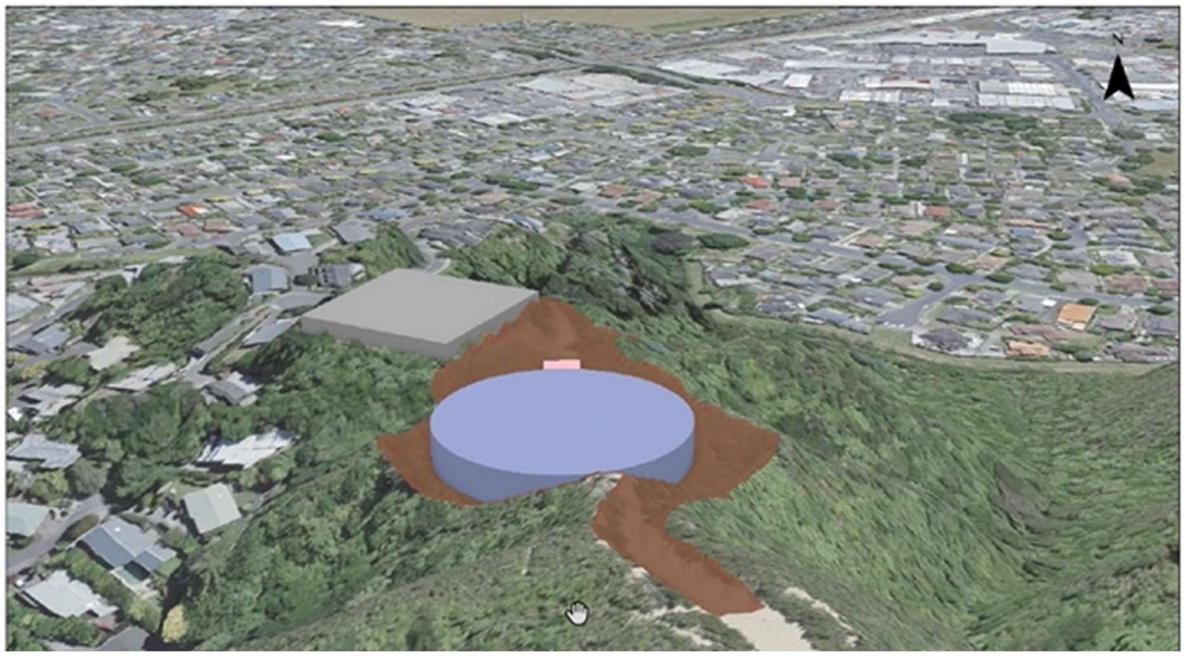
Wellington Water

EASTERN HILLS RESERVOIR

CONSTRUCTION TRANSPORT ASSESSMENT

11 SEPTEMBER 2023

PUBLIC



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REV	DATE	DETAILS
1	13/7/23	For external legal review
2	11/09/23	Issued to WWL

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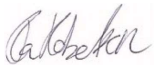
Reviewed by:	Ian Robertson	11/09/23	
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EXECUTIVE SUMMARY

The purpose of this report is to provide an assessment of the impact of construction traffic on the transport network around where the Eastern Hills Reservoir is being constructed.

The Eastern Hills Reservoir is being constructed adjacent to an existing reservoir which is accessed via Summit Road in Fairfield. New pipelines are also being constructed as part of the works, which will connect to the rest of the water network at Balgownie Grove. Access to construction sites is via quiet, residential cul-de-sacs. The whole construction period is expected to take approximately 2.5 years to complete.

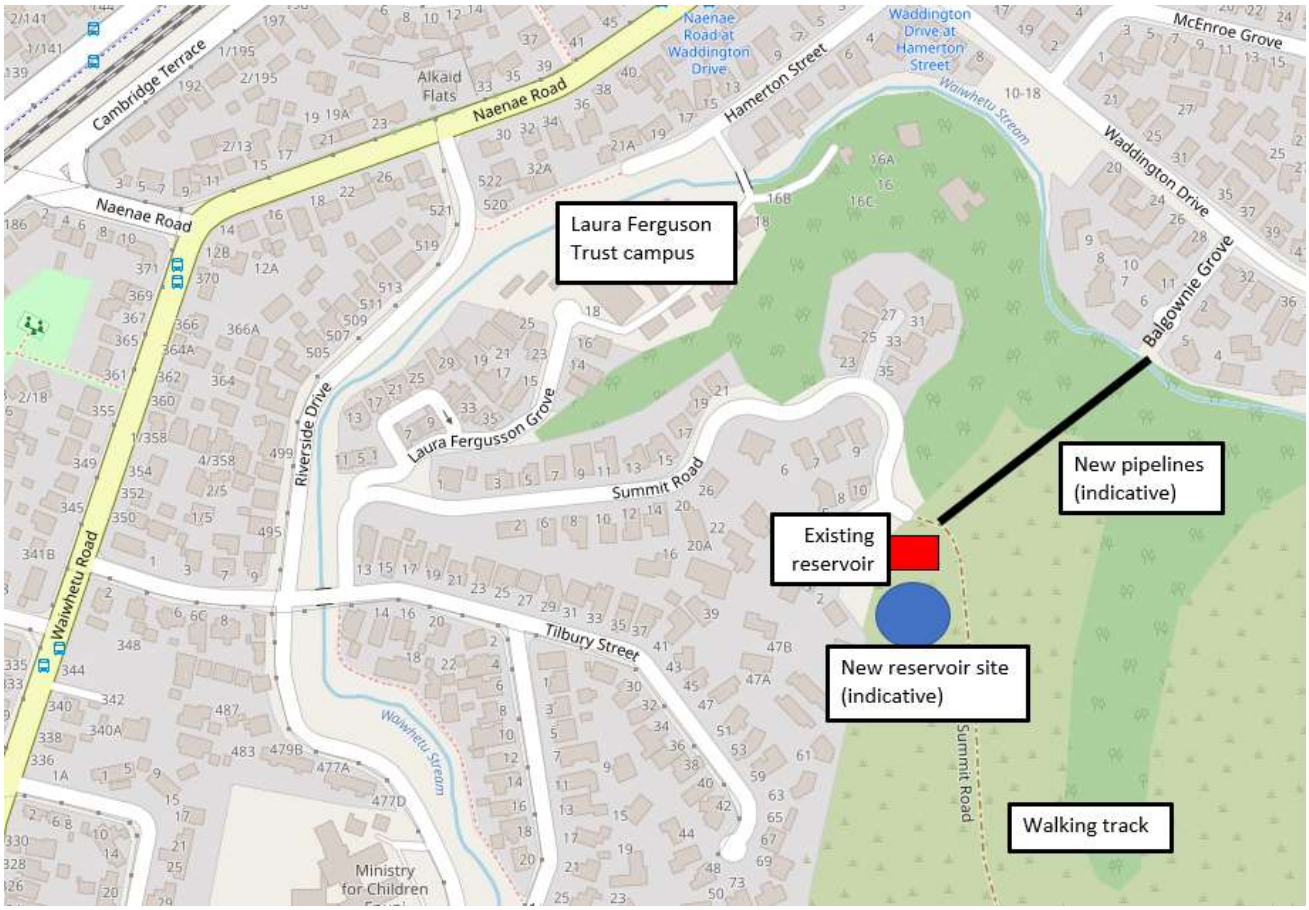

Figure 1: Map of site and surrounding area

We assessed the reservoir and pipelines construction transport effects based on construction methodology provided by prospective construction contractors.

The report considers the following effects:

Table 1: Summary of assessment of Eastern Hills Reservoir construction transport effects

EFFECT	RECOMMENDED MITIGATION	RATING (WITH MITIGATION)
Road network effects (impact on congestion, travel times): Summit Road and around	Early, and ongoing, communication with residents Monitoring of effects	Minor effect

EFFECT	RECOMMENDED MITIGATION	RATING (WITH MITIGATION)
Road network effects (impact on congestion, travel times): Balgownie Grove and around	Early, and ongoing, communication with residents	Negligible effect
Road safety effect: increase in exposure to Heavy Commercial Vehicles (HCVs) – Summit Road	Adherence to Traffic Management Plan (TMP), including reduced speed limit	Minor effect
Road safety effect: Summit Road / Tilbury Street intersection	Traffic control during busy stages of project	Minor effect
Safety effect: increase in exposure to HCVs – Balgownie Grove	Traffic management, including spotter when HCVs are accessing and leaving site	Minor effect
Safety effect: Naenae Road / Waddington Drive intersection	Parking removal at top of T intersection	Minor effect
Parking removal: Summit Road	Early, and ongoing, communication with residents Monitoring of effects	Minor effect
Parking removal: Balgownie Grove	Early, and ongoing, communication with residents	Negligible effect
Track closure	Advance signage at turn-off points and map boards Early, and ongoing, communication with residents and local track user groups	Minor effect

1 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to provide an assessment of the impact of construction traffic on the transport network around where the Eastern Hills Reservoir is being constructed. The report considers physical impacts, operational impacts, and road safety impacts on the transport system.

1.2 ABOUT THE EASTERN HILLS RESERVOIR

Wellington Water is working with Hutt City Council to build a water reservoir in the eastern hills above the suburbs of Naenae and Fairfield. The purpose of the project is to improve Lower Hutt's water supply resilience. The Eastern Hills Reservoir will be built immediately behind the existing reservoir on Summit Road, Fairfield. In addition, three new pipelines will be built. The construction of two of these will be accessed from Balgownie Grove for some of the time. The construction of the reservoir and most of the pipeline work will be accessed from Summit Road.

1.3 PROCESS

This assessment is based on the draft construction methodology provided in the appendix of the Notice of Requirement application. This methodology was prepared in consultation with prospective contractors HEB and Fulton Hogan.

The following steps were followed for this Construction Transport Assessment (CTA):

1. Review the area, considering the land use and transport context.
2. Review draft construction methodology, establishing:
    - Duration and staging of construction period,
    - Working hours,
    - Access to and from site,
    - Trip generation by different vehicle types,
    - Trip distribution.
3. Identify potential positive and negative effects of the construction on the transport system.
    - Physical effects,
    - Operational effects,
    - Road safety effects
4. Consider how the construction methodology reduces those effects. This is referred to as 'mitigation'.
5. Provide a rating of those effects and associated baseline mitigation, ranging from 'Negligible Effect' to 'Critical Effect'. The rating is based on the professional judgement of senior transport planners. Table 2 below indicates the matrix used to assess effects.

Table 2: Matrix for assessing effects

		Severity of effect			
		Low	Minor	Moderate	High
Likelihood of effect	Low	Negligible	Minor	Moderate	Major
	Minor	Minor	Minor	Moderate	Major
	Moderate	Moderate	Moderate	Moderate	Major
	High	Major	Major	Major	Critical

6. If necessary, make recommendations to further reduce the effects.

1.4 ASSUMPTIONS

This construction traffic assessment is based on the details provided in the draft construction methodology.

A Traffic Management Plan (TMP) will be developed as per the construction methodology and recommendations in this assessment.

The rating of each effect is made assuming that the recommended mitigations are in place.

This assessment has been desk-based with no on-site verification. The author has relied on:

- the information and data provided in the construction methodology,
- aerial imagery provided through Google Earth and Hutt City Council's GIS viewer,
- results from online surveys and face-to-face engagement with affected residents

2 TRANSPORT AND LAND USE CONTEXT

2.1 RESERVOIR ACCESS VIA SUMMIT ROAD

Access to the reservoir construction site will be via Summit Road, a 500m cul-de-sac leading into the eastern hills of Lower Hutt. Two other cul-de-sacs come off Summit Road: Farrelly Grove and Laura Fergusson Grove.

Summit Road, Farrelly Grove, and Laura Ferguson Grove are classified as Local Streets under Waka Kotahi's One Network Framework (ONF)[1]. Local Streets typically provide quiet and safe residential access. There are generally low levels of on-street activity and movement by people walking, cycling, and driving. Traffic volumes are very low with fewer than 250 vehicle movements per day (vpd). For the most part, the streets are only used for access to residential properties. Other trip generators include:

- A walking / mountain biking track that begins at the end of Summit Road
- An existing reservoir located just beyond the end of Summit Road
- Laura Fergusson Trust campus, located at the end of Laura Fergusson Grove (which can also be accessed from Hamerton Street)

Table 3: Transport information for Summit Road, Farrelly Grove, and Laura Fergusson Grove[2]

	SUMMIT ROAD	FARRELLY GROVE	LAURA FERGUSSON GROVE
ONF classification	Local Street	Local Street	Local Street
Traffic Volume	200 vpd	6 vpd	65 vpd
Heavy traffic volume	3% (6vpd)	0% (0vpd)	0% (0vpd)
Average carriageway width (kerb to kerb)	7.5-8m	7.5m	6.5-7m
No. property lots	30	10	32

[1] https://www.nzta.govt.nz/planning-and-investment/planning/one-network-framework/overview/street-categories/#local-streets

[2] Source: Mobile Roads and Hutt City GIS

Summit Road connects to the rest of the road network via Tilbury Street, which is also classified as a Local Street with an average of 1,730 vehicles per day.

Figure 2: Map of site and surrounding area

2.2 PIPELINE ACCESS VIA BALGOWNIE GROVE

Access for some of the construction of two of the new pipelines will be via Balgownie Grove (with the rest being from the Summit Road site). This street is also a low volume cul-de-sac, with fewer than 50 vehicle movements per day. Waiwhetū Stream is accessible on foot from the street, although there are no formal walking or cycling tracks.

There are 11 residential property lots on Balgownie Grove. Based on information provided at a street event, there are several home-businesses located on Balgownie Grove which require regular vehicle access.

Balgownie Grove connects to the rest of the road network via Waddington Drive, which is also classified as a Local Street, with an average of 2,530 vehicles per day.

2.3 CRASH HISTORY

Crash history is based on data supplied by Waka Kotahi through the Crash Analysis System (CAS).

2.3.1 SUMMIT ROAD AND AROUND

There have only been four recorded crashes in the last 10 years on and around Summit Road. Three of these were at the Waiwhetu Road / Tilbury Street intersection. No crashes have resulted in death or serious injury.

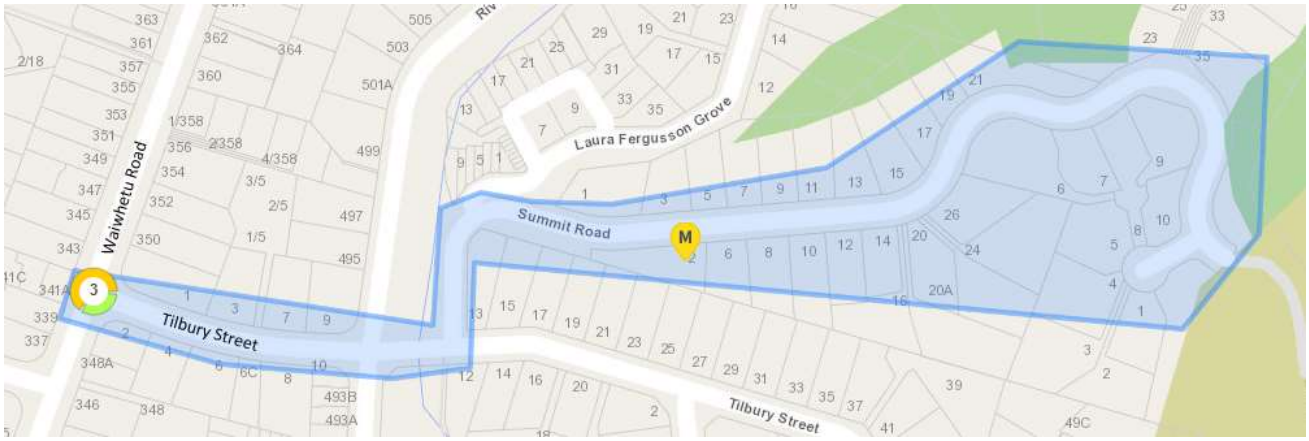

Figure 3: Recorded crash history Summit Road and around, 2013-2022 (Source: CAS, Waka Kotahi)

2.3.2 BALGOWNIE GROVE AND AROUND

There have been three recorded crashes at the Waddington Drive / Naenae Road intersection during the 10-year period from 2013-2022. There are no recorded crashes on Waddington Drive as far as Balgownie Grove, or on Balgownie Grove itself. No crashes have resulted in death or serious injury.

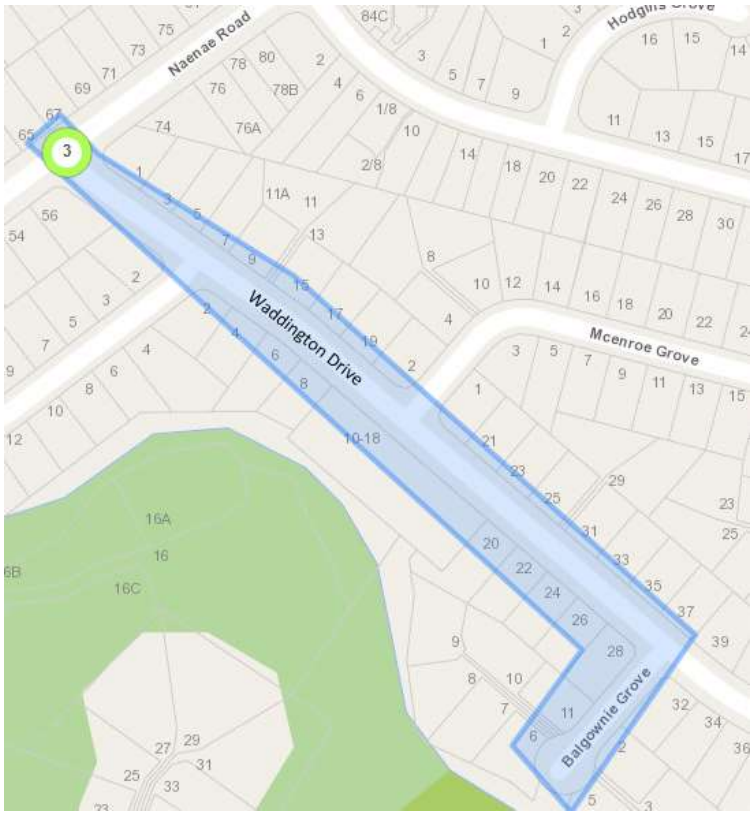

Figure 4: Recorded crash history Balgownie Grove and around, 2013-2022 (Source: CAS, Waka Kotahi)

3 PROPOSED WORKS

3.1 PROJECT DESCRIPTION

The Eastern Hills (previously referred to as Naenae 2) Reservoir will be a circular 15 million litres (ML) above ground concrete reservoir, with a 55m external diameter and an above-ground height of 8.4m. It will be located adjacent to the existing Naenae Reservoir at the top of Summit Road, Fairfield, Lower Hutt.

The Reservoir will be constructed at the same bottom water level (BWL) and top water level (TWL) elevation as the existing reservoir. It will require earthworks cut volumes of approximately 90,000 m^3 un-bulked, or 108,000 m^3 bulked.

Five new pipes will also be constructed. They are:

- An inlet pipe between the Reservoir and the Summit Road / Farrelly Grove intersection
- A delivery pipe between the reservoir and the potable water network on Balgownie Grove
- An overflow / scour pipe adjacent to the delivery pipe which discharges into Waiwhetu Stream
- A cross-connection between the existing reservoir and proposed reservoir
- A connection from the existing reservoir overflow pipe to the proposed overflow/scour pipe.

Figure 5 provides an overview map of the reservoir project and associated pipelines.

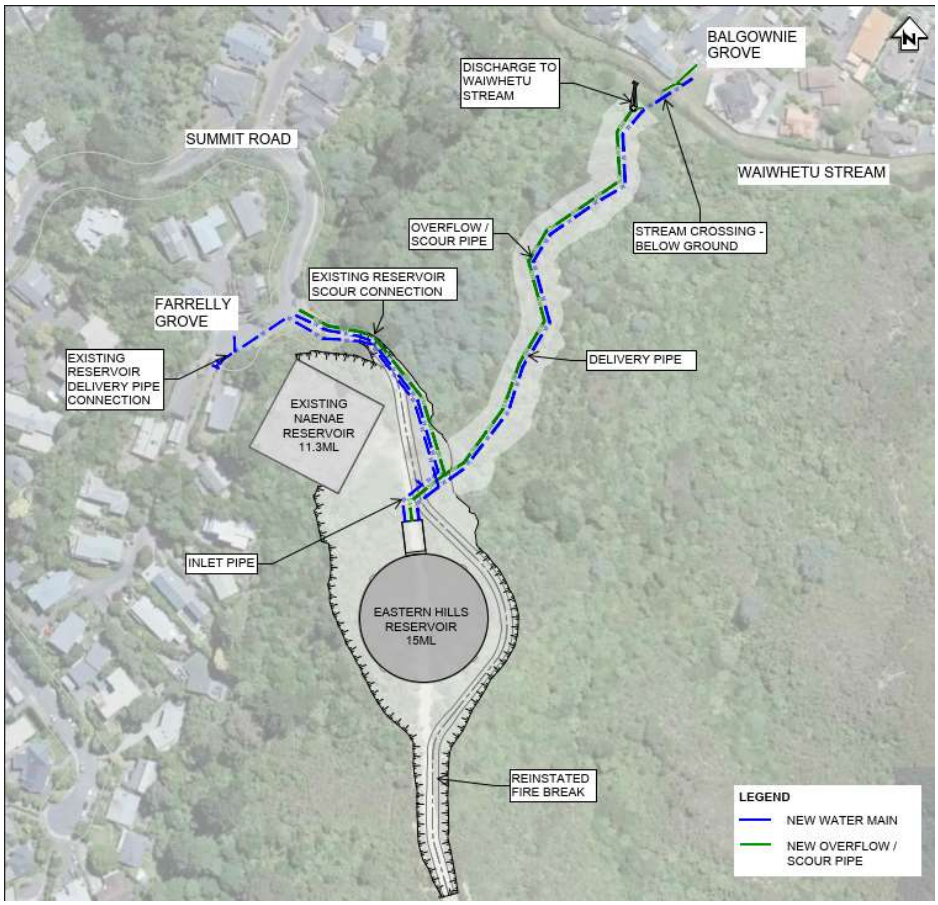

Figure 5: Map of Eastern Hills Reservoir Site Plan

3.2 CONSTRUCTION METHODOLOGY

The project will be completed in eight stages. Note that some of these stages overlap with each other.

1. Site establishment
2. Earthworks for reservoir
3. Enabling works for pipelines
4. Install scour and delivery pipeline
5. Stream pipe crossing and stream outfall
6. Reservoir construction
7. Valvehouse construction
8. Landscaping and site finishing works

3.2.1 DURATION OF CONSTRUCTION

The total project construction period is expected to be from winter 2024 to spring 2026, a period of 2.5 years.

3.2.2 WORKING HOURS

Working hours are expected to be Monday to Saturday, 7am-6pm. There will be no work on Sundays or public holidays.

There will be some instances where site access will be prior to 7am. This will be for tasks such as crane mobilisation or delivery of large panels which can only be delivered with traffic restrictions. Assuming the concrete panels can be transported on a flat-deck truck, and do not require large transporters, there will be limited occasions where access to site is required prior to 7am.

There will be approximately four nights of night works (starting around 3am) for large concrete pours and curing attendance.

3.2.3 SITE ACCESS

Access to the Reservoir site will be via Summit Road. Access to construct the delivery and scour/overflow pipes will be via the reservoir site at the top of Summit Road and via Balgownie Grove at the bottom. Site access via Balgownie Grove is only required during Stages 4 and 5 of the project.

3.2.4 TRIP GENERATION

The number of expected heavy commercial vehicle (HCV) movements are taken from the construction methodology. Vehicle movements contained within site are not included. Only HCV movements are considered. The construction methodology does not outline the numbers of light vehicle movements generated by the reservoir and pipeline construction. It is expected that core staff will be shuttled to and from site at the beginning and end of each working day from a designated location. Therefore, we anticipate only a minor number of light vehicle trips associated with the reservoir construction.

An estimated 102,000 m^3 of bulked material are to be removed from site during the earthworks stage. Rigid 6 and 8-wheel trucks will be used initially until there is sufficient room on site for truck and trailer units. During this 9–10-month earthworks stage (Stage 2), there is expected to be a maximum of 100 truck movements per day (50 return trips).

Concrete pours will occur during the Reservoir construction stage (Stage 6) and will also require a high number of HCV movements per day. It is estimated that there will be up to 120 concrete truck movements in one day (60 return trips).

Night works for four days only (starting approximately 3am) will be required during construction of the Reservoir (Stage 7) to enable concrete pours for the reservoir floor and roof.

Table 4 on the following page shows the expected vehicle movements per stage.

Table 4: Heavy vehicle trip generation summary for Summit Road during construction

STAGE (NOTE STAGES MAY OVERLAP)	EXPECTED DURATION	VEHICLES, ACCESS, TRAFFIC CONTROLS	EXPECTED TOTAL HCV MOVEMENTS (RETURN TRIP)	EXPECTED PEAK HCV MOVEMENTS PER DAY (RETURN TRIP)	FREQUENCY DURING PEAK (ASSUMING EVEN SPREAD THROUGHOUT DAY)
1. Site establishment	1-2 months	· Entry and exit via Summit Road · Excavators and trucks · No public access through to the firebreak from now until project completion	200 movements (100 return trips)	40 movements (20 return trips)	Every 15-20 minutes
2. Earthworks for reservoir	9-10 months	· Entry and exit via Summit Road · TMP and reduced speeds on Summit Road and surrounding streets · Heavy excavators · Rigid 6- and 8-wheel trucks · Truck and trailer units	18,200 movements (9,100 return trips)	100 movements (50 return trips)	Every 5-10 minutes
3. Enabling works for pipelines	1 month	· Entry and exit via Summit Road · TMP and reduced speeds on Summit Road and surrounding streets · Excavators and trucks · Truck and trailer units for half the excavated material	100 movements (50 return trips)	10 movements (5 return trips)	Every 60-70 minutes
4. Install scour and delivery pipeline	6-7 months	· Majority of plant will entry and exit via Summit Road · Limited access from Balgownie Grove · TMP and reduced speeds on Summit Road and surrounding streets · Excavators, large and small Hiab/flat bed, 10 tonne tipper trucks, truck and trailer units, concrete mixers, concrete pumps, compaction roller, etc	940 movements (470 return trips)	100 movements (50 return trips)	Every 5-10 minutes

STAGE (NOTE STAGES MAY OVERLAP)	EXPECTED DURATION	VEHICLES, ACCESS, TRAFFIC CONTROLS	EXPECTED TOTAL HCV MOVEMENTS (RETURN TRIP)	EXPECTED PEAK HCV MOVEMENTS PER DAY (RETURN TRIP)	FREQUENCY DURING PEAK (ASSUMING EVEN SPREAD THROUGHOUT DAY)
5. Stream pipe crossing and stream outfall	1-2 months	· Entry and exit from Balgownie Grove for concrete trucks, 13 tonne excavator, rigid truck, small Hiab/flat bed, 10 tonne tipper trucks, concrete pumps, crane, etc. · Limited access from Summit Rd via track down pipeline for excavators · TMP and reduced speeds on Balgownie Grove	60 movements (30 return trips)	10 movements (5 return trips)	Every 60-70 minutes
6. Reservoir construction	8-9 months	· Entry and Exit via Summit Road · TMP and reduced speeds on Summit Road and surrounding streets ·Large and small Hiab/flat bed, heavy plant transporters, 10-tonne tipper trucks, truck and trailer units, concrete mixers, concrete pumps, drilling rigs for piles, etc.	600 movements (300 return trips)	120 movements (60 return trips)	Every 5-6 minutes
7. Valvehouse construction	2-4 months	· Entry and exit via Summit Road · TMP and reduced speeds on Summit Road and surrounding streets ·Large and small Hiab/flat bed, heavy plant transporters, 10-tonne tipper trucks, truck and trailer units, concrete mixers, concrete pumps etc.	100 movements (50 return trips)	30 movements (15 return trips)	Every 20-30 minutes
8. Landscaping and reinstatement	1-2 months	· Entry and exit via Summit Road · Excavators, 10-tonne tipper trucks, truck and trailer units	400 movements (200 return trips)	40 movements (20 return trips)	Every 15-20 minutes
Total	30-36 months				

3.2.5 TRIP DISTRIBUTION

For construction traffic coming to or from SH2, the set route will be via Summit Road, Tilbury Street, Waiwhetu Road, Naenae Road, Daysh Street, Fairway Drive, Kennedy Good Bridge towards SH2. This is the preferred route for HCVs travelling both north and south.

This route is illustrated in Figure 6.

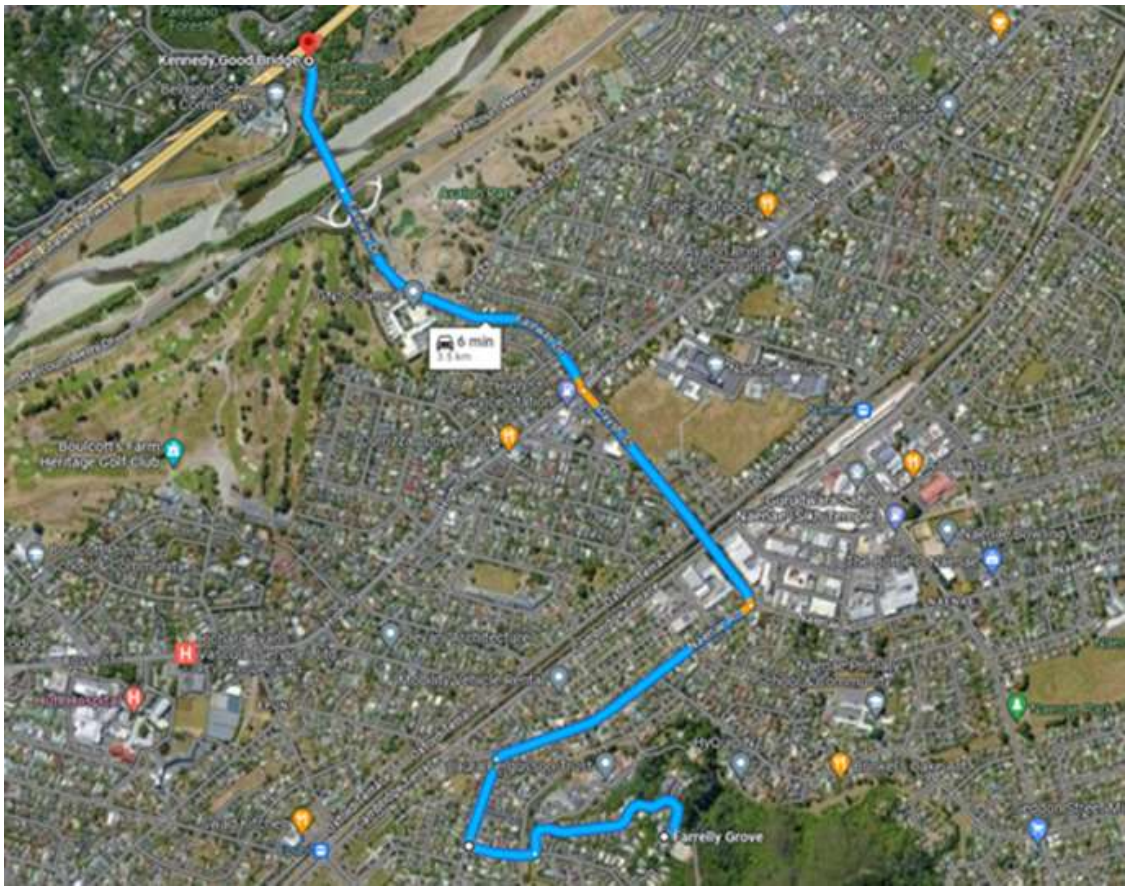

Figure 6: Traffic route for HCVs between site and SH2

The route is similar for access to the stream works and bottom of the pipeline site. Instead of Summit Road and Tilbury Street, the access streets are Balgownie Grove and Waddington Road.

The origins and destinations are assumed to be accessed via SH2.

4 ASSESSMENT OF EFFECTS

4.1 ROAD NETWORK EFFECTS

4.1.1 SUMMIT ROAD AND AROUND

Description of effect

At the busiest stage of the project, there is expected to be 120 HCV movements (60 return trips) per day accessing the Summit Road reservoir site. This represents an increase of 60% in total traffic volumes on Summit Road. Note that this only includes the additional HCV vehicles and not additional light vehicle construction traffic, which is expected to be low.

Table 5: Traffic volumes on affected streets currently and during construction

	Summit Road	Tilbury Street
Traffic volume (current)	200	1730
Traffic volume during construction (additional HCV vehicles only)	320	1850
Percentage increase	60%	7%

Due to their size, HCVs may restrict two-way traffic along sections of Summit Road and Tilbury Street. This may cause small delays for residents of Summit Road, Farrelly Grove, Laura Ferguson Grove, and Tilbury Street. The carriageway width of Summit Road is about eight metres, so vehicles are often restricted to one-way traffic flow currently when vehicles are parked on one or both sides of the street. Given the increase in traffic volumes due to construction vehicles, there will be an increase in the instances of one-way traffic flow where people have to stop and wait for vehicles in the opposing direction. This is tempered by the proposed temporary removal of on-street car parking which will better enable two-way traffic flow for light vehicles.

Due to low traffic volumes on local streets, it is expected that those affected streets have the capacity to absorb this additional volume without causing unacceptable delays.

Based on what information has been provided in the construction methodology, it is expected that residents of Summit Road, Farrelly Grove, Tilbury Street, and Balgownie Grove will be able to access their properties throughout the construction period. Road closures or the blocking of driveways will not be required at any point.

On Urban Connector roads such as Waiwhetu Road (4,000 vpd) and Naenae Road (12,000 vpd), the additional 120 heavy vehicle movements per day (maximum) is expected to have a negligible effect on road network congestion.

Mitigation

We support the proposed TMP outlined in the construction methodology which includes parking removal to better enable traffic flow for light vehicles on Summit Road.

While road network impacts are expected to be minor, they should be monitored throughout the project. We expect that the risk of unacceptable delays for residents of affected streets be addressed in the project's risk register.

It is recommended there be sufficient communication with Summit Road, Farrelly Grove, Laura Ferguson Grove, and Tilbury Street residents to expect limited delays due to the higher volume of HCVs. We expect a Communications Plan will be incorporated into the project.

Rating

Minor effect.

4.1.2 BALGOWNIE GROVE

Description of effect

HCV movements on Balgownie Grove are much fewer and cover a shorter distance (<80m) so the possible road network effects are much lower compared to Summit Road. The maximum number of HCV movements on Balgownie Grove is expected to be 10 movements (5 return trips) per day. There will be a total of about 60 HCV movements (30 return trips) over the course of one-two months (Stage 5 of the project).

At times, HCVs may block part of the cul-de-sac, preventing vehicles from doing a full turning circle. Driveway access to all properties will be retained.

It is expected that the footpath between No. 5 and No. 6 Balgownie Grove will be closed for the duration of the site works. This does not prevent pedestrian access to properties. Balgownie Grove is a quiet, safe street to cross the road on.

Due to low traffic volumes on Balgownie Grove, it is expected that those affected streets have the capacity to absorb this additional volume without causing unacceptable delays.

Mitigation

A TMP will be in place throughout the duration of the site works, advising of footpath closure and a reduced speed limit of 30kmph.

We recommend early and regular communication with Balgownie Grove residents to inform them of possible delays when HCVs are accessing site.

Rating

Negligible effect

4.2 IMPACTS ON ROAD SAFETY

4.2.1 INCREASE IN EXPOSURE TO HCVS – SUMMIT ROAD AND AROUND

Description of effect

HCVs pose a greater risk to road users, particularly when traveling with downhill momentum. There will be increased exposure to HCV movements on Summit Road and Tilbury Street. At the busiest time, there will be 120 HCV movements (60 return trips) per day on Summit Road. This is the equivalent of an HCV traveling inbound or outbound every 5-10 minutes throughout the working day. Road users such as cyclists, pedestrians, and motorcyclists are particularly vulnerable.

Mitigation

We recommend the TMP be implemented as indicated in the construction methodology. The TMP will highlight the increased presence of HCVs to road users. There will be a 30kmph speed limit in place throughout the duration of the construction period.

Adherence to this TMP will be sufficient to address safety concerns associated with increased HCV volumes.

In addition, we recommend that the TMP ensures that two HCVs are not traveling in the opposite direction at the same time on Summit Road or Tilbury Street. Vehicle tracking shows that there are many locations, particularly on corners, where opposing HCV paths overlap.

Consideration needs to be given to where HCVs stack while waiting for vehicles travelling in the opposite direction. HCVs traveling uphill may have priority over downhill traveling construction vehicles. This is presuming that stacking space is available on site. If not, uphill traffic would have to find room to park and wait for downhill traffic comes down before proceeding up hill to access site. Addressing this issue needs to be included in the TMP.

Rating

Minor effect.

4.2.2 SUMMIT ROAD / TILBURY STREET INTERSECTION

Description of effect

The left-turn in to, and the right-turn out of, Summit Road is tight. Vehicle tracking shows that HCVs turning left into Summit Road must cross the Tilbury Street centre line to enter Summit Road.

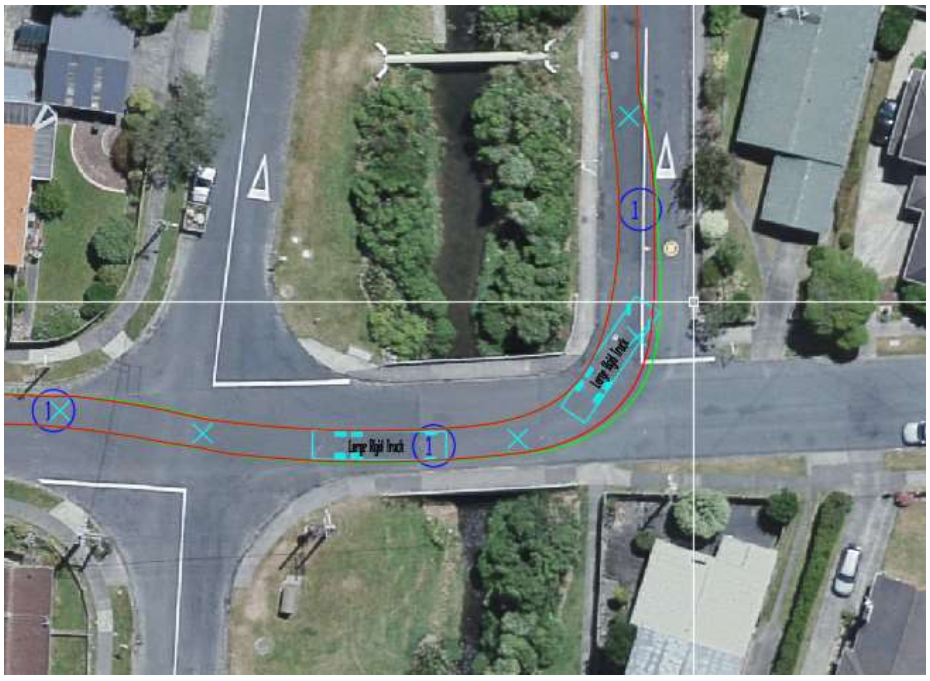

Figure 7: Vehicle tracking for large rigid truck left-turn from Tilbury Street into Summit Road

Right-turning vehicles onto Tilbury Street also cross the centre line as shown in Figure 8.

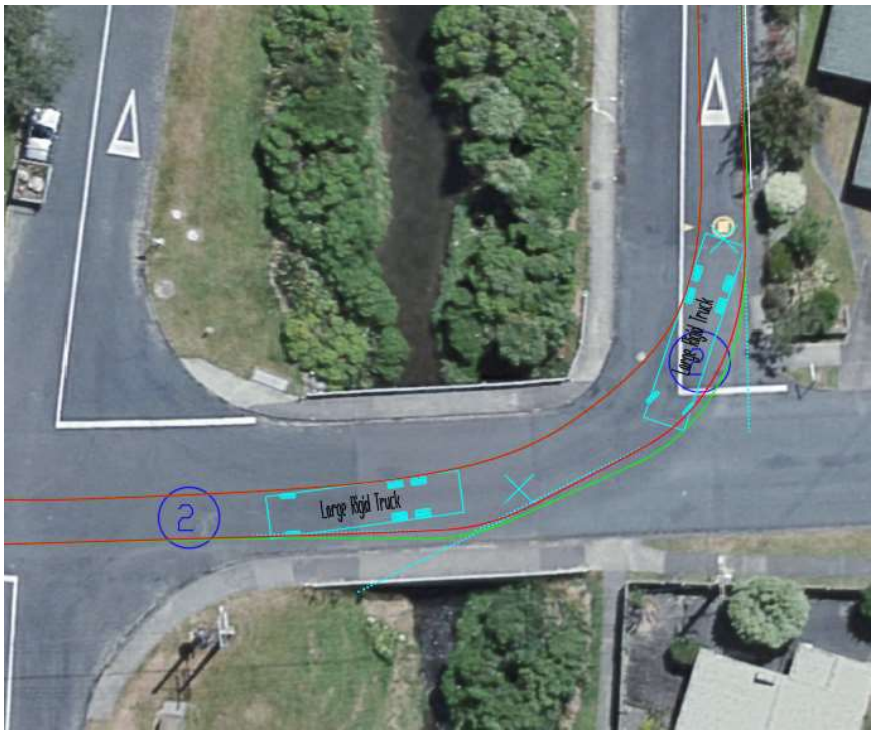

Figure 8: Vehicle tracking for large rigid truck right-turn from Summit Road into Tilbury Street

Mitigation

The construction methodology indicates temporary on-street parking removal to better facilitate HCV movements in the indicative TMP. There will be signs warning of truck movements and a temporary 30kmph speed limit.

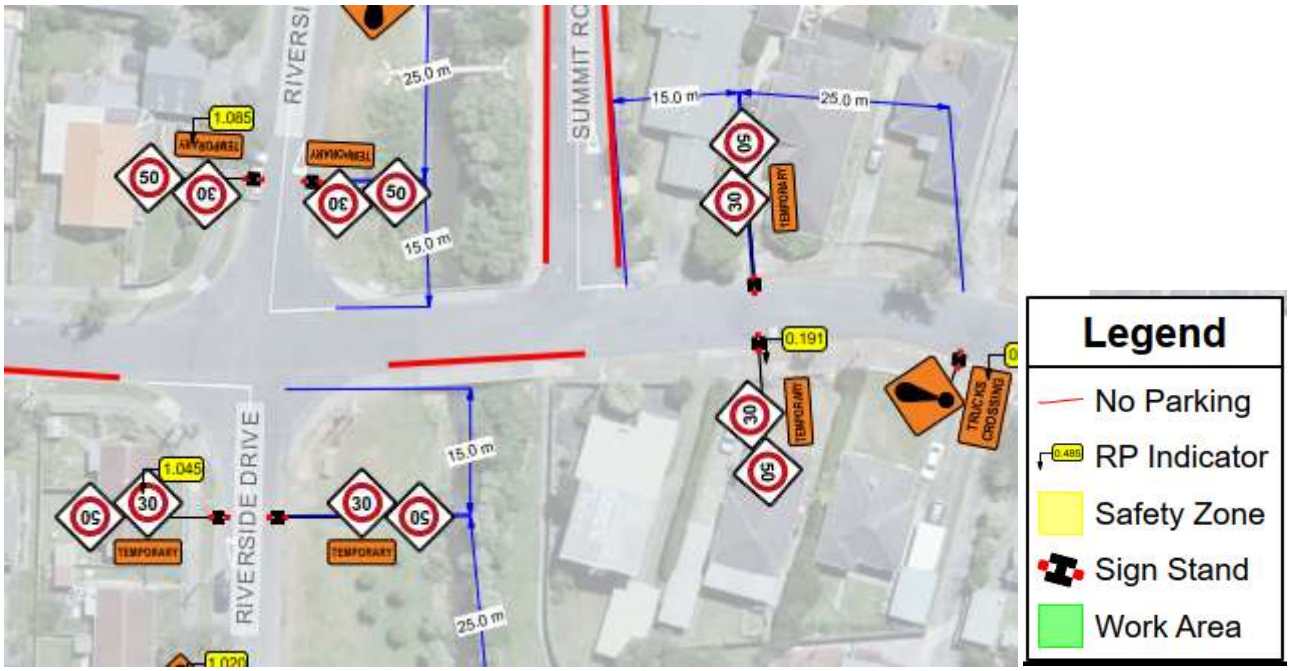

Figure 9: Proposed traffic management as per Fulton Hogan construction methodology

It is recommended that the TMP include traffic control on westbound vehicles on Tilbury Street and southbound vehicles on Summit Road whenever large rigid trucks or truck and trailer units will be accessing the site.

Rating

Minor effect.

4.2.3 INCREASE IN EXPOSURE TO HCVS – BALGOWNIE GROVE

Description of effect

There will be increased exposure to HCV movements on Balgownie Grove. At the busiest time, there will be 10 HCV movements (five return trips) per day on Summit Road. This is the equivalent of an HCV traveling inbound or outbound every hour throughout the working day. Road users such as cyclists, pedestrians, and motorcyclists are particularly vulnerable.

There are not many HCVs accessing the site at Balgownie Grove and it will be for a relatively short period – one to two months during Stage 5 of the project. However, HCVs will be required to reverse on to or off site, which poses additional risk.

If vehicles are parked on both sides of Balgownie Grove, there is only 2.8m width available for HCVs to travel through to access the site.

Mitigation

It is expected that traffic management will be in place for HCVs accessing and leaving site, including having a spotter present to assist with HCV movements and watch out for other road users including pedestrians.

Rating

Minor effect

4.2.4 NAENAE ROAD / WADDINGTON DRIVE INTERSECTION

Description of effect

For about six weeks, HCVs will be accessing Balgownie Grove. Most, if not all, of these vehicles will turn right at the Naenae Road / Waddington Drive intersection.

Vehicle tracking shows that there is a risk of large rigid trucks tracking over the traffic island and/or hitting parked cars at the top of the T.

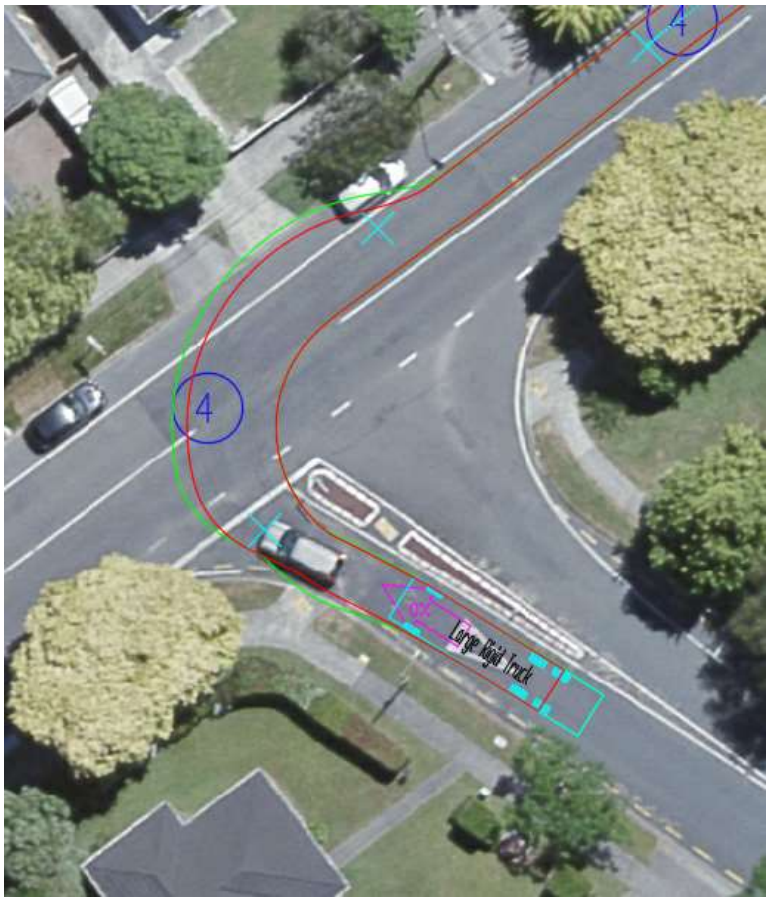

Figure 10: Vehicle tracking of large rigid truck turning right from Waddington Drive to Naenae Road at 5kmph

Mitigation

While HCVs are accessing the Balgownie Grove site, one or two on-street car parking spaces will be temporarily removed from the top of the T intersection. This will allow large vehicles, traveling at a very low speed to be able to manoeuvre a right-turn on to Naenae Road.

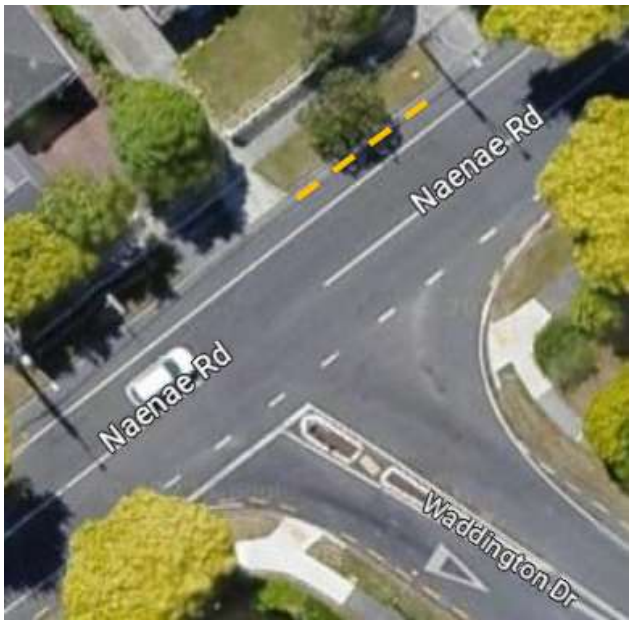

Figure 11: Recommended removal of parking at the Waddington Drive / Naenae Road intersection

Rating

Minor effect.

4.3 PARKING REMOVAL

4.3.1 SUMMIT ROAD

Description of effect

Summit Road is a narrow, windy road that will not be able to accommodate HCVs while retaining all on-street car parking. To enable HCV movements along Tilbury Road and Summit Road, it is proposed to remove most of the parking on both sides of the street.

This affects residents and visitors of Summit Road and Tilbury Road, who may have to park further from their destination.

The red lines on the TMP drawing provided (Figure 12) in the construction methodology shows where parking is proposed to be removed.

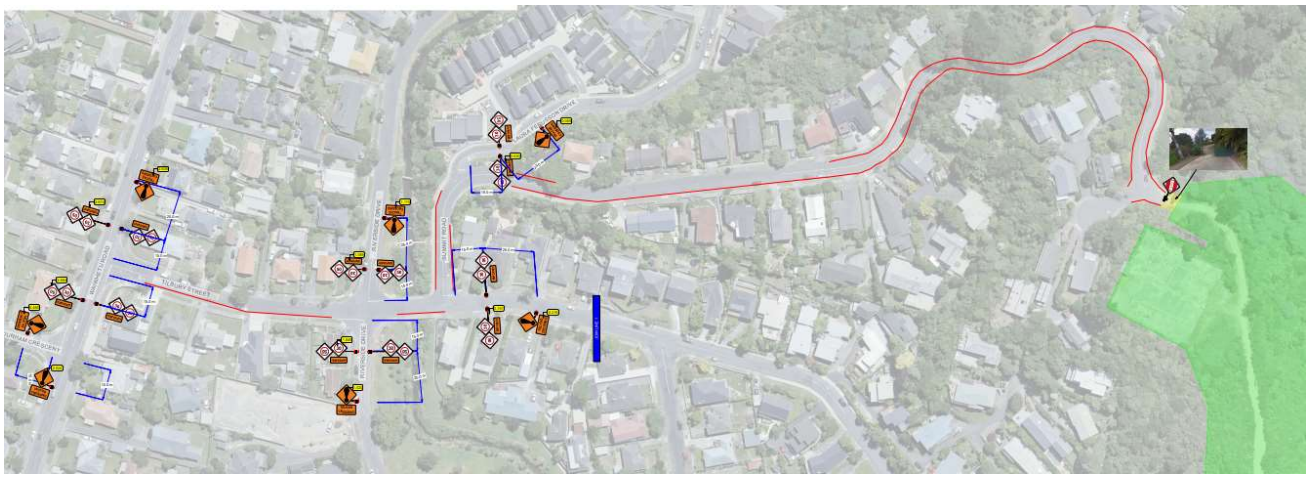

Figure 12: Proposed parking removal (red lines) as provided in construction methodology

Much of the parking being removed is along sections not immediately adjacent to residential properties. Considering only the on-street parking adjacent to residential properties, space for about 32 cars on Summit Road, and about 11 cars on Tilbury Street, will be temporarily removed. There are around 12 parking spaces remaining on Summit Road (after accounting for driveways). There are around eight spaces remaining on the northern side of Tilbury Street.

Parking spaces are not marked, so the number of car parking spaces is estimated by taking the distance of a parking section, taking away the distance covered by driveways, and dividing the remaining kerbside space by six metres, which is the common length of a car park.

Table 6: Impact on car parking spaces adjacent to residential properties on Tilbury Street and Summit Road

Street section	Estimated existing car parking spaces	Estimated car parking spaces being removed	Estimated car parking spaces being retained
Tilbury Street south side (#2-#8)	11	11	0
Tilbury Street north side (#1-#9)	8	0	8
Summit Road south side (#2-#26)	22	22	0
Summit Road north side (#1-#21)	22	10	12

A desk-based parking review of off-street parking availability and on-street parking occupancy using Google Earth and Hutt City council's GIS Viewer has been undertaken for the purposes of this CTA. No formal, on-the-ground parking occupancy surveys have been undertaken. Online and face-to-face surveys have been undertaken with affected residents. Questions about parking were included.

Aerial imagery indicates that most, but not all, Summit Road and Tilbury Road properties have off-street parking for at least one vehicle, and often more. The online residential survey indicated that four respondents (18%) would be affected by parking restrictions. Some concern about the reduction in on-street parking availability was also raised in the face-to-face surveys.

Table 7 shows the parking occupancy for the parking areas adjacent to residential properties on Summit Road and Tilbury Street, as observed from aerial imagery. Average occupancy is low which indicates that parking demand will be able to be absorbed by the parking spaces being retained. However, this is based on aerial imagery which is likely to have been taken during the middle of a weekday when many residents may be out. We do not have an indication of parking occupancy during the evening or at night, when parking occupancy may be higher.

Table 7: Parking occupancy adjacent to residential properties as observed from aerial imagery

Street section	Parking occupancy (based on Hutt City GIS aerial imagery (2021))	Parking occupancy (based on Google Earth aerial imagery (Jan 2022))	Average parking occupancy
Tilbury Street south side (#2-#8)	9%	18%	14%
Tilbury Street north side (#1-#9)	25%	0%	13%
Summit Road south side (#2-#26)	18%	23%	20%
Summit Road north side (#1-#21)	5%	0%	2%

Mitigation

For safety and access, we recommend adherence to the suggested parking removal provided in the construction methodology. It is expected that the parking spaces remaining will be able to absorb the demand on Tilbury Street and Summit Road. However, we recommend this be monitored throughout the project. We recommend that the risk of unacceptable parking issues for residents of affected streets be addressed in the project's risk register.

There needs to be early communication to residents about parking impacts.

Rating

Minor effect.

4.3.2 BALGOWNIE GROVE

Description of effect

The end of the cul-de-sac between #5 and #6 is required to be closed, with some parking removal in the cul-de-sac. This would prevent about four cars from parking perpendicular in the cul-de-sac.

Figure 13: Parking removal required on Balgownie Grove

All properties on Balgownie Grove have off-street parking and access to off-street parks will not be affected. There is space for approximately 11 vehicles along the rest of Balgownie Grove, where parking is not proposed to be removed. Aerial imagery indicates low occupancy currently.

Based on surveys with residents, it is understood that there are a few home-based businesses, which rely on on-street parking to some extent. It is expected that the remaining on-street parking will be sufficient.

Mitigation

Parking removal between number 5 and 6 Balgownie Grove is necessary for site access. It is expected that the project team will communicate with residents about the timing for parking removal as outlined in a Communications Plan. No further mitigation is required.

Rating

Negligible effect

4.4 TRACK CLOSURE

Description of effect

Construction of the reservoir requires the closure of the Summit Road firebreak track for the entire construction period of 2 – 3 years. This track provides access to a large network of trails within the eastern hills of Lower Hutt. While usage numbers are unknown, it is expected that this trail is well used by local trail runners, walkers, and mountain bikers.

An online survey of affected residents and on-site intercept survey carried out in July 2023 had no respondents saying the track was used for commuting or other non-recreational purposes. However, it is expected that there will be social and community impacts which have been considered in the Social Impact Assessment and Amenity and Recreation Assessment.

Mitigation

The construction methodology indicates that there will be signage provided at the site boundary that will advise of track closure.

It is recommended that Wellington Water communicate closure in advance to nearby residents and local mountain biking, walking, and trail running groups.

We recommended that signage further away than the site boundary be provided to prevent trail users from traveling a long way before realising there is a closure. Signage should include advice of alternative routes. We recommended advance signage at the locations suggested in Figure 14 as a minimum. Ideally, notices of closure will be made throughout the trail network wherever there are map boards.

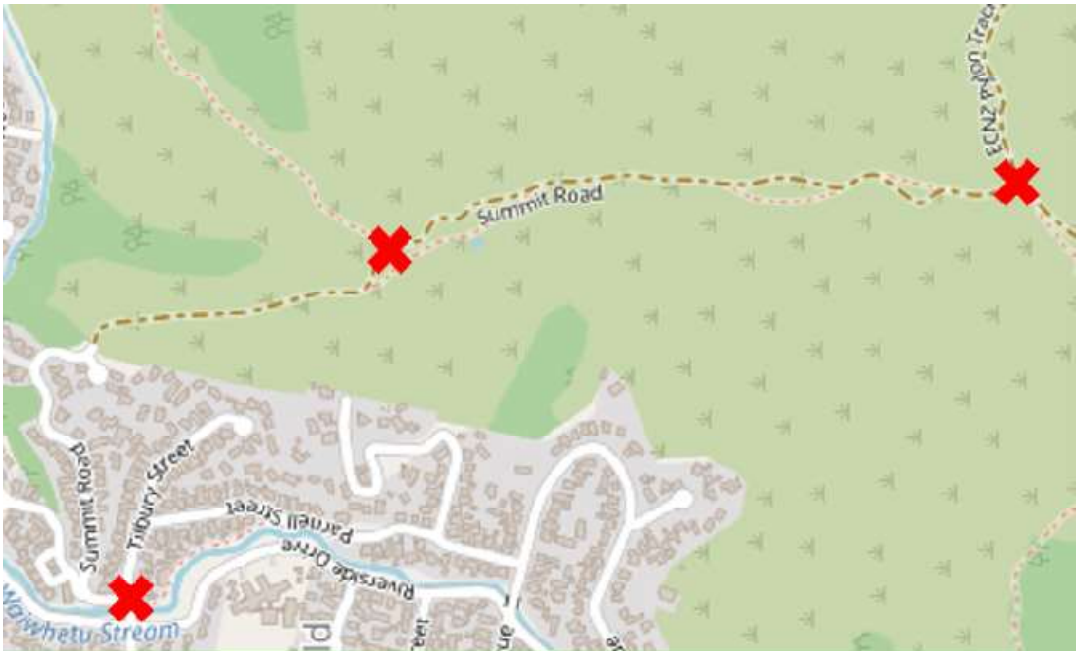

Figure 14: Suggested locations for track closure notification

Rating

Minor effect.

5 SUMMARY

This report provided an assessment of transport effects resulting from the construction of the Eastern Hills Reservoir in Naenae / Fairfield.

Table 8 outlines the effects considered.

Table 8: Summary of assessment of Eastern Hills Reservoir construction transport effects

EFFECT	RECOMMENDED MITIGATION	RATING (WITH MITIGATION)
Road network effects (impact on congestion, travel times): Summit Road and around	Early, and ongoing, communication with residents. Monitoring of effects.	Minor effect
Road network effects (impact on congestion, travel times): Balgownie Grove	Early, and ongoing, communication with residents.	Negligible effect
Road safety effect: increase in exposure to HCVs on Summit Road	Adherence to Traffic Management Plan (TMP), including reduced speed limit.	Minor effect
Road safety effect: Summit Road / Tilbury Street intersection	Traffic control during busy stages of project.	Minor effect
Road safety effect: increase in exposure to HCVs on Balgownie Grove	Traffic management, including spotter when HCVs accessing and leaving site.	Minor effect
Road safety effect: Naenae Road / Waddington Drive intersection	Parking removal at top of T intersection.	Minor effect
Parking removal: Summit Road	Early, and ongoing, communication with residents. Monitor of effects.	Minor effect
Parking removal: Balgownie Grove	Early, and ongoing, communication with residents.	Negligible effect
Track closure	Advance signage at turn-off points and map boards. Early, and ongoing, communication with residents and local track user groups.	Minor effect

6 LIMITATIONS

This report ('Report') has been prepared by WSP New Zealand Limited ('WSP') exclusively for Wellington Water ('Client') in relation to this Eastern Hills Reservoir Construction Transport Assessment ('Purpose') and in accordance with the Wellington Water Consultant Project Engagement form dated 10th March 2023] ('Agreement'). The findings in this Report are based on and are subject to the assumptions specified in the Report and Offer of Services dated 10th March 2023. WSP accepts no liability whatsoever for any use or reliance on this Report, in whole or in part, for any purpose other than the Purpose or for any use or reliance on this Report by any third party.