WESTPOWER LIMITED PROPOSED WAITAHA HYDRO SCHEME

ASSESSMENT OF ENVIRONMENTAL EFFECTS

Traffic Assessment

Dated June 2025

Report prepared for Westpower Ltd

Report prepared by: Melvin David Sutherland

Statement confirming compliance with the Environment Court's Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023

As an expert witness or peer reviewer, I have read, and I am familiar with the Environment Court's Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023.

I have prepared my, or provided input into, an assessment of effects for the Waitaha Hydro Scheme in compliance with the Code of Conduct and will continue to comply with it in this Fast-track Approvals Act process. In particular:

- my overriding duty is to assist the decision-maker impartially on matters within my expertise;
- unless I state otherwise, my assessment is within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express; and
- I have not, and will not behave as, an advocate for the Applicants.

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1 Introduction

Westpower Ltd (**Westpower**) proposes a run-of-the-river hydro-electric power scheme (**Scheme**) on the Waitaha River, on the West Coast of the South Island, New Zealand.

The proposed Headworks include a low weir and intake structure situated at the top of Morgan Gorge that will divert water into a pressurised tunnel and desander. A pressurised tunnel will convey the diverted water down to a Power Station below Morgan Gorge. Having passed through the turbines the diverted water will be returned via a tailrace and discharging to the Waitaha mainstem.

Construction access to the Headworks above Morgan Gorge would initially be via helicopter and/or on foot and then be via the access tunnel (once it is completed), while a short access road will provide temporary construction access between the access tunnel portal and Construction Staging Area 1.

A new access road and transmission line corridor would be required from the Power Station Site across Macgregor Creek. Heavy vehicles during construction would use existing private roads through farm area, a short section of Anderson Road and then Waitaha Road to access State Highway 6. Light vehicles used both during construction and operation would also use the same roads.

Details of the project design including the proposed construction methodology and Scheme operations as it relates to traffic is set out in Westpower's **Project Overview Report** and **Project Description.**

Westpower has commissions an independent expert view on the potential adverse effects of traffic movements associated with the construction and operation of the proposed Scheme.

My qualifications and experience our outlined in **Appendix A**.

A drive through inspection of the roading network that will be utilised under the Scheme was done on 1 December 2024. Dash cam video recordings were made of the state highway intersection, Waitaha Road and Anderson Road, (western section) and have been provided to Westpower.

This traffic report (**Traffic Report**) assesses the impact of the Scheme on traffic and the local roading network.

2 Existing environment

2.1 Site location

As above, the Project Site is approximately 45 km in a southwest straight-line direction from the nearest main service centre (Hokitika), approximately 55 km by road.

Appendix B provides a site location map. Full details are provided in the **Project Description** and **Project Overview Report**.

Access to the proposed Hydro Scheme is via

- State Highway 6 (SH6) managed by Waka Kotahi – New Zealand Transport Agency (NZTA)
- Local Roads (Waitaha Road and Anderson Road) into the Waitaha Valley – Westland District Council (WDC)
- Private land beyond the end of the local roads.

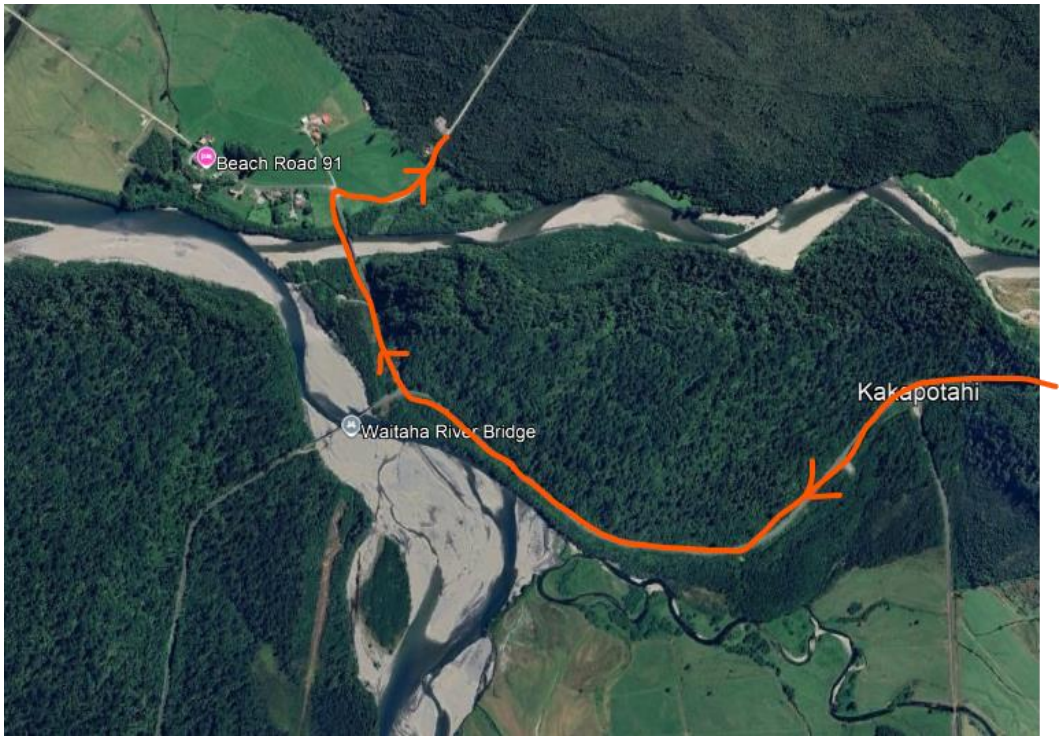
Furthermore, Westpower Ltd have included in the application the rebuild of an existing substation on Bold Head Road. The approximate route is shown below, refer **Slide 1**. The turn off onto Bold Head Road is from SH6, near the Waitaha Bridge. **Table 6** provides details of information supplied by Westpower Limited via email on 16 April 2025 which confirms the latest revision of the construction timeline with an assessment of the approximate light, heavy and oversize traffic numbers in the last three columns. The vehicle movements in the table are those anticipated on the **Waitaha Road** and the western section of **Anderson Road**.

An exception is the traffic associated with the rebuild of the Waitaha substation, which will use **Bold Head Road,** see Stage 3 in **Table 8.**

The substation is located on Bold Head Road. Kakapotahi Beach Road and Bold Head Road which are both local roads controlled by Westland District Council. Kakapotahi Beach Road is sealed, and Bold Head Road is unsealed.

The intersection of SH6 and Beach Road is approximately 1.6 km further to the west of the intersection between SH and Waitaha Road. An assessment of SH6 intersection, Beach Road and Bold Head Road has not been undertaken as part of this report; however, it is noted that the increase in traffic volumes is for a short 5 month period and the increase in the number of vehicles is insignificant.

Slide 1 Substation Bold Head Road



2.2 Road environment and network

The following is an overview of the SH6 and the local road environment and network.

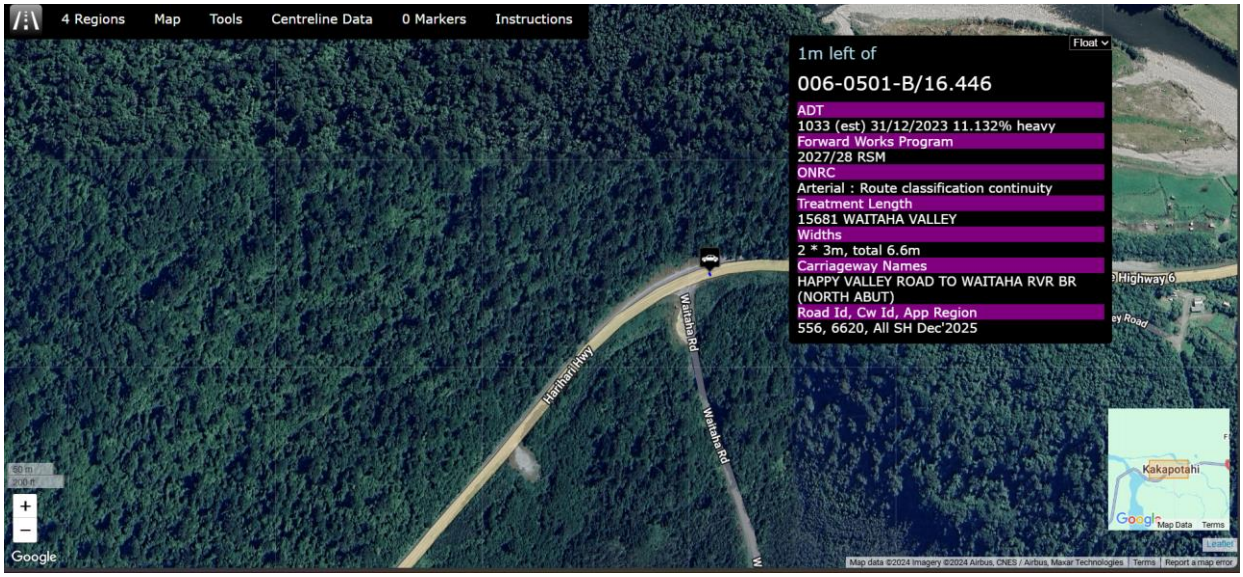
2.2.1 State Highway

SH 6 is the only access to the Waitaha Valley. In terms of the NZTA One National Road Classification system (ONRC) in this location it is classified as an Arterial route.

While traffic volumes are low based on the ONRC system with an average annual daily traffic volume of around 1000 vehicles per day, it is a critical connector as there is no alternative route, and it is a significant scenic route which links to significant tourist destinations.

Traffic lane widths are 3.0 metres with an overall sealed road width of 6.6 metres. This is a minimum standard where desirably traffic lane widths are 3.5 metres with wider shoulders. The reason for this lower standard is topography and low traffic volumes. Refer to **Slide 2 State Highway 6**. There are also several one-lane bridges on the SH6 network.

Slide 2 State Highway 6



2.2.2 Local Roads

Local roads considered are the Waitaha Road and a short (80 metre) section of Anderson Road. Beyond these roads Westpower intend to create and upgrade access across private property with agreement of landowners.

It is noted here that Westpower have negotiated with the landowner to relocate the farm access road off Anderson Road from the west side of the property where the access is close to a dwelling. Westpower propose to recreate a new access point on the east side of the property and provide earth bunding. The relocation of the access will also shorten the length of Anderson Road proposed to be used to approximately 50 metres. **Appendix C** provides a concept design plan for the works.

Waitaha Road intersects around the middle of a large sweeping curve on SH6, Slide 2.

There are several dairy farms in the Waitaha Valley with the most southern dairy farm being accessed via Anderson Road. Current predominate uses of the road are for farming. There is a community hall, a church and one mechanical servicing business. There is also a quarry (currently unused) off the southern end of Waitaha Road, and a business extracting schist from Waitaha River and Macgregor Creek.

It is noted that the Kokiri Lime Company Limited has applied for consent to operate the Waitaha Quarry recently,[1] and those proposed vehicle movements are assessed below. This consent is noted as traffic associated with the quarry could be travelling on the local roads at the same time as traffic associated with the Scheme.

. Other uses of the road will be for recreation, hunting, and fishing. The Waitaha Access Route (track) is off the western end of Anderson Road.

[1] Application and Assessment of Environmental Effects, Report: WQ325, 21 February 2025.

A summary of seal widths and ages is shown in **Table 1 Local Road Details.**

Table 1 Local Road Details

Item	Road	Start (m)	End (m)	Formed Width (m)	Surface Function	Length (m)	Construction Date	Age
1	SH6 Intersection	0	0	6.6	Seal	na	na	na
2	WAITAHA	23	810	6.5	Seal	787	16/12/2015	8
3	WAITAHA	830	1330	5.4	Seal	500	08/03/2018	6
4	WAITAHA	1310	1930	6	Seal	620	26/02/2019	5
5	WAITAHA	1930	3608	4	Seal	1678	01/2003	21
6	WAITAHA	3608	7034	4	Seal	3426	29/03/2023	1
7	WAITAHA	7034	10976	3.6	Seal	3942	19/02/2021	3
8	ANDERSON (WEST)	0	80	3.6	Seal	80	19/02/2021	3
9	ANDERSON (WEST)	80	708	2.5	Unsealed	628	na	na
10	BRIDGE (WAITAHA)	900	916	3.7	Sealed	16	25/12/1962	62

Key

1. m means metres
2. na means not applicable or unknown.
3. Source information from Mobile Roads, West Coast District Councils Asset & Work Manager System, (Table 1).

For **Table 1**, the section of sealed Waitaha Road that is 21 years old may have been resealed, however the information has not been updated on the WDC and Mobile Roads databases.

The first 1.93 km's of Waitaha Road is effectively two lanes with the width varying from 5.4 to 6.5 metres. Though the 500 m long – 5.4 m wide section this should be a minimum of 6 metres in accordance with the (WDC's Engineering Standard[2]. The remainder of this road (9.05 km) is narrow with widths starting at 4.0 m at the northern end and narrowing down to 3.6 m at the intersection with Anderson Road. There is a short section of Anderson Road leading into the last dairy farm with a sealed width of 3.6 metres.

There is one single lane bridge over Ellis Creek on Waitaha Road. The bridge was constructed in 1962. There is no posted speed or weight (less than Class I) restrictions on this bridge.

From the **Project Description** Waitaha Road is intended to be used for construction and operation traffic, and also a short section of Anderson Road to the west of the intersection with Waitaha Road.

[2] Downloadable from Westland District Council's web site.

2.3 Existing Traffic volumes

A summary of existing traffic volumes on SH6 and Waitaha Road are shown in **Table 2**.

Table 2 Traffic Volumes

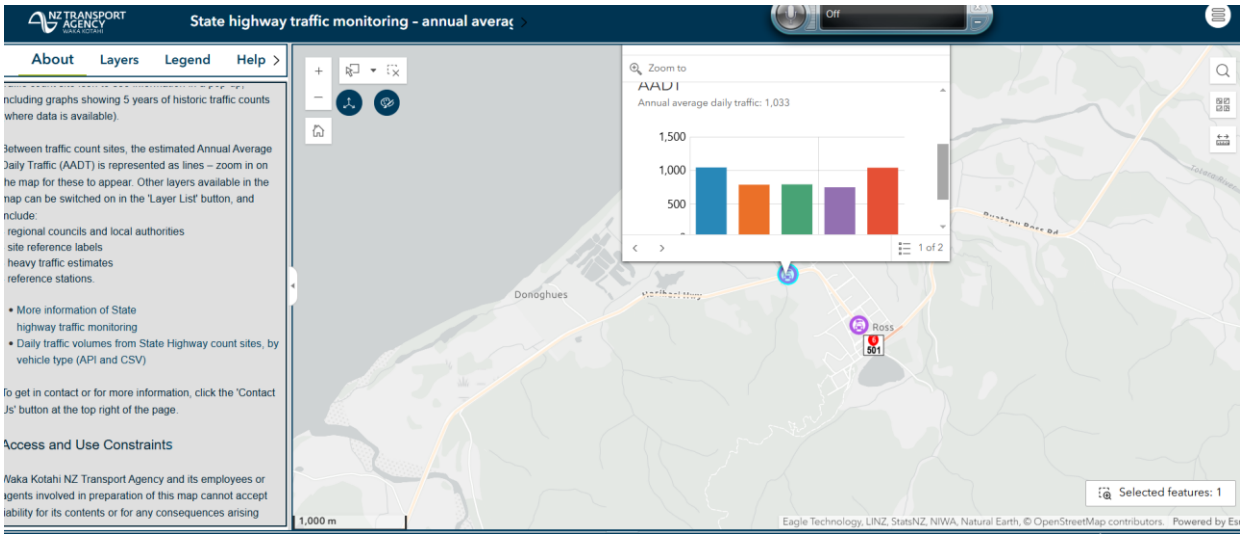
Item	Road	Start (m)	End (m)	Length (m)	ADT	% heavy vehicles	ADT Est Date	Comment
1	SH6 Intersection	0	0	na	**1033**	11.1	31/12/2023	
2	WAITAHA	23	810	787	**87**	32.8	19/07/2023	
3	WAITAHA	830	1330	500	**87**	32.8	19/07/2023	
4	WAITAHA	1310	1930	620	**87**	32.8	19/07/2023	
5	WAITAHA	3608	7034	3426	**87/22**	32.8	19/07/2023	22 ADT from Distance 6228 m
6	WAITAHA	7034	10976	3942	**22**	42.8	19/07/2023	
7	ANDERSON (West)	0	80	80	**10**	3	19/07/2023	Short sealed section past corner
8	ANDERSON (West)	80	708	628	**?**	?	na	Access to Waitaha River
9	BRIDGE (WAITAHA)	900	916	16	**87**	32.8	19/07/2023	On Waitaha Road (Single Lane Bridge)

Key

1. ADT means average annual daily traffic measured in vehicles per day (vpd).
2. Source information from Mobile Roads and West Coast District Council's Asset & Work Manager System (Table 2).

For the State Highway, based on a traffic monitoring site south of Ross township, traffic volumes on the highway reduced during the Covid Pandemic and are now showing an increase as tourists are returning to the area, see **Slide 3 Traffic volumes trend last 5 recorded years.**

Slide 3 Traffic volumes trend last 5 recorded years



The most recent actual traffic count for Waitaha Road was measured in March 2021 over the first 5.7 km section from the SH6 intersection.

The higher traffic volume sections of the local roads are classified as Access. (less than 200 vpd) and the lower traffic volume sections are Low Volume, (less than 50 vpd).

The proportion of heavy traffic on Waitaha Road is high at 12.5 per cent of the total traffic. This is due to the overall low traffic volumes and use by milk tanker traffic and general inwards and outwards goods associated with farming. Medium commercial vehicles (3.5 to 12 tonnes) and heavy commercial vehicles (over 12 tonnes) account for 33% of total traffic.

The above figures do not include traffic associated with Waitaha Quarry. The company has assessed the traffic volumes to be between ten to fifteen return truck movements per day. However, because of the nature of demand for quarried materials trucking movements could be nil. That is averaged over a full year average annual heavy truck movements from the quarry will be less.

The definitions for the functional classifications for the ONRC can be assessed via the following link.

https://www.nzta.govt.nz/assets/Road-Efficiency-Group/docs/functional-classification.pdf

The NZTA have introduced a new road classification system called the One Network Framework, however the ONRC has been used here as it is more straightforward to understand and is directly linked to traffic volumes.

2.4 Road safety assessment

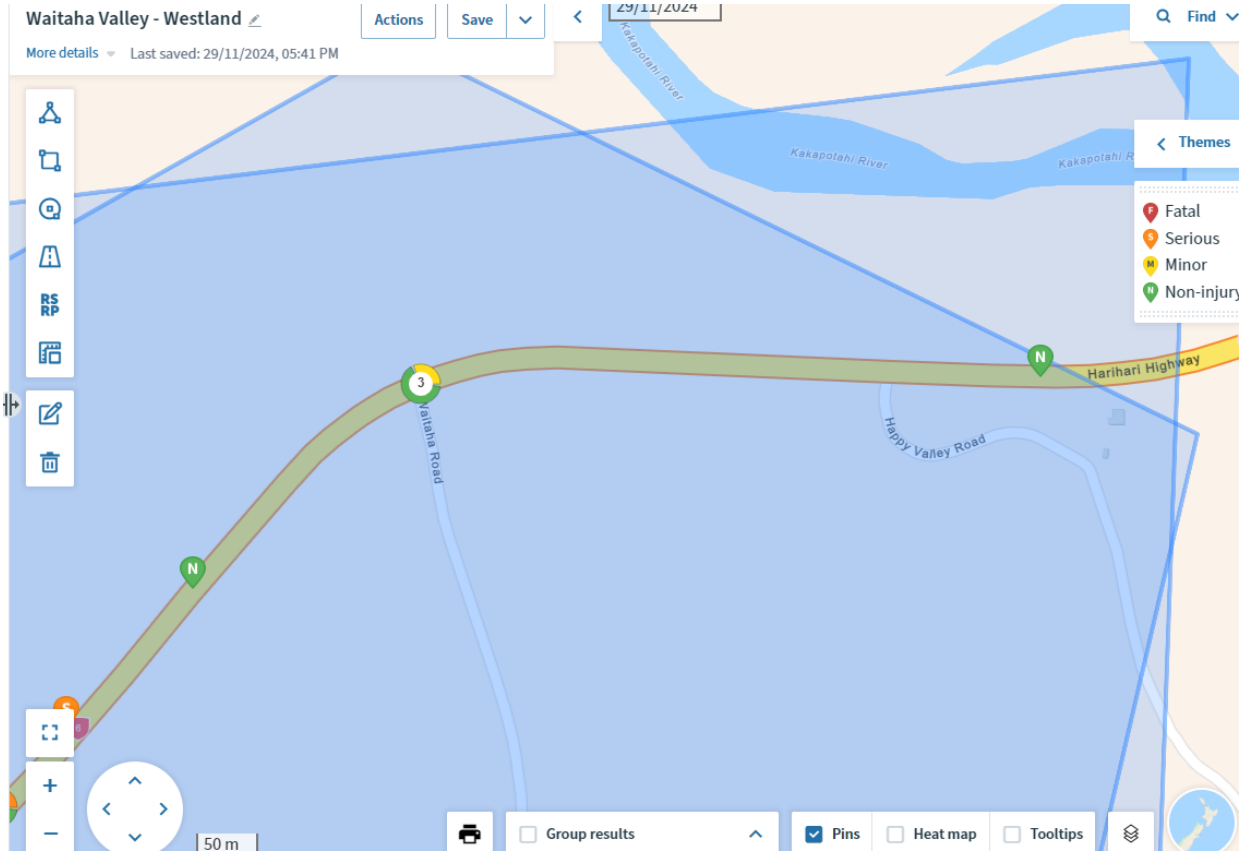
The following is a discussion on crashes, issues with existing driveways and sight lines milk tanker usage, the condition of the roads, geometry and signage.

Information has been sourced from NZTA's Crash Analysis System which records the location, severity and identified causes of reported crashes on all roads in NZ.

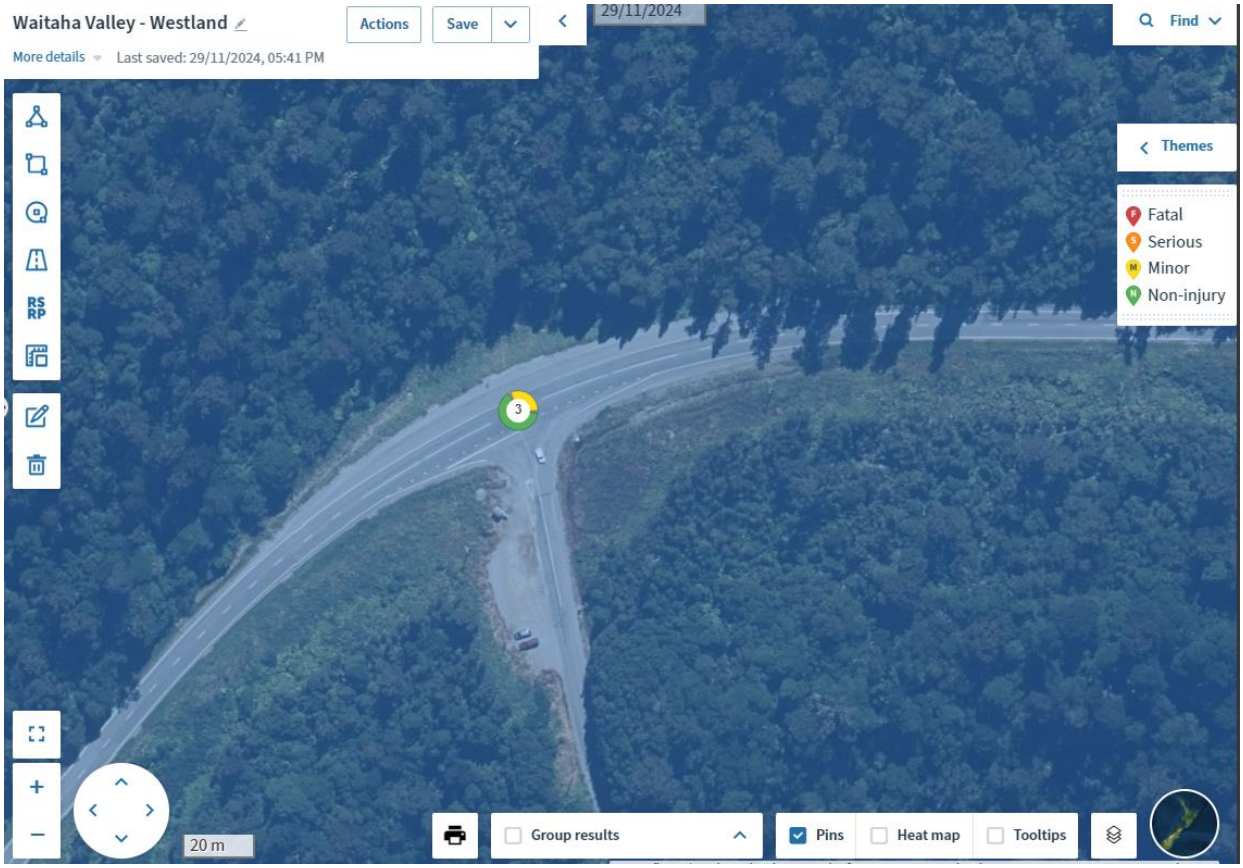
2.4.1 State Highway

There was one minor injury and two non-injury crashes on or about the SH6-Waitaha Road intersection. These were many years ago, (2001-2002). The two non-injury crashes were due to road factors involving a single vehicle. The minor injury crash involved two vehicles. Speed, and road factors (road under construction) were contributing factors. Refer **to Slide 4 Crashes SH6** and **Slide 5 Crashes SH6 Waitaha Road Intersection.**

Slide 4 Crashes SH6



Slide 5 Crashes SH6 Waitaha Road Intersection



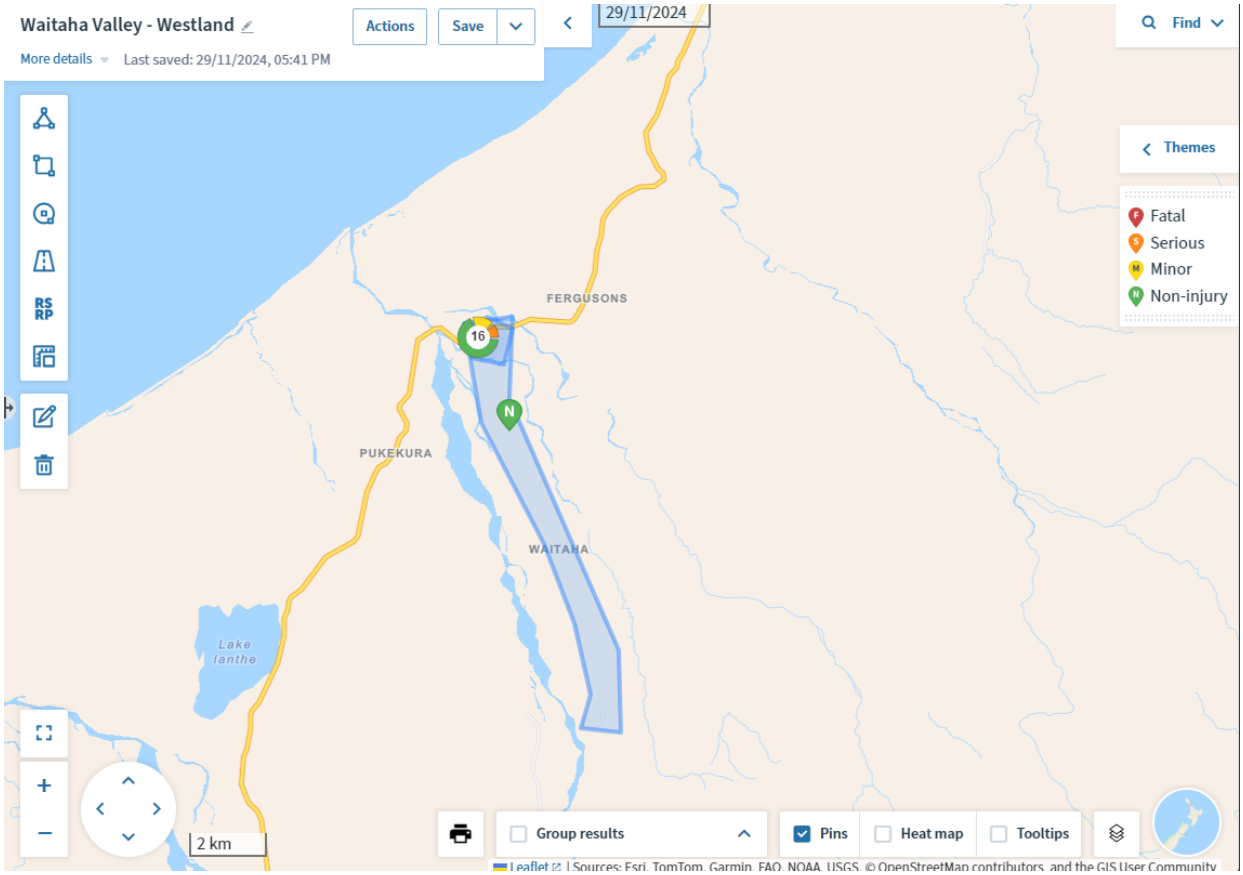
Other crashes on the highway are more than 100 metres either side of the intersection and are non-injury events.

A common road factor based on a review of road crashes in the area for the highway is slippery roads due to frost and ice.

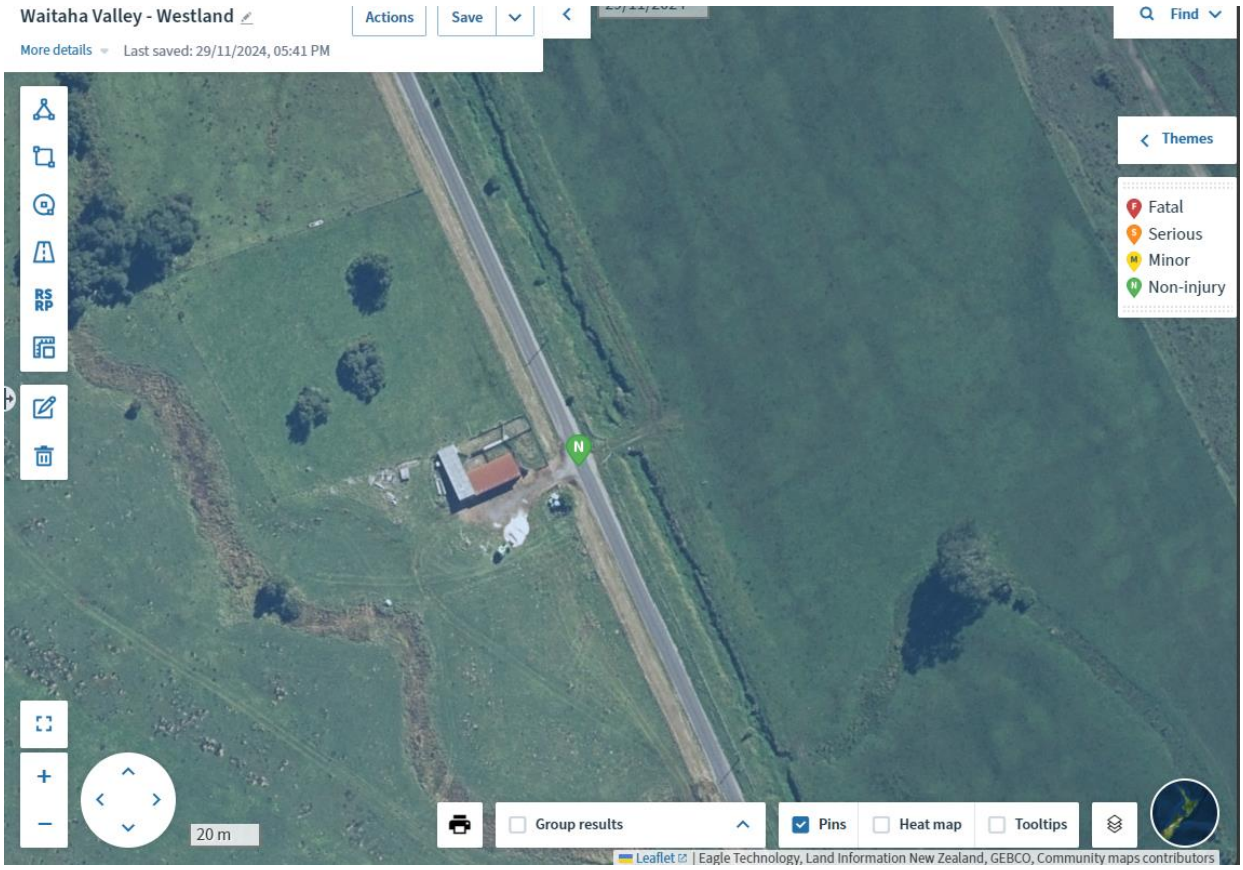
2.4.2 Local Roads

There was only one non-injury crash on the Waitaha Road. See **Slide 6 Crashes SH6 and Local Roads** and **Slide 7 Crash Waitaha Road.**

Slide 6 Crashes SH6 and Local Roads



Slide 7 Crash Waitaha Road



From the West Coast District Council's Asset & Work Manager System, below the sealed road surface Waitaha Road is constructed of 150 millimetres (mm) thick of compacted base course and a further 750 mm thick layer of compacted sub-base material.

Table 1 indicates that seal ages are not old, other than a section from 1.93 to 3.608 km where the seal age recorded is 21 years. Visually all of the road is in good condition. Only minor patching was observed towards the start of Waitaha Road on the steeper section. The underlying geology from SH 6 for the first 270 metres of Waitaha Road is glacial till deposits.

An indirect indication of the condition of the road is measured roughness. **Table 3 Condition Roughness Grades** provides the grading for roads based on an international index.

Table 3 Condition Roughness Grades

Measure	**Sealed Roads**				
Pavement Condition	Very Poor	Poor	Fair	Good	Very Good
International Roughness Index (IRI_	8+	6-7	4-5	3	0-2
IRI (Average)	8	6.5	5.5	3	1
NAASRA	211	171	144	78	25

Based on the measured road roughness, Waitaha Road is in a good condition and Anderson Road (West) is in a fair condition, refer **Table 4 Local Roads Roughness Condition**.

Notwithstanding the poorer roughness rating for Anderson Road at the time of inspection it appeared to be in good condition and had recently (2021) been resealed, refer **Table 1**.

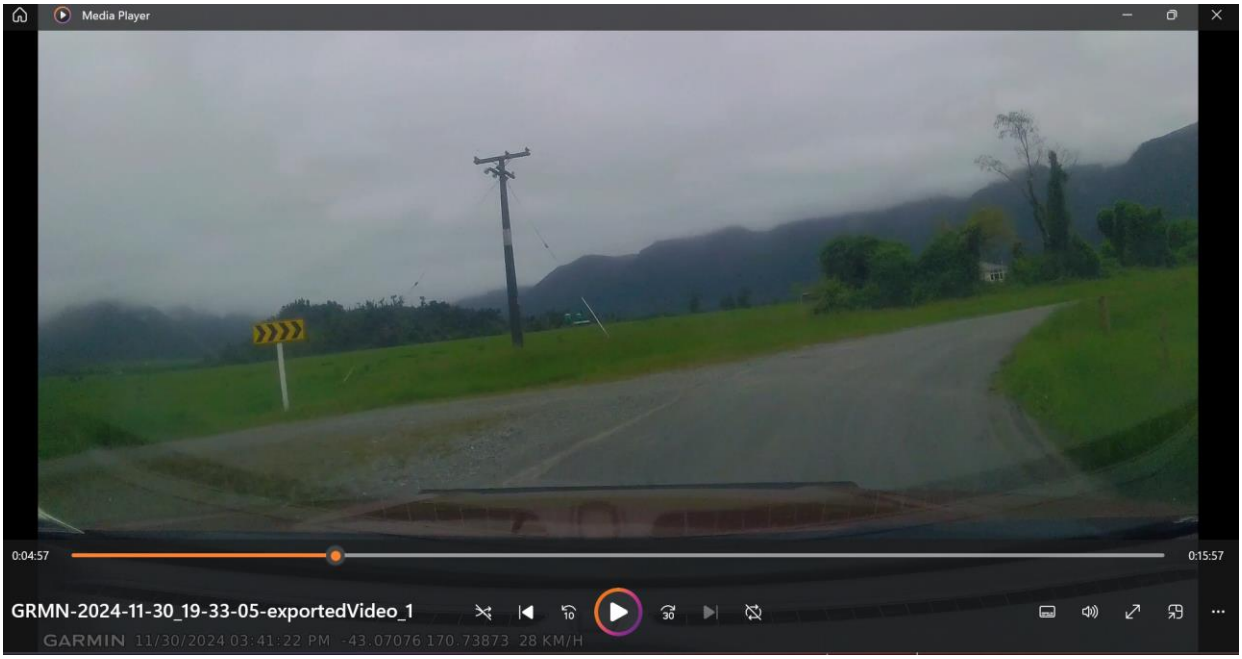
Slides 8 and 9 are screen shots of dash cam footage, showing the sealed intersection at Waitaha Road and Anderson Road and the sealed formation of Anderson Road looking west.

Table 4 Local Roads Roughness Condition

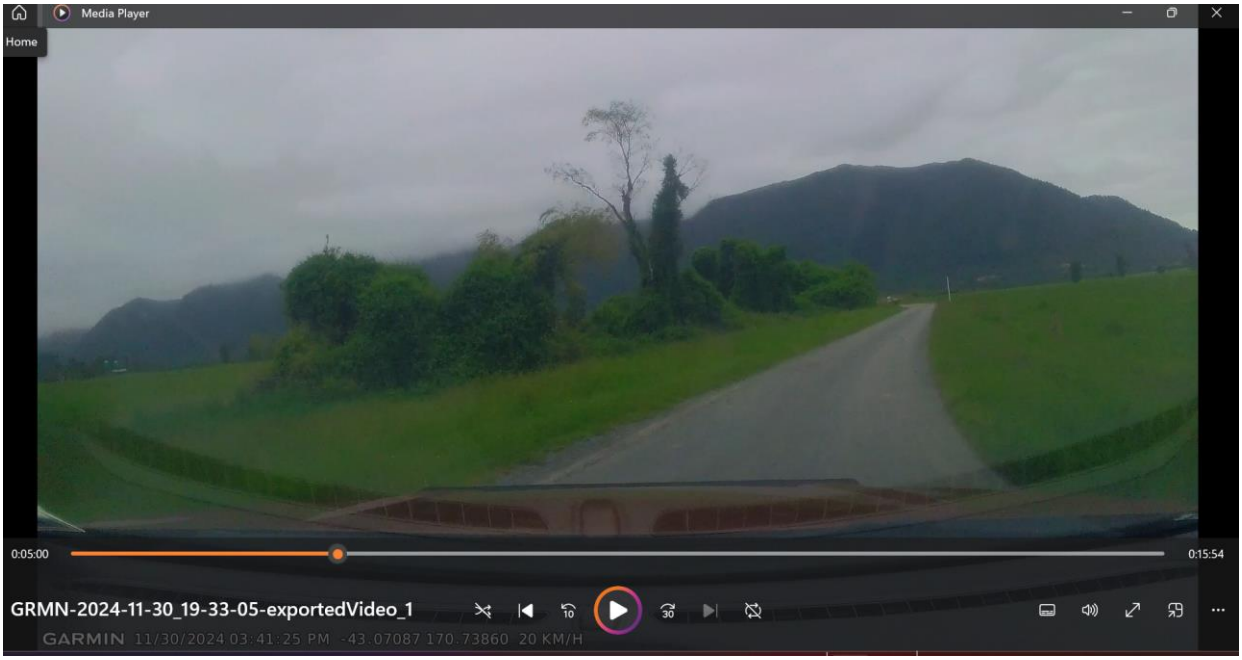
Road	Average of NAASRA	Average of Lane IRI
ANDERSON RD (WEST)	**141.3**	**5.4**
Left lane 1	132.9	5.1
Right lane 1	149.8	5.7
WAITAHA ROAD	**81.7**	**3.1**
Left lane 1	81.9	3.1
Right lane 1	81.6	3.1
Grand Total	**85.7**	**3.3**

Source West Coast District Council's Asset & Work Manager System.

Slide 8 Waitaha Road Anderson Road Intersection



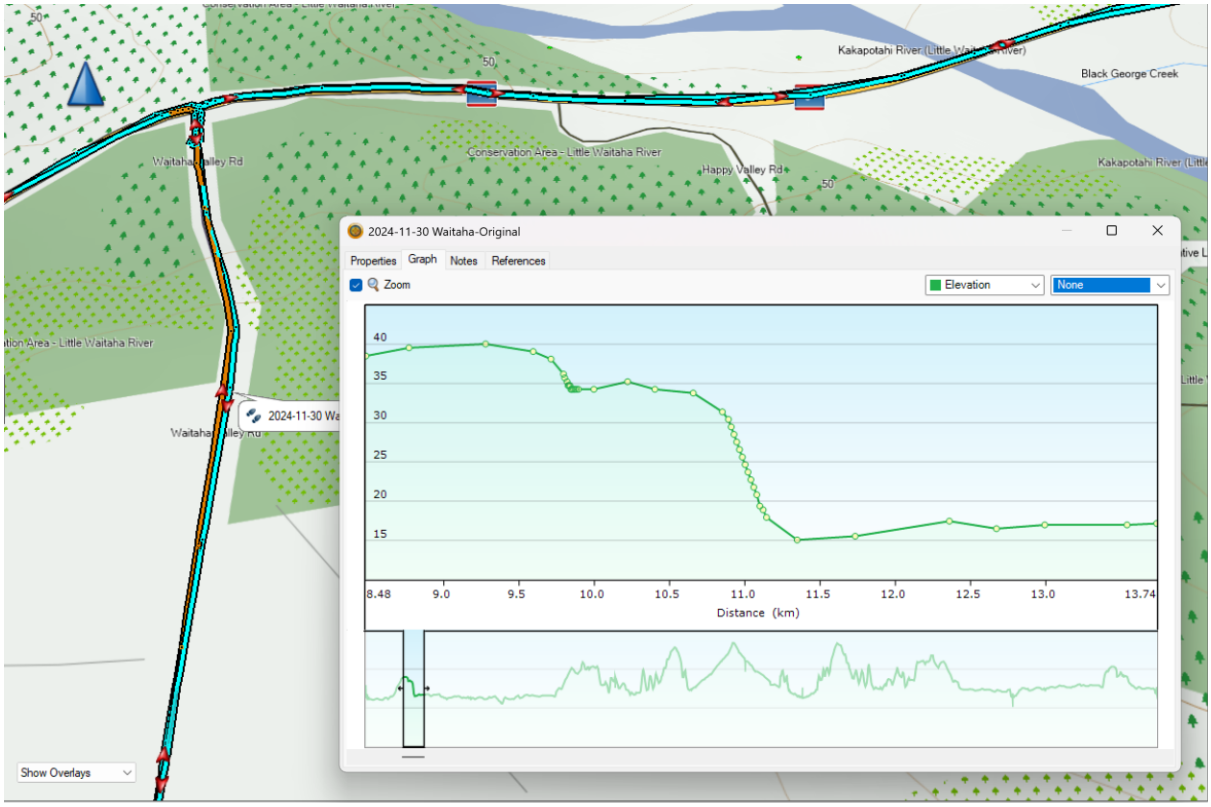
Slide 9 Anderson Road



For Waitaha Road and Anderson Road (West) this is likely to be due to the road being mostly on a foundation of river gravels of the Waitaha River Valley and the thickness of the compacted road basecourse and subbase layers. The public roads are also mostly flat and straight with large curves.

There is a short section of steep road close to the intersection with SH6 however the grades are reasonable for heavy traffic being assessed at around 1 (vertical) in 14 (horizontal) with a short section of 1 in 12. See **Slide 10 Waitaha Road Vertical Road Gradient near SH6.**

Slide 10 Waitaha Road Vertical Road Gradient near SH6



Source Garmin GPS device

The predominate issue is the narrowness of the road from 1.93 km in from SH 6 intersection. Currently this is not a significant issue as generally there is little need for vehicles to pass and traffic volumes are low. Heavy vehicles such as milk tankers will be making one inward and outward journey, per day during the dairy season, as will other heavy vehicles.

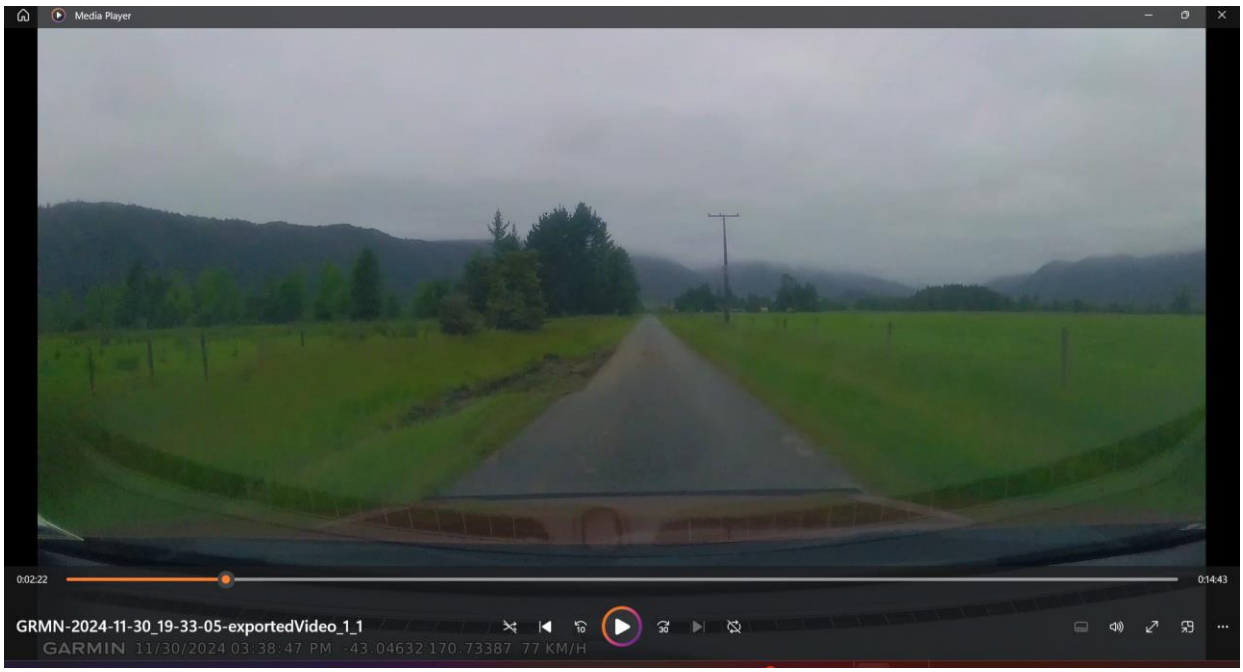
Light vehicles can pull over on to the grassed shoulders to allow other vehicles to pass without causing damage to the shoulders, see **Slide 11 Shoulder Use by Light Vehicles**.

Notwithstanding this, there is some visual evidence that when heavy vehicles do venture off the sealed road, there is rutting in the grassed shoulders, see **Slide 12 Damage to Road Shoulder** and **Slide 13 Further Damage to Road Shoulder**. The observed incidences where this has currently occurred is low (three sites).

Slide 11 Shoulder Use by Light Vehicles

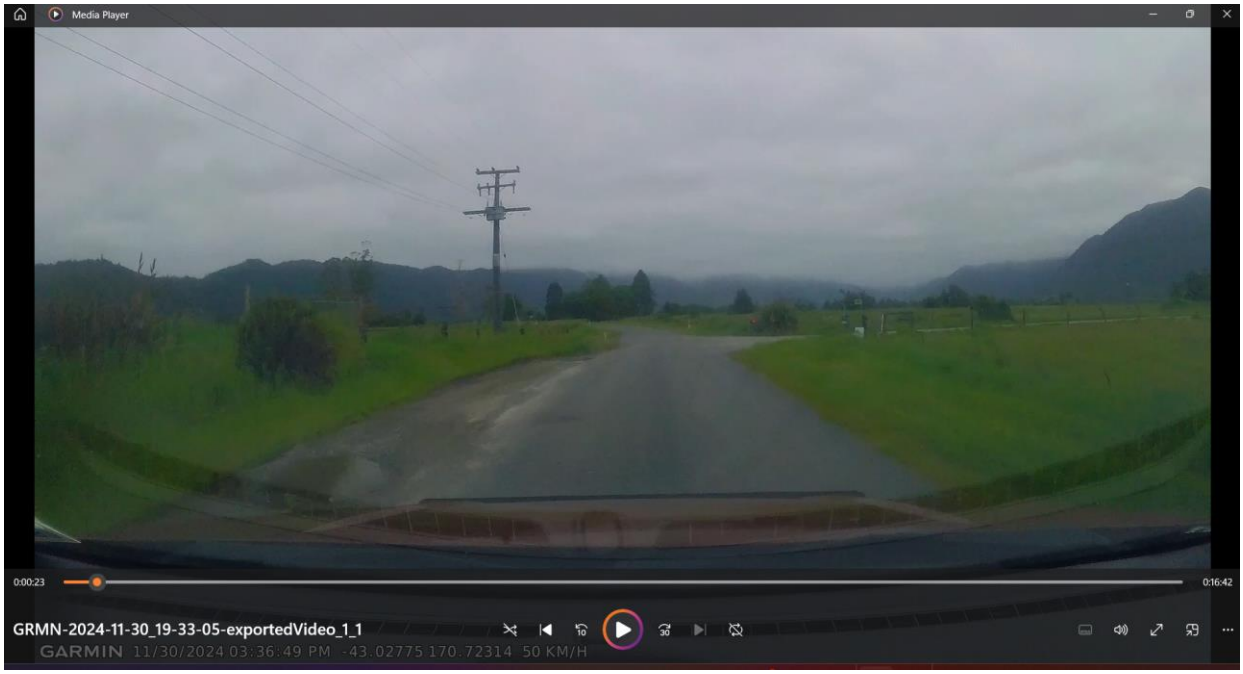
Slide 12 Damage to Road Shoulder

Slide 13 Further Damage to Road Shoulder



There are also wheel tracks where longer vehicles (e.g. truck and trailer units) are veering off the sealed road onto the unsealed shoulders in order to make turns into and out of accessways, see **Slide 14 Road Shoulder use by Heavy Vehicles** and **Slide 15 Further Road Shoulder Use by Heavy Vehicles**.

Slide 14 Road Shoulder use by Heavy Vehicles



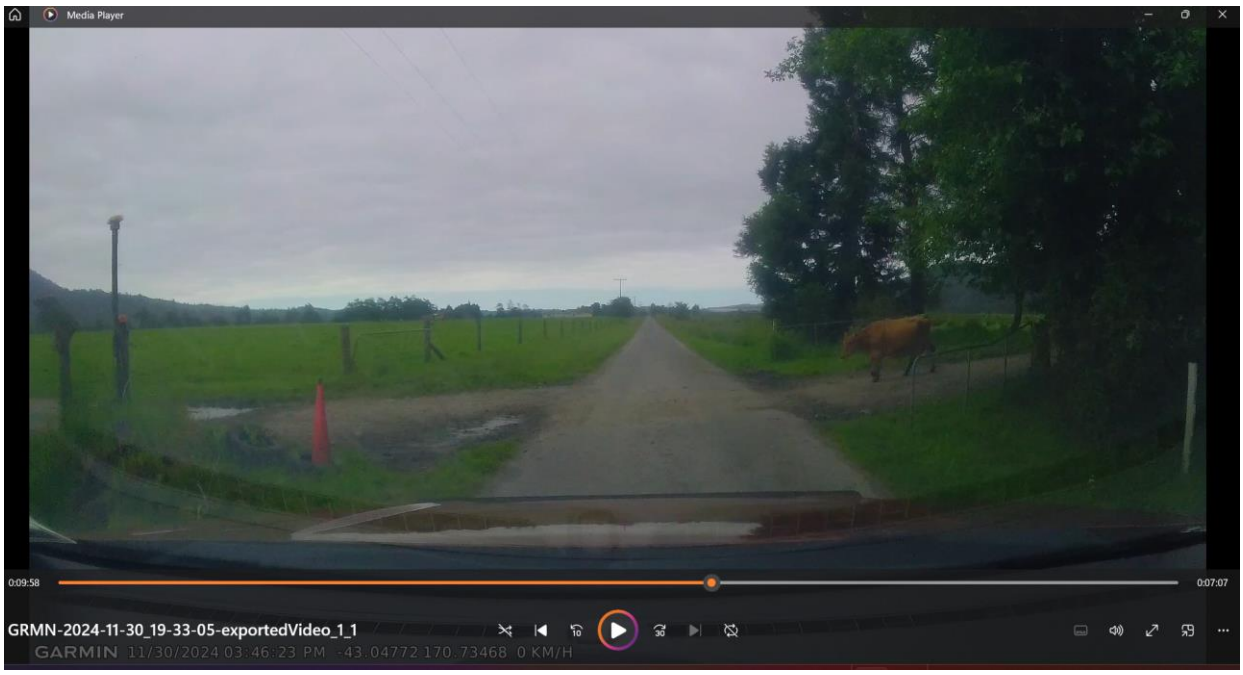
Slide 15 Further Road Shoulder Use by Heavy Vehicles

There are also sites where visibility from accessways is compromised by adjacent trees.

Predominantly, the road is characterised by not having high roadside growth, being grass shoulders, berms and grass paddocks, however there is the occasional site where this is not the case, see **Slide 16 Vegetation obscuring Vehicle Access**. There is also a stock crossing where trees obscure the visibility of dairy cows crossing Waitaha Road. The risk is mitigated at this site by the use of a roadside flashing light, see **Slide 17 Stock Crossing**.

Slide 16 Vegetation obscuring Vehicle Access

Slide 17 Stock Crossing



2.4.3 Road Reserve Widths Waitaha Road and Anderson Road

Based on scaled measurements from WDC's Online Maps, from the Intersection with SH6, Waitaha Road, which in this area heads south, the road is approximately 30 metres wide. It starts tapering down to 27 metres wide just before the S bend in the road which starts about 2 km from the SH 6 intersection. Through this S bend there is a short section of narrower road at 17 metres. Beyond this S bend, the Waitaha Road now travels in a Sou'-sou'-east direction and mostly stays 20 metres wide. The exception to this is three sections along Waitaha Road where localised widening exists out to 48 metres. There are two lengths that are 246 metres long and another section that is 59 metres long. All these localised widening areas are north of Douglas Road. Just south of Douglas Road is the Waitaha Hall. The reason for these localised widened areas is unknown.

Anderson Road legal road reserve width is 20 metres.

Given the road reserve widths, the generally flat and straight alignments, it should be straight forward to widen the road. This matter is discussed further below.

3 Traffic impacts of the Waitaha Scheme

3.1 Brief description of the Scheme

With respect to the development of the Scheme, most relevant to traffic and roading impacts Westpower advises.

1. An intense period of activity over a period of about 3 years as the Scheme is established, followed by a low level of activity during routine operation and maintenance.
2. Construction of the Scheme can be considered in 4 key stages.

Table 5 Hydro Scheme construction stages

Stage	Description	Estimated Period from Start
1.	Access road and transmission line from Waitaha Rd to the power station site. Staging Areas 2 and 3. Bridge across Granite Creek.	Months 1-10
2.	Tunnels and subsurface structures. Early works at the intake. Construction Staging Area 1 and the access track from the access portal to Construction Staging area 1. Short access track from access portal at the intake to the river.	Months 7-27
3.	Remaining water tunnel and desander excavations completed. Construction of the intake channel and weir. Construction of power station, switchyard and tailrace. Construction of the remaining section of the transmission line from Westpower's Waitaha Substation near SH6 to Macgregor Creek.	Months 28-33
	Rebuild of Waitaha substation.	
4.	Equipment installation and commissioning in power station, switchyard and intake.	Months 32-37

The **Project Description** provides:

- Construction Staging Area 3 is be developed near the true right bank of the Macgregor Creek. This area is beyond the southern end of Waitaha Road.
- At Construction Staging Area 3 offices, a workshop and a concrete batching plant will be established.
- All vehicles will use Waitaha Road, Anderson Road - West and private roads through the farm area.
- Spoil from the construction works is to be deposited and levelled in the area near the true right bank of Macgregor Creek adjacent to Construction Staging Area 3.

From the discussion with Westpower on 9 December 2024

- Local river gravels in the area will not be suitable for concrete construction due to the nature of the rock being schist based. However local river gravels will be used for roads and road upgrades.
- Westpower also confirmed details of construction traffic were discussed. Large (100 tonne) cranes will be required. Tunnel excavation machines, some generation

equipment and components (turbine, switchgear, generator, transformer, penstock sections) will be manufactured and transported to site. Construction materials such as cement, timber and steel will also be transported to site.

- It is assumed aggregate for concreate construction will be transported into the area using the Waitaha Road and Anderson Road (West). Gravel sources for new road construction, upgrading of Waitaha Road and Anderson Road (West) will be mainly sourced from the Waitaha valley area where possible, however it is recommended that Westpower consult with roading contractors experienced in construction and maintenance of roads in this area prior to commencing this work.

3.2 Traffic generation construction

Westpower have also done some more work on the project timeline since December 2024, mainly to clarify what the four stages of the construction will involve. The latest update was provided on the 16 April 2025 which also updates the traffic generation, refer **Table 6 Scheme Traffic Generation - During and Post Construction.**

Table 6 Scheme Traffic Generation - During and Post Construction

Stage	**Description**	**Estimated Period from Start**	**Approximate light vehicle movements – on average** (one way per day)	**Approximate heavy vehicle movements – on average** (one way per day)	**Approximate oversize vehicle movements** (in and out)
1.	Access road and transmission line from Waitaha Rd to the power station site. Staging Areas 2 and 3. Bridge across Granite Creek.	Months 1-10	12 - 15, and up to 31 for about a couple of months when combined with tunnel construction traffic	1 – 4, with the higher number for a couple of months when road and tunnel construction are happening concurrently	16
2.	Tunnels and subsurface structures. Early works at the intake. Construction Staging Area 1 and the access track from the access portal to Construction Staging area 1. Short access track from access portal at the intake to the river.	Months 7-27	17 for tunnel construction, and up to 22 for about three months when combined with intake works	Slightly over 4	22

Stage	Description	Estimated Period from Start	Approximate light vehicle movements – on average (one way per day)	Approximate heavy vehicle movements – on average (one way per day)	Approximate oversize vehicle movements (in and out)
3.	Remaining water tunnel and desander excavations completed. Construction of the intake channel and weir. Construction of power station, switchyard and tailrace. Construction of the remaining section of the transmission line from Westpower's Waitaha Substation near SH6 to Macgregor Creek.	Months 28-33	15 - 32 with the highest number of movements for about three months when tunnel, intake and power station/switchyard works are happening concurrently	1-6	8
	Rebuild of Waitaha substation.		2-3	1 – 2 **per month**	4
4.	Equipment installation and commissioning in power station, switchyard and intake.	Months 32-37	6 – 7 for installation and fit out	0 for installations and fit out	0

Westpower confirm that:

> 'Of relevance to your report (besides the information about the timeline), will be the approximate light, heavy and oversize traffic numbers in the last three columns. The vehicle movements in the table are those anticipated on the **Waitaha Road** and the western section of **Anderson Road**. An exception is the traffic associated with the rebuild of the Waitaha substation, which will use **Beach Road** and **Bold Head Road**.'

Westpower also advise that:

- During the busiest period (when the tunnelling, power station, headworks and transmission line works are overlapping), there would be 32 light vehicle movements one way (64 both ways) per day. The numbers exclude frequent short trips along the Waitaha Valley Road when transmission line will be built along the road corridor, and when there will be a constant presence of workers due to frequently moving between poles.

- After the initial few months, there would be a steady movement of trucks (= heavy vehicles) bringing in gravel and cement for concrete (for tunnel lining, intake, powerhouse) for approximately two years, with an average number of trucks being 4 per day one way (8 both ways) with a short 5 month period (months 28 to 33) where there will be up to 6 trucks per day one way (12 both ways). It is assumed that gravel for the access road between Macgregor Creek and the powerhouse would be sourced from Waitaha River near the road construction site, and these numbers have been excluded from the calculations for Waitaha Road. The calculations also exclude transporting spoil from tunnel, powerhouse site and road excavations to the designated area on the farm.
- Oversize vehicle movements would occur sporadically. Initially, to bring in parts for the temporary and permanent bridge for Granite Creek and for Macgregor Creek drift deck components, and then when the road to the powerhouse becomes useable to bring in tunnel excavation machines. Later in the build, the turbine and switchyard equipment (generator, transformer) would be brought in.

For this assessment an off site source of rock for concrete construction aggregate has been assumed, that is out of the Waitaha valley.

Of note for all the construction stages is the number of oversize vehicles, as these vehicles will take up more room on the existing roads.

Based on the Westpower traffic generation information, the 64 two-way vehicle movements have been split into 50% cars, 34% light commercial vehicles and 16% medium commercial vehicles, see **Table 7** below for definitions. 30 two-way heavy commercial vehicles movements have been assumed with the split being 34% HCV Class I and 66% HCV Class II. Again, see Table 7 for a definition of HCV classes.

The frequency of traffic movements very over the construction stages with the highest concentration of vehicles occurring from month 7 for a 20 month period.

Table 7 below shows the estimated increase in heavy traffic.

Stage 4 has not been included as there is only a low level of light vehicle movements with no heavy or oversize vehicles.

Effects on Anderson Road West have not been considered in this way. Noting that total existing traffic is 10 vehicles per day on Anderson Road, refer **Table 2**, and compared to Table 9, Section 3 of Waitaha Road (22 vehicles per day) the traffic effects will be doubled, notwithstanding total combined existing and construction traffic is estimated to be 104 vehicles per day. Effects on Anderson Road West are discussed further below.

Table 7 Percentage Increase in Construction Traffic for Waitaha Road

Waitaha Rd	Start (m)	End (m)	ADT	% Cars	% LCV	% MCV	% HCV I	% HCV II	Totals	Total Heavy %	
Section 1	0	5766	87	62.1	5.1	20.3	3	9.5	100	12.5	HCV I + HVC II
Section 2	5766	6228	87	62.1	5.1	20.3	3	9.5	100	12.5	HCV I + HVC II
Section 3	6228	10976	22	62.1	5.1	20.3	3	9.5	100	12.5	HCV I + HVC II
Traffic Volumes - existing	**Start**	**End**	**ADT**	**# Cars**	**# LCV**	**# MCV**	**# HCV I**	**# HCV II**	**Total Traffic #**	**Total Heavy Vehicles #**	**Total Heavy %**
				Cars	LCV	MCV	HCV I	HCV II			
Section 1	0	5766	87	54.0	4.4	17.7	2.6	8.3	87.0	10.9	12.5%
Section 2	5766	6228	87	54.0	4.4	17.7	2.6	8.3	87.0	10.9	12.5%
Section 3	6228	10976	22	13.7	1.1	4.5	0.7	2.1	22.0	2.8	12.5%

Carriageway No	Start	End	ADT	# Cars	# LCV	# MCV	# HCV I	# HCV II	Totals	Total Heavy Traffic #	Total Heavy %
Scheme Traffic During Construction			94	32	22	10	10	20	94		
Total Traffic include Construction Traffic											
Section 1&2	0	6228	181	86.0	26.4	27.7	12.6	28.3	181	40.9	22.6%
Section 3	6228	10976	116	45.7	23.1	14.5	10.7	22.1	116	32.8	28.2%
Percentage Increase in Construction Traffic											
Section 1&2	0	6228	157	59%	496%	57%	383%	242%	108%	276%	
Section 3	6228	10976	92	234%	1961%	224%	1515%	957%	427%	1091%	

Legend

Cars	cars and wagons
LVC	Light commercial vehicles - non-truck commercial vehicles, less than 3.5 tonnes
MCV	Medium commercial vehicles - 2 axle truck without trailer, between 3.5 and 12 tonnes
HCV I	Heavy commercial vehicles class I - truck with or without trailer, 3 or 4 axles, over 12 tonnes
HCV II	Heavy commercial vehicles - class II -truck and trailers with 5 or more axles, over 12 tonnes
ADT	Latest estimates from July 2023 = vehicles per day
% MCV	Percentage of medium commercial vehicles as per WDC data
% Bus	Not included as WDC data indicates a zero value
#	Number of vehicles in each category
(m)	metres

3.3 Traffic generation operation

Westpower also confirm that during the operation and maintenance of the Scheme vehicle movements are as follows.

- During the first year of operations there may be one to two visits per week to check on structures and for regular maintenance, after which these are expected to drop back to one visit per week.

Traffic generation impacts during the operation of the Scheme are assessed as less than minor and are not discussed further.

3.4 Brief assessment of traffic related effects of the Scheme

3.4.1 State Highway Intersection

From Section 2, the main potential issue is that the SH 6 is on a large radius sweeping curve with no speed restriction. Vehicles travelling on the highway through the curve can safely negotiate it at the open road speed limit of 100 km/hr. There are advance warning signs that the Waitaha Road intersection is ahead in both directions. The other indication of any change ahead on the highway is a school bus route sign on both the eastern and western approach to the intersection.

The potential highest risk manoeuvre is long slow-moving vehicles turning on to the highway from Waitaha Road. This is due to the speed of approaching vehicles. The other potential risk manoeuvre is a long slow moving vehicle wanting to turn right into Waitaha Road from SH 6. Together with the approach warning signs on SH6, these risks are mitigated by a sealed road widening on the outside of the curve and sealed widening tapers on the inside of the curve.

View lines for vehicles entering on to the SH 6 from Waitaha Road in both directions are adequate but will need to be maintained by ensuring the vegetation on the inside of the curve is kept low, (about 1 metre above the road surface at the intersection).

The condition of the road is not discussed here, as no information is readily available on the strength of the road, but based on visual observations, it appears fit for purpose.

3.4.2 Local Roads

From the above it can be inferred that the main unmitigated potential effects are as follows:

1. Increased deterioration of the unsealed shoulders and seal edge break of Waitaha Road due to the road being narrow over the 5.4 m – 500 m long section and the 3.6 to 4 m sections for at least 9 km of its length, (high impact). Vehicles must be no wider than 2.55 m on NZ roads. This effect will also occur on Anderson Road West.
2. Increased rate of deterioration of Waitaha Road sealed pavement due to increased volumes of heavy traffic, (moderate impact). For Anderson Road West potentially given that roughness is higher the same effect could occur to a moderate to high impact level.
3. Increased risk of crashes at the intersection of SH6 and Waitaha Road due to long vehicles entering or exiting Waitaha Road (low to moderate impact).
4. Increased risk of head on crashes on Waitaha Road and Anderson Road due to the narrow sections of road (low to moderate impact). It is likely that vehicles will move to the existing shoulders, potential for damage to occur and getting stuck if a heavy vehicle, but a better option than crashing.
5. Increased risk of side on crashes where vehicles and/or stock entering or crossing Waitaha Road from property accesses or stock crossings are obscured due to vegetation (moderate impact).

Again, it is noted here that effects do not include the effects created by traffic associated with the Waitaha Quarry, as these are addressed as part of the conditions for that consent. However, the recommendations in the next section will also indirectly benefit traffic effects from the quarry operation.

4 Recommendations

Table 8 outlines my recommendations to manage and mitigate the effects.

Table 8 Effects and Mitigation

Item	Effect	Mitigation	Reasons	Residual effect post mitigation
1	SH 6 Intersection Increased risk of crashes at intersection with Waitaha Road Low-moderate impact	Immediately prior to and during the construction period, discuss with NZTA any additional mitigation of installing temporary truck crossing signs on both approaches to the intersection with Waitaha Road  View lines for vehicles entering on to the SH 6 from Waitaha Road in both directions will need to be maintained.to ensure the vegetation on the inside of the curve is kept low, (about 1 metre above the road surface at the intersection). [redacted] on behalf of NZTA has provided initial feedback on 26 May 2025, refer **Appendix D**. Feedback only the lines of the proposed mitigation and also adds in the need to maintain the inside edge of the intersection curve to maintain and avoid seal edge break.	Further mitigation to warn motorists of long and slow-moving vehicles entering and exiting Waitaha Road. Typically truck crossing signs are used on private road accesses, however given the use of the highway by tourist traffic, these are recommended.	Low impact

2	Waitaha Road Deterioration/damage to unsealed shoulders and edge break due to the short 500 m narrow road section and the 9 km one-way sections of road. High impact	Create Passing Places[3] Discuss with WDC if there are any plans to widen the 5.4 m section. Passing places should be placed at least on one side of the road and be spaced a maximum of 1.5 km apart where there is unobstructed view lines to approach vehicles. Where view lines cannot be achieved, passing places will need to be at closer intervals. Some of these passing places could be incorporated into the existing accessways used by milk tankers and other freight vehicles. Allowing a passing place over the 5.4 metre section and through the 9 km one way road would mean a minimum of 6 sites. Alternatively, where there is no side accessway and with agreement with WDC the Passing Places could be unsealed with an agreement to contribute to the maintenance and repair of sealed shoulder-edge break and maintaining a trafficable surface. An overseas example of a Passing Plac**e is shown in Slide 18 Passing Place example** A typical layout[4] for sealed milk tanker access is shown in **Slide 19 Road Widening to accommodate heavy vehicles**. For just a passing place (one side of the road only) the widening and extent shown on the opposite side of the road to the accessway has been assumed as a minimum standard. As indicated in this slide the total width of the widened area together with the existing sealed pavement width should be at least 6 metres, to allow two vehicles to pass.	There is going to be a relatively short construction period of 3 – 4 years of increased traffic. With the increased traffic volumes, the roads could be widened to two 3 metre traffic lanes, however after this period, traffic volumes and traffic composition is going to virtually revert back to current levels where single lane carriageways can be considered for traffic volumes up to 150 vpd. Therefore passing bays will be sufficient to address this effect. Design documentation for the spacing of passing places was unable to be found. At an eye height of 1.52 metres with 20/20 vision you can see 5 km which is the point where the earth's curvature bends away from the surface. For traffic visibility your eye height is assumed to be just over 1 m. This gives a maximum distance of 3.2 km. A conservative 1.5 km has been assumed to allow for a safety factor, slight potential vision impairment, and weather effects. In all cases there will need to be a 1.5 km uninterrupted view along the road. If this is not achievable, locations will need to be adjusted and/or additional passing places provided.	Low – moderate impact

Item	Effect	Mitigation	Reasons	Residual effect post mitigation
3	The deterioration of Waitaha Road sealed pavement due to increased volumes of heavy traffic. Moderate-high impact Industry research confirms heavy transport causes the most damage to roads, therefore an increase in heavy traffic will reduce the service life of the road.	Conduct a full before, during and post construction assessment to record the visual and roughness condition of the pavement. Negotiate with the road controlling authority, WDC a contribution agreement to contribute to increased maintenance of the road during construction/and/or a post construction restoration treatment of the road. There is an increase in the proportion of heavy traffic relative to all traffic, however there is already an elevated level compared to other traffic on the roads. Due to the total traffic volumes being low, for the construction period the roads will experience a short-term increase in traffic. The percentage increase in heavy traffic could be used as a basis to negotiate a contribution towards the WDC local share of agreed rehabilitation works[5].	The road is in good condition and is already subject to a high percentage of heavy traffic. Total heavy traffic (HCVI + HCV II) percentages have been assessed as increasing from 12.5% to between 22.6% to 28.2.3%. The increase in heavy traffic created by the project is therefore between 10.1% to 15.7%. Refer to the above, Table 7. Notwithstanding there are likely to be effects, the overall total traffic volumes even with the increased heavy traffic are low.	Low - moderate impact

[3] Austroads – Guide to Road Design Part 3 Geometric Design 2021 Edition 3.4 is the operative NZ guide. Section 4.2.6 recognises single carriageways for traffic volumes less than 150 vpd and notes in Table 4.5 of the guide that wider sealed shoulders (lay-bys) are to be provided. For this project total traffic volumes on Waitaha Road are between 116 an 181vpd, however this higher traffic volume is only during the construction period.

[4] Refer Transit Planning Policy Manual Appendix 5B Accessway standards and guidelines. Still the operative guide and available via https://www.nzta.govt.nz/resources/planning-policy-manual/ It is noted that this accessway layout is not referenced in the WDC Engineering Standard, however it is likely to be the preferred solution by operators of dairy companies and milk tankers.

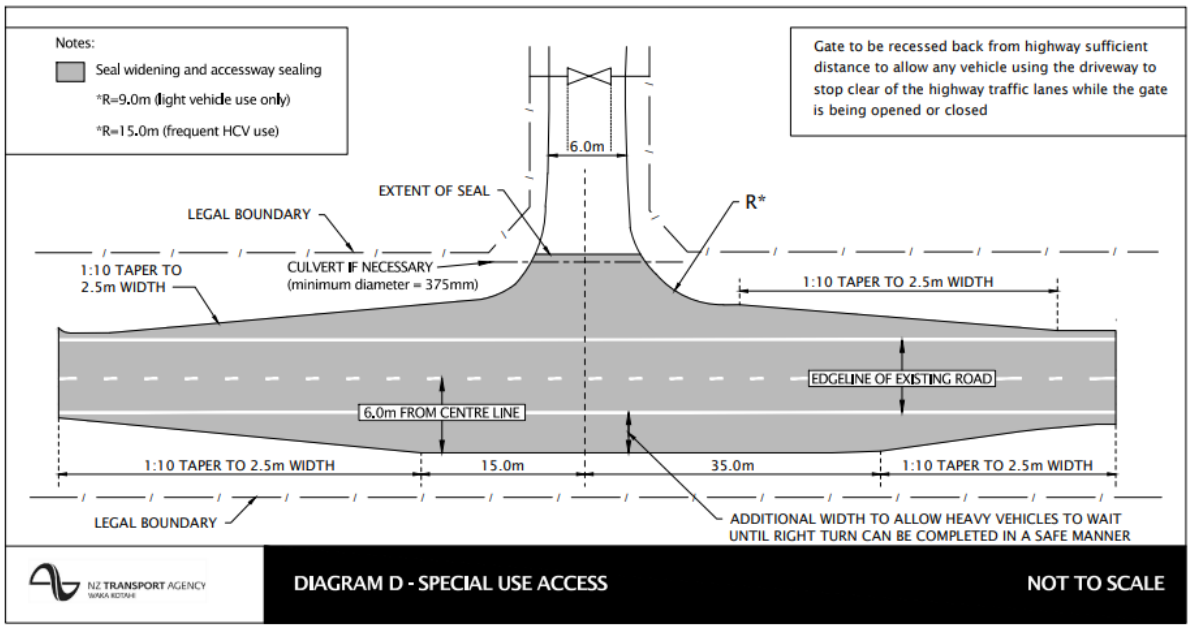
[5] For the local road improvements, WDC currently receives a 64% financial assistance rate which is generated from fuel taxes and road user charges and is paid via NZTA. This means the other 36% is funded locally by WDC. Local road improvements also need to meet NZTA economic evaluation criteria, and if not deemed to be economic, WDC has to fully fund any works it still considers to be of benefit to the district.

Item	Effect	Mitigation	Reasons	Residual effect post mitigation
4	Anderson Road West, deterioration and widening. High impact	Conduct a full before, during and post construction assessment to record the visual and roughness condition of the pavement. Negotiate with the road controlling authority, WDC a contribution agreement to contribute to increased maintenance of the road during construction/and/or a post construction restoration treatment of the road. Also, a Passing Place should be included with the location agreed between Council and local farmer. **Appendix C** provides a concept design plan for an improved road layout for Anderson Road and a relocated entrance which will effectively become part of the private road access for the Scheme. This proposal includes sealed road widening that will create a two-lane section over Anderson Road. The WDC District Plan will need to be confirmed with Council as to if a resource consent is needed for this new entranceway. .	The road appears to be in a fair condition for its current use. It is expected that the increased traffic generated for the construction of the scheme will cause increased deterioration. A review of Section 8.9.3 of the WDC's District Plan indicates the entranceway may meet the requirements as a Permitted Activity. The new entrance is approximately 50 metres from the Waitaha Road intersection. The National Speed Limit Register confirms the posted speed limit is 100 kph, however given the proximity of the Waitaha Road intersection, the start of the Waitaha Access Route and the existing entranceway, actual operating speed is likely to be less. A review of aerial photographs and dash cam footage taken in Dec 2024 indicates there is 160 metres visibility in both directions from the new proposed entrance. An added safety benefit of the proposed entrance is that it will separate Scheme traffic from traffic associated with the existing farming activities.	Low – moderate impact

Item	Effect	Mitigation	Reasons	Residual effect post mitigation
5	Head-on crashes on Waitaha Road Moderate-high impact	Create Passing Places As part of a construction traffic management plan, all vehicles associated with the construction phase could be required to keep their headlights on at all times. Two-way communication systems are also recommended for the higher frequency truck movements (e.g., rock aggregate cartage) so drivers can communicate with each other when approaching in opposite directions on the single lane road.	Potentially a dilemma could be created where neither vehicle approaching each other gives way, especially if they are heavy vehicles. Creating passing places means approaching vehicles can adjust and reduce their speeds and one of the two vehicles can pull into the passing place.	Low – Moderate impact
5	Side on crashes at accessways and stock crossings Moderate impact	Work with WDC and property owners to improve visibility where there is vegetation obscuring the views for approaching vehicles. Work with WCD to install advance stock warning signs.  Costs of making these improvements are likely to be low, however they would help improve safety for road users.	While these issues are imbedded existing hazards the increased traffic volumes during the construction period are going to increase the risk for road users who do not routinely use the road.	Low impact
6	General Mitigation Moderate impact	Part of a construction traffic management plan should include consideration where possible of scheduling traffic for the following: • If certain traffic can be scheduled outside the milk tanker runs to transport in large, prefabricated items. • To avoid other peck farming activities • To avoid Community events • To avoid School bus times	This type of mitigation would help with communication with key stakeholders such as the dairy company and the local farming community.	Low impact

Slide 18 Passing Place example

Slide 19 Road Widening to accommodate heavy vehicles



5 Conclusions

Based on the recommended mitigations presented in Section 4, the reduction of traffic effects to low to moderate will result from Westpower agreeing appropriate mitigations with the Council to mitigate any residual effects on:

- road rehabilitation due to heavy traffic caused by using the local road network during the Scheme's construction, including funding any necessary rehabilitation (that is, if damage occurs from Westpower's use); and
- road maintenance to the left hand curve seal edge and visibility view line vegetation of the SH6 -Waitaha Road intersection if required by NZTA during the Scheme's construction, including funding any necessary maintenance works (that is, if damage occurs from Westpower's use); and
- road safety signage and passing places to reduce congestion on Waitaha Road and Anderson Road;
- addition of advance warning signs on the state highway approaches to the SH6-Waitaha Road intersection;
- development and provision of a Construction Traffic Management Plan that can be used by Westpower and its agents to ensure. In particular, safe use of the public road and also the private access routes.

Prior to the above Westpower shall carry out conditions assessments of Waitaha and Anderson Road. These assessments should be also carried out during the construction period and shall be carried out after the construction period. These assessments shall be used as a basis for determining rehabilitation works to be funded by Westpower as required by WDC.

At an agreed time with WDC and prior to the Scheme commencing with the WDC, Westpower will need to submit corridor access, requests, detailed designs, constructions drawings, for WDC's approval.-

At agree times and prior to the Scheme commencing, Westpower will need to undertake the approved works, provide certification and as-built drawing that the works have been completed in accordance with the design and construction drawings. For the construction period Westpower shall maintain the approved works.

6 Document Control

Title:	Traffic Assessment	
Client:	Westpower Limited	
My Reference	202413	
Report Prepared By:	M D Sutherland	18/12/2024
Version 1	Draft	18/12/2024
Version 2	Update	9/05/2025 (Anderson Road East & Substation)
Version 3	Update	10/06/2025 (Anderson Road West)
Version 4	Update	27/06/2025 (Waitaha Quarry)

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7 Appendices

Appendix A – MELVIN DAVID SUTHERLAND QUALIFICATIONS AND EXPERIENCE

My qualifications are a BSc (Geography), BE (Civil), PGDBusAdmin (Law).

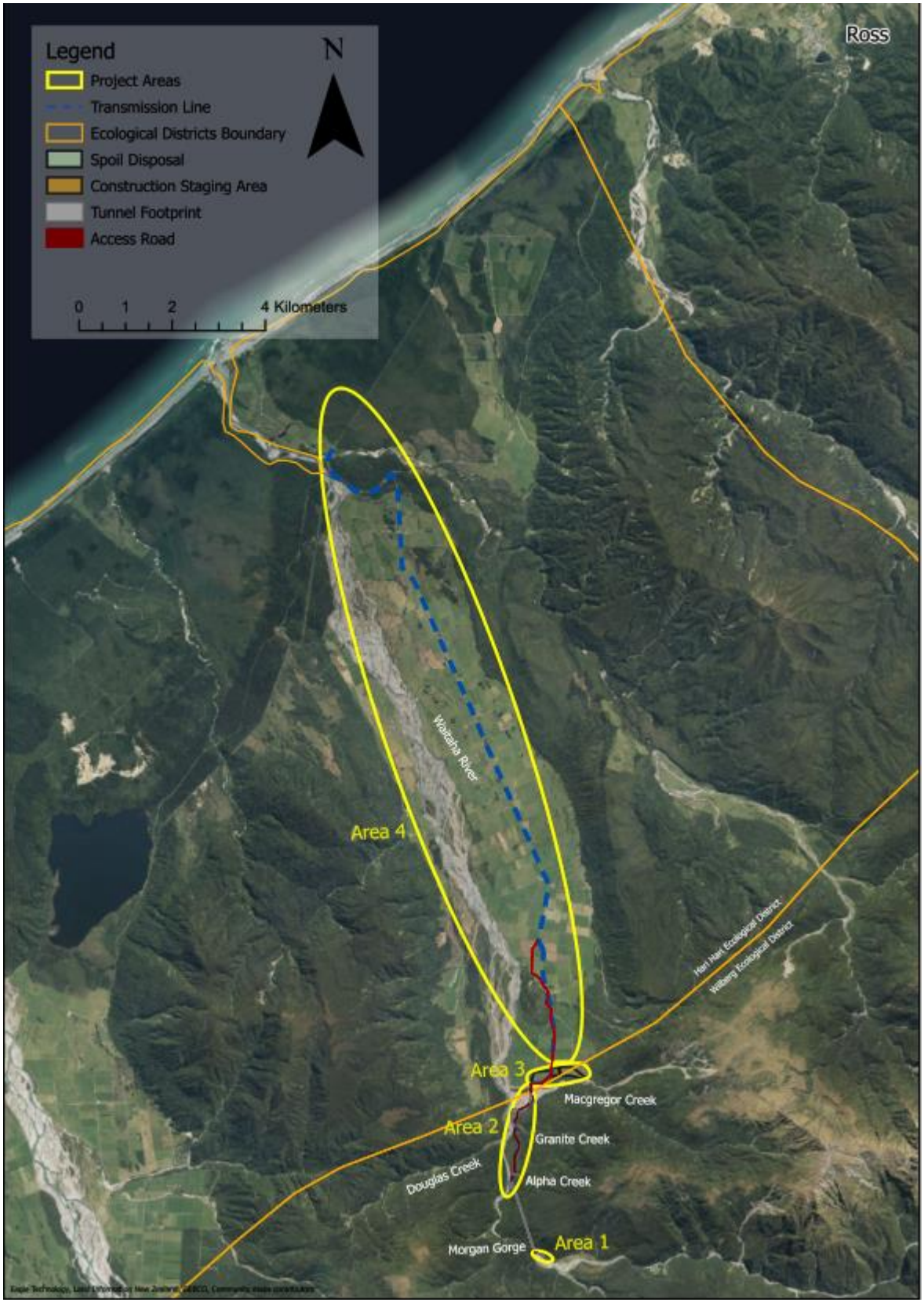
My relevant experience includes working in the local government infrastructure industry on the West Coast in the Grey District from 1985 and up to 2021.

From 1989 to 2021, I have been in second tier infrastructure management roles reporting to Chief Executives. From 2022 I have undertaken consulting work up to the present in the Westland District and the Buller District, primarily for local government clients.

I have also been on the Technical Advisory Committee to the Regional Transport Committee, West Coast Regional Council and have also chaired the West Coast Regional Lifelines Utility Committee. In local government and the private sector, I have considered transport effects relating to a range of activities from coal developments to subdivisions.

I am a Chartered Member of Engineering NZ and hold a current certificate from the Ministry for the Environment Making Good Decisions Programme.

Appendix B – Site Location Map



Appendix C – Farm Entrance Access – Waitaha-Anderson Roads

(attached separately)

Appendix D NZTA's feedback

From: [redacted]

Sent: Monday, May 26, 2025 1:27 PM

To [redacted]

Subject: RE: Waitaha Hydro Project - Waitaha Valley Road/State Highway Intersection

Hi [redacted]

Sorry just got comments back from safety on Friday.

These are our preliminary comments below:

- Recommendation to install advanced warning signage of heavy vehicles on the SH approx. 200m from the intersection.
- The condition of the intersection currently appears adequate and will withstand the additional traffic. However, the northern left turn approach may require some shoulder widening to prevent edge break from the increased volume of turning traffic. The widening would be most critical on the inside radius of the left-hand turn where it appears there are already issues with vehicles running outside of the seal and causing damage as shown below.

- Safety have concerns with this proposal particularly during the construction (busy period) due to the lack of sightlines combined with the extra vehicle movements (including trucks). However, if the advanced warning signs are implemented and if the vegetation can be cleared and appropriate sightlines achieved and maintained by the applicant during the construction periods that would be a solution.

Once you have a full application please feel free to send it to me and I can provide more in depth comments.

Thanks,

[redacted]