Central Otago District Council Comments

FAST-TRACK APPLICATION – BENDIGO-OPHIR GOLD MINE

Executive Summary

This report evaluates the fast-track gold mining application by Matakanui Gold Limited (MGL) with the assistance of a range of independent technical experts who have reviewed the reports released prior to lodgement along with the various reports submitted with the application, considered information gaps, undertaken site visits and attended post lodgements workshops relevant to their discipline.

The technical reviewers were also asked to identify any remaining information gaps and provide recommendations and an initial consideration of conditions of consent they think are appropriate. We have relied on their professional judgements and expertise to consider the effects of the proposal.

In terms of economic benefits, while the mine would likely provide significant regional economic benefits, the reviewer considers that the economic benefit of the project will only last for as long as the mine is operational. While the mine is expected to deliver significant regional benefits, such as sustaining a highly paid workforce, these advantages are temporary and tied to the lifespan of the mining activity. They also note that the project's role as an industrial mining sector provides a marginal diversification benefit to the already diverse Central Otago economy, but this contribution is finite.

Economic costs related to the loss of ecological values, landscape, heritage, permanent changes to recreational access, and potential damage to the "Central Otago brand" remain largely unquantified in the applicant's assessment.

The independent technical experts engaged by Central Otago District Council have expressed significant concerns regarding some of the project's environmental impacts, specifically noting the potential for irreversible damage to "nationally critical" vegetation, the loss of a cohesive historic heritage landscape and impact on the Outstanding Natural Landscape (ONL).

It is projected to result in the net loss of 600 hectares of ecologically significant vegetation, including habitat for at least 48 Threatened or At-Risk species. The biological values of the "nationally critical" spring annual *Ceratocephala pungens* and "nationally vulnerable" moraine ecosystems to be "irreplaceable," making full compensation for their loss impossible and the restoration methods proposed for these dryland ecosystems are also considered to be experimental and highly uncertain. The loss of national strongholds for critically threatened flora cannot be fully offset, and proposed restoration areas are considered suboptimal for these specific species.

In terms of heritage impacts the project will result in significant losses to the heritage landscape and archaeological sites. Specifically, 19 archaeological sites will be destroyed

outright, including the Rise and Shine workings, which represent the earliest physical evidence of alluvial gold activities in the area and are a integral part of the regional historical narrative. There are also concerns with the robustness of the assessments undertaken in relation to sites within the buffer zone. The destruction of key archaeological sites removes the physical representation of the area's earliest mining history of the Bendigo Quartz Reefs Historic Area.

The mine is located within an Outstanding Natural Landscape (ONL), and the scale of the open-cast pits and engineered landforms will, in the view of the technical reviewer, effectively "cut the ONL in two," eroding the integrity, cohesion, and aesthetic appeal of the Dunstan Range for decades. The landscape reviewer considers "industrialised" nature of the mining activity will erode the perceived aesthetic appeal and "dark sky" qualities of the Dunstan Range and potentially threaten its status as an Outstanding Natural Landscape.

Technical reviews also highlight discrepancies in the applicant's assessment of noise, vibration, and light pollution, indicating that the industrial activity would fundamentally degrade the sites quiet, dark-sky character.

There are critical infrastructure issues that remain unresolved in terms of roading. The application relies on the closure of Thomsons Gorge Road and the construction of a new alternative route (Ardgour Rise). The proposed replacement features extreme gradients that are not acceptable to Council. There is also a land tenure issues associated with a 1.3km section of the proposed Ardgour Rise alignment passes through Department of Conservation (DOC) land.

The Central Otago District Council (CODC) requires the new road to be constructed to a suitable safe standard and vested in Council as a public road, but it remains unclear if a continuous public road can be established over this land instead of just an easement. The alternative route should be constructed prior to the closure of Thomsons Gorge Road.

Weighing up the substantial, though temporary, economic gains against the permanent loss of environmental and cultural assets is a matter for the Panel to contemplate. As indicated above the economic benefits are finite and will only last for as long as the project is operational whereas the impacts are profound and largely irreversible in the context of ecological, heritage and landscape effects.

The Panel is able to consider adverse impacts of the proposal in terms of the proportionality assessment under section 85 (3) of the Fast Track Approvals if adverse impacts are sufficiently significant to be out of proportion to the project’s regional or national benefits. Ultimately, there is a tension between finite economic prosperity and the protection of the natural environment, which is central to the Central Otago values and identity and support a diverse and prosperous economy.

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1. Introduction

The Central Otago District Council (CODC) welcomes the opportunity to provide comments under s53 of the Fast-track Approvals Act 2024 in relation to the proposal by Matakanui Gold Limited (MGL) to mine approximately 600ha of land on Thomsons Gorge Road, Bendigo.

CODC has engaged a range of technical experts to review documents submitted in support of the application to inform our response on the proposal.

The comments in this report are focused on assisting the Panel by identifying where there may be matters not considered that should be considered, differences in terms of the approach or conclusions reached by the applicants' experts, identifying information gaps and providing an initial commentary on conditions of consent.

This report is structured as follows:

- **Section 2 - Central Otago District** provides an overview of the district.
- **Section 3 - Technical Reviews** provides brief overview of CODC's technical experts review of documents provided in support of the application.
- **Section 4 - Technical Expert Recommendations**.
- **Appendices A-H - Technical Expert Reports.**
- **Appendix I - Development Contribution Calculation.**

2. Central Otago District

The Central Otago District is vast fast-growing district with a population of 24,306 based on the 2023 census. This equates to a 12.7% increase since the 2018 census. A place of unique natural environments, outstanding landscapes and people, Central Otago offers exceptional outdoor recreation, family-friendly amenities, and a balanced lifestyle.

Central Otago consistently exceeds national statistics across the board in economic growth, employment growth, population growth and self-employment, while at the same time maintaining high living standards and low unemployment (1.4% in 2024). Economic growth and employment growth in Central Otago District are consistently higher than the national average over the ten years to 2024, and unemployment is significantly lower than the national average in the year to March 2024 (1.4% vs 4% nationally). Construction and agriculture generate 35% of employment and Tourism accounts for 10% of employment with $285.9 million in visitor spending in 2024.[1]

The Central Otago economy is driven by strong industry groups and a diversified economy, in construction, agriculture, horticulture, and viticulture, producing premium goods like merino wool, stone fruit, and Pinot Noir. Growing adoption of agri-tech and renewable energy are further positioning Central Otago as a hub for sustainable innovation and economic resilience. [2]

In 2023, the “Shaping Tomorrow Together” project was launched, which aimed to create a 50-year vision for the Central Otago district. The project included structured conversations with key stakeholders, focus groups with Central Otago residents in each of the four wards across the District, a separate focus group for youth and another for residents from diverse cultural backgrounds.

The Shaping Tomorrow Together project captured the aspirations of the people of Central Otago for the next fifty years. The key findings in terms of aspirations were:

- Protecting the health of the natural environment, for peaceful enjoyment, active recreation and as a fundamental prerequisite to high-quality productive enterprise.
- Building resilience - improving the sustainability of the economy, environment and society.
- Embracing the Future while honouring Central Otago’s strong roots.
- Managing growth and development in ways that are true to the community voice and values: e.g. protecting a small-town feel, providing wide-open natural spaces and enabling the pace and space that gives 'breathing room’ for people.
- Improving affordability - mostly (but not wholly) as it relates to housing.
- Strengthening the sense of belonging by developing welcoming, connected and supportive communities.

[1] Central Otago Economic Development Strategy 2025-2035
[2] Central Otago Economic Development Strategy 2025-2035

- Investing in world-class facilities and services (healthcare, education, infrastructure of all types be this roads and bridges, digital infrastructure, transport options).
- Recognising the importance of the freedoms that personal safety and security bring to enjoying the way of life Central Otago.
- It also suggests a subtle but significant shift in peoples' mindsets. While continuing to show respect for traditional values, there is also an emphasis on the need for progressive thinking and becoming more future focused if the preferred way of life in Central Otago is to be sustained.

This research was used to develop a vision for the Central Otago district. A draft of the vision "Our Place in the World" was presented to Council at the public workshop held on 30 September 2024 to discuss the community outcomes. *Our Place in the World*, was endorsed by the Central Otago District Council on 30 April 2025 as the foundation for future strategic development in the district.

Living well in Central Otago means being:

Grounded in respect for the environment

The state of wellbeing in Central Otago is grounded in respect for and protection of the natural environment. This is the foundation upon which all else depends. While the productive capacity of the natural environment is a core driver of economic prosperity, the recreational and aesthetic value of a healthy natural environment is also valued as fundamental to well-being and the way of life in Central Otago.

Advanced by increased economic prosperity

An appreciation of the need to invest in growth, innovation and new technologies to enhance productivity, provide employment and sustainable business opportunities so that people can afford to live a satisfying, healthy, fulfilling life, characterised by enjoying a good work/life balance

Empowered by a robust social fabric

Community wellbeing sits at the heart of the social fabric of Central Otago. This is underpinned by creating a strong sense of belonging, placing a high value on feeling safe and secure and by welcoming and treating people fairly and equally. Issues around the affordability of meeting day to day living costs with access to affordable housing is highlighted. There is a strong desire to see some of these issues addressed to create vibrant and socially cohesive communities with access to world-class facilities and services - such as health, education and affordable housing choices

Enriched by expressions of our culture

Central Otago has a unique and vibrant culture. It is ingrained in the landscapes and how people interact with the land. From when early Kāi Tahu lived and feasted in a land cloaked with kowhai, to hikers exploring new tracks and trails today. Creative expression is found both inside and well beyond gallery and studio walls. It is expressed in built heritage, and traditions. It values those who have gone before, while ensuring an enriching and sustainable future for those who come next. It is the region's identity and the expression of who we are.

Feet on the Ground
Eyes on the Future
Hearts in the Right Place

Figure 1: Central Otago – Our Place in the World, A fifty year vision[3]

[3] https://www.codc.govt.nz/services/community-development/1central-otago-our-place-in-the-world

This vision guides Council's priorities, informing discussions with Central Government, and other entities that influence longer term decisions in ways that deliver the best possible outcomes for the people and places of Central Otago. It has already been used to inform Council's Community Outcomes in the 2025-2034 Long-term plan and the 2025 Economic Development Strategy.

The Fast-track proposal is of a scale and nature that has not been seen before in Central Otago and will directly impact on the unique environment that drives the existing thriving local economy. It is important that any proposed development in the District is undertaken in a way that protects the natural environment, as the productive capacity of the natural environment is a core driver of economic prosperity in Central Otago and valued as fundamental to well-being and the way of life in Central Otago. This includes safeguarding the recreational and life supporting qualities of our waterways and groundwater.

3. Technical Reviews

Central Otago District Council engaged the service of technical experts to undertake a review of the various technical reports and provide advice in relation to information gaps and potential conditions of consent.

Central Otago District Council engaged the services of a range of technical experts to peer review the material submitted with the application and provide advice as indicated below:

- Ecology, Mr Mike Harding
- Heritage, Dr Chris Jennings (Origin)
- Landscape, Mr Stephen Brown
- Transportation and Roading, Mr Dave Smith, (Abley)
- Noise and Vibration, Mr Jon Styles (Styles Group)
- Light, Kate Macdonald (Pederson Read)
- Economics, Ms Natalie Hampson
- Bond, Jerremy Eldridge (Dam Watch)

The summaries in this section are intended to provide high-level comments on the findings of the technical experts that should be read alongside the full reports from each of the technical experts are attached in Appendices A-H.

Comments and issues identified by technical experts are outlined below along with the any recommendations for resolving potential issues or conditions of consent.

3.1. Ecology

Mr Mike Harding reviewed the terrestrial ecology material provided by the applicant and has undertaken several site visits, including two post the lodgement of the substantive when the applicant's ecologists along with ecologist from the Department of Conservation and the Otago Regional Council were present.

The mining operations are projected to result in the net loss of approximately 600 hectares (ha) of ecologically significant vegetation and habitat. Mr Harding has indicated that this area is of critical importance because it lies within the Dunstan Ecological District, where indigenous vegetation has already been depleted to less than 10%–30% of its original extent. Specifically, 87% of the 610ha Direct Disturbance Footprint (DDF) consists of "very high" or "high" value vegetation communities.

Mr Harding's review notes that the DDF supports an "exceptionally high number" of at least 48 Threatened or At-Risk species. The impacts on these species are considered particularly severe because:

- National Stronghold: The DDF is the national stronghold for the **nationally critical spring annual *Ceratocephala pungens*.**
- Vulnerable Species: The site also supports a large population of the nationally vulnerable *Myosotis brevis*.
- Cryptic Nature: These spring annual species are small and ephemeral, making them highly vulnerable to disturbance, as their presence is difficult to detect outside of brief annual windows.

The "naturally uncommon" land environments, such as moraine (glacial deposits), which carry a threat status of nationally vulnerable. These ecosystems are adapted to extreme climate conditions and are distinctive to the region. Because these biological values are considered "irreplaceable" or "vulnerable," Mr Harding considers it is not possible to fully compensate for their loss.

There are concerns that the magnitude of these threats may be substantially underestimated due incomplete data and the use of ecological assessment guidelines (EcIAG).

Mr Harding has identified significant gaps and incomplete surveys. The assessment of ecological effects is considered incomplete because substantial parts of the DDF and wider consent area have not been adequately surveyed for "spring annual" plant species and non-vascular species (mosses and lichens). Further targeted surveys were hampered by restricted access during lambing seasons, and Matakanui Gold Limited (MGL) has reportedly not released certain survey data and analyses. Without this data, the true magnitude of the project's effects cannot be accurately determined. He recommends that there be no mining the Come In Time (CIT) pit until further research or surveys can prove that the impact on "nationally critical" spring annuals would be less than 1% of the known regional population.

Mr Harding considers that the use of standard ecological assessment guidelines (EIANZ) tends to fragment and average ecological values, which can lower the perceived magnitude of the mining's effects on the area's overall ecological integrity. He considers the use of the EIANZ ecological assessment guidelines underestimates the project's impact. By fragmenting the site into smaller units and "averaging" values across those fragments, the assessment potentially dilutes the significance of high-value attributes. Additionally, using an 1840 baseline rather than present-day biodiversity values is viewed as inconsistent with the National Policy Statement for Indigenous Biodiversity (NPS-IB).

While MGL has proposed extensive rehabilitation plans, the methods for restoring dryland ecosystems, particularly cushionfields and spring annual herbs are described as experimental and highly uncertain. There is currently no demonstrated research proving that these specific rare plants can be successfully rehabilitated or that their habitat can be replicated once destroyed. Critical research intended to inform the rehabilitation design was scheduled for 2025 and 2026, but its execution remains unconfirmed, raising questions about the viability of the project's long-term recovery.

Given the ecological sensitivities on the site, Mr Harding considers it may be appropriate to consider underground mining as an alternative to the open cast pit proposed. Underground mining could potentially result in substantially smaller footprint and cause less terrestrial ecological damage. He suggests that a formal assessment of underground mining as an alternative to open-pit mining is desirable. This would allow

for a robust comparison of ecological costs against economic benefits, as underground mining would likely have a much smaller surface footprint.

The application proposes two Pest-Excluded Sanctuaries and the Ardgour Restoration Area to off-set ecological loss. Mr Harding as considered the proposals and provides the following comments:

Fenced Pest-Exclusion Sanctuaries

- Target Species: The two proposed sanctuaries are primarily designed to address the loss of lizards and lizard habitat.
- Habitat Limitations: While they include rockland and shrubland habitat, they only include small areas of cushionfield (the habitat for rare spring annual plants) incidentally.
- Management focus within these sanctuaries is focused on lizard protection rather than the preservation of spring annual flora.
- These sanctuaries are costly to maintain and will require guaranteed long-term funding to remain effective.

Ardgour Restoration Area (ARA)

- Natural Recovery vs. Intervention: Woody vegetation is already recovering naturally at Ardgour Station. While the proposed management (pest control, cattle removal, etc.) would secure this recovery, he argues the benefits are overstated because the landscape is not in the "state of decline" assumed by the applicant.
- Inadequacy for Spring Annuals: The ARA is considered suboptimal habitat for spring annual species due to its altitude and previous modifications.
- Limited Scope: The current management plans for the ARA do "little to enhance or increase the extent" of cushionfield habitats. The ARA will not adequately address the loss of vegetation and habitat within the Direct Disturbance Footprint (DDF).
- Mapping Inaccuracies: During his field inspection, Mr Harding found that the vegetation mapping for the ARA was simplified and inaccurate, such as grouping "native dominant scrubland" into "mixed scrubland," which makes it difficult to accurately analyse restoration outcomes.

The application is unclear about resourcing or who will be responsible for the on-going work in the sanctuaries and restoration area identified to mitigate effects of mining activity.

Mr Harding considers the proposed offsets to be insufficient for the unique dryland ecosystem, and recommends the following:

- Off-site Protection: The success of on-site cushionfield rehabilitation is highly uncertain, Mr Harding recommends the protection and management of high-quality cushionfield habitat elsewhere in the Dunstan Ecological District to address the loss of spring annual habitat.
- Long-term Funding: Establishing a "non-wasting endowment fund" to provide for the permanent management and protection of these areas.
- Independent Oversight: Forming a Biodiversity Advisory Group composed of technical experts to monitor compliance and review annual reports, rather than relying solely on the consent holder's data.

In an effort to support legal and financial security of the Covenant, Mr Harding recommends that a protective covenant be registered on the property title within 12 months of exercising the consent, and that the scope of the covenant be extended to protect all parts of the Consent Area and all indigenous biodiversity values present, not just the specific areas designated for restoration or offsetting.

3.2. Heritage

Council expert peer reviewer, Dr Chris Jennings considers the Project area has **"significant heritage values,"** primarily derived from its extensive history of gold mining and pastoral farming made up of several key components:

- Landscape and Collective Value: The area holds "collectively high heritage values". The applicant's assessment focus on the "individual archaeological values" of specific sites rather than acknowledging how these sites function together as a cohesive heritage landscape.
- Historical Narrative: The area is significant for its ability to tell the chronological story of the region, specifically from 1860s alluvial mining through to the 1930s. He highlights the Rise and Shine workings as a critical component of this significance, as they represent the physical remains of the earliest alluvial gold activities in the area.
- Official Recognition: The significance is formally recognized through the site's inclusion in the New Zealand Heritage List Rārangi Kōrero as the Bendigo Quartz Reefs (BQR) Historic Area (List No. 9097). It is also protected by the Bendigo Station Conservation Covenant, which was established specifically to maintain the landscape's historic values.
- Archaeological Depth: The area contains numerous recorded sites associated with the mid-1860s gold rush and the concurrent operations of the Morven Hills Station. These include complex features like the Come-in-Time Battery, stone huts, and water races.

The heritage loss associated the proposal is significant and according to the Heritage Assessment submitted with the application, the project's earthworks will lead to the immediate loss or alteration of dozens of sites:

- 19 archaeological sites will be destroyed outright. This includes the total destruction of the Rise and Shine workings, which represents the loss of the earliest physical evidence of alluvial gold activities in the area.
- 8 archaeological sites will be modified.

Dr Jennings identifies a "nominal distance" of 500 meters around the proposed mine pits where blasting vibrations could potentially destabilize or damage additional heritage features. He lists 23 specific sites located within these 500-meter buffer zones that were not assessed for vibration impacts in the Applicant's primary report. He also notes that the total quantity of heritage lost may actually be higher than recorded due to deficiencies in the archaeological surveys undertaken, the approach to evaluating heritage values and significance, the assessment of effects on heritage values and the management recommendations proposed. He notes that the baseline data is "out of date" (some over six years old at the time the applicant's reports were prepared) and incomplete, and numerous sites were never physically inspected or were identified only

through LiDAR, leading to a "diminished perceived significance" of the heritage landscape.

Dr Jennings considers that the assessment incorrectly uses an unattainable threshold, requiring sites to be of international or World Heritage status which effectively "raises the bar" unfairly by requiring international or World Heritage status for a "Very High" significance rating. He argues that the by requiring a site to have international or World Heritage status leads to a "diminished perceived significance" of the sites heritage, making local sites appear less valuable than they truly are within a New Zealand context.

He considers the assessment of the historic significance of the area to be flawed as the heritage landscape will be substantially affected by the proposed which includes the total destruction of the Rise and Shine workings, removing the physical representation of the earliest part of the area's mining history, undermining the historical narrative of the Bendigo Quartz Reefs Historic Area. Additionally, the assessment submitted with the application focuses on individual site values rather than the collective heritage value of the landscape that he considers to be more appropriate.

The current preservation plans are considered by Dr Jennings to be "easy wins" focused primarily on only protecting sites that do not interfere with the mine design.

Dr Jennings overall conclusions are that there are several critical failures in the project's current heritage management approach. Particularly in relation to the irreparable loss of historical narrative, specifically noting that the total destruction of the Rise and Shine workings would remove the physical representation of the area's earliest alluvial gold mining. He disputes the Applicant's claim that this won't detract from the area's values, noting it "does not make logical sense" given the site's historical significance. He considers that the project will cause "destruction on a massive scale" to the heritage landscape, archaeological sites, and the overall historical narrative of the project area.

Dr Jennings has made a number of recommendations for specific conditions to be imposed should consent be granted including a requirement for resurveys and research led investigation prior to work commencing, support for funding of housing of artefacts and the publishing of archaeological findings recording to preserve the history of the landscape as outlined is Section 4.

3.3. Landscape

The proposed mine is to be located as a central component of the Dunstan Mountains, which is identified as an Outstanding Natural Landscape (ONL) in the operative Central Otago District Plan. Mr Brown in his review describes the landscape as a *"highly intact mountain sequence"* and that the site sits at a "highly legible transition point". Battery Hill provides a central, legible local feature that separates the Rise and Shine Creek and Shepherds Creek valleys and occasionally breaches the skyline.

The natural character of the Dunstan Range is currently defined by a "high sense of naturalness" despite past farming and mining, featuring native kanuka, tussock land, and high value cushionfields. While a restoration plan exists, Mr Brown has raised concerns that the proposed rehabilitation of cushionfields is "experimental" and untested, making the long-term recovery of the site's natural character uncertain. This is further explored in the ecological review undertaken by Mr Harding.

Natural character effects are expected to peak at a "moderate-high" level for Shepherds Creek and "moderate" for Rise and Shine Creek, impacting their geomorphology, hydrology, and marginal vegetation.

Of most significance, however, would be the proposed mine's effects on the Dunstan Mountains ONL, which Mr Brown considers were not adequately addressed in BML's original landscape assessment. Again, such effects would not be consistent, but views of the proposed open-cast pits, artificial landforms and mining activities from the areas just described, together with parts of State Highways 6, 8 and 8A, would be bound to have an adverse effect on the residual naturalness, cohesion, aesthetic appeal and wider values of the Dunstan Range. They would erode the integrity of a central part of the Dunstan Range and would have an impact on the public 'face' and identity of the Bendigo - Tarras area.

Mr Brown describes a *"mosaic of vegetation cover"* that, while modified by human activity, retains a high sense of perceived naturalness with the presence of Native Communities including rugged kanuka stands, grey shrubland, matagouri, tussockland, and high-value cushionfield-herbfield communities.

He also considers the landscape has a "cultural veneer" resulting from interwoven histories associated with 1860's gold mining heritage with visible remnants on the valley floor; and mana whenua association with the range known as Matakanui noting the landscape contains traditional travel routes and mahika kai sites where resources like weka, tikumu (mountain daisy), and taramea (wild spaniard) were gathered.

While the applicant's assessment suggests the impacts will be "moderate," Mr Brown considers the proposed mining activity poses a significant threat to the Outstanding Natural Landscape (ONL) status of the Dunstan Mountains, particularly in the area surrounding the project site, concluding that the project will have profound and "significant" adverse effects on the values that define the ONL.

The loss of perceived intactness, cohesiveness, and naturalness potentially brings into question whether it will retain 'sufficient naturalness' and still be outstanding enough to retain their status as an ONL, due to the scale of the open-cast pits and engineered landforms will effectively "cut the ONL in two" for a significant duration, severing the natural continuum of the mountain range.

Mr Brown also considers that the landscape will be impacted by lighting from several specific sources the illumination of active working faces in the Rise and Shine (RAS) and Come in Time (CIT) pits will be clearly visible. Lighting will also be associated with the Engineered Landforms (ELFs), tailings storage facility (TSF), stockpiles, and processing plant. While bunding is proposed to minimize headlight wash, Mr Brown notes it may be ineffective due to the elevated nature of the mine site. Furthermore, current consent conditions do not actually control headlight wash.

The mining activity will introduce artificial light into a landscape valued for its "dark sky" qualities. While the applicant intends to follow some Dark Sky Reserve lighting standards, such as using LED sources and shielding fixed lights, these are not mandatory for the project area and include waivers for "operational practicality" and safety. The presence of earthworks, large vehicles, and night-time lighting will contrast sharply with the "somnolent, rounded profile" of the mountains. This "industrialised"

nature is expected to erode the perceived aesthetic appeal, cohesion, and legibility of the Dunstan Range for decades.

Overall Mr Brown considers the proposal will have a significant impact on the area's natural character, in relation to landforms, vegetation, ONL classification and water bodies. The applicant's assessment suggests these effects will be "moderate" initially and "low-moderate" upon closure, Mr Brown does not agree with this assessment and has concludes that the impacts will be more profound, enduring and effects "significant".

3.4. Traffic and Transport

Council has engaged Dave Smith from Abley to review documentations submitted with the application and provide advice on all traffic, transport and co-ordinate commentary on roading matters.

The project overview indicates an intention to close and stop a portion of Thomson Gorge Road from the intersection with Matilda Rise to Thomsons Saddle. The applicant proposes a new road (Ardgour Rise) to be constructed along the Ardgour Station ridgeline and through the Ardgour Conservation Area and across land on Matakanui Station administered by LINZ on behalf of the Crown.

The project description (A.10) indicates the applicant is proposing to provide a like for like 4m wide 4WD replacement with gradients of up to 25%, 'equivalent to a ski field access' that may be closed in winter months. These design characteristics for the replacement legal road are not acceptable to CODC.

The proposed alignment of Ardgour Rise features extreme gradients that fall well short of council standards. Two long sections have average grades of 17.1% and 18.7%, which significantly exceed the maximum allowable limit of 12.5%. The review notes that the current plans provide insufficient information to fully assess the road against all relevant standards.

Prior to the lodgement of the substantive application an application for a 'track' was lodged with Council (as indicated in section J). This application was not for a legal road but rather for a 4WD track and was subsequently withdrawn following further information requests that were unable to be satisfied. This application was effectively a track to nowhere as it stopped at the boundary of the Ardgour Conservation Area giving no indication of the route beyond that point.

There are significant issues associated with unresolved land tenure through DOC Land. A 1.3km section of the proposed Ardgour Rise alignment passes through Department of Conservation (DOC) land. The Central Otago District Council (CODC) requires the new road to be vested as a public road and will not accept an easement. It remains unclear if a continuous public road can be established over this land.

Councils' expectation is that the replacement road alignment (Ardgour Rise) will be vested in Council as legal road from the new intersection on Thomsons Gorge Road to Thomsons Saddle where it will re-join the remainder of Thomsons Gorge Road. The replacement road must meet the minimum standards indicated by CODC. The Road must also be constructed and vested prior to the closure of Thomsons Gorge Road.

Primary access to the site will be via Ardgour Road which is currently too narrow (generally 5.5m wide) to safely accommodate the significant increase in traffic, particularly heavy vehicles, during the mine's construction and operation. The project is predicted to generate a tenfold increase in truck conflicts and an increase in the risk of Death or Serious Injury (DSI) crashes along this corridor. Mr Smith strongly recommends widening the road to a minimum of 6.0m and implementing a temporary 60km/h speed limit during construction to manage these safety risks.

The project proposes closing the existing 270m easy walking track and replacing it with a new route. However, the replacement track is approximately 4.3km long and traverses much more challenging terrain with significant altitude fluctuations, making it far more difficult than the original. There is also uncertainty regarding the engineering standards of this new track and how it will cross Bendigo Creek. Mr Smith recommends that the replacement track be built to a standard consistent with the Department of Conservation's 'easy to intermediate walking track' category.

The existing intersection with State Highway 8 and Ardgour Road is deemed unsafe for increased traffic due to restricted sightlines caused by crash barriers and the lack of auxiliary turning lanes on SH8. While a right-turn bay is proposed, the review recommends upgrading the control from a "Give Way" to a "Stop" control and ensuring that the final design is certified by NZTA.

We also note that in terms of the closure of part of Thomsons Gorge Road and construction of the proposed Ardgour Rise as an alternative public route that no subdivision consent is sought that would enable the vesting of the alternative route in the CODC. It is not clear how the applicant proposes to address this.

Mr Smith has suggested a number of actions to address the outstanding gaps in the assessment as outlined in Section 4 of this report.

Note: A Development Contribution for Roading is payable and has been calculated at $90,000. The notice is attached in Appendix B

3.5. Economic

The economic peer review prepared by consultant Natalie Hampson for the Central Otago District Council, considers the applicant's claims regarding regional GDP growth, employment generation, and government revenue. Ms Hampson acknowledges that the mine would likely provide significant economic benefits through high-paying jobs and industry diversification, but she raises concerns that direct impacts may be overstated while indirect effects are poorly modelled.

Ms Hampson evaluates how the project aligns with local development strategies, noting a tension between economic prosperity and the protection of the natural environment, potential social costs, such as housing market pressure and impacts on the tourism sector, suggesting that the proposed temporary worker accommodation could help mitigate local strain.

The peer review of the Bendigo-Ophir Gold Project, conducted by Natalie Hampson for the Central Otago District Council, concludes that while the project is likely to deliver significant net regional economic benefits, the original assessment contains several

methodological flaws and information gaps that likely overstate direct impacts and understate indirect impacts.

Ms Hampsons report considers the project characteristics as a large-scale industrial activity that will provide the following primary benefits:

- Regional GDP and Income: The project will sustain a large, highly paid workforce, contributing to a marginal lift in average household incomes and overall district productivity.
- Diversification and Resilience: It establishes an industrial mining sector, diversifying the Inland Otago economy and improving resilience against global shocks that typically impact the tourism sector.
- Government Revenue: The project is expected to generate significant crown royalties and corporate taxes, though these are sensitive to gold price fluctuations.
- Local Business Support: Procurement of goods and services is expected to stimulate demand for local businesses, potentially leading to improved efficiency or productivity.
- Infrastructure Catalyst: The project may act as a catalyst for bringing forward planned electricity network investments, improving regional distribution resilience.

Within just CODC, the addition of the mining would further diversity and an already diversified economy (i.e. a more marginal diversification benefit applies when excluding Queenstown Lakes District Council). The reviewer has however noted, the economic benefit of the project will only last for as long as the project is operational. She does not identify any national benefits.

She also identifies several costs, though most are assessed as minor or manageable:

- Loss of Primary Production: The displacement of sheep grazing on the 550-hectare site is considered a minimal loss of GDP and employment.
- Housing Market Pressure: The project will create a one-off shift in housing demand. While operational impacts may be diffuse, the pre-production construction phase could cause acute pressure. The proposed 100-person worker accommodation is considered a vital mitigation tool.
- Tourism Impacts: Potential adverse effects on Central Otago's tourism brand or visitor activities are currently assessed as minor at the ward or district level, though the reviewer notes this is difficult to quantify with certainty.
- Externalities: Spending required to mitigate environmental impacts (e.g., ecological funding or site restoration) is classified as a cost of the project rather than a community benefit.

It is appropriate to note that Ms Hampson considers the current cost assessment as "provisional" because several key areas remain unquantified:

- **Tourism and Brand Impacts:** There is a lack of "bottom-up" assessment regarding the tourism sector. The potential damage to the "Central Otago brand" or the specific impacts on wine tourism revenue remain speculative and require further market research to quantify.
- **Housing and Social Infrastructure:** The basis for housing demand is uncertain because the applicant has not confirmed the number of employees moving to the

region or the requirements for outsourced labour. Additionally, there is no quantified assessment of the increased pressure on healthcare and schools.
- **Non-Market Values:** The economic costs associated with the loss of heritage sites and permanent changes to recreational access and public use have not been monetized by the applicant.

In addition to the information gaps in terms of unquantified areas identified in terms of tourism and brand, housing and social infrastructure and non-market values, Ms Hampson highlights several critical gaps that hinder a full validation of the project's economic claims:

- **Lack of NPV Reporting:** The original application failed to report cumulative impacts in Net Present Value (NPV). When discounted at the standard 8% rate, the projected Direct GDP drops from $5.8 billion to $3.1 billion.
- **Methodological Transparency:** The assessment does not explicitly state the input-output (I-O) tables, base years, or regional scopes used for its multipliers, making the results difficult to replicate.
- **Gold Price Sensitivity:** The modelling assumes a fixed gold price for nearly 14 years. No sensitivity analysis was provided to show how fluctuations would impact royalties and taxes.
- **Misclassification of Impacts:** "Direct GDP" estimates incorrectly include payments to contractors and purchases of goods, which should be classified as **indirect impacts**.
- **Unreliable Benchmarking:** The use of data from the Macraes Mine to estimate indirect impacts was found to be flawed due to unstable year-to-year ratios and inconsistent currency comparisons (US).
- **Employment Uncertainty:** There is a lack of clarity regarding which jobs are direct MGL employees versus contracted services, which creates uncertainty in planning for housing and social service pressures.

Ms Hampson considers the s53 process as a critical mechanism for obtaining further information that could refine her currently provisional assessments of the project's economic costs, explicitly stating that the information generated through this process may allow her to "more robustly examine potential economic costs".

Because substantial evidence from other commenters is still expected through this process, the Ms Hampson notes that her current assessments of economic costs related to tourism or environmental externalities are interim, anticipating that the s 53 reports will provide a broader range of perspectives and data from various commenters, which the applicant will also have the opportunity to respond to the reports.

3.6. Noise and Vibration

Councils noise peer reviewer, Mr Jon Styles, considers the applicant's use of World Health Organisation Guidelines, stating they provide "no meaningful guidance" for rural amenity in this context as they are designed for high-transport-noise environments. He emphasizes that the project will introduce a constant sound into a currently quiet area, changing the fundamental character of the rural environment.

Mr Styles has identified a discrepancy between predicted noise and proposed limits. While the applicant’s report (the MDA Report) predicts "minimal" noise effects based on

low predicted levels, the proposed conditions seek to authorize much higher limits (55dB LAeq during the day and 40dB LAeq at night). He notes that these authorized levels would be subjectively experienced as dominant and significantly above the ambient sound environment for most neighbours.

The applicant has requested a blasting vibration limit of 10mm/s PPV for 5% of blasts, which is twice the permitted standard of 5mm/s PPV set by the District Plan. Mr Styles points out that the applicant has not demonstrated why this higher limit is necessary or provided an assessment of how these higher vibration levels would be perceived by neighbours.

The applicant proposes "Date-Stamp" Qualifier for Noise Limits that Mr Styles identifies a significant issue with Proposed Condition 11 which includes a "date-stamp" limiting noise compliance to dwellings that existed at the time consent was granted. This differs from the District Plan, which requires compliance at the notional boundary of any dwelling, and essentially authorizes non-compliance for any future dwellings that might be lawfully established. He recommends that this condition be rejected as it effectively authorizes non-compliance with District Plan rules for future dwellings and uses neighbouring land as a noise buffer without proper assessment. Alternatively, if the date-stamp is kept, Mr Styles recommends it is "critical" that the applicant provide daytime and nighttime noise level contours for every stage of mining and rehabilitation and must assess the potential for new dwellings on neighbouring land and the overall effect the date-stamp will have on those properties.

The MDA Report identifies that 213 Ardgour Road is likely to experience noise levels of approximately 60dB LAeq(1hr) from project-related truck traffic. Mr Styles considers these levels potentially unreasonable for a rural dwelling and notes that the applicant has not yet responded to recommendations for further mitigation measures or to address the potentially unreasonable traffic noise affecting residents on Ardgour Road.

The review also identifies inconsistencies in terms of compliance with Rule 12.7.4(iv) of the District Plan which sets a permitted vibration limit of 5mm/s PPV, and proposed condition 17 that seeks to authorize vibration levels of up to 10mm/s PPV for 5% of blast events in any calendar year. Mr Styles notes that the MDA Report submitted with the application does not demonstrate why the higher limit of 10mm/s PPV is required for the project's operations, noting that there is currently no meaningful assessment of how these higher vibration levels might be perceived by neighbours or what the specific effects of these increased levels would be.

Mr Styles has suggested a number of actions to address the outstanding gaps in the assessment as outlined in Section 4 of this report.

3.7. Light

Council's peer reviewer for light Kate Macdonald, considers the applicant has misclassified the environmental zone in term of Light. The applicant proposed Environmental Zone A2 (low district brightness), where Ms Macdonald considers the site should likely be Zone A1 (Dark) due to its remote location and existing natural darkness.

This classification requires stricter limits, such as a maximum Upward Light Ratio (ULR) of 0.00 which she considers appropriate.

While Ms Macdonald notes that the applicant has substantively addressed the gaps in the assessment following her initial review, several critical issues remain:

- Deferred Modelling: Detailed lighting modelling has not yet been completed and is currently described as "intended methodology" rather than verified data, with compliance deferred to the detailed design stage.

- A primary concern is that many promised mitigation measures were not secured through enforceable provisions in the applicant's proposed consent conditions. The reviewer identified several "missing" or "partial" controls, including the lack of a formal requirement for neighbour consultation and independent verification.

- Visibility and Nuisance: While major plant areas are shielded by hills, the camp and office areas are on flat ground and will be visible to some local properties, potentially creating nuisance or glare.

- Ecological Risks: The reviewer highlighted that vehicle lights and mobile rigs could disturb native fauna by altering behaviour, increasing predation risk, or causing habitat avoidance.

Ms Macdonald considers that these issues can be resolved and residual effects kept to less than minor to minor, subject to the recommendations and conditions outlined in Section 4.

3.8. Bond

A project of the scale of the proposed mine requires consideration of the adequacy of contingency in the event that the consent holders are unable to complete the closure of the mine. Central Otago District Council engaged Mr Jeremy Eldridge of Damwatch Engineering Ltd as part of a review of the proposed mine closure and restoration bond for the mine.

While the existing reports provide clear descriptions of intent, they are qualitative and "voluminous" without providing sufficient quantitative criteria. This makes it impossible to accurately measure compliance or derive a precise bond value for any stage of the project. Without these measurable criteria, the outcomes of landscape rehabilitation and the true value of the bond cannot be accurately assessed or monitored for compliance.

The project's plan assumes a five-year maintenance period following restoration. The sources identify this as too short for monitoring the long-term performance and stability of a Tailings Storage Facility (TSF) and recommend a 20-year maintenance period instead, consistent with other gold mines in the region. Mr Eldridge considers a five-year window is a "short period" to ensure the ongoing integrity and safety of the trailing storage facility after restoration and considers adopting a 20-year maintenance period

would align the project with the standards and timeframes used for other gold mines in the region. The Shepherds TSF in particular is assessed as having a High Potential Impact Classification (PIC), which necessitates rigorous and extended dam safety compliance and surveillance.

Formal risk costs are not currently included in the Bond Introduction. Mr Eldgride considers that a formal risk assessment and review are necessary, and that contingency allowances should be explicitly identified and managed as separate items within the bond.

Mr Eldridge considers the bond calculation is based on unrealistic resource assumptions. It assumes that the mining company's own plant and labour will be available for closure. However, if the bond is called, these resources will not be available, requiring alternative contracting arrangements that would likely demand higher unit rates for earthworks.

The applicant's assessment is based on underestimated and inconsistent financial data. Several specific financial discrepancies were noted, including:

1. Groundwater monitoring costs that could potentially be two to three times higher than the low valuations currently adopted.
2. Inconsistent machinery rates, such as a 30t excavator rate being significantly lower than those for smaller 20t and 25t excavators.
3. Omission of Dam Safety Compliance costs, which are not recognized in the current Bond Introduction.

The Mine Closure Plan identifies twenty-two closure risks, which are detailed in a specific project risk register (Appendix F - Closure Risk Register by Greenroad). The majority of these twenty-two risks are associated with closure planning, closure implementation, and post-closure functions.

The risk categorisation identifies thirteen significant risks (where "unacceptable major disruption [is] likely," necessitating a different approach and priority management attention; eight moderate risks (defined as causing "some disruption" and may require a different approach or additional management attention); and one low risk (defined as having "minimum impact" and requiring only minimum oversight to ensure the risk remains low).

Mr Edridge considers the applicant's classification of these risks as "acceptable" to be counter intuitive. While the project's internal risk register (prepared by Greenroad) records the twenty-two risks as "acceptable" with proposed actions to strengthen controls, he highlights several concerns.

Thirteen of these risks are classified as "significant," which is defined as involving "unacceptable major disruption", Finding these risks "acceptable" despite that definition is what the reviewer considers counter intuitive. Additionally, the risks are not currently allocated to specific risk owners, and the effectiveness of mitigation controls has not been identified. Mr Eldridge recommends a joint review of the risk register and associated costs every two to three years through a formal workshop process.

Mr Eldridge has made several specific recommendations around extending timelines, requiring quantitative data, and adjusting financial assumptions to ensure the mine closure and restoration bond is sufficient and manageable (Section 5).

He also recommends that the councils conduct a joint review of this risk register every two to three years through a formal workshop process to ensure the risks and their associated costs are accurately reflected in the bond.

4. Technical Expert Recommendations

4.1 Ecology

- **Governance and Oversight**

  Establish a Biodiversity Advisory Group: Mr Harding strongly recommends forming an independent group of technical experts (similar to the model used for the Waimea Dam) to assist the council in reviewing annual monitoring reports and ensuring compliance with complex ecological conditions. The group should be funded by the applicant/consent holder.

- **Formal Certification of Management Plans**

  Consent conditions be amended to include a clear process for the council to review, amend, and formally certify the numerous ecological management plans once final conditions are set.

- **Alternative Mining Methods**

  A formal assessment of underground mining as an alternative to open-pit mining is desirable. This would allow for a robust comparison of ecological costs against economic benefits, as underground mining would likely have a much smaller surface footprint.

- **Legal and Financial Security**

  Early Covenant Registration: Rather than waiting until the end of mining, Mr Harding recommends that a protective covenant be registered on the property title within 12 months of exercising the consent.

- **Broader Covenant Scope**

  The scope of the covenant be extended to protect all parts of the Consent Area and all indigenous biodiversity values present, not just the specific areas designated for restoration or offsetting.

- **Long-term Funding**

  The consent should require the establishment of an inflation-adjusted endowment fund to ensure that restored habitats and fenced sanctuaries are managed and protected in perpetuity.

- **Mitigation for Rare Species**

The success of on-site cushionfield rehabilitation is highly uncertain, Mr Harding recommends the protection and management of high-quality cushionfield habitat elsewhere in the Dunstan Ecological District to address the loss of spring annual habitat.

- **Protection of the CIT Pit**

  Avoid mining the Come In Time (CIT) pit until further research or surveys can prove that the impact on "nationally critical" spring annuals would be less than 1% of the known regional population.

- **Technical Improvements to Consent Conditions**

  Changes are recommended to the proposed consent conditions to ensure they are enforceable and effective.

- **Strengthening Consent Conditions:** Mr Harding proposes numerous specific technical amendments, including:

  - Rewording objectives to ensure they focus on increasing the extent of indigenous herbfield (cushionfield) vegetation.
  - Requiring an accurate map at a scale of 1:1000 that delineates all vegetation types before management actions begin.
  - Extending the timeframe for Council certification of management plans, as the proposed 20 working days is deemed "inadequate" for specialist review.
  - Defining clear certification processes for the at least 12 different ecological management plans.
  - Adjusting the timing and value of payments to the Department of Conservation to account for inflation

4.2 Heritage

- **Update the Management Plan and Conduct Re-surveys:** The Archaeological and Heritage Management Plan (AHMP) must be revised to be "fit for purpose" by addressing outdated information. Specifically, new field surveys to update the condition of sites—many of which have data and are over six years old—and to physically inspect sites that were previously only identified via LiDAR.

- **Address Blasting Risks:** The project must identify all sites within a **500-meter buffer** of the pits that could be damaged by blasting vibrations. These sites should be included in an updated Heritage Assessment and inspected by a **structural engineer** to determine safe vibration thresholds and install monitoring equipment.

- **Implement a Research-Led Design:** Rather than "reactive" monitoring of earthworks, the reviewer recommends a **structured and systematic investigation**

of the five site complexes. This research design should focus on retrieving valuable archaeological information **before** any sites are destroyed.

- **Resource the Cromwell Museum:** Any agreement to provide artifacts or digital data (such as 3D models) to the Cromwell Museum must include **provisions for funding**. This support is necessary for the museum to properly catalogue, store, and display the materials.

- **Improve Public Dissemination:** Beyond mandatory technical reports, the results of the archaeological work should be published in a **public-friendly format**, such as a physical book or an eBook hosted on museum and company websites.

- **Ensure Physical Protection of Avoided Sites:** For sites that are meant to be avoided, the reviewer recommends they be **clearly marked with semi-permanent fencing**. He notes that simply providing contractors with spatial data is insufficient if the site locations have not been verified in the field, as this often leads to accidental destruction.

4.3 Landscape

- **Statutory Compliance:** That the project's effects on the Dunstan Range are **"**inconsistent with various statutory instruments"—including the Resource Management Act and the Central Otago District Plan—designed to protect ONLs. This suggests a recommendation that the project, as currently proposed, does not meet the legal requirements for protecting landscape integrity.

- **More Rigorous Assessment of Associative Values:** The reviewer identifies a major gap in the applicant's assessment regarding "associative landscape values," such as the area's sense of place, identity, and the potential impact on local branding (e.g., Bendigo's wine *terroir*). He recommends that these "perceptual or experiential effects" be more fully explored rather than treated as mere "amenity considerations".

- **Caution Regarding Experimental Restoration:** Mr Brown highlights "real concern" regarding the reliance on an "experimental" and "untested" cushionfield restoration design. He argues that the uncertainty of these trials raises serious questions about the viability of the long-term landscape recovery relied upon in the application.

- **Addressing Night-time Impacts:** He notes that the current proposals exclude controls over headlight wash and that mobile lighting in working pits will likely fail to meet dark sky standards. He implies that more stringent, non-voluntary controls are needed to mitigate the "industrialised" contrast created by mining operations at night.

4.4 Traffic and Transportation

- **Ardgour Road Safety and Capacity**

    - **Physical Upgrades:** Before construction begins, Ardgour Road should undergo seal widening to a minimum of 6.0m with additional 0.25m metalled shoulders on both sides. A swept-path analysis must be conducted on curves to ensure they can safely accommodate passing heavy vehicles.

- **Speed Management:** A temporary 60km/h speed limit should be implemented for the duration of the construction phase. Post-construction, the reviewer recommends a permanent reduction of the speed limit from 100km/h to 80km/h.
- **Safety Assessments:** Conduct a curve advisory speed assessment to determine if further signage or edge-line markings are required.
- **Pavement Maintenance:** Implement more frequent pavement monitoring and rehabilitation (quarterly during peak construction) to manage the accelerated deterioration caused by heavy mine traffic.

- **SH8 / Ardgour Road Intersection**

  - **Turn Bay and Widening:** Install an auxiliary right-turn bay on SH8 and widen the Ardgour Road approach to allow two articulated vehicles to pass one another at the intersection.
  - **Enhanced Control:** Upgrade the existing intersection control from a "Give Way" to a "Stop" control.
  - **NZTA Certification:** Ensure that all final design drawings for the intersection are certified by NZTA, as they are the road controlling authority for the State Highway.

- **Ardgour Rise (Thomson Gorge Road Realignment) Design**

  - **Adherence to Standards:** The design must be revised to meet CODC standards for a ‘mountainous Local Access B type’ road, which limits gradients to a maximum of 12.5%.
  - **Gradient Correction:** Extensive earthworks and the use of multiple switchbacks are likely necessary to correct the current proposed gradients of 17.1% and 18.7%.
  - **Detailed Documentation:** The applicant must provide sufficient engineering information, including long-sections and cross-sections, which were missing from the initial proposal.

- **Land Tenure and Public Access (DOC Land)**

  - **Road Vesting:** Ardgour Rise must be vested as a public road in the Central Otago District Council (CODC) rather than just being an easement.
  - **Perpetual Access:** Public access through the area must be maintained in perpetuity, including during the construction phase, to ensure the route remains a viable alternative to Cromwell Gorge.

- **Come in Time Battery Walking Track**

  - **DOC Standards:** The replacement track should be built to a standard consistent with the **Department of Conservation’s ‘easy to intermediate walking track’** category.
  - **Engineering Requirements:** The final design must clearly define the engineering standards for the track, specifically addressing how it will safely **cross Bendigo Creek**, which may be impassable without a bridge.

- **General Recommendations:**

    - **Staff Transportation:** To reduce traffic volume, MGL should be conditioned to consistently provide bus services for the workforce, with mandatory monitoring of staff uptake.
    - **Driver Code of Conduct:** A driver code of practice should be established requiring all project-related vehicles to use the Ardgour Road route, with the use of Matilda Rise permitted by exception only.
    - **School Bus Safety:** Review the location of school bus stops and install appropriate signage to alert drivers to the presence of children. If necessary, truck movements should be restricted during school bus pick-up and drop-off times.

4.5 Noise and Vibration

- The "date-stamp" in Proposed Condition 11—which limits noise compliance to dwellings existing at the time of consent—should be rejected. Mr Styles indicates it effectively authorizes non-compliance with District Plan rules for future dwellings and uses neighbouring land as a noise buffer without proper assessment.

  Alternatively, if the date-stamp is kept, Mr Styles recommends it is "critical" that the applicant provide daytime and nighttime noise level contours for every stage of mining and rehabilitation. They must also assess the potential for new dwellings on neighbouring land and the overall effect the date-stamp will have on those properties.

- To ensure the noise effects remain "minimal" as claimed in the applicant's report, the reviewer suggests setting operational noise limits that are consistent with (or only slightly above) the predicted noise levels, rather than the much higher limits currently proposed (55dB day/40dB night).

- The applicant must demonstrate why the higher vibration limit of 10mm/s PPV (twice the District Plan standard) is necessary. Furthermore, the applicant needs to provide a meaningful assessment of how these higher vibration levels will be perceived by neighbours.

- Because predicted noise levels of 60dB LAeq(1hr) are considered "potentially unreasonable" for a rural dwelling, the reviewer recommends the applicant consider further mitigation measures specifically to reduce the noise from project-related truck traffic at Mitigating Truck Noise at 213 Ardgour Road.

4.6 Light

- **Environmental Zone Confirmation**

  While the applicant proposed Zone A2 (Low district brightness), however the reviewer is of the view that the site is more accurately Zone A1 (Dark) due to its remote location and existing natural darkness. This classification requires stricter limits, such as a maximum Upward Light Ratio (ULR) of 0.00 which is considered appropriate.

- **Development of a Lighting Management Plan (LMP)**

  A major recommendation is the preparation of a formal LMP by a qualified professional, to be submitted for Council approval before construction begins. The LMP must:

  - Govern all fixed, mobile, and vehicle lighting.
  - Adopt a "start dark, add light only where needed" approach.
  - Include strategies for strategically locating mobile rigs to utilize natural landform shielding.
  - Define a clear complaints and certification process.

- **Technical Design and Equipment Standards**

  To minimize spill, glare, and sky glow, the reviewer recommends specific hardware and installation standards:

  - Zero Upward Light: All permanent exterior fittings must be flat-glass type luminaires with a ULR of zero and installed with zero tilt.
  - Colour Temperature: Lighting should be restricted to warm-coloured LEDs (≤3000K) to reduce ecological impact and atmospheric scattering, unless higher temperatures are proven necessary for safety.
  - Shielding: Direct all lighting downward and away from roads, waterbodies, and residences. All façade and feature uplighting are prohibited.
  - Interior Light Control: All site buildings must use blinds, tinted glazing, or coverings to prevent interior light from causing external glare.

- **Operational Controls**

  - **Adaptive Management:** Use automated timers, motion sensors, or dimming to switch off or reduce light when areas are unoccupied.
  - **Activity Timing:** Limit construction activities during hours of darkness wherever practicable.
  - **Fixed-Location Rule:** Mobile equipment that remains in one spot for **more than seven consecutive days** must meet the stricter standards of permanent fixed lighting.

- **Procedural Safeguards and Monitoring**

  - **Independent Verification:** The reviewer recommends that the final lighting design be reviewed and certified by a suitably qualified and independent lighting engineer who was not the original designer.

- **Compliance Monitoring:** Formal checks of light levels, spill, and glare must be conducted within six months of commissioning permanent lighting.
- **Neighbour Consultation:** The developer must engage with potentially affected neighbours before construction and establish a formal process to mitigate substantiated complaints.
- **Ecological Alignment:** All lighting must remain consistent with the National Light Pollution Guidelines for Wildlife (2023)

4.7 Bond

- **Extended Maintenance and Monitoring**

  The most significant timeline recommendation is to increase the post-closure maintenance period from five years to 20 years. This extension is deemed necessary to properly monitor the long-term performance and stability of the Tailings Storage Facility (TSF), aligning the project with other gold mines in the region.

- **Quantitative Requirements for Bond Setting**

  The reviewers recommend that the mining company (Matakanui Gold/Santana Minerals) provide specific quantitative definitions to replace the current qualitative descriptions. This includes:

  - **Material Quantities:** Specific volumes for materials involved in the coming year's work, as well as materials required for full mine closure and restoration.
  - **Measurable Compliance Criteria:** Detailed designs submitted annually that include specific vegetation areas, soil depths for the TSF, and engineering specifications for erosion control (such as slope gradients and drainage).
  - **Operational Programs:** A clear program of work for closure and restoration and the intended extent of works for each coming year.

- **Financial and Rate Adjustments**

  To ensure the bond value is realistic if the councils have to take over the site, the reviewers recommend:

  - **Using Commercial Rates:** Bond calculations should use commercial unit rates for local contractors rather than the mining company's internal costs, as company resources (plant and labour) may not be available if the bond is called.
  - **Adjusting the Confidence Level:** While current estimates use a P50 level, the reviewers recommend a P80 level to be consistent with other regional mining projects.

  [*P50 (Median Estimate): This represents a "best estimate" where there is a 50% probability that the actual cost will be higher than the estimate and a 50% probability it will be lower. It is essentially the middle-of-the-road forecast.*

P80 (Conservative Estimate): This is a more cautious approach where there is an 80% probability that the actual cost will be less than or equal to the estimate. Only a 20% chance remains that the cost will exceed this amount.]

By using P50 instead of P80, **the current project estimate is less conservative and carries a higher risk** that the bond funds will be insufficient to cover actual closure costs compared to the standards used by other mines in the area.

- **Revising Specific Costs:**
    - Perform a detailed assessment of **groundwater monitoring costs**, which are currently based on low valuations and could be two to three times higher.
    - Explicitly include costs for **Dam Safety Compliance**, including routine surveillance and documentation for the high-impact TSF.
    - Address inconsistencies in machinery rates to ensure they increase logically with plant size.

- **Risk Management**

  The reviewers recommend a more formal and rigorous approach to risk:

    - **Immediate Risk Allowance:** In the absence of a formal risk cost, they recommend applying a **15% allowance** for design, contract, environmental, and operational risks to the Year 1 bond.
    - **Regular Reviews:** A joint review of the risk register and associated costs should be conducted via a workshop process every **2 to 3 years**.
    - **Separation of Items:** Risk costs should be identified and managed as a **separate item** rather than being buried in a "catch-all" contingency sum.

- **Administrative and Legal Recommendations**

    - **Joint Management:** The bond should be implemented as a single project managed jointly by the Otago Regional Council, Central Otago District Council, and the Department of Conservation to ensure efficiency.
    - **Early Closure Strategy:** The councils should agree on a strategy for managing a potential **early mine closure**, focusing on strategic planning and contract procurement.
    - **Updating Outdated Reports:** Because the scope of work already exceeds original plans, the reviewers recommend updating all costs and quantities immediately, as the primary bond methodology report from May 2025 is already out of date.

Appendices:

A. Landscape Assessment

B. Heritage Assessment

C. Terrestrial Ecology Assessment

D. Traffic and Transport Assessment

E. Economic Assessment

F. Noise and Vibration Assessment

G. Light Assessment

H. Bond Assessment

I. Development Contribution Calculation