WATERCARE SERVICES LIMITED

ŌRĀKEI MAIN SEWER EMERGENCY REPAIR AND TEMPORARY DIVERSION

Land Use Resource Consent Application and Assessment of Environmental Effects

April 2024

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PART A

Resource Consent Application

FORM 9

APPLICATION FOR RESOURCE CONSENT OR FAST-TRACK RESOURCE CONSENT

Sections 87AAC, 88, and 145, Resource Management Act 1991

To Auckland Council

1. Watercare Services Limited ("Watercare") apply for the following resource consent from Auckland Council.

- Land use consent under section 330A of the RMA in relation to emergency works undertaken following the collapse of a portion of the Ōrākei Main Sewer on 26 September 2023.

2. **The activity to which the application relates (the proposed activity) is as follows**:

- Earthworks associated with the excavation, stabilization and reinstatement of the Ōrākei Main Sewer following the collapse of a portion of the sewer located at 79 St George's Bay Road, Parnell on 26 September 2023 – approximately 650 m^3 of material.
- The installation, operation, use and subsequent decommissioning (including earthworks) of a temporary diversion pump and aboveground diversion pipeline to divert wastewater around the collapsed portion of the Ōrākei Main Sewer.
- Earthworks at two connection points for the diversion pipe near 79 St Georges Bay Road and within Alberon Reserve – approximately 850m^3 of material.
- The alteration and removal of indigenous vegetation within a Significant Ecological Area ("**SEA**").
- The alteration and removal of trees within an Open Space Zone.
- Works within the protected root zone of trees within an Open Space Zone.

3. The site at which the activity occurs is as follows:

79 St Georges Bay Road, Parnell, legally described as:

- Lot 1 DP 80621

Alberon Reserve (Alberon Place, Parnell), legally described as:

- PT ALLOT 94 SEC 1 Suburbs AUCKLAND;

- PT ALLOT 94 SEC 1 Suburbs AUCKLAND;
- Lot 3 DP 31410;
- Lot 2 DP 35865;
- Lot 3 DP 35865;
- Lot 4 DP 35865;
- Lot 5 DP 35865;
- Lot 6 DP 35865;
- Lot 7 DP 35865;
- PT ALLOT 81 SEC 1 Suburbs AUCKLAND; and
- PT ALLOT 82 SEC 1 Suburbs AUCKLAND.

St Georges Bay Road Reserve.

4. The full name and address of each owner or occupier (other than the applicant) of the site to which the application relates are as follows:

79 St Georges Bay Road, Parnell
Sampson Corporation Limited

Alberon Reserve
Auckland Council
Private Bag 92300
Victoria Street West
Auckland 1142

St Georges Bay Road Reserve
Auckland Council
Private Bag 92300
Victoria Street West
Auckland 1142

5. There are no other activities that are part of the activities to which the application relates.

6. No additional resource consents are needed for the activities to which this application relates.

7. I attach an assessment of the effect of the activities on the environment that—

(a) includes the information required by clause 6 of Schedule 4 of the Resource Management Act 1991; and

(b) addresses the matters specified in clause 7 of Schedule 4 of the Resource Management Act 1991; and

(c) includes such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.

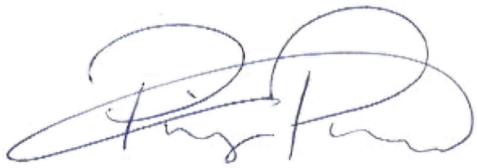
8. I attach an assessment of the activities against the matters set out in Part 2 of the Resource Management Act 1991.

9. I attach an assessment of the activities against relevant provisions of documents referred to in section 104(1)(b) of the Resource Management Act 1991, including the information required by clause 2(2) of Schedule 4 of that Act.

10. I attach the following further information required to be included in this application by the district plan, the regional plan, the Resource Management Act 1991, or any regulations made under that Act:

- Watercare Incident Management Plan;
- Landowner Agreement with Auckland Council for the use of Alberon Reserve;
- Section 330A(1) Notice to Auckland Council;
- Record of Titles;
- Ecology Assessment; and
- Noise Assessment.

Signature:



Priyan Perera

Head of Strategy and Planning

Watercare Services Limited

Date: 12 April 2024

Address for Service:	Watercare Services Limited Private Bag 92521 Victoria St West Auckland 1142
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B

PART B

Assessment of Environmental Effects

1. INTRODUCTION

1.1 BACKGROUND

On 26 September 2023, a portion of the Ōrākei Main Sewer ("**OMS**") collapsed resulting in a sink hole forming within the carparking area of the Parnell Quarter commercial area located at 79 St Georges Bay Road, and a significant blockage in the OMS. The OMS is part of a combined network collecting both wastewater and stormwater, servicing a large portion of Central and West Auckland. The location of the collapse and the general area around it is shown in **Figure 1** along with the OMS alignment. The collapse prevented normal wastewater and stormwater flows through the network, resulting in overflows at Engineered Overflow Points ("**EOPs**") which resulted in wastewater discharging into the Waitematā harbour, predominantly at outfalls located at Brigham (**Daldy**) Street, Bledisloe Wharf and Freyberg Wharf.

Watercare Services Limited ("**Watercare**" or "**the Applicant**") responded to the incident in line with the Watercare Incident Management Plan provided as **Appendix 1**, and commenced emergency works under section 330 of the RMA to respond to the OMS collapse to remove the cause of the overflows and to mitigate any actual or likely adverse effects of the collapse.

As a means to quickly reinstate normal flows and limit the volume of wastewater and stormwater overflows discharged into the Waitematā Harbour, Watercare began emergency works to stabilise the sink hole and install and operate a temporary diversion pump and aboveground diversion pipeline ("**diversion system**"), as set out schematically in **Figure 2** and **Figure 3** below. This has required the temporary closure of part of St Georges Bay Road, earthworks and the alteration and removal of vegetation within Alberon Reserve. The diversion system commenced transferring wastewater flows on 17 October 2023 and enabled regular flows to be reinstated through the network, reducing overflow discharges to the Waitematā Harbour to intermittent events during the initial period of operation of the diversion while wastewater solids in the system were removed. Watercare has continued to undertake works to remove debris and rubble to unblock the OMS and to implement a permanent repair of the sewer in the sink hole location with a prefabricated glass-reinforced plastic liner, scheduled to be installed in 2024.

The diversion system continued to operate until December 2023 by which time most of the debris had been cleared from inside the sewer, enabling wastewater to run through the sewer. The diversion pumps were removed in late January 2024; however, the diversion pipeline has been kept in place in case it is needed during the relining work. The pumps will be reinstalled if necessary. The diversion system will be disassembled

and decommissioned once the OMS repair is complete and normal wastewater flows are reinstated through the relined sewer.

Watercare is seeking land use consent under section 330A of the RMA to authorise (retrospectively):

1. The works associated with the excavation and stabilisation of the collapsed portion of the OMS following the collapse of a portion of the sewer located at 79 St George's Bay Road, Parnell on 26 September 2023;

2. The works (including earthworks) associated with the installation and operation of the temporary diversion pump and aboveground diversion pipeline to divert wastewater around the collapsed portion of the OMS;

3. The alteration and removal of trees and other vegetation within an Open Space Zone and Significant Ecological Area ("**SEA**"); and

4. Works within the protected root zone of trees within an Open Space Zone.

In addition. land use consent under section 330A of the RMA is sought to authorise works (including earthworks and works within the protected root zone of trees) associated with the reinstatement of the sink hole area and decommissioning of the temporary diversion pump and aboveground diversion pipeline.

1.2 WATERCARE

Watercare is a lifeline utility providing water and wastewater services to approximately 1.7 million people in the wider Auckland region. Its services are vital for life, keep people safe and help communities to flourish. More specifically, Watercare is the council-controlled organisation of Auckland Council responsible for municipal potable water and wastewater services to Auckland.

Watercare's key services include the:

- Collection, treatment and distribution of drinking water from various dams, groundwater sources and rivers; and
- Collection, treatment and disposal of wastewater, including trade waste, at various wastewater treatment plants ("**WWTPs**").

Figure 1: Ōrākei Main Sewer collapse area.

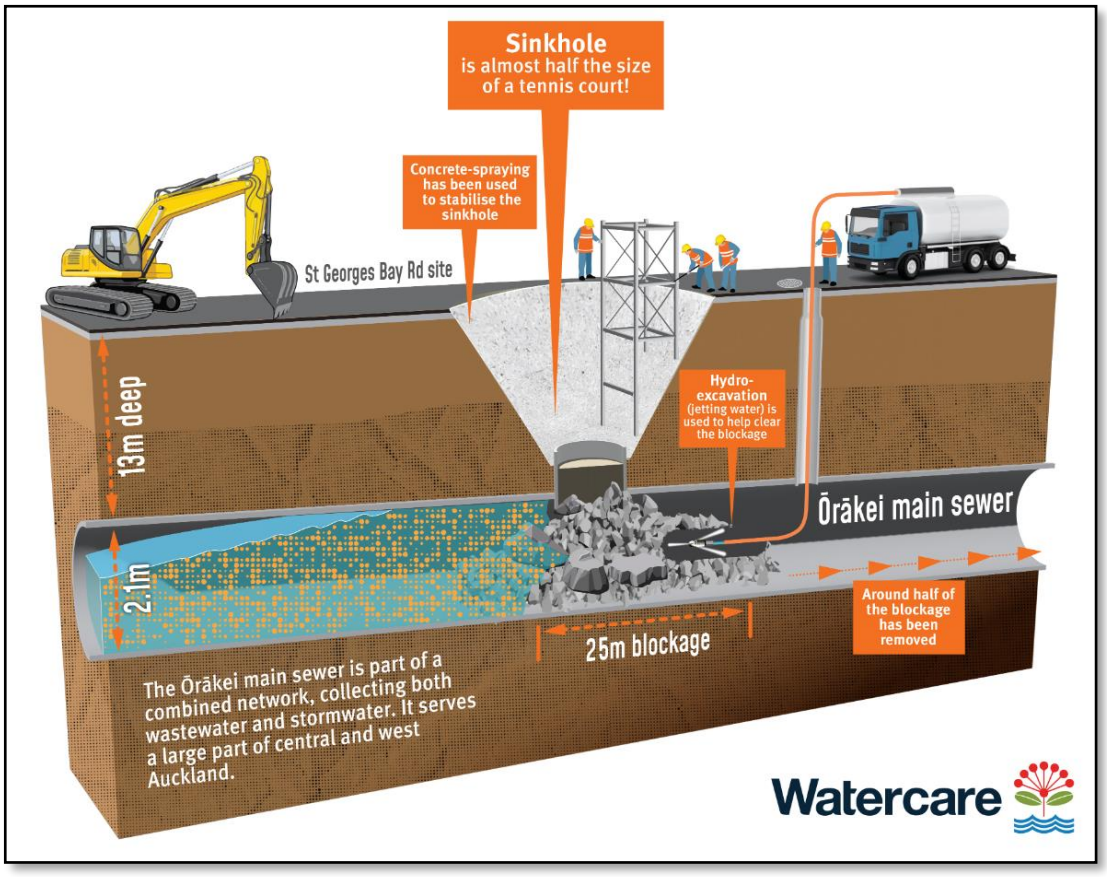

Figure 2: Schematic of the Ōrākei Sewer Collapse, stabilisation and rubble removal.

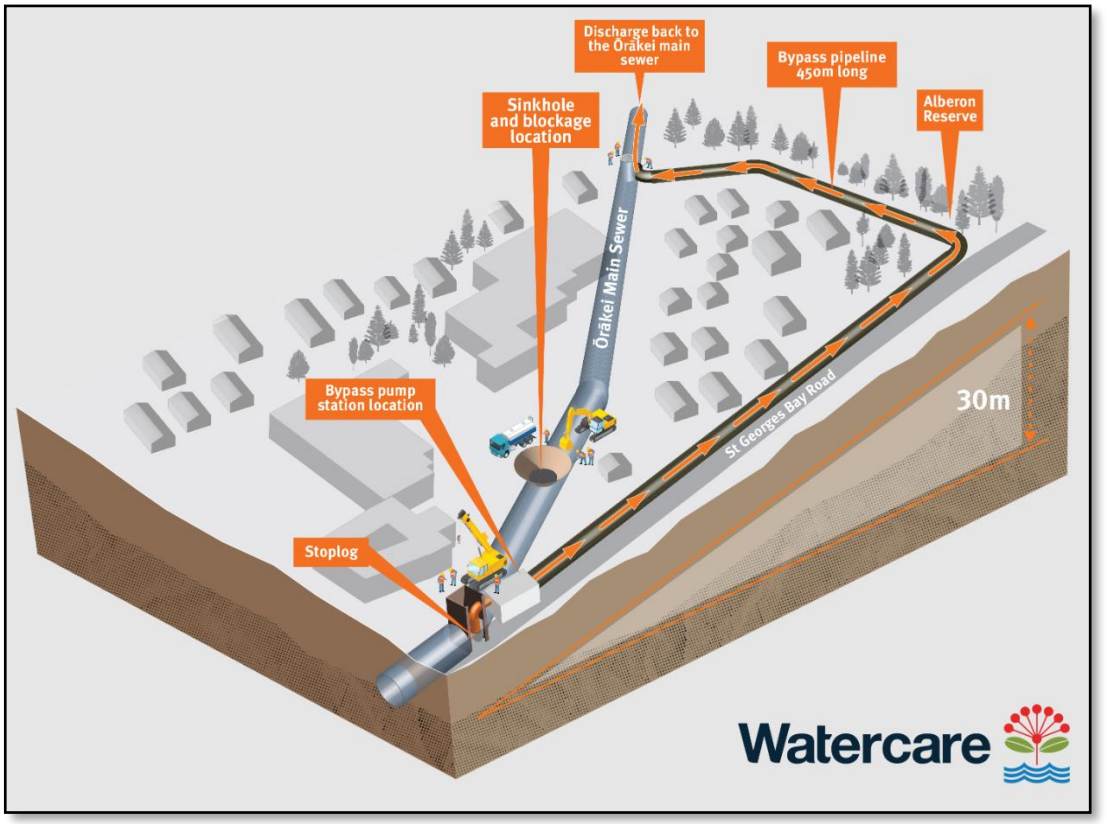

Figure 3: Schematic of the temporary diversion location.

1.3 SECTION 330 RMA

Section 330 of the Resource Management Act 1991 ("**RMA**") confers powers on authorised persons, such as lifeline utility operators, that allow them to ensure the ongoing operation of essential infrastructure that has been affected by an emergency by undertaking immediate preventative or remedial measures without first obtaining a resource consent. The sinkhole and resulting collapse and blockage of the OMS is an adverse effect on the environment that has affected Watercare's ability to operate the OMS. Watercare undertook immediate remedial measures under section 330(1)(e) of the RMA to mitigate actual or likely adverse effects from the sewer collapse, and overflows discharging into the Waitematā Harbour.

Section 330 does not give lifeline utility operators the right to enter private property to carry out emergency works. Alternatively, utility operators may pre-negotiate an agreement to allow emergency access. To undertake the emergency remedial works, Watercare required the use of Alberon Reserve, owned by Auckland Council, and 79 St Georges Bay Road which is under private ownership. Watercare and Auckland Council entered a Landowner Agreement for the temporary use of Alberon Reserve on 2 October 2023. The Landowner Agreement is provided as **Appendix 2** of this AEE. Watercare has also entered into a formal Landowner Agreement with the owners of 79 St Georges Bay Road for the temporary use and establishment of the Parnell Quarter carpark as a construction site.

Section 330A(1) of the RMA requires that where a network utility operator or lifeline utility has undertaken an activity under section 330, it must advise the consent authority within 7 days that the activity has been undertaken. Under section 330AA, where a network utility operator or lifeline utility undertakes an activity in an affected area under section 330 because of or in connection with the impacts of a "severe weather event" as defined in the Act, the timeframe for advising the consent authority under section 330A(1) is extended to 100 working days. Watercare formally advised the Auckland Council by letter of their exercise of section 330 powers on 20 October 2023. A copy of that letter is provided as **Appendix 3** of this Assessment of Environmental Effects ("**AEE**").

Section 330A(2) provides that where an activity undertaken, but for section 330, would contravene any of sections 9, 12, 13, 14, and 15 and the adverse effects of the activity continue, the person who undertook the activity must apply in writing to the consent authority for any necessary resource consents required in respect of the activity. Where emergency works are undertaken section 330 because of or in connection with the impacts of a "severe weather event", the time within which an application for resource consent must be lodged under section 330A(2) is extended to 160 working days after the consent authority was notified under section 330A(1).

1.4 REPORT STRUCTURE

This report provides an assessment of:

a. The actual and potential effect on the environment of the activities undertaken (or to be undertaken) as required by clause 6 of Schedule 4 of the RMA

b. The activities undertaken (or to be undertaken) against the relevant provisions of the relevant statutory planning documents under section 104(1)(b) of the RMA; and

c. The activities undertaken (or to be undertaken) against the matters set out in Part 2 of the RMA.

The following provides a general breakdown of the structure of this report.

SECTION 1. Introductory text, providing a general overview of the emergency works, the purpose of Watercare and relevance to section 330 of the RMA.

SECTION 2. Describes the existing environment.

SECTION 3. Provides a description of the emergency remedial works.

SECTION 4. Sets out the relevant resource consent requirements under the Auckland Unitary Plan Operative in part (Updated 16 February 2024) ("**AUP**").

SECTION 5. Provides an assessment of the actual and potential effects associated with the emergency remedial works.

SECTION 6. Identifies proposed conditions for the land use consent.

SECTION 7. Provides an assessment of the emergency works against the relevant statutory provisions.

SECTION 8. Provides a description of the consultation that has occurred to date.

SECTION 9. Provides a concluding statement.

2. EXISTING ENVIRONMENT

2.1 SITE AND LOCATION

The OMS collapse and sink hole (the "**Ōrākei collapse site**") is located within the carpark of 79 St Georges Bay Road, Parnell, legally described as Lot 1 DP 80621 (refer to **Appendix 4**). The site is located approximately 1.7 km east of the Auckland CBD, and approximately 850 m south of the Ports of Auckland and the Waitematā Harbour.

The land use in the immediate vicinity of the Ōrākei collapse site is the carparking facility for the surrounding Parnell Quarter commercial businesses. The surrounding area is characterised by a mixed use urban setting, commercial buildings and residential living apartments are located within the immediate vicinity. The wider environment to the south and east is characterised by standalone residential dwellings. The nearest noise receivers are depicted in **Figure 4**.

Figure 4: Location of noise receivers near the diversion pumps.

St Georges Bay Road extends southward from its intersection at The Strand approximately 330 m north of the Ōrākei collapse site, to its intersection with Parnell Road, approximately 600 m south of the Ōrākei collapse site. Notably, approximately 50 m south of the Ōrākei collapse site, St Georges Bay Road is divided with two adjoining cul-de-sac's effectively bisecting the commercial side of St Georges Bay Road (the northern end), and the residential side of St Georges Bay Road (the southern end). As such, through traffic from one end to St Georges Bay Road to the other is prevented.

Alberon Reserve is a recreation reserve vested in Auckland Council under the Reserves Act 1977 located approximately 200 m south of the Ōrākei collapse site (and approximately 115 m south of the St Georges Bay Road divider). The reserve has access points from St Georges Bay Road, Alberon Street and Alberon Place.

The reserve consists of a large central area of open greenspace enclosed in patches of regenerating and mature native forest with scattered stands of exotic palm trees. Alberon reserve borders an industrial zone to the North and is bounded almost entirely by residential housing to the South, East, and West. The reserve contains multiple overland flow paths which flow from South to North following the general slope of the area. Multiple paths run through the reserve commonly used for recreation, dog walking, and as a throughfare between St Georges Bay Road, Alberon Place, and Alberon Street.

The vegetation within the reserve is dominated by late stage regenerating native forest with many of the broadleaf trees having reached maturity. This native vegetation has been classified as a mixture of puriri and regenerating broadleaf forest. The regenerating forest in the reserve is part of the wider terrestrial Significant Ecological Area (SEA) SEA_T_6062), as classified by the Auckland Unitary Plan and is home to a variety of common and uncommon exotic palm species.

A series of bird nesting surveys were conducted to identify nests within the works footprint of the installation of the temporary diversion pipeline through Alberon Reserve. Measures were then taken to avoid the felling of trees with nesting birds.

A series of manual lizard searches were undertaken by Morphum and RMA Ecology in Alberon Reserve between 3 & 6 October 2023. Many copper skinks (*Oligosoma aeneum*) were observed, collected and relocated; however, no geckos were observed while spotlighting. While only copper skinks were observed on site, the area does contain suitable habitat for additional lizard species. Copper skinks observed at the site have a national conservation status of At Risk – Declining, while the site contains habitat associated with two other lizard species. Overall, the site has high herpetofauna value.

Based on the location of the site and surround urban environment it is considered highly unlikely bats are roosting in Alberon Reserve. Consequently, a bat survey was not

undertaken and their ecological value in relation to the site and activities was not assessed further.

Two overland flow paths identified on the overland flow path layer on Auckland Council Geomaps are present within the diversion pipeline area in Alberon Reserve. The eastern flow path is an unnamed soft-bottomed channel that originates within the reserve and is primarily fed by discharge from nearby residential properties on Alberon Street and is classified as an ephemeral watercourse. No suitable fish habitat was identified anywhere along the length of the reach. Due to the lack of fish habitat a freshwater fauna was not undertaken. The eastern flow path. was the only path affected by the works.

2.2 ŌRĀKEI SEWER

The OMS is a 2.1 – 2.4 m diameter underground pipe, with a concrete base and brick arch constructed in 1911. The pipe forms part of the combined wastewater and stormwater network that services much of Central and West Auckland. Flows within the OMS are highly variable, dependent on factors such as the day of the week, time of day and weather conditions. In general, the OMS can conduct flows of up to 1000 L/s. For the purposes of this AEE, the OMS is the section of the pipe that extends between Cleveland Road and Alberon Place, as indicated in **Figure 1**.

The OMS combined network is managed such that wastewater and stormwater overflows are discharged via EOPs, which are connected to outfalls into the Waitematā Harbour. Outfalls where discharges associated with the OMS collapse occurred are shown in **Figure 5** at Daldy Street (outfall A in **Figure 5**), Bledisloe Wharf (outfall C in **Figure 5**) and Freyberg Wharf (outfall D in **Figure 5**). The EOP's act as a contingency measure in the event of network blockages, flooding or high flows exceed the network capacity. The EOPs are designed to operate during severe wet weather events, during which wastewater is heavily diluted with stormwater, avoiding surcharging of the network and uncontrolled discharges of wastewater to land.

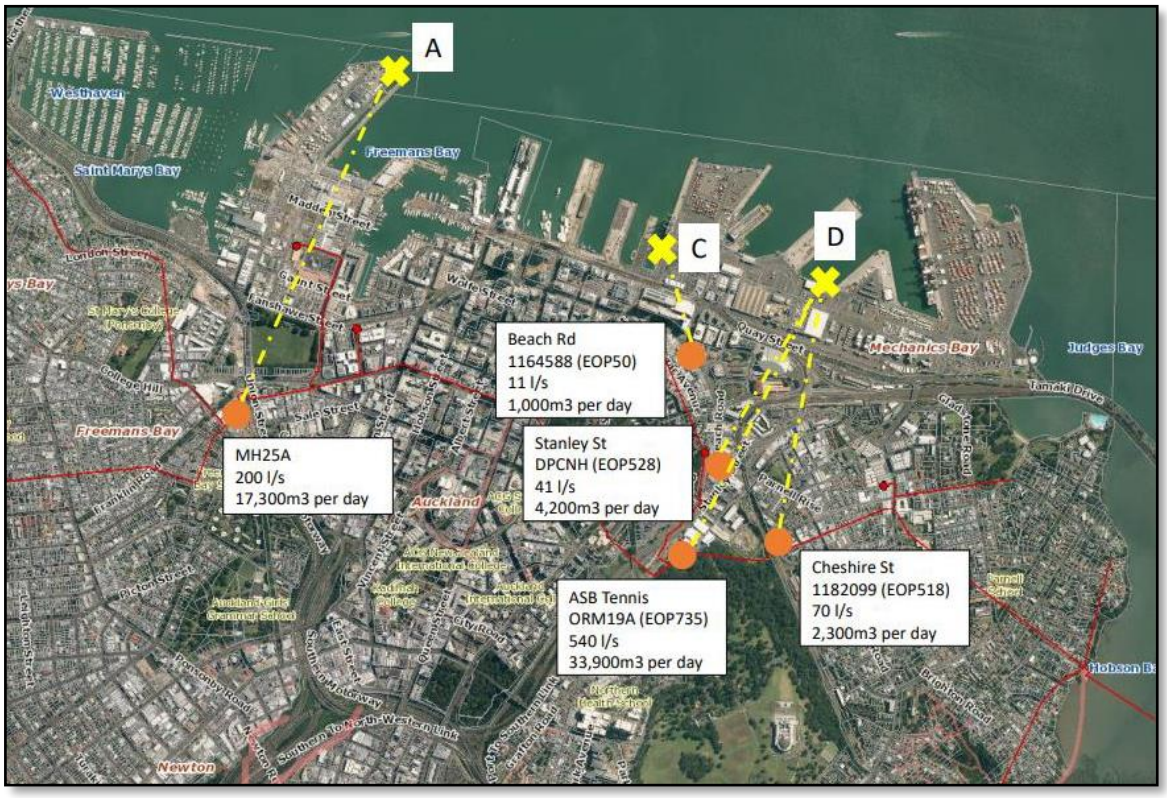

Figure 5: Harbour outfall locations.

2.3 ŌRĀKEI SEWER SINK HOLE

On 26 September 2023, the sink hole developed within the carpark for the Parnell Quarter commercial building complex at 79 Georges Bay Road, following 12 months of wetter than normal rainfall (up to 550% more in some months). . An independent report by WSP into the causes of the OMS collapse dated 1 March 2024 identified, as one of three factors contributing to the collapse, exceptionally wet weather in 2023. The report notes that 2023 was the wettest on record for Auckland. In the 9 months leading up to the collapse 50% more rain fell than the average for an entire year. Significant rainfall events include the Auckland Anniversary floods, Cyclone Gabrielle and heavy rainfall on 9th May 2023.

The collapse of the OMS caused a hole approximately 5 m wide and 13 m deep within the carpark of 79 Georges Bay Road, with rubble and material creating an approximately 25 m wide blockage within the OMS. All regular flows through the OMS were diverted and discharged into the Waitematā Harbour, predominantly via overflow outlets at Brigham (Daldy) Street, Bledisloe Wharf and Freyberg Wharf, with no wastewater or stormwater flows discharging to land at 79 Georges Bay Road.

2.4 CULTURAL SETTING

The Parnell and Auckland Central area is located within the rohe of multiple iwi and hapū of within Tamaki Makaurau Auckland. Auckland Council maps identify 16 iwi groups who's

rohe overlap within the Parnell and Auckland Central Area. The iwi groups include the following:

- Te Patukirikiri
- Ngāti Tamaoho
- Te Ahiwaru - Waiohua
- Te Patukirikiri
- Ngāti Pāoa
- Ngāti Maru
- Te Ākitai Waiohua
- Te Rūnanga o Ngāti Whātua
- Ngāti Whanaunga
- Te Kawerau a Maki
- Ngāti Whātua o Kaipara
- Ngāti Whātua Ōrākei
- Ngāti Tamaterā
- Ngāti Te Ata
- Te Uri-o-Hau
- Waikato Tainui Ngāi Tai ki Tāmaki

Many of the above iwi are also included within the Hauraki Māori Trust Board which was legislated under the Māori Trust Boards Act 1955. The Hauraki Māori Trust Board was established under its own Act Of Parliament, the Hauraki Māori Trust Board Act 1988.

3. ACTIVITIES RELATED TO THE CONSENT SOUGHT

As part of this application Watercare is seeking retrospective consent under section 330A of the RMA for the land use aspects of the emergency works undertaken in response to the collapse and blockage of the OMS, as well as for certain future works required to remediate the site. The following sub-sections detail the activities that have occurred to respond to the collapse and blockage of the OMS, and proposed activities to remediate the site.

3.1 DIVERSION PUMP & PIPE INSTALLATION AND DECOMMISSIONING

In response to the OMS collapse Watercare undertook emergency measures to stabilise the sink hole and install a temporary diversion system to reinstate wastewater and stormwater flows within the network, while the OMS is being repaired. The following land use activities have been undertaken:

- The establishment of 79 St Georges Bay Road carpark as a construction site, with construction screens;
- Excavation of approximately 650 m^3 of loose material within the OMS sink hole;
- Removal of excess rubble from the sink hole via a hydro vacuum;
- Spraying approximately 90m^3 of concrete on the banks of the hole to stabilise the banks of the OMS sink hole and prevent further material falling into the sewer (**Figure 6**);
- Installation of 6 diversion pumps within St Georges Bay Road ((**Figure 7** and **Figure 9**);
- Installation of a 600 mm in diameter aboveground polyethylene pipe located within Road Reserve between the Axis Building and a manhole within Alberon Reserve (approximately 450m) (**Figure 8** and **Figure 10**), including associated vegetation disturbance, alteration and removal; and
- Excavation of approximately 850 m^3 of material at the diversion pipe connections located on St Georges Bay Road and Alberon Reserve.

The works within Alberon Reserve required removal of some exotic and indigenous vegetation and works within the root zone of some trees in the reserve.

The diversion system was commissioned on 17 October 2023, and enabled typical flows within the network to diverted around the OMS collapse site. The diversion pumps initially operated 24 hours a day to accommodate flows, until flows could be restored in the OMS. The diversion pumps were removed in late January 2024. However, the diversion pipe has been kept in place in case it is needed, and the pumps can be reinstalled if necessary.

To enable installation of the diversion pipe through Alberon Reserve, a total of 54 trees were felled within the reserve, consisting of 18 native canopy trees including totara (*Podocarpus totara*), puriri (*Vitex lucens*), and nikau (*Rhopalostylis sapida*), and approximately 20 native subcanopy trees including māhoe (*Melicytus ramiflorus*), and kanuka (*Kunzea ericoides*). In addition, several introduced species were removed from the work area. A complete list of affected vegetation is included in **Appendix 5.**

A total of approximately 431 m^2 of tree canopy was removed and the total area of vegetation cleared was approximated at 810 m^2. In addition to the removal of the canopy and subcanopy trees, ground plants and forest litter have been removed, buried, trampled or otherwise damaged by machinery movement, construction and earthworks activities.

Watercare propose to repair the OMS in the vicinity of the sink hole with a prefabricated glass-reinforced plastic liner. In order to mitigate further risks of sewer collapse, the liner will be installed between the manhole on St Georges Bay Road upstream of the collapse site through to the next manhole downstream of the sink hole.

Figure 6: Ōrākei Main Sewer stabilised sink hole.

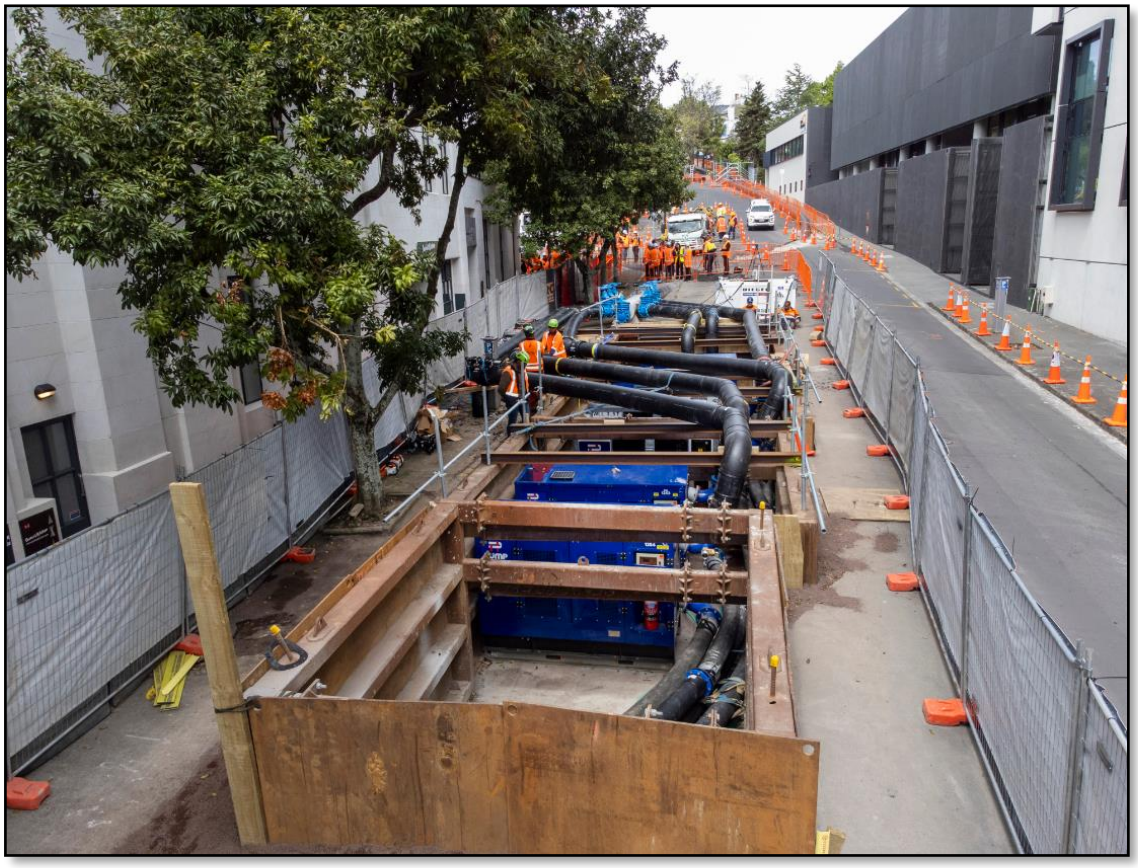

Figure 7: Diversion pumps installed on St Georges Bay Road.

Figure 8: Diversion pipeline located on the St Georges Bay Road Reserve.

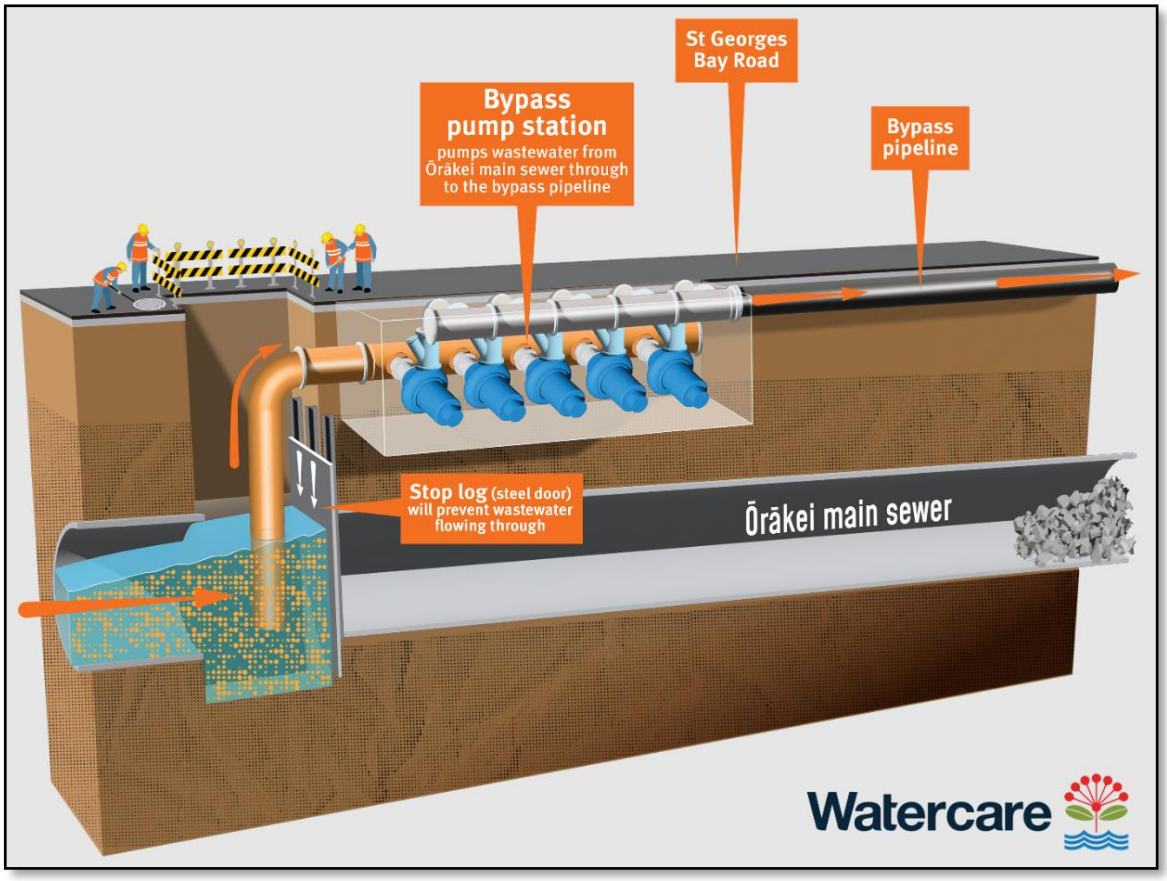

Figure 9: Depiction of temporary diversion pumps.

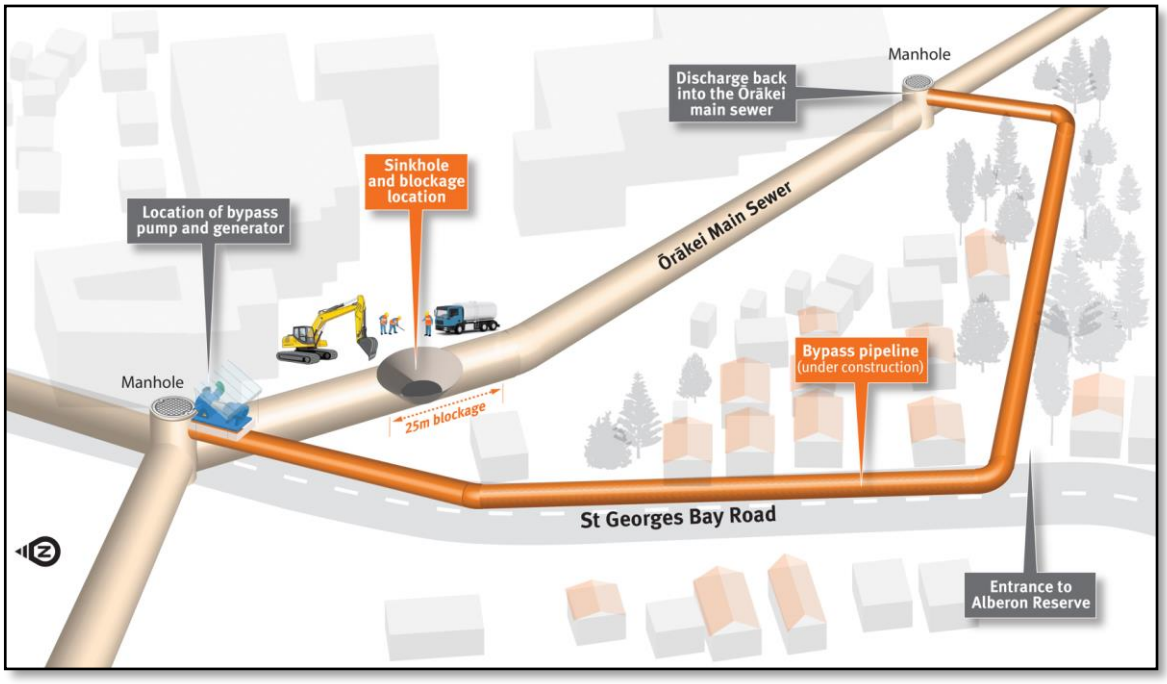

Figure 10: Overview of diversion pump and pipeline.

Upon completion of the OMS repairs, Watercare intend to fill the OMS sink hole with clean fill material. The fill will be compacted and sealed, and the carparking facility reinstated. The diversion pump and overland sections of the diversion pipe will be decommissioned. Watercare propose to undertake all necessary works to reinstate any damaged sections of St Georges Bay Road and footpath in accordance with Auckland Transport standards and the conditions specified in the National Code of Practice for Utility Operators' Access to Transport Corridors (2011). In addition, the development of a Reserve Reinstatement Plan is proposed, which will include measures to reinstate and re-plant indigenous vegetation within Alberon Reserve upon removal of the diversion pipe and access track.

No further vegetation removal is required for the restoration works but work in the root zone of trees will be required as part of the reinstatement works in the reserve.

3.2 TRANSPORT AND PUBLIC ACCESS

Traffic management measures were established in respect of the closure of one lane of St Georges Bay Road (blocked by the diversion system) between the intersection of Cleveland Road to the pedestrian entrance at Alberon Reserve, using traffic lights and stop go signals controls as appropriate. No street parking is provided for within this area of St Georges Bay Road.

Following consultation with Auckland Transport (J Latimer), a traffic management plan prepared by Parallaxx Limited in accordance with Waka Kotahi Traffic control devices manual, part 8 Code of practice for temporary traffic management, section E, appendix A was approved for the activities by Auckland Transport (A Shivkar, acting pursuant to delegated authority). Works access permits were also obtained from Auckland Transport by Parallax Limited for the works undertaken.

Public access to and through Alberon Reserve has also been temporarily restricted. The footpaths from St Georges Bay Road and Alberon Place are temporarily closed at both ends, with the use of temporary fencing and project signs to inform the public of the reason for the closure. Public access to the reserve is only provided for via Alberon Street, with public access restricted to the grassed areas of the Reserve while the diversion pipeline and associated access works remain in place.

3.3 NOISE GENERATION

When the diversion pumps are in operation (the pumps have currently been removed), a noise level of approximately 75 L_{Aeq} of noise occurs at the nearest noise receiver (less than 5 m in the Axis Building).

Table 1 below sets out the noise levels generated by the diversion pumps (when operating) at the nearest noise receivers, from noise measurements undertaken by

Marshall Day (**Appendix 6**). The noise levels identified in **Table 1** will continue (intermittently) as long as the diversion pumps operate at the site in St Georges Bay Road.

Initially the pumps were operated 24 hours per day. However, once flow was restored to the OMS in late October 2023, the pumps were mainly run for up to 1 hour during the day at approximately fortnightly intervals to ensure that they remained operational. The pumps were removed at the end of January 2024. However, they may need to be reinstalled during relining work in the vicinity of the sink hole.

Table 1: Measured noise levels and sources at noise receivers.

Noise Receiver	Distance from pump	Measured Noise Levels (dB)				Noise Source
		L_{Aeq}	L_R	$L_{eq,63HZ}$	$L_{eq,125HZ}$	
Business Zones						
Axis Building, max	< 5	75	80	97	83	6 pumps hum with clear high-pitched tone, generator, traffic not audible.
Axis Building, south	< 40	69	74	86	83	6 pumps hum with clear high-pitched tone, generator, traffic not audible.
Axis Building, north	< 50	59	64	74	75	6 pumps hum with clear high-pitched tone, generator, traffic not audible.
Xero Building	< 10	70	75	91	78	6 pumps hum with clear high-pitched tone, generator, traffic not audible.
Egali House	< 100	46	-	63	56	6 pumps hum with faint high-pitched tone, generator, HVAC from Central Bark, traffic faintly audible.
5 Cleveland Road	< 75	45	-	59	56	6 pumps hum with faint high-pitched tone, generator, HVAC from Central Bark, traffic faintly audible.

Noise Receiver	Distance from pump	Measured Noise Levels (dB)				Noise Source
		L_{Aeq}	L_R	$L_{eq,63HZ}$	$L_{eq,125HZ}$	
Residential Zones						
66 St Georges Bay Rd	< 120	59	-	72	67	6 pumps hum with faint high-pitched tone, generator, trucks clearing pipe, traffic not audible.
27 Garfield St	< 80	49	-	65	58	6 pumps hum with faint high-pitched tone, generator, traffic faintly audible .
27 Windsor St	< 100	42	47	59	49	6 pumps hum with clear high-pitched tone, generator, traffic faintly audible

4. RESOURCE CONSENTS SOUGHT

4.1 ZONE AND OVERLAYS

The activity falls within the following zones under the AUP, as indicated in **Figure 11** below:

- Road Reserve (Diversion pump and pipe);
- Open Space – Informal recreation Zone (Diversion pipe);
- Business - Mixed Use Zone (OMS repair works);

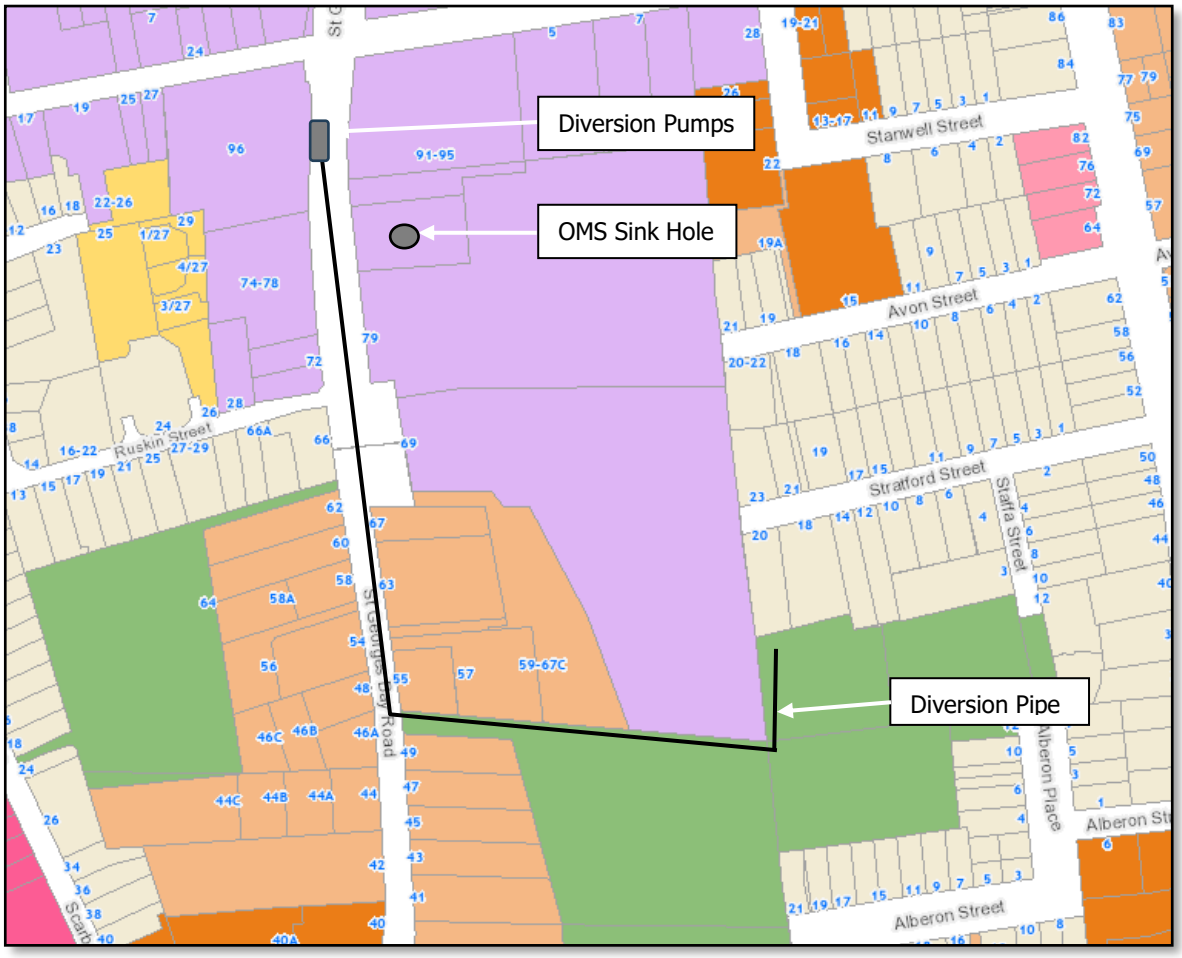

Figure 11: Auckland Unitary Plan Zone Map showing approximate Ōrākei sink hole and diversion pipe locations.

The activities are located within the following overlays, designations and controls under the AUP:

- Natural Resources: Significant Ecological Areas Overlay – SEA_T_6062, Terrestrial;
- Natural Heritage: Regionally Significant Volcanic Viewshafts And Height Sensitive Areas Overlay [rcp/dp] – T1, Rangitoto Island, Viewshafts;

- Natural Heritage: Regionally Significant Volcanic Viewshafts And Height Sensitive Areas Overlay [rcp/dp] – E8, Mount Eden, Viewshafts;
- Historic Heritage and Special Character: Auckland War Memorial Museum Viewshaft Overlay;
- Controls: Height Variation Control – Parnell, 21m;
- Controls: Centre Fringe Office Control;
- Controls: Macroinvertebrate Community Index – Urban; and
- Controls: Macroinvertebrate Community Index – Native.

There are no individual trees or groups of trees considered to be among "the most significant trees in Auckland" that have been scheduled as notable trees within the Alberon Reserve (Chapter D13 Notable Trees Overlay).

4.2 RULES ASSESSMENT

Under section 2 of the RMA, the definition of "infrastructure" includes "(f) a drainage or sewerage system." The AUP defines infrastructure as having the same meaning as in section 2 of the RMA.

The diversion system is a drainage or sewerage system associated with the existing OMS and is therefore "infrastructure" under the AUP provisions.

Table 2 below provides an assessment of the relevant rules of the AUP set out in Chapter 26 – Infrastructure and Chapter 25 – Noise and Vibration. It is noted that provisions related to viewshaft overlays or height controls or to macroinvertebrate controls do not apply to the activities.

Table 2: Auckland Unitary Plan Rules assessment.

Rule	Activity	Zone / Overlay	Activity Status
Chapter E26 – Infrastructure			
A50	Aboveground pipelines and attached ancillary structures for the conveyance of water, wastewater and stormwater.	Road Reserve Open Space Zone	Restricted Discretionary
A73	Emergency tree works	Significant Ecological Area	Permitted

Rule	Activity	Zone / Overlay	Activity Status
A77	Vegetation alteration or removal that does not comply with Standards E26.3.5.1 to E26.3.5.4.[1]	Significant Ecological Area	Restricted Discretionary
A81	Emergency tree works	Road Reserve Open Space Zone	Permitted
A88	Works within the protected root zone not otherwise provided for.	Road Reserve Open Space Zone	Restricted Discretionary
A93	Tree trimming, alteration or removal not otherwise provided for.	Road Reserve Open Space Zone	Discretionary
A95	Earthworks up to 2500m^2 other than for maintenance, repair, renewal, minor infrastructure upgrading.	Road Reserve Open Space Zone Business – Mixed Use Zone	Permitted
A96	Earthworks up to 2500m^3 other than for maintenance, repair, renewal, minor infrastructure upgrading.	Road Reserve Open Space Zone Business – Mixed Use Zone	Permitted
A110	Earthworks for maintenance, renewal and repair of network utilities and electricity generation activities.	Significant Ecological Area	Permitted
A117	Earthworks from 10m^2 to 2500m^2 and from 5m^3 to 2500m^3.	Significant Ecological Area	Restricted Discretionary
E25 Chapter – Noise			
A2	Activities that do not comply with a permitted activity standard.	Road Reserve Open Space Zone Business – Mixed Use Zone	Restricted Discretionary.

[1] Standards E26.3.5.1 to E26.3.5.4 include requirements such as the activity must be undertaken within and to 1m either side of existing tracks and fences, not include trees over 6m in height, or 600mm in girth and not result in the removal of more than 20m^2 of vegetation within a significant ecological area; the diversion pipeline works exceed these requirements.

It is noted that "emergency tree works" means the alteration or removal of any tree or vegetation immediately necessary to avoid any actual and imminent threat to the safety of persons or damage to property or to maintain or restore utility services. These works must comply with the standards specified in E26.3.5. Permitted activity standards and E26.4.5. Standards.

4.3 STANDARDS ASSESSMENT

Table 3 below, provides an assessment of the activities for which consent is sought against the relevant standards of the rules set out in **Table 2** above.

Table 3: Standards assessment.

Standard #	Standard	Comment	Compliance
Chapter E26 – Infrastructure			
E26.2.5.3.	(24) Any aboveground section of underground pipelines for the conveyance of gas, water, wastewater and stormwater must not exceed: (a) 25m continuous length of pipe that is aboveground in any one section; and (b) 300mm in diameter.	The diversion pipe is approximately 450 m long and has a diameter of 600mm.	Does not comply
E26.3.5.1.	(1) Must be undertaken within and to 1m either side of existing tracks and fences. (2) Must not include trees over 6m in height, or 600mm in girth unless their removal is otherwise permitted by a rule in this Plan. (3) Must not result in the removal of more than 20m^2 of vegetation within a significant ecological area. (4) Must not result in the removal of more than 50m^2 of vegetation from areas not identified as a significant ecological area.	Vegetation removal included trees over 6m tall and 600mm in girth and involved an area greater than 50m^2.	Does not comply

Standard #	Standard	Comment	Compliance
E26.3.5.2.	Vegetation alteration or removal: (1) Must not include trees over 6m in height, or 600mm in girth unless their removal is otherwise permitted by a rule in this Plan. (7) Vegetation alteration or removal from a significant ecological area must be for the purpose of: (a) the operation, maintenance, renewal, repair or removal of network utilities or electricity generation facilities or minor infrastructure upgrading and not result in the removal of more than 20m^2 of vegetation, except within the formation width of the road; or (b) the operation, maintenance, renewal, repair or removal of network utilities or electricity generation facilities or minor infrastructure upgrading and must be undertaken in any of the following: (i) within the formation width of existing roads, except where Standard E26.3.5.2(4) applies; or (ii) within 1m of the network utility, or existing access track; or (iii) in accordance with the Electricity (Hazards from Trees) Regulations 2003; or (c) maintaining the safety of the network utility and must be	As identified in **Appendix 5**, the works involved removal of several trees exceeding 6m in height and more than 600mm in girth over an area of approximately 810 m^2.	Does not comply

Standard #	Standard	Comment	Compliance
	undertaken in any of the following: (i) within state highway designations as at 30 September 2013; or (ii) within railway designations as at 30 September 2013; or (d) installing a service connection and must not result in the removal of more than 10m^2 of vegetation. (7A) Tree trimming or alteration of trees must comply with the following standards: (i) the maximum branch diameter must not exceed 50mm; (ii) no more than 10 per cent of live growth of the tree is removed in any one calendar year; (iii) the trimming or alteration must retain the natural shape, form and branch habit of the tree; (iv) trimming or alteration must meet accepted modern arboricultural practice.		
E26.3.5.3.	(1) Must be undertaken within and to 1m either side of existing tracks and fences. (2) Must not include trees over 6m in height, or 600mm in girth unless their removal is otherwise permitted by a rule in this Plan.	As identified in **Appendix 5**, the works involved removal of several trees exceeding 6m in height and more than 600mm in girth over an area of approximately 810 m^2.	Does not comply.

Standard #	Standard	Comment	Compliance
	(3) Must not result in the removal of more than 50m^2 of vegetation within an overlay.		
E26.3.5.4.	(1) Vegetation alteration or removal must not include trees over 6m in height, or 600mm in girth unless their removal is otherwise permitted by a rule in this Plan. (2) Must not result in the removal of more than 50m^2 of vegetation within an overlay. […]	As identified in **Appendix 5**, the works involved removal of several trees exceeding 6m in height and more than 600mm in girth over an area of approximately 810 m^2.	Does not comply.
E26.4.5.1.	(1) Tree trimming or alteration of trees in streets and open space zones must comply with the following standards: (a) the maximum diameter of any branch removed must be no greater than 100mm; (b) no more than 20 per cent of live growth of the tree must be removed which can be increased to 30 per cent under the direct supervision of a suitably qualified arborist; (c) the natural shape, form and branch habit of the tree must be retained for trees in public open space; (d) the natural shape, form and branch habit of the tree must be retained for trees in streets where practicable; and	As identified in **Appendix 5**, the works involved removal of several trees exceeding 6m in height and more than 600mm in girth over an area of approximately 810 m^2.	Does not comply.

Standard #	Standard	Comment	Compliance
	(e) All works must be carried out in accordance with best arboricultural practice.		
E26.4.5.2.	(1) For roots under 60mm: (a) excavation undertaken by hand digging or air spade or hydro vac or machine excavator within the protected root zone without direction and/or supervision of a qualified arborist […} (b) excavation undertaken by hand digging or air spade or hydro vac or machine excavator within the protected root zone with direction and/or supervision of a qualified arborist […] (c) excavation undertaken by trenchless methods must not be undertaken at a depth less than 800mm below ground level, and does not require the direction or supervision of a qualified arborist; (d) replacement of structures kerbs, and hard surfaces must be done so that […] (e) Standards E26.4.5.2(1)(a) - (d) above do not apply to any tree works undertaken inside infrastructure such as pipes and meter boxes. (2) For roots greater than 60mm but less than 80mm: (a) excavation undertaken by hand digging or air spade or hydro vac or machine	As identified in **Appendix 5**, the works involved removal of several trees exceeding 6m in height and more than 600mm in girth over an area of approximately 810 m^2.	Does not comply.

Standard #	Standard	Comment	Compliance
	excavator within the protected root zone with direction and/or supervision of a qualified arborist […] (b) Standard E26.4.5.2(2)(a) above do not apply to any tree works undertaken inside infrastructure such as pipes and meter boxes.		
E26.5.5.1.	Accidental discovery rule	All earthworks have been undertaken in a manner that complies with accidental discovery rule E26.5.5.1	Complies
E26.5.5.2.	Earthworks - General standards […] (1) Land disturbed for the operation, repair, renewal, upgrading or maintenance of utilities will be stabilised by re-vegetation, grassing or other suitable means as soon as practicable after completion of the works to avoid erosion and scouring. (2) Land disturbance must not, after reasonable mixing, result in any of the following effects in receiving waters: (a) the production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials; (b) any conspicuous change in the colour or visual clarity; (c) any emission of objectionable odour;	In terms of standards E26.5.5.2 the following is noted: Upon removal of the diversion pipe and pumps, St Georges Bay Road and footpath will be reinstated to Auckland Transport standards, Parnell Quarter Carpark will be reinstated with a bespoke design, and Alberon Reserve will be replanted with the implementation of a Reserve Reinstatement Plan. Earthworks have been managed to ensure effects (a – e) have not occurred after reasonable mixing.	Complies

Standard #	Standard	Comment	Compliance
	(e) the rendering of fresh water unsuitable for consumption by farm animals; or (f) any significant adverse effects on aquatic life. (3) Best practice erosion and sediment control measures must be implemented for the duration of the land disturbance. (7) Only cleanfill material may be imported and utilised as part of the land disturbance. (13) Works must not result in any instability of land or structures at or beyond the boundary of the property where the land disturbance occurs. (14) The land disturbance must not cause malfunction or result in damage to network utilities, or change the cover over network utilities so as to create the potential for damage or malfunction. (15) Access to public footpaths, berms, private properties, network utilities, or public reserves must not be obstructed unless that is necessary to undertake the works or prevent harm to the public. (17) Measures must be implemented to ensure that any discharge of dust beyond the boundary of the site is avoided or limited such that it does not cause nuisance.	Best practice erosion and sediment control measures area in place. Clean fill will be imported to fill excavated sites. All excavation sites are sufficiently separated from any structures. Concrete spraying the sink hole site has stabilised the loose material around the site. The earthworks are in direct response to damage to the OMS. There is no further risk to the wastewater network associated with the earthworks. Obstruction of the St Georges Bay Road footpath, Alberon Reserve and Parnell Quarter is necessary for the emergency works. Concrete spaying at the OMS sink hole has limited potential dust generation from the site.	
Chapter E25 – Noise			

Standard #	Standard	Comment	Compliance
E25.6.8.1	(1) The noise from any construction work activity must be measured and assessed in accordance with the requirements of New Zealand Standard NZS6803:1999 Acoustics – Construction noise.	Noise from any construction work activity will be measured and assessed in accordance with the requirements of New Zealand Standard NZS6803:1999 Acoustics – Construction noise.	Complies
E25.6.8.	Noise levels in Business – Mixed Use Zone. 7am – 11pm: 65dB L_{Aeq} 11pm – 7am: 55dB L_{Aeq} 65dB at 63 Hz L_{Aeq} 60dB at 125 Hz L_{Aeq} 75dB L_{AFmax}	Noise levels are measured to be 75 dB L_{Aeq} at the nearest noise receiver.	Pumping noise does not comply (nighttime noise).
E25.6.27	Construction noise.	Construction noise will meet the requirements of Table E25.6.27.2 "Construction noise levels for noise affecting any other activity."	Complies.

4.4 SUMMARY

Based on the above assessment of the relevant standards, resource consent is sought under the following rules:

- Rule E26.2.3.1 (A50), aboveground pipelines and attached ancillary structures for the conveyance of water, wastewater and stormwater – Restricted Discretionary;
- Rule E26.3.3.1 (A77), vegetation alteration or removal that does not comply with Standards E26.3.5.1 to E26.3.5.4. – Restricted Discretionary;
- Rule E26.4.3.1 (A88), works within the protected root zone not otherwise provided for – Restricted Discretionary;

- Rule E26.4.3.1 (A93), tree trimming, alteration or removal not otherwise provided for – Discretionary;
- Rule E26.6.3.1 (A117), earthworks from 10m^2 to 2500m^2 and from 5m^3 to 2500m^3. – Restricted Discretionary; and
- Rule E25.4.1 (A2), activities (diversion pump operation at night) that do not comply with a permitted activity standard. – Restricted Discretionary.

The activities are interrelated land use activities, so the most stringent activity status therefore applies. The resource consent sought should be considered as a **Discretionary Activity**.

5. ASSESSMENT OF ENVIRONMENTAL EFFECTS

5.1 POSITIVE EFFECTS

All works covered by this application are related to reinstatement of the OMS as a lifeline utility and / or seek to minimise the level of environmental effects caused by the OMS collapse.

The excavation of material from the sink hole, construction and installation of the temporary diversion system, and other subsequent land use activities, effectively minimised the volume of untreated wastewater and stormwater discharged into the Waitematā Harbour and enabled re-establishment of regular operations and flows through the wastewater network, while the OMS is being repaired. Since the temporary diversion has been in operation, there have been no dry weather overflows. Similarly, to date the diversion has been capable of accommodating wet weather flows within the network, and no wet weather overflows have occurred since its installation.

5.2 NOISE EFFECTS

Marshall Day Acoustics provided an assessment of the noise effects generated as a result of the operation of the diversion pumps, provided as **Appendix 6**

In summary, Marshall Day notes that the operation of the generator and 6 diversion pumps produced a steady low frequency hum, with a distinct high-pitched tone at 4 kHz that was noticeable and dominated the noise environment in St Georges Bay Road in the vicinity of the pumps. The assessment indicated that while operational, the diversion pumps would likely be audible at several locations and had the potential to cause disturbance, affect worker concentration and result in sleep disturbance. Flow was restored to the OMS in late October 2023, following which no further nighttime use occurred. Watercare is seeking to authorise this retrospectively. However, no further consent for infringement of noise levels is sought going forward.

The pumps were removed in January 2024, and will only be reinstalled if there is a need to diversion wastewater flows for brief periods during relining activities. Adverse effects of the type and duration described in the previous paragraph are not anticipated for the OMS reinstatement works.

Noise levels associated with removal of the pumps, OMS repair activities and rehabilitation of the site will comply with the requirements of New Zealand Standard NZS6803:1999 Acoustics – Construction noise.

5.3 SOIL EFFECTS

Watercare have stabilised the OMS sink hole using concrete-spray. This measure has effectively avoided further erosion of the sink hole and prevented loose sediment falling into the hole in the OMS increasing the blockage. The concrete-spray has also effectively minimised the potential for dust generation from the OMS sink hole site.

As set out in **Appendix 5**, the footprint of a temporary gravel path constructed for access related to the pipeline route through Alberon Reserve crosses an ephemeral watercourse which has been assessed as having negligible value. The implementation of best practice Erosion and Sediment Controls in accordance with the *Erosion and Sediment Guide for Land Disturbing Activities in the Auckland Region* (GD05) means that the overall level of effect is considered to be very low. Measures were put in place to stabilise the flow path and reduce sedimentation of the receiving environment. A section of the ephemeral watercourse has been piped for approximately 4 m under the temporary accessway to avoid erosion of the path that may have resulted sedimentation of the streambed and the subsequent blockage of the receiving stormwater outlet at the northern end of Alberon Reserve. Additionally, temporary bunding has been installed to divert flows from the temporary accessways into the stream channel to maintain the natural flow regime.

Earthworks at the diversion connection points and proposed earthworks to fill and reinstate the OMS sink hole and Parnell Quarter carpark, will be managed in accordance with GD05.

For the above reasons, all earthworks undertaken to date and required for completion of the OMS lining in the vicinity of the sink hole and rehabilitation of the works areas have been and will continue to be appropriately managed, so there are less than minor adverse effects on soil.

5.4 TERRESTRIAL ECOLOGY EFFECTS

Vegetation

The installation of the diversion pipe involved the removal of approximately 431 m^2 of tree canopy and the alteration and removal of approximately 810 m^2 of vegetation within Alberon Reserve. The effect of this removal has been assessed by Morphum, as set out in **Appendix 5.**

Ecological effects management was carried out for vegetation removal during the emergency works in Alberon Reserve. A suitably qualified and experienced arborist visited the site prior to vegetation removal to assess the vegetation removal activities. As the diversion pipeline installed was somewhat flexible, the least destructive route was selected to avoid multiple specimen trees marked by the supervising arborist. These

specimens included mature pohutukawa (*Metrosiderous excelsa*) and kahikatea (*Dacrycarpus dacrydioides*) trees. In order to mitigate the impact of the works, geotextile fabric and mulch was laid over the roots of specimen trees adjacent to the access route for protection and juvenile specimens were relocated out of the EOI where practicable.

Overall, the magnitude of effects on vegetation with the effects management approach adopted has been assessed as being high as discussed in **Appendix 5**.. Residual effects include the loss of high-value SEA vegetation and the establishment of pest plant species.

Avifauna

Vegetation removal in Alberon Reserve associated with the diversion pipeline works has resulted in indirect habitat loss for native avifauna as many of the canopy specimens removed were considered to be suitable foraging, nesting, and roosting habitats. While the total extent of habitat removal is minimal relative to the wider habitat availability of the Alberon Reserve, 0.8 ha of suitable avifauna habitat was cleared. In addition, the works were undertaken within bird nesting season (September to February), increasing the potential for effects on juvenile avifauna.

Ecological effects management was carried out for avifauna during the emergency works in Alberon Reserve, including multiple bird nesting surveys carried out by Morphum which resulted in all trees hosting nests to be marked and the clearance of these specimens being avoided. Results from these surveys found that while a song thrush nest remained occupied, one previously occupied Pīwakawaka (*Rhipidura fuliginosa*) nest with three eggs was disturbed likely due to the works. Residual effects include the loss nesting and foraging habitat for avifauna.

Herpetofauna

Direct effects of the works undertaken in Alberon Reserve include the mortality of lizards during vegetation clearance and establishment of the temporary accessway for machinery. Indirect effects include the loss of lizard habitat resulting in a habitat fragmentation and loss of ground coverage for lizards. Prior to vegetation removal, there was a vegetated area of low growing species and woody debris providing good ground coverage for native skinks. While the works resulted in some loss of these areas, the extent of suitable lizard habitat in Alberon Reserve remains high.

Ecological effects management was carried out for herpetofauna during the emergency works in Alberon Reserve, including lizard search and salvage undertaken by RMA Ecology and Morphum to mitigate the direct and indirect effects of the works. This included nighttime spotlighting of suitable canopy vegetation within the area for arboreal geckos both before and after clearance; however, no specimens were found. Additionally, daytime lizard searches of all suitable habitats within the area were undertaken prior to

the works commencing, resulting in the relocation of 7 copper skinks to a suitable habitat in a nearby reserve. Residual effects include the loss skink and gecko habitat.

As a means to remedy and mitigate actual and potential adverse ecological effects, Watercare proposes to produce and implement a Reserve Reinstatement Plan as a condition of this consent, which will set out intended indigenous remediation planting within Alberon Reserve upon the decommissioning of the diversion pipe. The Reserve Reinstatement Plan will detail measures to manage potential leaks and discharges from the pipeline during its removal, including daily inspections of the pipe, spill management kits and isolating discharges. At the time of preparation of this assessment, the location and extent of planting required is subject to further discussion with the landowner (Auckland Council). The implementation of the Reserve Reinstatement Plan will ensure that any actual and potential adverse ecological effects will be appropriately remedied and mitigated so that the residual effects will be no more than minor.

5.5 TRAFFIC EFFECTS

The installation, use and operation of the diversion system are located within the St Georges Bay Road Reserve. To protect these temporary assets while they are in operation, traffic management measures have been put in place on St Georges Bay Road, reducing the road to one lane between the entrance on Alberon Reserve and near the Cleveland Road intersection, causing potential adverse traffic related effects.

As St Georges Bay Road does not support through traffic between Alberon Reserve to the Cleveland Road intersection, the traffic related effects are limited generally to the residents living on St Georges Bay Road and the employees and customers of businesses located on St Georges Bay Road and the eastern end of Ruskin Street (from number 26 to St Georges Bay Road, which are accessed via St Georges Bay Road). The remainder of Ruskin Street is accessed via Bradford Street and / or Parnell Road, and is not obstructed by any traffic management, therefore residents are not inhibited from accessing their properties.

The traffic management measures on St Georges Bay Road affects approximately 18 properties on the south side of the St Georges Bay Road cul de sac, and the workers of the commercial buildings on the north side of the St Georges Bay Road cul de sac and the properties in Ruskin Street described above. While, the location of the diversion system, is likely to result in nuisance, its design and the traffic management in place ensures that only one secondary access way and the curb side carparking are obstructed. Workers of the surrounding commercial buildings are therefore able to continue to access the street and the private carparking facilities.

As a result, these activities are considered to generate adverse traffic related effects particularly for the residents and workers, whose dwellings and workplaces are located

on St Georges Bay Road. A traffic management plan is being implemented for the duration to mitigate the traffic effects associated with the works.

While the works and measures under the traffic management plan do cause disruption, the traffic related restrictions are temporary, and the road network will be reinstated upon completion of the OMS repair works. As such, traffic related effects associated with the emergency works area considered no more than minor.

5.6 RECREATION EFFECTS

The installation, operation and removal of the diversion pipe through Alberon Reserve has the potential to adversely affect the recreational values of the reserve.

As previously mentioned, for the duration of the emergency works, the Alberon Reserve footpaths from St Georges Bay Road and Alberon Place have been blocked off at both ends to prevent public access to the diversion pipe, thus preventing public access to those areas of the reserve. However, access to the reserve via Alberon Street remains open, and the open grassed area of Alberon Reserve remains available for public use.

The temporary pathway closures has likely generated adverse effects particularly for residents of St Georges Bay Road who would like to access the park. However, given access is still provided from Alberon Place, any access effects are considered to be the relatively minor inconvenience of users having to temporarily travel further to utilise Alberon Reserve.

Recreational values of the reserve are also reduced, as recreational users will temporarily not have access to pathways and areas that have some amenity or natural values. Given access to these footpaths will only be temporarily \restricted and the dominant recreational space (the open grassed area) has been and will remain open for public use, any recreational effects are considered no more than minor.

5.7 VISUAL AMENITY EFFECTS

The diversion pumps and pipe are prominent structures on the street scape of St Georges Bay Road, that is inconsistent with the surrounding mix use urban environment and Alberon Reserve given the aboveground location and bulk. The installation of the diversion system present a unique scenario, effectively turning a portion of St Georges Bay Road and Alberon Reserve into a temporary construction site. The structures will therefore temporarily detract from the amenity values of the surrounding area for the duration of their operation.

Upon completion of the OMS repair, the diversion pumps and pipe will be removed and St Georges Bay Road, damaged sections of footpath, Parnell Quarter carpark and Alberon Reserve will be reinstated to the same or similar form than prior to the works. As such,

there will be no long-term visual amenity effects associated with the activities for which consent is sought.

Primarily due to their temporary nature, the activities for which consent is sought will result in no more than minor adverse visual amenity effects.

5.8 CULTURAL EFFECTS

It is for Mana Whenua to determine the extent of effects on their cultural values. Section 8 below sets out the consultation undertaken with Ngāti Whātua Ōrākei.

Watercare has worked closely with Ngāti Whātua Ōrākei in all stages of the emergency works. Ngāti Whātua Ōrākei have acknowledged that they have opted not to produce a Cultural Values Assessment for the emergency works.

In general, it is acknowledged that the emergency works covered by this land use consent application are located in an urban environment, situated away from waterbodies or sites of significance to mana whenua, minimising potential effects on cultural values. The alteration and removal of indigenous vegetation within Alberon Reserve posses' potential risk of adverse effects on the mauri of the reserve. Prior to the removal of vegetation within Alberon Reserve, Ngāti Whātua Ōrākei representatives undertook a site visit with Watercare to Alberon Reserve to discuss the potential vegetation alteration and removal required within the reserve. Ngāti Whātua Ōrākei supported the removal of exotic trees and did not express any objections to the works required to diversion the OMS collapse area.

Watercare will continue to work closely with Ngāti Whātua Ōrākei to develop the Reserve Reinstatement Plan and the reinstatement of Alberon Reserve following the completion of the works required.

No further concerns have been raised by Mana Whenua in relation to the activities for which consent is sought.

6. PROPOSED CONSENT CONDITIONS

The following consent conditions are consent conditions proposed for the land use consent sought. It is anticipated that these conditions will be refined in consultation with Auckland Council.

Conditions

Pursuant to sections 108 of the Act, this consent is granted subject to the following conditions:

General Accordance

1. The activities authorised by this consent must be undertaken so as to be generally consistent with the document titled "*Watercare Services Limited: Ōrākei Main Sewer Emergency Repair and Temporary Diversion, Resource Consent and Assessment of Environmental Effects, April 2024*" (AC doc XXXX) ("**Application**") except where otherwise required in the resource consent conditions below. Where there is any inconsistency between the Application or a management plan requirement and the resource consent conditions, then the conditions below shall prevail.

2. The Consent Holder shall ensure that all staff and contractors undertaking works on site are aware of all conditions of this consent.

Earthworks

3. All earthworks shall be carried out in accordance with Auckland Council's *Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region*.[2]

Silt controls / Pollution / Contamination

4. Biohazard control and monitoring of the diversion pipeline and pump for damage and leaks is required throughout the occupation period by Watercare or its authorised contractors.

5. Any leaks or discharges from the diversion pipe to the land must be managed and contained as soon as practicable by Watercare or in the event of contamination being discharged from by diversion pipe or pump, or a significant spill occurs, the applicant must contact the Auckland Council Pollution Response Team (09 377 3107) and isolate the discharges to minimise effects.

Damage to public roads and open space

6. The consent holder will be responsible for the repair and reinstatement of the public roads / carriageway and open space reserve areas affected by the activities authorised by this consent to the satisfaction of the relevant Manager of Auckland Transport (roading) or Auckland Council (reserve).

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[2] https://www.aucklandcouncil.govt.nz/UnitaryPlanDocuments/mir-erosion-sediment-control-guide-auckland-region.pdf

7. The applicant must contact the Facilities Manager to arrange a pre-reinstatement meeting at least 5 days before the diversion pipeline is to be decommissioned and removed from Alberon Reserve.

8. Prior to the removal of the diversion pipeline, the consent holder shall prepare a Reserve Reinstatement Plan in accordance with conditions set out in the Emergency Landowner Approval granted by Auckland Council, to reinstate all damage to the surface of Alberon Reserve and its assets to their original condition. The Reserve Reinstatement Plan must identify:

    a. The vegetation replanting and maintenance that will be undertaken;

    b. The earthworks and other works to be undertaken to reinstate the footpaths and open space areas of the reserve, including the specifications for grass reinstatement within the reserve; and

    c. The timetable for the pipeline removal and reserve reinstatement works to be undertaken.

Buried services

9. The consent holder is responsible for the repair and reinstatement of any underground services damaged as a result of the activities authorised by this consent.

Debris on public roads

10. Any debris deposited on St Georges Bay Road or Alberon Street as a result of the activities authorised by this consent shall be removed by or at the expense of the consent holder. All debris is to be cleaned off the road at the end of each working day.

Complaints

11. The consent holder must log all complaints received by the consent holder about activities associated with the works authorised by the resource consent. The information log shall include:

    a. The date, time, location and nature of the complaint;

    b. Name, phone number and address of the complainant unless the complainant wishes to remain anonymous;

    c. Action taken to remedy the problem;

    d. Any equipment failure and remedial action taken; and

    e. The weather conditions on the day of the complaint including estimates of wind direction, wind strength, temperature and cloud cover.

12. Details of any complaints received that affect the consent holder's ability to comply with the conditions of consent shall be provided to the Auckland Council within 24 hours of receipt of the complaint(s) or on the next working day.

7. CONSULTATION

In undertaking emergency works under s330 of the RMA, Watercare has consulted with and provided ongoing communication and project updates to Auckland Council and surrounding residents, in particular, those within the Axis Building and others within 150 m of the diversion pipeline.

7.1 MANA WHENUA

Once the extent of the emergency had been assessed, Watercare initiated contact with mana whenua kaitiaki to alert them to the OMS collapse and overflow event. A summary of the contacts made during the period 27 September 2023 to 1 October 2023 is set out in **Table 4**.

Subsequent to the initial contacts made and on the advice of kaitiaki, Watercare continued to work with Ngāti Whātua Ōrākei regarding the emergency, in particular with Phil Wihongi and Kingi Makoare.

Prior to the removal of vegetation within Alberon Reserve, Ngāti Whātua Ōrākei representatives undertook a site visit with Watercare to Alberon Reserve to discuss the potential vegetation alteration and removal required within the reserve. Ngāti Whātua Ōrākei supported the removal of exotic trees and did not express any objections to the works required to divert wastewater around the OMS collapse area.

Watercare will continue to work closely with Ngāti Whātua Ōrākei to develop the Reserve Reinstatement Plan and the reinstatement of Alberon Reserve following the completion of the works required.

On 26 March 2024, Watercare met with Phil Wihongi and Kingi Makoare (Ngāti Whātua Ōrākei) to discuss the scope of the land use consent applications.

Watercare has worked closely with Ngāti Whātua Ōrākei through all stages of the emergency works. Ngāti Whātua Ōrākei have acknowledged that they have opted not to produce a Cultural Values Assessment for the emergency works.

Table 4: Initial Kaitiaki Contacts

Date	Mana Whenua Contact	Summary of Consultation
27 September 2023 9.01 am	kaitiaki@ngaitaitamaki.iwi.nz; eu@ngatimaru.iwi.nz; info@paoa.co.nz; NPTB@ngatipaoatrustboard.co.nz; edith@tamaoho.maori.nz; rmaofficer@tamaoho.maori.nz; rma@tamatera.iwi.nz; karl_flavell@hotmail.com; tetaritaiao@kaiparamoana.com; tokitaiao@ngatiwhatuaorakei.com; Kowhai Olsen (kowhai.olsen@teahiwaru.co.nz); Kaitiaki - Te Ākitai o Waiohua (Kaitiaki@teakitai.com); tiaki@tekawerau.iwi.nz; kaitiaki@ngatiwhatua.iwi.nz; lorraine.dixon@tainui.co.nz	Watercare initial contact with mana whenua to advise of a "major and ongoing pollution event": "*In Parnell, a tomo has developed over the top of the Ōrākei Main Branch Sewer, one of the key arteries of our wastewater network. Overnight the widening tomo has led to the collapse and blockage of the 2.1 m wide pipe, and wastewater has backed up to the lowest point – being the Pasadena Pump Station at the back of Pasadena Intermediate in Western Springs. The engineered overflow point from this pumpstation is directing the wastewater to Meola Creek, and from there it goes to the Waitematā.* *The pipe to Pasadena is a 1.5 m diameter, so the volumes going out will be very large, and much larger than in a "normal" overflow, which is typically from our smaller network pipes (often 10 times smaller). We have placed much of the harbour under black flags on the Safeswim website, Auckland Council will be placing physical "do not swim" signs up, and we have alerted Auckland Regional Public Health. But we want to get the message out to as many people as we can, so if you could pass the message through your networks that the inner harbour is not safe to swim in or take shellfish from for at least the next 48-72 hours we would greatly appreciate it."*

Date	Mana Whenua Contact	Summary of Consultation
27 September 2023 3.31 pm	Phil Wihongi, Ngāti Whātua Ōrākei	Update from Incident Controller. Phil Wihongi responded on behalf of Ngāti Whātua Ōrākei (27 September 2023) and requested that Watercare continue to consult with Ngāti Whātua Ōrākei so that they can inform their people about the dangers posed and how the matter is being dealt with, particularly in relation to Ōkahu Bay. Phil Wihongi also asked for the precise location so that one of their team can attend the site to assess the issue. Phil Wihongi further sought ongoing clarity as soon as information comes to hand, particularly around how water quality will be monitored to 'normal' levels. An incident report was also requested when the matter is resolved so that they can understand how Watercare will take any lessons to avoid future incidents of this nature that impact on Te Waitematā. Watercare responded to this by confirming the locations that are overflowing and providing the Safeswim team sampling schedule for the next two days. Watercare also noted that the plan was to continue sampling until water quality results match model results.
27 September 2023 3.36 pm	kaitiaki@ngaitaitamaki.iwi.nz; eu@ngatimaru.iwi.nz; info@paoa.co.nz; NPTB@ngatipaoatrustboard.co.nz; edith@tamaoho.maori.nz; rmaofficer@tamaoho.maori.nz;	Update from Incident Controller

Date	Mana Whenua Contact	Summary of Consultation
	rma@tamatera.iwi.nz; karl_flavell@hotmail.com; tetaritaiao@kaiparamoana.com; tokitaiao@ngatiwhatuaorakei.com; Kowhai Olsen (kowhai.olsen@teahiwaru.co.nz); Kaitiaki - Te Ākitai o Waiohua (Kaitiaki@teakitai.com); tiaki@tekawerau.iwi.nz; kaitiaki@ngatiwhatua.iwi.nz; lorraine.dixon@tainui.co.nz; stephtawha@teahiwaru.co.nz	
27 September 2023 4:16 pm	Phil Wihongi (Philw@nwo.iwi.nz); TeAmohaere1@ngatiwhatuaorakei.com; Tom Irvine (tomi@nwo.iwi.nz); Shazeaa Salim (SSalim@ngatiwhatuaorakei.com); Kingi Makoare (kingi@ngatiwhatuaorakei.com)	P Wihongi attended site visit with Watercare Operations Team. Confirmation of overflows at Freyburg Wharf and Daldy/Brigham Street.
27 September 2023 5:30 pm		Confirmation that M Bourne, J Sinclair, N Wilson and O Reweti met online with the Chair and Managers from Ngāti Whātua Ōrākei to give an update on the current situation. Outcomes from this meeting were as follows: 1. A rāhui would be placed on the Waitemata Harbour by Ngāti Whātua Ōrākei at 6am 28 September at Ōkahu Bay. 2. A joint media release between Ngāti Whātua Ōrākei and WSL would be drafted and released. 3. Ngāti Whātua Ōrākei want to be kept in the update loop, J Sinclair to update directly with M Royal, L Davis and T

Date	Mana Whenua Contact	Summary of Consultation
		Irvine. N Wilson to send out updates as these come to hand with emails directly to P Wihongi and Te Mahurehure marae. 4. All disappointed that this situation has arisen, but Ngāti Whātua Ōrākei supporting WSL in response to the situation. Attendees from Ngāti Whātua Ōrākei at Rāhui: M Royal, L Davis, T Irvine, Te Amohaere Morehu, M Pihema, Kingi Makoare, N Strong, H Yorke, Te Kurataiaho Kapea
27 September 2023 8:24 pm	kaitiaki@ngaitaitamaki.iwi.nz; eu@ngatimaru.iwi.nz; info@paoa.co.nz; NPTB@ngatipaoatrustboard.co.nz; Edith Tuhimata (edith@tamaoho.maori.nz); rmaofficer@tamaoho.maori.nz; rma@tamatera.iwi.nz; karl_flavell@hotmail.com; Shona Oliver (tetaritaiao@kaiparamoana.com); tokitaiao@ngatiwhatuaorakei.com); Kowhai Olsen (kowhai.olsen@teahiwaru.co.nz); Kaitiaki - Te Ākitai o Waiohua (Kaitiaki@teakitai.com); tiaki@tekawerau.iwi.nz; kaitiaki@ngatiwhatua.iwi.nz; lorraine.dixon@tainui.co.nz; stephtawha@teahiwaru.co.nz; Phil Wihongi (philw@nwo.iwi.nz)	Update from Incident Controller, schedule for Safeswim sampling
28 September 2023 11:42 am	Edith Tuhimata (edith@tamaoho.maori.nz); eu@ngatimaru.iwi.nz; info@paoa.co.nz; Kaitiaki - Te Ākitai o Waiohua (Kaitiaki@teakitai.com); kaitiaki@ngaitaitamaki.iwi.nz;	Update from Incident Controller

Date	Mana Whenua Contact	Summary of Consultation
	kaitiaki@ngatiwhatua.iwi.nz; karl_flavell@hotmail.com; Kowhai Olsen (kowhai.olsen@teahiwaru.co.nz); lorraine.dixon@tainui.co.nz; NPTB@ngatipaoatrustboard.co.nz; Phil Wihongi (philw@nwo.iwi.nz); rma@tamatera.iwi.nz; rmaofficer@tamaoho.maori.nz; stephtawha@teahiwaru.co.nz; Shona Oliver (tetaritaiao@kaiparamoana.com); tiaki@tekawerau.iwi.nz; tokitaiao@ngatiwhatuaorakei.com	
28 September 2023 3:12 pm	Edith Tuhimata (edith@tamaoho.maori.nz); eu@ngatimaru.iwi.nz; info@paoa.co.nz; Kaitiaki - Te Ākitai o Waiohua (Kaitiaki@teakitai.com); kaitiaki@ngaitaitamaki.iwi.nz; kaitiaki@ngatiwhatua.iwi.nz; karl_flavell@hotmail.com; Kowhai Olsen (kowhai.olsen@teahiwaru.co.nz); lorraine.dixon@tainui.co.nz; NPTB@ngatipaoatrustboard.co.nz; Phil Wihongi (philw@nwo.iwi.nz); rma@tamatera.iwi.nz; rmaofficer@tamaoho.maori.nz; stephtawha@teahiwaru.co.nz; Shona Oliver (tetaritaiao@kaiparamoana.com); tiaki@tekawerau.iwi.nz; tokitaiao@ngatiwhatuaorakei.com; tracey.temahurehure@gmail.com; christine.temahurehure@gmail.com	Update from Incident Controller
1 October 2023 6:05 pm	admin@patukirikiri.co.nz; Edith Tuhimata (edith@tamaoho.maori.nz); environs@uriohau.co.nz; eu@ngatimaru.iwi.nz; info@paoa.co.nz; Kaitiaki – Te Ākitai o Waiohua (Kaitiaki@teakitai.com); kaitiaki@ngaitaitamaki.iwi.nz;	Watercare provided mana whenua with a seventh and eighth Incident Controller updates. Phil Wihongi responded on behalf of Ngāti Whātua Ōrākei and highlighted that they appreciate the frequency and detail within

Date	Mana Whenua Contact	Summary of Consultation
	kaitiaki@ngatimanuhiri.iwi.nz; kaitiaki@ngatiwhatua.iwi.nz; karl_flavell@hotmail.com; Kowhai Olsen (kowhai.olsen@teahiwaru.co.nz); lorraine.dixon@tainui.co.nz; mbaker@ngaatiwhanaunga.maori.nz; NPTB@ngatipaoatrustboard.co.nz; Phil Wihongi (Philw@nwo.iwi.nz); rma@tamatera.iwi.nz; rmaofficer@tamaoho.maori.nz; Roimata Minhinnick (roimataminhinnick@yahoo.co.nz); runanga@ngatiwhatua.iwi.nz; stephtawha@teahiwaru.co.nz; Tame TeRangi (tame.terangi@ngatiwhatua.iwi.nz); Shona Oliver (tetaritaiao@kaiparamoana.com); tiaki@tekawerau.iwi.nz; TokiTaiao (tokitaiao@ngatiwhatuaorakei.com	the communication being provided. It was requested for Watercare to advise of the water monitoring and testing regime (including the extent of the physical area) which will be undertaken once the situation is in hand. They also asked whether this would begin once the bypass is in action or when the sewer that has failed is fixed. They also wanted to gain an understanding of the plan for localised inspection at the major overflow points to assess damage/sediment deposited in those marine environments as a result of this issue and whether there are likely to be any effects on their mussel restoration Kaupapa in Ōkahu Bay. They were also wanting to understand if there would be any increased inspection/monitoring of this particular line now that it has been placed under abnormal stress.
1 October 2023 7:07 pm	Phil Wihongi (Philw@nwo.iwi.nz; Kingi Makoare (kingi@ngatiwhatuaorakei.com; Te Amohaere (TeAmohaere1@ngatiwhatuaorakei.com)	Response to questions from P Wihongi

7.2 AUCKLAND COUNCIL

On 28 September 2023, Watercare contacted Auckland Council via phone call as per the Watercare Incident Management Plan (**Appendix 1**), regarding the OMS collapse and Watercare's immediate response.

On 2 October 2023, a written Emergency Landowner Approval was received from Auckland Council, to undertake emergency works and install a temporary sewer diversion pipe within Alberon Reserve, 12 Alberon Place, Parnell. The Auckland Council (Parks and Community Facilities) Landowner Approval is provided at **Appendix 2**. The Landowner Approval, sets out a suite of conditions Watercare must comply with, including but not limited to the following:

- Accurately record all damage within the reserve including to the ground, trees and vegetation;
- Arborist must document the current condition of notable trees affected by or near the pipeline route;
- Replace all damaged and/or removed trees to the specifications to the Urban Forest Specialist and Facilities Manager;
- Isolate pipe route from public access;
- Biohazard control and monitoring of the pipe for leaks throughout its occupation;
- Any leaks or discharge from the pipe to land must be managed and contained immediately. In the event of contaminants discharged from site or a significant spill, Watercare must contact Auckland Council Pollution Response Team and isolate the discharge;
- Watercare will undertake full reinstatement of any damage to the reserve surface or its assets to original or better condition.

In addition to the above, Watercare formally advised Auckland Council, via written letter on 20 October 2023, of its exercise of emergency powers under section 330 of the RMA in response to the collapse and blockage of the Ōrākei Main Sewer. This letter is provided as **Appendix 3**.

In summary, this letter set out how Watercare has responded to manage adverse effects on the environment and public health caused by the collapse and blockage of the OMS.

7.3 RESIDENTS

Watercare have been in consultation with the owners of 79 St Georges Bay Road since the development of the OMS sink hole and has an agreement to occupy the carparking and undertake remedial earthworks and repairs to the OMS.

Watercare has received several complaints from residents of the nearby apartment buildings due to high noise levels, following the installation and operation of the diversion pumps located adjacent to the Axis Building. Since nighttime operation of the diversion pumps ceased in late October 2023, noise associated with the operation of the diversion is now negligible and no ongoing noise complaints have been received.

Some concern has been expressed by residents regarding access through Alberon Reserve while the diversion pipeline is in place. Watercare is working with residents to re-establish walking access through the reserve.

7.4 PUBLIC UPDATES

Watercare has provided ongoing communication and project updates through a dedicated website (https://www.watercare.co.nz/About-us/News-media/crews-attending-major-wastewater-pipe-blockage-at).

Watercare understand that the collapse of the OMS and the subsequent emergency works is of interest and caused considerable disturbance to the wider public. For the duration of the emergency works, Watercare has continued to provide regular updates on the progress of the emergency repair works, via the Watercare official website. This has ensured that there has been a consistent location for up-to-date public information regarding the progress of the works, to ensure the public are appropriately informed.

8. STATUTORY ASSESSMENT

8.1 INTRODUCTION

The RMA is the principal statute governing the use of land, air and water in New Zealand. The purpose of the RMA, as set out in section 5(1), is to "*promote the sustainable management of natural and physical resources*". This section of the AEE sets out the framework under the RMA for the resource consent being sought from the Auckland Council. Watercare is seeking consent under section 330A(2) of the RMA, in accordance with the timeframes, as modified by 330AA of the RMA. The following sections set out the relevant statutory provisions applicable to this application.

8.2 SECTION 104 ASSESSMENT

Section 104 of the RMA lists the matters that a consent authority must have regard to in determining whether a resource consent application should be granted. It states:

1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to–

a) any actual and potential effects on the environment of allowing the activity;

ab) any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and

b) any relevant provisions of—

i) a national environmental standard:
ii) other regulations:
iii) a national policy statement:
iv) a New Zealand coastal policy statement:
v) a regional policy statement or proposed regional policy statement:
vi) a plan or proposed plan; and

c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.

2) When forming an opinion for the purposes of subsection (1)(a), a consent authority may disregard an adverse effect of the activity on the environment if a national environmental standard or the plan permits an activity with that effect.

2A) When considering an application affected by section 124 or 165ZH(1)(c), the consent authority must have regard to the value of the investment of the existing consent holder.

Section 104 of the RMA does not give any of the matters to which a consent authority is required to have regard, primacy over any other matter. All of the relevant matters are to be given such weight as the consent authority sees fit in the circumstances, and all provisions are subject to Part 2 of the RMA.

8.3 SECTION 104B

The retrospective and proposed activities associated with this application are discretionary activities.

Section 104B of the RMA sets out how a consent authority may determine applications for discretionary and non-complying activities. It states a consent authority:

(a) may grant or refuse the application; and
(b) if it grants the application, may impose conditions under section 108.

8.3.1 Actual and Potential Effects

With respect to section 104(1)(a) of the RMA, the actual and potential effects on the environment in respect to the activities for which consent is sought are set out in section 5 of this AEE.

The works covered by this application and the associated effects are related to reinstatement of the OMS as a lifeline utility and seek to minimise the level of environmental effects caused by the OMS collapse.

By way of summary, it is considered that any actual or potential adverse effects of the emergency works are temporary and are appropriately being avoided or mitigated so that any residual adverse effect is no more than minor.

8.3.2 Relevant Statutory Documents

In terms of section 104(1)(b) of the RMA, the following sub-sections provide an assessment of the land use activities associated with the Ōrākei Emergency Works, against the:

- Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 ("**NES Soils**"); and
- Auckland Unitary Plan.

8.4 RESOURCE MANAGEMENT (NATIONAL ENVIRONMENTAL STANDARD FOR ASSESSING AND MANAGING CONTAMINANTS IN SOIL TO PROTECT HUMAN HEALTH) REGULATIONS 2011

The NES Soils provide a national planning framework to manage and regulate activities a 'piece of land' as a result of hazardous activities on the land.

The areas in which the activities for which consent is sought would not be considered a 'piece of land' under sub-clause 5(7) of the NES Soils if no activities listed in the Hazardous Activities and Industries List ("**HAIL**") have occurred at these locations. No activities listed in the HAIL have been identified in the works area. The NES Soils regulations therefore do not apply and are not considered any further.

8.5 AUCKLAND UNITARY PLAN

It is considered that the following sections of the AUP are relevant to the assessment of the application:

- Chapter D9 – Significant Ecological Area Overlay;
- Chapter E12 – Land disturbance – District;
- Chapter E25 – Noise and vibration;
- Chapter E26 – Infrastructure; and
- Chapter H7 – Open Space Zones;

The following sub-sections provide an assessment of the activities for which consent is sought against the relevant objectives and policies of the chapters set out above.

8.5.1 Chapter D9 – Significant Ecological Areas Overlay

Chapter D9 of the AUP seeks to manage Auckland's significant indigenous biodiversity. The objectives and policies of Chapter D9 relevant to the application can be summarised as follows:

- Significant indigenous biodiversity areas are protected, and adverse effects are avoided as far as practicable. Where avoidance is not practicable, adverse effects are minimised and remedied;[3]
- Indigenous biodiversity values of significant ecological areas are enhanced;[4]

[3] AUP – Objective D9.2(1) and Policy D9.3(1)
[4] AUP – Objective D9.2(2)

- The relationship of Mana Whenua and their customs and traditions with indigenous vegetation is provided for;[5]
- Provide for the reasonable use and management of land including by enabling trimming of vegetation and vegetation removal in certain circumstances;[6]
- Avoid as far as practicable the removal of vegetation and loss of biodiversity in significant ecological areas from the construction of infrastructure;[7]
- Provide for the role of Mana Whenua as kaitiaki in managing biodiversity;[8]
- Manage the adverse effects from the use, maintenance, upgrade and development of infrastructure in accordance with the policies above, recognising that it is not always practicable to locate and design infrastructure to avoid significant ecological areas.[9]

In regard to the above relevant objectives and policies:

- Given the nature of the emergency works, the location of the diversion pipeline through the Alberon Reserve and SEA overlay presented the most practicable option as a temporary solution, while the OMS is being repaired. As such, adverse effects generated from vegetation alteration and removal could not be avoided. Adverse ecological effects were minimised as far as practicable, through locating the pipeline route to avoid large established indigenous trees and alteration and removal of indigenous vegetation only occurred in the direct path of the pipe. As previously mentioned, upon completion of the OMS repair, the diversion pipeline will be removed, and the areas with vegetation altered or removed will be replanted, so as to remedy any long-term ecological effects.

- Ngāti Whātua Ōrākei undertook a site visit of Alberon Reserve and supported the removal of exotic trees to make way for the diversion pipe. No further concerns were raised by Ngāti Whātua Ōrākei or the Hauraki Māori Trust Board regarding the alteration and removal of SEA vegetation.

- As previously mentioned, avoidance of the loss of vegetation was not practicable given the urgency required for the works to prevent or mitigate wider adverse environmental effects. The diversion pipeline route presented the best option to mitigate the OMS collapse effects, with any long-term ecological effects enabled to be appropriately minimised and remedied through a Reserve Reinstatement Plan.

[5] AUP – Objective D9.2(3)
[6] AUP – Policy D9.3(5)
[7] AUP – Policy D9.3(6)
[8] AUP – Policy D9.3(7)
[9] AUP – Policy D9.3(8)

- As mentioned, given the urgency of the works, it was not practicable to locate or design the pipeline to avoid the SEA. The chosen route enabled the efficient installation of the diversion pipeline, effectively reducing wastewater overflow discharges into the Waitematā Harbour.

For the above reasons, the activities for which consent is sought is in general accordance with the objectives and policies of Chapter D9.

8.5.2 Chapter E12 – Land disturbance – District

Chapter E12 of the AUP sets out the provisions to manage land disturbance within the district context throughout Auckland. The relevant objectives and policies of Chapter E12 can be summarised as follows:

- Land disturbance is undertaken in a manner that protects the safety of people and avoids, remedies or mitigates adverse effects;[10]
- Enable land disturbance necessary to provide for people and communities social, economic and cultural well-being;[11]
- Design earthworks in a manner that recognises the existing environmental constraints and ensures the stability and safety of the surrounding land, buildings and structures.[12]

Regarding the above relevant objectives and policies:

- Earthworks were undertaken to stabilise the Ōrākei sink hole and to connect and install the diversion system, which were an essential response to the collapse of the OMS and its repair. As such, the earthworks undertaken have been essential in facilitating a solution to provide and protect the long-term safety of people. Temporary noise and vibration effects were likely generated as a result of land disturbance activities during this time. Nevertheless, all best practice measures were taken to minimise adverse effects, including construction screens, traffic management and dust suppression measures.
- An effective wastewater and stormwater network is essential for people and communities to function effectively as a lifeline utility. The earthworks undertaken were an essential response to enable repair of the wastewater network, therefore contributing to providing for people and communities social, economic and cultural well-being.

[10] AUP – Objective E12.2.1 and Policies E12.3.1 and E12.3.2
[11] AUP – Policy E12.3(3)
[12] AUP – Policy E12.3(5) & Policy E12.3(6)

- The earthworks area for the activity has been kept to the minimum necessary to enable installation of the diversion pipeline and reinstatement of the OMS.
- The earthworks undertaken at the OMS collapse site have included stabilisation by excavating loose material and concrete spaying the exposed area. The excavation area is located within an open carpark, ensuring the stability and safety of the adjacent buildings are not compromised.

For the above reasons, the emergency works are considered to be generally consistent with the objectives and policies of Chapter E12.

8.5.3 Chapter E25 – Noise and Vibration

Chapter E25 of the AUP seeks to control the levels of noise and vibration created by activities to limit the adverse effects of noise and vibration on amenity values, human health and to protect existing noisy activities from reverse sensitivity effects. The relevant objectives and policies to the application can be summarised as follows:

- People and amenity values are protected from unreasonable levels of noise and vibration, particularly at night and potential adverse effects of noise and vibration are avoided, remedied or mitigated;[13]
- Construction activities that cannot meet noise and vibration standards are enabled while controlling duration, frequency and timing to manage adverse effects.
- Minimise, where practicable, noise and vibration at its source;[14] and
- Avoid, remedy or mitigate the adverse effects of noise and vibration from construction activities while having regard to the receiving environment, duration and hours of operation of the activity and the practicability of complying with permitted noise and vibration standards;[15]

Regarding the above relevant objectives and policies:

- The noise generated from construction activities and ongoing noise generated in particular from the operation of the 6 diversion pumps, have generated adverse noise effects, particularly for residents located within the Aix Building at night. For the temporary diversion system to function effectively, these pumps are required to be able to operate 24 hours a day, if necessary, in order to diversion wastewater around the sink hole area.

[13] AUP – Objectives E25.2(1) and E25.2(3) and Policy E25.3(1)
[14] AUP – Policy E25.3(2)
[15] AUP – Policy E25.3(10)

- To minimise and mitigate adverse noise generated from the diversion pumps, Watercare installed noise screens and built a temporary physical housing around the pumps, so as to provide a noise buffer at the pumps and minimise the level of noise heard from the surround noise receivers. In addition, operation of the pumps has been minimised to that necessary to ensure that the pumps remained operational and were available to transfer wastewater when necessary.
- The level of noise generated and heard by residents of the Axis building was considered significant during nighttime operation of the pumps. However, those effects have not occurred since nighttime operation of the diversion pumps ceased in late October 2023.

While the noise generated from the diversion pumps was significant for those residents in the Axis building, the nighttime operation of the diversion pump ceased in late October 2023. The pumps were removed in January 2024 and would only be reinstalled if it becomes necessary to divert wastewater during the relining operations in the vicinity of the sinkhole.

Overall, the operation of the diversion pumps generated noise that is generally inconsistent with the objectives and policies of Chapter E25. However, as the nighttime operation of the diversion pump has ceased and daytime operation would only occur intermittently, noise associated with the operation of the diversion is now negligible.

Ongoing activities associated with lining of the OMS and reinstatement / rehabilitation of the works area will comply with the with the requirements of New Zealand Standard NZS6803:1999 Acoustics – Construction noise.

8.5.4 Chapter E26 – Infrastructure

Chapter E26 of the AUP sets out the provisions that manage the construction, use, maintenance, repair and upgrade of infrastructure within Auckland. The relevant objectives and policies to the application can be summarised as follows:

- Safe, efficient and secure infrastructure is enabled;[16]
- Development, operation, maintenance, repair, replacement, renewal, upgrading and removal of infrastructure is enabled, while avoiding, remedying and mitigating adverse effects;[17]

[16] AUP – Objective E26.2.1(3)
[17] AUP – Objective E26.2.1(4) and Policy E26.2.2(4)

- Provide for the development, operation, maintenance, repair, upgrade and removal of infrastructure by recognising its functional need, route and design restraints and the need to quicky restore disturbed services;[18]
- Consider the degree the environment is already modified, the nature, duration, timing and frequency, and impact on the network and levels of service if work is not undertaken, the infrastructure in the context of the wider network and the benefits provided, when assessing the effects of infrastructure;[19]
- Enable the maintenance and repair of existing infrastructure within natural resources overlays, while adverse effects are avoided, minimised, remedied or mitigated;[20]

Regarding the objectives and policies:

- The retrospective and proposed works are a direct response to the OMS collapse, which required an immediate response to restore the affected wastewater network services.
- As detailed in section 5 of this AEE and previously within this statutory assessment, while adverse effects have been generated from the activities for which consent is sought, these are temporary, and Watercare have and continue to appropriately remedy, minimise and mitigate these effects to an appropriate degree.
- Section 5 of this AEE provides an assessment of the actual and potential effects associated with the emergency and repair works, including consideration of the environmental context, the nature and duration of the works, effects if work is not undertaken, and the corresponding positive effects of the works.
- The assessment against Chapter D9 of the AUP above, provides an appropriate consideration to the management of adverse effects within the SEA overlay.

For the above reasons, it is considered the emergency and repair works are consistent with the objectives and policies of Chapter E26 of the AUP.

8.5.5 Chapter H7 – Open Space Zones

Chapter H7 of the AUP manages activities with Open Space Zones. The relevant Open Space Zone objectives and policies to the application can be summarised as follows:

[18] AUP – Policy E26.2.2(2)
[19] AUP – Policy E26.2.2(5)
[20] AUP – Policy E26.2.2(7)(b)

- Adverse effects of use and development of open space areas are avoided, remedied or mitigated;[21]
- Enable the construction operation, maintenance and repair of infrastructure in open spaces;[22]
- The open space character, including amenity values and natural values are maintained or enhanced;[23]
- Informal recreation activities are the predominant use of the zone;[24]

In relation to the Open Space Zone objectives and policies:

- The installation of the temporary diversion pipeline, involved the trimming and removal of exotic trees and other vegetation within the Alberon Reserve SNA overlay, generating potential adverse ecological effects. As agreed in the Landowner Agreement discussed in section 7.2 below and in **Appendix 3**, upon completion of the OMS repair, the diversion pipeline will be removed from Alberon Reserve and the reserve will be reinstated.
- The installation of the diversion pipeline within Alberon Reserve is ancillary to emergency repair works on the combined wastewater and stormwater infrastructure. The diversion pipeline is therefore appropriately located.
- Given the nature of the emergency works, the location of the diversion pipeline through the Alberon Reserve presented the most practicable option as a temporary solution, while the OMS is being repaired. As such, adverse effects generated from vegetation alteration and removal could not be avoided.
- The open grassed space in Alberon Reserve has and will continue to remain publicly accessible for recreation use. The installation of the diversion pipeline involved tree trimming and removal in the direct path of the pipeline. In relation to the scale of indigenous vegetation within the reserve, the required vegetation alteration or/and removal is considered relatively minor and did not significantly alter the amenity or natural values of the open space area. In any case the reserve will be reinstated so ensure the long-term amenity and natural values of Alberon Reserve are maintained.

[21] AUP – Objective H7.2(2)
[22] AUP – Policy H7.3(4)
[23] AUP – Objective H7.5(1) and Policy H7.5.3(2)
[24] AUP – Objective H7.5(2)

- The open grassed area has and will continue to be publicly accessible to ensure that Alberon Reserve can be used for recreational purposes.

For the above reasons, the activities for which consent is sought are generally consistent with the objectives and policies of the Open Space Zone.

8.5.6 Summary

As outlined above, the retrospective and proposed activities associated with the OMS emergency repair works, are considered in general accordance with the relevant objectives and policies of the AUP.

8.6 RESOURCE MANAGEMENT ACT 1991 – PART 2

It is understood that a consent authority is generally no longer required to consider Part 2 of the RMA beyond its expressions in the relevant statutory documents unless it is appropriate to do so. However, for completeness and in accordance with Schedule 4(2)(1)(f) of the RMA, Part 2 of the RMA is considered in the following paragraphs.

The purpose of the RMA is to provide the sustainable management of natural and physical resources that enables people and communities to provide for their health and safety.

The emergency activities undertaken have been a direct response to the collapse and blockage of the OMS. The activities have therefore acted to reinstate the proper functioning of the OMS which is an essential lifeline utility that provides for people's health and safety. All disturbance to the road, pathway, private property (St Georges Bay Road carpark) and Alberon Reserve will be reinstated, ensuring the sustainable management of natural and physical resources are promoted in accordance with Part 2 of the RMA.

9. CONCLUSION

Watercare is seeking a retrospective land use consent for the activities associated with the construction, installation and operation of temporary diversion pumps and diversion pipeline and works related to the collapse and blockage of the OMS. These activities were undertaken as a mitigation measure to reduce the volume of wastewater overflows entering the Waitematā Harbour as a result of the OMS blockage, while the OMS is being repaired, and to mitigate future risks to the OMS in that vicinity.

Through this application Watercare also seeks resource consent to authorise works (including earthworks and works within the protected root zone of trees) associated with the reinstatement of the sink hole area and decommissioning of the temporary diversion pump and aboveground diversion system.

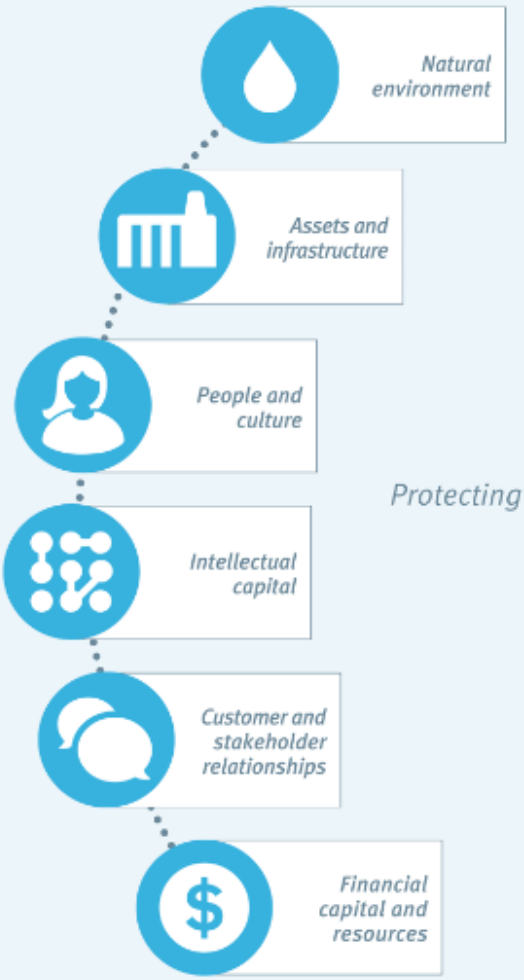
Adverse effects have been and continue to be managed to a minor or lesser degree, through the use of traffic management, vegetation assessment and erosion and sediment control measures. A Reserve Reinstatement Plan will be prepared in respect of reinstatement of the Alberon Reserve following removal of the diversion system. The location and extent of planting required is subject to further discussion with the landowner (Auckland Council).

An assessment against the relevant objectives and policies of the AUP identify that there is an operational need for activities associated with the installation, operation and decommissioning of the diversion system. All practical steps have been taken to minimise or mitigate adverse effects, and all disturbed areas will be appropriately reinstated following the repair of the OMS and decommissioning of the diversion system. The emergency works are therefore in general accordance with the relevant objectives and policies of the AUP.

While many of the activities within the scope of this application have now ceased, Watercare proposes a comprehensive set of conditions under which any ongoing activities including reinstatement of the road reserve and Alberon Reserve will be suitably managed.

Appendix 1: Watercare Incident Management Plan

Watercare incident management plan



Protecting value creation at Watercare

Watercare
An Auckland Council Organisation

Document Information		
Version Release Date:	3.0	20 April 2023
Approved for submission by:	Anatoly Yavorskiy	Senior Risk and Resilience Advisor
Approval		
Approved by:	Nigel Toms	GM Risk, Quality & Assurance
Status:	Final	Approved
Approval		

Version Control		
Number	**Changes Made**	**Name**
1.0	2019 Revision	N.Toms
2.0	2021 Revision	N.Toms
2.1	Updated links	V.Bhatnagar
2.2	Updated: Appendix References, p19 Appendices, Appendix 4: Key Internal Documents, Appendix 5: Key Contacts	A.Yavorskiy

Contents

Incident Definition:

An Incident is one that has the potential to cause harm to the population and severely disrupt, delay or stop the business operations of Watercare. It may potentially threaten the financial and / or operational viability of Watercare and place staff and other persons in a position of danger from an occupational health and safety perspective

Objectives

In addressing any incident, Watercare applies the following critical objectives:

- Protect the safety and wellbeing of all staff, contractors, visitors, community and the public
- Protect stakeholder value by protecting property, assets, brand and public health
- Manage impacts on and recover services to customers, stakeholders and the community
- Maintain the loyalty and trust of our staff, to protect and enhance the long-term value of our services
- Respond, Recover and Resume normal operations

What the plan covers?

This document has been designed to assist Watercare Services Limited (Watercare) respond to any event, which has potential to negatively impact achievement of Watercare's operational and strategic objectives.

This Incident Management Plan (IMP) sets out responsibilities and give guidance for matters to consider in an Incident. This plan helps avoid confusion and wasted effort and is designed to guide management in the planning of responses.

Key Responsibilities

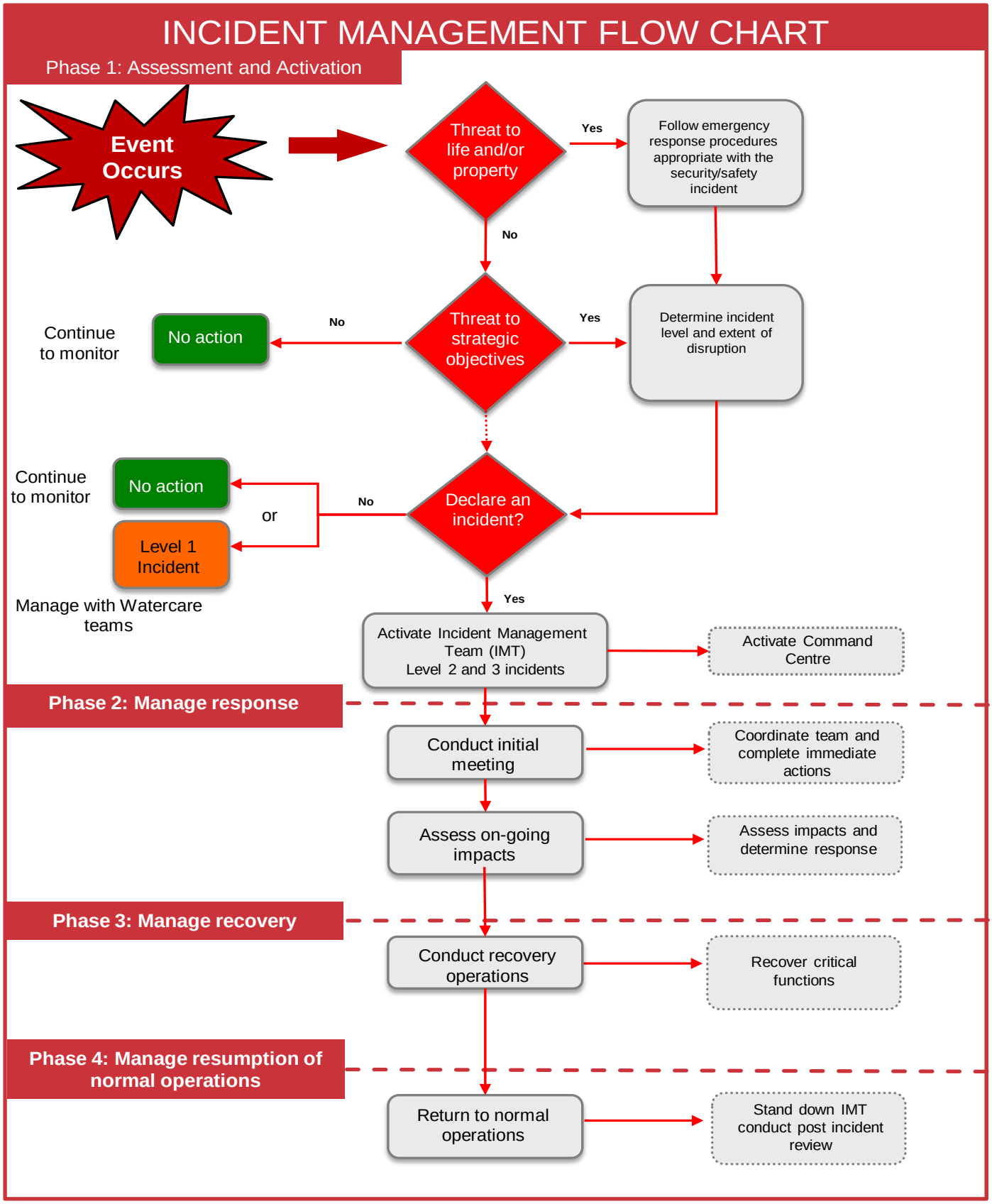
The key responsibilities of the Board, Chief Executive and Executive Team at various incident levels are outlined in Appendix 6.

The key responsibilities for the Incident Controller and the supporting coordinators (Intelligence, Planning, Operations, Logistics, Communications/ PIM and Welfare) have been defined in line with the CIMS structure and are available at Appendix 3.

Scope

The Watercare Incident Management Team (IMT) will use the IMP to coordinate incident management activation, response, recovery and resumption of normal operations across all Watercare business units / areas.

The four incident phases and related actions are shown in the flow chart below



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Incident Management Phases

The incident management process is divided into four phases which are outlined below:

Phase	Phase Name	Actions
Phase 1	Assessment and Activation	Recognizing and declaring an incident Deciding the incident level Incident Management Team Activation Establish command centre
Phase 2	Manage Incident Response	Response Procedures Checklists Incident Templates including Actions, Plans, Reporting and Logs Incident Communications
Phase 3	Manage Recovery and Return to Normal Operations	Incident De-brief Development of longer term Recovery Plans Termination of Incident Stand down of Incident Team
Phase 4	Post Incident Review Resumption of Normal Operations and Stand Down	Complete post incident review workshop with key players Complete root cause analysis Develop plans to prevent recurrence

Incident Management Phase 1: Assessment and Activation

Recognising and Declaring an Incident

Deciding the Incident Level

Incident Management Team Activation

Establish Command Centre

Incident Escalation

Water Supply Contamination Notification

Cyber Incidents

Civil Defence and Emergency Management

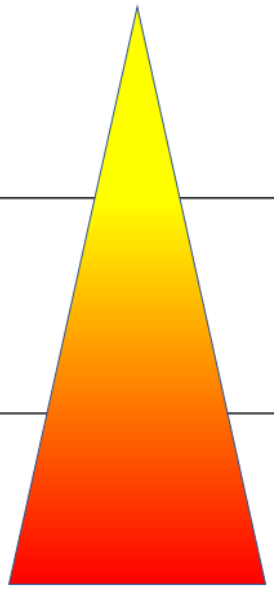
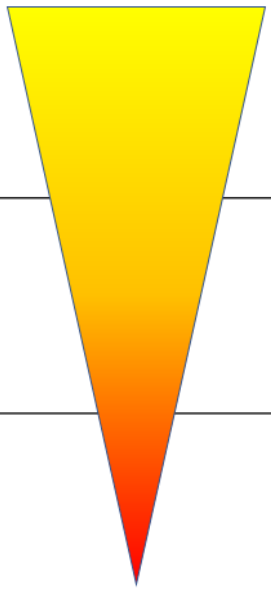
Auckland Regional Public Health Service

Recognising and Declaring an Incident

An incident is any set of circumstances that has the potential to cause loss of service or damage to Watercare assets or harm to employees or the public. This requires a strategic, response that must take priority over normal business activity.

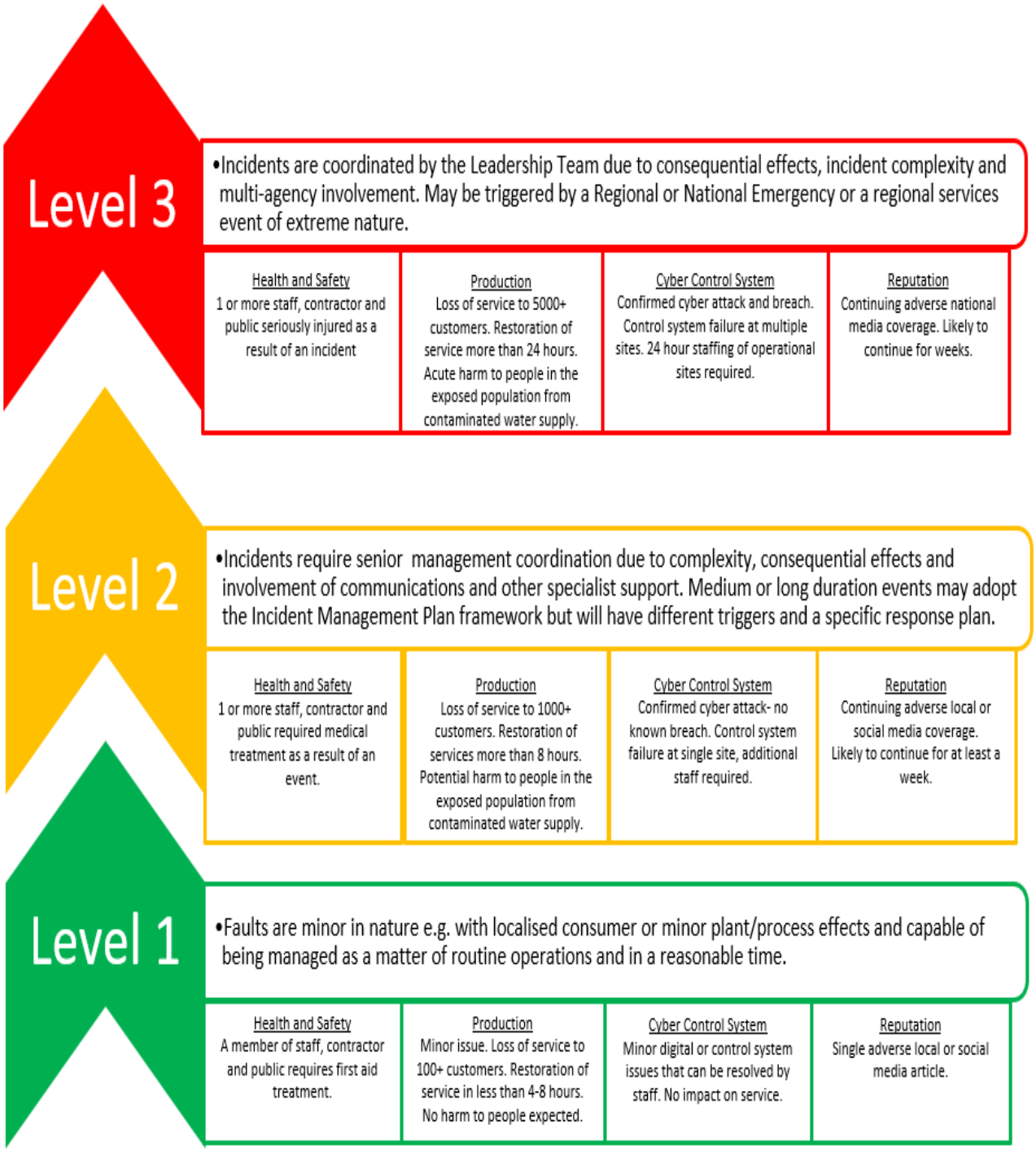
Deciding Incident Levels

The graphic below gives an overview of the escalation level based on the potential for severe damage to Watercare people, operations, environment, long-term prospects and/or its reputation.
The Duty Officer or Watercare Manager will decide whether to activate the IMT, by accessing information collected about the incident from first responders or the impacted business areas.

Escalation Level	Consequences	Occurrence	Controller
LEVEL 1: Minor Incident			Duty Staff
LEVEL 2: Significant Incident			CIMS2 Trained Tier 3 Manager
LEVEL 3: Major Incident			Chief Officer or CIMS4 trained Tier 3 Manager

Incident Escalation Levels

Examples of Level 1, 2 and 3 events/incidents are given below with more information for clarification in the Appendix 1 and 2 of the Incident Management Plan (IMP).



Activation of the Incident Management Team (IMT)

The Duty staff will cover Level 1 incidents. Level 2 and 3 incidents will result in the formation of an Incident Management Team following the scalable CIMS structure. The IMT will be responsible for managing the response, recovery and resumption phases of Level 2 and 3 incidents. Core responsibilities include:

- Taking actions to assume control of any situation
- Providing leadership during incidents
- Evaluating the extent and impact of the incident
- Determining priorities within the organisation
- Directing recovery activities
- Managing resources including materials, equipment, staff and funding
- Coordinating and maintaining internal and external communications
- Restoring functions as quickly as possible to minimise loss or damage

The roles and responsibility of the IMT listed at Appendix 3.

The IMT will be **scaled** to address the size and complexity of the incident.

Establish Command Centre

The Command Centre should be selected depending on the location of the incident. Normally it will be in Remuera Road where most staff are located. However, it can also be located at other Watercare sites.

Escalation

Some incidents will escalate over time and incident level should be re-assessed where the position is clearly changing.
Where the incident is escalated (e.g. from Level 2 to 3), associated additional actions such as advising the Board should be completed.

Water Supply Contamination Notification

Confirmed water contamination events will initially be assessed as a Level 3 incident requiring escalation. The detailed steps to be taken to communicate with all stakeholders in the event the water supply is contaminated is explained in detail in the separate supporting Water Contamination Communication Plan.

A link to the detailed Water Contamination Communication Plan is provided at Appendix 5(iii).

Cyber Incidents

A Cyber Incident is an incident that occurs accidental or deliberately, and that affects Watercare's communications or information processing systems. An incident may be any event or set of circumstances that threatens the confidentiality, integrity or availability of information, data or services in Watercare.

Cyber incidents will be assessed by the Digital team using the criteria in this plan. The response stages of the incident are outlined in Appendix 17.

National Emergency Management Agency

Where the incident has political and community implications, or the incident is part of a larger Civil Defence emergency, Auckland Civil Defence may be used to coordinate the wider impact of the incident leaving Watercare to manage the water/wastewater aspects of the incident:

- National Emergency Management Agency (NEMA) Emergency Coordination Centre (ECC) on impact on other agencies, community and political representatives (24/7 NEMA Duty Phone number: 027 473 8357).
- Engineering Lifelines Coordinator on implications to or from other lifelines (Lisa Roberts 021 379 130 or through 24/7 NEMA Duty Phone number: 027 473 8357).
- Auckland Regional Public Health Services on managing the public health risk (09 623 4600).
- Auckland Council: Environmental Services on managing the environmental effects (Pollution hotline: 09 377 3107).

Watercare will send a representative to all NEMA meetings where their incident extends to water and wastewater issues.

Auckland Regional Public Health Service

Auckland Regional Public Health Service (ARPHS) have responsibilities under the Health Act in relation to public health issues. ARPHS primary role in this respect is to assist in mitigation of public health risks and auditing of public health incidents. ARPHS is notified as required by the Health Act 1956 and when incidents pose significant public health risks and is contracted by the Ministry of Health to undertake investigations of outbreaks of infectious disease or illness.

Watercare's incident response team will work closely with the ARPHS, the Medical Officer of Health and Wai Comply DWAs to ensure that the public health aspects of the response are delivered in a way that controls and eliminates the risks to public health.

The ARPHS and Wai Comply may identify any additional steps required to protect consumers.

Watercare will inform ARPHS and Wai Comply of the situation including:

- The public health risk posed
- The numbers who could be affected
- Proposed mitigation plan covering
    - Actions to ensure drinking water safety
    - Actions to ensure safety of public
    - Proposed communication plan

ARPHS and Wai Comply will be provided with copies of mitigation plans for information.

Updates on the effectiveness of measures within the mitigation plan will be provided at regular intervals.

Where monitoring indicates that the measures are not the mitigating the public health risk as planned, further measures will be developed and implemented, including any specified by ARPHS and Wai Comply.

In certain circumstances a Medical Officer of Health may require Watercare to take specific actions to protect public health under section 69ZZH of the Health Act.

Where issue of a 'boil water notice' is being considered, ARPHS and Wai Comply should be consulted before it is issued.

Incident Management Phase 2: Manage Response

Response Checklist

Incident Communications

Response Checklist

The response checklists are a set of guidelines for Watercare staff to consider in all incidents. The checklists give suggested steps and may vary depending on the specifics of the incident. The checklists are not prescriptive but are designed to guide the IMT ensuring they consider all necessary aspects of the incident, and assess the situation based on the facts at the time.

The Incident Checklist gives the key steps from the start to finish for any incident.

NOTE: Where applicable in the first instance, the site emergency procedures should be implemented and followed. Only when the site is declared safe, should the IMT begin their planned actions.

	Corresponding Plans	Response Checklists
1.	Site Security Plans	
	Site Lockdown	Armed Offender
		Civil Unrest (e.g. Violent Protest, Strike, Demonstration)
		Explosive Device
	Chlorine Leak at Major Hazard Facility	Fire, Environmental, Biological, Radiological, Chemical Release
	Fire Evacuation	Site Evacuation
2.	Digital	
	Potential Cyber Intrusion	Cyber Security Incident
	Failure of Control Systems	IT and consequent utility failure
3.	Pandemic Plan	Health Issue / Disease Outbreak

Incident Communications

During all incidents, **all** communications will be reviewed and approved by the communications manager.

The communications manager will develop a communications strategy which will be tailored by the communications coordinator to suit the incident type.

During the incident staff **should not** contact or respond to any media enquiries. Any requests for information received from media sources should be sent to the communications coordinator for action.

The communications coordinator will:

- Respond to media enquiries
- Oversee supporting telephone and Watercare internet messaging
- Liaise with the Head of Commercial Customers to give proper messaging for Key Accounts. A list of Key Account areas is given in Appendix 4 (iii)
- Communications will tailor messaging to specific Stakeholder groups

Regular internal communication on the incident must be coordinated by the PIM and approved by the Incident Controlled to ensure consistent messaging.

Incident Management Phase 3: Manage Recovery

De-brief
Staff Recovery
Incident Termination
Medium/ Long Term Recovery Actions

De-brief

A de-brief will be completed immediately after an incident has concluded. The teams involved in the de-brief will review any further actions arising from the incident and decide the date for the Post Impact Review.

De-briefs involve all participants in the incident or exercise including contractors, service providers, affected parties and in some cases regulatory agencies. The Incident Controller or other assigned person will facilitate the de-brief.

Staff Recovery

Use Business Unit Loss of site Business Continuity Plans (BCP's)

Incident Termination

Authority for ending an incident rests with the Incident Controller after discussion with the relevant Chief Officers and the Chief Executive.

A recovery plan, which will continue after termination of the incident, should be developed and implemented.

Medium/ Long Term Recovery Actions

Agree actions required including upgrades and replacement to ensure the operations return to business as usual. Ensure supporting business cases are completed and any project are incorporated in Watercare's Asset Management Plan (AMP).

Incident Management Phase 4: Manage Resumption of Normal Operations

Manage Resumption
Post Impact Analysis / Root Cause Analysis
Insurance

Manage Resumption

Business units will follow agreed continuity plans to resume normal operations once an incident is closed.

Post Incident Review (PIR) / Root Cause Analysis

A PIR should be held at a suitable time after the event, to conduct a deeper analysis of gaps, follow-up on actions, key impacts and future prevention strategies.

Guidance on conducting a PIR:

When conducting a PIR, focus on the three "W's":

- What happened?
- What went well?
- What can we do differently?

A PIR should be prompt, accurate, interactive, objective and constructive. Different techniques can be used to collect information including surveys, workshops and/or interviews.

Root Cause Analysis should be used to find the underlying issue which caused the recent circumstances to eventuate.

The Post Incident Review and Root Cause Analysis evaluation / findings will inform recovery and future improvement actions.

Insurance

For all incidents, the Watercare's insurance focal point in the Finance team will be advised and will inform our insurance brokers as appropriate. The Watercare's insurance broker will advise relevant insurers, in case of a future claim.

Appendices

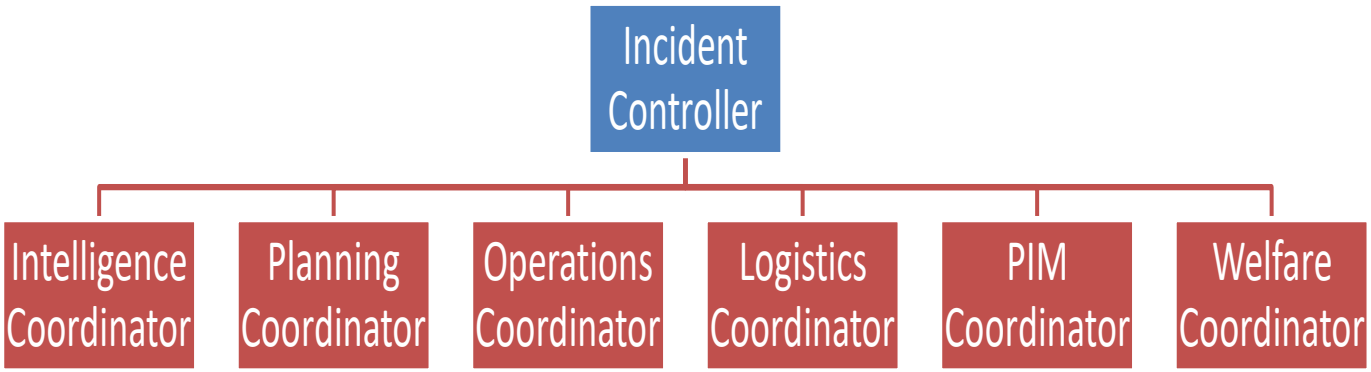
1. Type of Incidents
2. Incident Management Team: CIMS Structure
3. IMT Responsibilities
4. Key Internal Documents
5. Key Contacts
6. Key Stakeholder Responsibilities in an Incident
7. Stakeholder Contact Details Template
8. Meeting Agenda Template
9. Incident Log Template
10. Briefing Template
11. Communications Templates
12. Action Plan
13. Situation Report
14. Shift Handover
15. Post Incident Review
16. Response Procedures Checklists
17. Cyber Incident Management Approach

Appendix 1: Type of Incidents

Type of Incident	Level 1	Level 2	Level 3
Health and Safety	A member of staff required basic First aid treatment	1 or more staff required medical treatment / hospitalisation because of an event	1 or more staff seriously injured because of an event
Operations Service Delivery	Compromised Service Delivery 4-8 hours Loss of service to 100 customers. Restoration of service within 4-8 hours	Service Disruption 8-12 hours Loss of service to 100-1000 customers. Restoration of services within 8-12 hours	Major loss of Service for > 12 hrs Loss of service to>1000+ customers. Restoration of service more than 12 hours
Operation Production	Loss of water / wastewater treatment / transmission capability that does not affect customer or the environment Transgression from DWSNZ requirements, where limited remedial action is required No harm to people	Unplanned loss of supply/service for 100 to 1,000 customers for more than 24 hours Non-compliance with the Health Act or/and DWSNZ requirements where limited remedial actions is required. DW Assessor follow up inspection required Potential harm to people from contaminated water supply	Unplanned loss of supply/service for 1,000 to 5,000 customers for more than 24 hours Non-compliance with the Health Act and/or DWSNZ requirements that necessitates a small-scale response / remedial actions. Statutory powers of the DWA and/or MOH are exercised Acute harm to people from contaminated water supply
Cyber-attack on Control System **Loss of IS capability**	Minor digital or control system issues that can be resolved by staff. No impact on service Minimum or no impact on Watercare data or digital infrastructure. Minor Digital faults. No impact on business capability	Confirmed cyber-attack- no known breach. Control system failure at single site, more staff needed Impacting sensitive user data. Potential of disrupting services. Loss of business tools and/or applications needing immediate management action	Confirmed cyber-attack and breach. Control system failure at multiple sites. 24-hour manning and full operations support required High likelihood of impacting user and customer data. High likelihood of affecting systems and software which affect Watercare's ability to provide continual services to customer. Significant loss of Digital capability – Watercare operations affected

Type of Incident	Level 1	Level 2	Level 3
Reputation	Single adverse local or social media article	Continuing adverse local or social media coverage. Likely to continue for a week	Continuing adverse national media coverage likely to continue for weeks
Loss of Laboratory capability	Minor issues, no significant impact on laboratory	Loss of some testing capability needing immediate management action	Loss of significant testing capability requiring immediate management action
Loss of reporting fault capability	Minor issue, no impact on fault reporting	Fault reporting affected, diversion to external fault contractor required	Fault reporting capability ceases to function. Faults BCP activated

Appendix 2: Incident Management Team: CIMS Structure



Function	Responsibilities
Controller	Coordinates and controls the response
Intelligence Coordinator	Collects and analyses information and intelligence related to context, impact and consequences; also distributes intelligence outputs
Planning Coordinator	Leads planning for response activities and resource needs
Operations Coordinator	Gives detailed direction, coordination, and supervision of response elements on behalf of the Control function
Logistics Coordinator	Provides personnel, equipment, supplies, facilities, and services to support response activities
Public Information Management (PIM) Coordinator	Develops and delivers messages to the public, directly and through the media, and liaises with the community if required
Welfare Coordinator	Coordinates the delivery of emergency welfare services and resources to affected individuals, families/whānau, and communities

Appendix 3: IMT Responsibilities

The following table provides guidance on IMT responsibilities.

Incident Controller: Responsible for leading the IMT and making key decisions throughout an incident.
Setting objectives and providing an Action Plan that describes how they will be achieved
Directing the response
Confirm the safety and wellbeing of all staff, contractors and visitors
Obtain a briefing from the relevant person if incident or disruption has occurred
Assess the severity of the potential incident and determine incident level
Formally declare an 'Incident' after consultation with Chiefs and Chief Executive
Notify IMT members of location and time for the initial briefing
Activate the Incident Command Centre
Instruct IMT Support to maintain incident logs
Facilitate initial IMT meeting and confirm IMT protocols
Brief the Executive Team on incident
Ensure shift change over is activated after 10 hours

Intelligence Coordinator: is responsible for the collection and analysis of information relation to the context of the incident
Liaise with the Incident Controller and establish protocols for providing support and guidance to IMT
Participate in IMT meetings
Gather, collate and analyse information Gather information on the situation including: <u>Incident Details</u> ▪ What happened? ▪ When did the incident happen? ▪ What is the current situation? ▪ Anyone injured? How many? Who? ▪ Environmental impacts ▪ Infrastructure impacted : What is working / not working ▪ Is the situation stable, escalating or deescalating? ▪ Potential duration of impact <u>Site details</u> ▪ Current construction/operations underway ▪ Site occupancy levels <u>Actual and potential impacts to stakeholders / public:</u> ▪ Internal and external stakeholders impacted ▪ Water supplies impacted <u>Weather conditions:</u> ▪ What is the weather forecast for the next 24- 48 hours?
Liaise with Emergency Services to obtain further information
Develop and distribute intelligence related to situation reports
Contribute to the development of the Action Plan
Monitor and review internal and external situation for possible impact on the Action Plan

Planning Coordinator: Leads planning for response activities and related resource needs
Participate in IMT meetings
Ensure Planning Log is maintained
Assess planning unit resources to ensure continued effective operation and request additional resource if required
Develop long-term plans and contingency plans
Identify key risk exposures relating to the incident
Develop and maintain register of all resources requested, en-route, allocated to, and released from the incident
Assist with planning the transition to recovery

Operations Coordinator: Operations is responsible for the day-to-day coordination of the response, detailed task planning, and the implementation of the Action Plan
Participate in IMT meetings
Coordinate day-to-day response activities on behalf of the Controller
Contribute to the development of the Action Plan
Implement the Action Plan, making minor amendments as the situation changes (the Operations Manager handles assessing whether any changes require the Controller's approval)
Plan response tasks in detail
Communicate with the Public Information Management (PIM) Coordinator regarding any hazards identified
Activate alternate site/s, following advice from Recovery Coordinator
Procure and maintain physical resources, facilities, services and materials as needed
Integrate Liaison Officers into the PIM Coordinator
Forecast resource use or needs to Logistics and liaise with Planning and Logistics Coordinator

Logistics Coordinator: Logistics is responsible for providing and tracking resources to support the response and the affected communities, and providing logistics advice to other functions in the IMT
Participate in IMT meetings
Ensure Operations Logs are maintained
Request, receive, store, maintain, and issue procured resources
Coordinate establishment of staging area at incident site, such as media staging areas, family reception area etc. as directed by Operations Coordinator
Liaise with external resources and services providers and ensure procurement agreements are in place
Regularly provide progress reports on logistical support to the Incident Controller
Anticipate and estimate future service and support requirements
Ensure that staff members have enough supply of food and drinks during the span on the incident

PIM Coordinator: Also known as the Public Information Management (PIM) function is responsible for providing advice to the IMT Lead on reputational issues, whilst also managing internal and external communications. The function is responsible for informing the public about the incident and the response (including actions they need to take), media liaison and monitoring, and community liaison.
Participate in IMT meetings
Ensure Communications Log is maintained
Confirm procedures with the Incident Controller for approval of media releases / statements and other communications
Notification of progress to Contact Centre It is essential that the Contact Centre is kept up to date of progress particularly regarding consumer effects so that the correct messages can be relayed to incoming customer callers
Prepare and share information directly to the public (via social media, public meetings, pamphlets etc.), or via the media. Note that the content of official information such as warnings is generated by official processes, and approved by the Controller
Formulate and implement communication strategies to manage on-going communications
Monitor the public and media reactions and pass information to the relevant IMT function
Facilitate monitoring of stakeholder responses including media/social media activity
Establish effective media call logging system
Establish and maintain links with local media, and relevant government authorities
Establish and maintain links with Emergency Services
Ensuring call centres, helplines and reception personnel have current public information and key messages

Welfare Coordinator: Responsible for providing advice and managing issues relating to risk, health and safety and the wellbeing of staff, contractors and visitors.
Participate in IMT meetings
Ensure Welfare Log is maintained.
Assess current and potential people risks
Monitor and track the wellbeing of staff, contractors and visitors
Identify vulnerable staff
In conjunction with the Communications Coordinator, contact next of kin of injured people
Maintain records about the location and deployment of people resources
Determine people resources needed to respond to the incident
Assist with organising provision of counseling and welfare support arrangements
Manage relevant people issues and risks. i.e. fatigue management, trauma awareness, etc
In conjunction with Operations Coordinator, establish a Family Reception staging area if appropriate. In conjunction with the Communications Coordinator maintain liaison with next of kin
Arrange counsel support for 'at risk' individuals and promote welfare support

Business Recovery Coordinator: Responsible for providing advice and managing issues relating to the recovery of business functions (i.e. business continuity).
Participate in IMT meetings.
Ensure Business recovery logs are maintained
Conduct Impact Assessments to determine impacts on Critical Business Functions and mitigating actions
Identify impacted Critical Business Functions, including services, systems and infrastructure. Identify Critical Business Functions that cannot be restored within agreed recovery time objectives
Work with Operations Coordinator to activate alternate site/s for staff relocation, if necessary
Coordinate recovery procedures including restoration of Critical Business Functions
Provide personnel and skills for recovery of Critical Business Functions
Manage the insurance requirements during the incident
Identify site relocation or rebuilding requirements
Liaise with the Operations Coordinator to procure / purchase needed equipment/supplies to restore Critical Business Functions
Facilitate phased resumption of business operations
If required, commence planning for long term recovery and restoration including activation of third-party sites

Support Coordinator: are responsible for recording meetings and decisions, managing the Controller's diary, answering calls and responding to emails, and ensuring that the Control administrative arrangements are in place.
Participate in IMT meetings
Follow direction from Incident Controller
Ensure Support Log is maintained
Establish the IMT command room ▪ Set up whiteboards, butchers paper and logs to collect information ▪ Set up remote dial-in capabilities (conference call in)
Establish visual boards – Fact board, assumptions board, action log
Organise the provision of catering for the IMT
Arrange for shift rosters to be prepared and coordinate shift handovers
Provide administrative support to IMT
Collate and file all records related to the event

Appendix 4: Key Internal Documents

Name of Document	Location
Callout Roster	\\water.internal\ORG\Ops\Call Out Rosters\Operations On Call WATER.xlsm
Incident Management Plan	https://watercareserviceslimited.sharepoint.com/sites/intr-PolicyHub/SitePages/Home.aspx
Contact Lists(search)	https://watercareserviceslimited.sharepoint.com/teams/MaintenanceServices/Pages/Contacts.aspx
Preferred Suppliers	P:\FACILITIES\Suppliers & Contracts\Supplier Contacts.xlsx O:\Common\Supply Chain\Critical Suppliers.xlsx
Top 100 Customers	O:\Corporate\Retail\Comm Customer\Processes Collateral and Templates\Customer Incident Management
Facility Criticality	O:\Ops\Incident Management\Facility criticality list
Health & Safety Plan	HSW1053 - Health and Safety Plan 2017 to 2020.pdf
Laboratory (BCP)	\\water.internal\ORG\Lab\Laboratory Services\Laboratory_Manuals
Critical Staff Matrix	O:\Ops\Incident Management\Critical staff matrix
Watercare Quality Event	https://watercareserviceslimited.sharepoint.com/sites/intr-watersafety
Lifeline Utility Protocols (password-50volcanoes)	http://managers.alg.org.nz/emergency-plans/
Standard Operating Procedures	Respective W&WWTP's and Service Delivery Groups (Project wise)
Water Contamination Communications Plan	https://watercareserviceslimited.sharepoint.com/DocumentsCentre/DocumentCentre/Water%20contamination%20communications%20plan/1-Water-Contamination-Comms-Plan.pdf
Drought Management Plan	https://infocouncil.aucklandcouncil.govt.nz/Open/2023/03/20230330_PEPCC_AGN_11304_files/20230330_PEPCC_AGN_11304_Attachment_92654_1.PDF

Websites	Location
Civil Defence Website	www.aucklandcivildefence.org.nz
Auckland Regional Public Health Service	www.arph.govt.nz
Auckland Engineering Lifelines	www.aelg.org.nz (Members area password is cyclone99)
Weather Warnings	www.metservice.com/warnings/home
Tsunami warnings	www.geonet.org.nz/tsunami
Volcanic warnings	www.geonet.org.nz/volcano
Earthquake information	www.geonet.org.nz/quakes
Regional Critical Infrastructure	www.aelg.org.nz (Members area password is cyclone99)

Appendix 5: Key Contacts

Internal contacts

Name	Title	Function	Work Phone	Mobile Phone
	Auckland Council	Environmental Services	09 377 3107	
	Auckland Regional Public Health Services	Managing Public Health Risk	09 623 4600	
	Civil Defence Emergency Management (CDEM)			027 343 1157
	National Emergency Management Agency			027 473 8357
Ross Roberts	Lifeline Utility Coordinator			021 301 062

External contacts

Name	Job Title	Function	Work Phone	Mobile Phone
	Watercare Contact Centre	Fault/Enquires (24hrs) Staffed 7.30am-6.00pm	09 442 2222	

Name	Job Title	Function	Work Phone	Mobile Phone
	Watercare Contact Centre	Contact Centre Priority Number	09 970 1467	

Appendix 6: Key Stakeholder Responsibilities in an Incident

Stakeholder	Incident Levels		
	Level 1	**Level 2**	**Level 3**
Executive Team	Assign appropriate Watercare teams to manage incident Oversee incident actions Advise Chief Executive Provide supporting resources	Appoint Incident Controller Review action plans Provide regular update reports Draft media briefings Provide resources and support for the IMT	Appoint Incident Controller (senior Tier 3 or Chief officer) Lead development of the action plan Management of IMT Provide regular update reports Draft media briefings and attend press briefings if required Provide resources and support for the IMT
Chief Executive	Monitor incident information	Assume incident governance role Receive briefings, and approve action plans Approve appointment of Incident Controller Approve media briefings Advise Board if incident is escalating or is likely to impact external stakeholders	Assume incident governance role Receive briefings, approve action plans and provide strategic updates to the Board Approve appointment of Incident Controller Lead media briefings as the face of Watercare. Oversee management of external stakeholders
Board	No Action	No Action Note advisories for escalating incidents	Receive regular incident briefings Attend media briefings with Chief Executive if required Provide a sounding board during the incident to independently assess: • IMT performance against values • Perceived effectiveness of external communications Provide briefings to the Mayor, Councillors and Stakeholders Act as an advocate for Watercare with external stakeholders and provide feedback received from external stakeholders

Appendix 7: Stakeholder Contact Details Template

Incident Management Team

Team Position	Name	Job Title	Work Phone	Mobile Phone
Incident Controller				
Support Coordinator				
Intelligence Coordinator				
Planning Coordinator				
Operations Coordinator				
Logistics Coordinator				
Communication Coordinator (PIM)				
Welfare Coordinator				
Business Recovery Coordinator				
Chief Warden				

Appendix 8: Meeting Agenda Template

#	Agenda Item	By whom	☑
-	Establish Log Keeping and Records	Coordinator Support	
1.	Convene meeting and confirm presence and welfare of all IMT	Incident Controller	☐
2.	Confirm IMT roles and responsibilities	Incident Controller	☐
3.	▪ Agree IMT protocols: ▪ Purpose of meeting ▪ Duration ▪ Mobile and tablet/laptop etiquette	Incident Controller	☐
4.	Share information with IMT: ▪ Summary of events (Incident Controller) ▪ Confirmation of staff, contractors and visitors' safety and potential injuries (Operations) ▪ Update on people follow-on welfare (People) ▪ Communications and Media (Communications) ▪ Disruption to services. (Recovery) ▪ IT resources and requirements (ICT) ▪ Additional information (All IMT Members)	All IMT members	☐
5.	Determine if any IMT members have previous experience in a similar event	Incident Controller	☐
6.	Confirm Communication Strategy and procedures	Communications Coordinator	☐
7	Conduct Impact Assessment	All IMT members	☐
8.	Consider setting longer term (e.g. 24 hours, 1 week) objectives to achieve	Incident Controller	☐
9.	Agree on immediate tasks/actions	Incident Controller	☐
10.	Confirm time of follow-up meeting to provide update on actions and outcomes	Incident Controller Team Support	☐

Appendix 9: Incident Log Template

The following tool should be used to record information and decisions made during an incident. The information captured should be used by the IMT help monitor their progress, support Emergency Services who may need access to information, and refer to post incident so as to develop lessons learned.

Time	Event/Action	IMT Member	Comment
Example: 1315	*Identified 2 x staff sent to Auckland Hospital. Action: Arrange staff member to meet next of kin at hospital.*	*People Coordinator*	*Must be complete by 1500*

Appendix 10: Briefing Template

The following tool should be used by members of the IMT to structure briefings and ensure succinct communication during meetings and when communicating with relevant stakeholders.

What has occurred *(Description of known facts about the disruption / incident)*
Time: Specific Location: Description:
What has been the response? *(Actions conducted to date)*
What is planned to occur *(Actions to be conducted)*
Risk and Impact *(Is there an increase in risk to personnel and/or property? Current impact assessment)*
Control, Command, Communications *(Current communications plan)*
Next briefing will occur at: *(time)*

Appendix 11: Communications Templates

The Communication Coordinator should use the following template to record planned and completed communications.

Audience	**Key Messages** (To be included in the communications)	**Method** (email, SMS, phone call)	**Frequency/ When** (2 hours / daily)	**Comms Approval** (Who is approving this comms)	**Comms Release** (Who is releasing the comms)
INTERNAL					
Example: Receptionist	Holding message for callers. - Incident has occurred which is being managed by IMT - Updates will provided on Watercare's website	Email	Every 2 hrs	Communications Coordinators	Communications Team
Security					
Watercare Staff					
EXTERNAL					

The communications coordinator will provide the retail team with pre-approved templates are used to communicate with customers via txt, email or phone

Appendix 12: Action Plan

Action Plan			
Coordination Centre			
Type of report			
Report number			
Incident			
Date and time issued		Operational period covered	
Summary of incident			
Aim			
Objectives			
Plan of action/strategy			
Designated tasks			
Limiting factors			
Coordination measures			
Resource needs			
Information flow			
Public information plan			
Communications plan			
Organisation			
Appendices			
AP prepared by	Name:	Rank:	
	Response Role		
	Contact details: Phone number: Email:	Signature:	
AP approved by	Name:	Rank:	
	Response Role		
	Contact details: Phone number: Email	Signature:	
Distribution			

Appendix 13: Situation Report

Situation Report			
Coordination Centre			
Type of Report			
Report Number			
Incident			
Date and time issued		Period covered	
Summary of incident			
Actions carried out			
Predicted incident progression			
Resources in place			
Resources required			
Limiting factors			
Assessment			
Options			
Intended actions			
SitRep prepared by	Name:	Rank:	
	Response Role:		
	Contact details: Phone number: Email	Signature	
SitRep approved by	Name:	Rank:	
	Response Role:		
	Contact details Phone number: Email:	Signature	
Distribution			
Next SitRep due at	Date	Time	

Appendix 14: Shift Handover

All shift handovers should be coordinator by the Support person and attended by the both the outgoing and incoming role holder, as well as the Incident Controller were practicable. All shift changeovers will be planned and where possible, occur during daylight hours, outside of critical periods.

The following template should be used to ensure that a comprehensive handover is completed, and all relevant information passed on to the incoming role holder.

SHIFT HANDOVER TEMPLATE		
From:		**To:**
Item:	**Details:**	**Handover Notes:**
1.	Current Situation	
2.	Progress and projected developments	
3.	Current response plan, objectives, strategies and rationale	
4.	Current operational activities	
5.	Special hazards and safety issues	
6.	Outstanding or ongoing actions	
7.	Relevant resources and their deployment	
8.	Current and potential key risk exposures e.g. safety, operations, financial, legal, regulatory, and reputational	
9.	Key contacts and communication arrangements	
10.	IMT shift and welfare arrangements	
11.	Documentation control e.g. location of key information/documents	
12.	Any other relevant functional items	

Appendix 15: Post Incident Review

Points to cover during a PIR

Element	Description
Objectives	The purpose of this PIR was to evaluate the incident actions undertaken during the incident. The PIR worked under the following framework: ▪ Review what occurred during the incident ▪ Identify what worked well in relation to the incident response and management procedures ▪ Identify areas of improvement within the incident response and management procedures during the incident
Background	Details of the Incident: What happened? ▪ Where did it happen? ▪ What was the impact (quantified) across assessed impact areas? ▪ What was the outcome?
Assessment Criteria	▪ Detection of the incident. ▪ Notification of the incident. ▪ Assessment and evaluation of the incident ▪ Information capturing and management ▪ Command structure and roles ▪ Mobilisation of team(s) ▪ Response strategy used ▪ Response resources used ▪ Response effectiveness ▪ Recovery effectiveness ▪ Internal communications ▪ External agency relations ▪ Public Relations
Recommendations	Based on the assessed criteria
Conclusion	Summary of report

Appendix 16: Response Procedures Checklists

These response procedures should be read in conjunction with Incident Escalation Checklist and any Watercare standard operating procedures. The Incident Escalation Checklist provides the general steps from start to finish for any incident. The below actions are those actions specific to a particular incident, if relevant.

Response Procedure: Active Armed Offender	
Actions	☑
Establish contact with responders (e.g. wardens and security). Ensure they have contact with Police.	❑
Establish ongoing liaison protocols with first responders and Police for updates.	❑
Establish protocols for gathering information.	❑
Confirm if there have been any casualties.	❑
If safe, identify last known location of the active armed offender, including a description of the offender/s and whether they are moving in any particular direction.	❑
If safe, record details of any weapons being used.	❑
Confirm areas of the site that are locked down, and areas that have been evacuated.	❑
Consider the short-term and medium-term requirements for staff (e.g. amenities, food)	❑
After lockdown has finished, ensure confirmation from Police that it is safe for personnel to move.	❑
After lockdown has finished, ensure security and first responders conduct a sweep of the site to confirm possible injuries or trauma, damage to property and any additional threats.	❑
Confirm any final tasks with Police prior to their departure, or after their departure.	❑

Response Procedure: Civil Unrest (e.g. Violent Protest, Strike, Demonstration)	
Actions	☑
Inform and, in the initial instance, obtain advice from Police.	❑
Once threat determined, provide direction to responders (e.g. wardens, security) to activate emergency procedures in accordance with SOPs.	❑
Restrict all access to site and establish security procedures.	❑
Establish protocols for gathering information. Obtain the following information as a minimum: ▪ Who is involved? ▪ The nature of the unrest and motivation ▪ Is the protest imminent or is there time to implement further safety protocols? ▪ Is there a likelihood of physical violence?	❑
Where Watercare is directly targeted by a third party, consider establishing a high-level negotiation team to discuss issues and resolve conflict with key stakeholders (this will be done in conjunction with Police and other relevant agencies as advised by the Police).	❑

Response Procedure: Explosive Device	
Actions – First Responders (Warden Team)	☑
Initiate immediate actions – evacuate immediate area.	❑
Advise Police and establish ongoing liaison protocols (at a tactical level).	❑
Identify and establish perimeters to prevent people from going near the suspect device / entering the area of the explosion unnecessarily.	❑
Restrict physical access to buildings, if evacuation is not restricted.	❑
If possible and safe, restrict further vehicle access to site (bollards, gates, etc.).	❑
Ensure barriers do not inhibit the evacuation of people or access by Emergency Services.	❑
If possible and safe, activate triage staging area.	❑
Assess safety of existing normal evacuation routes and assembly area. If not safe, identify alternate assembly areas to evacuate to.	❑
Meet and brief Police when they arrive.	❑
Actions – Incident Management Team	☑
Establish ongoing liaison protocols with security for updates.	❑
Establish situational awareness protocols (collect information, assess, act).	❑
Ensure access to site plans, zone maps, and CCTV footage where possible.	❑
Establish ongoing Police liaison person.	❑
Establish a plan for the immediate, short term and medium-term care of people.	❑
Provide Police access to incident logs.	❑
Consider and respond to implications on operations.	❑

Response Procedure: Fire, Environmental, Biological, Radiological, Chemical Release	
Actions	☑
Coordinate with internal response teams to ensure relevant areas have been evacuated, and emergency procedures are being followed.	❑
Confirm that Emergency Services have been notified and have clear access to impacted area.	❑
Liaise with internal emergency response teams and Emergency Services to stabilise and contain the scene as soon as possible.	❑
Ensure assembly point management is in place. Staff may go to safe areas within sites where approved	❑
Establish and manage triage area.	❑
Where risk spreads beyond site/ site boundary, notify police, neighbours and community.	❑
Develop a plan for any casualties and next of kin. Establish counselling and welfare for affected people.	❑
Seek appropriate specialist advice to minimise, contain and control.	❑
Assess all hazards to people and the environment and provide response.	❑
Liaise with environmental authorities, appropriate Government, health and regulatory bodies, and investigative authorities.	❑
With external supports, define recovery goals and implement a full recovery plan.	❑
Evaluate and prepare response to any likely, broader operational effects.	❑
Consider legal, commercial, risk management and insurance ramifications of the incident.	❑
Consider longer term implications and potential need to evacuate larger parts of the site.	❑

Response Procedure: Health Issue / Disease Outbreak	
Actions	☑
Liaise with Public Health and DHB to obtain guidance.	❑
Establish an exclusion zone / containment area and access point, supported by security procedures.	❑
Liaise with Emergency Services for the coordination of impacted individuals to healthcare facilities on or offsite.	❑
Secure alternate sources of supply (e.g. water or food).	❑
Evacuate or stand-down all non-essential personnel while risk continues.	❑
Post health warnings and brief visitors to campus or incident location while risk continues.	❑
Assess exposure/culpability in outbreak.	❑
Following incident, ensure a clearance inspection conducted to ensure it is safe prior to allowing access again.	❑

Appendix 17: Cyber Incident Management Approach

Cyber Response functions

Security Incident Lifecyle Phase	Action
The "Preparation" phase allows Watercare and its incident response team to prepare for incident handling (and, if possible, to reduce probability of an incident occurring).	
Phase 1	During the "Detection and analysis" phase the incident response team analyses symptoms that might indicate an incident and decides whether it indeed is an incident.
Phase 2 and 3	The "Containment, eradication and recovery" phase is the period in which incident response team tries to contain the incident and, if necessary, recover from it (restore any affected resources, data and/or processes).
Phase 4	In the "Post-incident activity phase" the incident and all relevant incident handling procedures are analysed with two goals in mind: to reduce the probability of similar incident happening again and to improve incident handling procedures.

Appendix 2: Auckland Council Landowner Agreement for the use of Alberon Reserve

02 October 2023

Brent Evans
Head of External and Strategic Relations
Watercare Services Limited

Brent.Evans@water.co.nz

RE: Emergency Landowner Approval to undertake emergency works to install temporary sewer diversion wastewater pipe within Alberon Reserve, 12 Alberon Place Parnell

Dear Brent,

I refer to your application to,

- Undertake emergency works within Alberon Reserve to install a 600mm temporary sewer diversion wastewater pipe on top of the land as an emergency continency to allow repairs to a collapsed sewer on St Georges Bay Road.

Parks and Community Facilities Department on behalf of Auckland Council as landowner accepts the proposal because:

- The activity is immediately necessary due the existing St Georges Bay sewer collapse resulting in high-volume overflows into the Waitematā Harbour, Mechanics Bay and Freemans Bay,
- The activity is a safe and viable temporary alternative to allow repairs to be made to the St Georges Bay Sewer
- The Waitemata Local Board has been consulted and supports the exercise of officer delegation to approve the request
- The public will be informed and updated as to the ongoing works and will be excluded from a part of the reserve during the occupation period.
- Councils assets and land will be monitored and protected during the occupancy of the land
- At the end of the occupancy the pipe will be removed and all council land and assets reinstated by Watercare Services Ltd.
- The activity is supported by Land Advisory Services, councils Operational and senior managers.
- Site occupancy requirements will be formalised and agreed with Watercare Services Ltd after the temporary diversion pipe is installed.

This letter provides formal emergency landowner approval on behalf of Auckland Council and is contingent upon the below signatures of those persons authorised to bind the party they sign for and on behalf of.

This landowner approval is subject to the following conditions:

General conditions

1. The applicant must contact the Area Operations Manager (Martin Wong 021 629 061 martin.wong@aucklandcouncil.govt.nz)

and Facilities Manager (Don To'o 021577694 don.too@aucklandcouncil@govt.nz), with regard to any works on the land and any on going maintenance an monitoring of the pipe.

2. Watercare Services Ltd must accurately record all damage within the reserve including to the ground and to trees and vegetation.

3. Watercare's site arborist must document the current condition of notable trees affected by or near the route of the pipe. Auckland Council's Regional Arborists & Ecological Manager David Stejskal (021 842 678 David.Stejskal@aucklandcouncil.govt.nz will lead the councils advice and agreement on any effects to and management of notable trees.

4. Mitigation must be undertaken at the conclusion of the project to replace all damaged and/or removed trees to the specifications of the Urban Forest Specialist and Facilities Manager.

Site Safety

5. The route of the pipe will be isolated from public access by temporary site fencing for the duration of the occupancy.
6. The Parnell Kindergarten will be kept updated by Watercare Services Ltd, as to the progress of repairs and any maintenance/monitoring work of the temporary diversion pipe
7. The activity must be carried out in accordance with the requirements of the Health and Safety at Work Act 2015.
8. It is the responsibility of the applicant to ensure that any contractors undertaking works within the park comply with all necessary statutory and council Health and Safety standards.
9. Landowner approval must be held on site during the activity (when Watercare staff are on the site)
10. Rubbish, litter and debris must be contained and disposed of, off site.

Silt controls / Pollution/ Contamination

11. Biohazard control and monitoring of the pipe for leaks will be required throughout the occupation period by Watercare Services Ltd.
12. Any leaks or discharge from the pipe to the land must be managed and contained immediately by Watercare staff or in the event of contaminants being discharged from site, or a significant spill occurs on site, the applicant must contact the Auckland Council Pollution Response Team (09 377 3107) and isolate the discharge to minimise effects to land and trees and the public.

Reinstatement / Handover

13. The applicant must contact the Facilities Manager Don To'o and David Stejskal to arrange a pre-reinstatement meeting at least 5 days before the temporary pipe is to be decommissioned and removed from the reserve.
14. During the pre-reinstatement meeting council staff will:
    - inspect the area for any damage caused to the reserve and any reserve assets
    - confirm the assets that will require reinstatement and
    - arrange a date for post-reinstatement meeting for a final inspection

15. The applicant must undertake full reinstatement of any damage to the reserve surface or its assets to original or better condition.
    Any damage done to the reserve environment and not reinstated within 20 days of the works being carried out will result in council's contractor carrying out any reinstatement work necessary.
    The applicant will be invoiced for all expenses, including any staff time in reinstating the reserve area.
16. The applicant must reinstate all areas of disturbed ground to their original levels, in accordance with the Grass Re-instatement Specifications attached with this letter (Appendix D).
17. The applicant must leave the reserve and all its existing assets tidy and clear of stones, rubbish, debris, building materials and excess soil.

Please note, the council is granting approval for temporary access and activity in a non-regulatory capacity.

Please return this letter in its entirety, including the applicant's signature below to Allan Christensen, Parks and Community Facilities via email at allan.christensen@aucklandcouncil.govt.nz

AUCKLAND COUNCIL as landowner
under delegated authority by:

3 October 2023
Authorised Signatory

Print Name:
Allan Christensen,
Manager Land Advisory Services

Watercare Services Limited

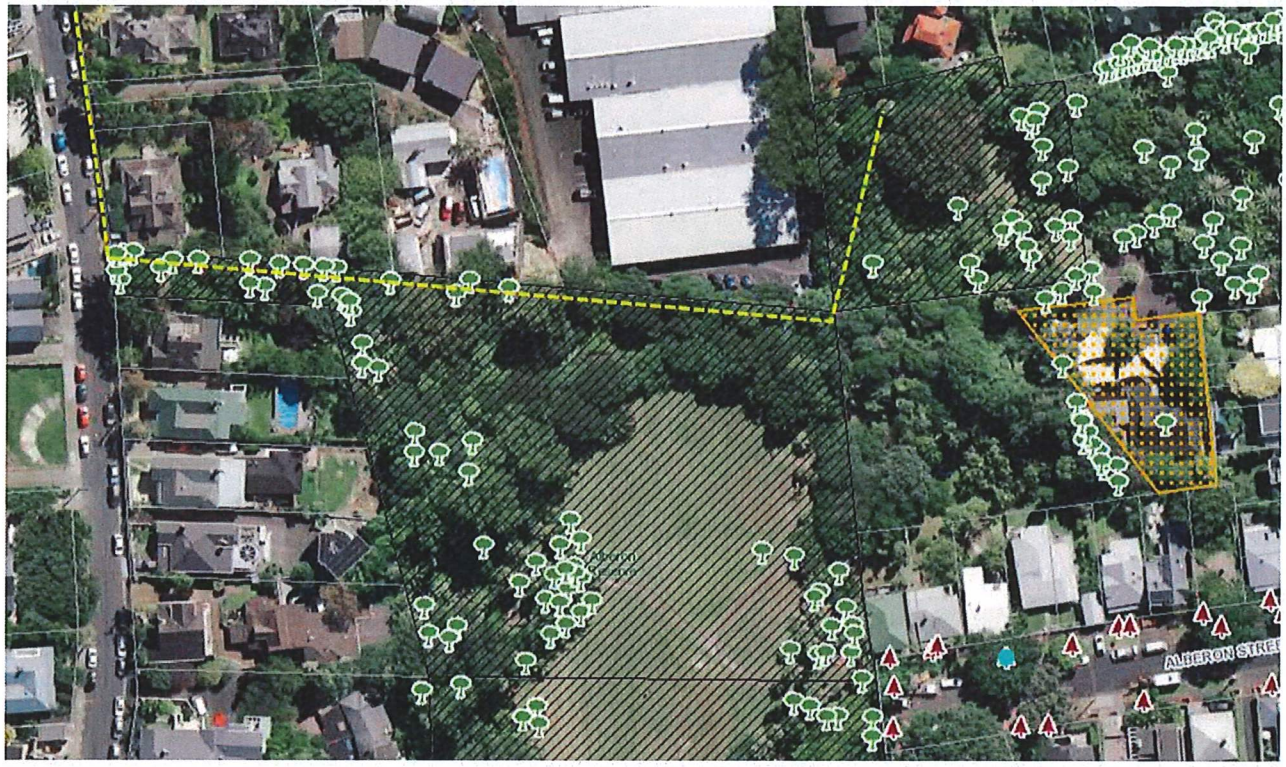
2/10/23
Authorised Signatory

Print Name: Brent Evans

Head of External and Strategic Relations

Attachment A: Alberon Reserve Temporary Diversion Wastewater Pipe location

GIS View showing general pipe location in yellow, notable trees and nearby Parnell Kindergarten.



Appendix 3: Watercare Advice to Auckland Council of the Exercise of Section 330

Watercare Services Limited
73 Remuera Road, Remuera,
Auckland 1050, New Zealand
Private Bag 92521, Victoria Street West,
Auckland 1142, New Zealand
Telephone +64 9 442 2222
www.watercare.co.nz

20 October 2023

Phil Wilson
Acting Chief Executive Officer
Auckland Council

By Email: phil.wilson@aucklandcouncil.govt.nz

Dear Phil

USE OF EMERGENCY POWERS UNDER SECTION 330 RESOURCE MANAGEMENT ACT 1991 IN RESPONSE TO COLLAPSE AND BLOCKAGE OF ŌRĀKEI MAIN SEWER

The purpose of this letter is to formally advise Auckland Council that Watercare Services Limited (Watercare) has exercised emergency powers under section 330 of the Resource Management Act 1991 (RMA) in response to the collapse and blockage of the Ōrākei Main Sewer (Sewer).

Background

On 27 September 2023, Watercare learned of a large sinkhole having developed on a private property in St George's Bay Road, Parnell above a section of the Sewer. The sinkhole has caused part of the Sewer to collapse and become blocked, in turn resulting in wastewater overflows to land at various points across Watercare's wastewater network, and overflows into the Waitematā Harbour at the western end of Wynyard Basin and two locations near the Port at Mechanics Bay.

Watercare has commissioned an independent review to determine what caused the sinkhole and section of the Sewer to collapse. However, Watercare understands the sinkhole is linked to the severe weather events earlier this year (Cyclone Hale, the heavy rainfall events in Auckland over Anniversary Weekend, and Cyclone Gabrielle).

Watercare has responded swiftly to manage adverse effects on the environment and public health caused by the collapse and blockage of the Sewer by:

- constructing and commissioning a temporary pipeline to divert wastewater up St George's Bay Road (within road reserve) and across Alberon Reserve to reconnect with the Sewer past the blockage point;
- unblocking and commencing repairs on the affected section of the Sewer;
- commissioning temporary bypasses to reduce stormwater flows being diverted into the Sewer and by engineering discharges of wastewater to the CMA via the existing outfall at Wynyard Basin to address surcharging of the Sewer as a result of the blockage.
- undertaking ongoing monitoring to identify exactly where overflows are taking place, and the environmental and public health effects of these overflows; and
- communicating with the Council, mana whenua, the Auckland Regional Public Health Service, other affected stakeholders and the public about progress with unblocking the Sewer, implementation overflow mitigation steps (including the diversion pipeline), the monitoring being undertaken and the ongoing risks to public health, pending completion of Watercare's emergency response.

RMA Emergency Powers

The sinkhole and resulting collapse and blockage of the Sewer is an adverse effect on the environment that has affected Watercare's ability to operate the Sewer and required Watercare to undertake immediate remedial measures under section 330(1)(e) of the RMA. These activities are required to mitigate actual or likely adverse effects of the Sewer having collapsed and become blocked.

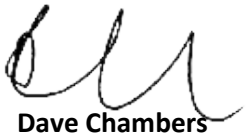
Watercare has therefore exercised powers under section 330 of the RMA that allow it to undertake emergency works and other activities that could otherwise breach sections 9, 12, 13, 14 and 15 of the RMA, without first obtaining resource consent from Auckland Council. Those works and activities are:

(a) construction, placement and operation of the temporary diversion pipeline in Alberon Reserve and St George's Bay Road;

(b) discharging contaminants (wastewater overflows) into the coastal marine area so as to minimize the risk (and associated adverse environmental and public health effects) of discharges, until such time as the relevant section of the Sewer is reinstated.

Watercare will apply in writing to Auckland Council for any resource consents required in respect of these activities within 160 working days of this notice, in accordance with sections 330A(2) and 330AA of the RMA.

Yours sincerely



Dave Chambers

Chief Executive Officer

Watercare Services Limited

cc: Mark Bourne, Chief Operations Officer, Watercare – mark.bourne@water.co.nz

Craig Hobbs, Director Regulatory Services, Auckland Council – craig.hobbs@aucklandcouncil.govt.nz

Barry Potter, Director Infrastructure and Environmental Services, Auckland Council – barry.potter@aucklandcouncil.govt.nz

Appendix 4: Property Titles

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **NA37B/308**

Land Registration District **North Auckland**

Date Issued 30 August 1977

Prior References
NA26A/117

Estate Fee Simple

Area 1.2846 hectares more or less

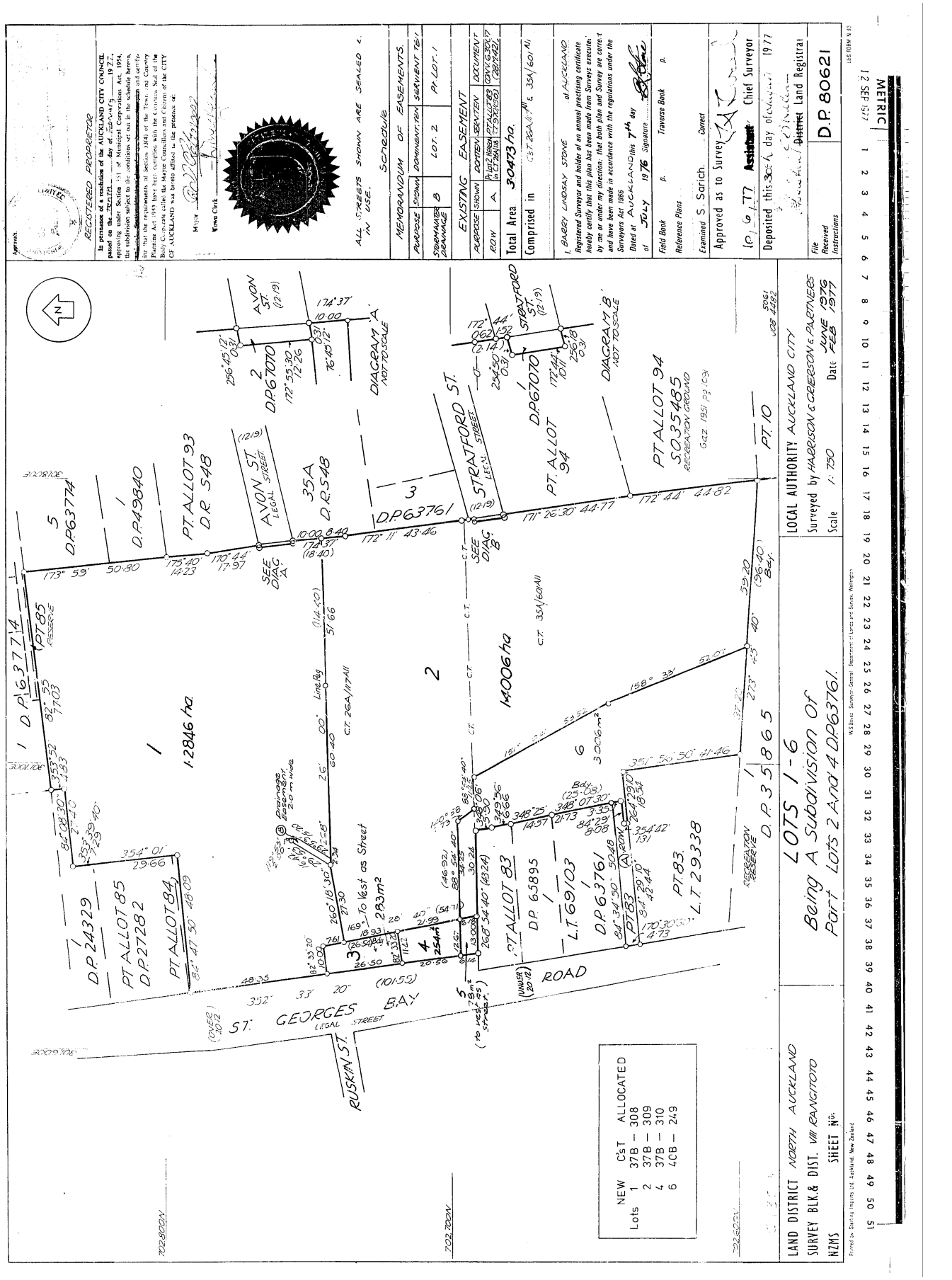
Legal Description Lot 1 Deposited Plan 80621

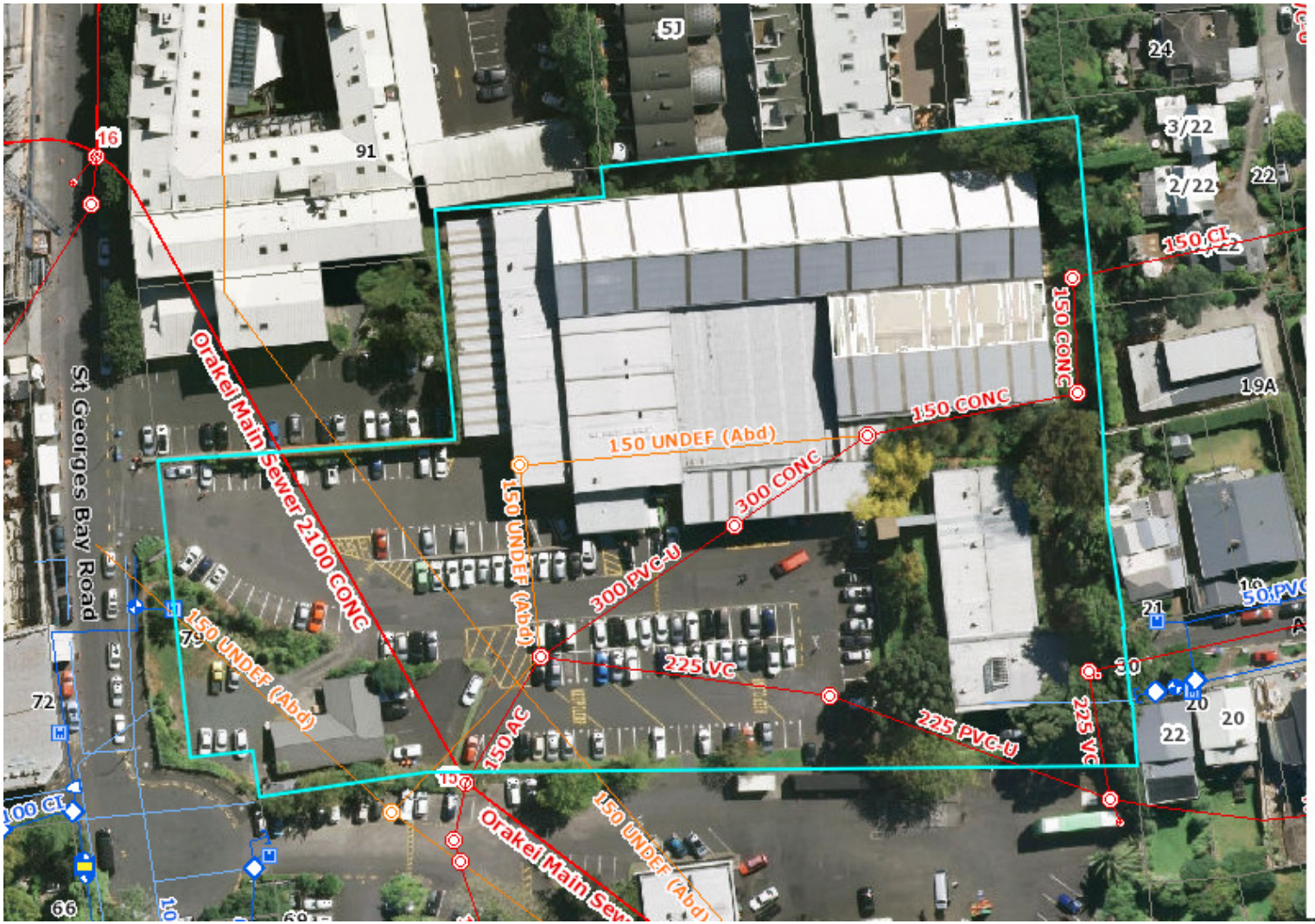
Registered Owners
Masfen Holdings Limited

Interests

Subject to a drainage right over part marked B on DP 80621 specified in Easement Certificate 649744.2 - 30.8.1977 at 9.02 am

The easements specified in Easement Certificate 649744.2 are subject to Section 351E (1) (a) Municipal Corporations Act 1954


REGISTERED PROPRIETOR
ALL STREETS SHOWN ARE SEALED & IN USE.
SCHEDULE
MEMORANDUM OF EASEMENTS.
EXISTING EASEMENT
Total Area 30473ha.
Comprised in
I, BARRY LINDSAY STONE of AUCKLAND
Registered Surveyor and holder of an annual practising certificate hereby certify that this plan has been made from Surveys executed by me or under my direction: that both plan and Survey are correct and have been made in accordance with the regulations under the Surveyors Act 1966
Dated at AUCKLAND this 7th day of JULY 1976 Signature
Field Book p. Traverse Book p.
Reference Plans
Examined S. Sarich. Correct
Approved as to Survey
Chief Surveyor
Deposited this 30th day of December 1977
District Land Registrar
File
Received
Instructions
D.P. 80621
LOCAL AUTHORITY AUCKLAND CITY
Surveyed by HARRISON & GREERSON & PARTNERS
Scale 1:750 Date FEB JUNE 1976 1977
LAND DISTRICT NORTH AUCKLAND
SURVEY BLK. & DIST. VIII RANGITOTO
NZMS SHEET No.
LOTS 1-6
Being A Subdivision Of
Part LOTS 2 AND 4 DP63761.
NEW CST ALLOCATED
Lots 1 37B – 308
2 37B – 309
4 37B – 310
6 40B – 249
PT ALLOT 93 DR 548
PT ALLOT 94
PT ALLOT 83 DP 65895
PT ALLOT 84 DP 27282
PT ALLOT 85 DP 27282
AVON ST
STRATFORD ST
RUSKIN ST
ST. GEORGES BAY ROAD
1.2846 ha
1.4006 ha
2.83m²
METRIC



(1 of 1) Clear

79 St Georges Bay Road Parnell Auckland 1052

Property address	79 St Georges Bay Road Parnell Auckland 1052
Legal description	Lot 1 DP 80621
CT number	NA37B/308
Land area	1.2846 HA
Property owner/ratepayer name	Masfen Holdings Limited
Mailing address	PO Box 2757, Shortland Street, Auckland 1140
Land use	Building materials (non timber
Description of improvements	FACTORY & OFFICE BUILDINGS
Property key	11253003
Valuation number	00005-04100510000
Latest capital value	38,000,000.00
Latest land value	34,000,000.00
Latest improvement value	4,000,000.00
Former local council	Auckland City
RID privacy restrictions	Not private

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **NA37B/309**

Land Registration District **North Auckland**

Date Issued 30 August 1977

Prior References

NA26A/117 NA35A/601

Estate Fee Simple

Area 1.4006 hectares more or less

Legal Description Lot 2 Deposited Plan 80621

Registered Owners

Masfen Holdings Limited

Interests

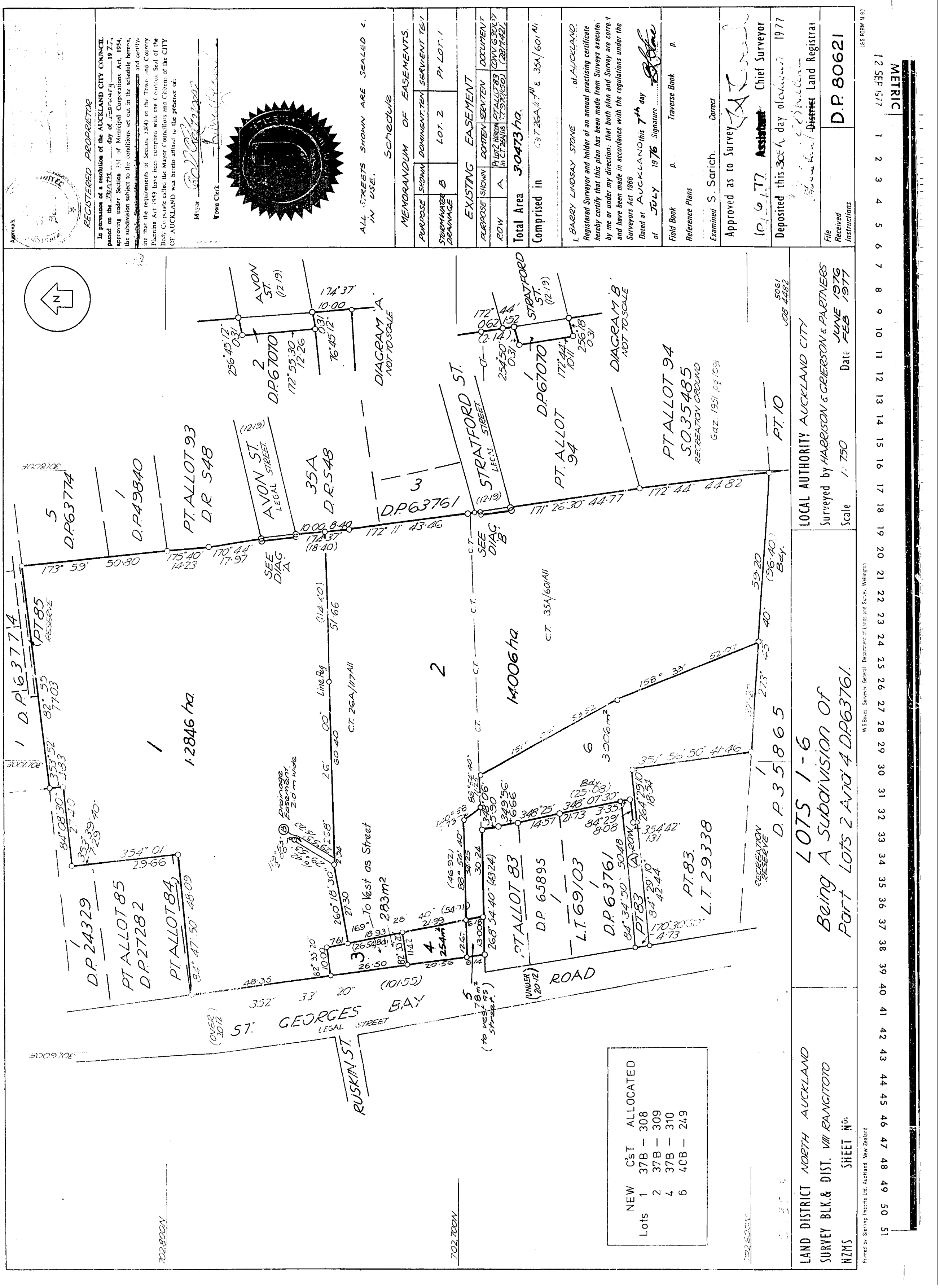
Appurtenant hereto is a right of way created by Conveyance 63007 (28M.421) (affects the part formerly in CT NA35A/601)

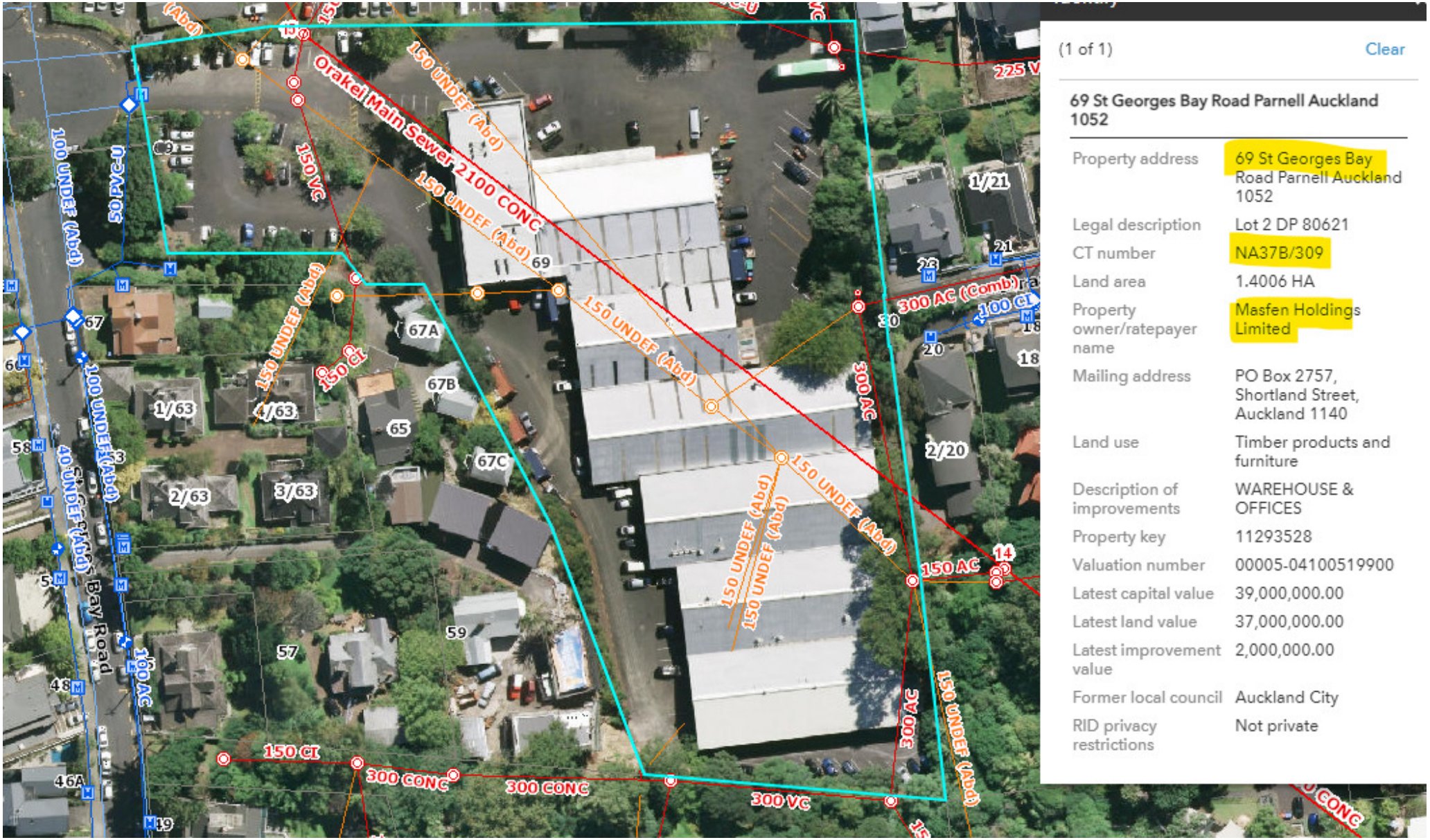
Appurtenant hereto is a drainage right specified in Easement Certificate 649744.2 - 30.8.1977 at 9.02 am

The easements specified in Easement Certificate 649744.2 are subject to Section 351E (1) (a) Municipal Corporations Act 1954

Subject to a right (in gross) to convey electricity over parts marked A, B and C all on DP 511244 in favour of Vector Limited created by Easement Instrument 11008863.1 - 5.3.2018 at 4:36 pm

Subject to a right (in gross) to convey gas over part marked A on DP 581896 in favour of Vector Limited created by Easement Instrument 12609564.1 - 23.11.2022 at 10:45 am


LOTS 1-6
Being A Subdivision Of
Part Lots 2 And 4 DP63761.
D.P. 80621
LOCAL AUTHORITY AUCKLAND CITY
Surveyed by HARRISON & GRIERSON & PARTNERS
Scale 1:750
LAND DISTRICT NORTH AUCKLAND
SURVEY BLK.& DIST. VIII RANGITOTO
ST. GEORGES BAY ROAD
STRATFORD ST.
AVON ST.
RUSKIN ST.
Total Area 3.0473 ha.
MEMORANDUM OF EASEMENTS.
EXISTING EASEMENT
ALL STREETS SHOWN ARE SEALED & IN USE.
NEW CST ALLOCATED
Lots 1 37B – 308
2 37B – 309
4 37B – 310
6 40B – 249
METRIC



(1 of 1) Clear

69 St Georges Bay Road Parnell Auckland 1052

Property address	69 St Georges Bay Road Parnell Auckland 1052
Legal description	Lot 2 DP 80621
CT number	NA37B/309
Land area	1.4006 HA
Property owner/ratepayer name	Masfen Holdings Limited
Mailing address	PO Box 2757, Shortland Street, Auckland 1140
Land use	Timber products and furniture
Description of improvements	WAREHOUSE & OFFICES
Property key	11293528
Valuation number	00005-04100519900
Latest capital value	39,000,000.00
Latest land value	37,000,000.00
Latest improvement value	2,000,000.00
Former local council	Auckland City
RID privacy restrictions	Not private

Appendix 5: Ōrākei Main Sewer Emergency Works and Repairs: Ecological Impact Assessment.

MORPHUM environmental

Co-creating a thriving ecosystem

Ōrākei Main Sewer Emergency Works

Ecological Impact Assessment

Final

Prepared for Watercare

Document Control

Client Name: Watercare

Project Name: Ōrākei Main Sewer Emergency Works

Project Number: P04326

Document: Ecological Impact Assessment

Revision History

Status	Date Issued (dd/mm/yyyy)	Author	Reviewed By	Released By
Final	14/03/2024	Fergus White	Andrew Rossaak	Dean Watts

Reviewed by:

Reviewer: Andrew Rossaak **Signature:** 

Released by:

Reviewer: Dean Watts **Signature:** 

Executive Summary

Morphum Environmental Ltd. (Morphum) has been engaged by Watercare Services Ltd. (WSL) to prepare an Ecological Impact Assessment (EcIA) to support the retrospective resource consent application for the emergency works undertaken to temporarily remediate a broken wastewater (WW) line on St Georges Bay Road, Parnell. These works included the installation of a temporary above ground WW pipe through a forested area in nearby Alberon Reserve. This report identifies the ecological values of the site, describes the potential and actual effects that the works have and may have on those values, describes all ecological management undertaken, and recommends measures to manage adverse effects. It is noted that an additional consent application is anticipated pertaining to a future permanent fix for the main sewer line.

The subject site is largely situated within the 2.67 ha Alberon Reserve, which features open greenspace and an area of regenerating broadleaf/puriri forest that is designated as a Significant Ecological Area (SEA) under the Auckland Unitary Plan (AUP). On 25 September, the collapse of the main sewer formed a large sinkhole in Parnell blocking the WW system. Consequently, untreated wastewater was discharging into the Waitamata harbour receiving environment from various locations, necessitating the emergency bypass being initiated under emergency provisions (s330) of the Resource Management Act. These works included the installation of a (DN630 mm PE) pipe to divert WW around the collapsed sewer to maintain flow and limit unwanted discharge. The adverse effects of the wastewater overflow discharges to the Waitemata are not considered here, being outside of the scope of this consent. To facilitate the installation of the pipe, a temporary accessway through the reserve was constructed for heavy machinery while an area was cleared to make way for the pipe. While efforts were made to avoid and mitigate ecological impacts during the works period, approximately 810 sq m of SEA vegetation was cleared as a direct impact of the works under the supervision of Morphum.

The ecological values of the site and levels of effect of the works were assessed using the EIANZ Ecological Impact Assessment Guidelines 2018 (Roper-Lindsay et al., 2018). Existing ecological values for different parameters were assessed and found to range from Negligible to Very High. Vegetation cleared was assigned a High ecological value due to the SEA classification, as well as considering puriri forest is a threatened ecotype in the Auckland Region (Singers *et al.*, 2017). Existing avifauna values were found to be Low as observed bird species were limited to common native and exotic species. Existing vegetation was found to support native herpetofauna which are representative of High ecological value due to their conservation status. The vegetation was determined to be unlikely to support native bats, however, if present would be representative of Very High ecological value due to their conservation status. As the watercourse directly impacted by the works has been classified as ephemeral it was assigned a negligible value.

Adverse effects of the proposed works include the removal of native vegetation within a SEA, including the pruning and felling of mature trees, direct mortality and loss of habitat and foraging areas for avifauna and herpetofauna, and sedimentation and erosion impacts on the receiving environment. Measures to avoid and mitigate these adverse effects were taken at the time of the works included avoiding the clearance of significant trees where practicable, seedling relocation, lizard relocation, bird management, and the implementation of erosion and sediment controls.

Overall, it is considered that the actual and potential impacts of the proposed works were not sufficiently addressed through avoidance, remedy, and mitigation actions. Therefore, it is recommended offsetting is undertaken to manage these residual impacts. It has been proposed that Biodiversity Compensation

Modelling (BCM) can be used to effectively calculate the offsetting requirements through additional plantings.

Contents

Figures

Tables

1. Introduction

1.1. Purpose and Scope

Morphum Environmental Ltd. (Morphum) has been engaged by Watercare Services Ltd. (WSL) to prepare an Ecological Impact Assessment (EcIA) to support the retrospective resource consent application for the emergency works undertaken to remediate a broken wastewater (WW) line on St Georges Bay Road, Parnell. On 25 September, the collapse of the sewer main formed a large sinkhole in Parnell blocking the WW system. Consequently, untreated wastewater was discharging into the Waitamata harbour receiving environment at various locations, necessitating the emergency bypass initiated under emergency provisions (s330) of the Resource Management Act. These works included the installation of a (DN630 mm PE) pipe through a forested area in nearby Alberon Reserve (herein the subject site).

Morphum understands that an EcIA is required to identify the ecological values of the subject site, describe the actual and potential ongoing impacts the remedial works may have had, or will have, on those values, and recommend measures to address the effects. The EcIA will be submitted with the retrospective consent application. This EcIA is limited to the installation of the remedial WW line works up to December 2023 and the effects on the immediate site. The adverse effects of the wastewater overflow discharges to the Waitemata are not considered here, being outside of the scope of this consent.

This ecological impact assessment focuses on the ongoing impacts of the vegetation clearance and installation of the above-ground WW diversion pipe. The ecological baseline is considered to be pre-installation. The Zone of influence (ZOI)[1] is noted to be a 10 m wide footprint surrounding the newly installed pipe, the cleared access route associated with the pipe, and the sinkhole.

This assessment has been undertaken in accordance with the Environmental Institute of Australia and New Zealand EcIA Guidelines (2018, second edition) (EIANZ Guidelines).

1.2. Site Overview

Alberon Reserve (2.67 ha) is situated in Parnell, approximately 1 km to the southeast of Auckland city centre (Figure 1). The reserve consists of a large central area of open greenspace enclosed in patches of regenerating and mature native forest with scattered stands of exotic palm trees. Alberon reserve boarders an industrial zone to the North and is bounded almost entirely by residential housing to the South, East, and West. The reserve contains multiple overland flow paths which flow from South to North following the general slope of the area. Multiple paths run through the reserve commonly used for recreation, dog walking, and as a throughfare with main access ways from St Georges Bay Road, Alberon Place, and Alberon Street.

The vegetation within the reserve is dominated by late stage regenerating native forest with many of the broadleaf trees having reached maturity. This native vegetation has been classified as a mixture of puriri and regenerating broadleaf forest (Singers *et al.*, 2017). The regenerating forest in the reserve is part of the wider terrestrial Significant Ecological Area (SEA) (SEA_T_6062), as classified by the Auckland Unitary Plan (AUP). Additionally, the reserve is home to a variety of common and uncommon exotic palm species

[1] The Zone of Influence (ZOI) refers to all land, water bodies and receiving environments that could be potentially impacted by the project.

thought to have been planted by the previous landowners in the early 20th century and more recently by the Palm and Cycad Society of New Zealand.

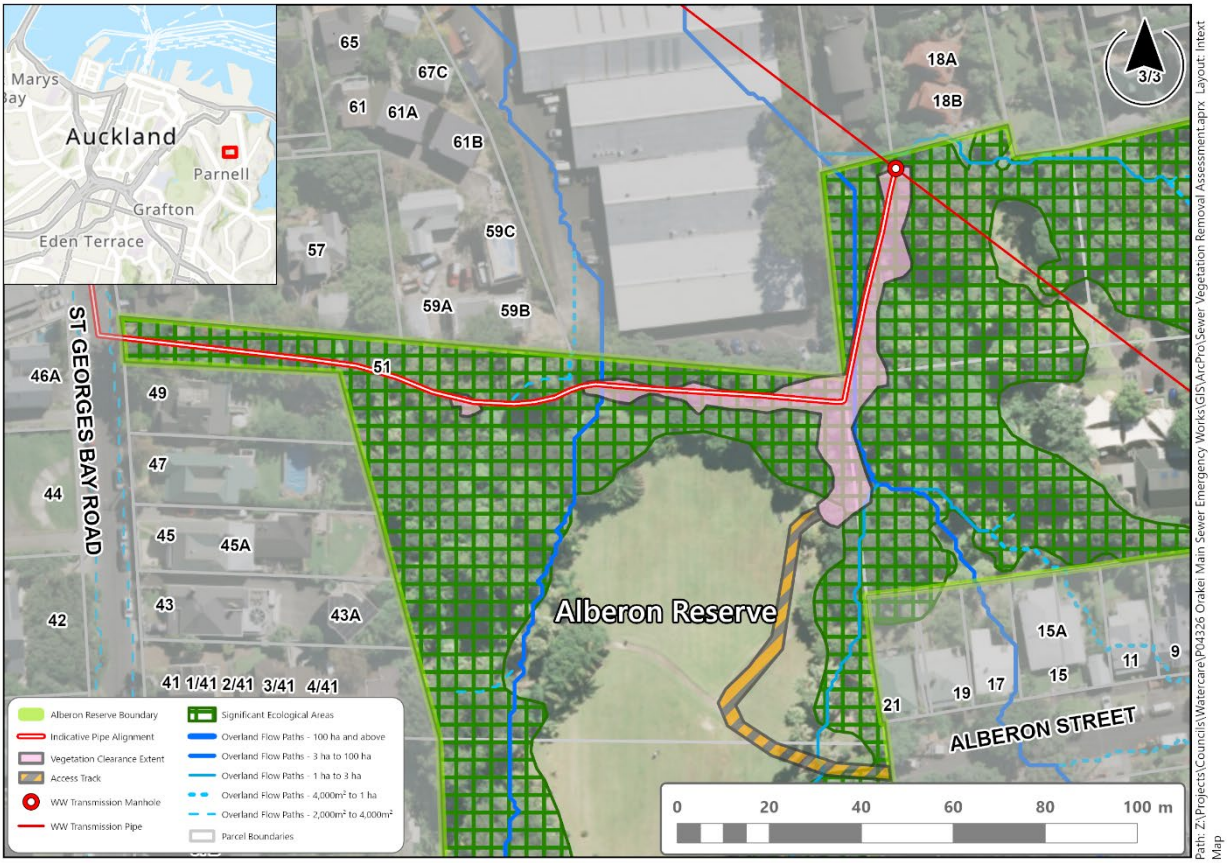


Figure 1: Site map displaying the WW diversion pipe and the vegetation clearance associated with the works.

Alberon Reserve falls within the Tamaki Ecological District, where indigenous vegetation cover is scarce. Only 6.9% of indigenous cover remains in the district, with the original vegetation having been highly modified from early Polynesian occupation through to more recent urban development (Lindsay *et al.*, 2009). The Auckland Council GeoMaps Ecosystem Potential Extent layer indicates that, prior to human disturbance, the area is likely to have been part of an extensive area of puriri (*Vitex lucens*) and taraire (*Beilschmiedia taraire*) forest (WF7.2; Singers *et al.*, 2017). This ecosystem type is regionally classified as critically Endangered and would have supported a wide variety of invertebrates, reptiles, birds and bats, prior to land use change and anthropogenic modification (Atkinson & Millener 1991; Worthy & Holdaway 2002).

An unnamed, soft-bottomed, ephemeral watercourse originates within the reserve and is primarily fed by discharge from nearby residential properties on Alberon Street. The watercourse flows through the SEA forest and into a flood prone area at the northern end of the site before either returning to the water table or entering a scruffy dome overflow inlet in the north of the reserve.

1.3. Current Ecological Management

Morphum were initially engaged to provide ecological and environmental support throughout the course of the emergency works. Consequently, some ecological management was undertaken at the site prior to the preparation of this report in order to avoid and minimise the ecological impacts associated with the works. Various memorandums have been prepared summarising these works and the ecological outcomes and these are included in the appendices to support this assessment. These include a lizard salvage memorandum, bird nesting memorandum, erosion and sediment control memorandum, stream classification memorandum, and an arborist report.

1.4. Methodology

A desktop review was undertaken of client supplied information, as well as the following literature and databases in order to assess any records and data relating to the ecological values of the site:

- Geomaps – Auckland Council, 2023
- Environmental Data Portal – Auckland Council, 2023
- iNaturalist
- eBird
- National Herpetofauna Database

Morphum has previously produced various memorandums to document these emergency works, and which are included in appendices and are included in the desktop assessment of values.

Multiple site visits were undertaken throughout October and November 2023 to assess the site and provide ecological assistance while the emergency works were undertaken.

Following the site visits and desktop review, the Environmental Institute of Australia and New Zealand Ecological Impact Assessment Guidelines (EIANZ Guidelines) have been used to describe the current ecological values within the ZOI. The EIANZ Guideline methodology summary tables are presented in Appendix 1.

2. Current Ecological Values

2.1. Terrestrial Vegetation

The vegetation established within the approximated 10 m wide ZOI from the Georges Bay Road accessway to the terminus of the temporary diversion pipe is dominated by native forest. While the canopy forest and understory is a modified forest ecosystem, it has previously been classified as regenerating broadleaved species scrub/forest (VS5; Singers *et al.*, 2017) according to Auckland Council Geomaps current ecosystem extent layer. Despite this previous classification, the forested area has many elements that also align with pūriri forest (WF7.3; Singers *et al.*, 2017). The forested area within the ZOI also sits within a SEA (SEA_T_6062) for reason 4C: Migration pathway.

The largest size class of flora present consists of canopy species including pūriri (*Vitex lucens*), karaka (*Corynocarpus laevigatus*), kanuka (*Kunzea ericoides*), kahikatea (*Dacrycarpus dacrydioides*), totara (*Podocarpus totara*), and kohekohe (*Didymocheton spectabilis*) at heights exceeding 12 m (Figure 2). These specimens provide multiple ecosystem services including potential bird nesting habitat, a source of woody debris for facilitating lizard habitat, and shading for the subcanopy/emergent flora. The native subcanopy is made up predominantly of nikau (*Rhopalostylis sapida*), mahoe (*Melicytus ramiflorus*), tī kōuka (*Cordyline australis*), and manuka (*Leptospermum scoparium*) at heights of 5-12 m. In the understory kawakawa (*Piper excelsum*), and *Coprosma spp*. are found heights of 0.3-2 m alongside various other juvenile specimens. Groundcovers include native grasses and ferns, and weedy species such as tradescantia (*Tradescantia fluminensis*) and blue morning glory (*Ipomoea indica*). Exotic mature specimens are also interspersed throughout the forested area including, English oak (*Quercus robur*), firewheel tree (*Stenocarpus sinuatus*), Queensland kauri (*Agathis robusta*), and palms such as phoenix palm (*Phoenix canariensis*). Notable native species within Alberon reserve outside the ZOI include Three Kings milk tree (*Streblus smithii;* At Risk – Naturally Uncommon) and Kawaka (*Libocedrus plumosa*).

Figure 2: Examples of canopy vegetation (left) and understory (right) prior to vegetation clearance.

Many aspects of the vegetation in Alberon Reserve such as the regenerating nature of the vegetation and the high proportion of kanuka align with the Auckland Council GeoMaps Current Ecosystem Layer which has the area classified as broadleaved species forest (VS5; Singers *et al.*, 2017). This forest type has a

regional IUCN threat status of 'least concern'. Alternatively, much of the flora observed are consistent with descriptions of pūriri forest (WF7.2; Singers *et al.*, 2017) which has a regional IUCN threat status of 'critically endangered'. This aligns with the Auckland Council GeoMaps Ecosystem Potential Extent layer that has the area classified as WF7.2 (Singers *et al.*, 2017) prior to anthropogenic modification. As the forest likely sits in a stage of regeneration between these two classified ecosystems as it returns to a remodified state, both will be considered when assigning ecological value to the vegetation on this site.

A summary of ecological values for vegetation within the ZOI is presented in Table 1.

Table 1: Assessment of current terrestrial vegetation values along the wetland margin.

Assessment matter	Ecological value (EIANZ, 2018)	Reasoning
Representativeness	**Moderate**	Highly modified forest that is on track to regenerate to 1840 like conditions.
Rarity/distinctiveness	**High**	Vegetation has many of the characteristics of Puriri forest which has a regional IUCN threat status of 'critically endangered'.
Diversity and pattern	**Moderate**	There is moderate diversity of native species, however, the area is small and contains no large scale environmental or ecological variation.
Ecological context	**High**	The ZOI sits within a SEA. The mature specimens are a native seed source for the surrounding environment and provide a consistent food for avifauna. It is noted as an important stepping stone for migratory species.
Overall	**High**	The area rates High for two of the four considerations and rates at moderate to for the remaining two.

2.2. Avifauna

A series of Bird Nesting Surveys were undertaken by Morphum in Alberon Reserve between 4 & 6 October 2023 while providing ecological support for the emergency works (Appendix 3). During these surveys one Piwakawaka (*Rhipidura fuliginosa placabilis*) nest and one Song Thrush (*Turdus philomelos*) nest were observed.

A review of the citizen science platforms iNaturalist and eBird was also undertaken for the general area the results of which are provided in Table 2 below.

Table 2: Bird species recorded near and within Alberon Reserve.

Common name	Scientific name	Threat classification (Robertson *et al.*, 2021)
Kereru	*Hemiphaga novaeseelandiae*	Not Threatened
Pīwakawaka +	*Rhipidura fuliginosa placabilis*	Not Threatened
Kingfisher	*Todiramphus sanctus*	Not Threatened

Ruru	*Ninox novaeseelandiae*	Not Threatened
Tui	*Prosthemadera novaeseelandiae*	Not Threatened
Silvereye	*Zosterops lateralis lateralis*	Not Threatened
Blackbird	*Haematopus unicolor*	Introduced and Naturalised
Rock Pigeon	*Columba livia*	Introduced and Naturalised
Eastern rosella	*Platycercus eximius*	Introduced and Naturalised
Mallard duck	*Anas platyrhyncho*	Introduced and Naturalised
Magpie	*Gymnorhina tibicen*	Introduced and Naturalised
Starling	*Sturnus vulgaris*	Introduced and Naturalised
Song thrush +	*Turdus philomelos*	Introduced and Naturalised
House sparrow	*Passer domesticus*	Introduced and Naturalised
Myna	*Acridotheres tristis*	Introduced and Naturalised

On-site observations are marked with +

Overall, given that all native bird species recorded are locally and nationally common. the current value of the site for avifauna was determined to be **Low**.

2.3. Herpetofauna

A series of manual lizard searches were undertaken by Morphum and RMA Ecology in Alberon Reserve between 3 & 6 October 2023 while providing ecological support for the emergency works (Appendix 4). These searches consisted of surveying and hand removal of suitable skink habitat within the ZOI during daylight hours and spotlighting for arboreal geckos at night. These searches were undertaken 48 hours prior to vegetation clearance. Many copper skinks (*Oligosoma aeneum*) were observed, collected, and relocated, however, no geckos were observed while spotlighting. While only copper skinks were observed on site, the area does contain suitable habitat for additional lizard species (Appendix 3). National Herpetofauna Database records displayed in Table 3 indicate three native lizard species have been found nearby.

Table 3: Native lizard species found within 3 km of Alberon Reserve.

Species	Common Name	Threat Status (Melzer *et al.*, 2022)	Preferred Habitat Type
Oligosoma aeneum +	Copper skink	At Risk - Declining	Grasslands, shrubland, forest
Oligosoma ornatum	Ornate skink	At Risk - Declining	Grasslands, shrubland, forest
Mokopirirakau granulatus	Forest gecko	At Risk - Declining	Canopy vegetation

On-site observations are marked with +

As copper skinks observed at the site have a national conservation status of At Risk – Declining (Appendix 4) their corresponding ecological value is high. Additionally, the site contains habitat associated with two other lizard species with high ecological value. Overall, the herpetofauna value of the site has been assessed as **High**.

2.4. Bats

Based on the location of the site and surround urban environment it is considered highly unlikely bats are roosting in Alberon Reserve. Consequently, a bat survey was not undertaken. It is noted that a long-tailed bat (*Chalinolobus tuberculatus*) has been recorded in Auckland within the 50 km foraging distance of the species. Therefore, the possibility of nocturnal, transient (foraging) long-tailed bat presence within the site cannot be ruled out, although highly unlikely.

Long-tailed bats (*Chalinolobus tuberculatus*) have a threat status of 'Threatened – Nationally Critical' (O'Donnell *et al*., 2017) and correspondingly would have a current ecological value of **Very High**. Short-tailed bats (*Mystacina tuberculata*) with a threat status of 'Threatened – Nationally Vulnerable' prefer old growth indigenous forest. Short-tailed bats are considered extremely unlikely to be found within the site.

Due to the unlikely presence of bats in an urban area and no nearby permanent watercourses, it is considered there would be no need for any specific bat effects management. Therefore, their ecological value in relation to the site and proposed activities has not been assessed further.

2.5. Fresh Water Values

Two overland flow paths identified on the overland flow path layer on Auckland Council Geomaps are present with the ZOI herby referred to as the western and eastern flow paths. The eastern flow path was the only path impacted by the works as the temporary pipe sits above the western channel (pipe bridge). The eastern flow path is unnamed soft-bottomed channel that originates within the reserve and is primarily fed by discharge from nearby residential properties on Alberon Street. This was classified by Morphum as an ephemeral watercourse according to AUP guidelines and definitions for reasons including; the absence of flow, and no defined bed or banks (Appendix 5).

As the limited surface water was present in the channel of the eastern flow path, there was no suitable fish habitat. Due to the lack of aquatic habitat and that it was assessed as an ephemeral flow path, a valuation for freshwater fauna in this eastern channel is not required.

3. Ecological Impact Assessment & Effects Management

This assessment is based on the initial and ongoing effects associated with the installation of the emergency wastewater bypass through Alberon Reserve, Parnell.

It is acknowledged that the works have the potential to result in adverse ecological effects. The following potential effects are expected to be associated with the proposed activities and are discussed further below:

- Loss of SEA vegetation
- Loss of avifauna habitat
- Loss herpetofauna habitat
- Establishment of pest plants
- Sediment discharge

All effects management has been to assess the potential effects in accordance with the Environmental Institute of Australia and New Zealand EcIA Guidelines (2018, second edition) (EIANZ Guidelines).

3.1. Vegetation Clearance

A total of 54 trees were felled within SEA_T_6062 as a direct impact of the installation of the WW bypass through Alberon Reserve (Appendix 6, Figure 3). These consisted of 18 native canopy trees including totara (*Podocarpus totara*), puriri (*Vitex lucens*), and nikau (*Rhopalostylis sapida),* and an approximated 20 native subcanopy trees including māhoe (*Melicytus ramiflorus*), and kanuka (*Kunzea ericoides*) with the remaining specimens being introduced species. A complete list of felled specimens is included in Appendix 6. The roots and foliage of various other trees were also pruned and/or damaged (Appendix 6). As this vegetation clearance was required for access, all woody debris and groundcover species were also removed from the ZOI (Figure 3). The total area of vegetation cleared was approximated at 810 sq m (Figure 1).

Figure 3: Vegetation clearance (Left) and temporary accessway and WW diversion (Right).

Without immediate reinstatement of vegetation in the ZOI, opportunistic pest plant species noted within Alberon Reserve have established within the works area. Species observed include blue morning glory, tradescantia, and brush wattle, additional species within the reserve that may establish in the ZOI include phoenix palm, Bangalow palm, tree privet, and Chinese privet. As the reserve is actively managed under the regional pest management plan (RPMP) (Auckland Council, 2019), scheduled pest plant control is likely undertaken throughout the reserve under usual conditions, however, the reserve is temporarily closed, and works under RPMP are likely halted. Subsequently, pest plants have been able to establish due to the removal of canopy vegetation and the absence of pest plant control.

Overall, the potential magnitude of effects on vegetation with no effects management has been assessed as **High** and the value of the vegetation has been assessed as **High**, therefore, the overall level of effect on vegetation, with no effects management, is considered to be **Very High**.

Ecological effects management was carried out for vegetation removal during the emergency works in Alberon Reserve. A suitably qualified and experienced arborist visited the site prior to vegetation removal to assess the vegetation removal activities. As the temporary WW line installed was somewhat flexible, the least destructive route was selected to **avoid** multiple specimen trees marked by the supervising arborist. These specimens included mature pohutukawa (*Metrosiderous excelsa*) and kahikatea (*Dacrycarpus dacrydioides*) trees (Appendix 7). In order to **mitigate** the impact of the works, geotextile fabric and mulch was laid over the roots of specimen trees adjacent to the access route for protection (Appendix 6) and juvenile specimens were relocated out of the EOI where practicable. These 49 relocated specimens are listed in Appendix 7.

Overall, the magnitude of effects on vegetation with currently employed effects management has been assessed as **Moderate** and the value of the vegetation has been assessed as **High**, therefore, the overall level of effect on vegetation with effects management is considered to be **High**.

Residual impacts include the loss of high-value SEA vegetation and the establishment of pest plant species in the EOI. Reinstatement and offsetting must be implemented to further reduce the residual effects of vegetation removal.

3.2. Avifauna

Vegetation removal in Alberon Reserve associated with the emergency works has resulted in indirect habitat loss for native avifauna as many of the canopy specimens removed were considered to be suitable foraging, nesting, and roosting habitats. While the total extent of habitat removal is minimal relative to the wider habitat availability of the Alberon Reserve 0.8 ha of suitable avifauna habitat was cleared. Additionally, these works were undertaken within bird nesting season (September to February) increasing the potential for deaths of juvenile avifauna.

Overall, the potential magnitude of effect on avifauna with no effects management has been assessed as **Very High** and the value of the avifauna has been assessed as **Low**, therefore, the overall level of effect on avifauna with no effects management is considered to be **Moderate**.

Ecological effects management was carried out for avifauna during the emergency works in Alberon Reserve. This management included multiple bird nesting surveys carried out by Morphum which resulted in all trees hosting nests to be marked and the clearance of these specimens being **avoided**. Results from these surveys found that while a song thrush nest remained occupied, one previously occupied Pīwakawaka (*Rhipidura fuliginosa*) with three eggs was abandoned, likely disturbed by the works.

Overall, despite the employment of effects management techniques for avifauna the magnitude of effect remains **Very High** and the value of the avifauna has been assessed as **Low**, therefore, the overall level of effect on avifauna with effects management is considered to be **Moderate**.

Residual impacts include the loss nesting and foraging habitat for avifauna. Offsetting must be implemented to further reduce the indirect effects of vegetation removal on avifauna. It is considered that the vegetation offsetting would also address the residual habitat loss for avifauna.

3.3. Herpetofauna

Lizard species known to be present within Alberon Reserve and the ZOI are listed as at-risk declining and are therefore considered high value (Appendix 4). Direct impacts of the works include the mortality of lizards during vegetation clearance and the establishment of a temporary accessway for machinery. Indirect impacts include the loss of lizard habitat resulting in a habitat fragmentation and loss of ground coverage for lizards. Prior to vegetation removal, there was a vegetated area of low growing species and woody debris providing good ground coverage for native skinks. Additionally, multiple kanuka, a species commonly associated with arboreal geckos, were removed during the works. Despite these losses, the extent of suitable lizard habitat in Alberon Reserve remains high.

Overall, the potential magnitude of effect on herpetofauna with no effects management has been assessed as **Very High** and the value of the herpetofauna has been assessed as **High**, therefore, the overall level of effect on herpetofauna with no effects management is considered to be **Very High**.

Ecological effects management was carried out for herpetofauna during the emergency works in Alberon Reserve. Lizard search and salvage was undertaken by RMA ecology and Morphum to **mitigate** the direct and indirect impacts of the works on herpetofauna (Appendix 4). This management included nighttime spotlighting of suitable canopy vegetation within the EOI for arboreal geckos both before and after clearance, however, no gecko specimens were found (Appendix 4). Additionally, daytime lizard search of all suitable habitats within the ZOI was undertaken prior to clearing resulted in the relocation of 7 copper skinks to a suitable habitat in a nearby reserve (Appendix 4, Figure 4).

It is recommended that habitat enhancement is undertaken in all areas where vegetation is reinstated following the removal of the temporary WW diversion. This should include the installation of multiple log stack refuges in areas where lizard habitat is known to have been present. In **reinstating** this habitat, there should be reduced temporary loss of skink habitat while the plantings mature.

Overall, by employing all effects management techniques for herpetofauna, the magnitude of effect remains **Very High** and the value of the avifauna has been assessed as **Low**, therefore, the overall level of effect on avifauna with effects management is considered to be **Moderate**.

Figure 4: Copper skink found in Ableron Reserve during search and salvage.

Overall, the magnitude of effect on herpetofauna with currently employed effects management effect has been assessed as **Moderate** and the value of the herpetofauna has been assessed as **High**, therefore, the overall level of effect on herpetofauna with effects management is considered to be **High**.

Residual impacts include the loss of skink and gecko habitat. Offsetting must be implemented to further reduce the indirect effects of vegetation removal on herpetofauna. It is considered that the vegetation offsetting and the additional lizard habitat (log piles) would also address the residual habitat loss for herpetofauna .

3.4. Sediment Control

Both the pipe and the footprint of a temporary access path crosses the two ephemeral flow paths seen in Figure 1. With no effect management, the accessway and pipe would temporarily disrupt ephemeral surface flows by damming overland flow. These ephementral flow paths are also considered to be a likely pathway for sediment runoff to reach the receiving storm water network and ultimately the Waitemata Harbour.

Best practice Erosion and Sediment Controls outlined in Appendix 8 in accordance with GD05 were implemented on site. The pipe has been raised on blocks at the point it intersects the western ephemeral flow path to **avoid** negative impacts. A section of the eastern flow path has been piped for approximately 4 m under the newly constructed temporary accessway (Figure 5) to maintain hydrology. The pipe was installed to **avoid** pooling and erosion of the eastern ephemeral flow path that may have resulted in sedimentation of the channel and the subsequent blockage of the receiving stormwater outlet at the northern end of Alberon Reserve. This pipe is to be removed on reinstatement. Additionally, temporary

bunding has been installed to divert flows from the temporary accessways into the eastern flow path to maintain the natural flow regime.

Overall, by employing all effects management techniques for sediment discharge, the magnitude of effect on the receiving environment is considered **Negligible**. While the value of the receiving environment cannot be assessed practicably, considering the negligible magnitude of effect from sediment release, no further management is required.

Figure 5: Culvert redirecting overland flow under the temporary accessway.

To continue to assess sediment control, the erosion and sediment control plan must remain in effect for the duration of the life of the bypass. In addition, the control plan should be revised to manage the pipe decommissioning and site reinstatement.

A summary of the level of effects before offsetting is provided in Table 4 below.

Table 4: Summary of Level of Effect of the undertaken activities with effects management (before offsetting).

Impact	Ecological Value (EIANZ, 2018)	Magnitude of Effect and Reasoning	Level of Effect (prior to management implementation)	Proposed Effects Management Measures and Magnitude post-Management.	Level of effect with current management
Vegetation	**High**	**High** – Loss of mature native canopy vegetation and understory within a SEA.	**Very High**	**Management:** Where possible, the removal of significant vegetation was **avoided** and seedlings were relocated outside of the ZOI. A planting plan is provided to **reinstate** the cleared vegetation following the removal of the temporary pipe. By following these avoidance practices and implementing remedial planting the magnitude of effect is reduced to **Moderate**.	**High**
Avifauna	**Low**	**Very High** – The clearance of vegetation in bird nesting season could potentially have had adverse direct effects on common native nesting avifauna present in the works area. Indirect effects include extensive loss of nesting and foraging habitat.	**Moderate**	**Management:** Nesting bird surveys were undertaken to **avoid** the felling of all trees with nesting birds. Despite this, one Piwakawaka nest was avoided, however this was unsuccessful. Indirect effects still include loss of nesting and foraging habitat which is partly addressed through reinstatement under the planting plan. By following these measures, the magnitude of effect has been reduced to **Moderate**.	**Moderate**

Impact	Ecological Value (EIANZ, 2018)	Magnitude of Effect and Reasoning	Level of Effect (prior to management implementation)	Proposed Effects Management Measures and Magnitude post-Management.	Level of effect with current management
Herpetofauna	**High**	**Very High** – The clearance of lizard habitat would likely have resulted in the direct mortality of many high-value skinks. Indirect effects include the loss of suitable skink habitat.	**Very High**	**Management:** Lizard search and salvage was undertaken prior to vegetation and ground clearance to **mitigate** any potential risk to native lizards. Multiple high-value skinks were relocated from the EIO. Following spotlighting surveys, it was considered that arborial geckos were absent from the site. To **avoid** any loss of habitat, skink refuges should be installed on site and planting restoration should be undertaken (see planting plan). In following these measures the magnitude of effect has been reduced to **Low**.	**Low**
Sediment Discharge	**NA**	**Moderate** – Potential for sediment discharge to the freshwater environment from the minor earthworks. Temporary modifications to the hydrology of an ephemeral watercourse and associated overland flow.	**NA**	**Management:** Installation of a culvert to maintain and manage hydrology. The implementation of best practice Erosion and Sediment Controls as outlined in Appendix 8 in accordance with GD05. Ongoing monitoring of the site as per Appendix 8. In following these measures, the magnitude of effect has been reduced to **Negligible**.	**Negligible - Low**

4. Residual Impacts and Offsetting

In following all effects management measures on the site discussed in Table 4, two residual ecological impacts remain at levels that require additional effects management:

- Loss of extensive mature vegetation within an SEA with a residual level of effect of **High**.
- Loss of extensive nesting and foraging habitat for avifauna associated with the vegetation clearance and a residual level of effect of **Moderate**.

It has been considered that these residual adverse ecological impacts can be addressed through biodiversity offsetting in addition to the site reinstatement. To determine the appropriate level of offsetting required, the Biodiversity Compensation Model (BCM) was utilised. The BCM was based on the current vegetation clearance extent.

The BCM uses inputs from the EIANZ (2018) guidelines, which are widely employed, providing clarity when assessing effects management options of offsetting and compensation.

The pre-works value is assessed against the impact of the works producing the impact value (biodiversity losses). The effects management actions are then assessed against the same guideline to assess if adverse effects can be shown to be appropriately addressed. The aim of the biodiversity offset is to demonstrate that there is No Net Loss (NNL) or a Net Gain (NG) in biodiversity/ecological values after enhancement actions have been employed.

The results of the BCM modelling are presented in Table 5. The effects management efforts (Planting) would see a 11.8% increase in ecological value of the 20-year finite end point. The total impact score of works was calculated at -0.06859 for vegetation removal which involves replating 0.28 ha of native vegetation resulting in a compensation score of 0.07671.

A planting plan (Appendix 9) has been prepared that takes into consideration the native species removed, species that form the VS5/WF7 ecosystem types. This plan accounts for the reinstatement of cleared vegetation of 810 sq m (reinstatement planting), however, additional plans are required for the 1990 sq m required for offsetting. It is anticipated this planting will be undertaken in the adjacent open greenspace within the Reserve. This may require Parks approval, and the location of the offset planting has not been secured.

If implemented, the reinstatement and offset planting will create a **Net Gain** in the overall level of effect compared to a **High** level of effect on vegetation and herpetofauna and **Moderate** level of effect on avifauna prior to replanting as calculated by the BCM model outputs.

It is understood that the installation of the pipe through Alberon Reserve is a temporary WW bypass that will be decommissioned upon the completion of a permanent fix to the Ōrākei main sewer. The removal of the (DN630 mm PE) pipe will likely require the use of machinery access routes cleared for installation prolonging all impacts until this date. It is important that any restorative actions taken for effects management are implemented after the decommissioning of the bypass and all associated works. It is anticipated that restoration will commence within 3 years of the initial impact.

Table 5: BCM model outputs and calculations (Baber *et al*, 2021b).

Model Inputs		
Input descriptors	**Input data**	**Commentary**
Project/reference name	Orakei Main Sewer Emergency Response	
Biodiversity type	Terrestrial Vegetation	
Technical expert(s) input	Fergus White, Andrew Rossaak	
Benchmark	5	Default benchmark
How many habitat types OR sites are impacted	1	Alberon Reserve Terrestrial Vegetation
Number of proposed compensation actions	1	Plantings
Net gain target	10%	Default for compensation (to allow for some contingency)
Habitat/Site Impact(s)	**Removal of Terrestrial Vegetation**	
Impact risk contingency:	3	High. The value of SEA vegetation removed has been assessed as High Value.
Impact uncertainty contingency:	2	Moderate. Pest species are opportunistic and can outcompete native species.
Areal extent of impact (ha):	0.081	
Value score prior to impact:	3.5	High (diversity and SEA) yet many exotic and weedy species are present.
Value score after impact:	0.001	Negligible (completely removed)
Compensation Action(s)	**Reinstatement and Additional Plantings**	
Discount rate:	3.0%	Default
Finite end point (years):	20	Estimated age to provide canopy cover and habitat for native birds.
Compensation confidence contingency:	2	High. The planting plan has been prepared by an ecologist and the reinstatement site has favourable conditions. Site for offsetting is not yet confirmed.
Areal extent (ha) of compensation type:	0.28	On site reinstatement and offsetting
Value score prior to compensation:	0.001	Negligible. The reinstatement area has been cleared and it is anticipated offsetting will occur in open grassland.
Value score after compensation:	3	After 20 years more diverse native species than pre-impact based on the proposed planting plan, however, the age will still not reflect the pre-impact vegetation.

Model outputs

	Total impact score
Impact score	-0.06859
	Total compensation score
Compensation score	0.07671
Net gain outcome	11.8%

5. Conclusions and Recommendations

This Ecological Impact Assessment has been prepared to support the retrospective resource consent application for the emergency works undertaken to remediate a broken wastewater (WW) line on St Georges Bay Road, Parnell. On 25 September, the collapse of the sewer main formed a large sinkhole in Parnell blocking the WW system. Consequently, untreated wastewater was discharging into the Waitamata receiving environment, necessitating the emergency bypass initiated under emergency provisions (s330) of the Resource Management Act. This assessment considers only the effects resulting from the bypass pipe being routed through an SEA, and does not consider any effects of the wastewater discharges to the Waitemata as a consequence of the pipe collapse.

The works to date consisted of removal of an estimated 810 sq m of a significant ecological area to support the installation of a (DN630 mm PE) pipe WW bypass and associated accessway through in Alberon Reserve. An ephemeral watercourse that runs through the reserve has been temporarily rerouted through a culvert under the accessway to maintain site hydrology and limit sediment runoff.

The current ecological values associated with the site have been assessed as **High** for terrestrial vegetation and herpetofauna and **Low** for avifauna based on a desktop review of literature and databases, lizard surveys, bird nesting surveys, and other on-site observations.

The emergency works undertaken include vegetation removal, redirecting stormwater flow, and general construction activities. Potential and realised effects include the following:

- Removal of vegetation and the associated loss of ecosystem services, including habitat provision and increased ''edge effects" for the remaining vegetation.
- Sediment, and potentially other pollutant, discharge during works.
- Injury and/or mortality to native skinks and nesting avifauna.
- Additional disturbance and displacement of native fauna through noise and vibration produced by machinery use during works.

The magnitude of the potential effects of these activities is considered to be Negligible to High across the various ecological components. The High magnitude of impact has been caused by terrestrial vegetation removal associated with the WW remedial works.

Effects management measures implemented to date include the routing of the pipe around significant trees and relocation of seedlings where practicable. Lizard management has been undertaken to salvage native lizards within the footprint of the vegetation removal. It is also recommended habitat enhancement for lizards is undertaken. Bird nesting surveys were undertaken prior to vegetation removal and all trees with nests were avoided. Best practice erosion and sediment controls have been implemented on site in accordance with GD05.

Considering both the existing ecological values and the magnitude of impacts (after the mitigation noted above but prior to offsetting) and the Contractors methodology, the level of

effect has been assessed as **Negligible** to **High** across the various ecological components (Table 4).

The primary residual effects relate to edge effects and loss of habitat from vegetation removal. To determine the appropriate level of offsetting required, the Biodiversity Compensation Model (BCM) was utilised. The BCM was based on revegetation of the works area as per the proposed planting plan. For clarity, the proposed effects management here includes both site reinstatement and **offsetting** of the residual effects. 810 sq m of planting is to reinstate the vegetation removed to facilitate remedial WW works as per Appendix 9 and 1990 sq m of planting to offset the residual effects associated with time lag in achieving the pre-impact biodiversity values. The combined reinstatement and offsetting efforts would see a 11.8% increase in ecological value of the 20-year finite end point for the site. Therefore, the ecological values of the site are returned to what they were prior to construction activities.

Subject to the recommendations within this report, the effects of the temporary WW bypass pipe on the ecological values of the works area have been assessed as **Net Gain** – **Very Low** as the impacts were largely mitigated at installation and remedial restoration and offsetting is planned through the planting of native flora. The description of low level of effect from the EIANZ assessment guidelines is:

> *Low and Very Low categories should not normally be of concern, although normal design, construction and operational care should be exercised to minimise adverse effects. If effects are assessed taking impact management developed during project shaping into consideration, then it is essential that prescribed impact management is carried out to ensure Low or Very Low level effects.*

The implementation of the recommendations in this report would ensure that the installation of the bypass pipe through the reserve has had a very low level of effect. The primary recommendations to manage the ongoing residual effects are:

- Site reinstatement of cleared areas of the 810 sq m of native vegetation removed. Reinstatement will be undertaken as per the proposed planting and pest management plan (Appendix 9).

  Offset planting with native vegetation of 1990 sq m for which an additional planting plan should be prepared that supports the VS5/WF7 ecosystem types.
- The construction of lizard habitat within the reinstatement footprint.
- Ongoing monitoring of sediment control measures for the life of the bypass pipe as per the sediment control memo (Appendix 8).
- A decommissioning plan to manage additional environmental impacts during this process.

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Appendix 1 Assessment of Effect Methodology

Table 6: Assigning value to species, vegetation, and habitats (summarised from EIANZ, 2018).

Value	Species Values	Vegetation/Habitat Values
Very High	Nationally threatened species found in the (Zone of Influence) ZOI either permanently or seasonally	Area rates High for 3 or 4 attributes (Representativeness, Rarity/distinctiveness, Diversity and pattern, Ecological context). Likely to be national important and recognised as such
High	Species listed as At Risk – Declining, found in the ZOI either permanently or seasonally	Area rates High for 2 of the attributes, Moderate and Low for the remainder, or Area rates High for 1 assessment matters, Moderate for the remainder Likely to be regionally important and recognised as such
Moderate	Species listed as any other category of At Risk, found in the ZOI either permanently or seasonally, or Locally (ED) uncommon or distinctive species	Area rates High for 1 assessment matters, Moderate and Low for the remainder, or Area rates Moderate for 2 or more of the attributes, Low or Very Low for the remainder Likely to be important at the level of the Ecological District
Low	Nationally and locally common indigenous species	Area rates Low or Very Low for majority of assessment matters and Moderate for 1 Limited ecological value other than as for habitat for tolerant native species
Negligible	Exotic species, including pest species having recreational value	Area rates Very Low for 3 matters and Moderate, Low or Very Low for remainder

Table 7: Criteria for describing magnitude of effect (summarised from EIANZ, 2018).

Magnitude	Description
Very High	Total loss of or major alteration to key features of the baseline condition causing a fundamental change or complete loss of the character, composition, or attributes of the site.
High	Major loss or major alteration to key features of the baseline condition causing a fundamental change of the character, composition, or attributes of the site.
Moderate	Loss or alteration of one or more key features of the baseline condition causing a partial change to the character, composition, or attributes of the site.
Low	Minor shift away from baseline conditions. Change may be discernible but underling character, composition, or attributes of the site will be similar to pre-development.

Negligible	Very slight change from existing baseline condition. Change barely distinguishable.

Table 8: Criteria for describing level of effects (from EIANZ, 2018).

		Ecological Value				
		Very High	**High**	**Moderate**	**Low**	**Negligible**
Magnitude	**Very High**	Very High	Very High	High	Moderate	Low
	High	Very High	Very High	Moderate	Low	Very Low
	Moderate	High	High	Moderate	Low	Very Low
	Low	Moderate	Low	Low	Very Low	Very Low
	Negligible	Low	Very Low	Very Low	Very Low	Very Low
	Positive	Net gain	Net gain	Net gain	Net gain	Net gain

Appendix 2 Nesting Bird Memo

MORPHUM environmental

Memorandum

Date:	17/10/2023
To:	Sifa Pole
From:	Fergus White
Project Number:	P04326
Reviewed by:	Ryan Adam; Jason Smith;
Released by:	Andrew Rossaak

Subject: Ōrākei Sewer Emergency Works Bird Nesting Survey

Introduction

Morphum Environmental Limited (Morphum) have been engaged by Watercare to provide ecological support to facilitate the temporary bypass pumping after the Ōrākei Main Sewer Line collapsed near St Goerge's Bay Road, Parnell. The temporary bypass is considered emergency works and was required to be installed to prevent wastewater discharges to the Waitematā Harbour.

The temporary bypass (DN630 mm PE pipe) was being constructed from St Georges Bay Road and is being diverted through Alberon Reserve which is a Significant Ecological Area (SEA_T_6062). To avoid direct negative impacts on avifauna, three days of bird nesting surveys were undertaken prior to the clearance of any potential nesting vegetation marked for removal. A summary of these surveys is provided below.

Methods

Bird nesting surveys were undertaken by Environmental Scientists, Jason Smtih, Ryan Adam, and Kendall Vaughan from Morphum Environmental. The methodology for undertaking the bird nesting surveys is as listed:

- Examining hollows, limbs and the crowns of trees for potential nest sites
- Listening for chicks in nests
- 10-minute observations and monitoring for bird movements out of potential nest sites
- Manual searching through undergrowth.

Results

- 4/10/2023: Four person-hours of nesting bird surveys were undertaken of the vegetation marked for removal. One nest was observed located on the limb of a mature Kānuka (*Kunzea ericoides*) marked for removal. No nesting birds were observed, this nest was likely abandoned prior to the initiation of emergency works as closer inspection also revealed a lack of any eggs. This tree was not required to be removed.
- 5/10/2023: Six person-hours of nesting bird surveys resulted in one Pīwakawaka (*Rhipidura fuliginosa*) nest and one Song thrush (*Turdus philomelos*) (Figures 1 & 2). The two nests are located within one meter of the works footprint for the alignment of the temporary diversion (Figure 3). Exclusion zones were set up around the nests and protected from the works footprint, however the standard 10 m exclusion zone could not be achieved due to the emergency works footprint, an exclusion zone of 1 m was achieved. While alternative options were considered, the decision was made to leave the nests in place and exercise care when manoeuvring around them as this would likely give the best chance of survival.
- 6/10/2023: One person-hour of nesting bird surveys. in the remaining trees to be removed took place. No additional nests were observed.
- 12/10/2023: Following the installation of the temporary sewer bypass, one person-hour of nesting bird surveys was undertaken for the previously identified nests located on 5/10/2023. The Song thrush nest remained occupied. After 30 minutes observing the Pīwakawaka (*Rhipidura fuliginosa*) nest, no adult individuals were sighted. Three eggs were found in the disturbed nest which were unlikely to hatch with no brooding parents. The nesting pair were potentially disturbed by the noise and vibration associated with temporary bypass installation or pest species such as rats which were observed by Morphum on site. It is likely the breeding pair relocated to establish a new nest elsewhere.

Figure 1: Pīwakawaka (*Rhipidura fuliginosa*) nest in a kohekohe (*Didymocheton spectabilis*).

Figure 2: Song thrush (*Turdus philomelos*) nest in a māhoe (*Melicytus ramiflorus*).

Figure 3: Location of nests in Alberon Reserve.

Summary

A series of bird nesting surveys were conducted by Morphum with the intention to identify nests within the works footprint of the installation of the temporary sewer diversion through Alberon Reserve. Measures were then taken to avoid the felling of trees with nesting birds. Following the emergency works, subsequent bird nesting surveys revealed that the effects on the resident bird community were likely limited. Aside from a single fantail nest which was likely disturbed by the emergency works, no other impacts were observed or otherwise noted.

Please do not hesitate to contact me if you have any queries regarding this memorandum.

Fergus White
Environmental Scientist
Morphum Environmental Ltd
021 437 961
Email: fergus.white@morphum.com

Appendix 3 Lizard Salvage Memo

Memo

To:	Brett Chick; ACH	Job No:	2232
From:	Mark Newton; RMA Ecology Ltd	Date:	12 February 2024
cc:	Graham Ussher; RMA Ecology Ltd, Kendall Vaughan, Morphum Environmental Ltd		
Subject:	Orakei Sewer Main Emergency Works: Lizard Salvage		

Dear Brett,

A sinkhole formed off St Georges Bay Road, Parnell, that impacted a sewer main necessitating the installation of a temporary overland wastewater pipeline bypass along St George Road and through a Significant Ecological Area (SEA_T_6062) in Alberon Reserve to divert wastewater around the sinkhole and then back into the wastewater network (Figure 1).

Additionally, an access road needed to be constructed from Alberon Street into Alberon Reserve to facilitate construction activities.

The temporary bypass is considered emergency works and was required to be installed to prevent wastewater discharges to the Waitematā Harbour (believed to be more than 150 L/s). The required emergency works within Alberon Reserve involved vegetation clearance and land disturbance. These activities occurred in areas of native lizard habitat.

This report confirms that a preclearance lizard salvage was undertaken at the site and details the methods and results of the lizard salvage.

In total, seven native copper skinks were salvaged within the works footprint at Alberon Reserve and transferred to good quality lizard habitat in Newmarket Park.

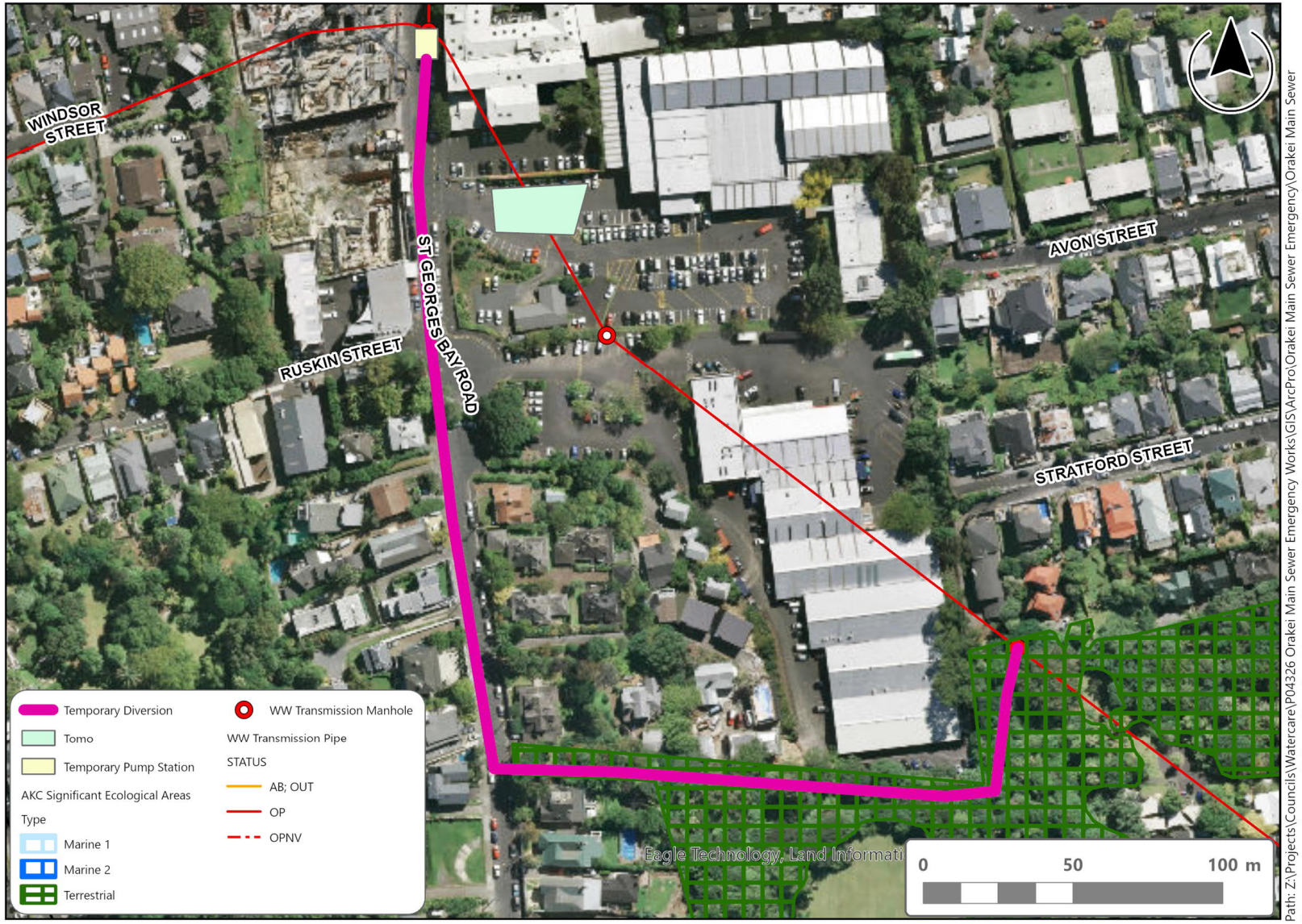


Figure 1. Approximate location of the temporary sewer main pipeline.

1 Lizard records nearby the site

National Herpetofauna Database records indicate the presence of three native lizard species within three kilometres of the site (Table 1).

Table 1. Native lizard species within 3 km of the site.

Species	Conservation status	Number of records
Copper skink (Oligosoma aeneum)	At Risk - Declining	13
Ornate skink (Oligosoma ornatum)	At Risk - Declining	1
Forest gecko (Mokopirirakau granulatus)	At Risk - Declining	1

2 Site walkover and habitat survey

Mr Ryan Adam (Morphum Environmental) and Mr Mark Newton (RMA Ecology) undertook a site walkover on 3 October 2023 to survey and map areas of potential native lizard habitat within the construction footprint (Figure 2).

The survey identified five potential lizard habitat types at the site. Habitat types were:

- mature kanuka amongst native and exotic forest
- mature mixed native and exotic forest, including areas of deep leaf litter and scattered woody debris on the ground. Tree species included mature pūriri (Vitex lucens), nīkau (Rhopalostylis sapida), karaka (Corynocarpus laevigatus), poplar (Populus sp.), fishtail palm (Caryota sp.), banana (Musa sikkimensis) and pohutukawa (Metrosideros excelsa)
- leaf litter and shrubs: approximately 100 m^2 leaf litter, tradescantia, shrubs, and woody debris
- three garden waste piles of approximately 25 m^2, 10 m^2, and 20 m^2, and
- scattered woody debris.

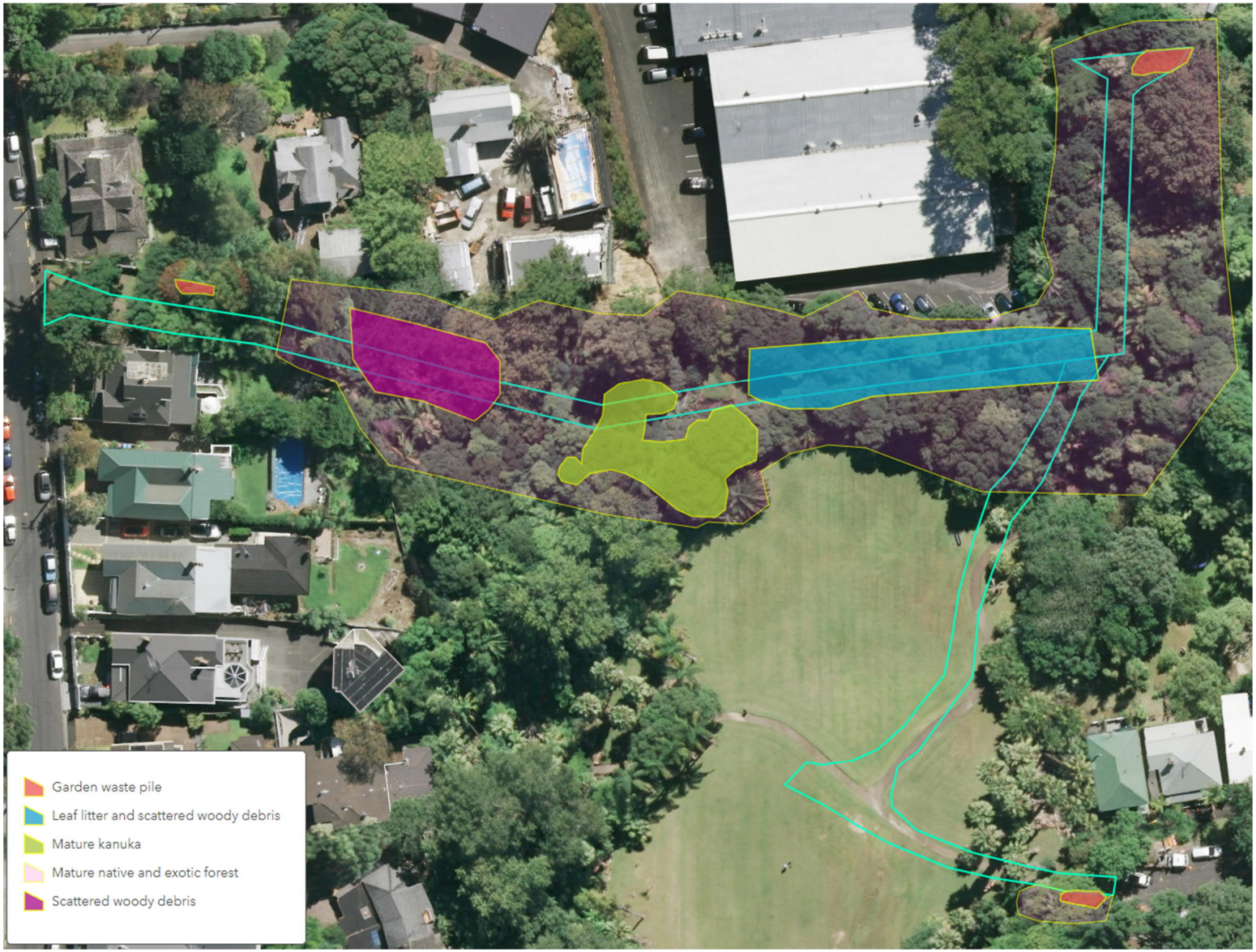


Figure 2. Potential lizard habitat at the site. The approximate vegetation clearance footprint is indicated by the turquoise line.

3 Salvage methods

The personnel undertaking the salvage works included Mr Ryan Adam (Morphum Environmental, ecologist), Mr Mark Newton (RMA Ecology, ecologist) Ms Kendall Vaughan (Morphum Environmental, ecologist), and Mr Fergus White (Morphum Environmental, ecologist). Dr Graham Ussher was the project herpetologist. Dr Ussher has many years' experience capturing, handling and relocating native lizards throughout New Zealand, including the lizard species in the Auckland Region.

3.1 Manual search

Manual searching was undertaken on 04, 05, and 06 October. Manual search methods included raking areas of deep leaf litter, dismantling/overturning scattered woody debris, dismantling garden waste piles, and raking tradescantia. All applicable potential native lizard habitat within the works footprint was searched using these methods.

A total of 31.5 person hours were spent conducting manual searches for native lizards within the works footprint.

Seven native copper skinks were captured by hand searching.

3.2 Search of felled vegetation

During tree clearance, at least two ecologists worked with the arborists to search the foliage, trunks, branches, and cavities of trees that were felled. This search method was conducted on 05 and 06 October for a total of 4.5 person-hours.

A further nocturnal search of the felled vegetation was undertaken on 05 October. Two ecologists used appropriate torches to systematically search the foliage, trunks, branches, and cavities of trees that were lying on the ground. This included both up-close searching, as well as from further back to look for eye shine. This method of searching was used for a total of one person-hour.

No native lizards were found using this search method.

3.3 Nocturnal search

Nocturnal searches were undertaken on the evenings of 03 October and 05 October. All applicable potential arboreal gecko habitat within the construction footprint was searched via nocturnal searching. This included mature mixed native and exotic forest, and mature kānuka habitat.

Nocturnal searching was undertaken in ideal conditions for lizard activity during calm evenings and involved using appropriate torches and headlamps to search foliage within the footprint. Temperatures on both nights were between 12.5° and 13° C.

A total of 4.5 person-hours were expended in nocturnal searching. No native lizards were salvaged using this method.

4 Data collection

When a lizard was captured it was immediately transferred to an aerated container that contained leaf litter for cover. If the lizard was identified as a native species, the following information was recorded;

- Capture site;
- Capture technique;
- Sex;
- Snout-vent length;
- Tail length (full tail length, and break to tip length, if the tail is regenerated);

- Gravidity of female animals; and
- Photograph of dorsal surface

See Appendix B for biometric information collected during this lizard salvage.

Exotic species were released immediately onsite rather than being transferred to a release site. No data was collected for exotic lizards.

5 Conclusions

A total of seven native copper skinks (Oligosoma aeneum) were salvaged within the works footprint. Four copper skinks were captured in garden waste piles, and three in leaf litter on the forest floor of the mature mixed native and exotic forest habitat.

Total search effort was 41.5 person-hours was expended over the entire lizard salvage operation. This equates to a catch per unit effort of one native lizard per six hours of searching.

Vegetation and lizard habitat was cleared immediately following salvage, and it is recommended that those areas are managed in a way that does not allow lizard habitat to re-establish.

All of the captured copper skinks were released into good habitat at Newmarket Park, approximately one kilometre to the south. The release site contained dense native scrub and decomposing woody debris suitable for copper skinks, and a pest trapping programme is in place as evidenced by the many pest traps observed while at the park.

The salvage was undertaken in accordance with the site Lizard Management Plan, DOC Wildlife Permit 101814-FAU.

An ARDS card with capture details has been submitted to DOC in accordance with the LMP (Appendix C).

Yours sincerely,

Mark Newton

Ecologist[1]

12-Feb-24
g:\shared drives\rma ecology main drive\rma ecology ltd\active projects\2232 morphum lizards\working\alberon reserve\lizard salvage_2232_orakei_sewer_main_feb2024.issued.docx

[1] This report has been prepared for the benefit of our Client with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement. Any use or reliance by a third party is at that party's own risk. Where information has been supplied by the Client or obtained from other external sources, it has been assumed that it is accurate, without independent verification, unless otherwise indicated. No liability or responsibility is accepted by RMA Ecology Limited for any errors or omissions to the extent that they arise from inaccurate information provided by the Client or any external source.

Appendix A – Site photos

Plate 1 (left). One of two garden waste piles in Alberon Reserve. Four copper skinks were salvaged from this area.

Plate 2 (right). Leaf litter and scattered woody debris in Alberon Reserve.

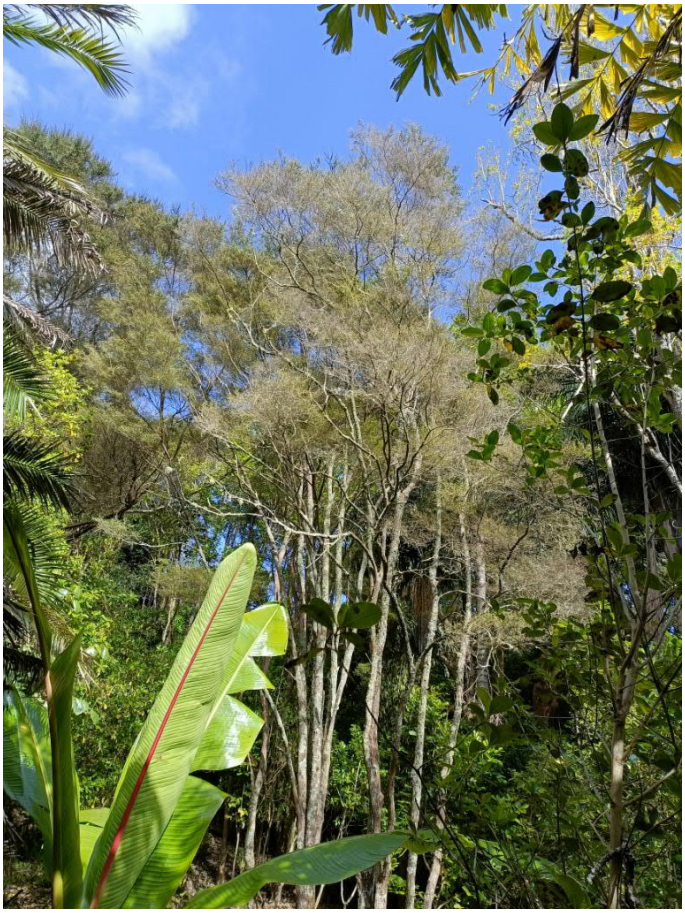


Plate 3 (left). Mixed native and exotic forest.

Plate 4 (right). Mature kanuka trees amongst mixed native and exotic forest.

Plate 5 . Two ecologists conduct a manual search in leaf litter in the mature mixed native and exotic forest at Alberon Reserve. Three native skinks were salvaged in leaf litter using this search technique.

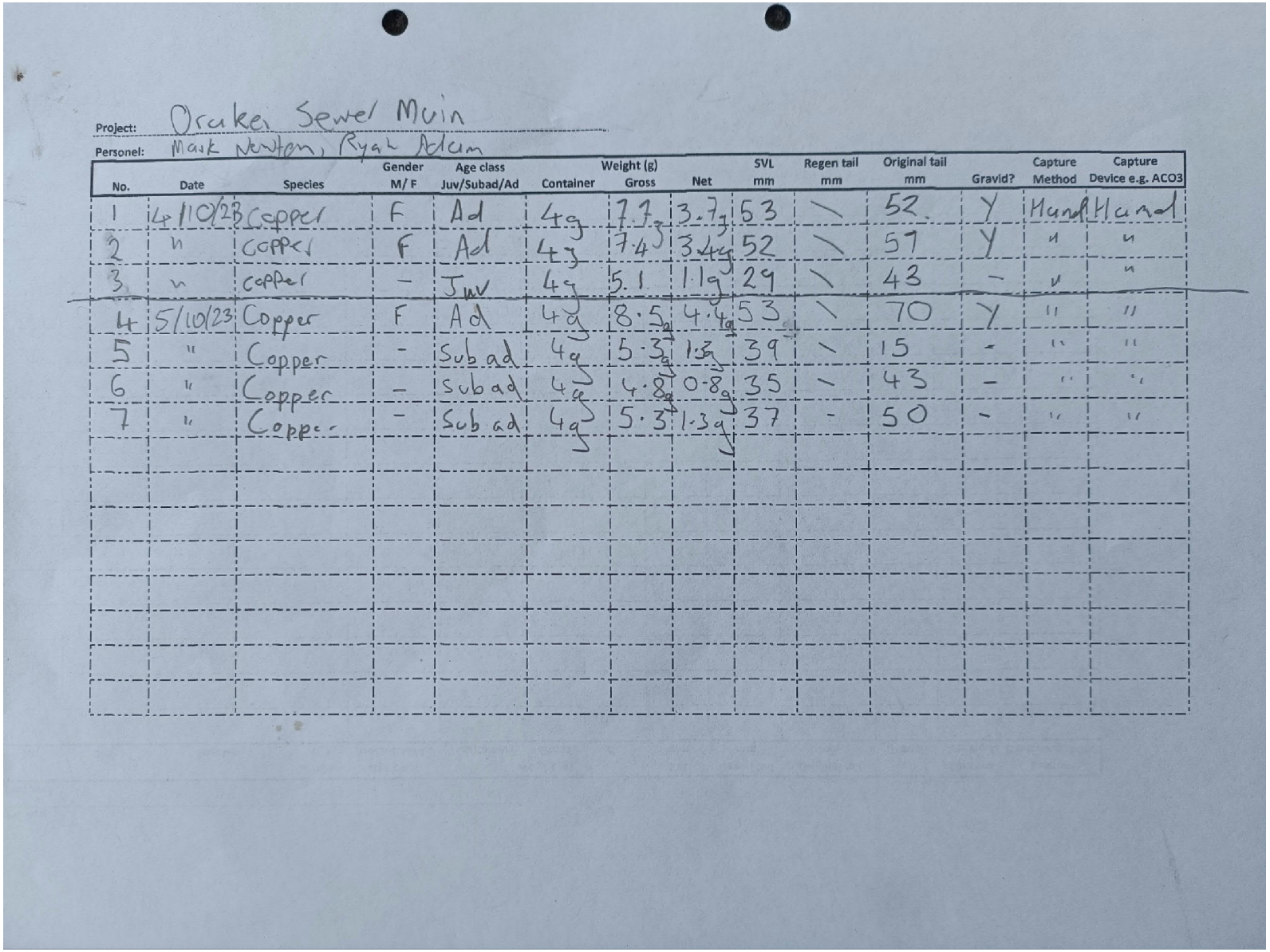
Plate 6 (left). An ecologist searches through the foliage, branches, trunks, and cavities of felled mature kānuka.

Plate 7 (right). A copper skink salvaged at Alberon Reserve that was released into Newmarket Park.

Plate 8 (left). The release site at Newmarket Park contained decomposing logs and dense native scrub.

Plate 9 (right). The release site at Newmarket Park.

Appendix B – Biometric lizard data



Project: Orakei Sewer Main

Personel: Mark Newton, Ryan Adam

No.	Date	Species	Gender M/F	Age class Juv/Subad/Ad	Container	Weight (g) Gross	Net	SVL mm	Regen tail mm	Original tail mm	Gravid?	Capture Method	Capture Device e.g. ACO3
1	4/10/23	Copper	F	Ad	4g	7.7g	3.7g	53	\	52.	Y	Hand	Hand
2	"	Copper	F	Ad	4g	7.4g	3.4g	52	\	57	Y	"	"
3	"	Copper	-	Juv	4g	5.1	1.1g	29	\	43	-	"	"
4	5/10/23	Copper	F	Ad	4g	8.5g	4.4g	53	\	70	Y	"	"
5	"	Copper	-	Subad	4g	5.3g	1.3g	39	\	15	-	"	"
6	"	Copper	-	subad	4g	4.8g	0.8g	35	\	43	-	"	"
7	"	Copper	-	Subad	4g	5.3	1.3g	37	-	50	-	"	"

Appendix C – ARDS Card

ARDS CARD

NEW ZEALAND AMPHIBIAN/REPTILE DISTRIBUTION SCHEME
Herpetofauna Administrator, Department of Conservation, P.O. Box 644, Napier.

Bioweb-Herpetofauna Card No:

Observer: M (Initials) Newton (Surname)

Date: 04/10/2023 – 06/10/2023

Alt (m)

Locality Name: Alberon Reserve, Parnell

Address: 12 Alberon Place, Parnell, Auckland

Affiliation: RMA Ecology Ltd.

	Easting	Northing
GPS	-36.864	174.783
Series / Map No.		
Easting		
Northing		

Area Office:

Conservancy:

Ecol. District: Tamaki

Species name	No.	Time	Habitat	Weather
Oligosoma aeneum	3	11am – 5pm	3/4, H	1,2,1
Oligosoma aeneum	4	2pm – 5pm	3/4, E	1,2,1

Voucher specimen(s) Yes/No Specify:

Photograph(s) Yes/No

Extra notes on reverse side Yes/No

Notes: Skinks were salvaged in Alberon Reserve as part of emergency tree clearance works and earthworks to install a temporary sewer main. Released in to Newmarket Park.

Identified by: Mr Mark Newton
Authority used: Dr Graham Ussher Permit number: 101814-FAU

Weather

Light
1 Fine/Sunny
2 Part Cloudy
3 Overcast
4 Showers
5 Rain
6 Night
7 0-½ Moonlit
8 ½-1 Moonlit

Temperature
1 Hot
2 Warm
3 Moderate
4 Cool
5 Cold

Wind
1 Calm
2 Light breeze
3 Mod breeze
4 Gusty
5 Strong winds

Major Habitat Types

1 Beech Forest
2 Podocarp forest
3 Broadleaf forest
4 Exotic forest
5 Scrub
6 Sub-alpine
7 Alpine
8 Undeveloped tussock land
9 Developed farmland
10 River terrace
11 Fresh water
12 Wet land
13 Coastal
14 Scree
15 Bare rocks
16 Beach
17 Urban
18
19
20

Micro habitats

A Foliage
B Trunk
C Branches
D Under stones
E Under wood
F Open ground
G Crevices
H Leaf litter

Appendix 4 Stream Classification Memo

MORPHUM environmental

Memorandum

Date:	27/10/2023
To:	Sifa Pole
From:	Fergus White
Project Number:	P04326
Reviewed by:	Ryan Adam and Jason Smith
Released by:	Andrew Rossaak

Subject: Ōrākei Sewer Emergency Works Stream Classification

Background

Morphum Environmental Limited (Morphum) have been engaged by Watercare to provide environmental support to facilitate the temporary bypass pumping after the Ōrākei Main Sewer Line collapsed near St Goerge's Bay Road, Parnell. The temporary bypass (DN630 mm PE pipe) was constructed from St Georges Bay Road and was diverted through Alberon Reserve. An unclassified watercourse flows through the Northeastern corner of the reserve, previously identified as a potential overland flow path on the Auckland Council GeoMaps. Installation of the wastewater diversion required the construction of a temporary access route for heavy machinery crossing this unclassified watercourse.

Morphum were sub-contracted by ACH Consulting who were engaged by Watercare assist with the the Ōrākei Main Sewer Line collapsed. This memo provides a classification assessment of the watercourse in accordance with the definitions of the Auckland Unitary Plan: Operative in Part (AUP:OP).

Description

A site walkover was undertaken on the 3rd of October 2023 within the watercourse classification period recommended by Auckland Council (July to October). The definition of an ephemeral stream from the AUP:OP infers that watercourse classification should occur 48 hours after a significant rainfall event that would have resulted in stream flow to allow an assessment of water retention. Given the steady rainfall in the week prior the site walkover, the minimal rainfall 48 hours before would likely have been sufficient to induce flow (Table 1).

Table 1: Dates and depth of rainfall in the days prior to the field assessment (Albert Park weather station).

Date	Daily Rainfall (mm)
28/09/2023	7
29/09/2023	2.5
30/09/2023	9
01/10/2023	0
02/10/2023	4.5
03/10/2023 (prior to site visit)	0.5
Total Rainfall (mm)	**23.5**

The site watercourse is fed by stormwater from nearby residential properties on Alberon Street flowing through the reserve and into a flood prone area at the Northern end of the site before returning to the water table below ground level (Figure 1). Surface water was present in patches along much the reach with a wetted width of up to 40 cm. The bed was poorly defined identified only by either surface water or wet soils (Figure 2). In the diversion path a series of shallow pools (<5 cm deep) with a maximum wetted width of 40 cm (Figure 3) were present.

The watercourse is shaded by mature trees comprised of various native forest species with exotic palms and pest plants typical of forest in the surrounding area. While some woody species associated with riparian margins such as māhoe (*Melicytus ramiflorus*) and kanuka (*Kunzea ericoides*) were present, no hydrophilic groundcovers or shrubby species were observed.

Classification

The watercourse is located within a depression in the landscape where a natural hydrological system could be expected. The upstream catchment has been heavily developed for residential use and there is a substantial proportion of impervious surfaces.

The AUP:OP defines a permanent river or stream as: *the continually flowing reaches of any river or stream.* At the time of the site visit there was no surface flow so the watercourse cannot be considered permanent.

The AUP:OP defines an intermittent stream as: *Stream reaches that cease to flow for periods of the year because the bed is periodically above the water table. This category is defined by those stream reaches that do not meet the definition of a permanent river or stream and meet at least three of the following criteria [as listed in Table 2].* At the time of the site visit there was no surface flow so the watercourse cannot be considered intermittent despite steady rainfall the week prior to the walkover. Additionally, only two of the criteria listed in table 2 were met.

The AUP:OP defines an ephemeral stream as: *Stream reaches with a bed above the water table at all times, with water only flowing during and shortly after rain events. This category is defined as those stream reaches that do not meet the definition of permanent river or stream or intermittent stream.*

Table 2: Criteria for Identifying ephemeral Watercourses (AUP:OP)

Criteria	Assessment of evidence	Result
It has natural pools.	Isolated pools were present throughout the reach containing evidence of deposition.	**Criteria met**
It has a well-defined channel, so that the bed and banks can be distinguished.	No bed or banks were distinguishable.	**Criteria not met**
It contains surface water more than 48 hours after a rain event which results in stream flow.	There was likely rainfall in the 48 hours prior to the site assessment which resulted in stream flow. Surface water was present as isolated shallow ponds.	**Criteria met**
Rooted terrestrial vegetation is not established across the entire cross-sectional width of the channel.	Terrestrial vegetation was rooted within the channel at multiple points (Figure 4).	**Criteria not met**
Organic debris resulting from flood can be seen on the floodplain.	The watercourse lacks a defined floodplain and the lack of upstream sources of organic debris means that this criteria was not able to be assessed.	**Could not be assessed with confidence**
There is evidence of substrate sorting process including scour and deposition.	Substrate was uniform across the bed; no evidence of substrate sorting was observed.	**Criteria not met**

This assessment was completed within the period recommended stream classification period (July to October), and following a week of steady rainfall (Table 1). It could be expected for a permanent or intermittent stream that these conditions would result in flow, however, no surface flowing was observed, only standing water (pooling). One criteria (criteria 5) could not be assessed as the watercourse had no distinguishable floodplain and no upstream source for debris (Table 2). Criteria 1 and 3 were met (Table 2) as pools were present within the reach. While there was no discernible flow surface water was present throughout much of the reach. The flow path also terminates in front of 20 Stratford Street, Parnell to no outlet and the flow path has no connectivity with any other watercourse of stormwater system downstream.

Overall, with two criteria met, it is considered that the site watercourse is likely to be an ephemeral watercourse.

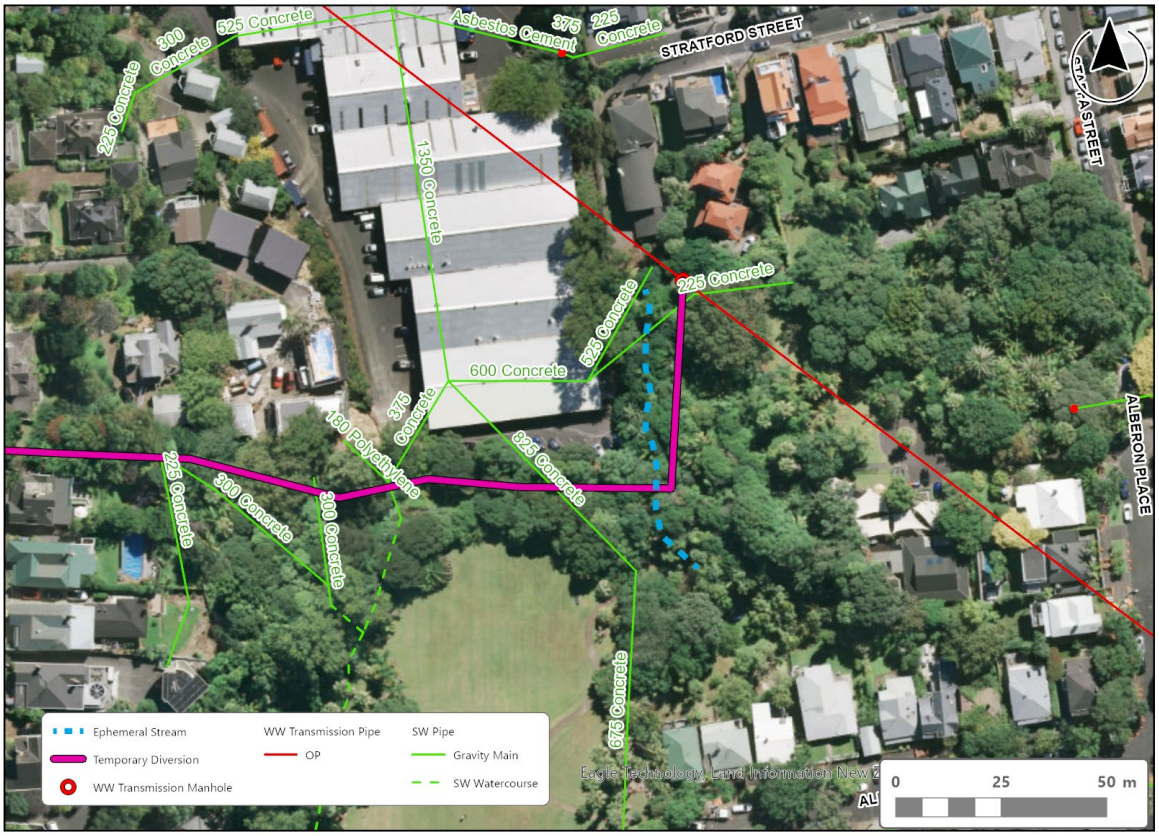


Figure 1: Map of site including the location of the temporary diversion.

Figure 2: Minimal surface water with no clearly defined channel.

Figure 3: Evidence of pooling.

Figure 4: Rooted vegetation established across the channel.

Summary

A watercourse assessment was conducted by Morphum prior to the emergency works undertaken by Watercare in Alberon Reserve. Upon assessment of the watercourse, it is considered that the site watercourse is likely to be an ephemeral watercourse.

Please do not hesitate to contact me if you have any queries regarding this memorandum.

Fergus White
Environmental Scientist
Morphum Environmental Ltd
Email: fergus.white@morphum.com

Appendix 5 Arborist Report

CRAIG WEBB
Consultant Arborist

MEMORANDUM

Re: Orakei Trunk Sewer – Emergency repairs

Date:	14 December 2023
To:	Bernardo Santos – Auckland Council Urban Forest Specialist
	Julia Bailey – March Cato Contractors
	Ryan Adam – Morphum Environmental Limited
From:	Craig Webb
Subject:	**Record of tree removal and recommendations for remediation of vegetation clearance**

INTRODUCTION

A sinkhole on the Orakei trunk sewer main has necessitated emergency works that affect Council-owned trees in roads and Alberon Reserve, Parnell. Due to the significance of harm from sewerage overflows, remedial works were initiated under emergency provisions (s330) of the Resource Management Act. The remedial works involved installation of a temporary pipe to divert the flow of wastewater around the sink hole location. The approximate position of the diversion is shown below (Figure 1).

March Cato Contractors were engaged by Watercare to install the pipe diversion. Arboricultural contractors (Treescape Limited) were engaged to undertake vegetation removal to enable access for the urgent remedial work to be completed. The approximate location of affected trees, the access route, pipe alignment and extent of vegetation clearance are shown on the plans attached to this memo (Appendix B).

BACKGROUND

I was engaged by Morphum Environmental Limited to assist with arboricultural input during the implementation of emergency works. I met with March Cato, Morphum, Auckland Council and Treescape representatives, on 3 October 2023 to carry out an assessment of arboricultural effects of the proposal to install the temporary diversion pipe.

On 4 October 2023 the alignment of the temporary diversion pipe was confirmed and tree removal in Alberon Reserve commenced. I surveyed and marked trees that were required to be removed for access for installation of the temporary overland pipe.

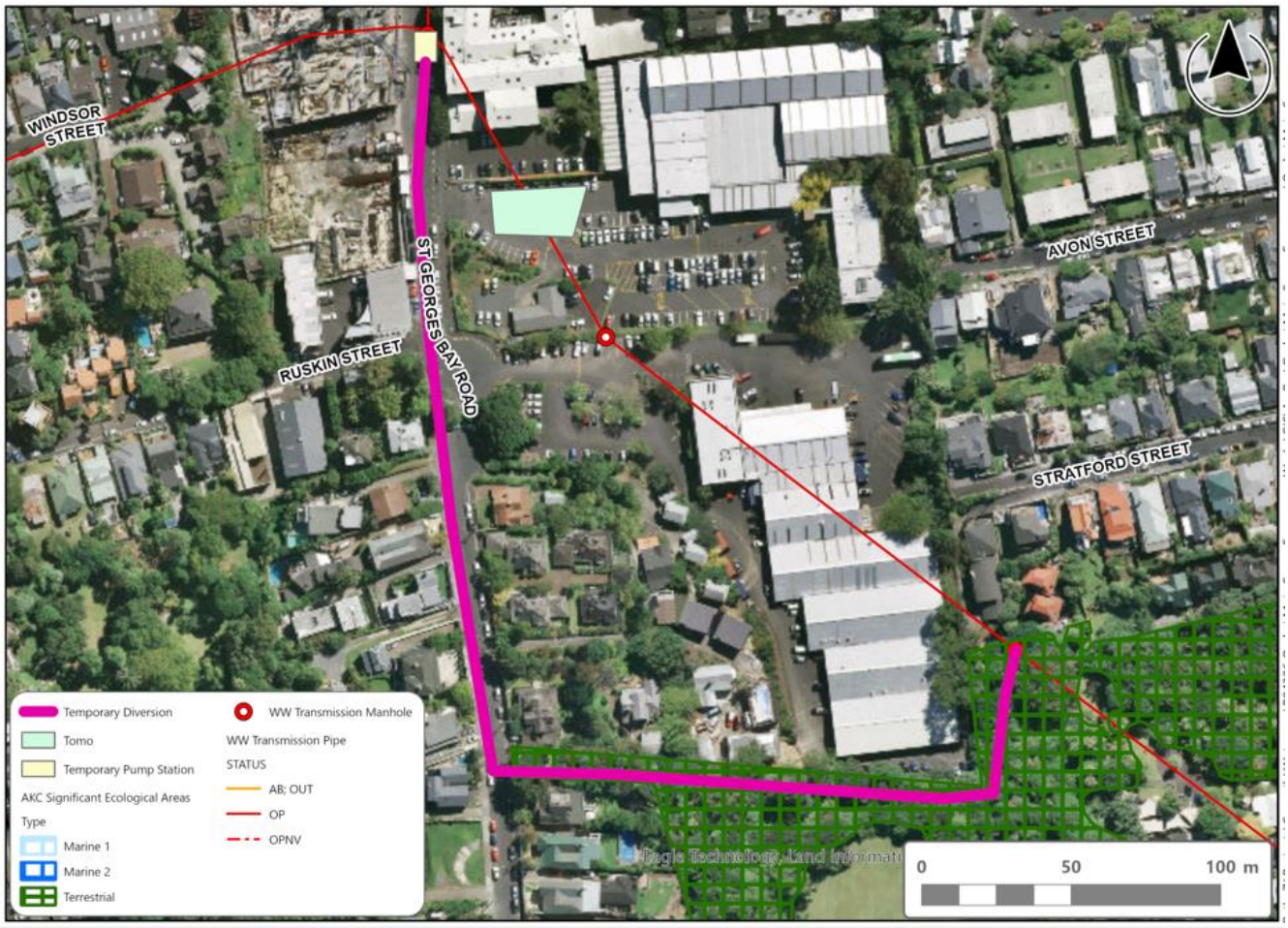


Figure 1 - Location of the sink hole (Tomo) and temporary wastewater diversion

ARBORICULTURAL IMPACT ASSESSMENT

Alberon Reserve contains an intact forest canopy comprised of native and exotic species. A significant ecological area (SEA) overlay applies to the area of native / exotic forest. A list of affected trees, their approximate heights and trunk diameters, and the impact of the works on them is provided in Appendix A of this memo. It should be noted that the list of tress is not exhaustive and lists only the most prominent of tree specimens affected. The locations of the trees shown on the tree location plans are approximate.

A total of 21 canopy trees were removed for access to install the trunk sewer diversion pipe. Another 7 groups of trees containing approximately 33 native and exotic trees and palms were also removed. The effects of tree removal include loss of tree canopy cover and loss of the multiple benefits that the trees provide. Loss of a swathe of tree canopy introduces an edge effect that may result in impacts on remaining trees and the forest composition. The removal of trees affects amenity values of Alberon Reserve. A total of approximately 431 m^2 of tree canopy has been removed.

In addition to the removal of the listed canopy and subcanopy trees, ground plants and forest litter has been removed, buried, trampled or otherwise damaged by machinery movement, construction and earthworks activities.

Tree pruning and works within the root zone affects many remaining trees. Collateral damage to trees from site activities includes:

- Tree pruning.
- Alteration to the root zone, including soil sealing and surface compaction.
- Physical contact damage from machinery or material movements.

Tree pruning that was necessary to establish the access from Alberon Street to the site of works included work that was minor to substantial alteration of trees. At the entrance to Alberon Reserve from Alberon Street one *Olearia* (Tree 12) received substantial pruning, involving removal of main stems, to provide space for machinery and truck access. The form of this tree has been significantly altered and the amount of foliage removal is likely to result in copious epicormic growth response and potentially a reduction in tree condition. Tree 9 (one pōhutukawa and one pigmy date palm) and Tree 41 (puriri) received pruning that involved stem and branch removal that affects form and may affect overall condition of the specimens. Pruning elsewhere involved crown lifting, by branch removal and reduction, that was minor in nature, which the trees are expected to fully recover from.

Machinery and material movements during tree felling and temporary road building activities resulted in damage to tree roots and the trunks of trees. Kahikatea tree 18 had the surface roots mashed and stripped of cambium by digger movement during tree felling operations. I applied and pinned geotextile fabric and instructed the contractor to lay mulch over the damaged roots to assist cambium survival and prevent further damage. Kahikatea tree 17 received a wound on its trunk from machinery movement. I covered the trunks of this tree, tree 18 and tree 40 to protect them in the event of further machinery strikes. Mahoe tree 21 received bark wounds from movement of tree debris. Kohekohe tree 6 received significant abrasion damage to its trunk where the pipe string was thrust past this tree to the bottom of Alberon Reserve. Such damage to the base of the tree will result in decay in a crucial structural zone, which may impact the structural integrity of the tree and affect its longevity. Melia tree 3 received a wound on the base of the trunk from pipe stringing activities, and excavation for pipe insertion likely resulted in some root loss and damage in the structural root zone of this tree.

The temporary access is comprised of geotextile fabric laid directly on the ground, which may allow water and air permeability to be maintained to the roots that are buried by this temporary structure. I expect that the impact of this will be negligible, as the trees' roots will adapt to such alteration with new root growth.

RECOMMENDATIONS

Melia tree 3 should be removed because of damage to its base and the structural root zone.

Remediation of the site must aim to reinstate forest canopy, sub canopy and understory species, as well as amenity plantings, across the entire area that has been altered during the works.

Remedial measures must be implemented as soon as possible following completion of the trunk sewer repair works.

Prior to planting, all spoil, waste and other foreign materials must be removed from the site and the ground levels reinstated as close as possible to natural, pre-works levels. Removal of the temporary access must be undertaken with care to avoid damage to tree roots and disturbance or alteration to the natural ground surface below.

Areas that have been compacted by vehicle movement must be decompacted by manual forking prior to planting.

The entire disturbed zone should be covered with a 50 mm layer of well-composted, wood chip mulch prior to planting.

Planting must use a selection of native and exotic species to replicate the composition of trees that were removed. Planting must include large grade (e.g. 45-litre and greater) trees across the planting areas to provide instant landscape remediation. A list of species that are recommended to be planted is provided in Appendix C of this memo.

The plant selection and layout of plants should be confirmed with arborist and ecologist input.

All native plants and trees must be locally sourced, and all plants and trees must be good quality nursery stock.

Maintenance to ensure weed control and replacement planting of any plants that fail to establish should occur for at least 2 years following completion of planting.

Please don't hesitate to contact me if there are any queries relating to this memo.

Craig Webb

Director / Consultant Arborist

CWCA Limited

APPENDIX A, TABLE 1 – SCHEDULE OF CANOPY TREES REMOVED

tree number	tree species		Note: height and dbh dimensions given are approximate		
	botanical names	common names	height (m)	dbh (mm)	comments
11	*Podocarpus totara*	totara	9	150	Early-mature specimen in alignment of access route
16	*Vitex lucens*	puriri	14	480	Mature specimen in alignment of access route
19	*Rhopalostylis sapida*	nikau	8	250	Mature specimen in alignment of access route
20	*Rhopalostylis sapida*	nikau	9	250	Mature specimen in alignment of access route
22	*Rhopalostylis sapida*	nikau	7	250	Mature specimen in alignment of access route
23	*Vitex lucens*	puriri	10	330	Mature specimen in alignment of access route
24	*Phoenix canariensis*	Canary Island date palm	10	1200	Mature specimen in alignment of access route. Pest plant
25	*Phoenix canariensis*	Canary Island date palm	10	1100	Mature specimen in alignment of access route. Pest plant
26	*Pittosporum eugenoides*	tarata	12	180	Mature specimen in alignment of access route
27	*Corynocarpus laevigatus*	karaka	12	350	Mature specimen in alignment of access route
28	*Vitex lucens*	puriri	12	220	Mature specimen in alignment of access route
29	*Corynocarpus laevigatus*	karaka	14	310	Mature specimen in alignment of access route
30	*Rhopalostylis sapida*	nikau	9	300	Mature specimen in alignment of access route
31	*Vitex lucens*	puriri	12	500	Mature specimen in alignment of access route
32	*Rhopalostylis sapida*	nikau	9	320	Mature specimen in alignment of access route
33	*Corynocarpus laevigatus*	karaka	14	280	Mature specimen in alignment of access route
35	*Vitex lucens*	puriri	14	480	Mature specimen in alignment of access route
36	*Vitex lucens*	puriri	12	250	Mature specimen in alignment of access route
37	*Trachycarpus fortunei*	Chinese windmill palm	7	300	Mature specimen in alignment of access route. Pest plant
38	*Rhopalostylis sapida*	nikau	11	350	Mature specimen in alignment of access route
39	*Vitex lucens*	puriri	12	220	Mature specimen in alignment of access route

APPENDIX A, TABLE 2 – SCHEDULE OF TREE GROUPS REMOVED

tree number	number of trees	tree species		Note: height and dbh dimensions given are the approximate dimensions of the largest tree within each group.		
		botanical names	common names	height (m)	dbh (mm)	comments
2	3	*Syagrus romanzoffiana*	queen palm	12	400	Three palms removed at entrance to Alberon Reserve from St Georges Bay Road.
5	5	*Cordyline australis*	tī kōuka	6	80	Group on RHS of path removed for pipe access.
7	5	*Melicytus ramiflorus*	māhoe	5	80	Group on steep bank within alignment of temporary pipe
8	5	*Melicytus ramiflorus*	māhoe	5	80	Group on steep bank within alignment of temporary pipe
10	5	*Kunzea robusta, Strelitzia nicholai*	kānuka, giant bird of paradise	10	350	Group of 4 trees and 1 monocot within pipe alignment.
14	2	*Butia capitata*	Jelly palm	4	600	Two of five palms in lawn at edge of bush are removed for access
15	8	*Coprosma robusta, Pittosporum crassifolium, Prunus campanulata*	karamu, karo, Taiwan cherry	8	150	Group on inside corner of path removed to allow access.

APPENDIX A, TABLE 3 – SCHEDULE OF TREES RETAINED

tree number	tree species		Note: height and dbh dimensions given are approximate		
	botanical names	common names	height (m)	dbh (mm)	comments
1	*Jacaranda mimosifolia*	jacaranda	12	500	Small woody roots removed during soil removal from traffic island. Crown lift pruning for vehicle access.
3	*Melia azedarach*	melia	6	500	Damage to base of stem from material movement and root loss from excavation for pipe entry.
6	*Didymocheton spectabilis*	kohekohe	6	190	Damage to base of stem from abrasion by pipe sliding down hill.
9	*Phoenix roebelenii, Metrosideros excelsa*	pigmy date palm, pōhutukawa	-	1500	Stems pruned for pipe access.
12	*Alectryon excelsus, Olearia sp.*	Titoki, tree daisy	-	-	Canopy reduced / lifted to allow access from end of Alberon Street.
13	*Vitex lucens*	puriri	13	1200	Canopy reduced / lifted to allow access to be formed.
17	*Dacrycarpus dacrydioides*	kahikatea	14	380	Mechanical damage to trunk. Temporary access formed against trunk.
18	*Dacrycarpus dacrydioides*	kahikatea	12	360	Temporary access formed against trunk. Tree roots damaged prior to access being laid.
21	*Melicytus ramiflorus*	mahoe	11	240	Mechanical damage to trunk from material movement.
34	*Corynocarpus laevigatus*	karaka	10	180	Retained adjacent to access. Site waste deposited within root zone.
40	*Laurelaceae?*	unknown	25	800	Surface root and buttress scuffing from pedestrian access. Access track formed against trunk.
41	*Vitex lucens*	puriri	11	400	Canopy reduced to allow access around chamber for connection to sewer main.
42	*Alectryon excelsus*	titoki	-	-	Pruning undertaken to gain clearance above chamber excavated in St Georges Bay Road.

CRAIG WEBB
Consultant Arborist

Project: Orakei Sewer Main Emergency Works
Title: Tree location plan 1
Client: Watercare Services Limited

Drawing No.: J2610-09-01

Version: 01

Date: 5 December 2023

CRAIG WEBB
Consultant Arborist

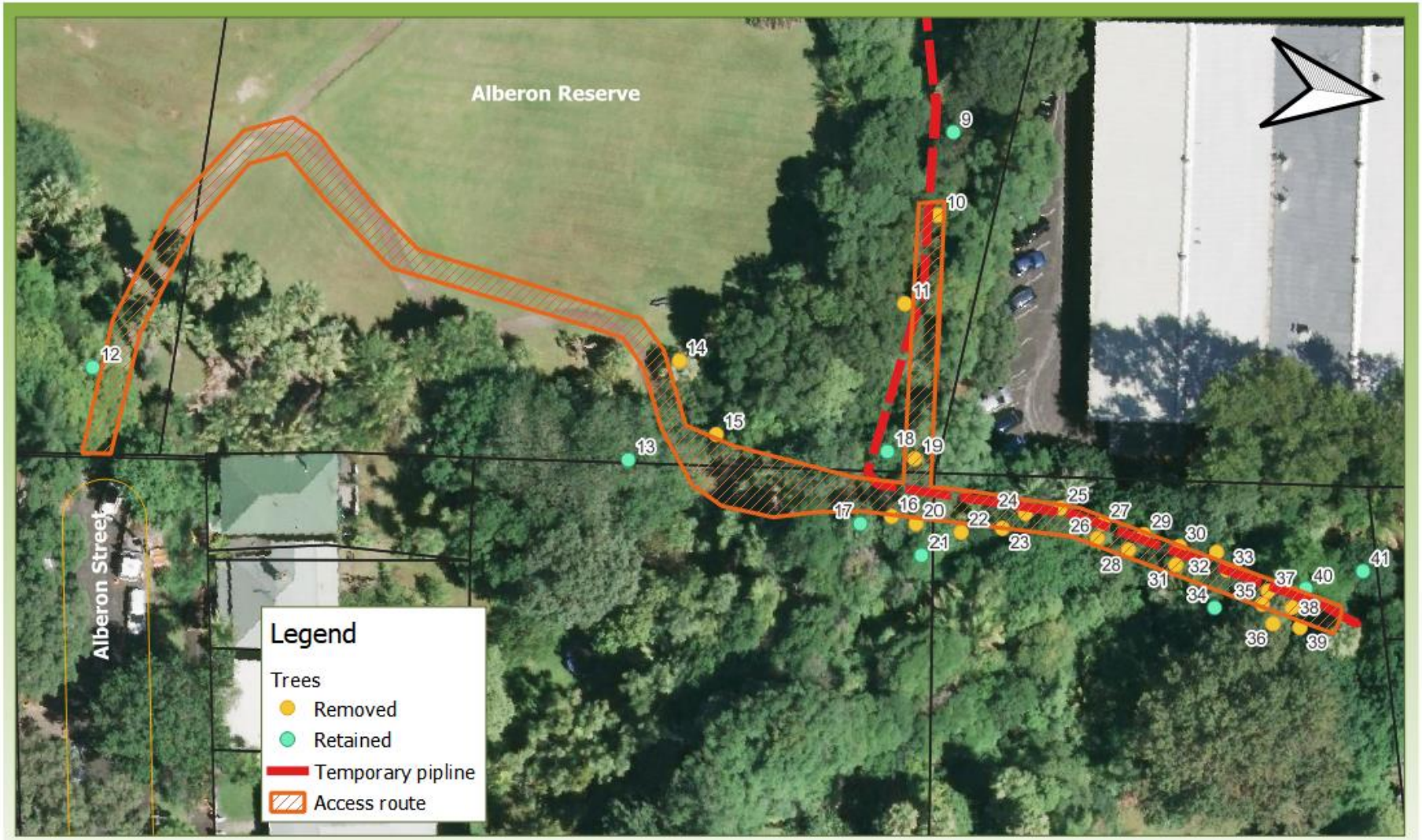
Project: Orakei Sewer Main Emergency Works
Title: Tree location plan 2
Client: Watercare Services Limited

Drawing No.: J2610-09-02

Version: 01

Date: 5 December 2023

CRAIG WEBB Consultant Arborist	**Project: Orakei Sewer Main Emergency Works** **Title: Tree location plan 3** **Client: Watercare Services Limited**	Drawing No.: J2610-09-03 Version: 01 Date: 5 December 2023



CRAIG WEBB
Consultant Arborist

Project: Orakei Sewer Main Emergency Works
Title: Tree location and access route plan
Client: Watercare Services Limited

Drawing No.: J2610-09-04

Version: 01

Date: 14 December 2023

Appendix 6 Summary of Ecological Works

MORPHUM environmental

Memorandum

Date:	13/10/2023
To:	David Moore - WSL
From:	Ryan Adam
CC:	Joel Jeffries (WSL); Ranesh Chand (WSL); Tim Price (WSL); Brett Chick (ACH); Mike Cope (March Cato)
Project Number:	P04326
Reviewed by:	Dean Watts
Released by:	Dean Watts

Subject: Ōrākei Main Sewer Emergency Works – Ecological Summary

Introduction

Morphum have been engaged to provide environmental and ecological support to facilitate the temporary bypass pumping after the Ōrākei Main Sewer Line collapsed near St Goerge's Bay Road, Parnell.

The temporary bypass (DN630 mm PE pipe) is being constructed from St Georges Bay Road and is being diverted through Alberon Reserve which is a Significant Ecological Area (SEA_T_6062) (Figure 1). Lizard salvage, tree protection and seedling relocation, and nesting bird surveys were all undertaken with a summary for each provided below.

Lizard Salvage and Relocation

Three days of lizard salvage and relocation was undertaken in the works area. Weather was fine throughout. The first day of gecko spotlighting on the night of 3/10/23 did not result in any lizards salvaged, nor on the second night (5/10/2023). The second day on 4/10/23 included raking leaf litter, dismantling garden waste piles, hand searching woody debris and artificial refugia and shrubs, checking mature kānuka (*Kunzea ericoides*) post felling and dismantling planks of wood. This resulted in the salvage of three copper skinks (*Oligosoma aeneum*). The third day (5/10/23) included raking leaf litter and dismantling woody debris, raking tradescantia, and hand searching trees being felled which resulted in the salvage of four copper skinks. On the fourth day (6/10/23) leaf raking, hand searching of trees being felled and searching of felled vegetation was undertaken. All seven copper skinks (Figure 2) were released into good quality habitat in the nearby Newmarket Park.

There was evidence of pest trapping within Newmarket Park with multiple traps observed to be in good order and regularly maintained.

Lizard salvage was implemented in accordance with best practice methodologies described in the Department of Conservation's (DOC's) Inventory and Monitoring Toolbox: Herpetofauna with the specific methods employed reflective of the likely species present, habitat types and site conditions. All lizard salvage and relocation works were undertaken in accordance with Graham Ussher's Wildlife Act Authority Permit (101814-FAU).

Bird Nesting Survey

Three days of bird nesting surveys were carried out as part of emergency works. The first day on 4/10/23 included four person-hours of nesting bird surveys were undertaken of the vegetation marked for removal. On the second day (5/10/2023) six person-hours of nesting bird surveys resulted in one Pīwakawaka (*Rhipidura fuliginosa*) and one Song thrush (*Turdus philomelos*) (introduced and naturalised) nest observed and recorded (Figure 2), both were next to the proposed alignment of the temporary diversion pipe. The two nests are located with one meter of the works footprint for the alignment of the temporary diversion. Exclusion zones were set up around the nests and protected from the works footprint. The decision was made to leave the nests in place and exercise care when manoeuvring around them as this would likely give the best chance of survival. On the third day (6/10/23), one person-hour of nesting bird surveys in the remaining tress to be removed took place.

Terrestrial Vegetation

The supervising works arborist, Craig Webb marked specimen pohutukawa (*Metrosiderous excelsa*) and kahikatea (*Dacrycarpus dacrydioides*) trees for protection. Additional tree protection works included supervising and implementing best practice tree protection methodologies including 100 mm of mulch being placed over large roots and geofabric wrapped around trees that will likely have the DN630 mm wastewater pipe placed against them.

Juvenile and seedling species were relocated out of the works area as part of the emergency works. These were removed from three areas within the works area including the vicinity of the manhole, near to a Kahikatea tree, and on the bank.

The seedlings relocated included the following:

- 18 *Carex spp.*
- 19 Harakeke (*Phormium tenax*)
- 8 Nīkau (*Rhopalostylis sapida*)
- 1 Totara (*Podocarpus totara*)
- 2 Tītoki (*Alectryon excelsus*)
- 1 Pūriri (*Vitex lucens*)

Next Steps

To assist in preparing the retrospective resource consent the following is recommended from an environmental and ecological perspective:

- Once the initial bypass is operational the site should be stabilised and cleanwater diversion bunds formalised around the Haul Road through Alberon Reserve.

- Ongoing monitoring of the overland flows paths to assess flooding risks/induced wetland formation.
- Preparation of the nesting bird survey memo.
- Preparation of the lizard management works report.
- Arborists report.
- Ecological Impact Assessment.
- Planting Plan.
- Biodiversity offsetting calculations (if required).

Disclaimer

This memo has been prepared for Watercare Services Ltd, according to their instructions, for the particular objectives described herein. Morphum Environmental Ltd accepts no responsibility for the content of this report if it is used by any other party or for any other objective. Any use of or reliance on the information contained in this report for decisions made by third parties is the responsibility of these third parties. Morphum Environmental Ltd accepts no responsibility for damage incurred by third parties resulting from the use of or reliance on this report, or if the report is used by any party for purposes other than the objectives described herein.

Please do not hesitate to contact me if you have any queries regarding this memorandum.

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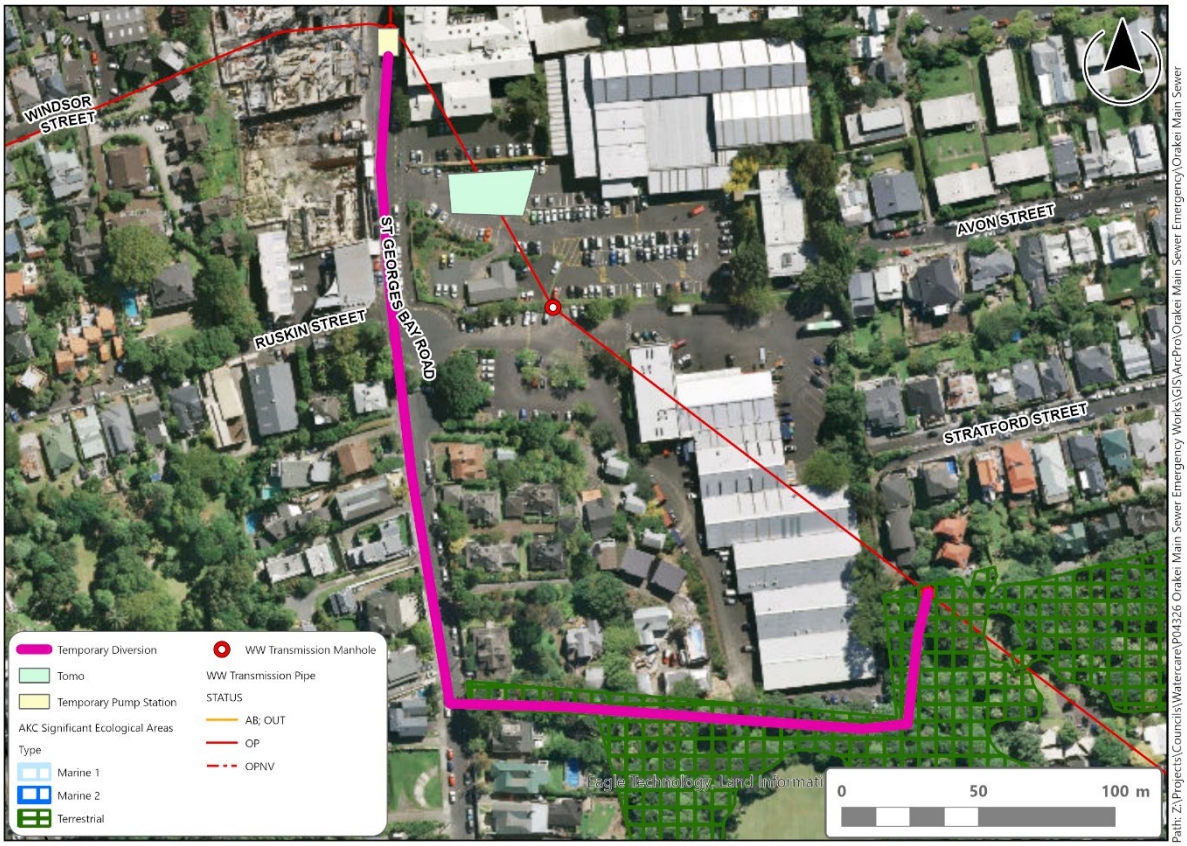

Figure 1: Map of proposed diversion and location of the SEA and sink hole.

Figure 2: Left, Song Thrush nesting next to the temporary division. Right, a copper skink (gravid) about to be released in Newmarket Park.

Appendix 7 ESC and Tree Protection Memo

MORPHUM environmental

Memorandum

Date:	17/10/2023
To:	Julia Bailey and Mike Cope – March Cato
From:	Ryan Adam
CC:	David Moore – (WSL); Joel Jeffries (WSL); Ranesh Chand (WSL); Tim Price (WSL); Brett Chick (ACH);
Project Number:	P04326
Reviewed by:	Dean Watts
Released by:	Dean Watts

Subject: Ōrākei Sewer Emergency Works – Erosion and Sediment Control and Tree Protection

The following is recommended to address erosion and sediment controls and tree protection (and legacy issues) for the Ōrākei Sewer Emergency works Project.

1. Remove construction debris including boardwalk from within the vegetation canopy (Figure 1).
2. Remove geofabric from any trees that are no longer within the immediate works footprint.
3. Install and culvert and drainage to reinstate the overland flow currently pooling next to the pipeline bend within Alberon Reserve (Figure 1). An arborist must be present for any exaction works required to reinstate the overland flows.
4. Place mulch on all highly disturbed areas (there are several throughout the site) except where the pipeline enters Alberon Reserve from St Georges Bay Road where coconut matting should be used instead to stabilise this area (more exposed area and don't want mulch accumulating near stormwater cesspits.
5. The large Kahikatea tree should remain in place unless its removal is absolutely necessary. If possible, the supervising ecologist and works arborist should be present prior to removal.
6. Clean water diversion Bunds within Alberon Reserve should be extended slightly to ensure water does not pool next to the works area – the clean water diversion bund should be extended to direct flows towards the existing overland flows/streams using heavy silt socks pinned to the ground (see attached). This will avoid the need for any additional earthworks (Figure 1).
7. The hotmix cleanwater diversion bunds along St Georges Bay Road around the temporary pump station will need to be reinstated once the pump station is commissioned.
8. It is recommended that the supervising works arborist visits site monthly to check on the health of the species that are/have been impacted by the vegetation clearance works.
9. It is recommended that a suitably qualified and experienced environmental scientist with ecological and erosion and sediment control experience undertakes fortnightly site inspections of the erosion and sediment controls, overland flow paths, nesting birds, and potential flooding impacts.

Figure 1: Photo schedule of erosion and sediment control works required.

Please do not hesitate to contact me if you have any queries regarding this memorandum.

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Figure 2: Location of the recommended clean water diversion bund extensions.

Appendix 8 Planting Plan

MORPHUM environmental

Co-creating a thriving ecosystem

Ōrākei Main Sewer Emergency Works

Planting Plan

Final

Prepared for ACH Consulting

Document Control

Client Name: ACH Consulting

Project Name: Ōrākei Main Sewer Emergency Works

Project Number: P04326

Document: Planting Plan

Revision History

Status	Date Issued (dd/mm/yyyy)	Author	Reviewed By	Released By
Draft	25/01/2024	Fergus White	Mark Lowe	Andrew Rossaak

Reviewed by:

Reviewer: Mark Lowe **Signature:** 

Released by:

Reviewer: Andrew Rossaak **Signature:** 

Contents

1. Introduction

Morphum Environmental Ltd (Morphum) have been engaged by ACH Consulting to provide monitoring and consent-related documentation as part of the Ōrākei Main Sewer collapse bypass works.

On 25 September, the collapse of the sewer main formed a large sinkhole in Parnell blocking the Waste Water (WW) system. Consequently, untreated wastewater was discharging into the Waitamata harbour receiving environment, necessitating the emergency bypass initiated under emergency provisions (s330) of the Resource Management Act. These works included the installation of a (DN630 mm PE) pipe through a forested area in nearby Alberon Reserve (herein the subject site) necessitating the removal of 810 sq m of Significant Ecological Area (SEA) (SEA_T_6062) vegetation for the piping footprint and machinery access.

It is proposed in the Ecological Impact Assessment (EcIA) prepared by Morphum that the areas where SEA vegetation was removed will be reinstated. While additional plantings will be required to achieve a no net loss of ecological value outcome as calculated using the Biodiversity Compensation Model (BCM), this Planting Plan pertains only to site reinstatement or 0.081 ha of the total required to completely offset vegetation clearance. It is recommended an additional plan be prepared for offsetting once the location is secured.

1.1. Site Overview

Alberon Reserve (2.67 ha) falls within the Tamaki Ecological District, where indigenous vegetation cover is scarce. Only 6.9% of indigenous cover remains in the district, with the original vegetation having been highly modified from early Polynesian occupation through to more recent urban development (Lindsay et al., 2009[1]). The reserve consists of a large central area of open greenspace enclosed in patches of regenerating and mature native forest with scattered stands of exotic palm trees. While the canopy forest and understory is a modified forest ecosystem, it has previously been classified as regenerating broadleaved species scrub/forest (VS5; Singers et al., 2017[2]) according to Auckland Council Geomaps current ecosystem extent layer. Despite this previous classification, the forested area has many elements that also align with pūriri forest (WF7.3; Singers et al., 2017[2]). The forested area within the works area also sits within a SEA (SEA_T_6062) for reason 4C: Migration pathway.

A total of 54 trees were felled within SEA_T_6062 as a direct impact of the installation of the WW bypass through Alberon Reserve. These consisted of 18 native canopy trees including totara (*Podocarpus totara*), puriri (*Vitex lucens*), and nikau (*Rhopalostylis sapida*), and an approximated 20 native subcanopy trees including māhoe (*Melicytus ramiflorus*), and kanuka (*Kunzea ericoides*) with the remaining specimens being introduced species. This area of vegetation clearance associated with the emergency works is estimated to be 810 sq m.

[1] *Lindsay, H.; Wild, C.; Byers, S. (2009). Auckland protection priorities: prioritising the protection of biodiversity values in the Auckland Conservancy. Internal report. Department of Conservation, Wellington (unpublished). 81 p. (DOCDM-239922)*

[2] *Singers, N. J., Osborne, B., Lovegrove, T., Jamieson, A., Boow, J., Sawyer, J. W. D., ... & Webb, C. (2017). Indigenous terrestrial and wetland ecosystems of Auckland. Auckland Council, Te Kaunihera o Tāmaki Makaurau.*

The Auckland Council GeoMaps Ecosystem Potential Extent layer indicates that, prior to human disturbance, the area is likely to have been part of an extensive area of puriri and taraire (*Beilschmiedia taraire*) forest (WF7.2; Singers et al., 2017).

1.2. Pre-Planting Site Assessment

Plants are most successful at sites for which they are best adapted. To ensure the success of a revegetation programme it is important that plants which are used are appropriate to the site-specific characteristics, these are listed in Table 1.

Table 1: Pre-Planting Site Assessment

Criteria	Site
Ecological District	Tāmaki
Slope	Between 0 - 30 degrees
Soil characteristics	Clay underlying topsoil.
Soil drainage	Poor drainage due to clay base
Wind	West
Aspect	Varied
Degree of shading	High existing shading in areas where vegetation is planned to be reinstated. Poor shading in current open greenspace areas.
Distance from coast	700 m
Frost exposure	Low; given the latitude, proximity to the coast, low elevation, and remaining canopy vegetation.
Extent and nature of existing native vegetation	There is no vegetation present in the areas where replanting will take place other than mown grasses. The vegetation was removed to facilitate works or is open greenspace.
Distance from established bush	Directly adjacent.

2. Planting Plan

2.1. Planting Objectives, Limitations, and Reasoning

The objective of this Planting Plan is to reinstate the site given the native vegetation removal. The planting will focus on all other areas where the vegetation has been removed.

Planting must occur after the decommissioning of the WW bypass following the removal of the pipe and the temporary haul road. Additionally, plants must not be planted on any walking tracks re-instated following the works.

This Planting Plan provides the number of plants and species for planting. An overview of the subject site is shown in Appendix 1.

The planting has been divided into two sections based on appropriate plant species for each section, a summary of each area is provided in Table 2.

Table 2: Planting Sections.

Planting area	Location	Plant species selection reasoning
PA1	Cleared Vegetation Reinstatement	This mix should be shade-tolerant subcanopy and emergent species representative of the native species currently present and to the WF7.3 habitat type.
PA2	0-3 m from the ephemeral flow paths	Tolerance to wet conditions, flood flows (within the floodplain) and dense planting for stabilisation.

3. Methodology

3.1. Site Preparation

1. The planting areas 1 and 2 shall be cleared of existing weed species. Weed control must be carried out to ensure there are no weed species that can impact the growth rates of planted trees and/or the potential for native regeneration are present.
2. Any herbicide used must be applied in accordance with the manufacturer's recommendations and application of any chemical must follow all relevant legislation including (but not limited to) NZS8409 Management of Agrichemicals. No herbicide should be applied within the riparian planting margin (Appendix 4), to prevent herbicide runoff into the receiving environment.

3.2. Plant Stock and Delivery

1. Plants shall be first-class specimens of nursery stock, true to name and type with well-developed and well-shaped trunk or stem and head (foliage). They shall be well hardened off to cope with the climatic conditions of the site, and free from pests and disease. Plants shall be free from disfiguring knots, bark abrasions, wind, or freezing injury or other disfigurements and shall bear evidence of proper pruning.
2. Legible labels shall be attached to each plant delivered to site as a separate unit, or to each box, bundle or bale containing plants. The labels shall give the approved botanical name, size, age and quantity and other information required to identify the plant or plants.
3. The roots shall have a high percentage of fibrous roots that are just touching the edge of their containers. Plants with roots that are wound round their containers in circular fashion shall be rejected. Where several specimens of the same species are to be selected, evenness of shape and size is required within the size range specified.
4. If shoots or roots suffer slight damage, they shall be carefully pruned and treated with an approved fungicidal sealant. If major damage occurs, the plants shall be replaced.
5. Delivered plants shall be placed in a secure, temporary storage area on site. Plant delivery shall be limited to that able to be planted over the following three days. Plant roots shall be protected at all times from sun or drying winds. Roots shall not be left uncovered at any time. Plants that cannot be planted immediately on delivery shall be kept in the shade, well protected, with soil kept well-watered.

3.3. Planting Methodology

1. Planting shall be not undertaken during periods of severe frost, drought, or persistent strong winds.
2. All plants shall be thoroughly watered a few hours prior to planting.
3. The planting hole shall be larger than the plant container or root ball. Once the hole is large enough, the soils on the sides and bottom of the hole should be loosened to allow the plant to penetrate the soil easily. The planting hole should be deep enough so that the base of the stem where the roots start is slightly below ground level on most sites and slightly above (1 -2 cm) on wet or saturated sites.

4. The plant shall be removed from its pot, plastic bag, or root trainer carefully, retaining as much of the soil around roots as possible. If the roots are tightly bound, gently tease them apart.
5. All plants shall be planted into holes and set in their final positions with the main stem vertical and at such a depth so that the soil level is at the same height as the nursery earth marks on the stem or the container soil level.
6. All plants except for ones planted into saturated soils or below the water level shall be given 10 grams of well-balanced, 6-month slow-release fertiliser including available nitrogen, phosphorus and potassium plus magnesium and trace elements. Fertiliser shall be in granular form to allow distribution through the backfill mix.
7. All soil around the plant roots in the hole shall be hand-firmed and subsequently with the heel of a boot.
8. All pots and other protective materials shall be properly disposed of off the site after planting.
9. The contractor shall be sufficiently qualified to identify suitable environmental conditions for the positioning of plants and may be required to adjust the locations of some plant species to account for site specific conditions.

An indicative replanting and maintenance schedule has been provided in Appendix 3.

4. Pest Management and Monitoring

This section provides the objectives required to maximise the likelihood that vegetation successfully establishes. The objectives include:

- Control of pest plant species.
- Ongoing monitoring of pest plants.
- Ongoing monitoring of the planted species for successful establishment.
- The replacement of any damaged or dead plants on a 1:1 basis (being number of plants, species may be altered to another species from the planting schedule to account for any specific microenvironmental conditions).

This section has been prepared to provide flexibility in the maintenance and management of the planting, it is to be updated on an as required basis for any pest plants that are noted by routine monitoring.

The pest management strategy prepared below assumes that the recommendations of this Planting Plan have been followed. The Regional Pest Management Plan (RPMP)[3] has been used to guide pest management strategies and methods. The Auckland Unitary Plan Operative in Part (AUP:OP) Appendix 16 recommends ongoing monitoring and maintenance for a period of 5 years, to maximise the likelihood of replanting success[4].

The routine maintenance activities shall be considered the minimum requirement. Extra site monitoring should occur after storm events and prolonged dry or wet periods.

An indicative maintenance and pest control schedule has been provided in Appendix 3.

4.1. Pest Plant Management

Ongoing maintenance will be required to release the planting from any colonising weed species to ensure the establishment and success of the planting. This is recommended to occur for 5 years after the initial planting.

Regular monitoring, by a suitably qualified and experienced contractor, shall occur at a minimum of 4 times a year. 3 times in spring/summer when weed species are likely to be growing and once in autumn to observe and replant any plants that have died over the course of the previous year.

Control methodologies will be driven by the type of pest plant occurring on site, a non-exhaustive list of the pests that are likely to be encountered and best practice control methodologies can be found in Appendix 4.

Any chemicals used must be applied in accordance with the manufacturer's recommendations and application of any chemical must follow all relevant legislation including (but not limited to) NZS8409 Management of Agrichemicals.

[3] *Auckland Council (2020). Auckland Regional Pest Management Plan 2020-2030.*

[4] *Auckland Council (2016). Auckland Unitary Plan: Operative in part. Auckland Unitary Plan.*

4.2. Plant Pathogen Avoidance

Kānuka and Pohutukawa, myrtle rust species, is present within the existing vegetation within the SEA, so the focus of pathogen avoidance is on myrtle rust (*Uredo rangelii*).

If any plants showing signs of infection by myrtle rust, or any other notifiable plant disease, are detected during monitoring, the relevant organisation should be informed, for myrtle rust this is via the Myrtle Rust Reporter hosted on iNaturalist[5].

[5] *https://www.inaturalist.org/projects/myrtle-rust-reporter*

Appendix 1 Planting Schedule

ALBERON RESERVE PLANTING PLAN

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PA1 - Terrestrial Planting	Area 630 m ^{2}				
Species	**Māori name**	**Plant Grade**	**plants/m ^{2}**	**% cover**	**Number**
Melicytus ramiflorus	māhoe	PB3/1.5 L	1	10%	63
Kunzea ericoides	kanuka	PB3/1.5 L	1	15%	95
Cordyline australis	tī kōuka	PB3/1.5 L	1	15%	95
Podocarpus totara	totara	PB3/1.5 L	1	5%	32
Vitex lucens	pūriri	PB3/1.5 L	1	10%	63
Rhopalostylis sapida	nīkau	PB3/1.5 L	1	5%	32
Didymocheton spectabilis	kohekohe	PB3/1.5 L	1	10%	63
Beilschmiedia tarairi	taraire	PB3/1.5 L	1	10%	63
Macropiper excelsum	kawakawa	PB3/1.5 L	1	5%	32
Pseudopanax arboreus	whauwhaupaku	PB3/1.5 L	1	5%	32
Hedycarya arborea	porokaiwhiri	PB3/1.5 L	1	5%	32
Coprosma robusta	karamū	PB3/1.5 L	1	5%	32
			Total	**100%**	**630**

PA2 - Lowland Planting	Area 180 m ^{2}				
Species	**Māori name**	**Plant Grade**	**plants/m ^{2}**	**% cover**	**Number**
Coprosma robusta	karamū	PB3/1.5 L	1	15%	27
Elatostema rugosum	parataniwha	PB1/0.5 L	1	25%	45
Melicytus ramiflorus	māhoe	PB3/1.5 L	1	10%	18
Cordyline australis	tī kōukka	PB3/1.5 L	1	15%	27
Dacrycarpus dacrydioides	kahikatea	PB3/1.5 L	0.5	15%	14
Schefflera digitata	patē	PB3/1.5 L	1	10%	18
Freycinetia banksii	kiekie	PB3/1.5 L	1	10%	18
			Total	**100%**	**167**

Z:\Projects\Councils\Watercare\P04326 Orakei Main Sewer Emergency Works\GIS\ArcPro\Sewer Vegetation Removal Assessment_Layout: Offset Planting Map

- Overland Flow
- PA1 - Terrestrial Planting
- PA2 - Lowland Planting
- Alberon Reserve Boundary
- Significant Ecological Areas
- Parcel Boundaries

Client WATERCARE

Project **ORAKEI MAIN SEWER EMERGENCY WORKS**

0 20 40 m

Project no. P04326
Date 14 Mar 2024

Drawn PZ
Approved AR

Appendix 2 Indicative Schedule of Works

Year and task	Month											
Initial Planting	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Initial Planting				•	•							
Plant Maintenance & Pest Control										•		•
Year 1	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Plant Maintenance & Pest Control	•			•						•		•
Year 2	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Plant Maintenance & Pest Control	•			•						•		•
Year 3	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Plant Maintenance & Pest Control	•			•						•		•
Year 4	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Plant Maintenance & Pest Control	•			•						•		•
Year 5	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Plant Maintenance & Pest Control	•			•								

Appendix 3 Pest Control Methodologies

Species	Common name	Auckland Regional Pest Management Plan					Control method	Herbicide / Pesticide
		Exclusion	Eradication	Progressive Containment	Sustained Control	Site Led		
Cenchrus clandestinus	Kikuyu	-	-	-	-	-	Hand-releasing around seedlings and spot spraying. General weed eating.	Haloxyfop (where revegetation species are not monocots)
Ligustrum lucidum	Tree privet	-	-	-	x	-	Pull or dig out seedlings; cut and paint stumps smaller individuals; drill and poison larger specimens.	Glyphosate /Metsulfuron-methyl
Ipomoea indica	Blue Morning Glory	-	-	-	x	-	Dig out small patches, stem scrape and paint with glyphosate. Cut and paint stumps with glyphosate.	Glyphosate/Metsulfuron-methyl

							Spray (summer – autumn).	
Solanum mauritianum	Woolly Nightshade	-	-	-	x	-	Dig out scattered plants. Paint stump. Treat fresh cut bases.	Triclopyr
Zantedeschia aethiopica	Arum lily	-	-	-	x	-	Slash tops, cut down and paint stumps.	Metsulfuron-methyl
Convolvulus spp.	Convolvulus	-	-	-	-	-	Hand Release, foliar spraying	Glyphosate/Tripclopyr
Tradescantia fluminensis.	Tradescantia	-	-	-	x	-	Foliar spraying	Triclopyr
Anredera cordifolia	Madeira Vine	-	-	-	x	-	Cut and pull vines away from desirable trees and native plants before foliar spraying.	Glyphosate/Metsulfuron-methyl

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Appendix 6: Marshall Day Noise Measurements

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www.marshallday.com

26 October 2023

Watercare Services Ltd
73 Remuera Road
Remuera
Auckland 1050

Attention: Tim Price

Dear Tim

ŌRĀKEI MAIN SEWER BYPASS EMERGENCY PUMPS – OPERATIONAL NOISE MEASUREMENTS

In summary, significant noise mitigation measures should be implemented

Marshall Day Acoustics has been engaged by Watercare Services Ltd to conduct noise measurements and provide mitigation advice for six emergency pumps enabling the Ōrākei Main Sewer bypass. The Main Sewer has been blocked because of a large sinkhole, and the temporary pumps are required to operate whilst the Main Sewer is repaired. The emergency pumps are in St Georges Bay Rd, Parnell.

We understand the pumps will be needed for at least 3 months, but that the total duration is unknown at this stage. We understand that Watercare has sent letter drops and email newsletters to nearby residents to notify them of the disruption. We understand that residents in the adjacent Axis Building have complained about noise from the emergency pumps (on the night we took our measurements).

We understand that further noise complaints were received from residents near the discharge by Alberon Reserve and note that an enclosure is being constructed there. We plan to undertake further noise measurements later this week.

Our noise measurements and site observations indicate that the pumps are likely to cause sleep disturbance to nearby residents, particularly at the Axis Building. Furthermore, a high-pitched tone at 4 kHz is particularly noticeable and likely to cause additional annoyance. We understand that a timber enclosure is being considered for mitigation.

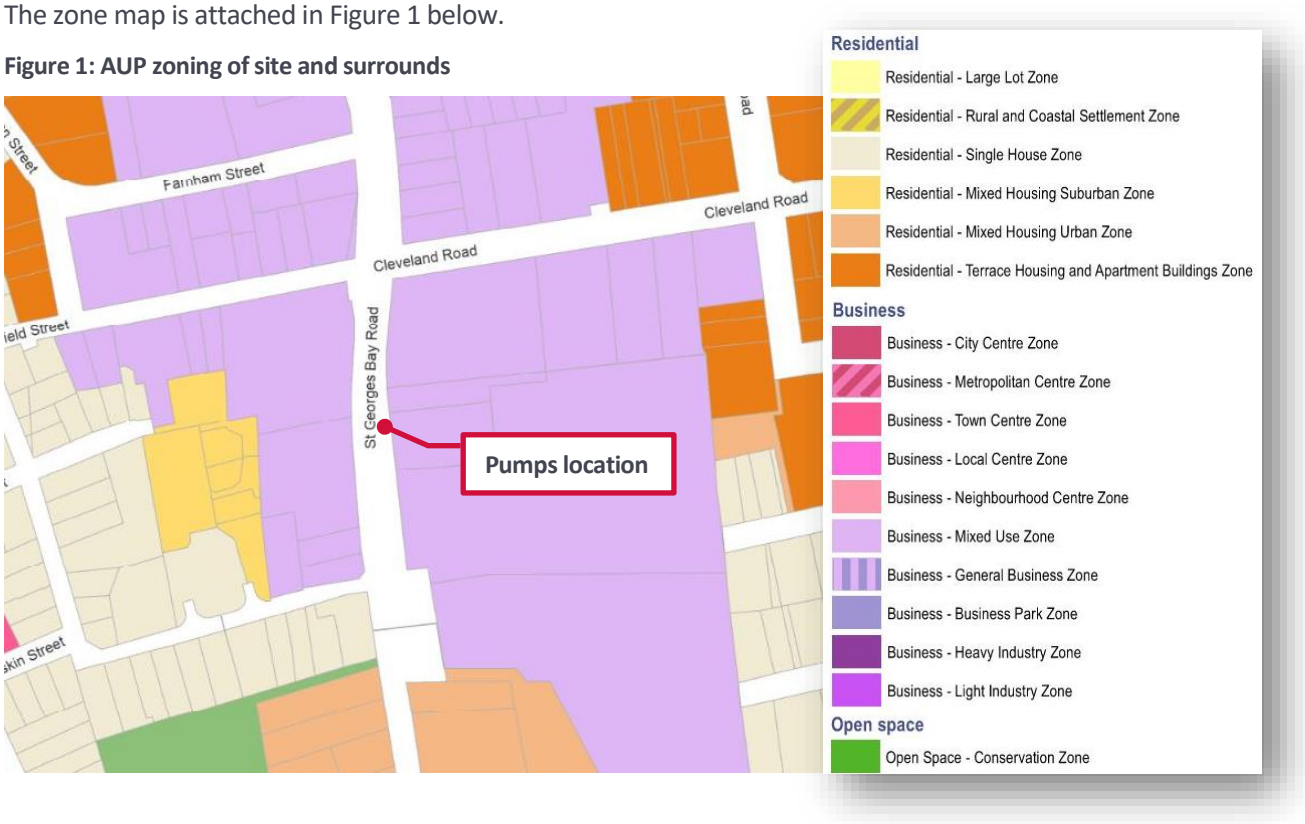
We recommend offering alternative accommodation to the most affected residents at the Axis Building, and continuing written communication to all residents within 150 metres of the site to notify them of project updates.

The pumps are within the road reserve adjacent to *Business - Mixed Use Zone* sites

The pumps are located on the footpath of St Georges Bay Road, within the road reserve. The adjacent sites are zoned *Business - Mixed Use Zone*, with and *Residential - Mixed Housing Suburban Zone* to the west. Other sites to the east and south are zoned *Residential - Single House Zone*, *- Mixed Housing Urban Zone*, *- Terrace Housing and Apartment Building Zone*, and *Open Space - Informal Recreation Zone*.

The zone map is attached in Figure 1 below.

Figure 1: AUP zoning of site and surrounds



The night-time construction noise limit at the adjacent apartments is 45 dB L_{Aeq}

The emergecy pumps are required as part of the construction activities. Rule E25.6.29 in the AUP applies to noise emmisions from construction activities within the road. Relevant parts of the rule are reproduced for refernce, in part, below:

(1) Noise from any construction, maintenance and demolition activities in the road must comply with the relevant noise levels in the following relevant table:

(a) Table E25.6.27.1 Construction noise levels for activities sensitive to noise in all zones […]

(b) Table E25.6.27.2 Construction noise levels for noise affecting any other activity

*(2) The noise levels specified in Standard E25.6.29(1) above **do not apply** to unplanned repair or maintenance works or planned works in the road between the hours of **10pm and 7am** where:*

(c) because of the nature of the works the noise produced cannot be practicably be made to comply with the relevant noise levels of the following tables:

i. Table E25.6.27.1 Construction noise levels for activities sensitive to noise in all zones […]; or

ii. Table E25.6.27.2 Construction noise levels for noise affecting any other activity

*(3) The noise levels specified in Standard E25.6.29(1) above **do not apply** to unplanned repair or maintenance works or planned works in the road between the hours of **7am and 10pm** where:*

(b) because of the nature of the works and the proximity of receivers the noise generated cannot practicably made to comply with the relevant noise levels of the following tables:

iii. Table E25.6.27.1 Construction noise levels for activities sensitive to noise in all zones […]; or

iv. Table E25.6.27.2 Construction noise levels for noise affecting any other activity

(6) For the purpose of Standards E25.6.29(1) to E25.6.29(4A) above:

(a) planned work means work that has been planned to take place at least seven days before the work commences;

(b) the measurement and assessment of all construction noise must be in accordance with New Zealand Standard NZS 6803:1999 Acoustics – Construction noise

Tables E25.6.27.1 and Table E25.6.27.2 are reproduced in Table 5 and Table 6 in Appendix A. In summary, the relevant typical duration construction limits are:

- Daytime: 75 dB L_{Aeq} at all occupied buildings
- Night-time: 45 dB L_{Aeq} at occupied residential buildings
  80 dB L_{Aeq} at occupied commercial/industrial buildings

Rule E25.6.29 parts (2) and (3) refer to the noise rules above, but the noise limits do not apply where the activity cannot practicably comply (noting further qualifying clauses in the rules not repeated here). Regardless, the noise limits set a benchmark to achieve where practicable.

The night-time noise limits for other activities in the Mixed Use Zone is 55 dB L_{Aeq}

Where it is not practicable to achieve the noise limits in E25.6.29, it is appropriate to consider the noise effects more closely. The construction noise limits in E25.6.27 are generic for a wide range of receiving environments. The night-time noise limits for activities other than construction are **55 dB L_{Aeq} in *Mixed Use*** zones (with additional low frequency controls) and **45 dB L_{Aeq} at *Residential*** zones. These noise limits provide more specific guidance on acceptable noise levels for permanent, rather than temporary, mechanical plant operating at night.

For the *Mixed Use Zone*, Rule E25.6.8 in the AUP states that:

(1) The noise (rating) level and maximum noise level arising from any activity in the […] Business – Mixed Use Zone measured or assessed as the incident level on the façade of any building on any other site in the […] Business – Mixed Use Zone must not exceed the limits in Table E25.6.8.1 Noise levels in the […] Business – Mixed Use Zone below:

Table 1: AUP Table E25.6.8.1 Noise levels in the […] Business – Mixed Use Zone

Time	*Business – Mixed Use Zone noise level*
7am - 11pm	*65 dB L_{Aeq}*
11pm – 7am	*55 dB L_{Aeq}* *65 dB at 63 Hz L_{eq}* *60 dB at 125 Hz L_{eq}* *75 dB L_{AFmax}*

The pumps are located in the road adjacent to a *Business* zone, so we consider it appropriate to benchmark with the business zone interface rule. Rule E25.6.19 in the AUP states that:

(1) The noise (rating) and maximum noise level from any activity in the business zones must not exceed the levels in Table E25.6.19.1 Noise levels at the business zone interface when measured within the boundary of a site in a residential zone […].

Table 2: AUP Table E25.6.19.1 Noise levels at the business zone interface

Time	*Noise level*
Monday to Saturday 7am-10pm *Sunday 9am-6pm*	*55 dB L_{Aeq}*
All other times	*45 dB L_{Aeq}* *60 dB L_{eq} at 63 Hz* *55 dB L_{eq} at 125 Hz* *75dB L_{AFmax}*

Bedrooms in *Mixed Use* Zones must be designed to achieve 35 dB L_{Aeq} inside

The AUP contains rules for internal noise levels for bedrooms and noise sensitive spaces in Business zones. In particular, this affects the Axis Building, *Egali House* apartments at 10–12 Cleveland Road, and the townhouses at 5 Cleveland Road. Rule E25.6.10 states that:

(1) Noise sensitive spaces must be designed and/or insulated so that the internal noise levels do not exceed the levels in Table E25.6.10.1 Noise levels for noise sensitive spaces in the […] Business – Mixed Use Zone […] below:

Table 3: AUP Table E25.6.10.1 Noise levels for noise sensitive spaces in the Business – City Centre Zone, [or the] Business – Mixed Use Zone

Unit affected	*Time*	*Level*
Bedrooms and sleeping areas in the Business – Mixed Use Zone	*Between 11pm and 7am*	*35 dB L_{Aeq}* *45 dB at 63 Hz L_{eq}* *40 dB at 125 Hz L_{eq}*
Other noise sensitive spaces	*At all other times*	*40 dB L_{Aeq}*

(2) The levels in Table E25.6.10.1 Noise levels for noise sensitive spaces in the […] Business – Mixed Use Zone […] above must be met based on the maximum level of noise permitted by the zone or precinct standards or any adjacent zone or precinct standards.

This indicates that bedrooms should be constructed to ensure a minimum façade reduction of 20 dB overall and at the 63 and 125 Hz octave bands for bedrooms in *Mixed Use Zone*.

Note that these façade controls are intended to mitigate permanent operational noise, and not temporary construction works.

Our measurements show that pump noise infringed night-time noise limits

We visited the site on 18 October 2023 in the early hours of the morning to conduct noise measurements. We measured noise in general accordance with New Zealand Standard NZS 6801:2008 "*Acoustics – Measurement of Environmental Sound*" with a Brüel and Kjær 2250 sound level meter. The weather was generally fine and suitable for environmental noise measurement with low wind.

We measured as close to the relevant boundaries as we could, but couldn't access them in some cases. We conducted measurements at a number of other locations, for about 2 minutes at each location.

The generator and pump equipment produced steady noise, so only short measurements were required. We understand that the pump operates at constant load, with negligible fluctuations throughout the day and night. Traffic was intermittent, and we excluded it from our measurements when it was audible above the ambient noise environment.

The emergency pump location and measurement locations are shown in Figure 2.

Figure 2: Emergency pump location and measurement locations

We assessed the noise levels against the AUP zone limits in accordance with New Zealand Standard NZS 6802:2008 *Acoustics - Environmental Noise* and New Zealand Standard NZS 6803: 1999 *Acoustics - Construction Noise*, and summarise our measurements in Table 4. Appendix A shows site photos.

Table 4: Measured noise levels and sources

Measurement location	Distance to Pumps	Time (duration)	Measured noise levels (dB)				Noise sources (dominant sources underlined)
			L_{Aeq}	L_R	$L_{eq,63Hz}$	$L_{eq,125Hz}$	
Business Zones							
Axis Building, max *†	< 5	12:13am (2:00)	75	80	97	83	6 pumps hum with clear high-pitched tone, generator, traffic not audible
Axis Building, south *†	< 40	12:16am (2:01)	69	74	86	83	6 pumps hum with clear high-pitched tone, generator, traffic not audible
Axis Building, north *†	< 50	12:19am (2:00)	59	64	74	75	6 pumps hum with clear high-pitched tone, generator, traffic not audible
Xero Building *†	< 10	12:22am (2:04)	70	75	91	78	6 pumps hum with clear high-pitched tone, generator, traffic not audible
Egali House	< 100	12:56am (2:02)	46	–	63	56	6 pumps hum with faint high-pitched tone, generator, HVAC from *Central Bark*, traffic faintly audible
5 Cleveland Road	< 75	12:50am (2:00)	45	–	59	56	6 pumps hum with faint high-pitched tone, generator, HVAC from *Central Bark*, traffic faintly audible
Residential Zones							
66 St Georges Bay Rd	< 120	12:43 (2:00)	59	–	72	67	6 pumps hum with faint high-pitched tone, generator, trucks clearing pipe, traffic not audible
27 Garfield St	< 80	1:02am (2:43)	49	–	65	58	6 pumps hum with faint high-pitched tone, generator, traffic faintly audible
27 Windsor St †	< 100	12:30am (2:00)	42	47	59	49	6 pumps hum with clear high-pitched tone, generator, traffic faintly audible

* Measured 0.5m from the façade, so a façade correction of –3 dB has been applied in accordance with the provisions in NZS6801:2008. All other measurement positions can be considered free field.

† Measurement contained tonal special audible characteristic at 4 kHz when assessed using the simplified test method in NZS6801:2008 Appendix B4. A +5 dB penalty has been applied to the measured L_{Aeq} levels to obtain the noise rating L_R to enable comparison with the limits in E25.6.8 and E25.6.19. No penalty has been applied to the measured octave-band levels.

The noise environment in St Georges Bay Rd was dominated by pump noise, The pumps had a low frequency hum, with a distinct high-pitched tone at 4 kHz that was very noticeable.

Daytime noise levels

All measured L_{Aeq} levels complied with the daytime construction noise limits. However, there may be some infringements of up to 5 dB at the upper levels of the Axis Building where there is line-of-sight to the pumps.

We understand that the *Xero* Building (Figure 6) is primarily commercial offices that would typically only be occupied during the daytime. However, internal noise levels during the day may be around 55–60 dB L_{Aeq}, and the high-pitched tone may be audible. This would likely cause disturbance and affect worker concentration.

Bedrooms in *Mixed Use* zoned buildings

We measured infringements of the night-time zone limits at the adjacent Axis Building (Figure 3), with the highest noise levels of 75 dB L_{Aeq} (80 dB L_R), and 97 dB $L_{eq,63Hz}$ and 83 dB $L_{eq,125Hz}$. Façade measurements were taken at ground level and were well-shielded by temporary noise barriers. Incident façade levels at the upper levels of the Axis Building are predicted to be up to 5 dB higher than measured at ground level.

We understand that the Axis Building contains apartment units facing the site, and we do not know where these are within the building but anticipate they would be on the upper levels. Considering the 20 dB façade reduction requirement as per AUP Rule E25.6.10, the estimated noise within the most exposed habitable room in the Axis Apartments would be approximately 65 dB L_R, with low frequency levels of 80 dB $L_{eq,63\ Hz}$ and 65 dB $L_{eq,125Hz}$. The high-pitched tone would likely be clearly audible, and we anticipate that sleep disturbance to the residents would be highly likely.

Measured levels at *Egali House* (Figure 8) and 5 Cleveland Road (Figure 9) were below the limits, and internal noise levels of the pumps are likely below 30 dB L_{Aeq}. Typically, these levels are unlikely to cause sleep disturbance. However, it is possible that the high-pitched tone may be audible to residents and cause annoyance and/or sleep disturbance, even if the levels are low.

Bedrooms in *Residential* zoned buildings

We measured infringements of the night-time zone limits at 66 St Georges Bay Road (Figure 10). A truck near the sinkhole clearing the pipe (Figure 11) was audible at 66 St Georges Bay Road. Truck and pumps noise levels were similar in loudness at this measurement position with a combined level of 59 dB L_{Aeq}, and the truck provided some masking of the high-pitched tone. Internal noise levels within a habitable room at 66 St Georges Bay Road may be up to 45 dB L_{Aeq} with windows open and up to 40 dB L_{Aeq} with windows closed. There is a moderate risk of sleep disturbance to residents near the St Georges Bay Rd and Ruskin St roundabout which have bedrooms that face the site.

At the time of measurement, we understand that the truck was operating 24/7. However, we understand that at the time of reporting, the truck is now only operating during the daytime from the caisson within the sinkhole. This has likely decreased the overall noise levels at buildings near the St Georges Bay Rd and Ruskin St roundabout by about 3 decibels. However, the high-pitched tone is likely more noticeable without the benefit of adequate masking from the truck noise.

Measured levels at 27 Garfield St (Figure 12) and 27 Windsor Street (Figure 13) were above the limit, but internal noise levels of the pumps are likely below 35 dB L_{Aeq}. Typically, these levels are unlikely to cause sleep disturbance. However, it is possible that the high-pitched tone may be audible to residents and cause annoyance and/or sleep disturbance, even if the levels are low.

We recommend significant mitigation measures to reduce sleep disturbance

At the time of the measurements, we understand that complaints had been received from occupants of the adjacent Axis Building. To minimise sleep disturbance to the nearest buildings, we recommend significant noise mitigation.

We understand that the high-pitched tone on the pumps may be due to high pumping load requirements over long distances. We understand that the pumps cannot be moved as a trench has been excavated for their location. We understand that Vector has offered Watercare a transformer which may enable replacing the existing pumps with suitable electric alternatives. This is likely to reduce noise levels, but we do not have the data to quantify by how much.

We note that there is effective mitigation to the ground floor levels of the adjacent buildings by using mass loaded vinyl barriers. Temporarily, we recommend constructing a second row of noise barriers above what has been installed, and angling them towards the plant if possible, in attempts to mitigate noise to the upper levels occupied by residential activities.

We understand that ACH Consulting are in the process of designing a solid enclosure. The enclosure material should have a minimum surface mass comparable to 25 mm plywood and lined with sound absorption material on the walls and roof. The panels of the enclosure should be overlapped if possible, with no gaps. We understand that this enclosure would be mechanically ventilated for the pump exhaust air. If this option is pursued, we recommend that ACH Consulting submit the enclosure design and ventilation system to us for review prior to construction.

Alternatively, acoustic louvres may be considered which would provide both acoustic mitigation and ventilation. However, this option may be cost and lead-time prohibitive for a temporary solution.

Due to the very high levels incident on the Axis Building, it is unlikely that a solid enclosure would adequately reduce noise levels to acceptable levels within the apartments. It is possible that the most affected residents at the Axis Building may consider their apartments to be untenable for the foreseen period of operation. We recommend you consider offering temporary relocation on a case-by-case basis in consultation with the residents in the meantime.

We recommend ongoing written communication with the residents and occupants within 150m of the site, in particular updates on the foreseen duration of operation. We recommend ensuring that it contains contact details and names of the comms teams who receives complaints and enquiries. Furthermore, we recommend including these contact details in public signage near the pumps.

We trust this information is satisfactory. If you have any further questions, please do not hesitate to contact us.

Yours faithfully

MARSHALL DAY ACOUSTICS LTD

Maggie Zhang

Acoustic Consultant

APPENDIX A CONSTRUCTION NOISE LIMITS

Table 5: AUP Table E25.6.27.1 Construction noise levels for activities sensitive to noise in all zones […]

Time of week	Time period	Maximum noise level	
		dB L_{Aeq}	dB L_{AFmax}
Weekdays	0630 – 0730	60	75
	0730 – 1800	75	90
	1800 – 2000	70	85
	2000 – 0630	45	75
Saturdays	0630 – 0730	45	75
	0730 – 1800	75	90
	1800 – 0630	45	75
Sundays and public holidays	0630 – 0730	45	75
	0730 – 1800	55	85
	1800 – 0630	45	75

Table 6: AUP Table E25.6.27.2 Construction noise levels for noise affecting any other activity

Time of week	Time period	Maximum noise levels dB L_{Aeq}
All days	0730 – 1800	75
	1800 – 0730	80

APPENDIX B PHOTOS

Figure 3: Measurement position at *Axis Building, max* viewed from south

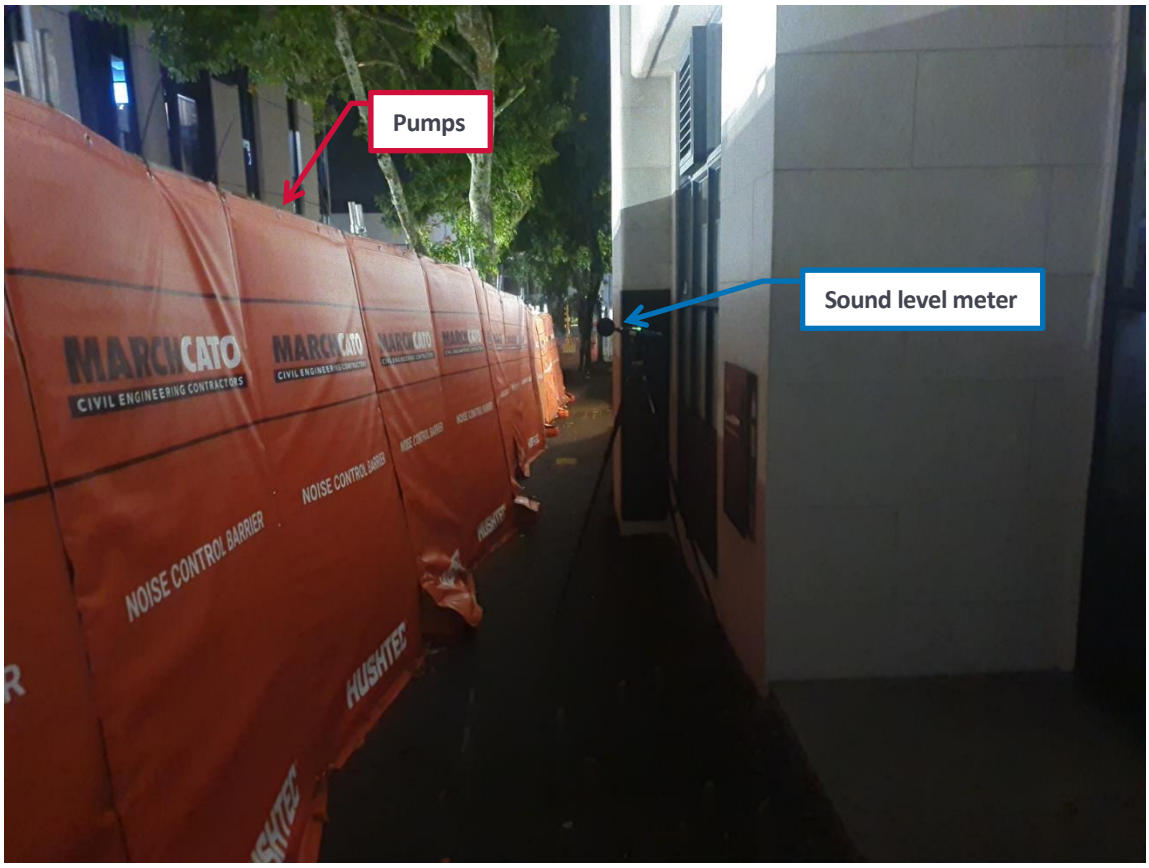


Figure 4: Measurement position at *Axis Building, south* viewed from south

Figure 5: Measurement position at *Axis Building, north* viewed from north

Figure 6: Measurement position at *Xero Building* viewed from south

Figure 7: Trench containing six pumps relative to nearest buildings

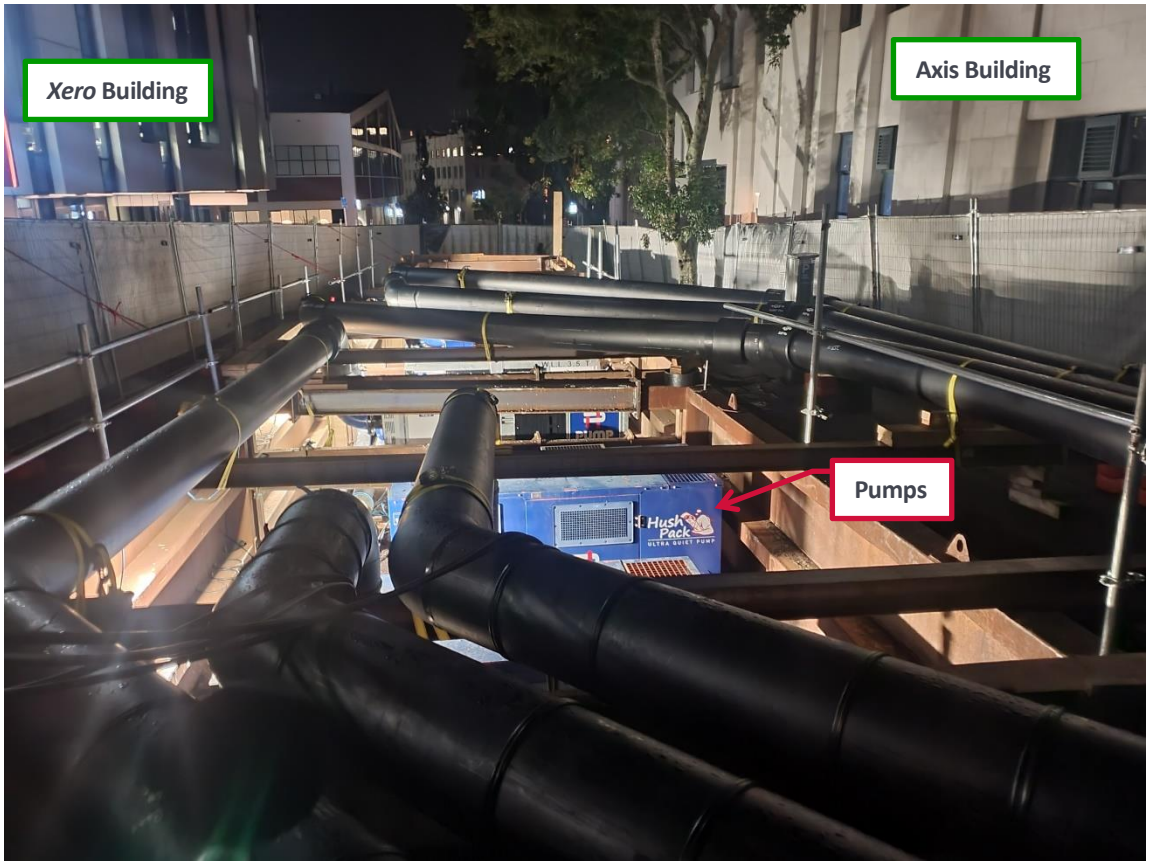


Figure 8: Measurement position at *Egali House*

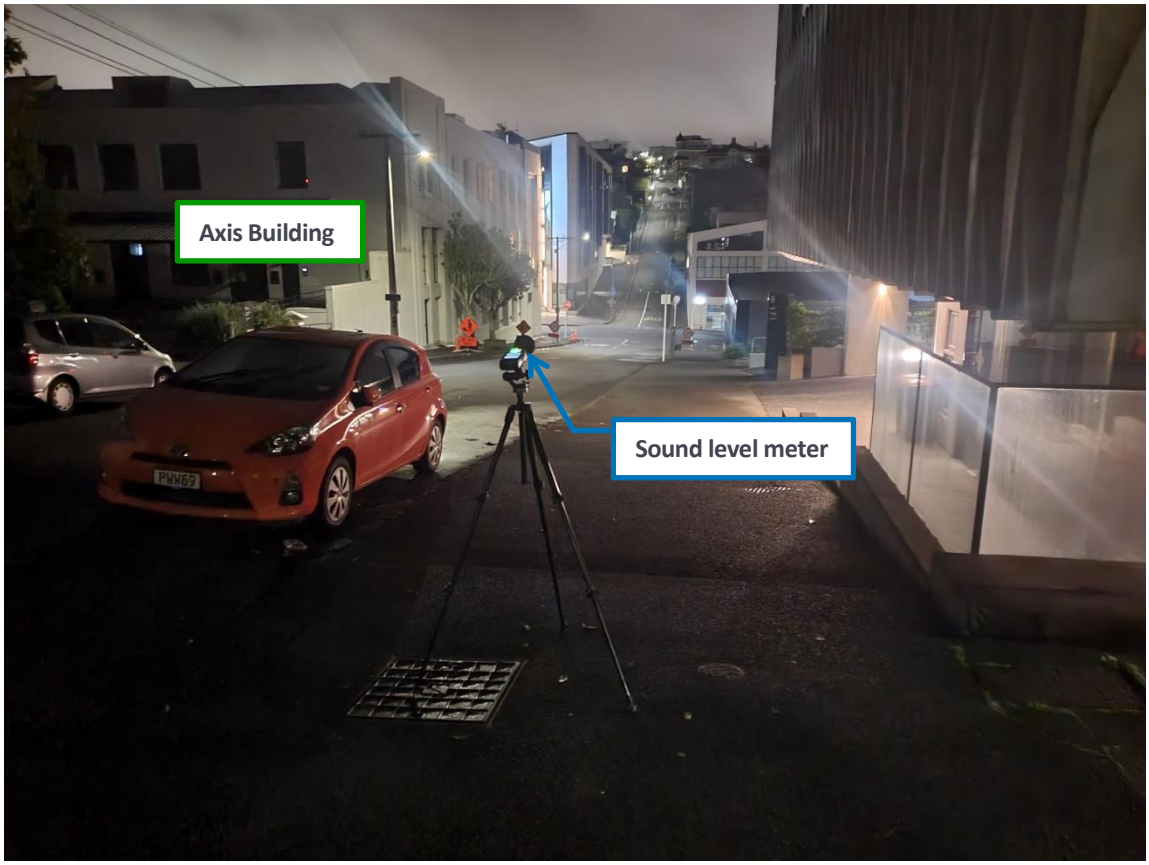


Figure 9: Measurement position at 5 Cleveland Road

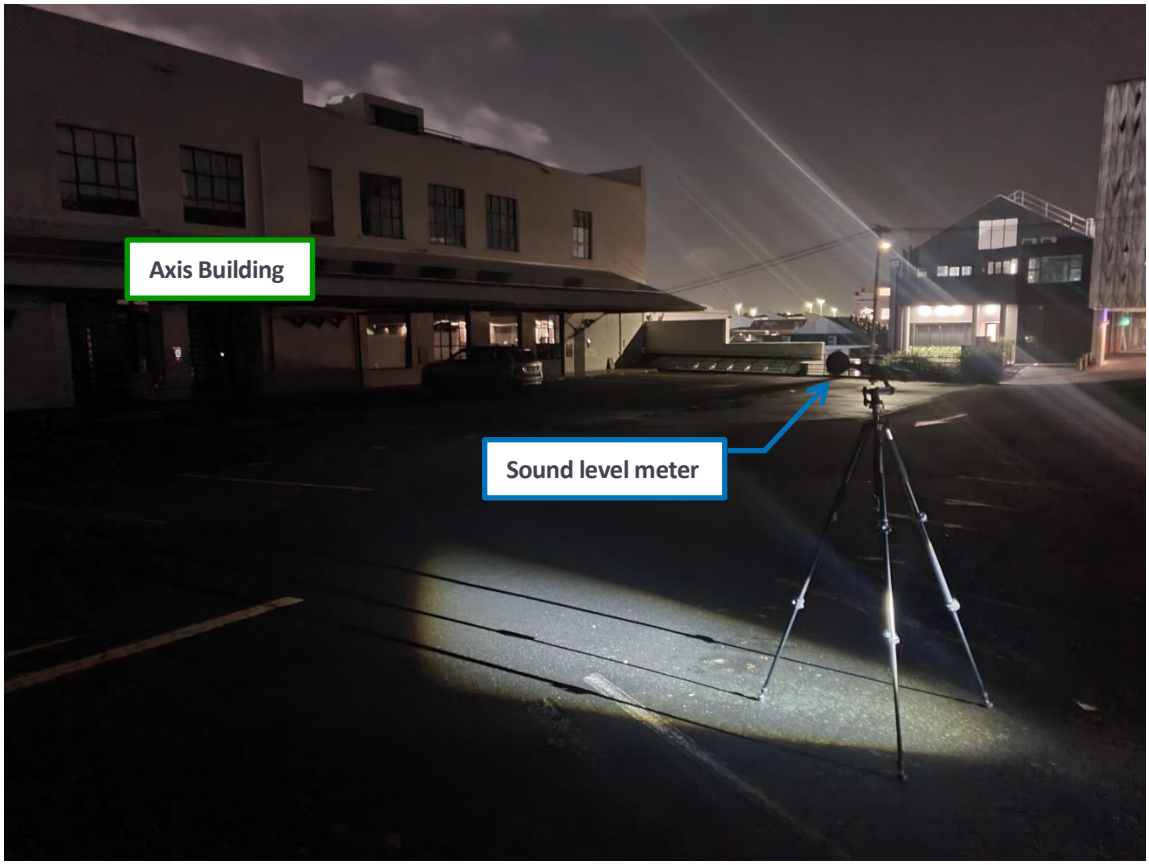


Figure 10: Measurement position at 66 St Georges Bay Road relative to pumps

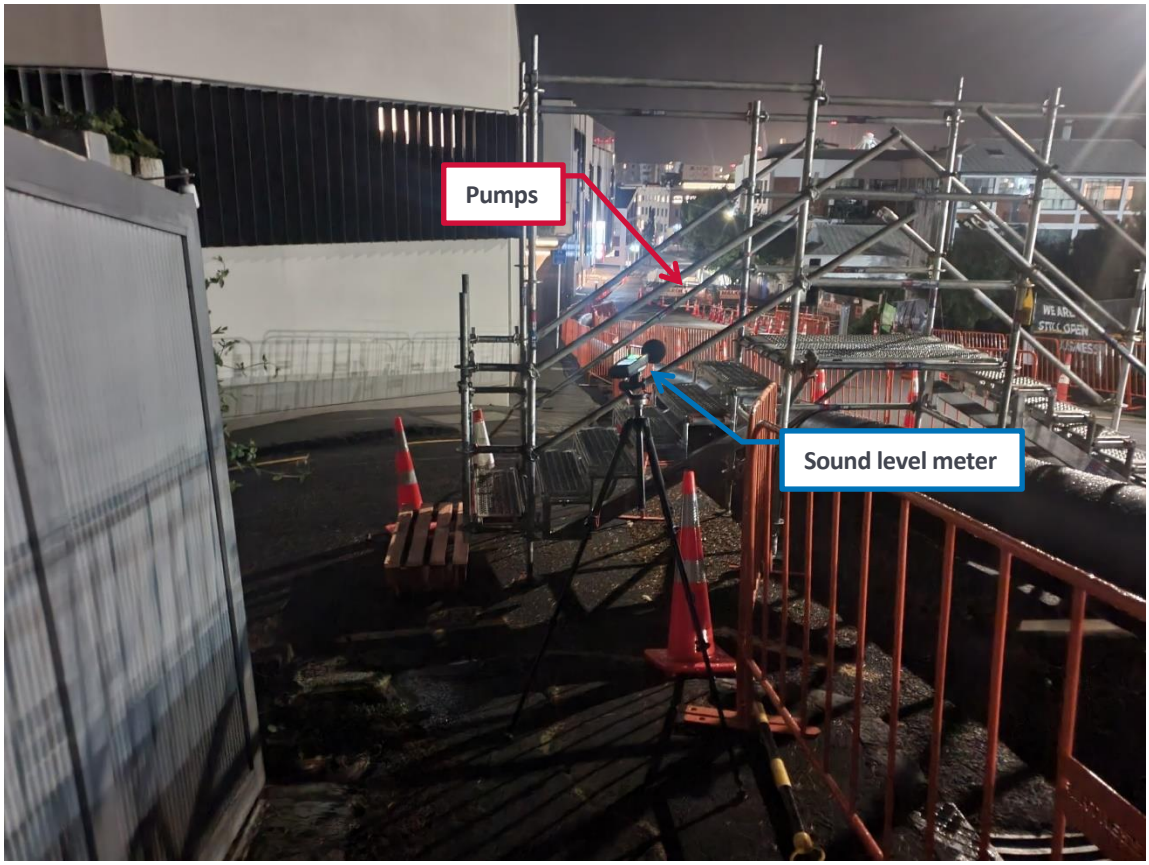


Figure 11: Measurement position at 66 St Georges Bay Road relative to truck clearing pipe

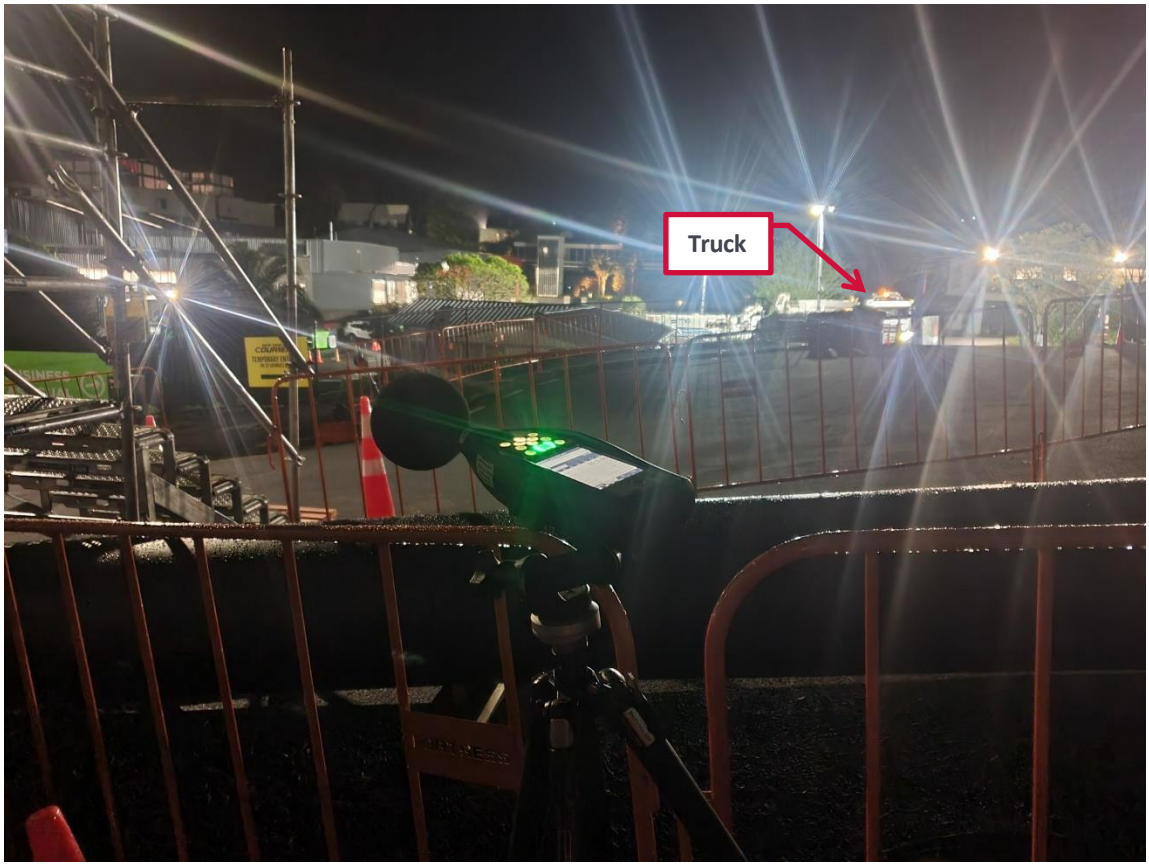


Figure 12: Measurement position at 27 Garfield St

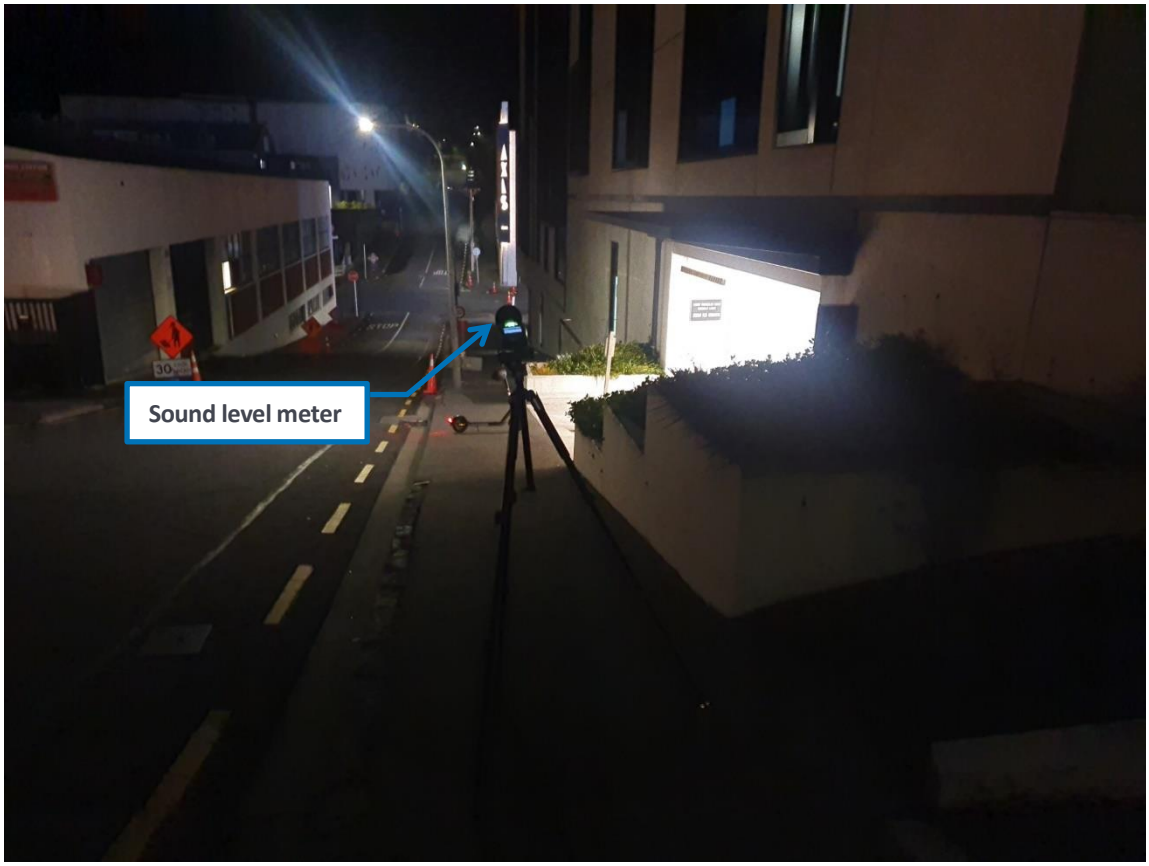


Figure 13: Measurement position at 27 Windsor St