Auld Creek Project

Site Access Options Assessment

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Rua Gold

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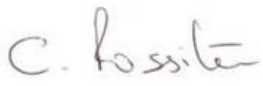

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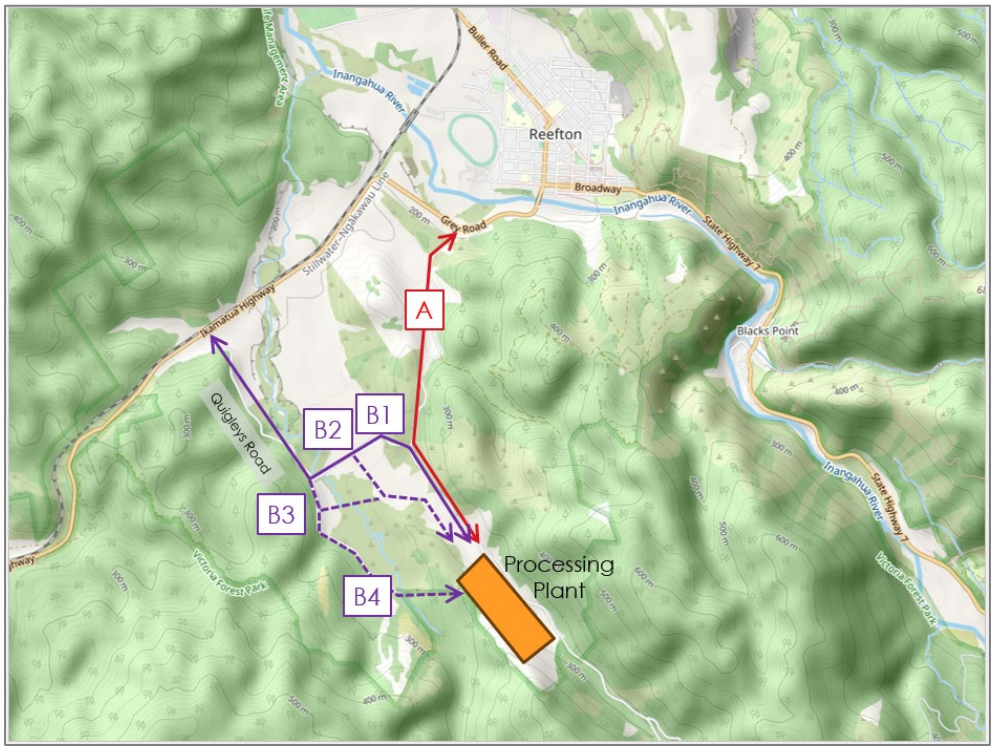
Executive Summary

The Rua Gold Auld Creek Project proposes to establish a new underground mine south of Reefton to access gold and antimony deposits. The mine portal and a new processing plant will be established on rural land south of Soldiers Big River Road. This report provides a preliminary assessment of potential vehicle access routes to the processing plant.

The following figure shows that there are broadly two route choices to the site from State Highway 7 (SH7). Option A follows Soldiers Big River Road passing residential properties and established activities. The second group of options are based on access via Quigleys Road, a private forestry road. There are a range of potential route choices to the site from Quigleys Road that use different lengths of public road and have different river crossing requirements.



Overall, access via Quigleys Road is preferred to access via Soldiers Big River Road because it will have less effect on existing, established activities. Using Soldiers Big River Road would require significant works along the road to either widen or provide passing bays. There may be some consenting risks associated with this as the formed road is not wholly within the legal road reserve.

Since Quigleys Road is a private road, access can be controlled and the existing track can be widened to meet the demands of the Project. Options B1 and B2 will require a new river crossing to be constructed on Harwood Road immediately downstream of the confluence of the two streams through the valley. Options B3 and B4 will each require two river crossings but these would be shorter than the Harwood Road crossing because of their position upstream and because they cross a single stream only.

Options B2, B3 and B4 are considered preferrable to Option B1 as they make less use of the public road network. The final route choice will require more detailed investigation of the river crossings and infrastructure required.

Since Soldiers Big River Road follows an alignment through the proposed location of the mine's surface infrastructure, it is proposed that the road is re-aligned around the western side of the infrastructure so that there is no need for public access to the plant site and avoids the potential for conflict with any mine vehicles. The proposed deviation will increase journey lengths by about 300 m and journey times by about 40 s. This level of change would not be noticeable to drivers using the road to access destinations such as the Alburns Track car park.

Overall, it is considered that forming a safe and practical access to the site is feasible with a route via Quigleys Road being preferred.

Acronyms / Abbreviations

Acronym / Abbreviation	Full Name
BDC	Buller District Council
NZTA	NZ Transport Agency
SH7	State Highway 7
vpd	Vehicle movements per day
vph	Vehicle movements per hour

1 Introduction

Rua Gold Auld Creek Project proposes to establish a new underground mine south of Reefton to access gold and antimony deposits. The mine portal and a new processing plant will be established on rural land south of Soldiers Big River Road.

This report provides a review of vehicle access options to the processing plant and mine portal. It has been structured to provide an overview of the surrounding transport network to provide site context before setting out the access options and identifying a preferred option.

2 Site Context

2.1 Site Location

Figure 2-1 shows the site location south of Reefton. The processing plant will be located on a generally level area of farmland on the southwestern side of Soldiers Big River Road. The mine portal will be located on the opposite side of the road.

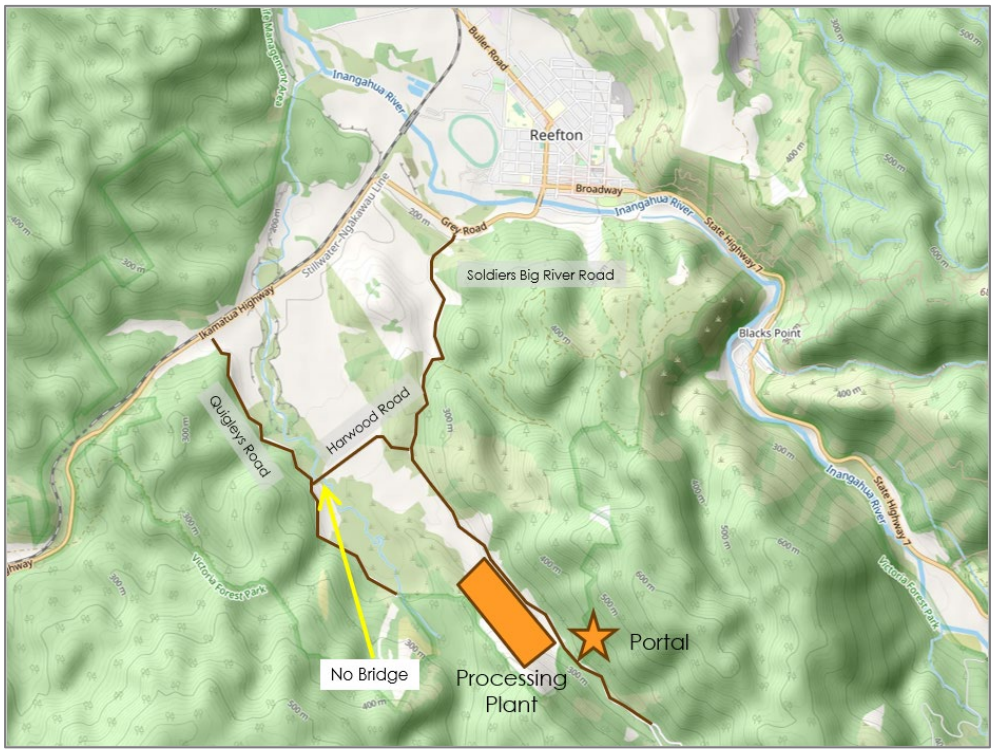


Figure 2-1: Site Location

Soldiers Big River Road is the only public road passing the site. It links to State Highway 7 (SH7) on the outside of a small radius curve less than 1 km from Reefton. Harwood Road runs from Soldiers Little River Road to the west and historically would have provided access to Quigleys Road, a private forestry road, along the western side of the valley. Although the legal alignment of Harwood Road crosses the river east of Quigleys Road, currently there is no bridge or formed crossing.

2.2 Surrounding Activities

There are multiple small farms and lifestyle properties with access from Soldiers Big River Road. Other activities include:

- The Tai Poutini Polytechnic Reefton Campus is located off Harwood Road but it is understood that this site is due to be closed.
- The Reefton Lookout Point is accessed via a 2.6 km long, narrow gravel road from Soldiers Big River Road about 1 km south of SH7.
- A small riding stable is located less than 1 km from SH7
- The Alborns Track car park is located some 7.6 km from SH7 along Soldiers Big River Road.

3 State Highway 7

3.1 Highway Formation

SH7 forms one of two east-west routes across the central South Island. It connects State Highway 1 on the East Coast about 60 km north of Christchurch with Greymouth on the West Coast via Lewis Pass. Within Reefton, SH7 connects with State Highway 69 which joins State Highway 6 to the north. Between Reefton and Greymouth, SH7 connects the smaller settlements such as Ikamatua, Ahaura and Stillwater.

South of Reefton, SH7 has been formed as a two-lane, rural highway with a sealed carriageway width of about 7 m. The road has been marked with a centre line and edge lines but does not include sealed shoulders (Photograph 3-1). There are grassed berms on each side of the road.

Photograph 3-1: SH7 west of speed threshold

The speed limit is 70 km/h between the Inanguhua River Bridge in Reefton and a position about 80 m west of Soldiers Big River Road and then increases to 100 km/h (Photograph 3-2).

Soldiers Big River Road meets SH7 on the outside of a small radius curve with a 55 km/h advisory speed at a priority intersection (Photograph 3-3). The intersection has no right turn bay or no seal widening opposite the side road which means that any right turning vehicle that stops in the carriageway could temporarily obstruct through movement.

Photograph 3-2: 100 / 70 km/h speed threshold

Photograph 3-3: SH7 / Soldiers Big River Road intersection

There is an unobstructed sightline to the west from Soldiers Big River Road but the sight distance to the east is about 130 m. This is below the desirable minimum Safe Intersection Sight Distance (SISD) for a

70 km/h road of 160 m but does meet the recommended SISD for a 60 km/h approach speed. The SISD for a vehicle waiting to turn right into Soldiers Big River Road is constrained by the curve to less than 100 m.

3.2 Traffic Volumes

Figure 3-1 shows the average, 90th percentile and 98th percentile daily traffic volumes recorded by NZTA on SH7 south of the Inangahua River. The average daily volumes have risen from about 1,200 vehicles per day (vpd) in 2022 to nearly 1,400 vpd in 2025. The higher traffic volumes recorded in 2024 is likely to be directly attributable to higher truck volumes over the first seven months of the year because the railway between Ngakawau on the West Coast and Ikamatua was closed for repairs and required coal from the Stockton mine to be transported by road rather than rail.

Figure 3-1: Annual traffic volumes on SH7 South of Inangahua River

The large differences between the average daily volumes and 90th percentile volumes indicates that there are strong seasonal variations in the daily flows. This can be seen in Figure 3-2 which shows that weekday day volumes are lowest during the winter months, typically ranging from 1,100 vpd to 1,300 vpd, and highest during the summer months with average volumes of over 1,700 vpd.

Figure 3-3 shows hourly flows recorded over a week-long period in February 2025. It indicates the hourly volumes rise through the morning from about 50 vehicles per hour (vph) at 6:00 AM on weekdays to a peak of about 150 vph in the early afternoon before falling to below 50 vph by 7:00 PM.

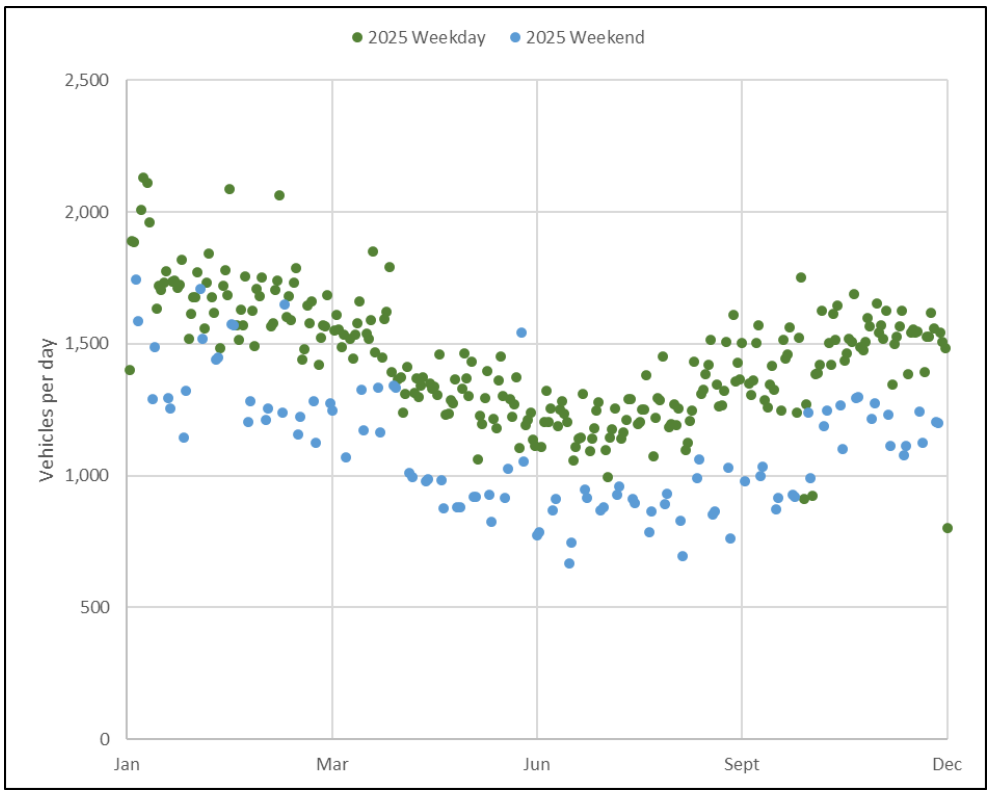


Figure 3-2: Daily volumes on SH7 South of Inangahua River in 2025

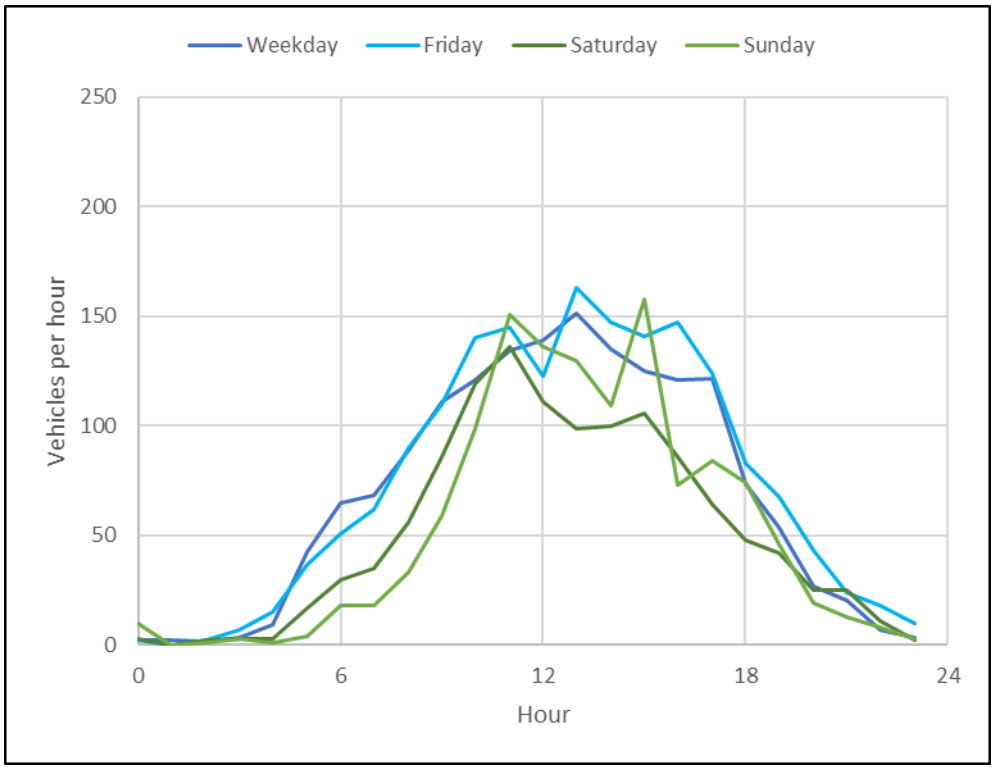


Figure 3-3: Hourly flows in February 2025

3.3 Road Safety

3.3.1 Road Safety Record

Figure 3-3 shows the locations of the six crashes reported on SH7 close to the site over the five year period 2021 to 2025. One serious injury crash was reported which required the driver to be taken to hospital due to her distressed state and possible head injury. The crash report suggests that the driver had intended to pull over to the side of the road but slid into the adjacent ditch. No other vehicles were involved.

A minor injury crash was reported at the Devil's Creek bridge along a straight section of highway. The crash report indicates that the driver fell asleep at the wheel and the vehicle has gone off the road.

Three crashes have been reported at a curve in the highway with a 65 km/h advisory speed with one crash causing minor injuries to a motorcyclist who attempted to negotiate the corner at high speed and lost control. The other crashes at the bend were also due to drivers travelling at excess speed. The non-injury crash at Soldiers Big River Road was attributed to a loss of control due to excess speed with alcohol as a contributing factor.

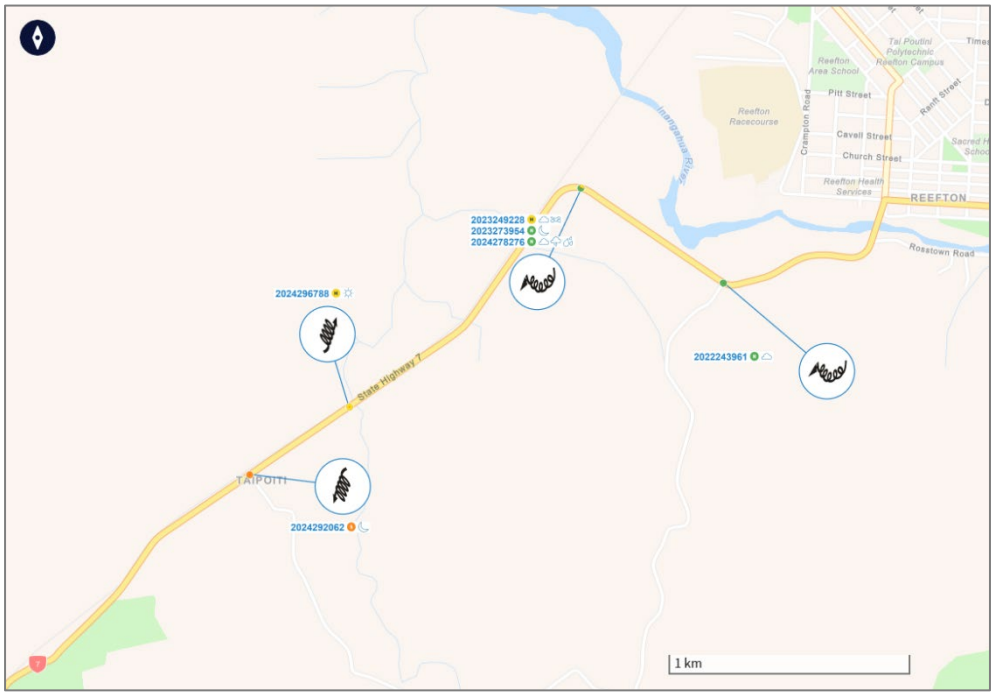


Figure 3-4: Crash Locations 2021 to 2025

3.4 Safety Risk Ratings

SH7 south of Reefton has a Medium Infrastructure Rating Risk which reflects the lack of sealed shoulders, grassed berms and small radius bends. This contributes to the Medium to High personal risk rating and Medium collective risk rating on the road.

The primary hazards along the road relate to the lack of shoulders and grassed berms which increases the risk of drivers losing control if their vehicle leaves the traffic lane. The presence of drains and power poles beside the highway represent impact hazards for vehicles in the event of a crash.

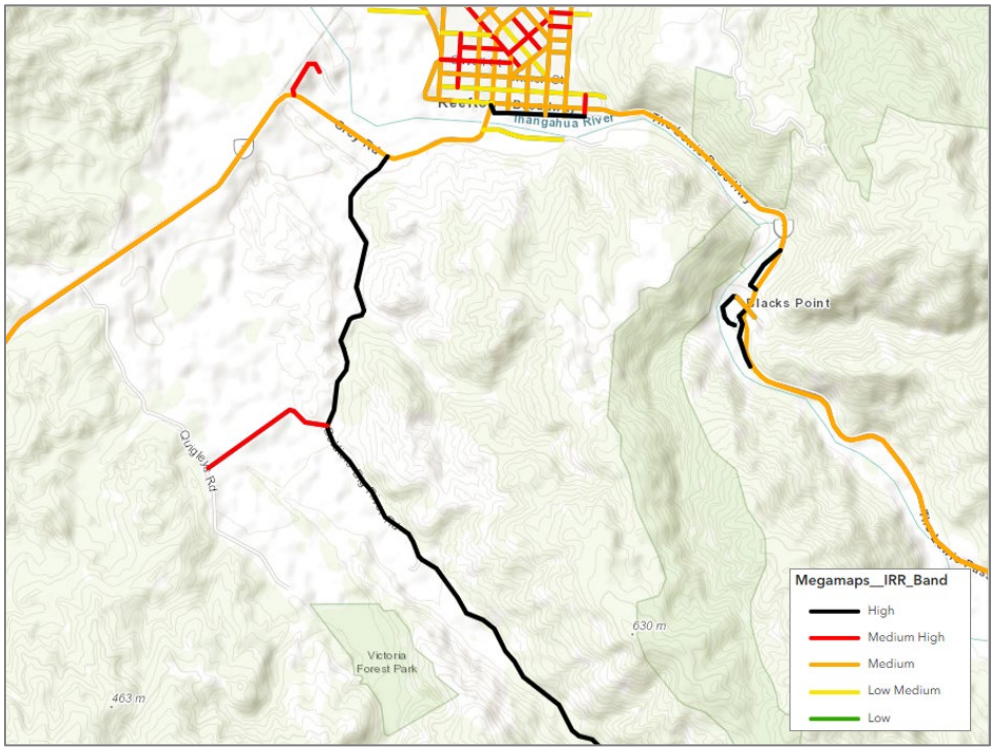


Figure 3-5: NZTA Infrastructure Rating Risk

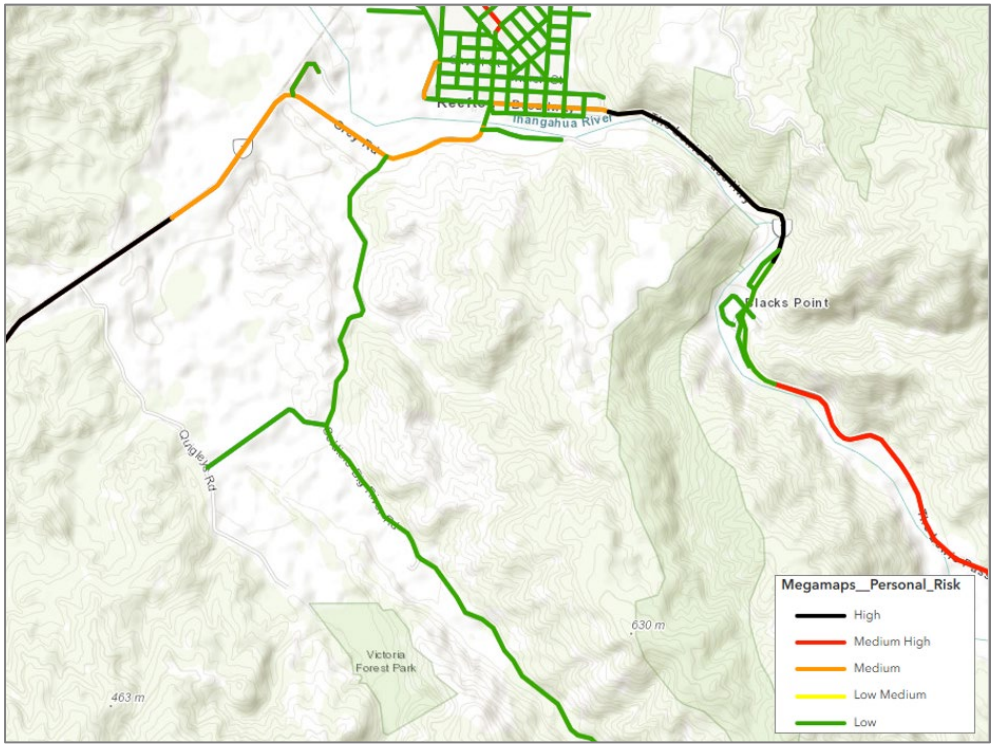


Figure 3-6: NZTA Personal Risk Rating

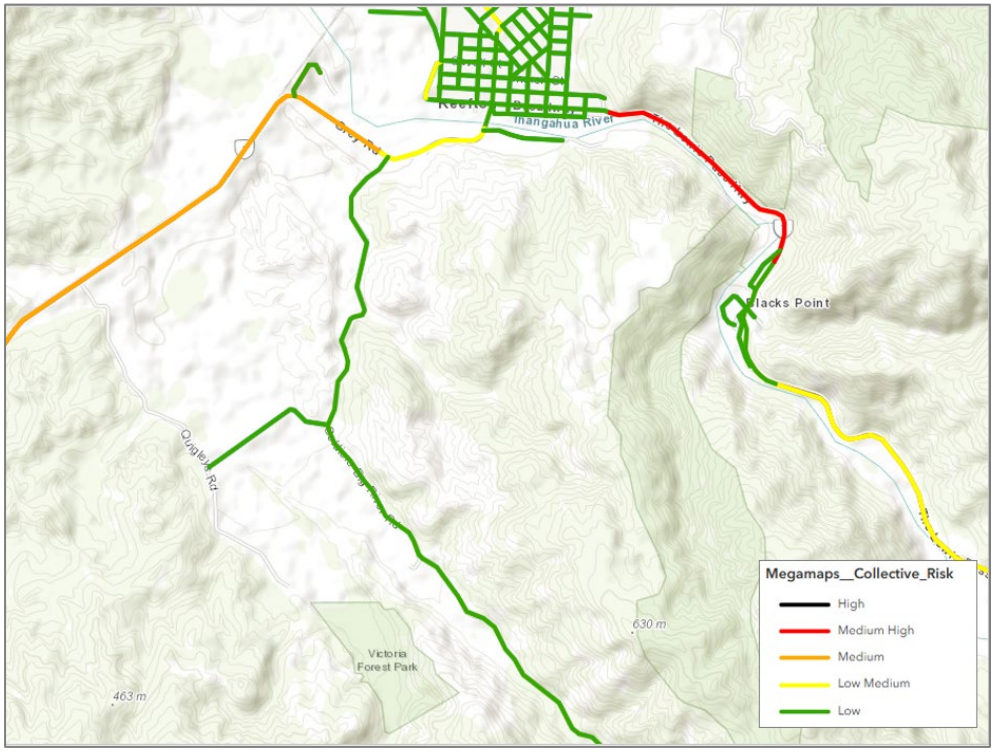


Figure 3-7: NZTA Collective Risk Rating

4 Local Roads

4.1 Soldiers Big River Road

Soldiers Big River Road has an approximate 6 m wide sealed carriageway on its approach to SH7 (Photograph 4-1) but narrows to 4.0 to 4.5 m to the south (Photograph 4-2). The road is sealed for a distance of about 1.3 km and is gravelled thereafter.

Although there are no speed limit signs on Soldiers Big River Road, the national speed limit register indicates that it is subject to the 100 km/h rural road limit. In practice, since the road has been formed with an undulating and winding alignment, vehicle speeds are much lower and an operating speed of 40 to 50 km/h is considered more likely.

The road does not include any provision for passing manoeuvres. In the event that a driver meets another vehicle, it will be necessary for one vehicle to use the grassed shoulders to pass or for one vehicle to reverse to a position where passing is possible.

Traffic volumes on the road are estimated to be about 60 vpd.

Photograph 4-1: Soldiers Big River Road approach to SH7

Photograph 4-2: Soldiers Big River Road south of SH7

4.2 Harwood Road

Harwood Road primarily provides access to the Tai Poutini Polytechnic Reefton Campus and has been formed as a gravelled road (Photograph 4-3 and Photograph 4-4). It meets Soldiers Big River Road at an uncontrolled intersection. South of the campus, the road continues to Devils Creek. There is no formed crossing at the river (Photograph 4-5). There is evidence of an old bridge structure but it is unknown when this was washed away. Recent storms have eroded the eastern bank making the approach to the river very steep. South of the river, the road continues as a farm track to Quigleys Road (Photograph 4-6).

Photograph 4-3: Harwood Road north of campus access

Photograph 4-4: Harwood Road north of campus access

Photograph 4-5: Harwood Road / Devils Creek crossing

Photograph 4-6: Harwood Road south of Devils Creek – looking toward Devils Creek

4.3 Quigleys Road

Quigleys Road is a private forestry road that meets SH7 along a straight section of the highway with a gentle gradient (Photograph 4-7 and Photograph 4-8). The road has been formed with a 3.0 to 3.5 m wide gravelled surface (Photograph 4-9 and Photograph 4-10) and currently provides access to a single residential property. Between SH7 and Harwood Road, Quigleys Road has a level grade with a gently winding horizontal alignment.

Photograph 4-7: SH7 / Quigleys Road access

The straight alignment of the highway means that the available sight distances exceed 300 m which is appropriate for a 100 km/h road.

Photograph 4-8: SH7 at Quigleys Road

Photograph 4-9: Quigleys Road north of Harwood Road

Photograph 4-10: Quigleys Road south of Harwood Road

4.4 Road Safety

4.4.1 Crash Records

The NZTA Crash Analysis System includes records of only three crashes on the local road network (Soldiers Big River Road and Harwood Road) in the ten year period 2016 to 2025. Two crashes were reported at the SH7 intersection and one at the Harwood Road intersection with Soldiers Big River Road. Each of the crashes involved a single vehicle only and the crash reports indicate that alcohol was a likely contributing factor.

Although there have been very few crashes reported, this primarily reflects the very low traffic volumes, rather than the lack of hazards on the roads.

4.4.2 Safety Risk Ratings

The local roads have narrow carriageways and few opportunities to pass opposing traffic. There are grassed berms and drains either side of the road which means that a driver may not be able to recover control in the event that a vehicle leaves the carriageway.

The winding nature of the roads and unsealed surface means that vehicle speeds are less than 50 km/h which will reduce the potential for serious injury in the event of a crash.

5 Auld Creek Project Traffic Generation

5.1 Establishment Phase

Figure 5-1 shows the indicative layout of the surface infrastructure for the mine which will be located broadly between Soldiers Big River Road and Devil's Creek. For safety reasons, it is proposed that Soldiers Big River Road is re-aligned around the western side of the mine infrastructure to minimise the potential for any conflicts arising between general public vehicle movements and mine vehicles. The re-alignment will affect approximately 1.2 km of the public road network.

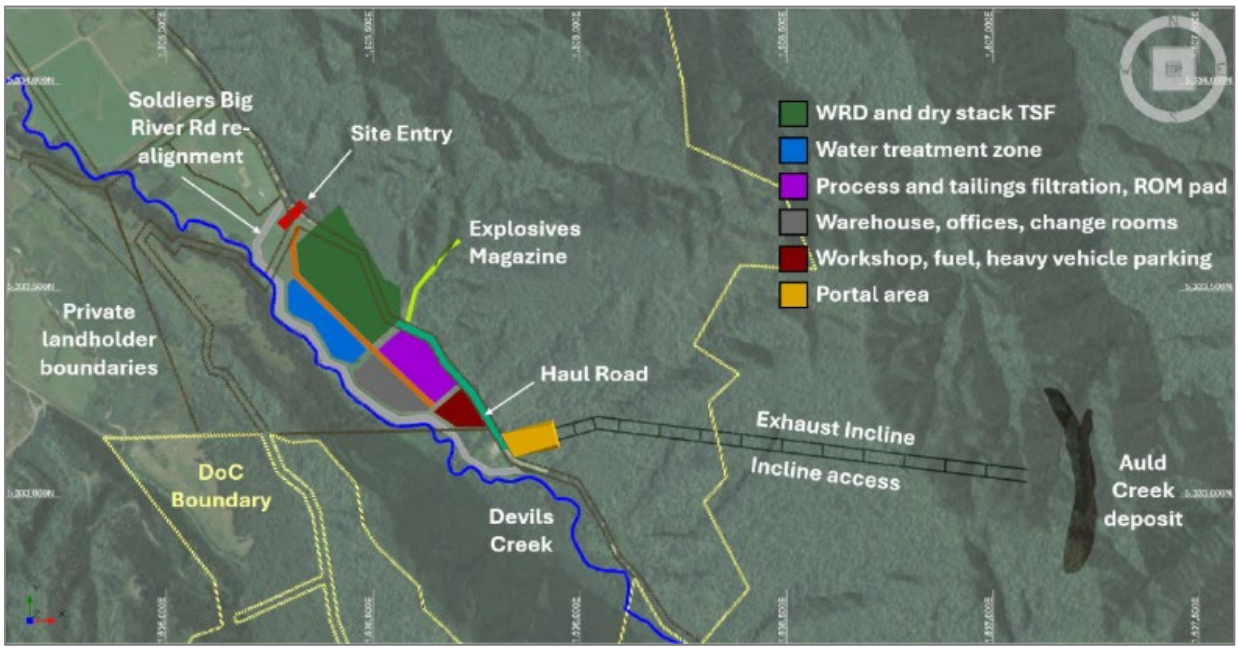


Figure 5-1:Indicative site layout

The construction works for the site establishment are expected to take about 12 months and involve an average of 60 people being on site with a peak of 100 people. Construction workers will be encouraged to share vehicles for site travel to reduce the number of vehicle movements to and from the site. Peak hourly construction volumes of up to 30 vph can be expected early in the morning and late afternoon as workers arrive on site and subsequently leave.

Material deliveries to the site for the construction works are expected to generate 20 heavy vehicle movements per day on average, that is 10 deliveries. These movements are expected to be spread across the day and on that basis, peak heavy vehicle movement volumes of 2 to 3 per hour can be expected. Days with a concrete pour will generate higher volumes of truck movement but these will be single unit trucks rather than articulated trucks. Concrete pours would normally be planned for the early morning and completed before midday.

Overall, the construction works could generate about 50 light vehicle movements per day on average based on a minimum vehicle occupancy of two people and about 20 heavy vehicle movements per day on average.

5.2 Operational Phase

The Auld Creek Project is expected to employ about 200 people in total. This will broadly comprise about 50 office-based people that will work during the day only on weekdays and 150 people working on a rotating shift pattern. Based on this level of employment, the Project will generate a typical daily demand for 150 people to travel to and from the site.

It is understood that buses or minivans will be provided for travel from Reefton and Greymouth to minimise the need for independent private vehicle travel to the site. For the purposes of this assessment and to be conservative, an average bus capacity of 30 passengers has been adopted. If 80% of workers travel by bus with the balance being by private vehicle, the staff travel could generate about 30 to 40 vehicle movements per day (vpd) with 12 of these being buses.

Service vehicle movements, deliveries and other movements could generate 20 heavy vehicle movements per day (two-way).

6 State Highway Access Requirements

6.1 NZTA Planning Policy Manual

NZTA issued new guidance for the design of accesses to private property in September 2025 as an update to its Planning Policy Manual (PPM)). The relevant extract from this guidance is replicated in Figure 6-1. Since the daily traffic volumes on SH7 are typically below 2,000 vpd and the Auld Creek Project is expected to generate less than 150 vpd, the PPM guidance indicates the Diagram C Highway intersection design configuration (Figure 6-2) 'may' be appropriate.

The PPM then goes on to identify that given the site traffic generation involves more than 50 vpd and 1 heavy vehicle movement per day, then Diagram E design configuration (Figure 6-3) is required. (NOTE: There is a potential inconsistency in the PPM guidance between the guidance diagram and subsequent notes.) The Diagram E Access Treatment requires that the carriageway is widened opposite the access over a distance of 90 m either side of the access to provide a minimum width of 6 m between the centre line and edge of seal. For SH7, this means widening the carriageway by 2.5 to 3.0 m.

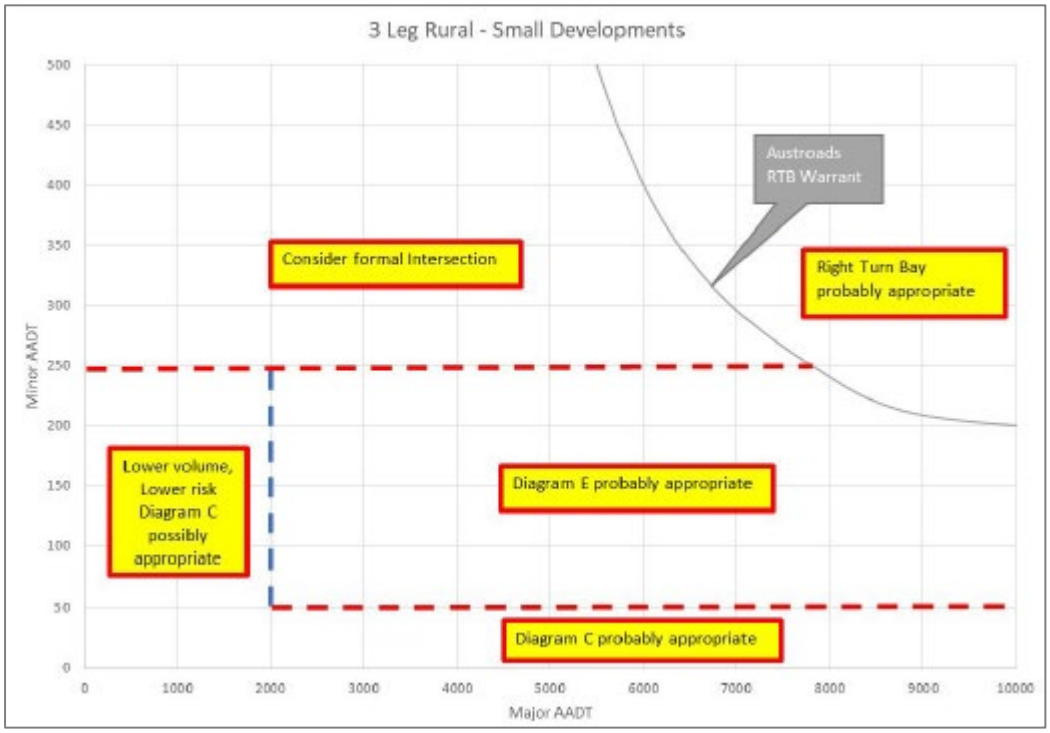


Figure 6-1: Low Volume Rural Access Treatments

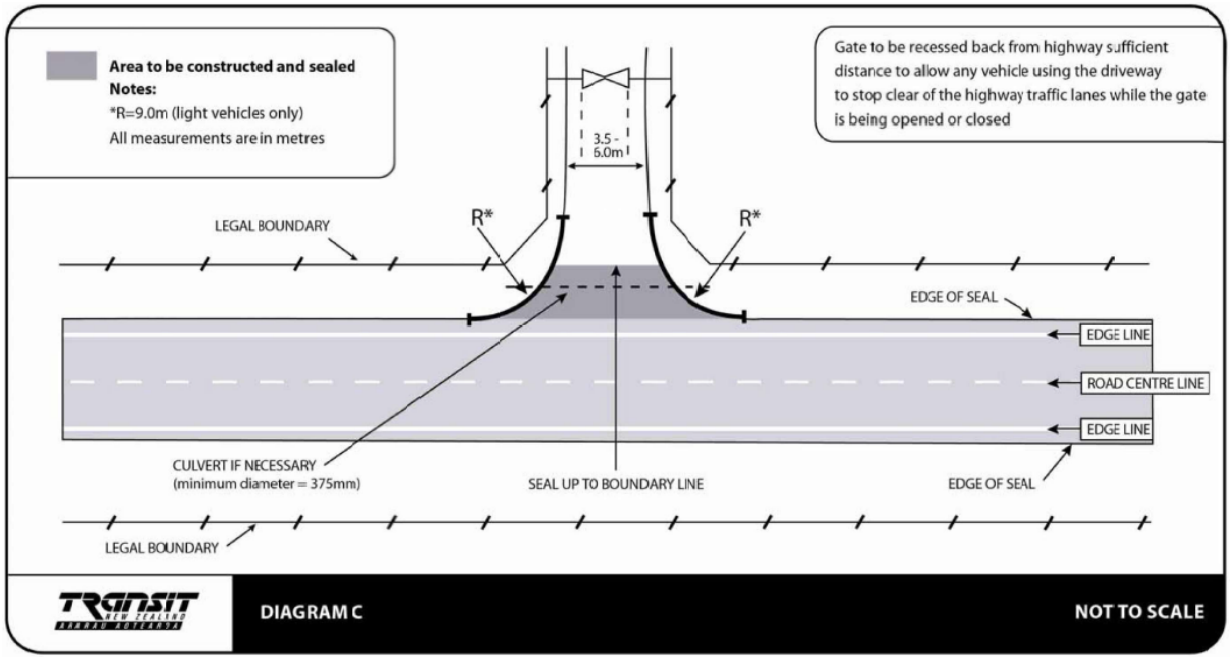


Figure 6-2: PPM Diagram C Access Treatment

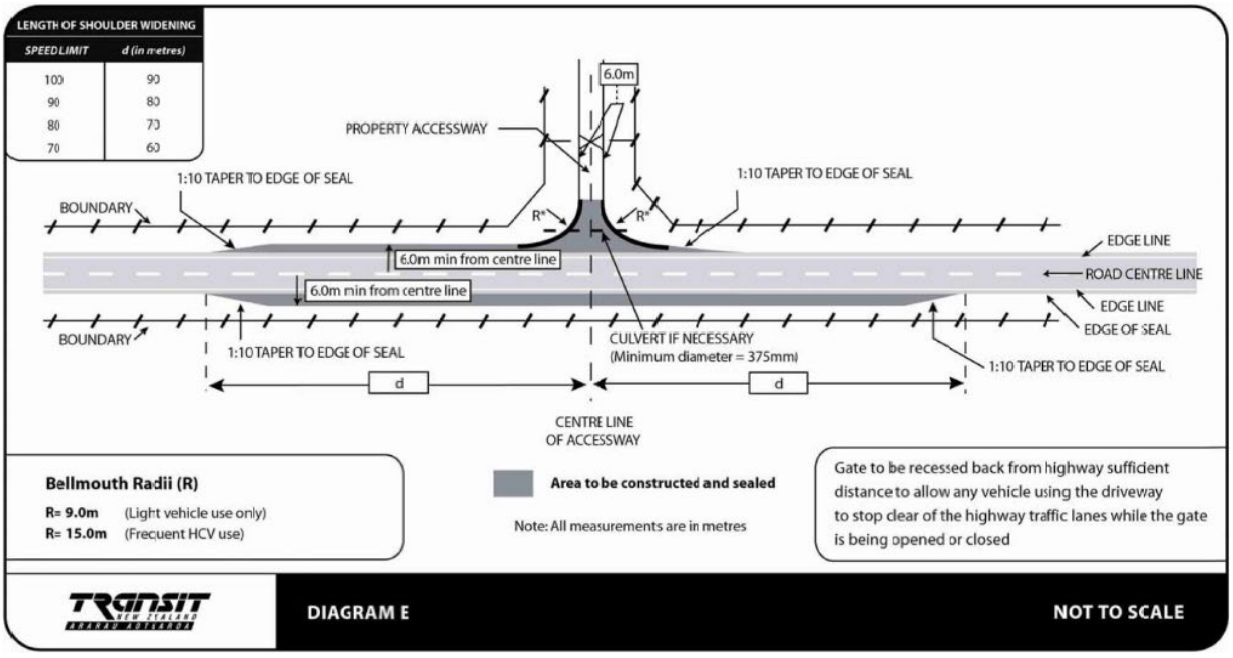


Figure 6-3: PPM Diagram E Access Treatment

7 Site Access Route

7.1 Options

Based on the location of the site, there are broadly two groups of access options as shown in Figure 7-1, either access via Soldiers Big River Road or via Quigleys Road.

- Option A is based on using the existing legal road, Soldiers Big River Road, for travel between SH7 and the site.
- Option B1 uses Quigleys Road between SH7 and Harwood Road and then Harwood Road to Soldiers Big River Road. This option avoids effects on existing properties at the northern end of Soldiers Big River Road. A new river crossing On Harwood Road will be required.
- Option B2 is initially similar to Option B1 but is based on a new access road being formed across farmland from Harwood Road through the Tai Poutini Reefton Campus to the plant to further reduce the need to use the public road network. A new river crossing on Harwood Road will be required.
- Option B3 is based on a new river crossing being formed upstream of Harwood Road and makes use of any existing track with the Reefton campus land. This still requires a new river crossing but it is smaller than with Option B1. A second existing crossing would need upgrading.
- Option B4 follows the full length of Quigleys Road and then requires a new access track to be formed. There are two river crossings on this route but these would be much smaller than required at Harwood Road (Photograph 7-1).

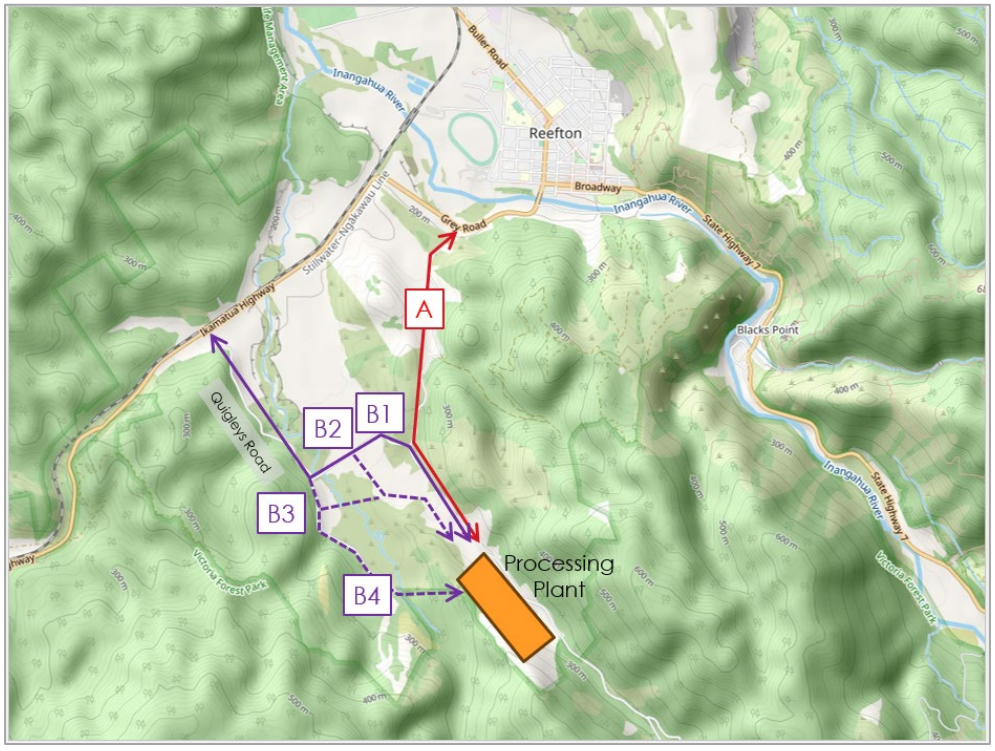


Figure 7-1: Site access route options

Figure 7-2: Option B1, B2 and B3

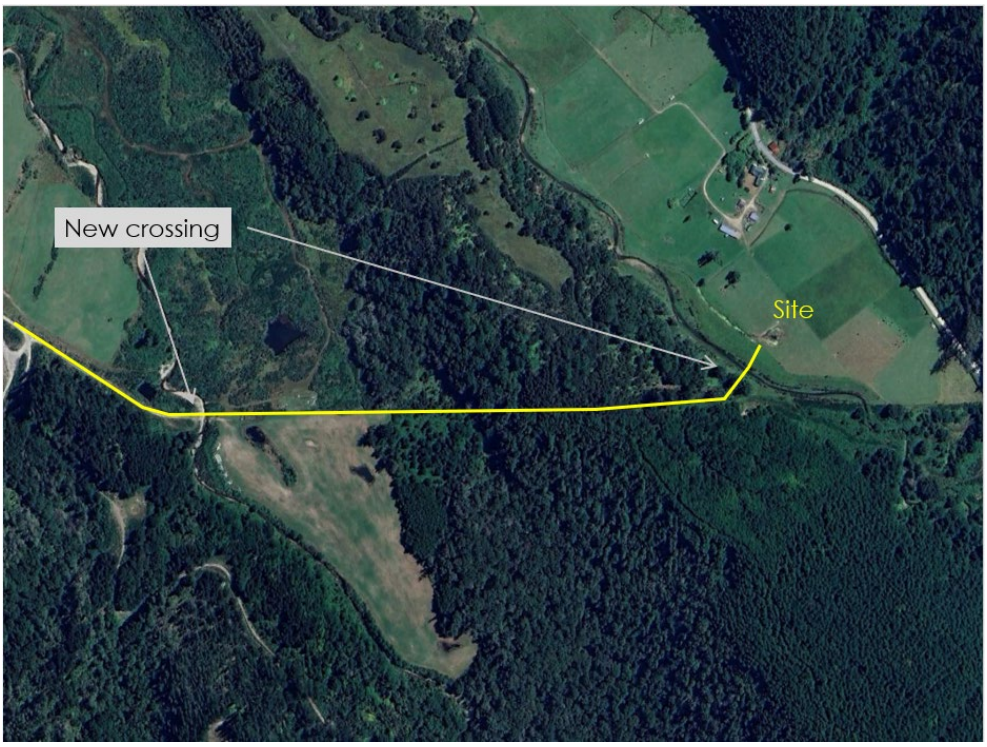


Figure 7-3: Option B4

Photograph 7-1: Option B4 river crossing east of Quigleys Road

7.2 Comparison of Options

7.2.1 State Highway Intersection / Access Design

The Soldiers Big River Road intersection is located on the outside of a curve on a 70 km/h section of highway but with a 55 km/h advisory speed. The curve constrains the sight distance to approaching vehicles for traffic turning into Soldiers Big River Road to about 70 m and is below the recommended minimum sight distance which represents a safety hazard. Widening the carriageway to meet the PPM diagram E standards may not be practical in this location and would not eliminate the safety risk associated with the forward sight distance.

The straight alignment of the highway at the Quigleys Road access means that there are no constraints on sightlines and there is more opportunity to widen the carriageway. However, since widening the carriageway to the Diagram E standard will reduce clearance from power poles, it may be necessary to install a safety barrier around the poles or to relocate them (Photograph 7-3).

Although the operating speeds close to Quigleys Road are higher than close to Soldiers Big River Road, the straight alignment provides greater scope to create a safe access.

Photograph 7-2: Constrained sight lines at Soldiers Big River Road intersection

Photograph 7-3: Power poles beside highway near Quigleys Road

7.2.2 Effects on Existing Activities

Using Soldiers Big River Road for all vehicle access will have much greater effects on existing activities than using the Quigleys Road options. The Project could increase traffic volumes by 100 to 150 vpd which will increase the potential for two-way conflicts to arise along the narrow road.

The additional movements will contribute to higher noise from the road and could generate more dust nuisance on the gravelled sections of road. Control of dust may require surface treatment of the road.

7.2.3 Infrastructure

Table 7-1 provides a summary of the transport infrastructure improvements that are likely to be required for each option. Each of the options involve improvements to 3 to 4 km of road. Since Soldiers Big River Road and Harwood Road are public roads, widening to provide at least a 5.5 m and desirably a 6 m wide carriageway width would be recommended to accommodate two-way movements. Since the Quigleys Road options involve a private road where vehicle movements are largely tidal and can be controlled at other times, a narrower carriageway with provision for passing bays represents a practical option. Adopting a similar approach on Soldiers Big River Road is not considered practical because it is no possible to control the movements of non-mine related traffic and the winding nature of the road would require passing opportunities to be provided at intervals of 100 m or less in places to ensure visibility was available between passing bays.

Options B1 and B2 involve construction of a new river crossing on Harwoods Road. The design will need to take account of its position immediately downstream of the confluence of the two streams in the valley. Although Options B3 and B4 involve two river crossings, their locations further upstream will reduce the size of structures required, potentially involving culverts rather a bridge.

Table 7-1: Transport Infrastructure Improvements

Option	State Highway	Roading	Infrastructure
A	• Diagram E seal widening	• Widen approx. 3 km of Soldiers Big River Road. • Dust suppressant treatment.	•
B1	• Diagram E seal widening • Underground / relocation of power poles or barrier protection	• Widen 1.5 km of Quigleys Road. • Widen 0.9 km of Harwood Road • Widen 1 km of Soldiers Big River Road	• New river crossing on Harwoods Road
B2	• Diagram E seal widening • Underground / relocation of power poles or barrier protection	• Widen 1.5 km of Quigleys Road. • Widen 0.9 km of Harwood Road • Form / upgrade 1.4 km of access track	• New river crossing on Harwoods Road
B3	• Diagram E seal widening • Underground / relocation of power poles or barrier protection	• Widen 1.7 km of Quigleys Road. • Form / upgrade 1.6 km of access track	• One new river crossing • One improved crossing

Option	State Highway	Roading	Infrastructure
B4	• Diagram E seal widening • Underground / relocation of power poles or barrier protection	• Widen 2.7 km of Quigleys Road. • Form 0.6 km of access track	• Two new river crossings

Widening of Soldiers Big River Road may have some consenting risk as some parts of the road are outside the legal road corridor – see Appendix A.

7.3 Preferred Site Access Route Option

Primary access to the site via Quigleys Road rather than Soldiers Big River Road is preferred because a safer access design can be achieved at the highway and it will have less effect on existing activities along Soldiers Big River Road.

Option B1 is the least preferred of the Quigleys Road options because it still makes extensive use of the public road network and would still affect some properties.

Options B3 and B4 may involve lower overall costs than Option B2 because the required river crossings are shorter and likely to be less complex than constructing a new crossing at Harwood Road. More detailed investigation of the crossing design requirements in each location is required.

8 Soldiers Big River Road

8.1 Proposed Re-alignment

The Project proposes to realign about 1.2 km of Soldiers Big River Road around the western side of the mine's surface infrastructure so that any public vehicle movements are not affected by vehicle movements within the mine site. Although the final alignment will be dependent on the site layout and the need to avoid construction close to the river, there is ample space within the valley floor to achieve this. This represents a pro-active approach to managing safety because it will eliminate the risk of conflict with any machinery or vehicles that would be operating within the mine site.

8.2 Effects of Re-alignment

The primary effect of the road re-alignment is that travel distances along the road will increase by about 300 m. This could increase journey times by about 30 s. Since a journey on Soldiers Big River Road from SH7 to the Alburns Track car park, one of the primary destinations and nearest one beyond the plant site involves a one-way travel distance of 7.6 km and journey time of over 10 minutes, the increase in journey time and distance due to the re-alignment of the road represent changes that are unlikely to be noticeable to drivers.

Since the re-aligned section of road can be designed to provide a wider carriageway, good forward sight distances and regular passing opportunities, it will improve safety compared with the existing section of road.

Appendix A Soldiers Big River Road

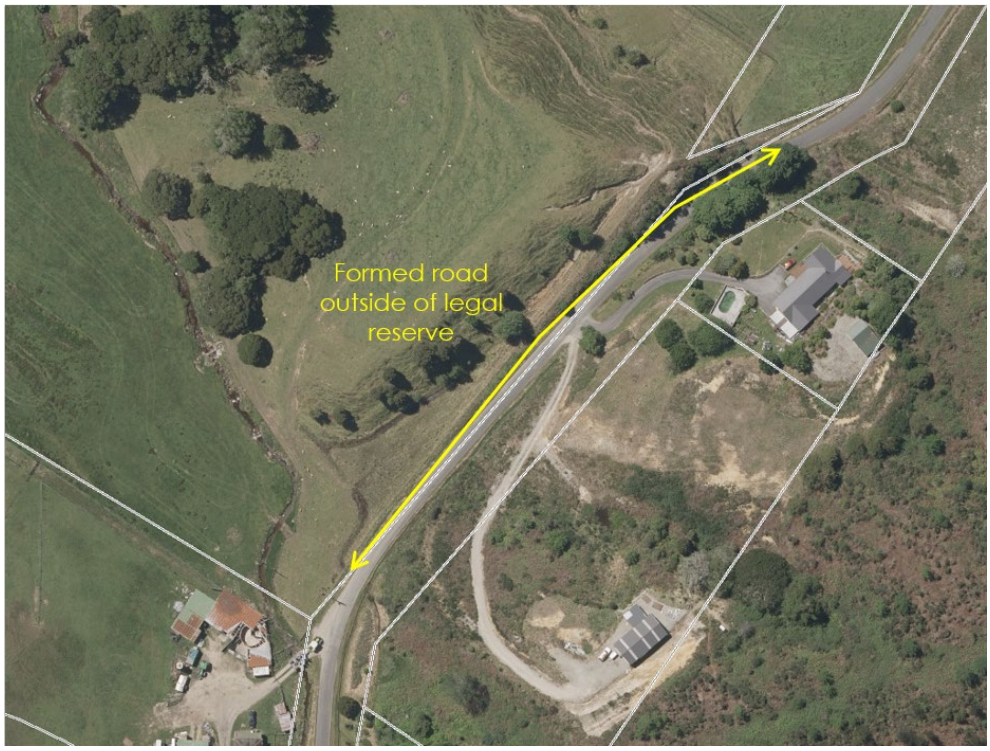


Figure 7-1: Formed road outside legal road reserve

Figure 7-2: Formed road outside legal road reserve

Stantec

Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

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