, drought and browser risks. Importantly,

⁵³ The DDF has been used by the various ecological reports. Includes the 568 hectare Project Site and buffers which range from 0-100 m for different project components.



however, the LERMP notes no single 'pre-degradation state' exists that would be resilient under current or future climate and management conditions.

The rehabilitation of native-dominated Central Otago ecosystems with enhanced ecological values requires different management across the DDF, characterised by different Landscape Management Units (“**LMU**”) for both the DDF and adjacent MRZ’s. LMU’s will be rehabilitated within the DDF while the surrounding MRZ’s will be enhanced.

The various LMU’s and MRZ’s within the LERMP are shown in Figure 3-34 below.

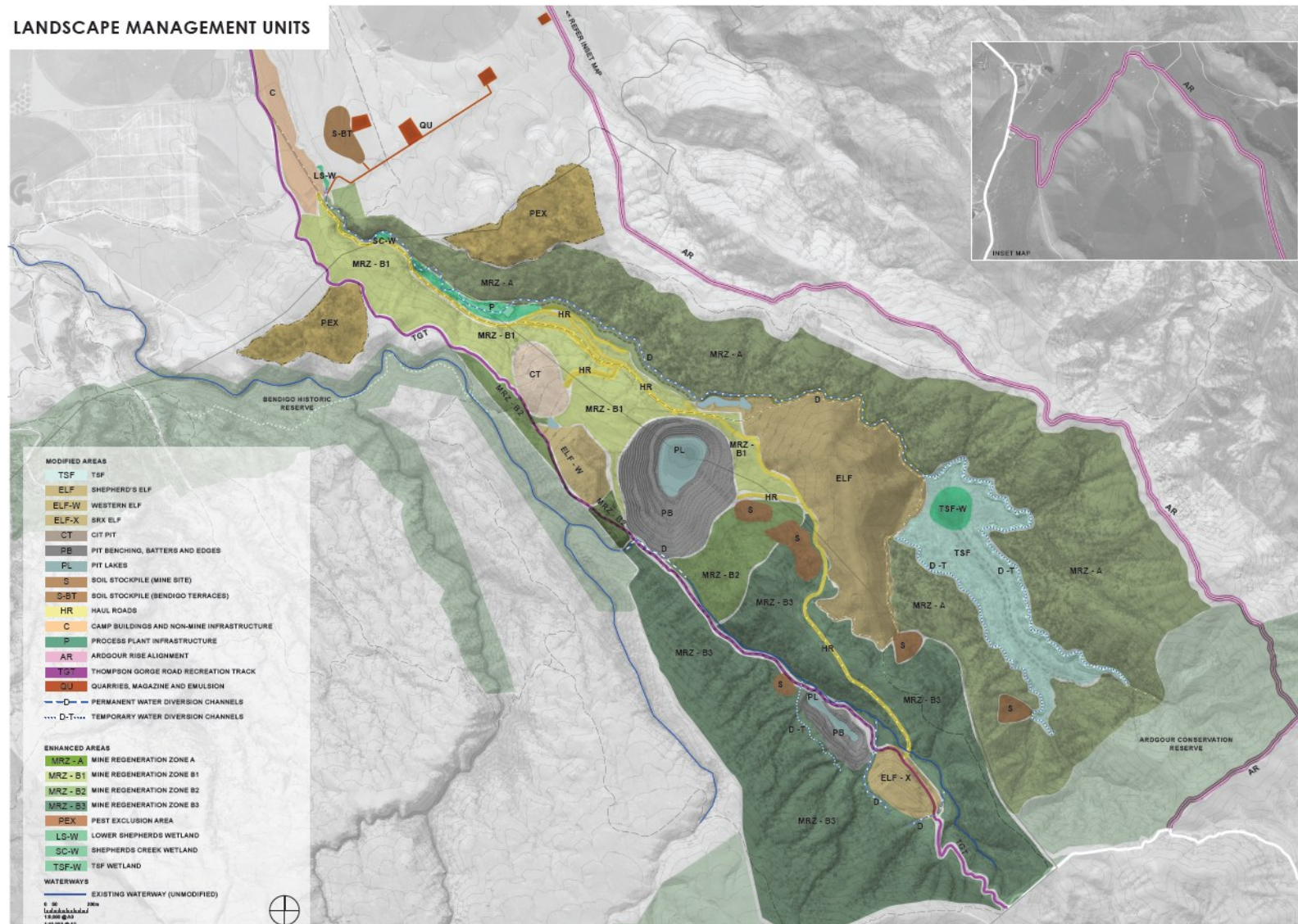


Figure 3-35: Landscape Management Units

3.21.4 Timing

Rehabilitation is to occur in a sequenced manner as soon as final landforms become available, starting with clean water diversion channels / stream diversions and 'final' edge enhancement. Small but important mine rehabilitation areas are proposed to be completed in years 2-3 (notably the Western ELF), with larger areas completed following the mining of the SRX Open Pit. MRZ enrichment and enhancement will commence alongside mining operations and extend throughout the mine life. However, most mine rehabilitation will occur after mining stops, with the TSF and associated soil / brown rock sources being the last large areas to be rehabilitated after the deposition of tailings ceasing.

3.22 ENVIRONMENTAL ENHANCEMENT AND MITIGATION ACTIVITIES

A comprehensive suite of ecological measures are proposed to manage the actual and potential effects of the BOGP on the environment, including extensive offsetting and compensation measures. Several of these activities require resource consents or other approvals under the Act, and while other measures (e.g. native plantings) are permitted activities, they are considered to form part of the wider project.

As such, a summary of these measures is provided in the sub-sections below, with further details provided in subsequent sections of this report.

3.22.1 Ecological Rehabilitation Activities

In accordance with the LERMP, MGL is proposing to undertake ecological rehabilitation activities across all available areas within the DDF (approximately 480 hectares), noting this excludes the majority of the two permanent pit lakes and pit walls and permanent infrastructure such as roads and water treatment facilities. This includes:

- > The re-establishment of four indigenous terrestrial vegetation communities, including approximately 230 hectares of Indigenous woody scrubland, approximately 222 hectares of indigenous tussockland, approximately 2 hectares of taramea herbfield and shrubland and approximately 19 hectares of cushionfields;
- > The deployment of at least 480 rock stacks and creation of at least 96 rubble pits (totalling 1.5 hectares of combined) to collectively provide high-value habitat for lizards and select Threatened and At-Risk invertebrates, and a favourable environment for establishing plants; and
- > The establishment of at least 24 reproductively viable kōwhai clusters.



The ecological rehabilitation activities will also include the re-establishment of indigenous swamp / marsh wetland communities across 7.5 hectares. This includes 3.5 hectares of swamp wetland (with at least 0.5 hectares of open water), 4 hectares of marsh wetland which includes two smaller marsh wetland communities of 0.4 to 0.5 hectares in size each. This wetland habitat includes:

- > The construction of a 0.5 hectare wetland within Shepherds Creek on the Ardgour terrace (“**Ardgour Terrace Wetland**”) that will be created in year 1 of the mine life using salvaged wetland sods from the establishment works for the Shepherds Service Corridor. It will act as a nursery for wetland species that will be relocated to proposed wetlands in the project site at mine closure;
- > The construction of a large wetland on the TSF at closure (“**TSF Wetland**”) that will cover at least 6 hectares, with 0.5 hectares of open water supporting aquatic invertebrates, wetland birds, and Threatened sedge species; and
- > The construction of a 0.5 hectare wetland within the Shepherds Valley (“**Lower Shepherds Wetland**”) using salvaged wetland sods and individual plants.

As noted throughout this section, the proposed BOGP will result in the reclamation of sections of Shepherds Creek and Rise and Shine Creek and associated tributaries which will be remedied through the provision of rehabilitated and enhanced stream diversions.

Lengths of Shepherds Creek and Rise and Shine Creek (and associated tributaries) will be impacted by mine components, including the TSF, RAS Open Pit and various ELFs, or realigned to accommodate the Shepherds Service Corridor. The construction of various clean water diversion channels will capture and divert clean water from the Shepherds and Rise and Shine Creek catchments around these mine components. These diversion channels will be naturalised at closure, with water allowed to exit bunds at multiple places to enhance plant growth. Within the Shepherds Creek catchment, the northern and southern diversion channels alongside the TSF will be opened to allow flows to drain to the rehabilitated TSF surface and wetland habitat.

In addition to the clean water diversion channels, the loss of these sections of watercourse will be remedied through the provision of new, permanently rehabilitated stream diversions (or the enhancement of retained sections of Shepherds Creek) within the Shepherds and Rise and Shine Creek catchments which will be naturalised over the mine life in accordance with diversion design principles set out in Boffa Miskell (2025a) and the Freshwater Ecology Management and Monitoring Plan.

The diversion channels will be designed to replicate similar flow characteristics to similar mountain creeks and streams as far as practicable to promote naturalisation over the project life and the reestablishment of indigenous flora and fauna. MGL propose to follow the Freshwater Ecology Management and Monitoring Plan design principles which set out that the temporary and permanent diversions should be of a similar width, length, hydrological function, natural meanders, instream habitat, and should have a low flow channel, bank full channel and, where applicable a floodplain area. MGL also propose to provide habitat within the diversion of a similar form and structure to the stream to be reclaimed and create stream profiles to undertake riparian planting close to and extending over and into the water surface along the stream diversions.

Further to the above, MGL proposes to enhance approximately 6.7 km of Bendigo and Clearwater Creeks by way of the management of crack willow trees and enhancement of riparian margins of these creeks. These creeks are located in the Bendigo Historic Reserve, immediately west of the Project Site, as shown in Figure 3-35 below.

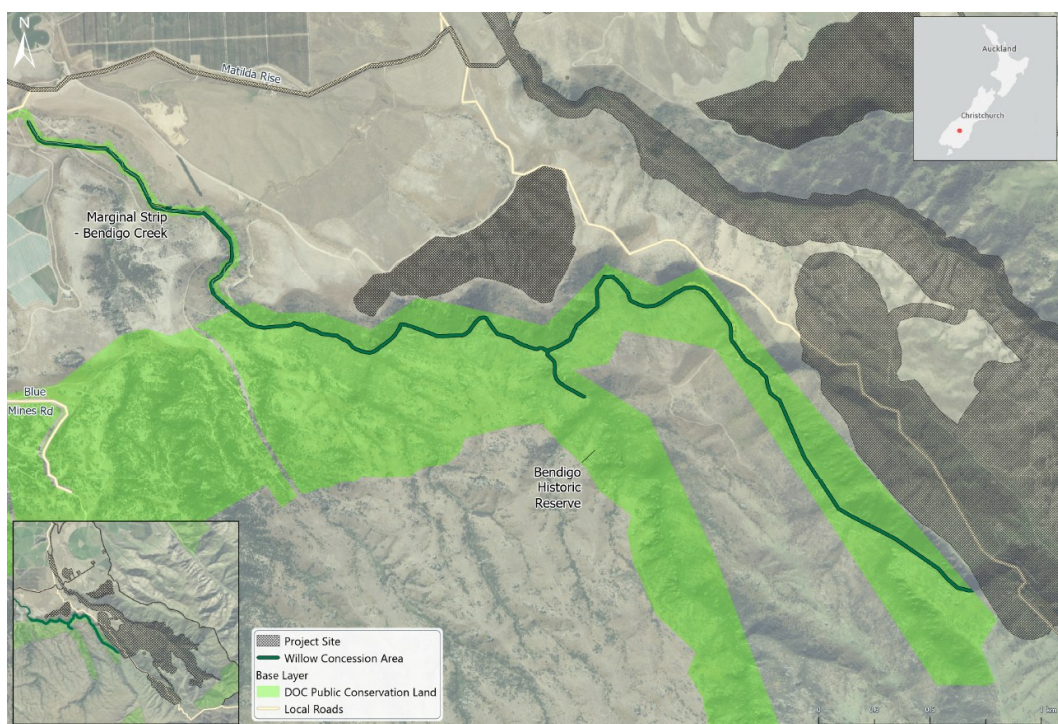


Figure 3-36: Indicative Location of Crack Willow Management Activities

These works may include, with agreement of the Department of Conservation, the spot spraying of herbicide to kill willow trees, the progressive and / or partial removal of willow trees, and the partial replacement of cover with native vegetation. Once willows are sprayed and standing dead (approximately 12 to 24 months) the tree trunks will be manually chain sawed and left in place to naturally rot along the riparian margins. Willows will generally not be removed from the creeks due to the steep and confined nature of parts of the valley.



As outlined in the details RMA rules assessment provided in **Part H** of these application documents, the discharge of agrichemicals (including spot spraying of crack willow) is a permitted activity under the Regional Air Plan and the removal of crack willow within the riparian margins of a waterbody is a permitted activity under the District Plan.

Further details on willow management activities are provided in the Biosecurity and Pest Plant Management Plan, a copy of which is provided in **Part G** of these application documents.

3.22.2 Ecological Restoration and Enhancement Areas

As part of the proposed suite of offsetting and compensation measures, MGL proposes to undertake ecological restoration and habitat enhancement activities across approximately 2,219 hectares of habitat surrounding the DDF. This restoration and enhancement programme includes:

- > The Mine Regeneration Zones;
- > The Ardgour Restoration Area; and
- > The Ardgour and Bendigo Sanctuaries.

The spatial extent of these ecological restoration and enhancement areas are illustrated in Figure 3-36 below. While these measures are described further as part of the assessment of environmental effects in Sections 6.7 and 7 of this report, the key features of each of these areas is summarised in the sub-sections below.

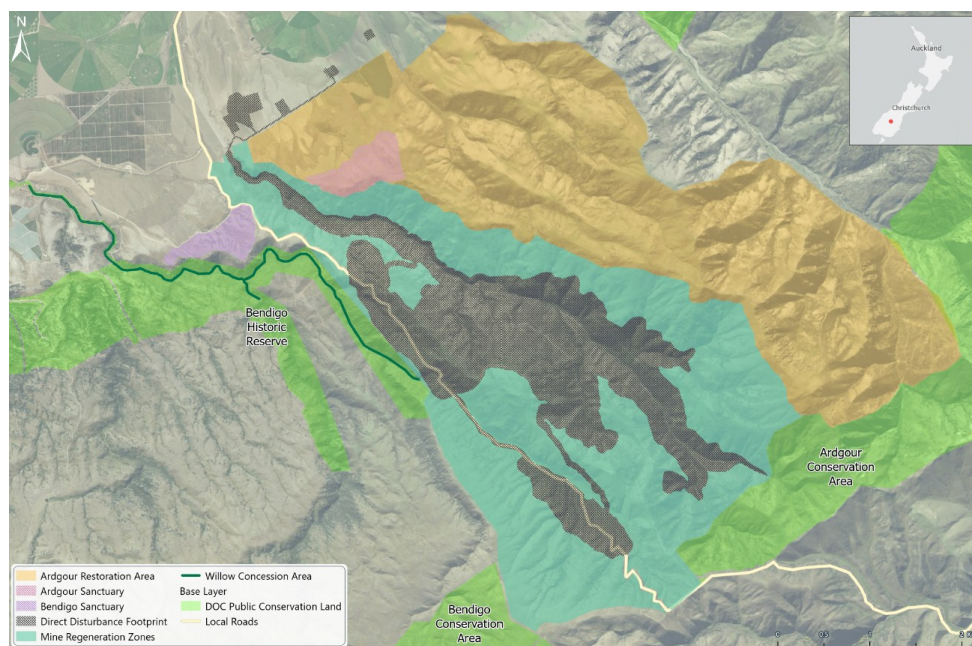


Figure 3-37: Ecological Rehabilitation and Enhancement Areas



3.22.2.1 Mine Regeneration Zones

MGL proposes to undertake ecological enhancement of habitat within approximately 889 hectares of undisturbed land adjacent to the DDF - referred to as MRZ's - which are established around the northern, southern and eastern extents of the DDF. MRZs have been defined by similar geographic and or ecological features, with ecological values within each zone proposed to be enhanced by activities such as grazing and browser management, weed management, planting of seeds and or seedlings in selected locations and the establishment of pest exclusion / sanctuary areas.

There are four proposed MRZs which are shown in Figure 3-34 above. In summary:

- > MRZ-A runs along the northern side Shepherds Valley and surrounds the TSF. The key management priority is to focus on maximising native regeneration on the northern side of the Shepherds ELF and TSF while protecting Shepherds Creek headwaters, seepages and riparian zones;
- > MRZ-B1 is centred around the CIT Open Pit. The primary management objective is to protect and enhance cushionfields, native spring annual herbs and associated invertebrates as dominant components of the vegetation mosaic. MRZ-B1 is where the Cushionfield ARP will be focussed (refer to Landcare (2025));
- > MRZ-B2 is located along the southwestern extent of the RAS Open Pit, Western ELF and CIT Open Pit. The primary management objective is to protect cushionfields, and the secondary objective to enhance ecological values of the currently degraded ecosystem; and
- > MRZ-B3 connects the high-elevation Ardgour Conservation Area to the lower-elevation Bendigo Historic Reserve and surrounds the SRX pit and ELF. The key management priorities are to enhance the ecological values of currently degraded ecosystems and provide increased flow and diversity of native propagules across and into several mine components (the SRX pit and ELF and stockpiles). It also seeks to protect and enhance the riparian zones and seepages of Jean Creek.

MRZ-B1 to B3 also include remnant kōwhai trees present within the DDF that will be protected throughout mining activities, with all trees fenced to protect against mammalian pests and interplanted with kōwhai and other vegetation communities.

Refer to the LERMP in **Part G** of this application for further details on these proposed environmental enhancement activities and mitigation measures.



3.22.2.2 Ardgour Restoration Area

Ecological restoration works are proposed to be undertaken across approximately 1,263 hectares of Ardgour Station referred to as the “**Ardgour Restoration Area**”. This area is currently used for grazing as part of the station and lies to the northeast of the DDF and is shown in Figure 3-36 above.

The overarching objective of this area is to enhance woody ecosystems and sustain indigenous dominated herbfield (cushionfield) ecosystems to compensate for residual adverse effects on native biodiversity as a result of the BOGP.

A detailed Ardgour Restoration Area Management Plan has been prepared to guide these works (provided in **Part G** of this application) which sets out 35-year restoration outcomes to be achieved in the area. It then provides five-year goals as initial steps to achieve these outcomes, which will be subsequently updated every five years.

The works include livestock management (via fencing and grazing management), track establishment and management, restoration planting, mammalian pest control, pest plant control, habitat enhancement and fire management. Lizards and invertebrates salvaged prior to clearance activities within the DDF will also be relocated to the Ardgour Restoration Area (refer to the Lizard Management Plan in **Part G** of this application).

3.22.2.3 Predator-Proof Sanctuary Areas

MGL is proposing to establish and operate two predator-proof sanctuaries outside of the DDF in perpetuity, with the objective to restore and preserve regional biodiversity through comprehensive ecological protection and species recovery programmes. These sanctuary areas are shown in Figure 3-36 above, with key details as follows:

- > The Bendigo Sanctuary Area, which is proposed to cover 29 hectares and be enclosed by approximately 2.9 km of fencing. The key habitat types in this area include existing schist rock formations and natural crevices, remnant areas of tussockland, native shrubland and cushionfields, and constructed habitat enhancement features; and
- > The Ardgour Sanctuary Area, which is proposed to cover 38 hectares and be enclosed by approximately 3 km of fencing. This area is comprised of rolling and less structurally complex terrain that will require extensive habitat enhancement. Habitat types include Threatened cushionfield ecosystems that require specialised management, modified pastoral areas for restoration, constructed rock refugia systems and enhanced tussock establishment zones.



Both sanctuary areas utilise proven predator-proof fence technology and are strategically located and designed to maximise conservation outcomes whilst ensuring operational feasibility and long-term sustainability. These areas would be designed to exclude all mammalian pests,⁵⁴ which will in turn enable the translocation, establishment and recovery of nationally or regionally Threatened or At-Risk flora and fauna that have been extirpated from the local landscape.

The construction, operation and maintenance of the sanctuary areas will be undertaken across two phases:

- > The establishment phase (years 1 to 3), involving fence construction (and associated localised vegetation clearance, earthworks and temporary erosion and sediment control), comprehensive pest eradication through aerial baiting and ground-based control, and lizard habitat enhancement features; and
- > The operational phase (years 4 to 35) which will involve ongoing surveillance, structured maintenance and adaptive management with rapid response protocols.

Refer to the Sanctuary Management Plan provided in **Part G** of these application documents for further details on the establishment, operation and maintenance of these sanctuary areas.

3.23 THE BOGP BIODIVERSITY AND HERITAGE ENHANCEMENT FUND

As introduced in Section 1 of this report, and in addition to the proposed offset and compensation measures, MGL proposes to establish and implement the BOGP Biodiversity and Heritage Enhancement Fund which is intended to support conservation efforts within the Dunstan Ecological District and heritage conservation with Central Otago.

The BOGP Biodiversity and Heritage Enhancement Fund is intended to start from year 3 of mine life (or six months after commercial production is declared) and provide \$500,000 + GST per year for every year of gold production up to a maximum of 10 years. A maximum total of \$5,000,000 + GST will be paid. These funds are proposed to be provided to the local Alexandra Office of the Department of Conservation to support an existing programme of works within the Dunstan Ecological District. The primary intention of the BOGP Biodiversity and Heritage Enhancement Fund is to contribute to the protection and enhancement of cushionfield habitat outside of the BOGP Consent Area, or alternatively to support Threatened or At-Risk species and to provide for the conservation of heritage values outside of the BOGP Consent Area within Central Otago.

⁵⁴ This includes deer, pigs, goats, mustelids (ferrets, stoats, and weasels), possums, feral cats, hedgehogs, rabbits, hares, rats and mice.

While the specific objectives and details of the BOGP Biodiversity and Heritage Enhancement Fund are set out in the proposed conditions provided as **Part D** of these application documents, MGL propose to consult with the Department of Conservation throughout the fast-track process to establish the specific details and mechanics of the fund.

3.24 INDICATIVE PROJECT TIMELINE

3.24.1 Overview

The BOGP is expected to be an approximately 25-year project including pre-development, construction, operation and active closure activities.

As previously noted, mining is proposed to commence at the RAS Open Pit and begin supplying ore from month 11 of the BOGP. This will enable the processing of the ore from the RAS Open Pit from month 15 onwards.

The RAS Underground will commence development in Year 6 of processing. The SRX Open Pit will be mined and processed last.

The total material proposed to be processed from the RAS Open Pit, RAS Underground and SRX Open Pit across the project timeline is illustrated in Figure 3-37 below.⁵⁵

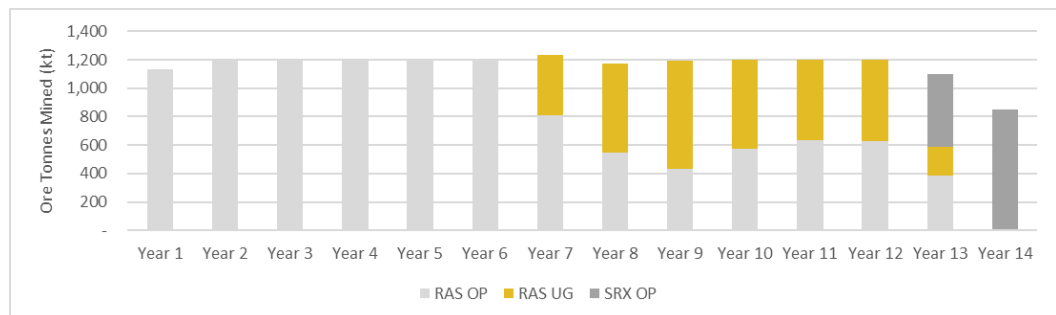


Figure 3-38: Overview of Material Processed by Source

3.24.2 Project Stages

A summary of the general establishment, operation and closure stages of the BOGP are described in further detail in the following sections, with figures which illustrate each stage provided at the end of the section.

⁵⁵ In accordance with the *Bendigo-Ophir Gold Project Updated Pre-Feasibility Study*, dated 1 July 2025. The total material proposed to be processed from the SRE Open Pit is minor (less than 0.1 million tonnes) and this information is not confirmed for the CIT Open Pit.



3.24.2.1 Start-Up Phase

The startup phase is the initial establishment phase of the BOGP. To access the Project Site, the proposed new access road will be formed on Ardour Station land and through the lower Shepherds Creek gorge at the outlet of Shepherds Valley. The mine access road will require the realignment of Shepherds Creek along the northern side of the valley to form the Shepherds Stream Diversion.

The mine access road will allow machinery to access the Shepherds Valley Site, containing the processing plant and supporting infrastructure and Shepherds Service Corridor, where earthworks will commence to start forming the service corridor and operational area platform. Topsoil in this area will be stripped and placed into local stockpiles. Cuts will be made into the rock slope on the south side of the Shepherds Valley, which may require drilling and blasting. Temporary sediment retention ponds will be required for erosion and sediment control during earthworks until the surface can be stabilised with a wearing course.

At the same time, the bore pump and power will be established to abstract groundwater from the Bendigo Aquifer and a delivery pipeline established into the Project Site. The pipeline will be run to the RAS Open Pit area for filling water carts for dust suppression.

The construction camp and administration buildings will be established at the Ardour Terrace Site.

Earth moving equipment will be established at the RAS Open Pit and will initially cut the haul road from RAS Open Pit to the Shepherds ELF in Jean Creek. An initial temporary sediment retention pond will be formed at the toe of Jean Creek and the central diversion channel will be partially formed upslope. Topsoil and residual soils from the surface of the RAS Open Pit, Shepherds ELF and Western ELF will be stripped and put into stockpiles for later rehabilitation. Brown weathered rock from the top of the pit will be placed at the top of Jean Creek for ease of access for embankment construction and rehabilitation. Unweathered overburden rock will be stripped and placed lower in Jean Creek, an area which will be buried by future raising of the Shepherds ELF.

The start-up phase for the BOGP is illustrated in Figure 3-38 below.

3.24.2.2 Project Development

This is the main construction stage, comprising the construction of the processing plant and supporting infrastructure and buildings, the TSF starter embankment and drainage, the Shepherds Seepage Collection Sump and Shepherds Silt Pond and the northern and TSF southern diversion channels.



In this stage, the stripping of the overburden rock continues with placement in the Shepherds ELF and Western ELF, and the stripping of topsoil and residual soil at the ELF footprint continues. The southern diversion channel is extended. This stage is completed by the commissioning of the processing plant and TSF which will be ready to receive ore and produce gold and tailings. The project development phase for the BOGP is illustrated in Figure 3-39 below.

3.24.2.3 Operation Phase – RAS Open Pit Mining

The initial operational stage involves only mining the RAS Open Pit and the early disturbance area for the CIT Open Pit. This requires the development of the full haul road from RAS Open Pit back to the processing plant and ROM pad at the Shepherds Valley Site. The TSF is now operational and is progressively raised to create storage for the tailings. The Shepherds ELF continues to receive material from RAS Open Pit. At this stage the construction of the Western ELF is potentially complete with rehabilitation activities commencing. This phase is illustrated in Figure 3-40 below.

3.24.2.4 Operation Phase – RAS Open Pit and RAS Underground Mining

This phase involves the mining of both the RAS Open Pit and RAS Underground. The portal for the RAS Underground mine is established separate to the RAS Open Pit. The twin development drives to the mine are progressed and underground mining will then progress. The RAS Open Pit will continue to expand, and a section of the pit will cross the Rise and Shine Creek. The TSF will continue to be raised. This phase is illustrated in Figure 3-41 below.

3.24.2.5 Operation Phase – RAS Open Pit, RAS Underground and CIT Open Pit Mining

This phase involves the mining of the RAS Open Pit, RAS Underground and CIT Open Pit (noting mining of the remainder of the CIT Open Pit outside of the early disturbance area is subject to the results of the Cushionfield ARP (refer to Landcare (2025) in **Part B** of these application documents). The Shepherds ELF and TSF will continue to be raised. As the ELF is developed higher, a defined dirty water diversion channel will be formed on the southwestern side of the ELF to sheet water off the ELF. This phase is illustrated in Figure 3-42 below.

3.24.2.6 Operation Phase – RAS Open Pit, RAS Underground and CIT Open Pit Backfill

This phase involves the RAS Open Pit, RAS Underground and CIT Open Pit being backfilled and rehabilitated. The CIT Open Pit will be mined before the completion of RAS Open Pit, so overburden rock can be used as backfill for the CIT Open Pit. Stripped topsoil, residual soil and brown rock from RAS Open Pit will be used as rehabilitation material for CIT Open Pit.



The Shepherds ELF and TSF will continue to be raised, and progressive rehabilitation of the front face of the ELF will begin. This phase is illustrated in Figure 3-43 below.

3.24.2.7 Operation Phase – RAS Open Pit, RAS Underground and CIT Open Pit Backfill, SRE and SRX Open Pit Mining

The SRE and SRX Open Pits are likely to be mined at the end of RAS Open Pit and RAS Underground Mining. The overburden rock from the SRX and SRE Open Pits will be stored in the SRX ELF. Clean water will be diverted around the SRX Open Pit and SRX ELF, with dirty water from the SRX ELF diverted into the SRX Open Pit. From there, water from SRX Open Pit will be released to the Rise and Shine Creek. This final operation phase is illustrated in Figure 3-44 below.

3.24.2.8 Active Closure

During the active closure stage all mining will be complete with rehabilitation activities being undertaken. The rehabilitation activities include:

- > Profiling of the TSF for final closure landform;
- > Decommissioning of the Shepherds Valley Site, which includes the removal of the processing plant and supporting infrastructure;
- > Construction of a WTP and / or PTS at site of the former processing plant;
- > Retreating out of the underground mine and removal of pumps, allowing the underground mine to begin to flood;
- > Management of the RAS pit water in combination with the flooding of the RAS Underground;
- > Rehabilitation capping of the Shepherds ELF, SRX ELF and TSF;
- > Formation of a weir to control surface water discharge off the rehabilitated TSF surface to an outlet channel; and
- > Redirection of water from the SRX pit and SRX ELF to the RAS pit.

The active closure phase is illustrated in Figure 3-45 below.

3.24.2.9 Passive Closure

By this stage, the final closure site arrangements are in place and the water treatment plant (or passive treatment ponds) will continue to operate. The haul roads will be rehabilitated. The site will continue to be monitored to ensure it is a long-term stable landform. The passive closure phase is illustrated in Figure 3-46 below.



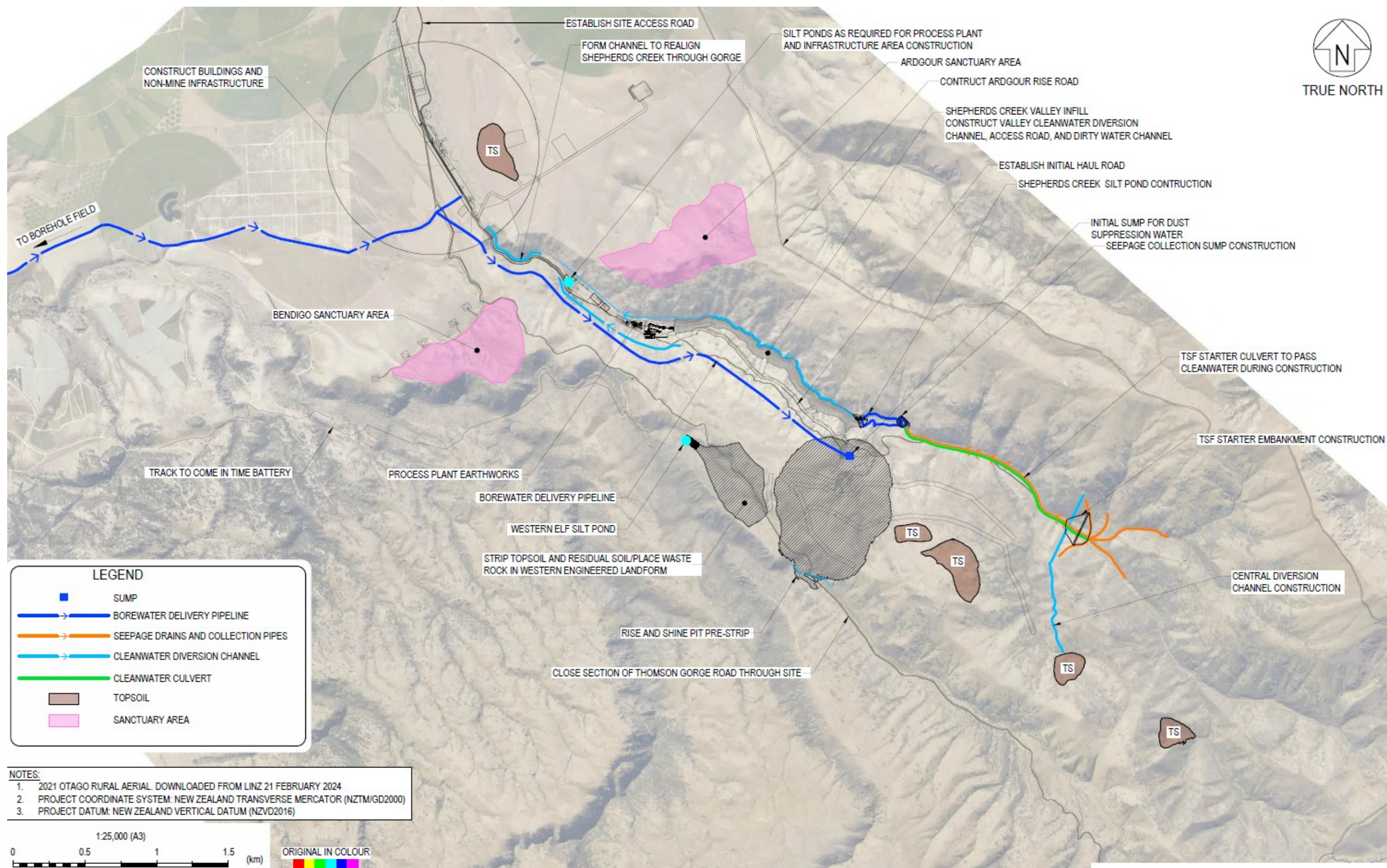


Figure 3-39: Start Up Phase

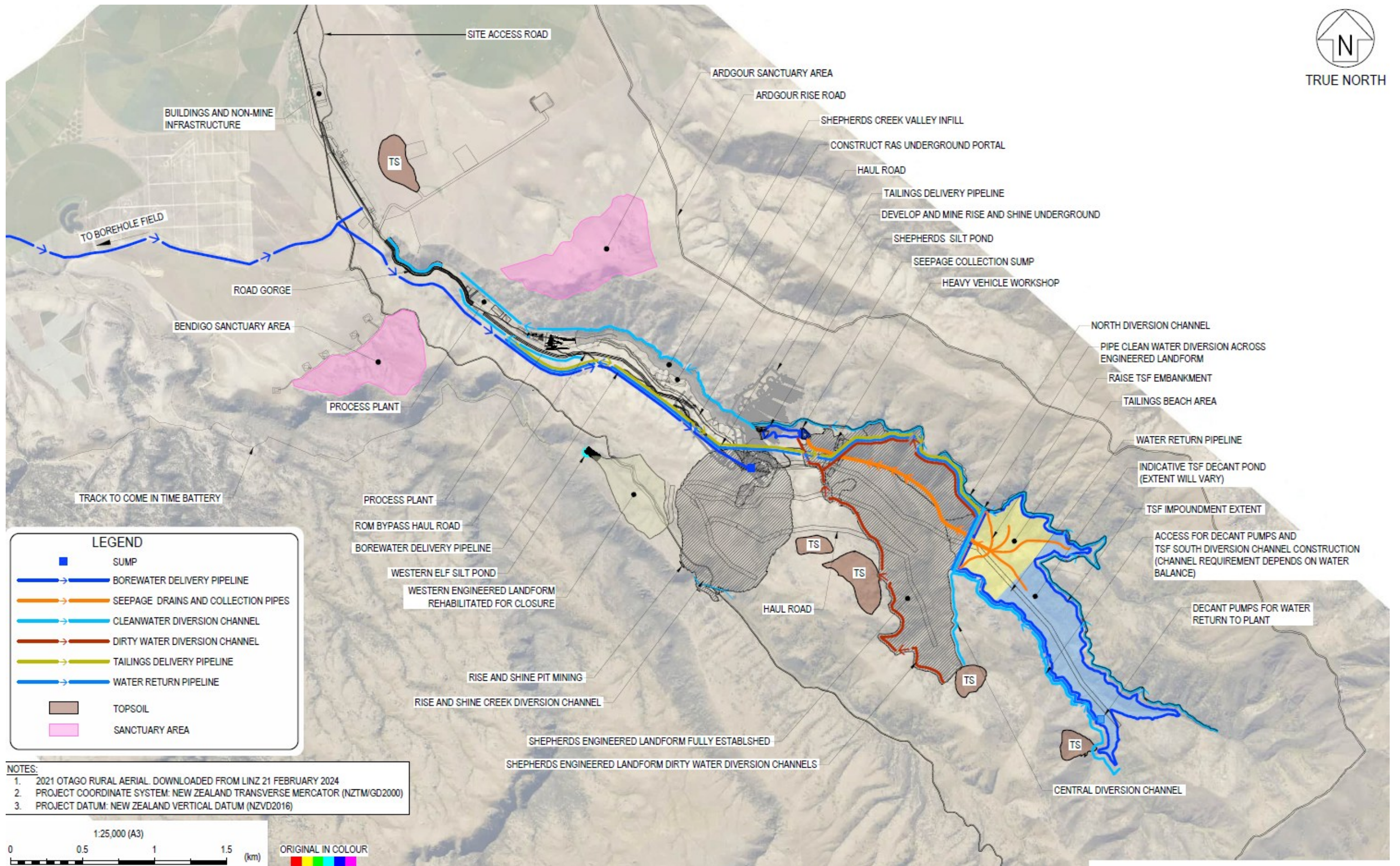


Figure 3-42: Operation Phase – RAS Open Pit & RAS Underground

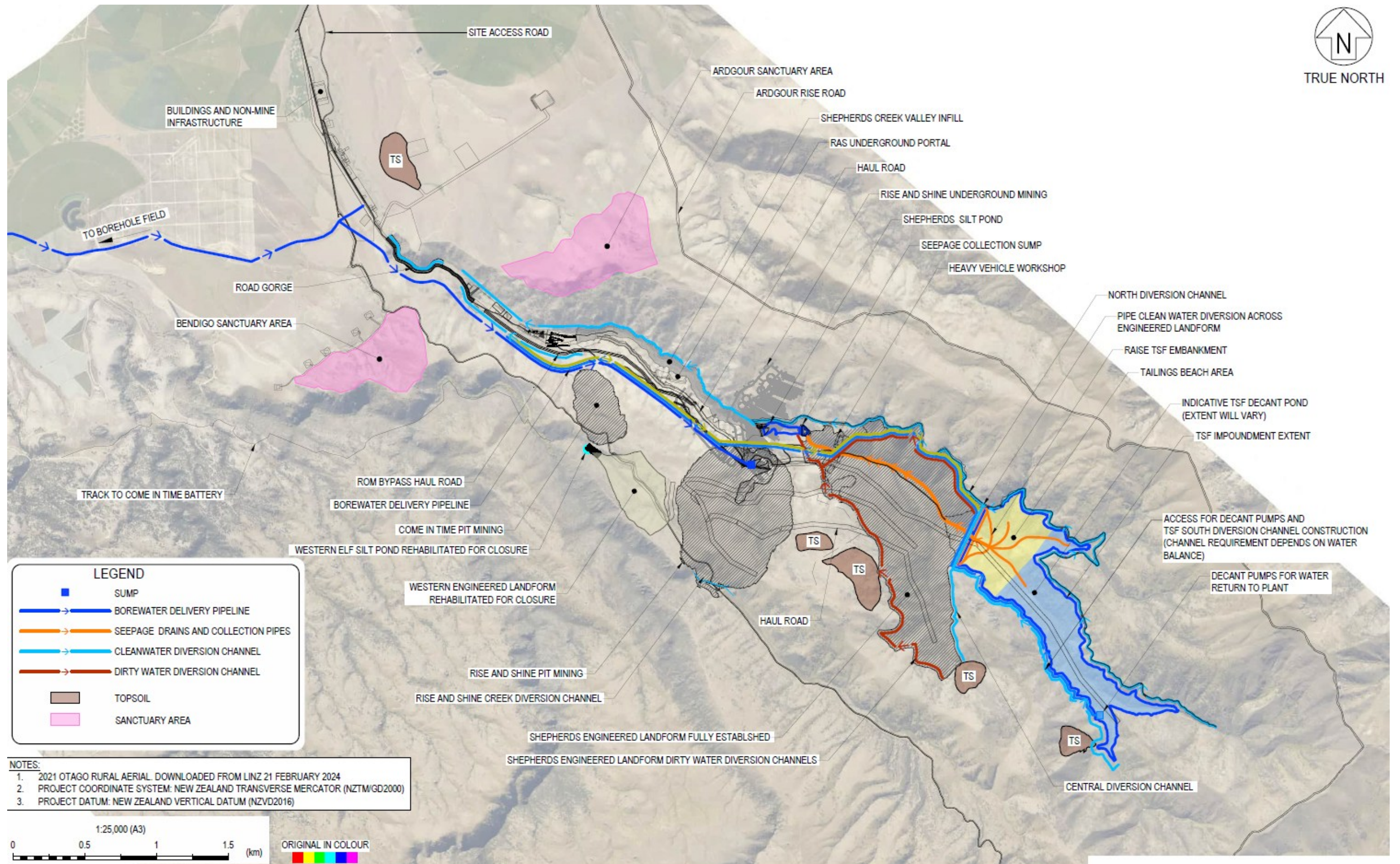


Figure 3-43: Operation Phase – RAS Open Pit, RAS Underground and CIT Open Pit

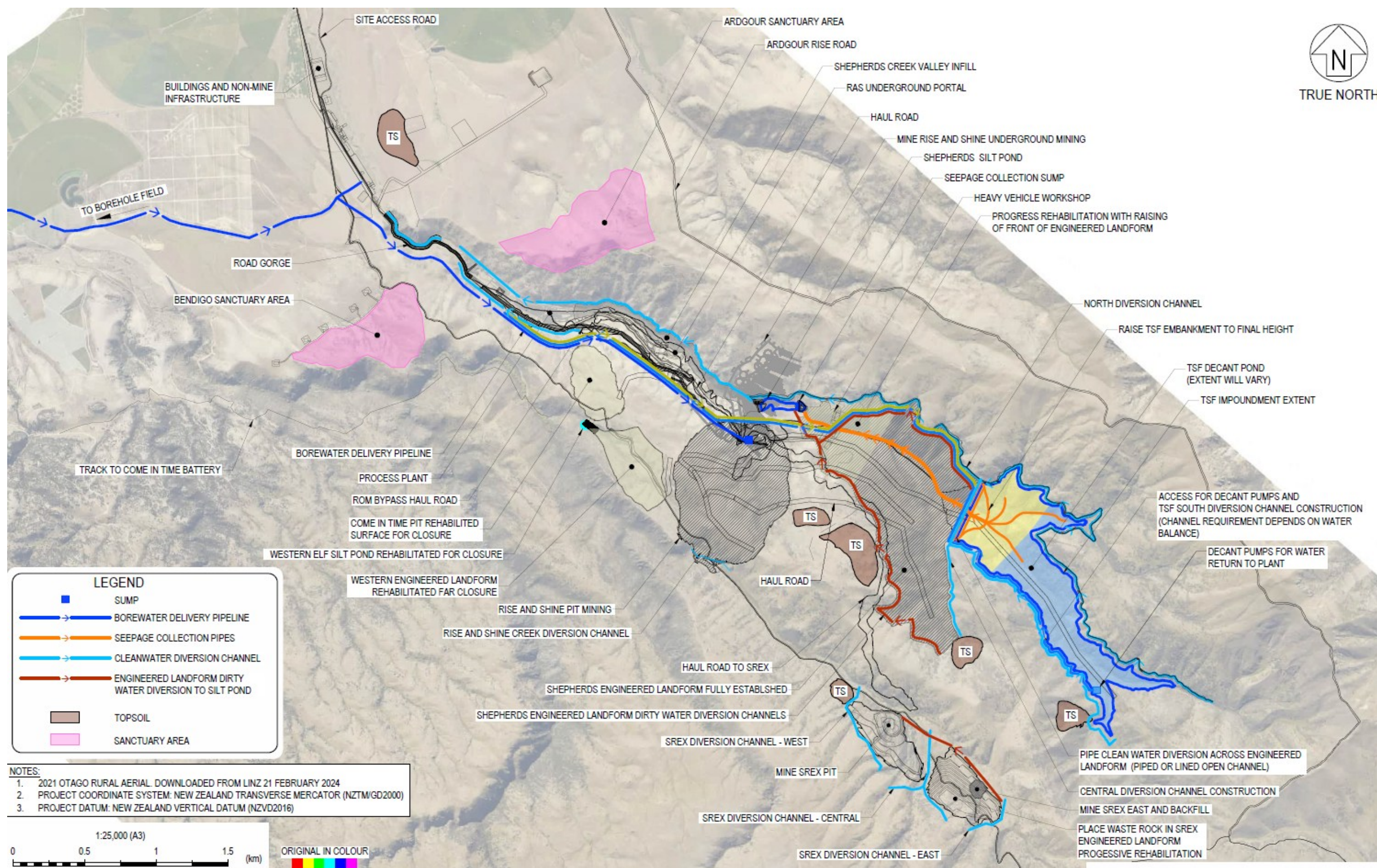


Figure 3-45: Operational Phase – RAS Open Pit, RAS Underground, CIT Open Pit Backfilled, SRX Open Pit

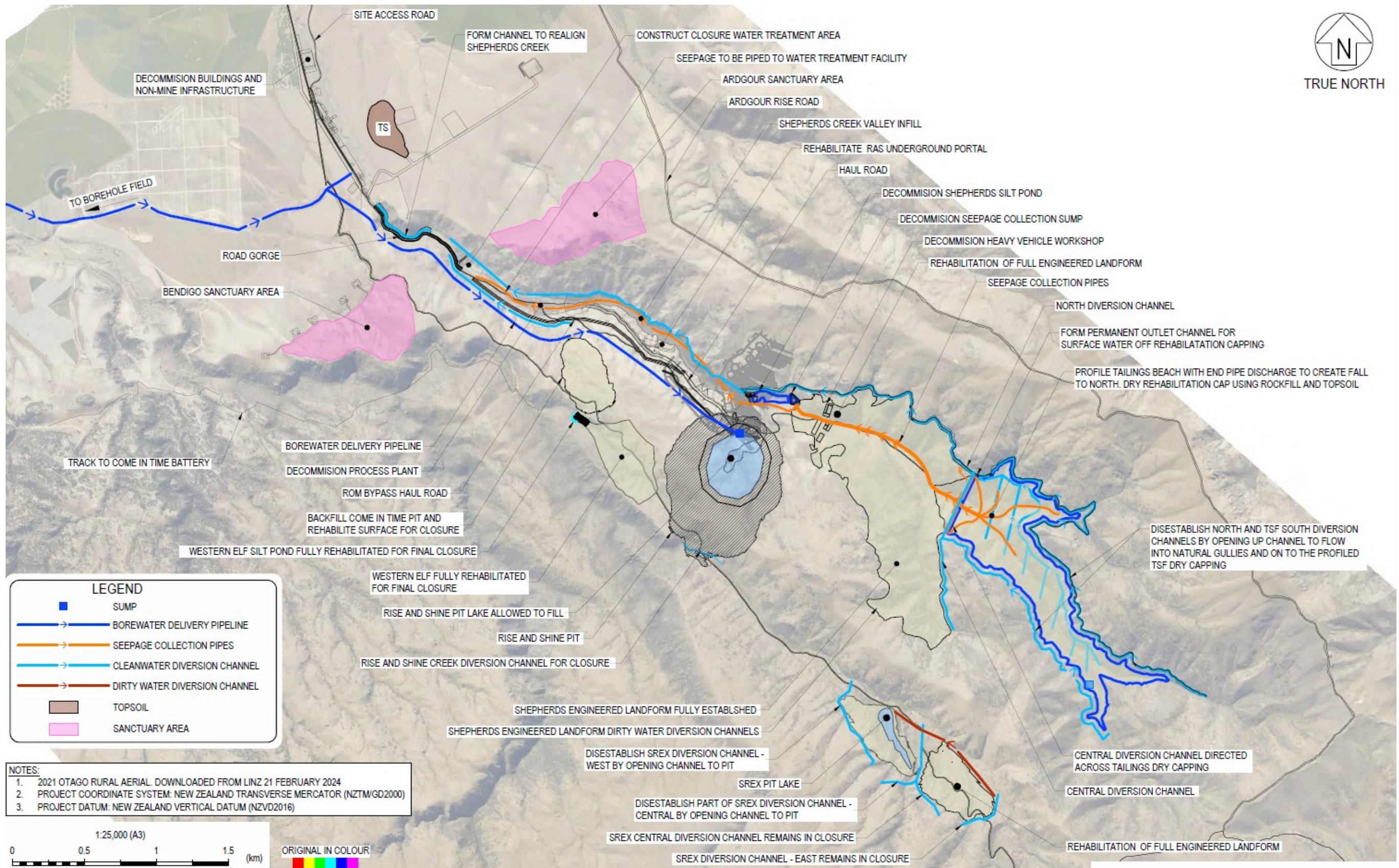


Figure 3-46: Active Closure Phase

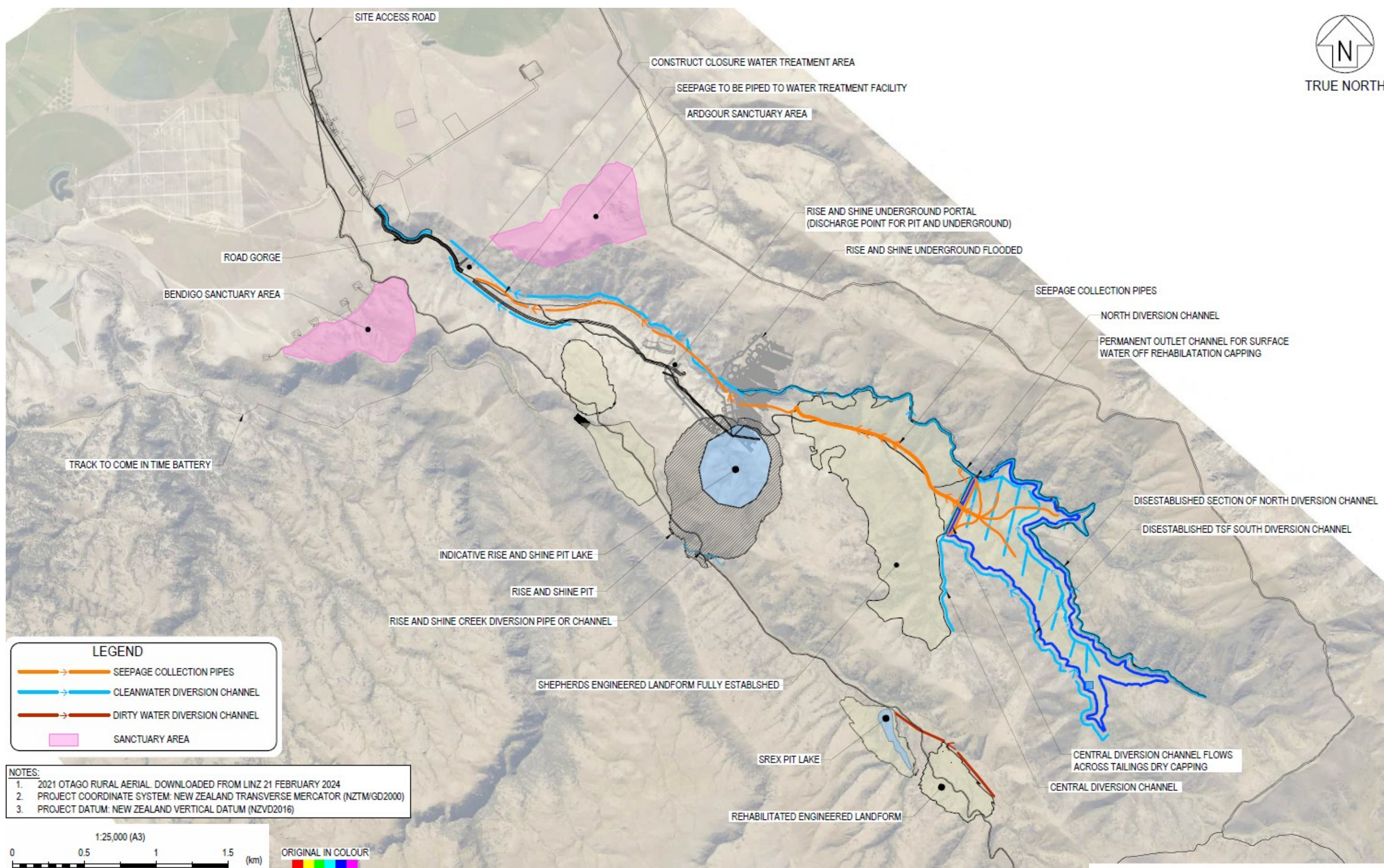


Figure 3-47: Passive Closure Phase