Bendigo/Ophir Gold Project Fast-track Approvals Application

Transportation Review

Prepared for	Central Otago District Council
Project Number	CODC-J026
Revision	A
Issue Date	20 March 2026
Prepared by	Logan Copland, Principal Transportation Planner; Dave Smith, Technical Director
Reviewed by	Dave Smith, Technical Director

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1. Introduction

Abley Limited (Abley) was engaged by Central Otago District Council (Council) to provide independent transportation advice in respect of a Fast-track[1] resource consent application for the Bendigo-Ophir Gold Project (BOGP), lodged by Matakanui Gold Limited (MGL).

This technical note describes Abley's review of the Stantec Integrated Transport Assessment (ITA) report that has been prepared on behalf of MGL in support of the project[2]. Alongside this, we have also reviewed the draft condition sets titled:

- "BENDIGO-OPHIR GOLD PROJECT PROPOSED LAND USE CONSENT AND CONDITIONS FOR ACTIVITIES WITHIN THE JURISDICTION OF CENTRAL OTAGO DISTRICT COUNCIL" (undated) and
- "BENDIGO-OPHIR GOLD PROJECT COMMON CONDITIONS WHICH APPLY TO ALL OF THE RESOURCE CONSENTS WITHIN THE JURISDICTION OF THE CENTRAL OTAGO DISTRICT COUNCIL AND OTAGO REGIONAL COUNCIL" (undated) (Draft Conditions)

The authors of this technical note have both undertaken site visits. Logan Copland has visited the site on three separate occasions, as follows:

- With MGL staff on 28 July 2025.
- As part of the 'DOC Concessions' workshop, with staff from MGL and associated representative consultants, CODC staff, and DOC staff, on 17 February 2026.
- A drive over of Ardgour Road with CODC Roading / Infrastructure staff on Friday 27 February 2026. Dave Smith also attended this site visit.

Abley has been providing advice to Council on this project since July 2025. During that time, we have issued the following the following documents (listed in order of issue):

[1] Under the Fast-track Approvals Act 2024
[2] Revision F, dated 12 September 2025

Table 1.1 Document summary – Abley

Document (file name)	Date	Purpose
Abley_Santana Minerals Transport Review_20250811	08 August 2025	Initial review of Stantec ITA, Revision D, dated 13 May 2025 (pre-lodgement). This was the source of initial RFIs on transportation matters[3].
Bendigo-Ophir Gold Project List of Transportation Issues Rev A	15 December 2025	Summary of outstanding transportation issues based on lodged documents, in alignment with CODC Consultant FTAA Completeness checklist which Abley also completed on 10 November 2025.
Bendigo-Ophir Gold Project Ardgour Rise Upgrade	21 January 2026	Review of proposed new Ardgour Rise alignment and recommendations on design standards.
Bendigo-Ophir Gold Project Response to Outstanding Transport Issues Memo 20260225	25 February 2025	Review of RFI responses provided by MGL (dated 23 January 2026), in response to our 15 December technical note.
Bendigo-Ophir Gold Project Ardgour Road upgrade review 20260302	02 March 2026	Review of upgrade requirements on Ardgour Road, following a meeting held between MGL representatives and Stantec (transport expert for MGL), CODC infrastructure staff, and Abley (transport expert for CODC).

1.1 Project overview

The ITA provides an assessment of transportation effects arising from the BOGP, which we understand comprises a new gold mine, ancillary facilities, and environmental mitigation measures at Bendigo and Ardgour Stations, approximately 20km north of Cromwell, refer Figure 1.1. The BOGP includes mining of four identified gold deposits which are referred to as Rise and Shine (RAS), Come in Time (CIT), Srex (SRX) and Srex East (SRE). Mining will occur via open pit methods at each deposit, with some underground mining proposed at the RAS pit to access the deeper gold deposits.

[3] Note that a key change since that document is that originally 3.5km of Thomson Gorge Road was proposed to be upgraded, whereas the current proposal proposes only 1.6km is upgraded.

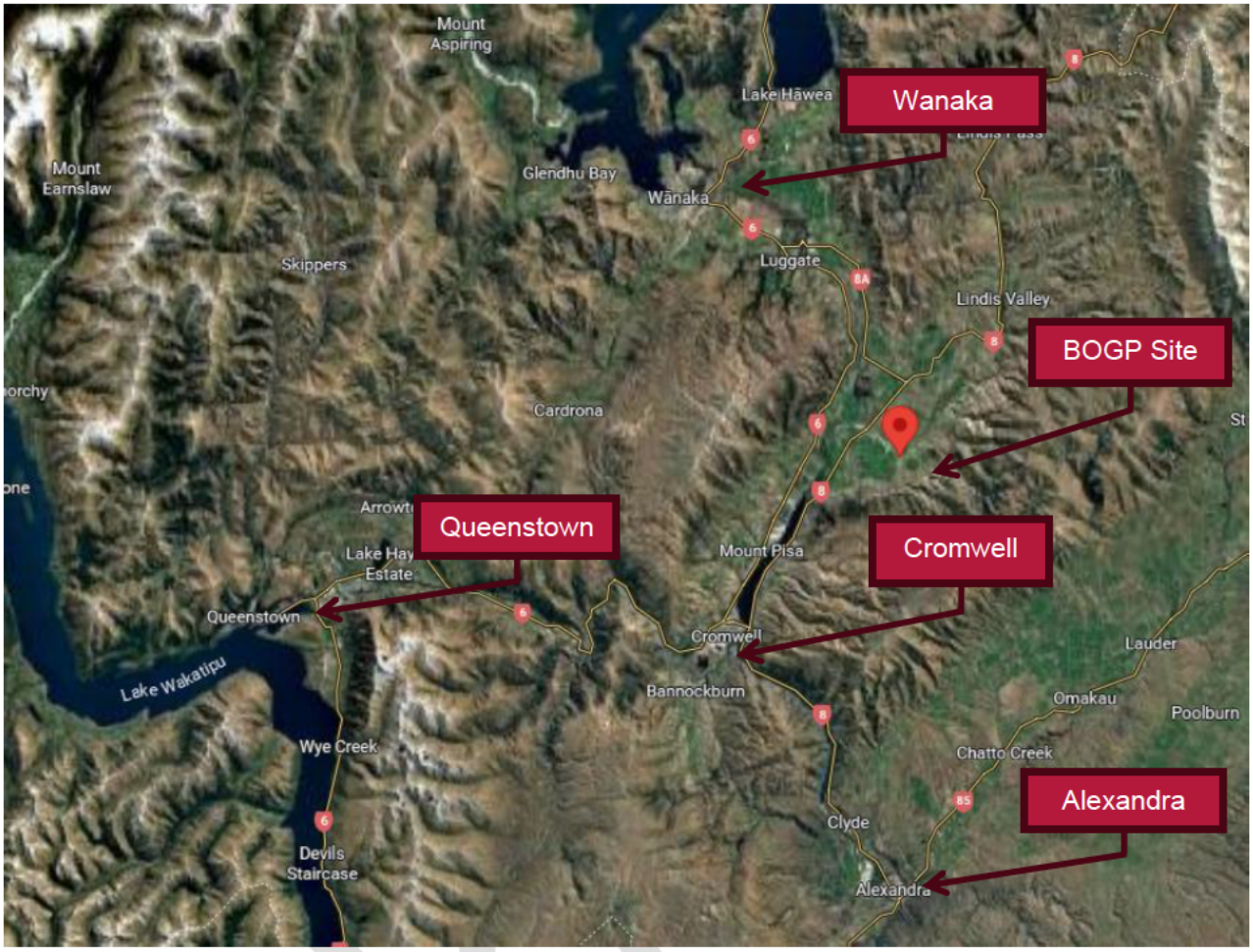

Figure 1.1 Site location. (Source: Google Maps, marked up by Abley).

Of particular relevance from a transport perspective, the following is proposed by the applicant as part of the project[4]:

- Widening and sealing of 1.6 km of Thomson Gorge Road south of Ardgour Road to provide a 6.5 m wide sealed carriageway[5].
- Safety improvements at the SH8 / Ardgour Road intersection. This includes the formation of a right turn bay on SH8 and minor realignment of safety barriers to improve sightlines.
- Construction of a new private road extending from the proposed Ardgour Rise alignment (just off Thomson Gorge Road) through the "neck" of the lower Shepherds Gorge into the processing plant area; and
- Development of a new 13.3 km road enabling a replacement / realignment of a portion of Thomson Gorge Road through Ardgour Station, and through an existing easement in the DOC reserve that then re-joins with the existing road at Thomsons Saddle. The road is referred to in most correspondence as 'Ardgour Rise'. The ITA states that the new road will be formed to a standard supporting public access and vesting to CODC[6] as a public road.

[4] Refer Section 4.2 of the ITA.
[5] Note that this is the approximate distance along Thomson Gorge Road between Ardgour Road and the proposed Ardgour Rise intersection.
[6] Refer Section 4.2 of the ITA.

1.2 Project Phasing

The BOGP will broadly include two phases, with the first being site establishment and the second being the operational phase.

Site establishment phase

This phase is anticipated to take approximately 12-months, and as specified in the Stantec report (copied verbatim), will involve:

- *"High levels of heavy vehicle movements associated with importing building and construction materials….there will be some over-weight / over-dimension vehicles.*
- *Staff movement by light vehicles and contractor / operator buses, including external contractors and those employed by MGL / Santana Minerals."*

Operational phase

This phase will be ongoing, and as specified in the Stantec report (copied verbatim), will involve:

- *"High levels of staff related movement associated with those working on the site, which may be managed with contractor / operator provided transport.*
- *Heavy vehicle movement associated with consumables delivery, equipment delivery and mine product."*

1.3 Traffic routing & Site Access

The ITA states that the site will be accessed from the north, from SH8, then utilising Ardgour Road and Thomson Gorge Road, refer Figure 1.2. Access will then be from the proposed new Ardgour Rise.

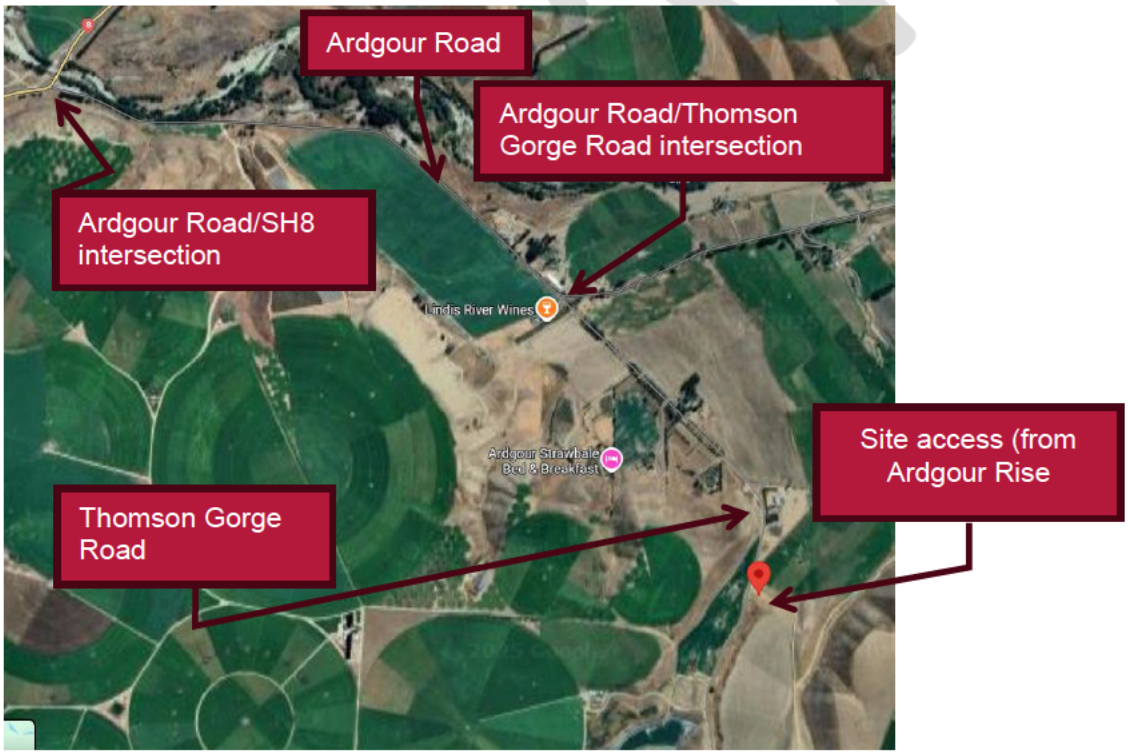

Figure 1.2 Traffic routing. (Source: Google Maps, marked up by Abley).

The ITA notes that some use of Bendigo Loop Road and Matilda Rise may be necessary during the initial project phases[7]. No specific details are provided on the design of the site access itself. We presume the internal (private roads) will be designed to meet operational needs of MGL, noting public access will not be permitted.

1.4 Thomson Gorge Road realignment (Ardgour Rise)

The BOGP footprint extends into the current Thomson Gorge Road corridor, and as a result, MGL seeks to "stop" that section of Thomson Gorge Road and construct a new road of a similar standard on a new alignment to maintain public access over the Dunstan Mountains. We understand the section of Thomson Gorge Road that is proposed to be stopped spans from just south of Matilda Rise at the northern end to the start of the Mount Moka 4WD track at the southern end, refer Figure 1.3. This is intended to ensure that access to the Mount Moka 4WD track is maintained from the southern end of Thomson Gorge Road in perpetuity. We understand that the road stopping process is being addressed outside of the resource consent application for the BOGP. We comment further on this aspect in Section 4.4 of this report.

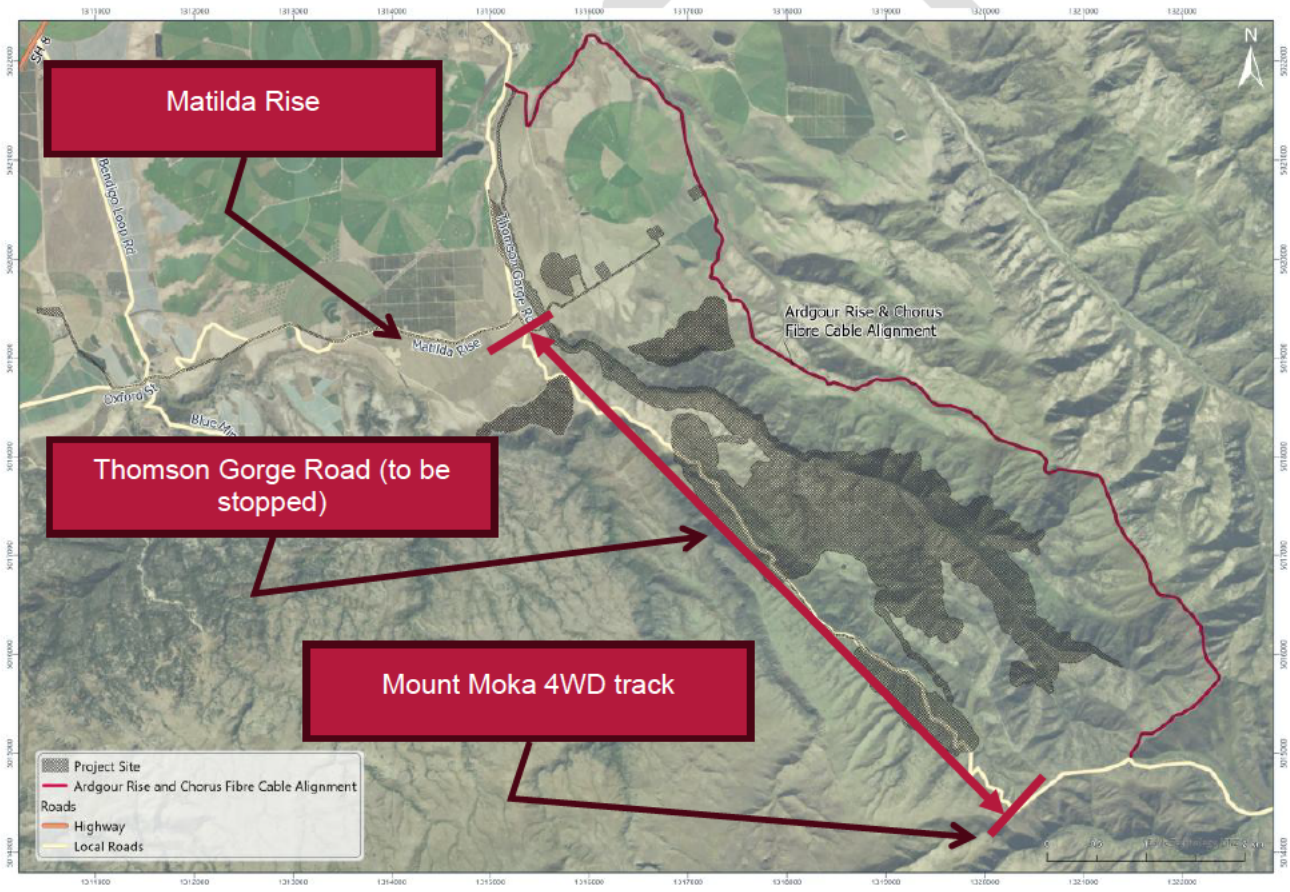

Figure 1.3 Section of Thomson Gorge Road proposed to be stopped (between red lines). (Source: Additional info submitted 10 March 2026)

The proposed new alignment is referred to as "Ardgour Rise" and is shown in Figure 1.4. Ardgour Rise will increase the route length by approximately 1.2km, from the current circa 12.1km to circa 13.3km. 12km of the new route is shown to pass over Ardgour Station, and the remaining 1.3km is shown to

[7] Refer Section 1.1 of the ITA.

pass over DOC land (this is at the southern end of the route where Ardgour Rise is shown to join back in with Thomson Gorge Road (this section is shown in Figure 4.2, later in this report).

The timing of the construction of Ardgour Rise is stated to depend on when the new mine pit operations will disrupt the safe and through function of the existing Thomson Gorge Road alignment[8].

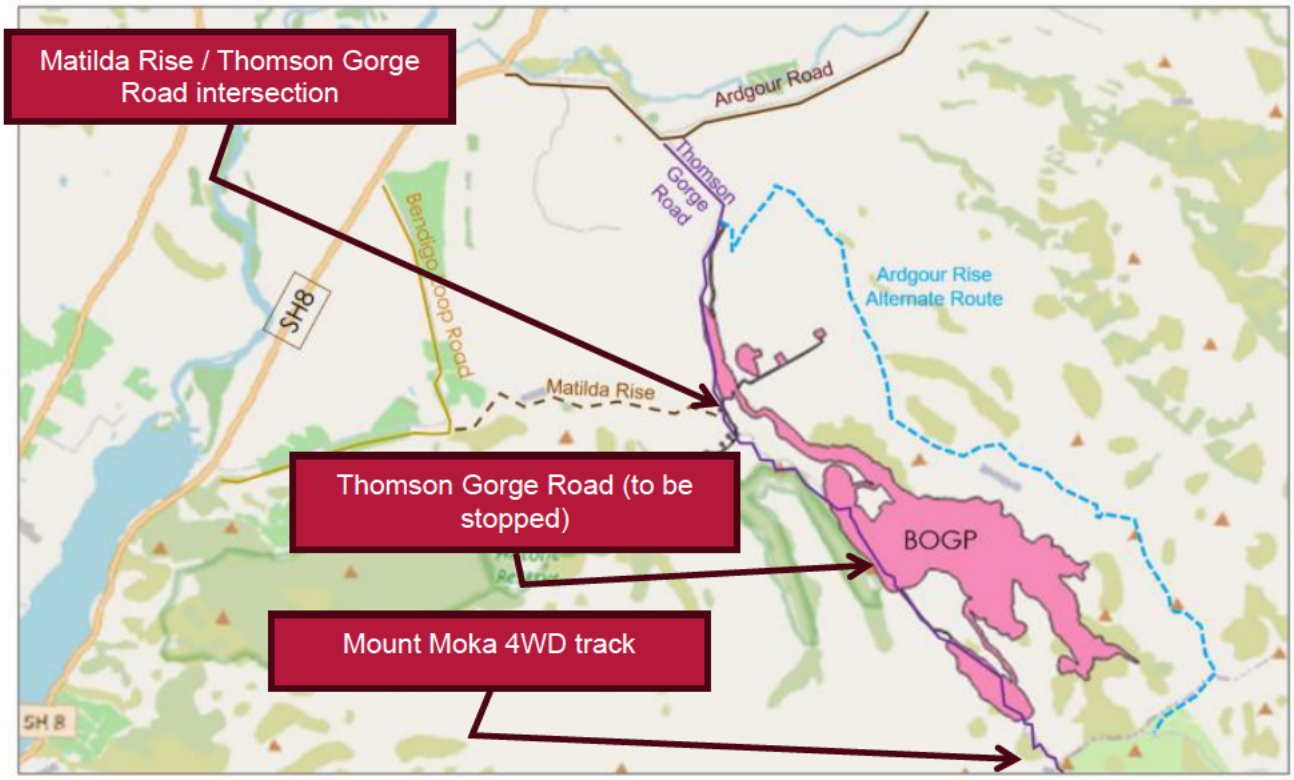

Figure 1.4 BOGP context plan showing proposed Ardgour Rise alignment. (Source: Stantec ITA, marked up by Abley).

2. Transportation Network

The ITA includes a comprehensive description of the surrounding transportation network, including a detailed analysis of traffic flows and a crash analysis. For completeness we have documented the key aspects of the road network insofar as we consider they are relevant to the BOGP project.

Ardgour Road / SH8 Intersection

SH8 has a posted speed limit of 100km/h and Ardgour Road meets SH8 on the outside of a curve, immediately south of the Lindis River single lane bridge. The bridge operates with priority signage with southbound traffic on SH8 being required to give way to northbound traffic. The curve has 45km/h advisory speed signs on both approaches. There are no auxiliary turning lanes or shoulder widening at the intersection, so traffic turning off SH8 into Ardgour Road has potential to disrupt through traffic. The ITA sets out that the crash barriers restrict sight distances at the intersection, which was observed on our site visit. Sight lines at the intersection from the Ardgour Road approach are shown in Figure 2.1 and Figure 2.2.

[8] Refer Section 6.7 of the ITA.

Figure 2.1 Ardgour Road / SH8 intersection looking east along SH8

Figure 2.2 Ardgour Road / SH8 intersection looking west along SH8

Ardgour Road

Ardgour Road is a sealed two-lane/two-way road with a dashed centre line. It is sealed to a width of generally 5.5m wide with no sealed shoulders refer Figure 2.3. The posted speed limit is 100km/h. Stantec report that there is widening on curves up to approximately 6.0m sealed width.

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Figure 2.3 Ardgour Road

The ITA confirms that traffic counts on Ardgour Road range from 230 vehicles per day (vpd) - 300vpd during the week, reducing in the weekend[9]. The traffic counts confirmed the 85th percentile operating speed is between 86km/h-93km/h[10] order of 90km/h in both directions, reducing as it approaches SH8.

It is noted that Council's Addendum to NZS4404:2004 (CoP) requires a rural road serving between 150-300vpd to have a sealed width of 6.0m, with 0.25m wide shoulders, refer Figure 2.4. Hence, the road meets the minimum requirement in the sense that it is sealed, but it falls short of the formed width requirement of 6.0m, by 0.5m, based on current traffic conditions. It also falls short of the requirement as it does not have formed metal shoulders.

[9] Based on traffic counts commissioned by Stantec in November 2024.
[10] Refer Section 3.1 of the ITA

Table 3.2(a) Road Standards – Rural

Type of Road	Topography	Traffic (ADT) or Number Lots	Number of Traffic Lanes	Carriageway Width (m)	Shoulder Width (m)	Design Speed (kph)	Maximinum Longitudinal Grade	Minimum Road Reserve Width (m)	Type of Surface
Collector	Flat	> 500	2	7.0	0.25 metal	100	4%	20	Seal
	Rolling		2	7.0		100	6%	20	Seal
	Mountainous		2	7.0		70	10%	20	Seal
Local Sealed	Flat	300-500	2	6.5	0.25 metal	100	4%	20	Seal
	Rolling		2	6.5		90	6%	20	Seal
	Mountainous		2	6.5		60	10%	20	Seal
	Flat	150-300 > 15 lots	2	6.0	0.25 metal	100	4%	20	Seal
	Rolling		2	6.0		80	6%	20	Seal
	Mountainous		2	6.0		50	10%	20	Seal
Local Gravelled	Flat	<150 ≤ 15 lots	2	6.0	Nil	80	Flat	15	Gravel
	Rolling		2	6.0		70	6.5%	20	Gravel
	Mountainous		2	6.0		50	10%	20	Gravel
Local Access A	Flat	50-150	2	5.5	Nil	70	Flat	15	Gravel
	Rolling		2	5.5		50	10%	20	Gravel
	Mountainous		2	5.5		30	12.5%	20	Gravel
Local Access B	Flat	< 50	1	4.5	Nil	70	Flat	15	Gravel
	Rolling		1	4.5		50	10%	20	Gravel
	Mountainous		1+	4.5+		30	12.5%	20	Gravel
Right of Way	Flat	< 6 lots	1	4.5	Nil	20	8%	10	Gravel
	Rolling		1	4.5		20	12.5%	10	Gravel
	Mountainous		1+	4.5+		20	16.7%	10	Seal

NOTES

(1) Roads with ADT exceeding 2,500 require specific design.
(2) All roads that provide access to more than 6 potential lots shall vest in the Council as legal road.
(3) Flat topography includes level or gently rolling country which offers few obstacles to the construction of a road. Rolling topography is rolling, hilly or foothill country where the slopes generally rise and fall moderately gently with occasional steep slopes. Mountainous topography includes rugged hilly and mountainous country and river gorges. Often involves long, steep grades and limited sight distances. Passing bays to be provided in mountainous terrain for Access B and ROW's.
(4) Normal camber of 4% on sealed roads and 5-8% on gravel roads.
(5) All unsealed local roads to be constructed in accordance with Council's Standards for Gravel Roads for inclusion in Central Otago District Council Roading Hierarchy – November 2000 or superseding documents.
(6) Widening of carriageway shall be in accordance with Austroads Guide to Geometric Design of Rural Roads

Figure 2.4 Excerpt of Table 3.2(a) from CoP

Site visits have confirmed that regular edge break is occurring which both suggests the current width is inadequate and further reduces the available width. The edge break is significantly worse on the straight sections of the road (up to 80mm deep in places) and is minimal on corners. On some straight sections of Ardgour Road there is evidence that vehicles are tracking on the grass shoulder with impressions of tyre marks consistent with larger vehicles clearly visible, refer Figure 2.5.

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Figure 2.5 Ardgour Road edge break and wheel mark tracking in shoulder

It was also noted during drive overs that the road feels narrow, especially on the horizontal curves. When meeting opposing vehicles, drivers were observed to slow down to enable them to safely pass one another.

Thomson Gorge Road

Thomson Gorge Road intersects with Ardgour Road some 2.5km south of the Ardgour Road / SH8 intersection. The Ardgour Road / Thomson Gorge Road intersection is controlled by a Give Way sign on the Ardgour Road approach. The intersection is split for traffic arriving from and departing to the north and east, refer Figure 2.6. Thomson Gorge Road is unsealed and operates as a single lane road, with a formed width generally in the order of 4.0m-5.0m, refer to Figure 2.7 and Figure 2.8. The ITA confirms the current traffic flows are between 100-125vpd during the week and less than 100vpd during the weekend[11]. Circa 20% of those flows comprise heavy vehicle movements. Traffic speeds are lower at approximately 60km/h, which reflects the narrow and unsealed standard of the road at present.

[11] Refer Section 3.2 of the ITA.

Figure 2.6 Ardgour Road / Thomson Gorge Road intersection

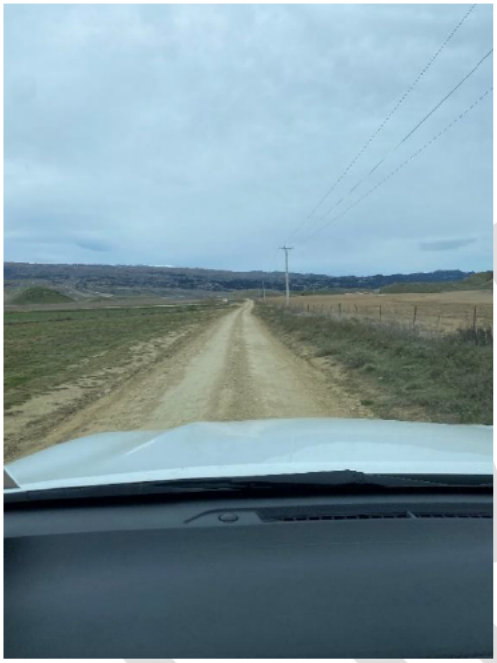

Figure 2.7 Thomson Gorge Road looking south toward the site

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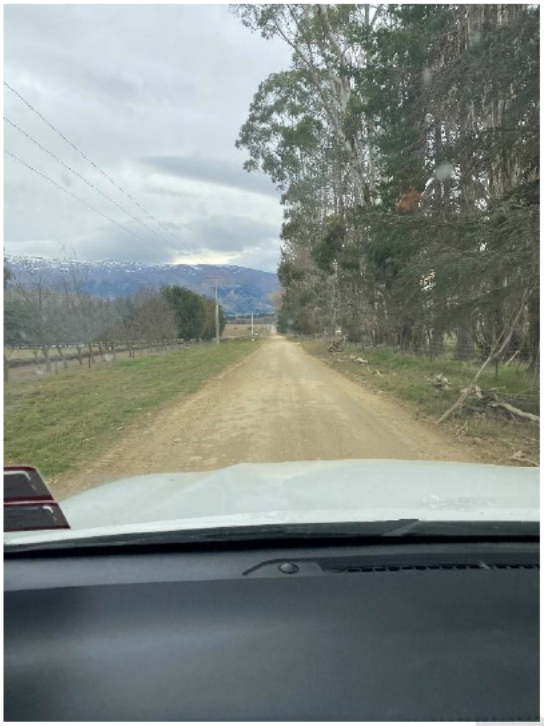

Figure 2.8 Thomson Gorge Road looking north toward Ardgour Road

2.1 Bendigo Loop Road / Matilda Rise Route

It is possible to also access the site via Bendigo Loop Road (two legs) and Matilda Rise. However, the ITA documents that the Ardgour Road route (that which is shown in Figure 1.2) was selected as the preferred route because it was considered safer and comparably more efficient from a time and distance perspective[12]. We agree that the Ardgour Road route is the more desirable route since this is the most direct route when accessing the site from major settlements including Cromwell, Wanaka and Queenstown, and requires less local road travel. Additionally, it is considered that the topography on Matilda Rise is more challenging with respect to developing a road of a suitable standard for primary access to the mine.

The ITA recommends that a driver code of practice is developed that requires all vehicles travelling to and from the BOGP site to use the Ardgour Road route[13]. It goes on to say that use of Matilda Rise should be by exception only and this should be detailed in the recommended Project Traffic Management Plan. We agree this is important as Matilda Rise is not fit to accommodate any significant increase in traffic use unless substantial improvements are undertaken.

However, we note that this requirement is not reflected in the Draft Conditions. We have commented on this further in Section 5 of this report.

3. Trip Generation

The ITA separately assesses traffic generation of the construction phase and operational phase and given the nature of the activity a bespoke assessment has been done, with input from MGL, to determine the likely level of trip generation during each phase.

[12] Refer Section 4.2 of the ITA
[13] Refer Section 6.6 of the ITA.

Construction Phase

The ITA sets out there will be approximately 150 people on-site each day with a 12-month construction phase planned for. It is noted there will be a 50 people workers camp established at the Ardgour Terrace Site[14].

Since the trip generation assumptions are prepare by MGL based on their anticipated level of activity and experience, we have not interrogated them in detail against industry standards. This acknowledges that the activity is somewhat bespoke, and we consider the trip generation to appear reasonable. Rather, we have focussed our assessment on the impacts of the trip generation as estimated in the ITA.

The ITA estimates that the site will generate approximately 200vpd in the first few months of construction (expected to be from late 2025), and later increase to approximately 400vpd toward the end of 2026 (Heavy Commercial Vehicles (HCV) and light (ie non-HCV) vehicle movements). It will then decrease to about 250vpd toward the end of construction, once site infrastructure works are completed and the operational phase begins (estimated to be mid-2027).

During the construction phase, there will be a high number of additional heavy vehicles using the road network. These will peak at around 170 HCV movements per day in Q2 2026, and then fall to around 120 HCV movements per day at the end of 2026.

Overall then, the peak daily traffic generation during the construction phase is estimated to be in the order of 400vpd, inclusive of heavy and light vehicles, for a construction period of approximately 12 months.

Operational Phase

The operational mine workforce will be between 250-350 full time employees, most of which will be shift workers[15]. The mine will operate on 12-hour shifts, seven days per week. The shifts will be 6am-6pm for day shift and 6pm-6am for the night shift. The ITA states that if all employees travel to the site in single occupancy vehicles, the trip generation could be up to 450vpd. However, MGL proposes to operate buses between the major settlements of Wanaka, Cromwell and Alexandra which is supported as a travel management measure to reduce the number of vehicle trips on the road network. The ITA estimates that the total number of vehicle movements will therefore be more likely in the order of 250vpd during the week (understood to be comprised of 210 light vehicle movements and 40 bus/heavy vehicle movements).

It is recommended that the ongoing provision of these services be conditioned, and monitoring of uptake be further conditioned. This is intended to provide confidence that the bus services will be effective in reducing the project traffic generation. Should higher daily traffic generation eventuate, further transport upgrades beyond the mitigation recommended in our transport review may be required.

4. Transportation Impacts

The ITA notes that the change in traffic flows on Ardgour Road and Thomson Gorge Road are substantial (particularly during the construction phase), primarily due to the low traffic flows at present[16]. These impacts are considered below, with reference to the ITA.

4.1 SH 8 / Ardgour Road Intersection

The ITA has assessed four options to improvements to this intersection. These are:

[14] This facility is the subject of RC250126, which we understand has been approved by CODC
[15] There will be approximately 25 administration staff working a standard 40-hour week.
[16] Refer Section 6.1 of the ITA.

- Do nothing
- Do minimum (shoulder widening on SH8 and widening of Ardgour Road to accommodate two-way flow of large vehicles, consideration of reduced speeds)
- Right turn bay
- Signal controls (to control movements across the bridge and from Ardgour Road)

A preliminary safe system assessment was undertaken in the ITA. We have not reviewed the safety assessment included in Appendix D including the scoring applied but consider the outcomes to be intuitive. The assessment concludes that installation of an auxiliary right turn lane achieves the same safe system score as the existing configuration (that is, the existing configuration with no development traffic added to the intersection). The assessment also showed that signal controls will result in a better safety outcome than the auxiliary right turn lane option (and in fact would result in an improved safety outcome when compared to the existing situation). However, the ITA states that signals were discarded because they do not align well with NZTA operational objectives (signals in an open road speed environment). It then states that signals would be a consideration for the future if NZTA choose to address safety and / or efficiency performance of the bridge.

The solution recommended in the ITA is the installation of an auxiliary right turn lane since the safe system assessment shows that this offsets any safety effects caused by the development traffic, and they note this has been agreed as the preferred option with NZTA. It will also include widening of the Ardgour Road intersection approach to accommodate opposing articulated vehicles at the same time. We consider this response to be reasonable, and we note that Appendix E to the ITA indicates that NZTA support the proposed intersection upgrades.

The concept design of the right turn lane shows widening on the southern side of the highway and retaining the existing edge of seal on the northern side. It is recommended that as part of detailed design, consideration is given to whether the curve advisory of 45km/h remains appropriate with the adjusted geometry for southbound highway traffic (as the turn will be slightly tighter).

Given the increased use and complexity of the road environment it is recommended that the existing give way signage and road marking be upgraded to stop control.

4.2 Ardgour Road Effects

Resulting traffic flows (operational and construction)

Based on the estimated trip generation assessment done by Stantec, traffic generation is expected to peak at about 400 veh/day by the end of 2026, falling to around 250 veh/day by mid-2027 when the operational phase is expected to begin (inclusive of light and heavy vehicles). Hence the daily weekday traffic flow on Ardgour Road is likely to increase to around 700 veh/day during construction and to 550 veh/day during the operational phase[17]. Operational traffic will primarily be light vehicles but will also include some heavy vehicles and will consistently include buses.

We note that a rural road serving more than 500vpd is required to have a 7.0m wide carriageway with unsealed shoulders, refer Figure 4.1. As set out in the ITA, Ardgour Road currently has a carriageway width of 5.5m and therefore falls short of this requirement by 1.5m and does not have formed metal shoulders.

[17] Based on current daily volumes of up to 300 veh/day as per the ITA

Table 3.2(a) Road Standards – Rural

Type of Road	Topography	Traffic (ADT) or Number Lots	Number of Traffic Lanes	Carriageway Width (m)	Shoulder Width (m)	Design Speed (kph)	Maximinum Longitudinal Grade	Minimum Road Reserve Width (m)	Type of Surface
Collector	Flat	> 500	2	7.0	0.25 metal	100	4%	20	Seal
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	Mountainous		2	6.5		60	10%	20	Seal
	Flat	150-300 > 15 lots	2	6.0	0.25 metal	100	4%	20	Seal
	Rolling		2	6.0		80	6%	20	Seal
	Mountainous		2	6.0		50	10%	20	Seal
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	Rolling		2	6.0		70	6.5%	20	Gravel
	Mountainous		2	6.0		50	10%	20	Gravel
Local Access A	Flat	50-150	2	5.5	Nil	70	Flat	15	Gravel
	Rolling		2	5.5		50	10%	20	Gravel
	Mountainous		2	5.5		30	12.5%	20	Gravel
Local Access B	Flat	< 50	1	4.5	Nil	70	Flat	15	Gravel
	Rolling		1	4.5		50	10%	20	Gravel
	Mountainous		1+	4.5+		30	12.5%	20	Gravel
Right of Way	Flat	< 6 lots	1	4.5	Nil	20	8%	10	Gravel
	Rolling		1	4.5		20	12.5%	10	Gravel
	Mountainous		1+	4.5+		20	16.7%	10	Seal

NOTES

(1) Roads with ADT exceeding 2,500 require specific design.
(2) All roads that provide access to more than 6 potential lots shall vest in the Council as legal road.
(3) Flat topography includes level or gently rolling country which offers few obstacles to the construction of a road. Rolling topography is rolling, hilly or foothill country where the slopes generally rise and fall moderately gently with occasional steep slopes. Mountainous topography includes rugged hilly and mountainous country and river gorges. Often involves long, steep grades and limited sight distances. Passing bays to be provided in mountainous terrain for Access B and ROW's.
(4) Normal camber of 4% on sealed roads and 5-8% on gravel roads.
(5) All unsealed local roads to be constructed in accordance with Council's Standards for Gravel Roads for inclusion in Central Otago District Council Roading Hierarchy – November 2000 or superseding documents.
(6) Widening of carriageway shall be in accordance with Austroads Guide to Geometric Design of Rural Roads

Figure 4.1 Excerpt of Table 3.2(a) from CoP

General comments

Previous Abley reports have expressed concerns around the adequacy of Ardgour Road to accommodate the projected additional traffic flows in its current state. This is the case due to our observations relating to existing edge failure on Ardgour Road, combined with its narrow feel. We also find it unusual that it is proposed to build Thomson Gorge Road to a higher standard than Ardgour Road (minimum 6.5m wide versus 5.5m wide, respectively), particularly in the context that Thomson Gorge Road will have a lower volume than Ardgour Road. The ITA proposes mitigation in the form of clearing vegetation that may limit visibility, adding edge line markings on curves and speed advisory signage but does not propose to increase the sealed width of the corridor or to form shoulders. We consider further mitigation than is set out in the ITA is required to address adverse transport effects.

Below we have considered the construction and operational phases separately as they relate to Ardgour Road effects.

Road Safety and Maintenance Considerations

In our view further mitigation is required to address adverse effects on Ardgour Road. The adverse effects are primarily a safety issue due to the narrow carriageway and insufficient room for vehicles to safely pass each other. This is an existing issue based on our observations but it is exacerbated by the application. Section 6.2 of the ITA states "*over the length of Ardgour Road from SH8 to Thomson Gorge Road, a truck is likely to pass another car or truck in the opposing direction **1 in 4** times (compared to 1 in 43 times under existing conditions)*". This is a tenfold increase in truck vs other vehicle conflicts along Ardgour Road as a result of this application. The ITA also estimates a doubling in the number of Death and Serious Injury Crashes (DSI) crashes along the corridor as a result of the increase in development traffic – this is a consistent result applying two different models[18].

The increase in traffic is also anticipated to result in more edge break as a larger number of vehicles shy away from the centreline. The tenfold increase in truck vs other vehicle conflicts identified in the

[18] Refer Table 6-1 of the ITA

applicant's ITA would intuitively result in a tenfold increase in vehicles shying away from the centreline, dropping wheels onto the grass shoulder and a tenfold increase in stress on the edge of the pavement which results in seal edge break. In addition to being a road maintenance issue, the shying away could further exacerbate our road safety concerns (that is, accelerated road pavement deterioration will increase the potential for vehicles losing control as they veer away from broken edges of seal or lose control as they shy off the seal to avoid a large vehicle travelling in the other direction). Stantec has done crash prediction modelling to understand what impact seal widening would have on the number and likelihood of Death and Serious Injury Crashes DSI crashes. The reduction in crashes as modelled by Stantec in the ITA of approximately 10% when an extra 1m of seal width of provided is technically correct based on the models applied, however we do not consider this to be representative in this scenario.

Noting the substantial increase in the number of truck movements and conflicts[19] as a result of this application it is important to consider the width of trucks in the context of the narrow sealed carriageway. The maximum width for trucks under NZTA's land transport rule[20] (that is before they are classified as over-sized vehicles) is 2.55m plus up to an additional .24m for mirrors or other features on each side of the vehicles. This means if a maximum width truck had its lefthand wheels on the edge of seal it would require up to 2.79m of width. Clearly if another truck of similar width were coming the other way they would strike mirrors (as lanes are 2.75m). When undertaking vehicle tracking at speed, traffic engineers generally allow for a 0.5m buffer around each vehicle. To achieve this separation would mean that both vehicles would be required to drop wheels on the shoulder which is an issue in relation to seal edge break but is also a safety concern with the potential for loss of control when dropping wheels off the seal especially at speed. The same goes for any light vehicle which may come into conflict with a truck and have insufficient room in the sealed portion of the carriageway.

On this basis, we strongly recommend that the full corridor needs to be widened to address adverse safety and road maintenance effects, and further consider that a reduction in the operating speed along the corridor is one means of assisting in offsetting the predicted increase in crashes when traffic volumes increase.

It is further noted that pre and post construction pavement monitoring is also offered by the applicant which we support. The frequency of monitoring can be worked through between the Applicant and Council as part of the establishment of Construction and Project Traffic Management Plans. The Project TMP proposes quarterly pavement monitoring during construction followed by annual monitoring thereafter. We remain concerned that noting the increased in usage including HCVs more frequent monitoring and subsequent rehabilitation may be required. We have recommended additional wording to this effect in Section 5.

Ardgour Road recommended widening

To achieve an acceptable ongoing transport outcome our advice is that the following is required with widening works implemented prior to any construction on the mine site:

- Seal widening to a minimum sealed width of 6.0m with additional 0.25m metalled shoulders on both sides of the road to maintain a generally consistent road width between SH6 and the site access (that is, a more similar standard to the proposed Thomson Gorge Road upgrade width).
- A swept-path analysis should be undertaken on the curves to check the design is adequate to safely accommodate passing of the design vehicle at an appropriate speed with satisfactory buffer between opposing vehicles. Additional sealed width beyond 6.0m may be required to achieve an acceptable outcome.
- A curve advisory speed assessment should be undertaken to determine if advisory speed signage should be installed on the curves. The review should consider whether edge-line markings are also an appropriate treatment, and whether the willow trees should be removed.

[19] Refer Section 6.3.2 of the ITA.
[20] https://www.nzta.govt.nz/assets/resources/factsheets/13/docs/13-vehicledimensions-and-mass.pdf

Construction phase impacts – Ardgour Road posted speed

Since the traffic generation numbers are significantly higher during the mine construction phase, the road safety risks will similarly be higher unless appropriate mitigation measures are implemented. Two key factors that influence the likelihood of DSIs occurring is the daily traffic flow and the operating speed of traffic. Reducing the operating speed will reduce the likelihood of DSIs occurring because drivers will have more time to perceive and react to a hazard, and additionally the impact speed would be lower which will reduce the severity of any crash should one occur. The current operating speed is between 86km/h and 93km/h and the posted speed is 100km/h. The minimum speed for rural roads that could be permanently applied is 80km/h based on current NZTA speed limit rule but we do not consider reducing the speed limit to 80km/h is sufficient to achieve any material reduction in operating speed and therefore associated reduction in road safety risk.

It is therefore recommended that as part of the Construction Traffic Management Plan that Ardgour Road is subject to a temporary speed limit of 60km/h[21] for the full duration of the construction period when traffic volumes and the number of heavy vehicles on Ardgour Road is high. This solution can be implemented under current guidance as a temporary speed limit which is appropriate to manage construction impacts.

Operational phase impacts – Ardgour Road posted speed

A temporary speed limit of 60km/h is not acceptable under NZTA's current speed limit rule. Therefore, after construction, the speed limit would automatically revert back to 100km/h. We recommend that a speed limit of 80km/h would be more suitable and may result in a small reduction in the current observed operating speeds of 86km/h and 93km/h.

We also note that the setting of permanent speed limits is a matter for Council and not one for the applicant. We recommend that Council review the speed limit along Ardgour Road to assess the suitability of a permanent reduction from a posted speed of 100 km/h to 80 km/h. This recommendation is irrespective of the application.

It is further noted that Ardgour Road is a school bus route. It is recommended that the location of any bus stopping areas along the corridor between SH8 and Thomson Gorge Road be reviewed including confirming there is suitable signage installed to alert drivers to the presence of children and bus manoeuvring. Should there be any additional concerns, limiting the use of the corridor by vehicles associated with the development site at both school bus pick up and drop off times is recommended.

4.3 Thomson Gorge Road

The ITA (and draft conditions) states that the first 1.6km of Thomson Gorge Road (between Ardgour Road and the proposed Ardgour Rise intersection) will be widened and sealed to provide a 6.5m wide sealed carriageway. We understand from this that there will be no access to the mine directly from Thomson Gorge Road south of the proposed Ardgour Rise intersection. Should this be required by the applicant, we recommend that the applicant be required to extend the Thomson Gorge Road upgrade up to the point of any site access.

The ITA sets out that given the forecast traffic flows both during construction and operational phases, that Thomson Gorge Road in its current state is inadequate. We agree with this, and in principle support the applicant's approach to upgrade Thomson Gorge Road between Ardgour Road and Ardgour Rise, subject to detailed design approval from CODC.

During the construction phase the ADT on Thomson Gorge Road is expected to increase by up to 400vpd. Since the current traffic flows are in the order of 100-125vpd, the daily volume could increase to approximately 530vpd during construction.

[21] This is recommended based on crash prediction modelling.

During the operational phase, the volume on Ardgour Road could increase by approximately 250vpd, hence the daily volume could be as high 375vpd. Operational traffic will primarily be light vehicles but will also include some heavy vehicles and will consistently include buses.

We consider that the standard recommended in the ITA of a ~6.5m wide sealed carriageway with shoulders on both sides is generally appropriate (as that accords with what is expected for a road serving between 300-500vpd in the COP), with sufficient edge delineation given the road will be regularly used during hours of darkness.

However, we would add that given there will be large vehicles using the road, including in an ongoing manner, that the detailed engineering design should be supported by a swept-path analysis to confirm that the designed width is adequate to accommodate the vehicles expected to use it, particularly on horizontal curves. We also recommend that accesses connecting to Thomson Gorge Road will need to be sealed at least 2.0m back to prevent edge break and loose material migrating onto the road.

4.4 Ardgour Rise Construction

Overview

Ardgour Rise is proposed to be constructed to the east of the existing Thomson Gorge Road alignment and be vested in CODC as road (refer to discussion in 1.4 for further context). Abley previously noted that in principle, even though the realignment will slightly increase the route length, the suggested realignment is considered an appropriate response from a transport perspective when balanced against the proposed land use of the wider site[22]. This comment was made in the context that the public will continue to be able to travel between Ardgour Road and Bendigo Loop Road (via Matilda Rise) without significant change, and will still be able to access into and over the Dunstan Mountains albeit via a different, slightly longer route.

The ITA sets out that the existing Thomson Gorge Road alignment, particularly south of Matilda Rise, is a constrained, low volume, mountainous road with warning signs relating to the hazards presented by the road, but acknowledges its importance from a resilience perspective since it is an alternative to Cromwell Gorge[23]. We agree that Thomson Gorge Road plays an important role in the local network from a resilience point of view and this underscores that it is critically important to ensure that a suitable alternative is provided should the road stopping proceed as proposed by MGL.

Process

In terms of process, we understand the proposed stopping of Thomson Gorge Road is to be administered under the Public Works Act, and under that legislation a suitable alternative is required to be in place and must be vested as a public road with Council prior to the stopping being approved.

The details of the design of Ardgour Rise are yet to be confirmed, as is the exact alignment, which has been subject to separate discussions with DOC and CODC. We also understand that there remains an unresolved issue regarding the 1.3km section of Ardgour Rise that is shown to pass over DOC land, refer Figure 4.2.

[22] Refer to our initial review dated 08 August 2025.
[23] Refer Section 6.7 of the ITA.

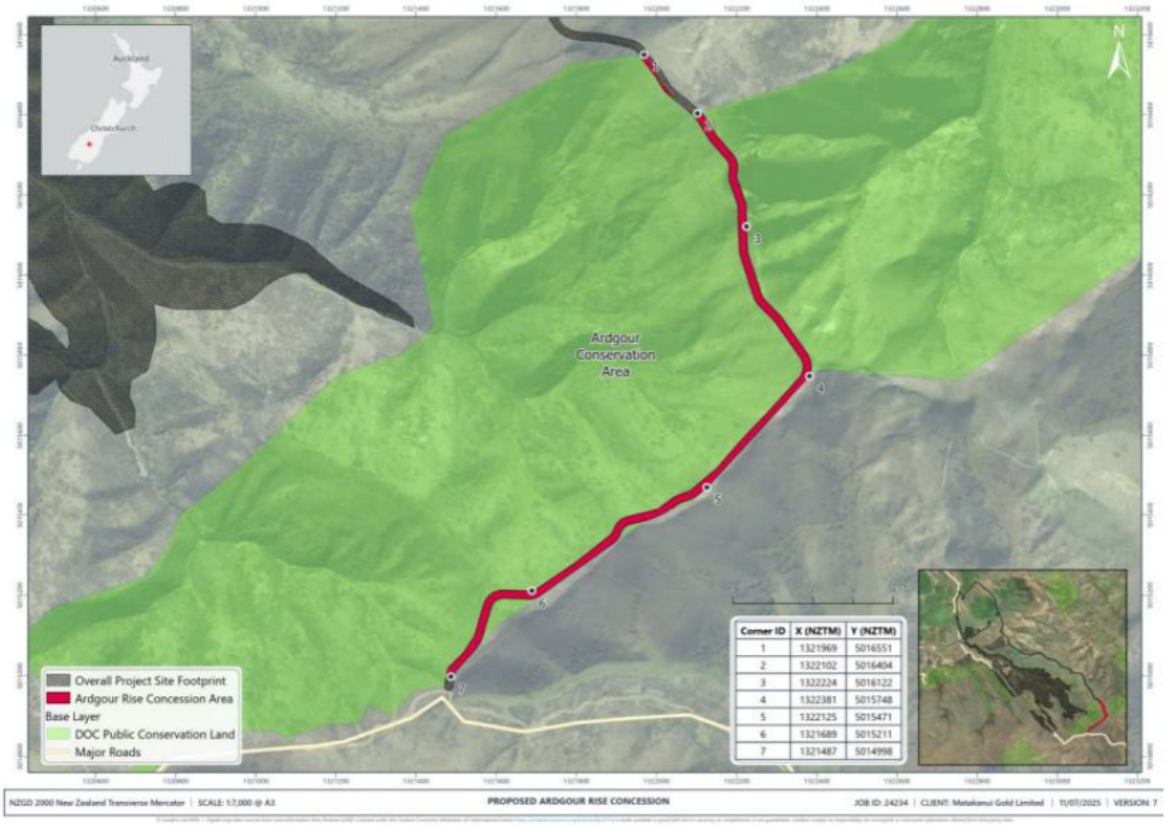

Figure 4.2 Section of proposed Ardgour Rise alignment that passes over DOC Reserve

CODC has confirmed that whatever the alignment, Ardgour Rise as the replacement to Thomson Gorge Road will need to be provided in the form of a vested public road and not an easement. We are unaware of discussions between the Applicant and DOC in this regard so are not able to comment on the feasibility of a continuous public road (that is to replace the stopped section of Thomson Gorge Road) being established.

Design requirements

Since issue of our initial review in August 2025, further discussions have been held between CODC and MGL regarding the design of Ardgour Rise. CODC have engaged Archie Reed or Meyer Cruden (Civil Engineers) to review the Ardgour Rise alignment against Council's engineering standards. The proposed route reviewed by Mr Reed is included in the application package as *C.22 Ardgour Rise Alignment and Chorus Fibre Alignment* (dated 9 March 2026). The Meyer Cruden assessment dated 20 March 2026 prepared by Mr Reed is attached as Appendix A to this transport review, and includes the following conclusions (repeated verbatim):

- "*The plan provided has insufficient information to assess it against all relevant CODC standards.*"
- "*The vertical alignment of the proposed route falls well short of the current CODC minimum standard...of which two sections (nearly 1km long each) have a average grades of 17.1% and 18.7%. This is well in excess of the 12.5% maximum grade.*"
- "*The proposed route is 1.4km longer than the existing route and has a higher average gradient over the mountainous section. The proposed route also has a higher average gradient than many other 'back-country' roads in the area.*"

- "*Whilst the existing Thomson Gorge Road also falls short of current standards it needs to be considered in the context that it was formed over 100 years ago. In this respect it does not necessarily represent an acceptable standard on which to base the design of a new alternative route*."

Abley have also been asked by CODC to provide independent advice related to other (non-CODC) design standards which may be applicable[24]. In summary, we recommended that the Table 3.10 design standards for 'road type 4C mountainous' corridors from ARRB *Unsealed Roads Manual: Guidelines to Good Practice* (Giummarra, G 2009, *Unsealed roads manual: guidelines to good practice, 3rd edn*, ARRB Group, Vermont South, Vic.) provides suitable minimum design standards for Ardgour Rise, refer Figure 4.3. The ARBB standard is endorsed by Austroads[25] (the organisation of Australasian road transport and traffic agencies – including NZ Transport Agency Waka Kotahi).

We note that the ARRB standard is not dissimilar to the CODC standard with a slightly slower design speed (20 km/h vs 30 km/h), narrower minimum carriageway width (4m vs 4.5m) and similar longitudinal grade (12% vs 12.5% albeit with an allowance for short sections of higher grades).

Design parameter	4C Access road – rolling terrain	4C Access road – mountainous terrain
Operating speed	40 km/h	20 km/h
Minimum crossfall	5%	5%
Maximum superelevation	8%	10%
Minimum carriageway width	5m (3m lane + 1m shoulders)	4m (3m lane + 0.5m shoulders)
Minimum formed width (including verges)	7m	6m
Minimum curve radius	60m	15m
Minimum sight stopping sight distance	50m	30m
Minimum meeting sight distance	100m	60m
Maximum vertical grade	8%	12% although higher grades of up to 20% can be allowed for short sections (about 150m)
Minimum crest vertical curve	K value = 8	K value = 2
Minimum sag vertical curve	K value = 3	K value = 2

Figure 4.3 Guidelines for class 4C geometric design standards for unsealed roads (excerpt from ARBB Table 3.10)

The design specifications should be considered in the local context including specialist civil engineering input to ensure the road is suitably engineered to be fit-for-purpose, including the advice provided by Meyer Cruden. It is recommended that the minimum design standards for Ardgour Rise should be consistent with:

- the 'mountainous Local Access B type' road under the CODC addendum to NZS4404:2010 - Code of Practice for Land Development 2020, and
- CODC Standards for Gravel Roads (March 2003).

Together these standards address geometric design, pavement condition and drainage requirements as specified in the Meyer Cruden assessment. In addition, the ARRB provides more detailed geometric design standards which may supplement those in the CODC standards.

We have not seen an engineering design that meets the guidelines in Figure 4.3 so are unable to comment on the feasibility of establishing a fit-for-purpose public road as an alternative to the stopped Thomson Gorge Road. However we note Mr Reed's observation from his site visit that "*Generally, only minor earthworks would be anticipated to widen the existing tracks to form the proposed route. The two long, steep sections mentioned above were investigated. It is likely that extensive earthworks and multiple switchbacks would be required to form these sections to CODC standards*."

[24] Refer "Bendigo/Ophir Gold Project Ardgour Rise Upgrade" Abley technical note dated 21 January 2026
[25] Refer Section 1.1 of Austroads Guide to Road Design Part 3: Road Design

We also consider that from an ongoing public access perspective, it should be a requirement that public access through the area is maintained in perpetuity, including throughout the construction phase. This is likely to require ongoing coordination between the CODC roading department and MGL to ensure that safe and efficient public access is not obstructed by mining or construction activities.

4.5 Access to the Come in Time Battery Walking Track

Within the application site there is currently a short recreational walk to a historic site known as the Come in Time Battery walk[26]. There is an old mine entrance and restored mining relics accessible via this track. The walk is currently accessible via Thomson Gorge Road and is approximately 270m in length with a 50m descent to the CIT Battery site. The walk is classified by DOC as an '*easy to intermediate walking track*'.

The application proposes to close this track and build a replacement access track to the CIT battery site from Bendigo Loop Road. The specific alignment over DOC land is available in the application materials[27]. Based on the walk alignment and coordinates provided in Schedule 4 of this document we have undertaken 3-D mapping to understand the likely terrain over which the replacement walk will traverse. This is shown in Figure 4.4 with the terrain profile also included in the top right corner.

Image attribution: Google Earth, map data: AirbusData SIO, NOAA, U.S. Navy, NGA, GEBCOCNES / AirbusLandsat / Copernicus

Figure 4.4 3D mapping of proposed replacement CIT Battery walk

This route is approximately 4.3km in length crossing over several gullies. The walk includes a number of ascents and descents with a range of gradients, but fluctuating by around 150m in altitude over the length of the walk. In our view this is far longer and more challenging than the current 270m long track with 50m descent.

It is unclear what standard this track is proposed to be engineered to, and we note that it crosses Bendigo Creek which has a relatively large catchment and may be impassable at times unless bridged.

[26] https://www.doc.govt.nz/parks-and-recreation/places-to-go/otago/places/bendigo-area/things-to-do/come-in-time-battery-walk/
[27] D.08-Concession-and-Conditions-for-Access-Route-to-CIT-Battery-Track-Changes-10-March-2026.pdf Schedule 4

We recommend that this be built to a standard consistent with the '*easy to intermediate walking track*' set out by DOC on their website[28], and this should be reflected in the relevant conditions set.

5. Review of Draft Conditions

5.1 Bendigo-Ophir Project Proposed Land Use Consent and Conditions for Activities within the Jurisdiction of Central Otago District Council

Below are our comments on the Bendigo-Ophir Project Proposed Land Use Consent and Conditions for Activities within the Jurisdiction of Central Otago District Council as they relate to transportation matters.

Transportation

State Highway 8 and Ardgour Road Intersection

Condition 43 requires the intersection to be designed in accordance with NZTA requirements but Condition 44a states that the final design drawings are to be submitted to CODC for certification. Given the works are proposed on a state highway, we recommend that they are also required to be certified by NZTA who are the road controlling authority.

Thomson Gorge Road Widening

Condition 47 requires the applicant to widen Thomson Gorge Road between Ardgour Road and the proposed new intersection of Thomson Gorge Road / site access road (a distance of approximately 1.6km). Based on our understanding of the Thomson Gorge Road Widening Plan[29], the 'site access road' will not intersect with Thomson Gorge Road at all. Instead, Ardgour Rise will intersect with Thomson Gorge Road, and the site access will intersect with Ardgour Rise (not Thomson Gorge Road as is stated in the draft condition). Importantly, it is our understanding that there will be no use of Thomson Gorge Road south of the proposed Ardgour Rise by mine traffic. Should this be required by the applicant, we recommend that the applicant be required to extend the Thomson Gorge Road upgrade up to the point of any site access. It is equally important that use of Thomson Gorge Road south of Ardgour Rise, by mine traffic, be by exception only (as is the case for Matilda Rise and Bendigo Loop Road).

Subject to the above, and noting the condition requires the applicant to submit design drawings to CODC for certification prior to construction, we support Condition 47 but in addition we recommend that:

- A clause is added that requires Thomson Gorge Road to be upgraded up to the point of any site access to the mine (i.e., accounting for a scenario where an access is required directly from Thomson Gorge Road further south of Ardgour Rise).
- A swept-path analysis is submitted in support of the design to confirm that the designed width is sufficient to accommodate the vehicles likely to use it (including on curves and at the Ardgour Rise / Thomson Gorge Road / Access intersection.
- Accesses connecting to Thomson Gorge Road be sealed at least 2.0m back to prevent edge break and loose material migrating onto the road.

Establishment of Ardgour Rise

Condition 48 states that prior to the closure of Thomson Gorge Road an alternative must be constructed to maintain access to the Dunstan Mountains, referred to as Ardgour Rise, generally in accordance with the alignment shown on Plan 1 – Project Overview Plan. Based on CODC's

[28] https://www.doc.govt.nz/parks-and-recreation/things-to-do/walking-and-tramping/track-categories/
[29] Refer to *D.01 CODC Land Use Consent Conditions* document, Attachment B

preference that this road is vested in Council, we consider that this should form part of the consent condition and should be formed to be consistent with the 'mountainous Local Access B type' road under the CODC addendum to *NZS4404:2010 - Code of Practice for Land Development 2020,* and the *CODC Standards for Gravel Roads (March 2003)*.

5.2 Bendigo-Ophir Project Common Conditions which apply to all of the resource consents within the Jurisdiction of the Central Otago District Council and Otago Regional Council

Below are our comments on the Bendigo-Ophir Project Common Conditions which apply to all of the resource consents within the Jurisdiction of the Central Otago District Council and Otago Regional Council as they relate to transportation matters.

Management and Monitoring Plans

C13 requires *where an activity authorised by this consent is addressed in one or more of the following management plans / documents, they have been certified as part of the approval of the BOGP pursuant to section 81 of the Fast-track Approvals Act 2024 and form part of this consent, and the Consent Holder must undertake the activity in general accordance with that management plan / document:*

…b. Project Traffic Management Plan

There is no detail provided as to what should be included in this plan. As noted in our 25 February 2026 technical note, the purpose and proposed contents of the TMP were listed in MGLs response dated 13 February 2026. For ease of reference these are copied below.

The purpose of the PTMP is to manage traffic safety risks, mitigate adverse effects on the road network, protect road condition, and minimise effects on other road users and the surrounding community. Content of the PTMP The PTMP will include:

- *Traffic safety risk assessment for construction and operation.*
- *Approved site access points and travel routes, with Matilda Rise use by exception only.*
- *Forecast traffic volumes by project stage and vehicle type.*
- *Management of over-weight and over-dimension loads including routes, timing, piloting, and contingencies.*
- *Driver code of conduct covering speed, school buses, unsealed roads, and public road users.*
- *Road improvements and temporary traffic management, including RCA approvals.*
- *Pavement monitoring, repair, and post-construction rehabilitation.*
- *Traffic and pavement monitoring with quarterly reporting during peak construction (>50 heavy vehicle movements per day) reducing to annual thereafter.*
- *Road Controlling Authority Approval requirements for works in the road reserve and expected temporary traffic management plan guidance for implementation by contractors, as necessary*
- *Communication, complaints procedures, and community liaison*

As noted in our 25 February 2026 technical note, we again recommend that this should be captured in conditions of consent which is the case for other management plans put forward to mitigate effects. In addition to the above, the PTMP should also include

- The section of Thomson Gorge Road between Ardgour Rise and Matilda Rise should be treated the same as Matilda Rise. That is, given this section will not be upgraded, use of it should be by exception only.
- More frequent provision for pavement monitoring and rehabilitation. We recommend adding *'The Road Controlling Authority reserves the right to request more frequent traffic and pavement monitoring be undertaken (with subsequent rehabilitation as may be required) where this is deemed necessary to maintain the safe operation of public roads*'.

- An ongoing requirement for the applicant to provide bus services, and monitoring of uptake of the use of buses by staff given the reliance placed on buses from a traffic generation assessment perspective (that is, it has been assumed that a significant number of staff will be bussed to site which reduces the estimated level of traffic generation).
- Consideration of what steps are required to ensure children can safely wait for buses on Ardgour Road. The proposed annual bus use assessment and any mitigation (such as reducing speeds when passing children or avoiding travel coinciding with bus pick up/drop off times) should also be captured in the Construction and Project TMPs in the condition set.

C34 requires *The existing walking access to the historic Come-In-Time Battery within the Bendigo Historic Reserve must be closed to restrict access to the BOGP Project Site and, prior to closing access to Thomson Gorge Road, the Consent Holder must provide and continue to maintain alternative walking access to the Come-In-Time Battery*.

We recommend the addition of text addressing the track standard as follows. *The alternative walking access to the Come-In-Time Battery shall be formed to a standard consistent with Department of Conservation's 'easy to intermediate walking track' standard.*

Other required conditions

School bus safety

- The location of any bus stopping areas along Ardgour Road between SH8 and Thomsons Gorge Road must be reviewed including confirming there is suitable signage installed to alert drivers to the presence of children and bus manoeuvring.
- A school bus use assessment must be completed at the applicant's cost at the beginning of each year to understand the usage of Ardgour Road by school buses. The outcomes of any such assessment must be included in the PTMP to ensure ongoing safety for school children on Ardgour Road. This should include limiting the speeds of truck drivers associated with the Bendigo-Ophir project as they pass known school pick up or drop off areas when children are present, or not allowing truck movements along Ardgour Road at these times.

Ardgour Road between SH6 and Thomson Gorge Road (Ardgour Road)

- During the construction phase, Ardgour Road shall be subject to a temporary speed limit of 60km/h.
- Prior to commencement of the construction phase, Ardgour Road shall be upgraded to include a 6.0m sealed carriageway with 0.25m wide metalled shoulders on both sides.
- Detailed engineering plans shall be provided to CODC for certification prior to construction. The plans shall be supported by a swept-path analysis on the curves to check the design is adequate to safely accommodate passing of the design vehicle at an appropriate speed with satisfactory buffer between opposing vehicles, and include further seal widening on curves as required.
- A curve advisory speed assessment shall be undertaken to determine if advisory speed signage should be installed on the curves. The review should consider whether edge-line markings are also an appropriate treatment, and whether the willow trees should be removed.

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Appendix A.
Peer Review Of Road Design – Proposed Realignment of Thomson Gorge Road (Meyer Cruden report)

MEYERCRUDEN
CIVIL | STRUCTURAL | GEOTECH

20 March 2026

Quinton Penniall c/- Central Otago District Council
[redacted]

Reference: L2025074

PEER REVIEW OF ROAD DESIGN – PROPOSED REALIGNMENT OF THOMSON GORGE ROAD.

Quinton,

Meyer Cruden Engineering Ltd. (MCE) have been engaged by Central Otago District Council (CODC) to complete a review of the proposed realignment of a length of the existing Thomson Gorge Road (commonly referred to as Thomsons Track). The realignment is being proposed by Santana Minerals Ltd.

We understand the scope of works to be:

- Undertake a desktop study of the proposed route relative to CODC minimum requirements (NZS 4404 and CODC addendums) and the existing alignment.
- Complete a site walkover of the proposed route.
- Report the review findings to CODC.

The review of the realignment has been conducted in relation to a drawing titled 'Ardgour Rise Alignment and Chorus Fibre Alignment' (Ref: 24234, 09/03/2026). This is included in Appendix A. The drawing provided comprises a basic layout plan. No long-section or cross-sections have been reviewed as part of this letter.

BACKGROUND

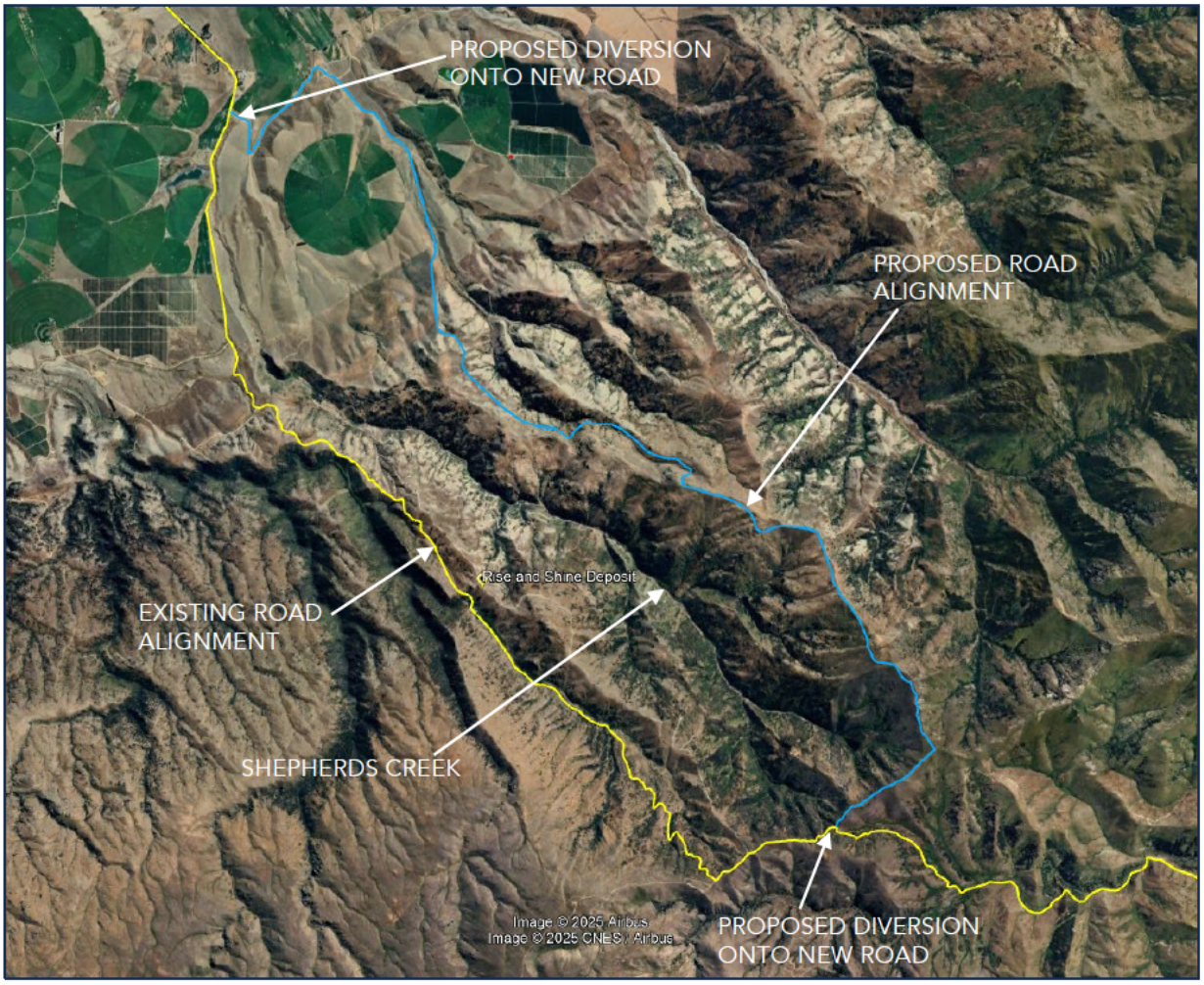
Thomsons Gorge Road is an unsealed mountain pass which connects Ardgour Road near Lindis Crossing with Racecourse Road near Omakau. The existing road passes over the Dunstan Mountains and is 28km in total length (refer Figure 1).

The proposed Santana 'Bendigo-Ophir' gold mine is located directly adjacent to part of the existing road. It has been deemed unsafe by others for a public road to pass this close to a working mine. Specifically, the road passes close to the main "Rise and Shine" gold deposit and proposed open pit. Santana is proposing to realign a length of the existing road to bypass the open pit.

The proposed new route is show in Figure 1 below. The route follows a farm track from the

Ardgour Station Woolshed before heading south where it meets the foothills of the Dunstan Mountains. The route then generally follows a ridgeline on the east side of Shepherds Creek before crossing Thomsons Saddle and rejoining the existing Thomson Gorge Road. The southernmost 1.2km of the route is on Department of Conservation (DOC) land, the rest is on Ardgour Station land.

Figure 1: Existing and Proposed Road Alignment



CODC RELEVANT STANDARDS AND MINIMUM REQUIREMENTS

We have reviewed the proposed route in relation to the following standards:

- CODC addendum to NZS4404:2010 - Code of Practice for Land Development 2020 (COP) [1]. Specifically, the guidance in Table 3.2.
- CODC Standards for Gravel Roads (March 2003) [2], specifically relating to a 'Track' and 'Access Road' based on Table 1 of the standards.

In Table 3.2 (see Figure 2 below), a number of road types are presented for a 'Rural' road. The type which most closely aligns with Thomson Gorge Road is Local Access B. Specifically a 'mountainous' Local Access B type road.

Figure 2: Table 3.2(a) - Road Standards - Rural from the CODC Addendum to NZS4404:2011

Table 3.2(a) Road Standards – Rural

Type of Road	Topography	Traffic (ADT) or Number Lots	Number of Traffic Lanes	Carriageway Width (m)	Shoulder Width (m)	Design Speed (kph)	Maximum Longitudinal Grade	Minimum Road Reserve Width (m)	Type of Surface
Collector	Flat	> 500	2	7.0	0.25 metal	100	4%	20	Seal
	Rolling		2	7.0		100	6%	20	Seal
	Mountainous		2	7.0		70	10%	20	Seal
Local Sealed	Flat	300-500	2	6.5	0.25 metal	100	4%	20	Seal
	Rolling		2	6.5		90	6%	20	Seal
	Mountainous		2	6.5		60	10%	20	Seal
	Flat	150-300 > 15 lots	2	6.0	0.25 metal	100	4%	20	Seal
	Rolling		2	6.0		80	6%	20	Seal
	Mountainous		2	6.0		50	10%	20	Seal
Local Gravelled	Flat	<150 ≤ 15 lots	2	6.0	Nil	80	Flat	15	Gravel
	Rolling		2	6.0		70	6.5%	20	Gravel
	Mountainous		2	6.0		50	10%	20	Gravel
Local Access A	Flat	50-150	2	5.5	Nil	70	Flat	15	Gravel
	Rolling		2	5.5		60	10%	20	Gravel
	Mountainous		2	5.5		30	12.5%	20	Gravel
Local Access B	Flat	< 50	1	4.5	Nil	70	Flat	15	Gravel
	Rolling		1	4.5		50	10%	20	Gravel
	Mountainous		1+	4.5+		30	12.5%	20	Gravel
Right of Way	Flat	< 6 lots	1	4.5	Nil	20	8%	10	Gravel
	Rolling		1	4.5		20	12.5%	10	Gravel
	Mountainous		1+	4.5+		20	16.7%	10	Seal

For a Local Access B type road, the CODC standards limit the maximum longitudinal grade to 12.5%. The target carriageway width is 4.5m. This is in line with the existing road carriageway width.

LENGTH AND VERTICAL ALIGNMENT OF PROPOSED ROUTE

We have used Google Earth Pro [4] to analyse the length and vertical alignment of the proposed new route.

The length of the existing Thomson Gorge Road to be bypassed is 12.2km long, of which the first 3.3km passes through generally sub-horizontal farmland. The 'mountainous' section of the existing route is approximately 8.8km long.

The proposed new route is 13.6km long. The first 3.9km passes through generally sub-horizontal farmland. The 'mountainous' section of the new route is approximately 9.5km long. The proposed realignment results in an overall increase in length of 1.2km, of which 0.7km is 'mountainous'. This equates to a length increase of approximately 10%.

Table 1: Comparison of road lengths – data from Google Earth Pro [4].

Road	Total Length (km)	Mountainous Length (km)
Existing Route	12.2	8.8
Proposed Route	13.6	9.5

An assessment of the vertical alignment was carried out using Google Earth Pro [3]. This is not as accurate as a specific topographic survey and design approach, however, it still gives a useful estimate of the longitudinal grades. This assessment is shown in Appendix B as an elevation profile.

The elevation profile shows that a 6.7km long section of the route from the start of the 'mountainous' section to the high point of the route has an average longitudinal grade of 13.2%, this exceeds the CODC maximum grade of 12.5%. We have also identified two long, sustained sections (one 820m long, the other 910m long) which have average gradients of 17.1% and 18.7% respectively. This is well in excess of the maximum of 12.5%.

We have carried out a gradient assessment of the existing Thomson Gorge Road route and other similar "back-country" and ski field roads to provide a comparison with the proposed route.

Again, Google Earth Pro was used to assess the grades. The comparison was completed as an average grade over the 'mountainous' section of each road. A summary of the different roads is shown in Table 2 below.

Table 2: Comparison of the existing Thomson Gorge Road and other similar 'back-country' roads

Road	Total Length	Average Grade
Proposed Thomsons Track *(northern side to summit)*	6.7km	13.2%
Existing Thomsons Track *(northern side to summit)*	8.8km	9.7%
Blue Mine Track	3.6km	10.9%
Treble Cone Road	7.3km	14.7%
Ohau Ski Field Road	8.9km	12.9%
The Nevis Road *(east side)*	9.8km	9.9%
The Nevis Road *(west side)*	7.3km	9.4%

The above table shows that the proposed alignment is on average steeper than most of the 'back-country' roads assessed. Only the Treble Cone Road has a steeper average gradient than the proposed route.

SITE WALKOVER OF PROPOSED ROUTE

A route walkover was completed by representatives from Meyer Cruden and Santana on the 5th of June 2025. This was in advance of the provision of this plan. The walkover followed the same general alignment as shown on the plan in Appendix A. The proposed route generally passes along a ridgeline which has a steeply sloping northeast face and a less steeply sloping southwest face. Much of the route follows existing farm tracks along the southern side of the ridge. Generally, only minor earthworks would be anticipated to widen the existing tracks to form the proposed route.

The two long, steep sections mentioned above were investigated. It is likely that extensive earthworks and multiple switchbacks would be required to form these sections to CODC standards.

HORIZONTAL ALIGNMENT

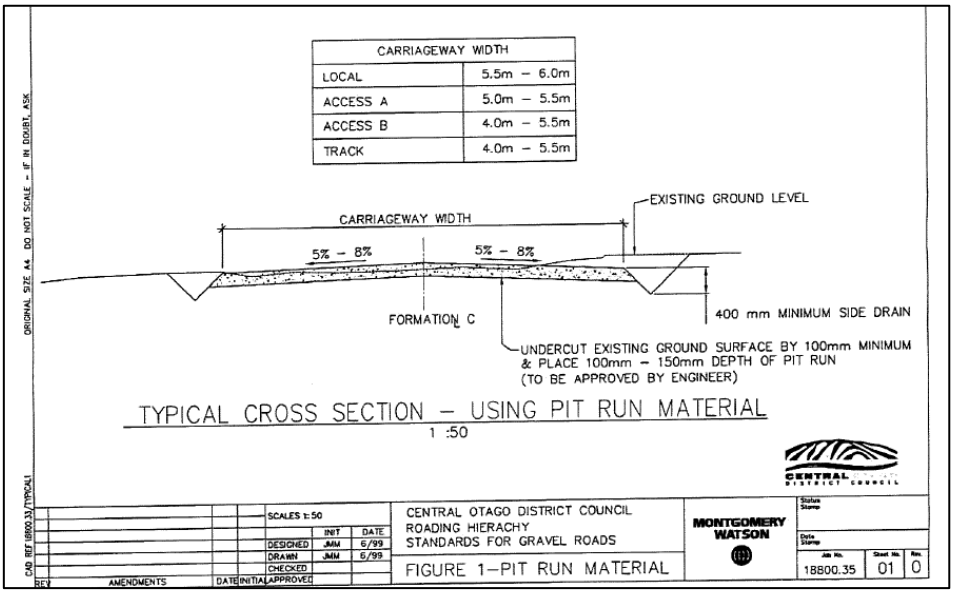
The plan provided does not include any details of horizontal curve radii.

Section 4.2 of the CODC's Standards for Gravel Roads requires "minimum horizontal curve radius such that a truck and trailer unit can safely negotiate curves in one pass". For horizontal curves less than 25m radius a carriageway width of 7m is required.

CROSS-SECTION GEOMETRY

The plan provided does not include cross-section information. Any cross-section design should follow the guidance in the CODC Standards for Gravel Roads, specifically Table 1 of the standards. An extract showing the typical cross-section is included in Figure 4 below.

Figure 3: Extract from Standards for Gravel Roads showing a typical cross-section



STORMWATER

The plan provided does not include any details of stormwater management proposed.

Generally, the proposed route follows a ridgeline from 7.4km (based on the northern end being the start of the route, i.e. 0km) to the southern end of the route and there is minimal upstream catchment to generate surface water runoff. However, at 7.2km the road crosses the bottom of a catchment approximately 31Ha in size. In addition to this, from 5.6km to 7.2km the road runs along a bench on the side of a valley with an upstream catchment to the west. The road crosses several small gullies along this section, all of which will capture surface water runoff generated from the upstream catchments.

Culverts should be specifically sized for each catchment to manage the runoff and need to also meet the absolute minimum requirement of 300mm diameter. The design of the culverts should follow CODC standards. The relevant standard is NZS4404, including CODC's addendums.

The Standards for Gravel Roads' typical cross-section geometry (shown in Figure 4 above) should be followed for sizing of side drains. "Cut outs" to remove water build up from side drains will also be required to avoid excessive flow in these drains.

SIGHT DISTANCE

Table 1 within the Standards for Gravel Roads requires a forward sight distance of 40m for a 'mountainous track'.

We have not completed a detailed sight line assessment. However, there are very few switchbacks and sharp turns along the route. As per Section 4.1 of the Standards for Gravel Roads, "where the terrain governs the sight distance the road shall be sufficient to enable two vehicles to pass safely. In these circumstances the width shall be a minimum of 5.5m". Carriageway widths should be extended where needed to meet this requirement.

PAVEMENT

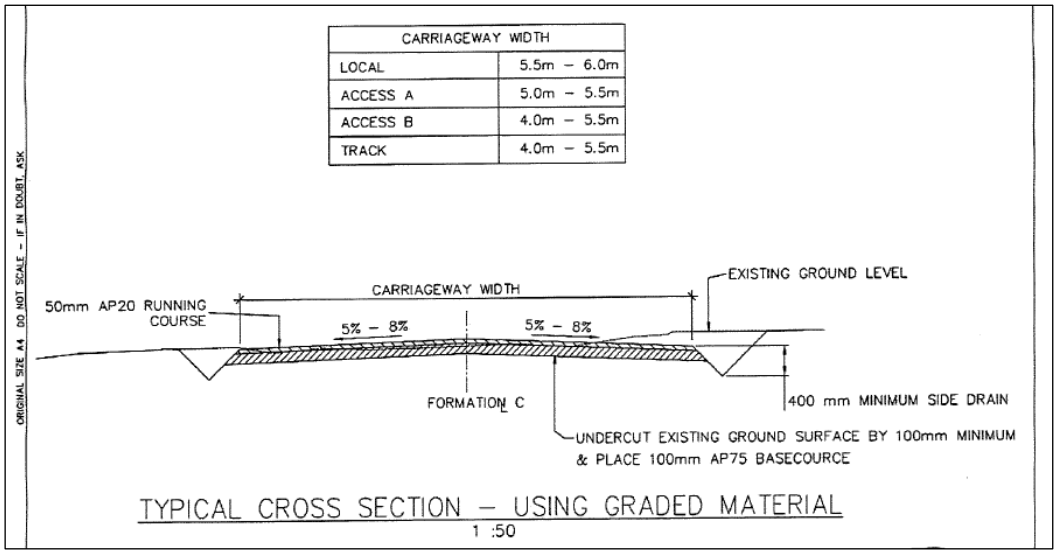
Section 8 of the Standards for Gravel Roads provides two options for the pavement.

- Option 1 - 50mm AP20 over 100mm AP75, see Figure 5 below.
- Option 2 - 100-150mm depth Pit Run (no topsize specified), see Figure 4 above.

Of these two options we recommend Option 1, subject to an aggregate containing a clay fraction being used to produce the AP20 and the AP75. The presence of the clay will help keep the pavement bound during drier periods.

We recommend that at least the AP20 be produced by crushing to improve interlock and shear resistance. This will help the pavement maintain shape during wet periods.

Figure 4: Extract from Standards for Gravel Roads for a cross-section using graded material (Option 1 above).



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CONCLUSIONS

We have reviewed the proposed Thomson Gorge Road realignment in reference to current CODC design requirements. We have also compared the proposed realignment to the existing road alignment and other 'back-country' roads in the district.

The plan provided has insufficient information to assess it against all relevant CODC standards. Our assessment focused mainly on the vertical alignment.

The vertical alignment of the proposed route falls well short of the current CODC minimum standard. The mountainous section has an average grade which exceeds CODC's max grade limit of 12.5%, of which two sections (nearly 1km long each) have a average grades of 17.1% and 18.7%. This is well in excess of the 12.5% maximum grade.

The proposed route is 1.4km longer than the existing route and has a higher average gradient over the mountainous section. The proposed route also has a higher average gradient than many other 'back-country' roads in the area.

Whilst the existing Thomson Gorge Road also falls short of current standards it needs to be considered in the context that it was formed over 100 years ago. In this respect it does not necessarily represent an acceptable standard on which to base the design of a new alternative route.

As it is though, this road is predominantly used by recreational users and is not a 'commuter' route. The proposed route would provide additional amenity value for recreational users such as cyclists, walkers and 4WD enthusiasts as views are better.

This letter does not consider safety barriers and signage as those details have not yet been provided by Santana Minerals Ltd. CODC's own standards in relation to these matters are not wholly defined for unsealed roads.

Regards,

Archie Reed
MEng (Hons)

REFERENCES

[1] CODC, "CODC Addendum to NZS 4404:2004," 2004.

[2] CODC, "Standards for Gravel Roads," 2003.

[3] NZS, "4404:2010 Land Development and Subdivision Infrastructure," 2010.

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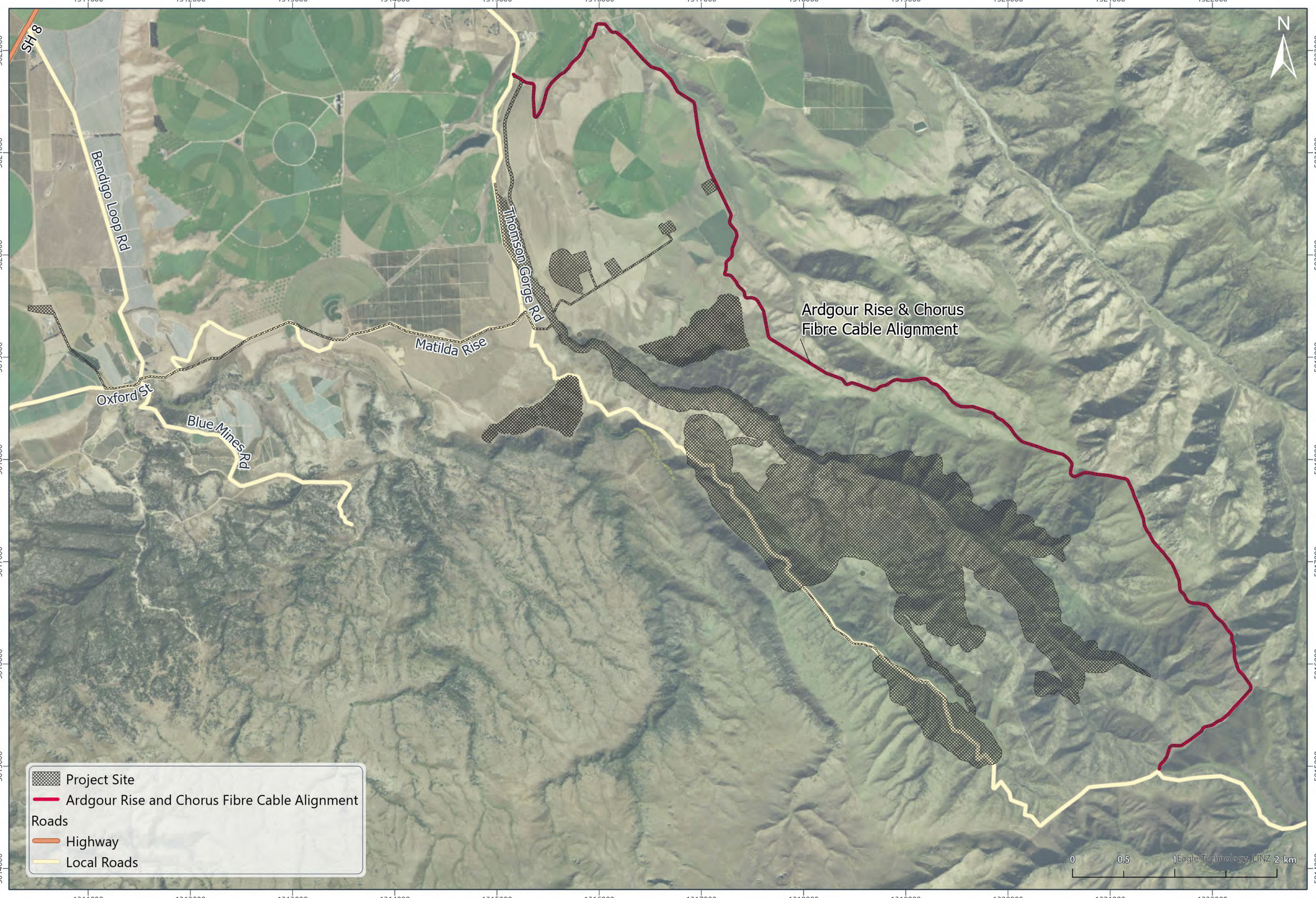
APPENDIX A – PLAN OF PROPOSED ROUTE



NZGD 2000 New Zealand Transverse Mercator | SCALE: 1:32,000 @ A3

ARDGOUR RISE ALIGNMENT AND CHORUS FIBRE ALIGNMENT

JOB ID: 24234 | CLIENT: Matakanui Gold Limited | 9/03/2026 | VERSION: 15

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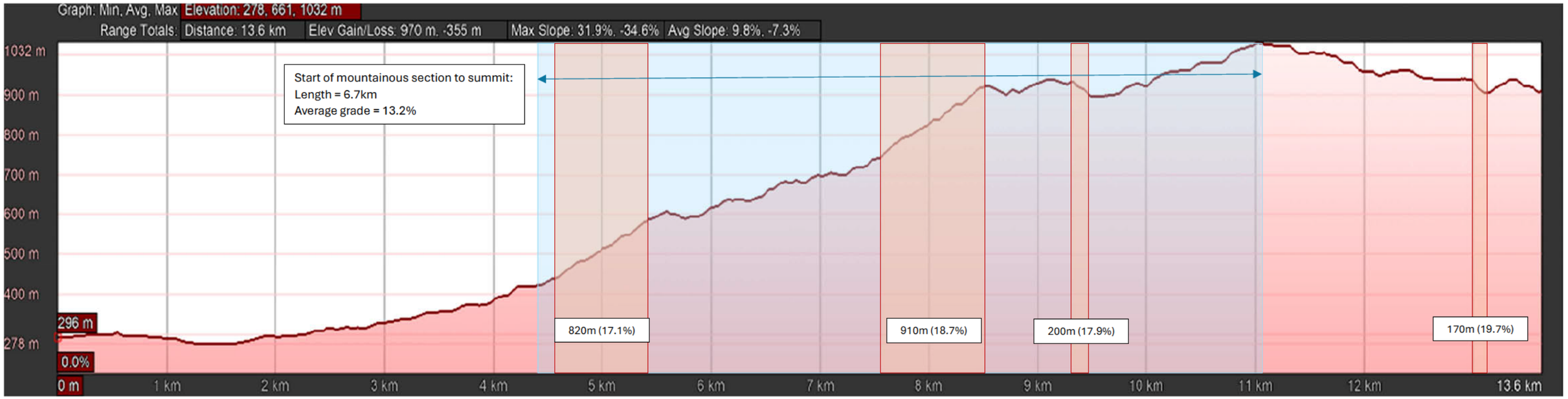
APPENDIX B – ELEVATION PROFILE OF PROPOSED ROUTE

PROPOSED THOMSONS TRACK ALIGNMENT ELEVATION PROFILE

Note: Extract of elevation profile with steep sections highlighted.



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