Notice of Requirement
and
Application for Resource Consent

Project title and description

Whenuapai Wastewater Servicing Scheme

Package 1

28 October 2022

prepared for Watercare by:

Beca

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An Auckland Council Organisation

Sens

Whenuapai Wastewater Servicing Scheme Package 1 – Notice of Requirement and Application for Resource Consent

Assessment of Effects on the Environment

Prepared for Watercare Services Ltd
Prepared by Beca Limited

28 October 2022

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Revision History

Revision Nº	Prepared By	Description	Date
1	Rachael Clark	Draft for internal review	30 August 2022
2	Rachael Clark and Sarah MacCormick	Draft for Watercare review	20 September 2022
3	Rachael Clark and Sarah MacCormick	Final for lodgement	28 October 2022

Document Acceptance

Action	Name	Signed	Date
Prepared by	Rachael Clark and Sarah MacCormick		28 October 2022
Reviewed by	Sarah MacCormick		28 October 2022
Approved by	Jenny Vince		28 October 2022
on behalf of	Beca Limited		

Contents

Appendices

Glossary of Terms and Acronyms

Term	Description
AEP	Annual Exceedance Probability, which is the probability of an event occurring in any given year
ANZECC	Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (ANZECC 2000 Guidelines)
Auckland Council Healthy Waters	Auckland Council department responsible for the management of stormwater across the Auckland Region, to reduce flooding and prevent pollution of Auckland's waterways
AUP:OP	Auckland Unitary Plan: Operative in Part
bgl	Below Ground Level
BPO	Best Practicable Option
CNVMP	Construction Noise and Vibration Management Plan
DSI	Detailed Site Investigation
ECBF	East Coast Bays Formation
EcIA	Ecological Impact Assessment
GSMCP	Groundwater and Settlement Monitoring and Contingency Plan
HAIL	Hazardous Activities and Industries List. A list established by Ministry for the Environment, of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal.
L_{AEQ}	Equivalent continuous noise level
L/s	Litres per second
mRL	Metres Reduced Level, which is a calculated elevation in relation to a particular datum
NES CS	Resource Management (National Environmental Standard for Assessment and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
NES:F	Resource Management (National Environmental Standards for Freshwater) Regulations 2020
NoR	Notice of Requirement
NPS:FM	National Policy Statement for Freshwater Management
Package 1 –	Pump Station with gravity main and rising main.
Package 2 –	Connecting gravity sewer from Package 1
Package 3 –	Four gravity pipelines services the Southern Redhills area.
RMA	Resource Management Act 1991
SAP	Site Access Point
Watercare	Watercare Services Limited, a council controlled organisation responsible for providing water and wastewater services across the Auckland Region.

Executive Summary

Whenuapai is expected to experience significant urban development over the next 30 years. However, the existing wastewater network has limited capacity available to service this growth. Increasing wastewater flows through the existing network without providing additional capacity risks adverse effects on the environment.

In response to this growth, Watercare Services Limited (Watercare) is proposing to construct a wastewater pipeline and pump station (Whenuapai Wastewater Servicing Scheme – Package 1 Project, the Project). The Project will deliver the necessary wastewater infrastructure network to unlock land within Whenuapai, and the wider area, for development, and is part of a wider scheme to convey wastewater from the Whenuapai Catchment to the Northern Interceptor.

The Project involves the installation of a gravity main pipeline from the existing pump station in Whenuapai village to 23A Brigham Creek Road; an underground pump station at 23A Brigham Creek Road (with aboveground ancillary structures); a rising main between 23A Brigham Creek Road and 32 Mamari Road; and a break pressure chamber at 32 Mamari Road. The works also require installation of a culvert at 31 Brigham Creek Road, which will result in the loss and modification of 63 m of natural channel. A 426 m reach of Sinton Stream is proposed to be enhanced to compensate this loss.

Construction and laydown areas to support the works will be located at 20-22 Brigham Creek Road, 23-27 Brigham Creek Road, 32 Mamari Road, and 28 Brigham Creek Road. The pipeline will be constructed by both trenched and trenchless methods, including open trenching through a wetland at 23-27 Brigham Creek Road. Following construction, the disturbed areas of the wetland will be reinstated, replanted, and recontoured to the original landform. Protected trees will be removed from the riparian area of the stream, and may also be removed from the open space zone. Non-pest plants replaced at a ratio of 1:1.5 (or by agreement with stakeholders) and in conjunction with Oyster Capital works where appropriate.

There is potential for temporary effects on the environment during construction, including erosion and sedimentation, elevated noise levels in exceedance of the construction noise standards, and traffic disruption. Effects resulting from installation of the pipeline will be progressive along the alignment. Measures will be put in place to manage potential effects, including an Erosion and Sediment Control Plan (ESCP), Construction Noise and Vibration Management Plan (CNVMP), and Traffic Management Plan (TMP). There is unlikely to be any significant effect associated with groundwater dewatering or settlement however monitoring is proposed prior to and during construction to monitor and respond to effects.

Watercare will continue to engage with Mana Whenua and stakeholders, including landowners, Community Facilities, Healthy Waters, Auckland Transport, and other network utility operators.

An assessment of alternatives has been carried out throughout the design of the Project. The project is considered reasonably necessary to meet Watercare objectives, coordinates with known development currently planned within the area. An assessment of the relevant objectives and policies of the relevant statutory and non-statutory documents has been undertaken, which demonstrates that the Project is generally consistent with the relevant objectives and policies, and the purposes and principles of the RMA.

Overall, there will be some permanent and temporary adverse effects during the construction of the Project. Mitigation measures have been proposed to avoid, minimise or reduce these effects. Once the Project is in place, it will have significant benefits associated with providing wastewater servicing capacity for the Whenuapai catchment, unlocking land for development.

1 Introduction

1.1 Purpose

This Notice of Requirement (NoR), Outline Plan Waiver and Resource Consent application is submitted by Watercare Services Limited (Watercare) in accordance with Section 168, Section 176A and Section 88 of the Resource Management Act 1991 (RMA). This application seeks a designation and resource consents for the construction, operation and maintenance of the proposed Whenuapai Wastewater Servicing Scheme – Package 1 Project (the Project), which includes a gravity main, pump station, rising main, and associated infrastructure.

1.2 Watercare

Watercare is a Requiring Authority pursuant to Section 166 of the RMA. Watercare is Council Controlled Organisation (CCO) wholly owned by Auckland Council. Watercare manages and has financial responsibility for all water and wastewater related infrastructure assets and asset development programmes within Auckland Council. In particular Watercare collects and treats about 410 million litres of wastewater around the Auckland region.

Watercare continually reviews its activities, identifying the need for infrastructure maintenance, replacement and upgrade, as well as initiating new infrastructure projects to ensure it meets its customer's needs, business objectives and statutory requirements, including due to future urban growth.

1.3 Project Background

Whenuapai is expected to experience significant growth over the next 20 years. By 2041 the number of dwellings within the Whenuapai catchment is expected to increase from approximately 2,400 to 10,200 (or 30,720 people), and peak wet weather wastewater flows projected to increase from 74 L/s to 320 L/s[1]. Wastewater flows from Whenuapai Village are currently delivered into the Riverhead rising main. However, the existing network has limited capacity available to service development within the catchment, and increased wastewater flows through the Riverhead rising main risk increasing the number of overflows at the Riverhead Pump Station. Further development of the catchment is therefore constrained, and additional wastewater infrastructure is needed to unlock the development potential of the land in the wider area and prevent adverse effects on the environment.

The Whenuapai-Redhills Wastewater Servicing Scheme (the Scheme) has been developed to deliver the necessary wastewater infrastructure network in Whenuapai (and nearby Redhills) using a staged approach. The Scheme will be delivered in three different packages, designed to respond to growth and necessity as demand increases across the area.

The first package, "Package 1" (referred to as 'the Project' which is the subject of this application), is sized to provide wastewater servicing capacity for approximately growth in the Whenuapai catchment. Package 2 and Package 3 will be delivered at a later stage (further information on Package 2 and Package 3 is available in Appendix J – Assessment of Alternatives)[2].

[1] Dwelling number projections were calculated in Housing Infrastructure Fund Wastewater Servicing Detailed Business Case, 2018, and include dwellings on septic tank in 2018.

[2] Package 2 extends from 32 Mamari Road to 2A Buckley Avenue, Hobsonville and will include the construction of the break pressure chamber. Package 3 includes local wastewater connections within Redhills.

The Project includes the following five key components (see Figure 1):

1. A **Pump Station** at a point where the Whenuapai and Redhills Catchments meet at 23A Brigham Creek Road, with an emergency overflow outfall to the Sinton Stream
2. A **Gravity Main Pipeline** (approximately 700m long and 375 – 475 mm in diameter) between the existing Whenuapai Village Pump Station on Tamiro Road and the Pump Station
3. A **Rising Main** (approximately 1.5km long and 500 mm in diameter) between the Pump Station and a proposed new break pressure chamber on Mamari Road.
4. A **Culvert** (approximately 63 m long including wing wall and rip rap) to provide access for the rising main across Sinton Stream.
5. A **Break Pressure Chamber** located on the corner of Mamari and Spedding Roads[3].

For the purposes of this AEE, the Project also includes construction activities including site access, construction yards/laydown areas and temporary access road(s) (described in more detail in Section 4.2). The physical footprint of the Project is represented by the designation boundary (shown on Figure 1).

The proposed works are described in detail in Section 3 of this AEE, and the design drawings are provided in Appendix A.

1.4 Notice of Requirement

Watercare has lodged a Notice of Requirement (NoR) which seeks to designate 90,180 m^2 of land for a public work; being the construction, operation, and maintenance of new wastewater infrastructure (including a new pump station, rising main, gravity main and auxiliary works) within Whenuapai, in the Auckland Unitary Plan: Operative in part (AUP:OP) and any subsequent proposed Unitary Plan applying to the land subject to this designation.

The proposed Designation drawings are in Appendix B.

1.5 Outline Plan Waiver

Watercare is seeking confirmation that an Outline Plan is not required for the Project works (except the break pressure chamber), under Section 176A(2)(b) for the proposed works, given that detailed information required has been provided within this application in accordance with the requirements of Section 176A(3).

The break pressure chamber is excluded from the Outline Plan Waiver request. The break pressure chamber, which is being designed and consented as part of Package 2 works. As part of a future consenting package, an Outline Plan will be provided, and any relevant regional consents will be applied for.

1.6 Summary of resource consents sought

Resource consent is required for a **Discretionary Activity** under the AUP:OP and National Environmental Standards : Freshwater (NES:F), pursuant to Section 9 (2), 13 and 14 of the RMA for the following activities (outlined in further detail in Section 4 of this AEE report):

- Works within the bed of a wetland not otherwise provided for (AUP:OP Rule E3.4.1(A1)) (**Discretionary Activity**), for installation of a new pipelines within the bed of a wetland, and associated land disturbance and vegetation removal.

[3] The location of the break pressure chamber has been influenced by the alignment of the rising main and is being designated as part of the Project. Detailed design for the break pressure chamber is being completed as part of 'Package 2' and therefore resource consents will be part of that consenting package.

- Installation of a culvert more than 30m in length (AUP:OP Rule E3.4.1(A33)) (**Discretionary Activity**), for installation of a culvert of 63 m in length (including wingwalls and rip rap), in Sinton Stream.
- Dewatering of groundwater not complying with standards (AUP:OP Rule E7.4.1(A20)) (**Restricted Discretionary Activity**), for dewatering which occurs for greater than 30 days during construction.
- Diversion of groundwater caused by an excavation that does not meet permitted activity standards (AUP:OP Rule E7.4.1(A27)) (**Restricted Discretionary Activity**), for temporary sheet piling around the pump station site and stream diversion which is in place for greater than 30 days, which divert groundwater over a length of greater than 20 m, at a depth greater than 2 m below groundwater levels.
- Vegetation alteration and removal from the riparian area (AUP:OP Rule E26.3.3.1(A77)) (**Restricted Discretionary Activity**)). Up to 94 protected tees will be removed from the riparian area and open space zone, and approximately 43 protected trees in the riparian area will have root zones infringed.
- Earthworks which exceed 10,000 m^2, including over 2,500 m^2 in the Sediment Protection Area and on land with a slope exceeding 10 per cent (AUP:OP Rule (E26.5.3.1 (A107)) (**Restricted Discretionary Activity**) to construct the culvert in Sinton Stream.
- Construction of specified infrastructure in proximity to a wetland (NES:F Regulation 45(1, 2, and 4)) (**Discretionary Activity**), for vegetation clearance, earthworks, and damming and diversion of water within a natural wetland for the purpose of constructing specified infrastructure.

1.7 Report structure

This report contains the following information:

- A description of the existing environment;
- A description of the proposed activities;
- An assessment of alternatives considered;
- An assessment of the potential and actual effects on the environment of the activity and the proposed mitigation measures;
- Engagement and consultation undertaken for the project;
- Notification assessment
- An assessment of the proposed activities against matters set out in Part 2 of the RMA; and
- The statutory framework relevant to the assessment of effects.

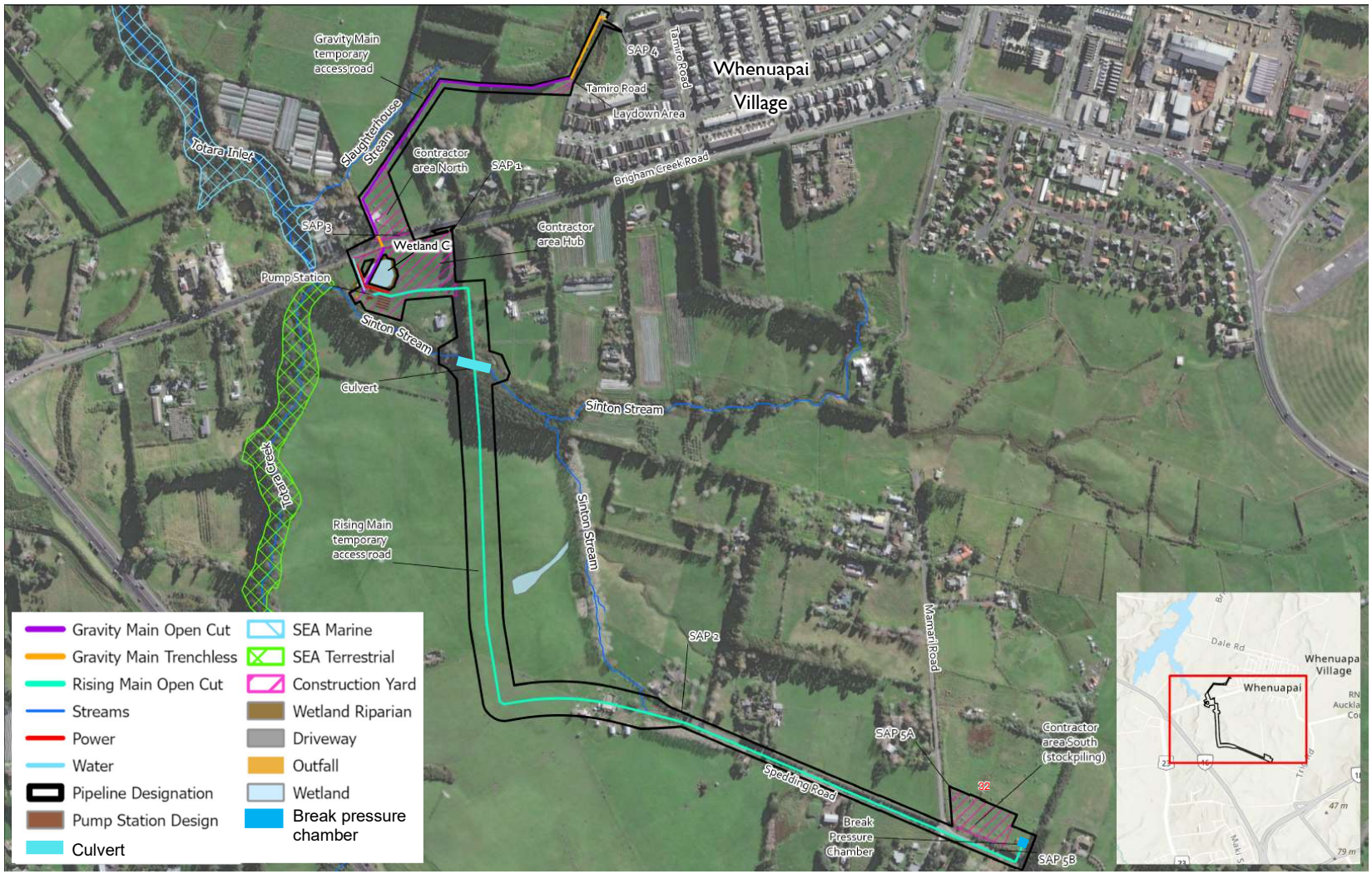

Figure 1. The Project – Location and Project overview

2 Existing environment

This section provides an overview of the existing environment, including the location and surrounding land use and, AUP: OP zoning and notations.

2.1 Location and surrounding land uses

Figure 1 above shows the location of the proposed works in Whenuapai, Auckland.

The following describes the location of the proposed works across the three key work areas, including the Gravity Main Project Area, the Pump Station Project Area, and the Rising Main, Culvert and Break Pressure Chamber Project Area.

2.1.1 Gravity Main Project Area

The gravity main works will be located at Roundel Crescent, Tamiro Road, and from 28 to 20 Brigham Creek Road, in Whenuapai, Auckland (refer to Table 1 and Figure 2). Records of Title for the sites are provided in Appendix C.

Table 1. Property information for the gravity main project area

Property Address	Legal Description	Area (ha)	Owner
Roundel Crescent (existing pump station)	LOT 809 DP 492005	.09	Watercare
Tamiro Road (stormwater embankment)	LOT 812 DP 508816	1.0	Auckland Council
28 Brigham Creek Road	LOT 3 DP 51941	4.0	Natural Harmony Company Ltd
26 Brigham Creek Road	LOT 2 DP 51941	4.6	24 Brigham Creek Road
20-22 Brigham Creek Road	LOT 1 DP 51941	5.3	N. Apsell
Brigham Creek Road	N/A – road reserve	N/A	Auckland Transport
23-27 Brigham Creek Road	SECT 2 SO 569103	4.6	Brigham Land Limited Partnership (Oyster Capital)

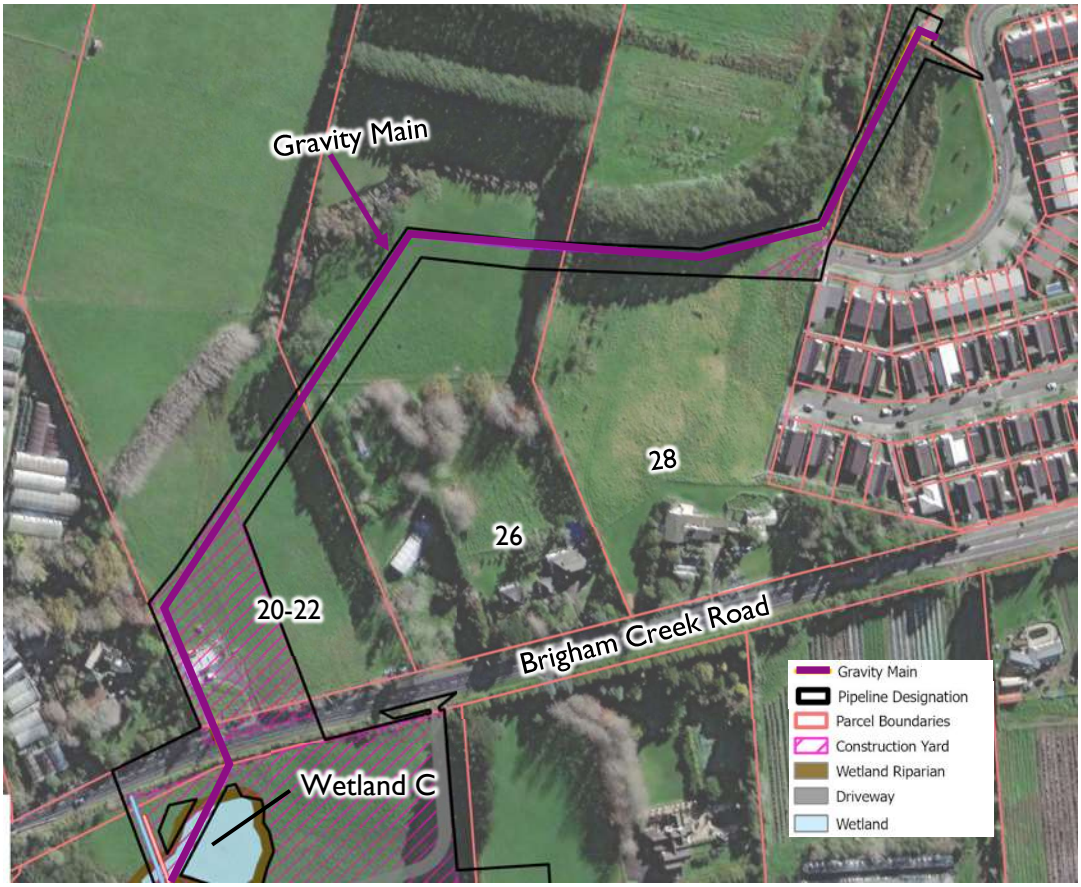

Figure 2. Gravity main project area (designation extent outlined in black) (Source: Designation drawing GIS-4219201-1, Appendix B)

The eastern section of the gravity main project area includes the existing pump station at Tamiro Road, which is owned by Watercare. There is an existing vehicle crossing to Tamiro Road, and a stormwater pond embankment which is owned by Auckland Council. The remainder of the gravity main project area is grassed farm paddocks. The western section of the project area at 20-22 Brigham Creek Road contains a farm shed at the south western corner, and has an existing vehicle crossing to Brigham Creek Road along the southern boundary.

Freshwater features within the gravity main project area include Slaughterhouse Stream, a permanent stream which flows in a westerly direction along the northern edge of the project area, and a wetland (Wetland C) which is located at 23-27 Brigham Creek Road. Slaughterhouse Stream and Wetland C are described further in Section 2.3 below. Vegetation includes native landscape planting on the stormwater pond embankment, exotic trees located along the riparian margin of Slaughterhouse Stream, and shelterbelts along property boundaries.

The area to the east of the gravity main project area comprises the residential town of Whenuapai Village, whilst land use to the north, west and south is predominantly rural, including agricultural and horticultural uses. In addition, Brigham Creek Road, an arterial road which carries an average of 12,000 vehicles per day, runs through the project area in an east to west direction. Brigham Creek Road currently has a speed limit of 80 km per hour. Auckland Transport is proposing to lower the speed limit to 60 km per hour, which if approved, will be implemented in November / December 2022.

2.1.2 Pump Station Project Area

The pump station works will be located at 23A Brigham Creek Road, Whenuapai (refer to Table 2 and Figure 3).

The portion of the site to be used for the permanent pump station is owned by Watercare, whilst the remainder of the site is owned by Oyster Capital. The site is a farm paddock, which contains a vacant dwelling and ancillary buildings on the eastern boundary of the site. An existing vehicle access to Brigham Creek Road is located in the north eastern corner of the site.

Records of Title for the sites are provided in Appendix C. As the survey of the pump station location by Watercare has been recently completed, this is not yet reflected in the Record of Title.

Table 2. Property information for the pump station project area

Property Address	Legal Description	Area (ha)	Owner
23-27 Brigham Creek Road	SECT 2 SO 569103	4.6	Brigham Land Limited Partnership (Oyster Capital)
23A Brigham Creek Road	SECT 1 SO 569103	0.1	Watercare

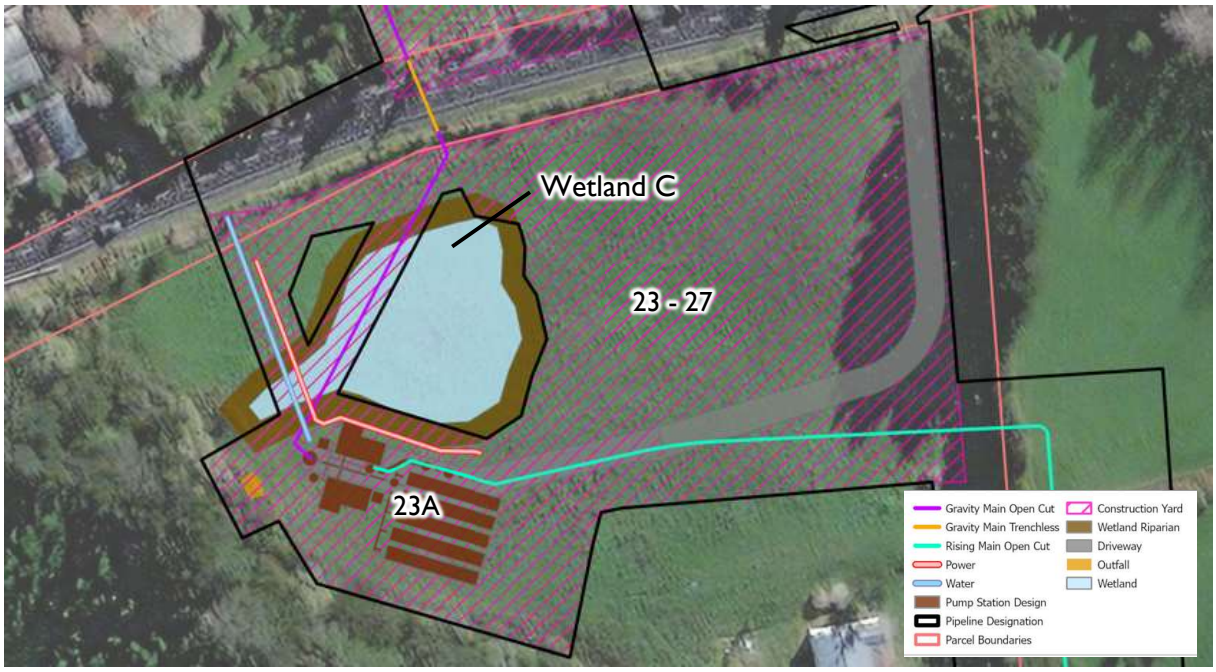

Figure 3. Pump Station area (designation boundary outlined in black) (Source: Designation drawing GIS-4219201-2, Appendix B)

Freshwater features within the Pump Station Project Area include Sinton Stream, a permanent stream which flows in a north west direction, and Wetland C. Sinton Stream and Wetland C are described further in Section 2.3 below. Vegetation surrounding the pump station site includes exotic trees planted along the eastern property boundary as a shelterbelt, and native and exotic trees (including a significant number of pest plants), lining the riparian margin of Totara Creek.

2.1.3 Rising Main, Culvert, and Break Pressure Chamber Project Area

The rising main, culvert, and break pressure chamber works will be located at 23 to 31 Brigham Creek Road, 15 to 19 Spedding Road, the Spedding Road road reserve, and 32 Mamari Road, in Whenuapai, Auckland (refer to Table 3 and Figure 4). Records of Title for the sites are provided in Appendix C.

Table 3. Property information for the rising main project area

Property Address	Legal Description	Area (ha)	Owner
23-27 Brigham Creek Road	SECT 2 SO 569103	4.6	Brigham Land Limited Partnership (Oyster Capital)
31 Brigham Creek Road	LOT 14 DP 53740	4.0	Private owner
15-19 Spedding Road	PT LOT 4 DP 24410, LOT 1 DP 24410, PT LOT 5 DP 24410	29	Clover Farms Whenuapai
Spedding Road	N/A – road reserve	N/A	Auckland Transport
32 Mamari Road	SECT 2 SO 582220*	4.0	Private owner (partially leased by Watercare)
	SECT 1 SO 582220*	0.15	Watercare
**The legal description of 32 Mamari Road was previously PT LOT 19 DP 62344. The property was subdivided, and SECT 1 SO 582220 purchased by Watercare, in August 2022. Updated Certificates of Title to reflect these changes are expected to be available in approximately December 2022.*			

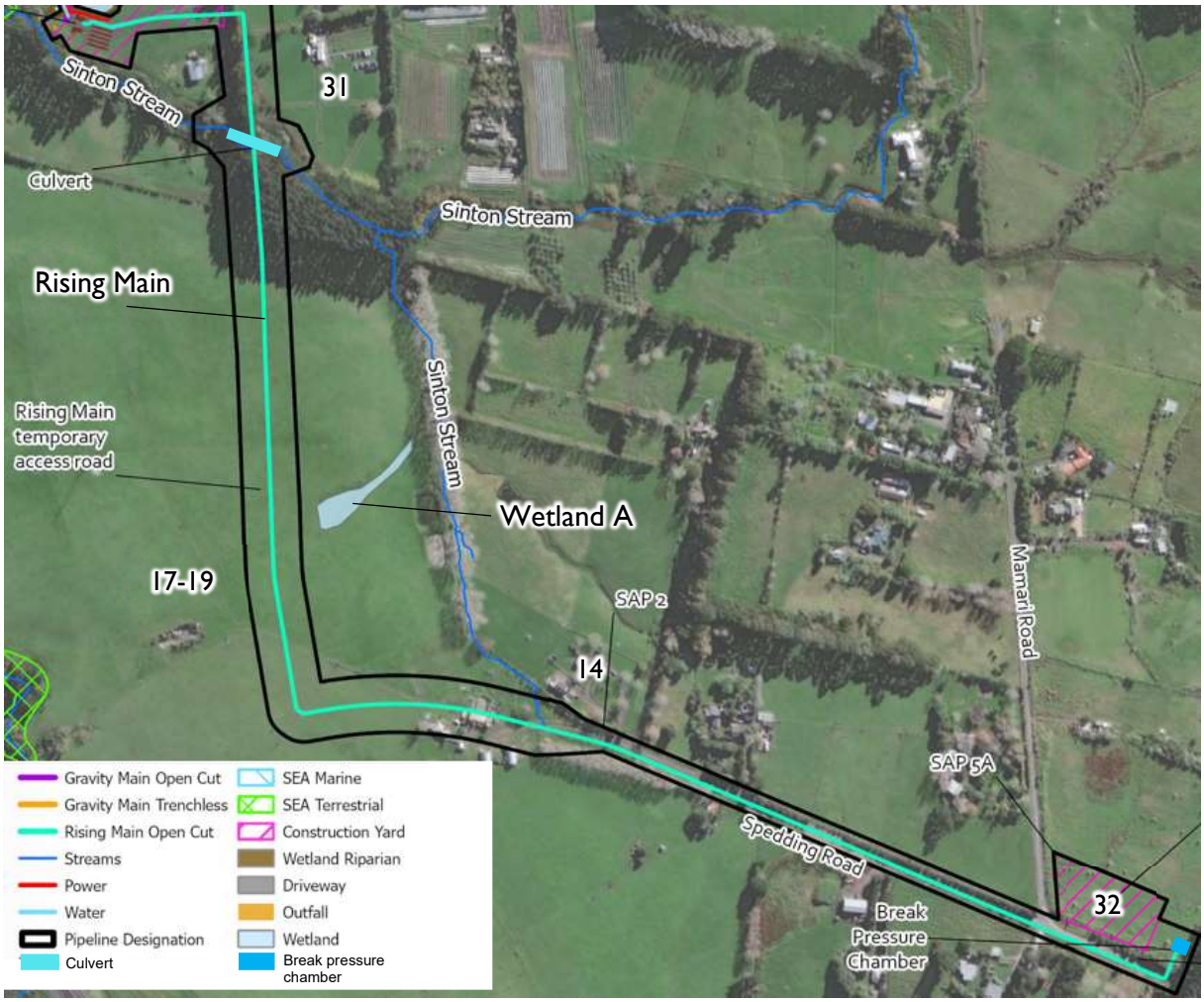

Figure 4. Rising main, culvert and break pressure chamber area

The northern end of the rising main project area, including 23 to 31 Brigham Creek Road, and 15-19 Spedding Road, is grassed farm paddocks. The central section of the project area is the Spedding Road road reserve which begins at the southern boundary of 15-19 Spedding Road and extends to the southern end of the project area at 32 Mamari Road. The road is unsealed for the majority of the project area but is sealed from 32 Mamari Road (where the project terminates), to the subsequent intersection with Trig Road. The break pressure chamber will be located at 32 Mamari Road, a farm paddock.

Freshwater features in proximity to these components include Wetland C to the north and Wetland A 60m to the east of the rising main alignment. These features are described further in Section 2.3 below. Vegetation in the rising main project area includes a crop of approximately 130 pine trees surrounding Sinton Stream at 31 Brigham Creek Road. Approximately 40 of the pine trees are within the riparian area of the stream. In addition, several native and exotic trees line the Spedding Road road reserve and private property boundaries.

Landuse surrounding this Project Area is primarily rural, and used for agricultural, horticultural, and residential purposes.

2.2 AUP:OP zones and overlays

Table 4 and Figure 5 provide an overview of the relevant zoning, overlays, controls and across the project area.

Table 4. Relevant AUP zoning and overlays across the project area.

Location	Zone	Overlays, controls, designations
Roundel Crescent (existing pump station)	• Residential – Mixed Housing Urban Zone	• Nil
Tamiro Road (stormwater embankment)	• Open Space - Informal Recreation Zone	• Overland Flow path • 1% AEP Flood plain
28 Brigham Creek Road	• Future Urban Zone	• Stream • Overland Flow path • 1% AEP Flood plain
26 Brigham Creek Road		
20-22 Brigham Creek Road		
Brigham Creek Road	• Road reserve	• Arterial Road Control
23A Brigham Creek Road	• Future Urban Zone • Proposed modification to Business – Light Industry Zone (Private Plan Change 69 – Spedding Block)	• Nil
23-27 Brigham Creek Road		• Stream • Overland Flow path
31 Brigham Creek Road	• Future Urban Zone • Proposed modification to Business – Light Industry Zone and Road[4]	• Stream • Overland Flow path • 1% AEP Flood plain
15-19 Spedding Road		• Overland Flow path
Spedding Road	• Road reserve	
32 Mamari Road	• Future Urban Zone	

[4] Private Plan Change 69 – Spedding Block

Sensitivity: General

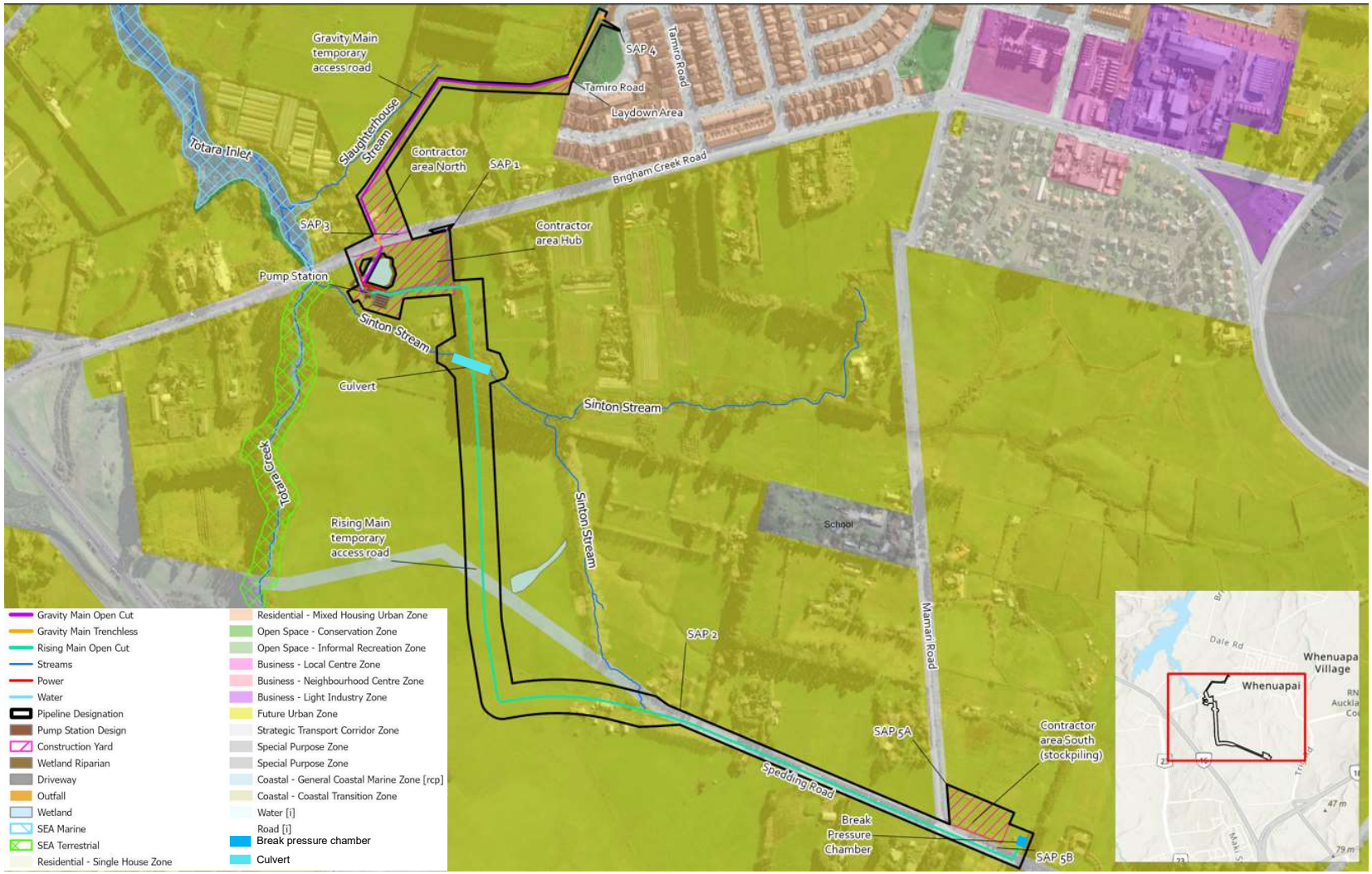

Figure 5. Indicative location of works, including relevant zones, controls and overlays applicable to the site under the AUP:OP (indicative works outlined in red, designation footprint outlined in black) (Source: Auckland Council planning maps)

2.3 Ecological Features

The Ecological Impact Assessment (EcIA) (Appendix D) provides a description of the hydrological and ecological features of the site. These features are summarised below.

2.3.1 Slaughterhouse Stream

Slaughterhouse Stream is a permanent stream with a natural channel bed comprised of predominantly stiff clay, which flows from east to west, and discharges into Tōtara Inlet. There is predominantly mature exotic vegetation in the riparian area of the stream which provides low to moderate shading. The stream is unfenced from stock. The stream has been assessed as having **low-moderate** ecological value.

2.3.2 Sinton Stream

Sinton Stream is a permanent stream with a natural channel bed which flows from south east to north west across the project area, discharging into Tōtara Creek. The stream provides a variety of habitat features for fish. An existing culvert which is approximately 5.1 m in length is located within the stream at the eastern boundary of 23-27 Brigham Creek Road.

The banks of the stream have a gradient of >30 degrees. There is predominantly mature exotic vegetation in the riparian area which provides moderate shading. The stream appears unfenced from stock.

The stream has poor macroinvertebrate diversity, with the macroinvertebrate ecological value classified as low. Nevertheless, the stream has good hydraulic and biogeochemical function, and the ecological value of the site for freshwater fish is classified as high given the stream contains several native fish species, including several species (longfin eel, inanga and koura) which have the conservation status ‘At risk – declining’.

Overall the ecological value of the stream is assessed as **moderate**.

2.3.3 Wetland C

Wetland C is located approximately 10 m north of the proposed pump station location, and expands and contracts in size seasonally, with a maximum area of 1,418 m^2. Vegetation within the wetland is predominantly exotic grasses, wiwi (*Juncus edgariae*), and slender knotweed (*Persicaria decipiens)*. The wetland area is highly modified and degraded, with limited suitable habitat for fauna. Overall, the wetland is assessed to have **low** ecological value.

2.3.4 Wetland A

Wetland A is located approximately 60 m to the east of the rising main and is approximately 1,178 m^2 in area. Vegetation within the wetland is predominantly exotic pasture grass, with wiwi (*Juncus edgariae*) and other native and exotic species also present. The wetland area is highly modified and degraded as it is in a paddock with unrestricted stock access and has limited habitat available for fauna. Overall, the wetland is assessed to have **low** ecological value.

2.3.5 Terrestrial fauna

Bats

Trees within the Sinton Stream riparian margin, and particularly the pine stand, have the potential to be used intermittently as bat roost trees due to their size. No bat activity is known to be recorded within the Project area at Sinton Stream. However, bat activity has previously been recorded within the Tōtara Creek corridor, approximately 300 m from the Project.

Whilst the level of activity recorded within the vicinity of the works is not high, the long-tailed bat species have a conservation status of 'Threatened – national critical'.

Lizards

Neither records nor field observations indicate native lizards are present within the site area. Whilst it is possible the native Copper Skink species may be present within the works areas due to presence of suitable habitat, including riparian margins and long pasture grasses, the likelihood that uncommon 'At Risk' species are present is low.

Birds

Several common indigenous and exotic native birds species with the conservation status of either 'introduced and naturalised' or native 'not threatened' have been observed or have recorded observations within the vicinity of the works.

2.4 Landscape and visual characteristics

A Landscape and Visual Assessment has been prepared for the Project and is provided in Appendix E. This provides a description of the main landscape characteristics of the site, which is summarised below.

The predominant landscape attributes and values within the works areas include open pasture fields, with established exotic shelterbelts lining some property boundaries. Additional features contributing to landscape values include the two streams, with natural channel beds and riparian margins lined with predominantly exotic vegetation, the two wetlands which are highly modified and degraded, and the pine forest located either side of Sinton Stream.

The natural character of the project area includes the living organisms which shape the ecosystem, the water catchments and landform ('abiotic' attributes), and the interpretation of human experience of the waterbodies and their margins within the project area ('experiential' attributes). The abiotic attributes of the project area have moderate natural character value, with project area landform including gently rolling terrain which reduces in elevation towards the relatively intact streams and the Totara Inlet, and a natural depression where a wetland has formed at the pump station site. The experiential values of the waterbodies within the project area range from very low to moderate-low as the streams are modified by existing culverts, the riparian margins of the streams have exotic or invasive species and/or are limited, and the wetlands have limited habitat and prominent exotic vegetation.

2.5 Underlying geology and hydrogeology

A Groundwater and Settlement Effects Report has been undertaken for the project (refer Appendix F), which describes the underlying geology and hydrogeology of the project area.

The gravity main and pump station are underlain by the Tauranga Group Alluvium and Tauranga Group Puketoka Formation, whilst the rising main is underlain by the Tauranga Group Puketoka Formation only. The Tauranga Group deposits were found to comprise predominantly silts and clays with varying amounts of sand. The basement geology for the area is East Coast Bays Formation (ECBF), which is described as alternating sandstone and mudstone deposits. Within the ECBF, layers of Albany Conglomerate have been identified, which are described as being a completely to highly weathered sandstone or conglomerate.

The depth at which the ECBF rock is found varies across the pump station site. Around the immediate vicinity of the pump station and wet wells, ECBF rock is encountered at approximately -3.5 metres Reduced Level (mRL) whilst at the north of the pump station and wet wells, ECBF rock is not encountered until approximately -9 mRL. These varying depths to ECBF rock also mean a varying thickness of Tauranga Group Alluvium above the ECBF. Tauranga Group Alluvium is likely to be more compressible than other

materials encountered on site, which has the potential to impact the effects of groundwater drawdown and settlement at the site.

Peat layers are also identified to be present within soils at some locations, including deposits at the same depth as works underneath Brigham Creek Road, and underneath the stormwater pond embankment.

Groundwater levels vary between approximately 0.35 metres below ground level (m bgl) and 5.1 m bgl across the project area. Groundwater levels fall in the spring and summer and rise in the autumn and winter, with the shallowest groundwater levels occurring in the winter months. Groundwater along the gravity main is assessed to generally flow to the north towards Slaughterhouse Stream, whereas groundwater at the location of the pump station generally flows west and south towards Sinton Stream.

2.6 Contamination

A Detailed Site Investigation (DSI) has been prepared for the Project and is provided in Appendix G. The DSI includes the historic land use and potential for contamination in the area.

The DSI concludes it is 'more likely than not' that Hazardous Activities and Industries List (HAIL) activities occurred along the proposed alignment at six sites. The HAIL activities are associated with commercial/industrial wastewater treatment and disposal, storage and use of hazardous goods, and horticulture. Soil sampling results from these sites indicate that heavy metals (trace elements) are below the adopted National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (Resource Management Regulations 2011 (NES CS) health criteria and within naturally occurring background levels for volcanic and non-volcanic soils. Organic compounds were also found to be below the laboratory detection limit. Groundwater sampling results from the HAIL sites indicate the concentrations of dissolved heavy metals are below the laboratory detection limit and the adopted ANZECC[5] 80% and 95% freshwater criteria, and organic compounds are below the laboratory detection limit.

Soil sampling results from other (non-HAIL) sites along the alignment indicate that heavy metals at these locations are also within naturally occurring background levels for volcanic and non-volcanic soils and are below the adopted NES CS health criteria. Low concentrations of hydrocarbons and asbestos fibres were detected in shallow soils along the alignment. However, the concentrations of hydrocarbons were below permitted activity levels and are commensurate with concentrations identified in soils within road carriageways, whilst asbestos fibres were at levels below the adopted health criteria under BRANZ guidelines. Sampling results from groundwater at non-HAIL sites reported dissolved heavy metal concentrations below ANZECC 80% limits with the exception of three locations, including the samples taken at the pine stand at 15-19 Spedding Road, and the trenchless construction launch sites at 28 Brigham Creek Road and 23-27 Brigham Creek Road. At these locations concentrations of copper, nickel, and zinc in groundwater were reported above the adopted ANZECC 80% and 95% screening criteria for the protection of freshwater species.

2.7 Future environment

A private plan change was submitted by Oyster Capital Ltd in April 2020 to rezone the land outlined in red on Figure 6 from Future Urban Zone to Business – Light Industry Zone. The plan change includes an extension of the existing Spedding Road to meet Brigham Road between 23-27 and 31 Brigham Creek Road.

It is currently uncertain whether the plan change will be approved, and if so, whether any Oyster Capital works will precede the works planned as part of this project. Therefore, project components have been

[5] Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (ANZECC 2000 Guidelines)

designed to be constructed in either the existing or planned future environment. The effects of the project have been assessed against the existing environment (i.e. the current zoning).

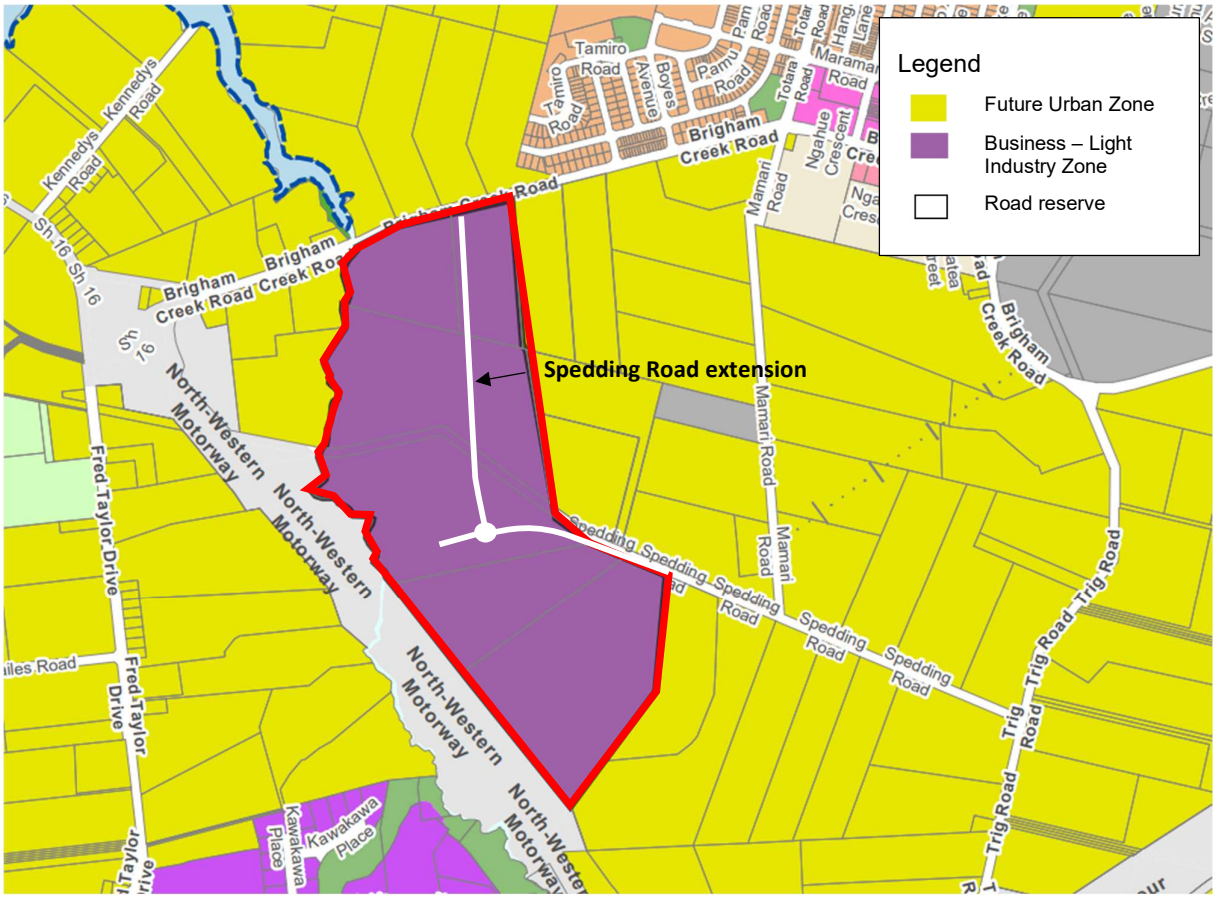

Figure 6. Oyster Capital Ltd Private Plan Change proposed zoning (private plan change area outlined in red).

3 Description of the Project

The following sections provide an outline of the proposed physical works and an indicative construction methodology for the Project. Design drawings are provided in Appendix A, and the indicative Erosion and Sediment Control Plan is provided in Appendix H.

3.1 Need for the Project and Project Objectives

As described in Section 1, the Project is part of a wider programme of work referred to as the Whenuapai-Redhills Wastewater Servicing Scheme (the Scheme), and is required to deliver the necessary wastewater infrastructure network in Whenuapai (and nearby Redhills) to respond to the significant growth anticipated over the next 20 years.

The Project is the first part of the Scheme (Package 1) which will be delivered in stages to respond to growth and necessity as demand increases across the area. The additional wastewater infrastructure will enable the development potential of the land in the wider area to be unlocked.

The following Project Objectives have been developed for the Project (discussed further in Section 5 and the alternatives assessment in Appendix J).

1. To provide additional capacity in the wastewater network for growth and development of the Whenuapai-Redhills catchment in a manner that:
    a. Protects public health;
    b. Optimises investment decisions, including being efficient, effective and financially responsible;
    c. Minimises private property development disruption
    d. Coordinates with existing and known planned development; and
    e. Integrates with the existing Watercare wastewater network.
2. To provide statutory protection for Package 1 of the Whenuapai-Redhills Wastewater Servicing Scheme to enable its construction, operation, and maintenance.

3.2 Physical works

The main components of the Project are:

1. A **Gravity Main Pipeline** (approximately 700m long and 375 – 475 mm in diameter) between the existing Whenuapai Village Pump Station on Tamiro Road and the Pump Station
2. A **Pump Station** at a point where the Whenuapai and Redhills Catchments meet at 23A Brigham Creek Road, with an emergency overflow outfall to the Sinton Stream.
3. A **Rising Main** (approximately 1.5km long and 500 mm in diameter) between the Pump Station and a proposed new break pressure chamber on Mamari Road.
4. A **Culvert** (approximately 63 m long including wing wall and rip rap) to provide access for the rising main across Sinton Stream.
5. A **Break Pressure Chamber** located on corner of Mamari and Spedding Roads.

More detail on each component is included below.

3.2.1 Gravity main

The existing Tamiro Road pump station in Whenuapai Village will be decommissioned and flows from the Whenuapai Village catchment will be diverted to the new pump station (described below in Section 3.2.2) via a new gravity main (see Figure 7). The alignment of the new gravity main follows along the edge of the Slaughterhouse Stream floodplain then turns south, crossing underneath Brigham Creek Road and through Wetland C to connect to the proposed pump station.

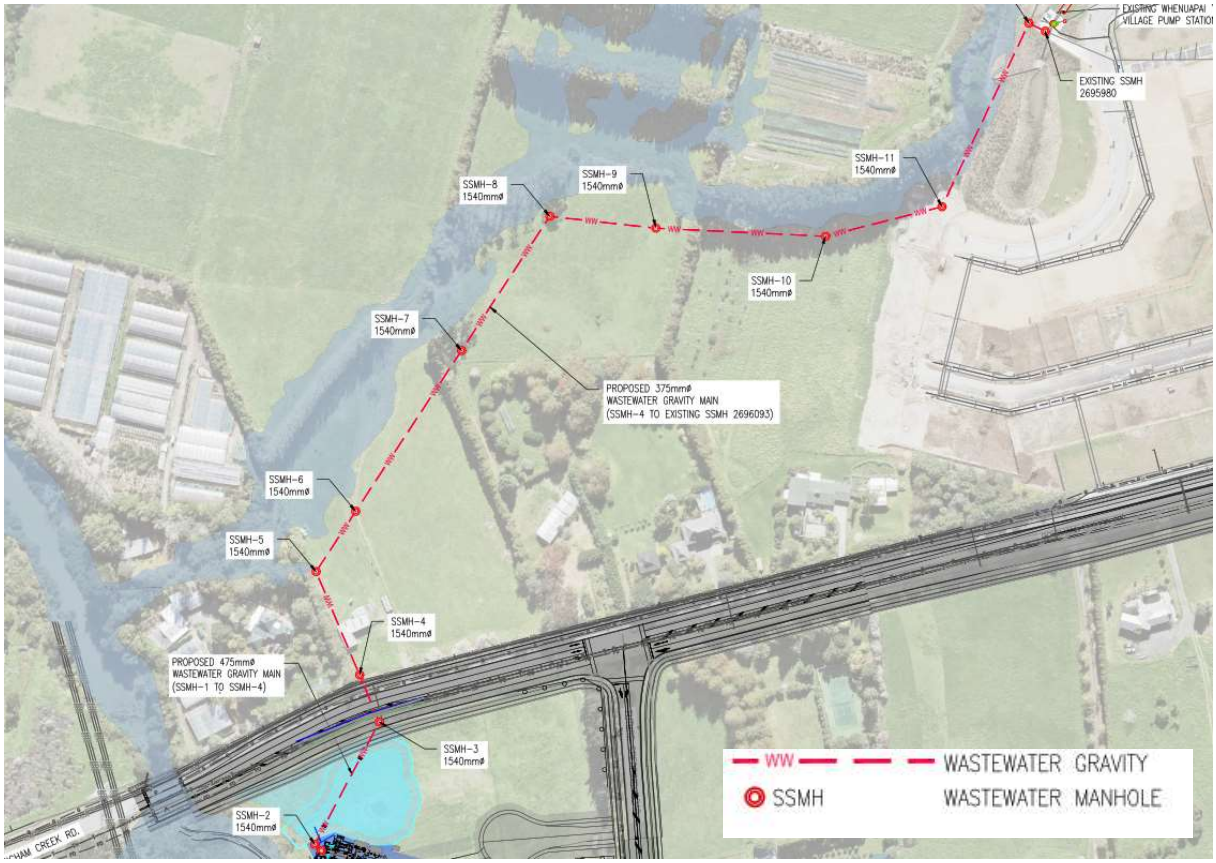

Figure 7. Gravity main works (snip from Drawing R0017910.004, WSP GHD, provided in Appendix A)

The gravity main comprises:

- A new gravity main approximately 740 m in length from the Tamiro pump station to the proposed pump station at 23A Brigham Creek Road. The pipe will be 375mm nominal diameter between Tamiro Road and Brigham Creek Road, then 475mm nominal diameter from Brigham Creek Road to the pump station.
- Eleven new manholes will be located along the gravity main. In addition, the existing stormwater manhole adjacent to the Tamiro pump station with a larger manhole.

3.2.2 Pump station

A new pump station will be constructed at the 23A Brigham Creek Road property owned by Watercare (refer to Figure 8). The pump station will have a total capacity of 320L/s, and be predominantly located underground.

The pump station will comprise:

- A below ground structure approximately 25 m wide and 15 m long, which will have a below ground wet well structure to a depth of approximately 9.5 m bgl, and a storage tank structure to a depth of approximately 6 m.

- An emergency outfall structure discharging to Sinton Stream, including a wingwall, and 3 m of rip rap (see Figure 9)
- An approximately 10 m long pipe (500 mm diameter) between the pump station and the outfall
- An approximately 40 m long section of gravity main (diameter to be confirmed), which will connect into a future Oyster Capital pipeline.
- Potable water pipes and power supply from Brigham Creek Road, to service the new pump station.
- Ancillary above ground structures, including a paved turning area, an electrical cabinet / container, an approximately 3.5 m high gantry, a flow meter chamber, and 2 x green dome carbon filters.
- A 7 m wide vehicle crossing between 23-27 Brigham Creek Road, and Brigham Creek Road.
- A 6 m wide permanent access road between the existing Brigham Creek Road vehicle crossing and the pump station to provide operational access to the pump station.

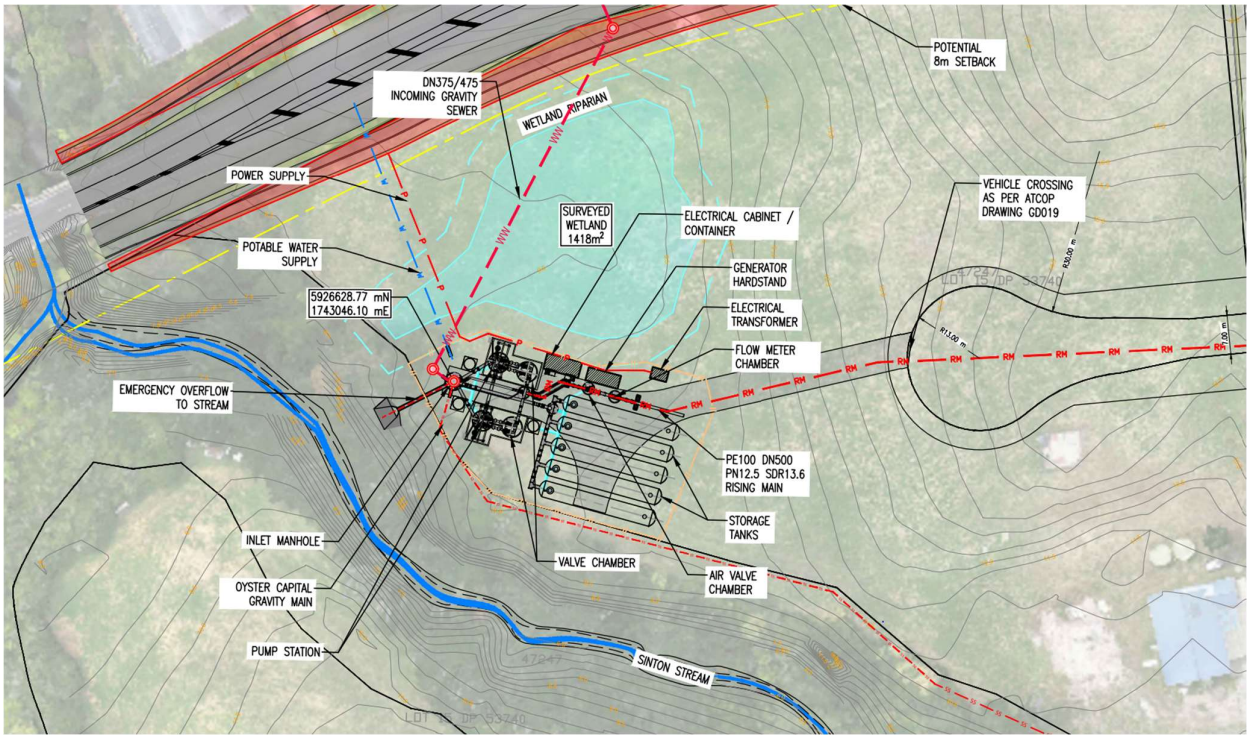

Figure 8. Pump station works (snip from Drawing 2013646.004, WSP GHD, provided in Appendix A)

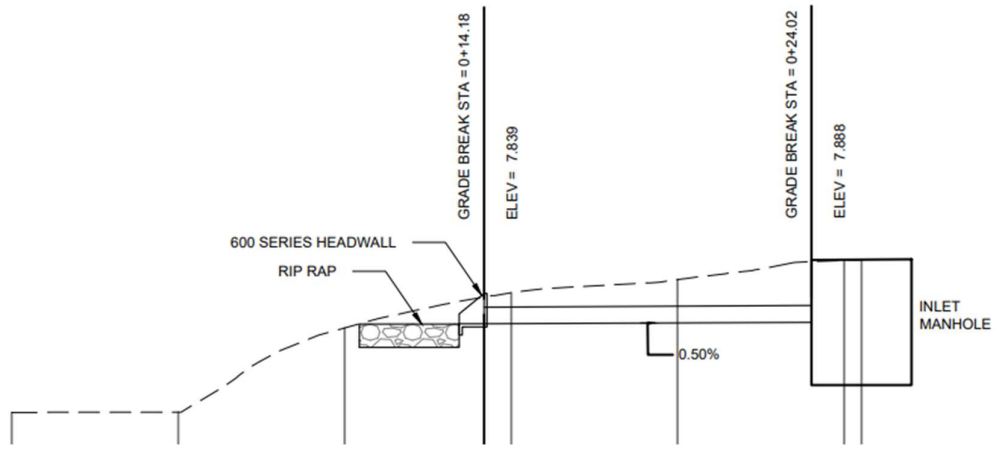

Figure 9. Emergency outfall structure discharging to Sinton Stream (snip from Drawing 2013646.012, WSP GHD, provided in Appendix A)

A landscape plan has been done following works at the pump station (see Figure 10 and Appendix A):

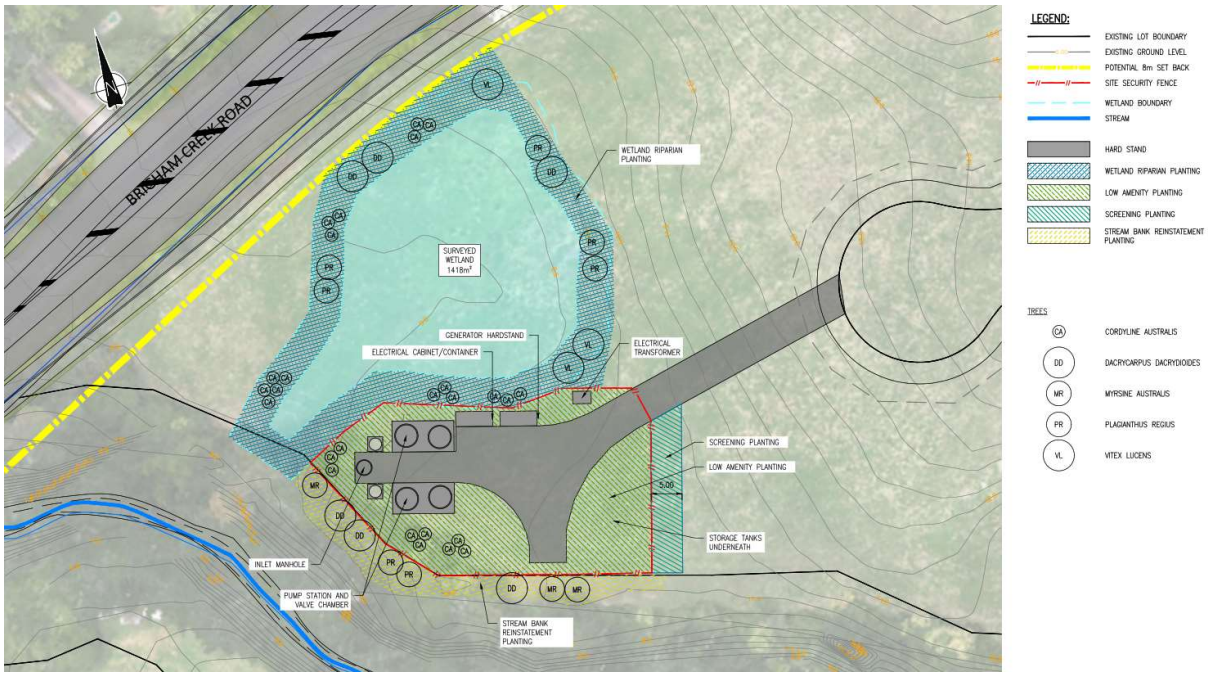

Figure 10. Pump station landscape plan (snip from Drawing 2013646.001, WSP GHD, provided in Appendix A)

3.2.3 Rising main

From the pump station, the new rising main will run east, then turn south at 31 Brigham Creek Road to follow the future Spedding Road extension corridor through the Whenuapai Development, proposed by Oyster Capital (refer to Figure 1). It is assumed that the pipeline will be constructed prior to the road being constructed. At the southern end of 31 Brigham Road, the rising main will cross Sinton Creek via a culvert, which will be constructed as part of the works (if not already constructed by Oyster Capital) (refer to Figure 11). The rising main will then run through 15-19 Spedding Road farmland to meet the existing Spedding Road, and follow the existing Spedding Road to the location of the break pressure chamber, which will be installed at 32 Mamari Road.

The rising main works will include:

- A 560 mm nominal diameter pipe approximately 1.5 km in length, from the proposed pump station at 23A Brigham Creek Road to the proposed Break Pressure Chamber at 32 Mamari Road.
- Two air valves (approximately 1.2 m in height and 660 mm wide) and two underground scour valves along the pipeline alignment.
- A new culvert (an approximately 43 m long x 3.5 m high x 3.5 m wide box culvert), with a 5 m long wing wall and 5 m of rip rap either side of the culvert[6].
  - The culvert will have a low flow channel, and the invert will be placed so that 0.9 m / 25% of the height is below the level of the stream bed.
  - Gabion baskets will be placed above the wing walls to retain the embankment.
  - A maximum of 3m fill is required upon the culvert to obtain the design level of the future Spedding Road extension, with 3:1 batter slopes each side of the road alignment sloping down to the Stream.
- Removal of the existing culvert from within Sinton Stream.

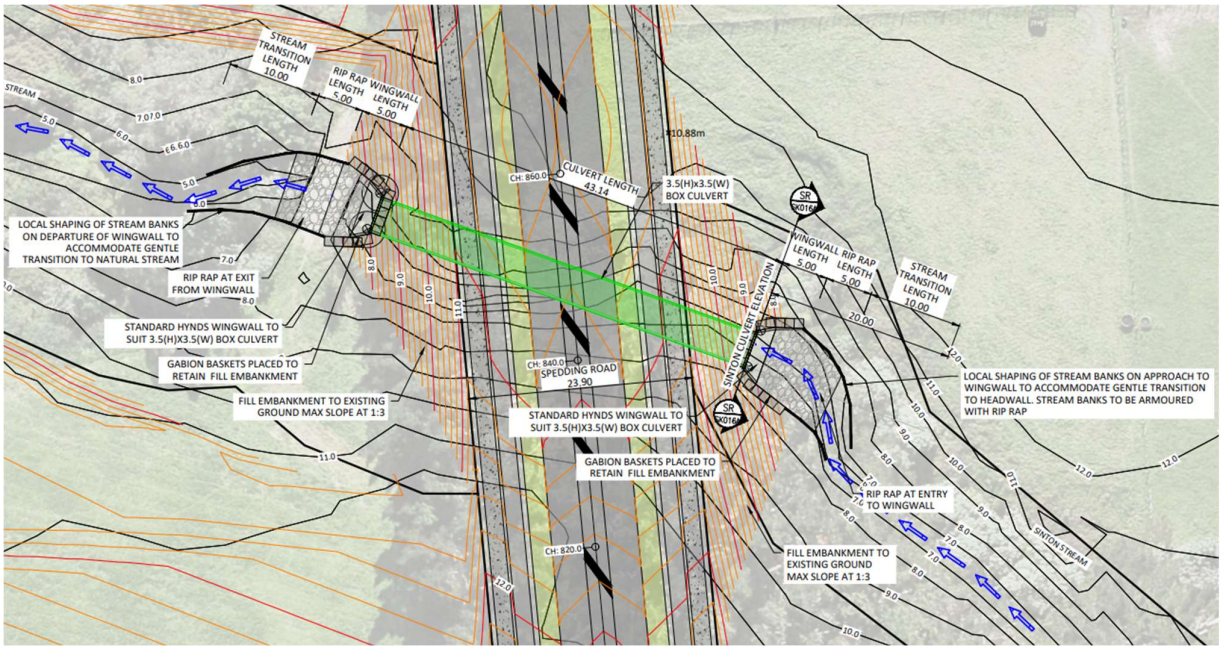

Figure 11. Sinton Stream Culvert (snip from Drawing SK016, Crang Civil Consulting Engineers, provided in Appendix A)

3.2.4 Break Pressure Chamber

The rising main will terminate at a break pressure chamber located at 32 Mamari Road (refer to Figure 11 and Figure 12).

The break pressure chamber will include:

- The dimensions of the break pressure chamber, which will be completely underground, are yet to be confirmed, but will be a minimum of 7.5 m in diameter, and 12 m deep.
- A ventilation stack which will be located approximately 10 m away from the break pressure chamber, which will be 200 mm in diameter, and greater than 3 m in height.
- A 4 m wide concrete access road around the perimeter of the break pressure chamber.

[6] Culvert is sized to underlay Spedding Road extension, proposed as part of Oyster Capital Private Plan Change 69.

Sensitivity: General

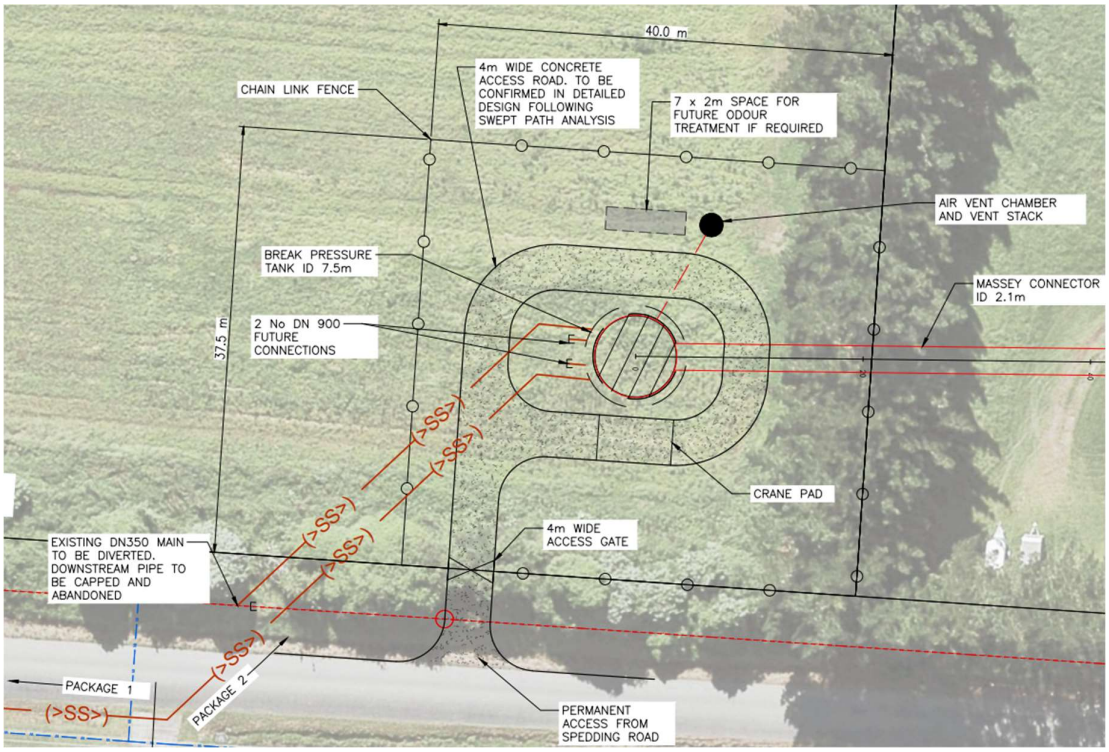

Figure 12. Plan view of the break pressure chamber (snip from Drawing 2013661.800, Mott MacDonald, provided in Appendix A)

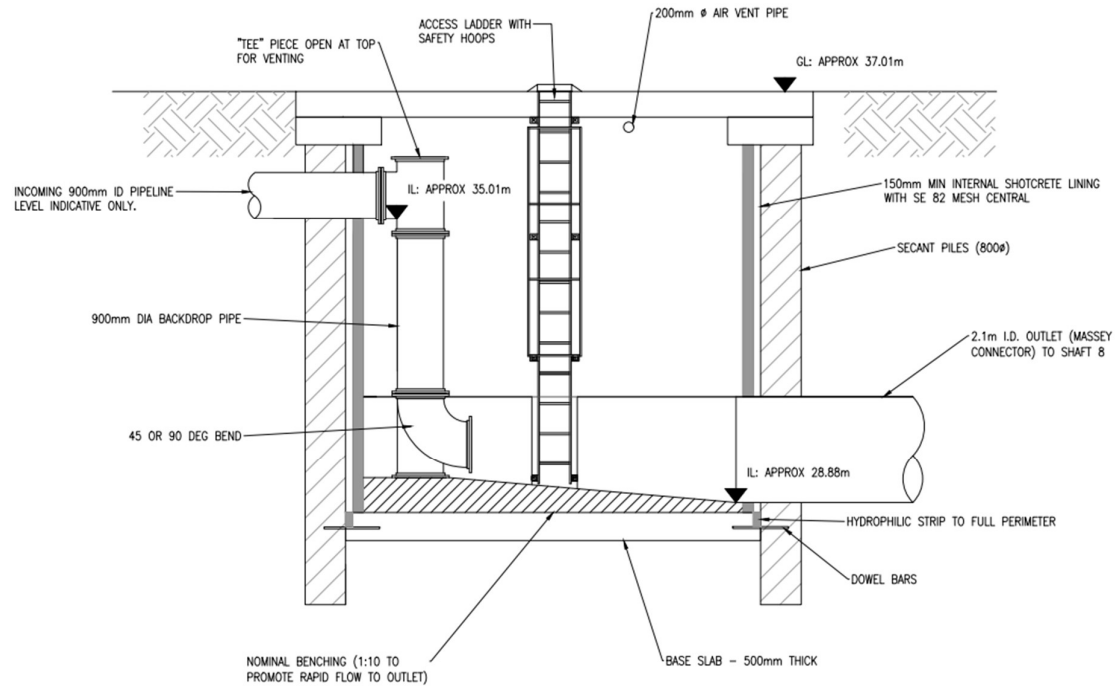

Figure 13. Cross section view of the break pressure chamber (snip from Drawing 2013661.801, Mott MacDonald, provided in Appendix A).

3.3 Operation

3.3.1 Pump Station site access

Permanent site access to the new pump station at 23A Brigham Creek Road will be via the existing vehicle crossing at 23 – 27 Brigham Creek Road, which will be widened to be 7 m to provide access for large vehicles.

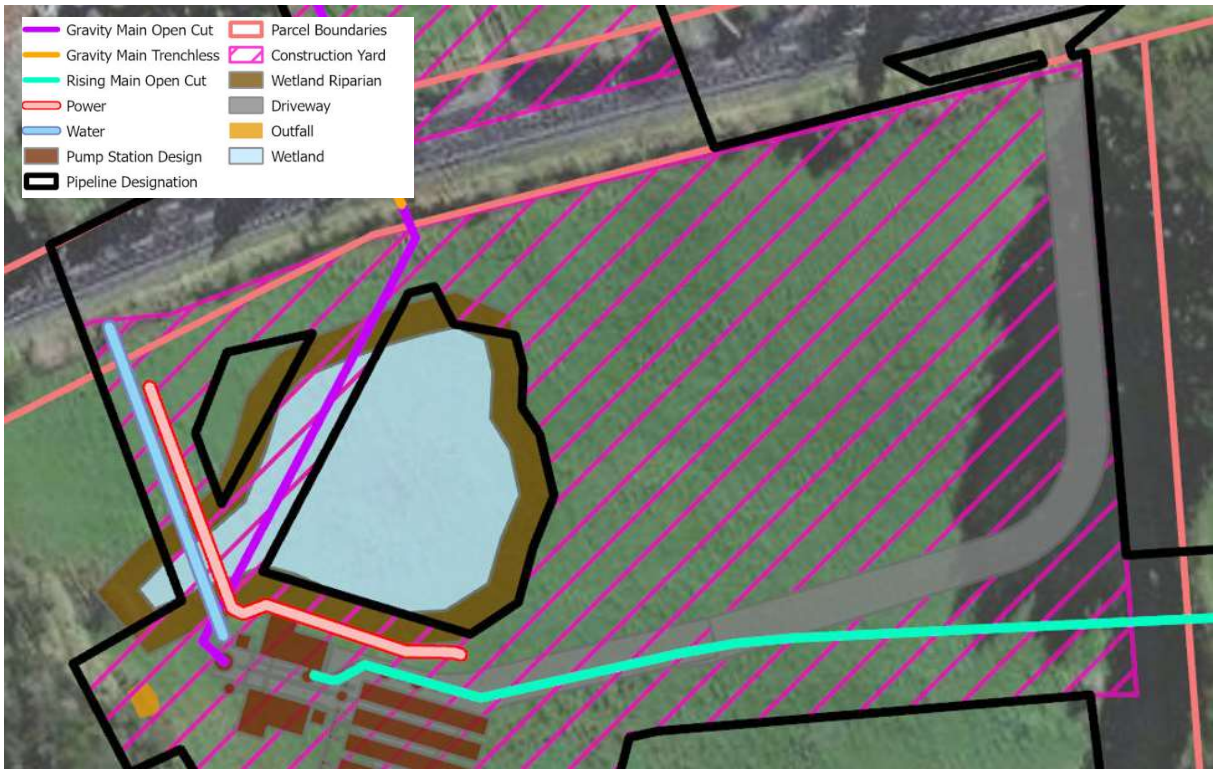

Figure 14. Permanent and temporary access to the pump station (shown in grey)

3.3.2 Pipeline and pump station operation

The proposed gravity pipeline has been sized to match future 100-year flows expected at the existing Tamiro Road Pump station (which will be decommissioned at a future date), and then further upsized by one pipe size to allow for unforeseen future catchments.

The proposed pump station has a total capacity of 320L/s and has been designed with 4 hours (700 m^3) of emergency storage. In the event of an overflow, flows will be discharged into Sinton Stream via the emergency overflow point.

The proposed pump station and rising main have been sized and designed to provide sufficient capacity for 30 years.

3.3.3 Maintenance

It is anticipated that one vehicle (likely a ute) will visit the site each week, with two additional visits per month to attend to alarms and faults. A larger vehicle such as a Hi-ab will visit the site 3 to 4 times per year to undertake maintenance activities.

3.3.4 Odour filters

Two air valves are proposed to be installed at localised high points along the rising main alignment. The provision for future connection for an odour control device is allowed for in the air valve design detail.

4 Construction Methodology

The following sets out the anticipated construction methodology of the proposed works. Whilst this is indicative only, and those implemented on site may differ once a contractor is appointed, the construction methodology is broad enough that any changes to it are not expected to change the outcome of the assessment of effects on the environment set out in Section 5.

4.1 Construction duration

The Project is expected to take approximately 16 months to complete. The key components (the gravity main, pump station, and rising main) will likely be constructed in parallel, with all three work fronts operational from project commencement.

Principal construction hours would be 07:30 to 18:00 hours Monday to Saturday. Night works may be required as a contingency measure for construction of the pipeline under Brigham Creek Road, if open trenching is required.

4.2 Site establishment

A 6 m wide stabilised access road will be constructed along the entire length of the gravity main and rising main to provide temporary access to the works areas[7]. The access road will be covered with a layer of 400 mm compacted hard fill over a geofabric membrane. The access road will be dis-established once works are complete, with the exception of the section between the vehicle crossing at 23 – 27 Brigham Creek Road to the pump station, which will remain in place to provide ongoing vehicle access to the pump station[8].

One laydown area and three contractor areas will be established to support the works (refer to Table 5):

- Laydown area to support the Tamiro Road Stormwater Embankment trenchless construction works (see Figure 15)
- Contractor Area North to support the gravity main works (see Figure 16)
- Contractor Area Hub to support the pump station works (see Figure 17)
- Contractor Area South to support the rising main works (see Figure 18)

Each contractor area will provide for stockpiling and materials storage area, light vehicle parking, amenities and smoko room, gates, and a gate house. The main project site office will be located within the Contractor Area Hub. The laydown area near Tamiro Road will be used to store equipment, a muck skip and a site container (see Figure 16).

Table 5. Contractor Areas and laydown areas

Area	Address	Area (m^2)	Site access
Contractor Area North	20-22 Brigham Creek Road	5,000	Existing vehicle crossing at 20-22 Brigham Creek Road (widened to 15 m to accommodate vehicle tracking)
Contractor Area Hub	23-27 Brigham Creek Road	10,000	Existing vehicle crossing at 23-27 Brigham Creek Road (widened to accommodate vehicle tracking)
Contractor Area South	32 Mamari Road	5,000	Two new vehicle crossings, including a crossing to Mamari Road (entrance only), and a crossing to Spedding Road (exit only).

[7] If the Oyster Capital works precede construction, the Spedding Road extension constructed as part of those works will be used as an access road for rising main works.

[8] This will be disestablished if / when a permanent access is constructed as part of the Oyster Capital works.

Sensitivity: General

Area	Address	Area (m²)	Site access
Tamiro Road laydown	28 Brigham Creek Road	144	Internal access road

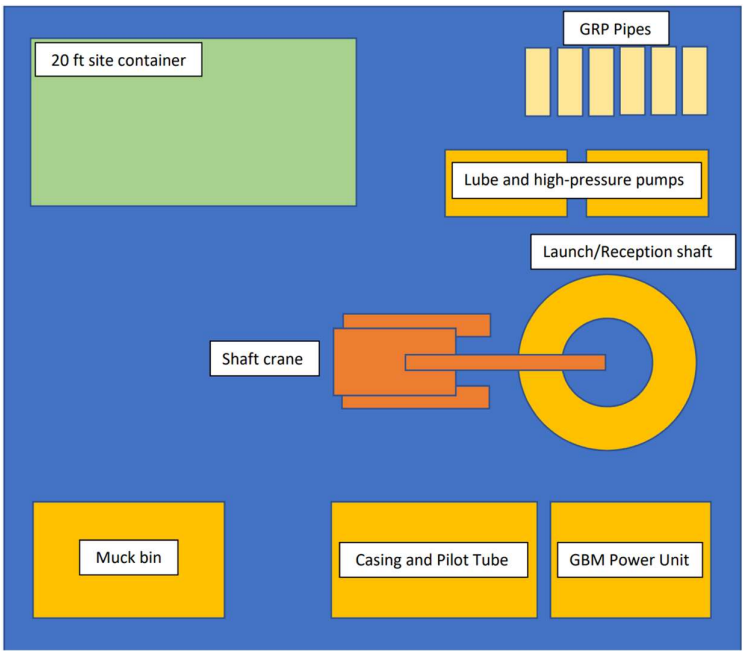

Figure 15. Approximate layout of the Tamiro Road stormwater embankment trenchless construction laydown area

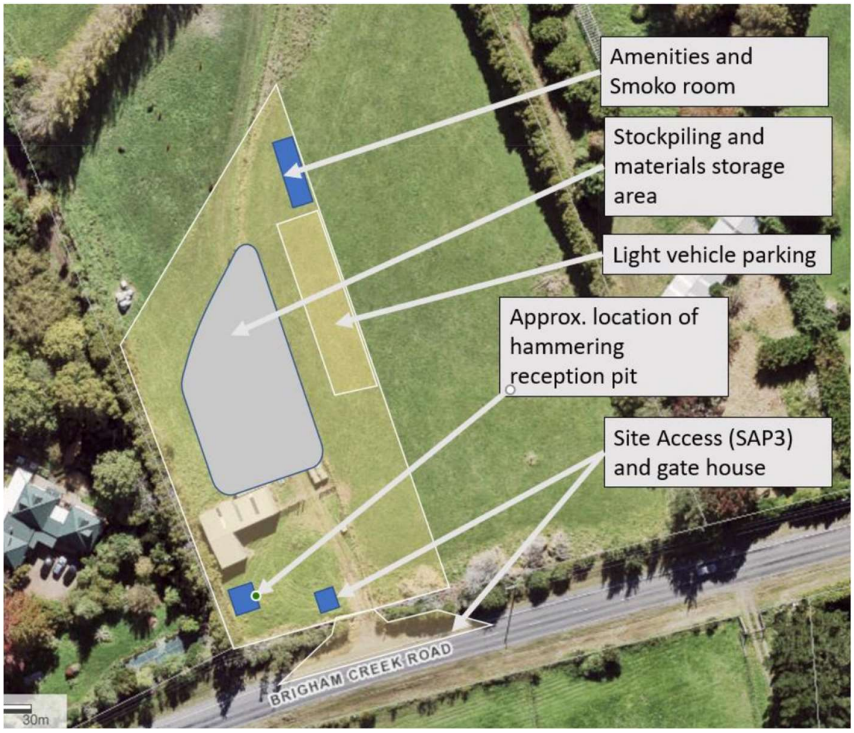

Figure 16. Contractor Area North – Approximate Layout

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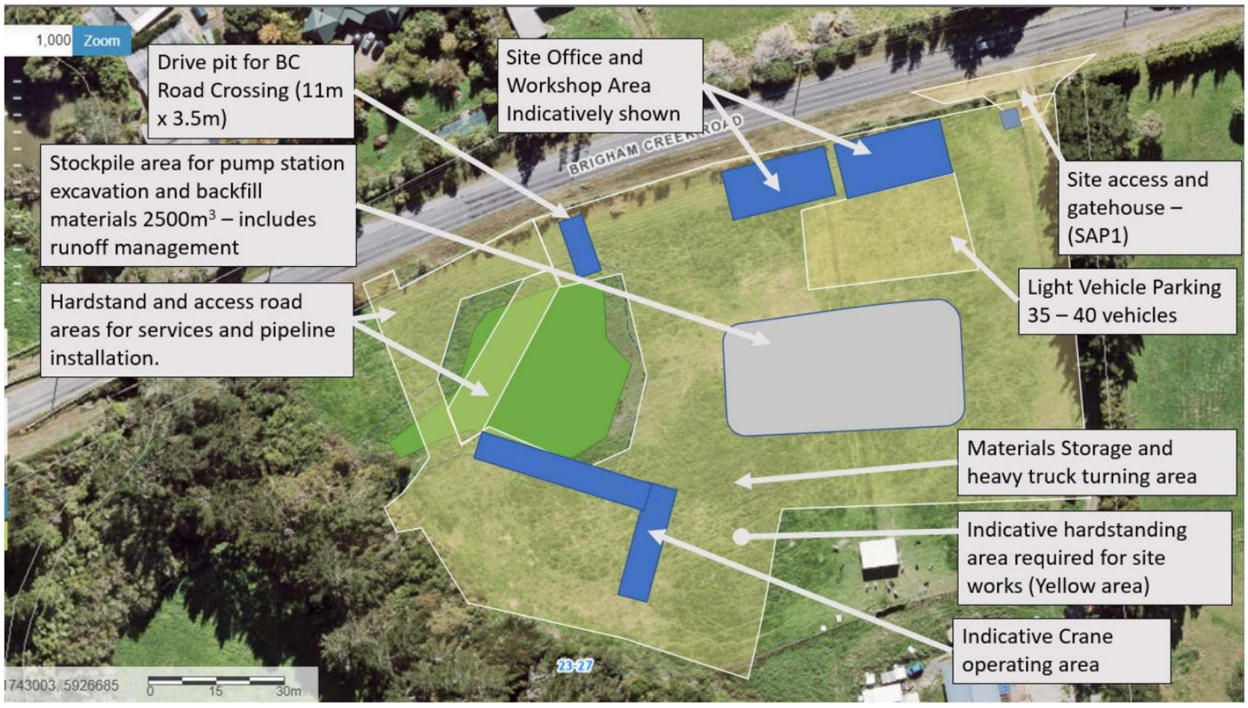


Figure 17. Contractor Area Hub Approximate Layout

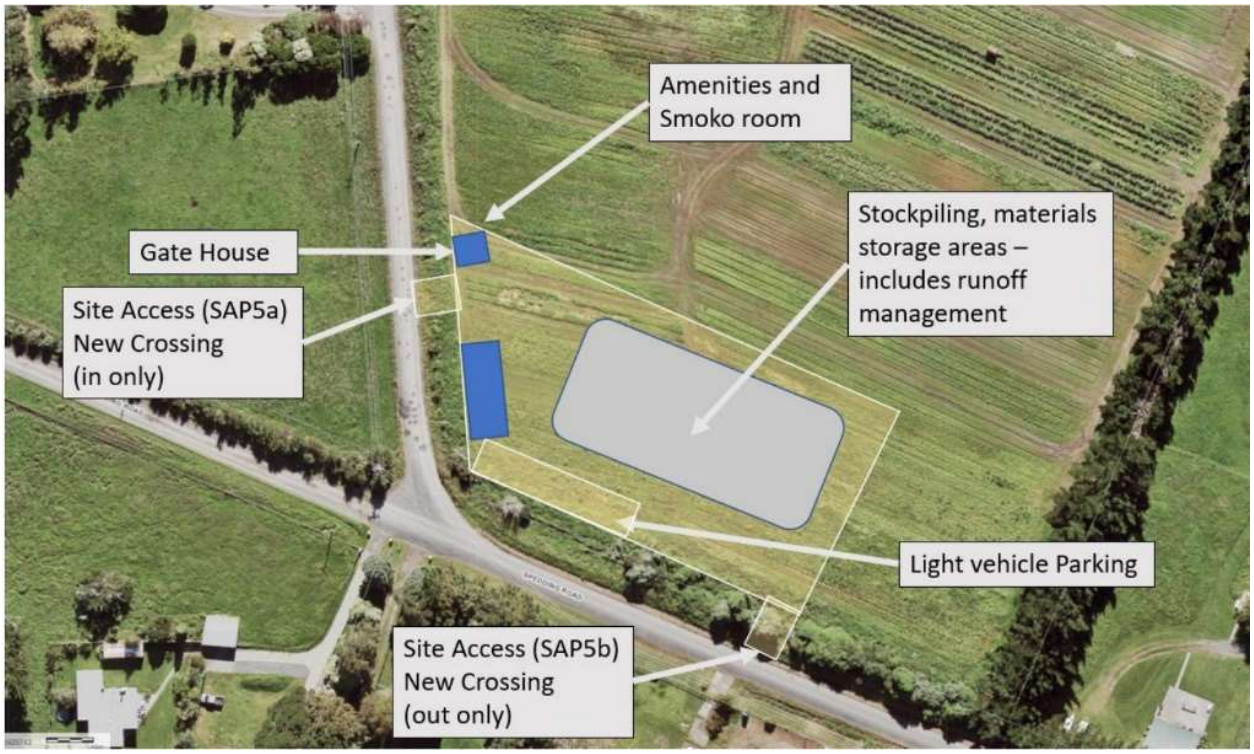


Figure 18. Contractor Area South – Approximate Layout

As part of the site establishment works, erosion and sediment controls will be installed around the extent of the works area in accordance with the Erosion and Sediment Control plan in Appendix H.

In summary, erosion and sediment control measures include:

- The use of clean water and dirty water diversion bunds
- Sediment retention ponds for the works at the pump station and the rising main
- Silt fences
- A clean water stream diversion channel around the culvert works area

4.3 Pump station construction

Construction of the pump station and auxiliary works will take approximately 16 months to complete. Works are expected to be staged, and will start with site establishment then deep structures, working progressively to the surface structures and civil works. The key construction activities are shown on Figure 15 above.

4.3.1 Site establishment

Access will be from Brigham Creek Road, at the existing access point to the north west of the site. The vehicle crossing will be widened to 15 metres to accommodate construction vehicles. The temporary vehicle crossing for construction will become the permanent vehicle crossing for the pump station once works are complete but will be reduced to 7m in width.

Once access and erosion and sediment control measures are established, hardstand areas will constructed which will include:

- Implementing appropriate stormwater runoff treatment, prior to discharge into the environment
- Stripping of topsoil to 400 mm, placement of geofabric and GAP 65 compacted in place.
- Removed topsoil will be stockpiled locally.

4.3.2 Main pump station works

The works will start with constructing deep structures, through to surface structures and civil works. Extensive temporary works will be required to facilitate the construction of the underground chambers and connecting pipes (shown on Figure 19 below). Sheet piled excavations are proposed for the inlet works and wet wells and associated deep piping.

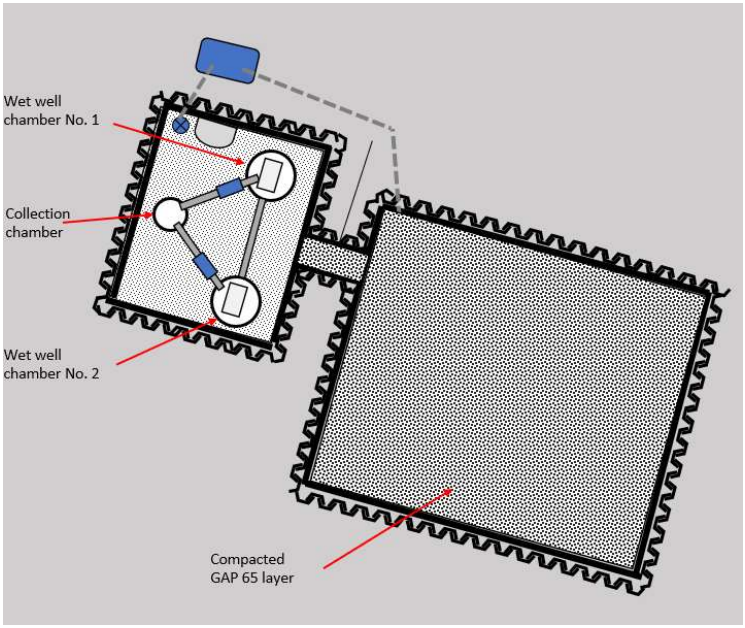


Figure 19. temporary works for the installation of pump station inlet structures

The excavation for the inlet chamber, wet wells and interconnecting deep pipelines would be in the order of 140m^2 and 1400m^3 of material.

The storage tanks will require a separate sheet piled excavation to be constructed adjacent to the excavation for the pump station wet wells and inlet works (see Figure 20 below). The footprint area of the second sheet piled excavation would be in the order of 600m^2 require the excavation of approximately 3,900m^3 of material. Following this, crane pads will be installed (for approximately 6 days).

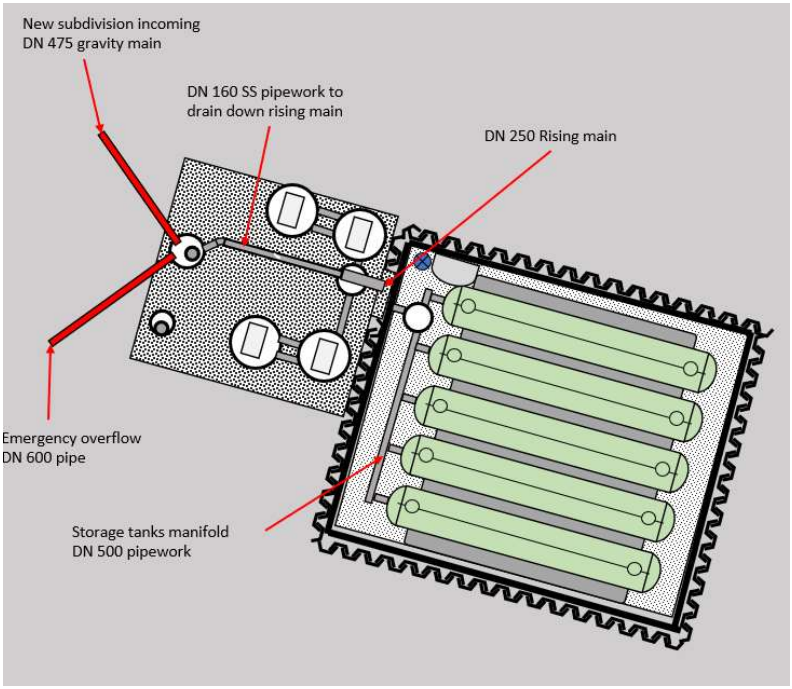


Figure 20. temporary works for installation of storage tanks

All excavated material is proposed to be stockpiled locally to the pump station site within the Contractor Area Hub yard stockpiling area, while it is carted off site for disposal at clean fill site, while retaining the necessary material on site for backfilling.

Dewatering for storage tanks and connections will occur over approximately 35 days, and approximately 16days for inlet works, wet wells, and associated deep piping;

Dewatering facilities and water treatment will be used during excavations to manage ground water. Any groundwater discharged from the site will be treated prior to discharge, using a sedimentation pond or alternatively a ‘silt-buster’ sediment removal system. Dewatering discharge rates and treatment requirements will be determined during the preparation of temporary works and sediment and erosion controls design.

4.3.3 Power and water supply

Power and water supply will be connected to the pump station and constructed via open trenching. Electric ducting will be installed, and HV cabling installed into the ducts.

4.3.4 Emergency overflow

To enable construction of the emergency overflow outfall from the pump station, Vegetation will first be cleared out to 2metres beyond the footprint of the infrastructure shown on the drawings, including the rip-rap, headwall and pipeline. The outfall would be excavated with foundations and riprap installed, followed by the placement of the precast headwall and casting of an apron slab.

4.3.5 Final works

The construction access for the pump station will be formalised as a new concrete driveway. The kerb, channel, pavement and stormwater drainage will take approximately 45 days. Once the structural works are completed the sheet piles will be removed and cleaned and excavations backfilled in accordance with the specification in compacted layers.

4.3.6 Completion

Following completion of works, the hardstand areas will be removed and replaced with the native topsoil, which would be stabilised and seeded. Pre-commissioning testing will also occur. Landscaping and planting work will be undertaken and a boundary fence constructed. This will take approximately 65 days.

4.4 Open trenching works

Approximately 2 km of pipe will be installed by conventional open trenching, between 28 Brigham Creek Road and 20-22 Brigham Creek Road, and between 23-27 Brigham Creek Road and 32 Mamari Road (refer to Figure 21). The section between the existing Tamiro Road Pump Station, and 28 Brigham Creek Road, will also be trenched if trenchless construction methods fail (refer to Section 4.5 below). The trench will be approximately 1.4 to 6 m wide, and between 2.4 m and 5.5 m deep depending on the location along the alignment, with the pipe laid, jointed and the trench backfilled. The trench will be benched with trench shields used for support (as required). However, where trench shields are not practicable, additional shoring such as sheet piles may be required.

Pipes will be welded at the construction yard to a maximum of three pipes per pipe string, then transported to the work area.

Trenched construction will be progressively opened, closed and stabilised in 100 m lengths, where the part of the trench that is open at any given time is no longer than 10 days. Once the pipe has been installed the disturbed area will be backfilled and reinstated to its pre-construction condition.

Dewatering will be required for up to 10 days in any one location for trenching works, up to 14 days to install manholes, and up to 30 days to install air valve chambers (allowing for contingencies).

Figure 21. Example of open trenching using trench shields (Photograph: Tingran Duan, 2 September 2022)

4.5 Pilot boring trenchless construction – Tamiro Road stormwater embankment

The first approximately 100 m of the gravity main beneath the Tamiro Road stormwater embankment will be installed by pilot boring trenchless construction at a depth of approximately 1 m to 1.5 m bgl.

- Manhole 11) will be constructed first and used as the drive shaft. The drive shaft will be 2.5 m in diameter and have a concrete slab base.
- The existing manhole adjacent to the Tamiro Road pumpstation (Manhole 2696093) will be replaced with a new manhole with a minimum diameter of 2 m and used as the reception shaft.
- Wastewater flows from the existing wastewater line will be temporarily diverted around Manhole 2696093 during construction.
- The rig will be installed within the drive shaft, and a series of rods will be pushed through to the reception shaft.
- The lead auger casing will then be attached to the rig and driven through to the reception shaft.
- Muck and drill fluid will be removed from the launch shaft.

The works under the stormwater embankment is expected to take approximately 8 to 10 weeks. Dewatering will be required at the drive shaft for the duration of the works.

Following completion of the works, the manholes will be installed, and the construction areas will be reinstated.

If trenchless methods fail (due to, for example, an underground obstruction), the pipe will be open trenched using the method described in Section 4.4.

4.6 Pipe hammering trenchless construction – Brigham Creek Road

It is proposed to install approximately 30 m of the gravity main beneath Brigham Creek Road by pipe hammering trenchless construction at a depth of approximately 3 m to 5 m bgl (refer to Figure 22).

Figure 22. Photograph of indicative pipe hammering set up (Source: Brian Perry Civil)

The drive shaft will be located on the northern boundary of 23 - 27 Brigham Creek road at the location of future Manhole 3, and will be approximately 11 m long and 3 m wide (refer to Figure 23). The shaft will be excavated using sheet piles, have a concrete slab base and guide rail bed, with the pipe hammer installed on top of the guide rails.

The reception shaft will be located near the southern boundary of 20 - 22 Brigham Creek Road, at the location of future Manhole 4 (see Figure 21), with trench shields or a manhole box used to support the sides of the pit.

As the hammering progresses, casing pipe sections would be welded into the string as each length is hammered into place. Once the casing is in place the spoil will be removed from the casing pipe, and the sewer pipe installed and grouted into place. Following completion of the works, Manholes 3 and 4 will be installed, and construction areas will be reinstated.

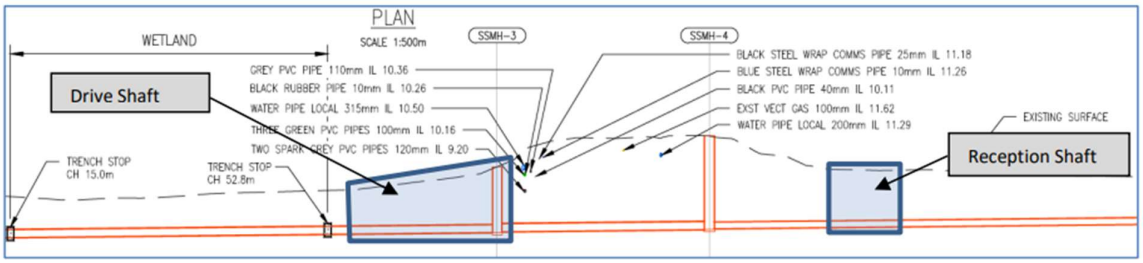


Figure 23. Indicative cross section of pipe hammering drive set up for the Brigham Creek Road works (Source: Brian Perry Civil)

The casing pipe will pass within 800 mm underneath the southern cross international fibre cable. The works have been designed in agreement with Chorus, such that potholing will be undertaken to enable the site team to see if the casing is approach the cable and take remedial action as required.

Construction of the shafts for this section of works is expected to take approximately 30 days, with dewatering required during this time. Pipe hammering is expected to take approximately two weeks.

If trenchless methods fail (due to, for example, an underground obstruction), the pipe will be open trenched using the method described in Section 4.4).

4.7 Culvert

As set out in Section 3.2.3, a culvert is required to provide access for the rising main across Sinton Stream. To enable installation of the proposed culvert along the rising main alignment, the stream will be temporarily diverted around the works area via an approximately 100 m long sheet piled diversion channel (as shown in Figure 24). A geotextile lined clay fill coffer dam will be placed at the upstream and downstream ends of the works. The works area will then be dewatered, with any fish salvaged and released downstream.

Once the diversion is in place, the existing culvert will be removed, and new culvert elements will be installed, including a cast insitu slab, and precast headwalls and box culvert elements. Compacted clay substrate with a low flow meandering channel will be placed on the base of the culvert. The stream banks will be shaped over a length of approximately 10m both upstream and downstream of the culvert, to accommodate a gentle transition to and from the culvert.

Once the culvert is in place, the ground will be reinstated, with gabion baskets placed at the edges of the wingwall to retain the embankment.

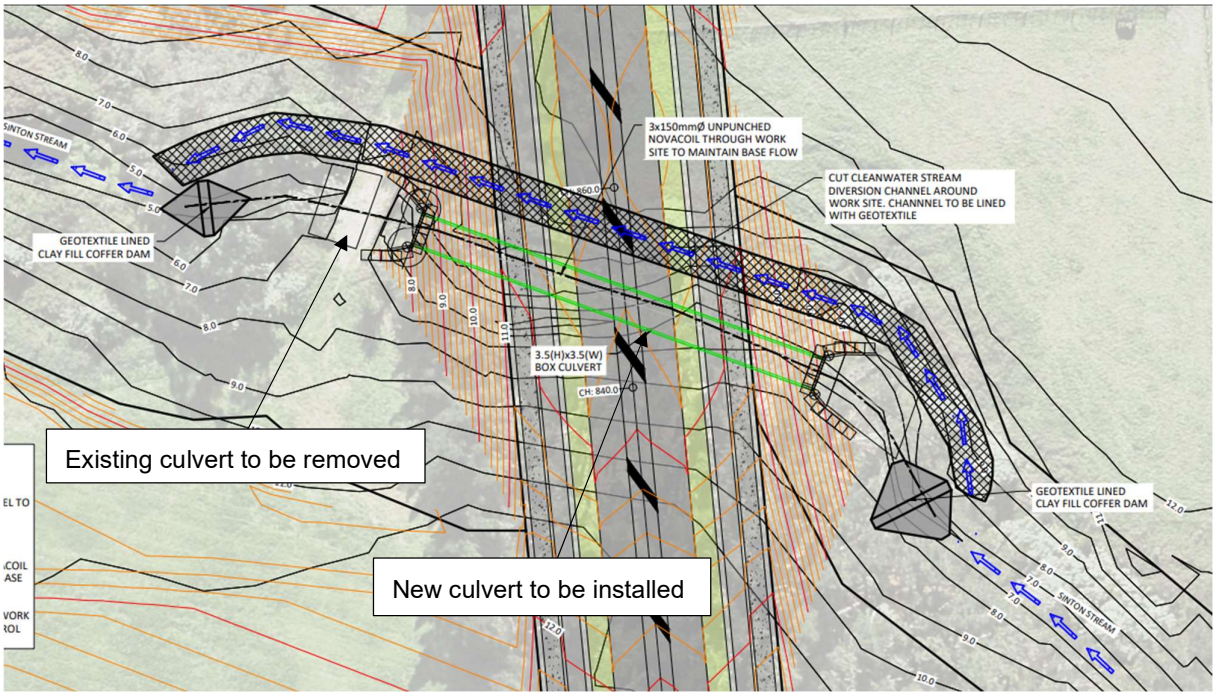


Figure 24. Temporary stream diversion plan for Sinton Stream culvert installation (snip from Drawing No. SK016B, Crang Civil Consulting Engineers, provided in Appendix A).

4.8 Break Pressure Chamber construction

Watercare have an indicative construction methodology for the break pressure chamber as detailed design is yet to be completed. Further details on construction will be provided at Outline Plan of Works stage. At this stage, for the purposes of seeking applicable regional consents, the following information is available:

- The chamber will be excavated using secant piles and have a concrete slab base.
- Once the gravity main is constructed, the break pressure chamber lining will be installed, piping connections completed, and precast lids placed.
- The site will then be reinstated to the existing condition.

4.9 Vegetation alteration and removal

Open trenching works to construct the gravity main will include works in the root zone of up to 43 protected trees in the riparian margin of Slaughter House Stream. If trenchless construction underneath the Tamiro Road stormwater embankment fails, and open trenching is required, this will require removal of up to 51 protected trees from the Tamiro Road Stormwater Embankment.

Works to construct the pump station emergency outfall will include removal of 3 protected trees and works in the root zone of 4 protected trees in the riparian area of Sinton Stream.

Works to install the culvert will include removal of approximately 40 protected pine trees from the pine stand adjacent to Sinton Stream. For health and safety reasons, trees will be removed from the construction area, and also from within the fall range of the works site.

A number of other trees which are not protected are also required to be removed to enable the works.

A summary of the vegetation to be altered or removed for the works is provided in Table 6.

Table 6. Vegetation alteration and removal required for works

Status	Works	Location	Gravity main	Pump Station	Rising main	Total
Protected	Remove	Riparian	1	3	40	**44**
		Open Space	50	N/A	N/A	**50**
	Works in Root Zone	Riparian	43	4	N/A	**47**

4.10 Earthworks

Earthworks will be required to establish the laydown areas, complete pump station, gravity main and rising main works, and construct the break pressure chamber. Construction laydown areas will be closed and stabilised prior to other areas on site being opened. The approximate area and volume of earthworks, for each project component, are outlined in Table 7.

Table 7. Earthworks estimates for each construction site.

	Activity	Average depth (m)	Indicative earthworks area (m^2)	Indicative earthworks volume (m^3)
Gravity main	Access Road	1	4,300	1,720
	Construction Area North	1	5,000	2,000
	Tamiro Road stormwater embankment laydown area	1	150	60
	Trenched construction (undertaken progressively in 100 m lengths) (average).	~3	300	900
Pump station	Construction Area Hub (partially located within 50 m of stream and wetland)	1	10,000 (~4,000 m^2 within 50 m of stream / wetland)	4,000
	Pump station (located within the sediment control protection area)	Up to 9.5 m	750 m^2	5,300
Rising main	Access Road	1	17,000	10,000
	Construction Area South	1	5,000	2,000
	Trenched construction (undertaken progressively in 100 m lengths) (average).	~3	300	900
	Culvert (located within the sediment control protection area, riparian yard, and on land with a slope >10 degrees)	N/A	4,000	< 2,500
Break Pressure Chamber	Break pressure chamber	TBC	200	< 2,500
Overall estimated earthworks required*		N/A	47,000	30,000

** Works will be staged, with earthwork areas progressively opened and closed as required. Not all areas will be open at any one time.*

5 Assessment of Alternatives

171(1)(b) of the RMA requires a territorial authority (in this case Auckland Council), when making a recommendation on a Notice of Requirement and any submissions received, to have particular regard to whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work if either

i) the requiring authority does not have an interest in the land sufficient for undertaking the work; or

ii) it is likely the work will have a significant adverse effect on the environment.

As outlined in Section 2 above, Watercare owns the underlying land for the existing Tamiro Road pump station, proposed pump station at 23A Brigham Creek Road and break pressure chamber at 32 Mamari Road. Watercare also has an agreement in principle with Oyster Capital, and a lease agreement with the owner of 32 Mamari Road, to utilise 23-27 Brigham Creek Road and 32 Mamari Road respectively for construction areas for the duration of the Project works.

Watercare does not have an interest in other parts of the alignment sufficient for undertaking the work, which includes private properties at:

1. 20-22 Brigham Creek Road
2. 26 Brigham Creek Road
3. 28 Brigham Creek Road
4. 31 Brigham Creek Road,
5. 23-27 Brigham Creek Road; and
6. 15-19 Spedding Road

Therefore, a consideration of alternative sites, routes and methods of undertaking the work needs to be undertaken for the Project, as per s171(b) RMA.

This AEE and the specialist technical assessment reports, however, demonstrate that the proposed work will not result in significant adverse effect on the environment. Conditions are proposed to appropriately manage other actual and potential adverse effects on the environment.

The following section summarises the consideration of alternatives for the proposed works. The full Assessment of Alternatives report is in Appendix J.

5.1 Assessment of Alternatives Process Summary

As summary of the assessment of alternatives process for the Project is set out in Figure 25:

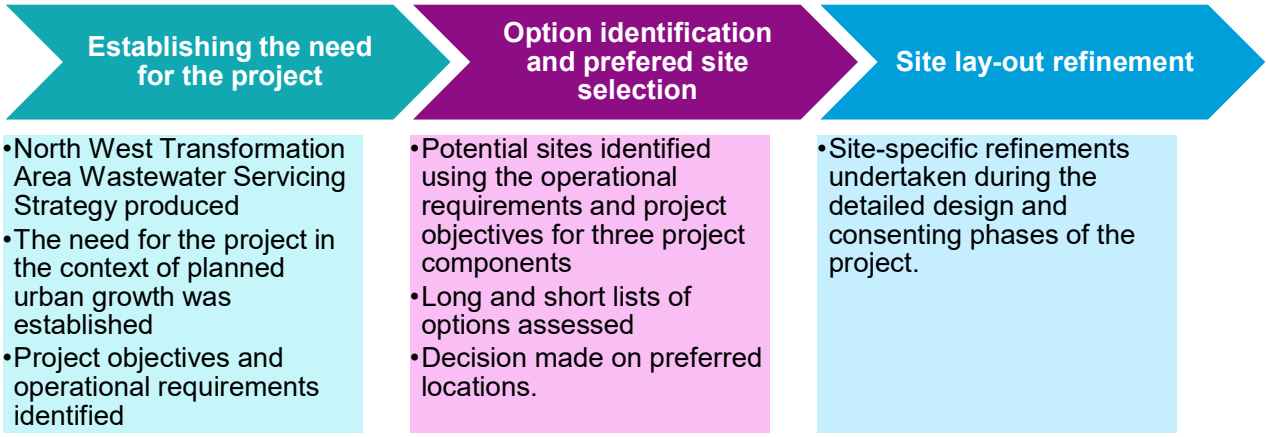


Figure 25. The Project Assessment of Alternatives process

5.2 Project Objectives

The Project Objectives are:

1. To provide additional capacity in the wastewater network for growth and development of the Whenuapai-Redhills catchment in a manner that:
    a. Protects public health;
    b. Optimises investment decisions, including being efficient, effective and financially responsible;
    c. Minimises private property development disruption;
    d. Coordinates with existing and known planned development; and
    e. Integrates with the existing Watercare wastewater network.
2. To provide statutory protection for Package 1 of the Whenuapai-Redhills Wastewater Servicing Scheme to enable its construction, operation, and maintenance.

5.3 Pump station

5.3.1 Site selection

It was fundamental for the decision on the pump station location to be made prior to the location of other connecting pipes and supporting infrastructure. The location needed to enable efficient movement of wastewater between catchments in proximity to Brigham Creek Road.

Watercare identified a long-list of six options for potential alternative sites for the pump station. These were identified from review of the Project Objectives, the overall network strategy, the requirement to locate the pump station at a point of catchment convergence, and topographical requirements for operating a gravity wastewater network. These are shown as Options A, B, C, D, E and F on Figure 26 below.

The ‘do nothing’ option was also considered and discounted. This option provides no additional wastewater conveyance for the Whenuapai catchment and therefore does not meet the Project Objectives and was not considered further.

The long-listed sites were analysed against key engineering, environmental and financial constraints. Three of the sites were ruled out due to 'fatal flaws' to create a short-list of three sites (sites with a dark purple outline on Figure 24):

1. Option A: 14-16 Brigham Creek Road, owned by Watercare
2. Option B: 23-27 Brigham Creek Road, owned by Oyster Capital Development
3. Option C: 20-22 Brigham Creek Road, owned by a private owner

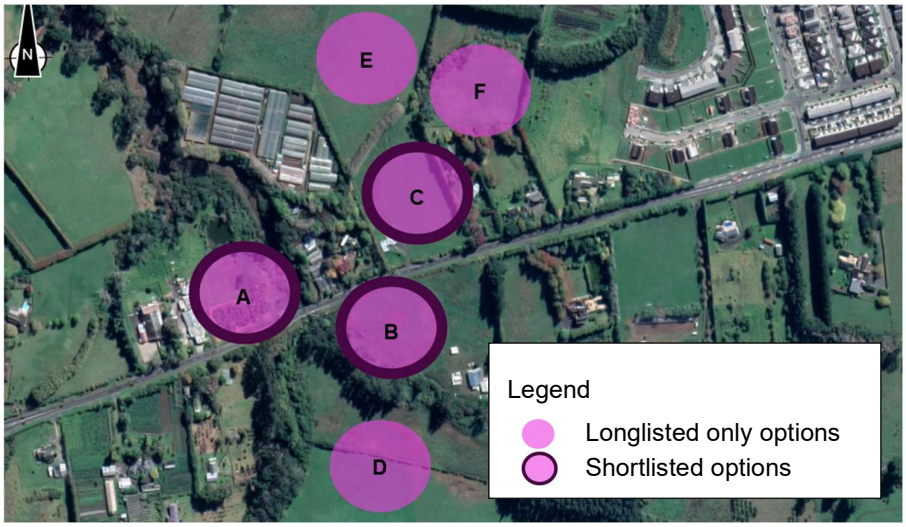


Figure 26. Pump station options considered

The short-listed sites were then qualitatively assessed against criteria related to the Project Objectives, including current and future network integration and function, environmental and social constraints, cost, and constructability.

Option B was selected as the preferred site for the pump station. This requires only one stream crossing, it is in a location that coordinates with planned development, avoids existing Transpower infrastructure, results in a shorter gravity main than Option A and shorter rising main than Option C, and is strategically placed to connect to other catchments if required in the future.

5.3.2 On-site layout options and refinements

In refining the final location of the pump station, the assessment considered the location of the wetland in the north-west of the site, the availability of suitable land for purchase, and operational requirements.

The preferred location of the pump station is shown in Figure 10. This location:

- Avoids permanent reclamation or dewatering of the wetland.
- Is adjacent to Sinton Stream to enable emergency overflow
- Enables Watercare to purchase only the minimum amount of land required for the pump station, without need to purchase other portions of land which would not otherwise be able to be utilised.
- Co-ordinate with known and planned development as part of the proposed Oyster Capital plan change

This site has subsequently been purchased by Watercare, who therefore now have a financial interest in the site, sufficient to undertaking the works.

5.4 Gravity main

The options for the gravity main were developed following the decision on the preferred location for the pump station. Watercare considered the location of the pump station the Project Objectives, operational

requirements, environmental constraints, and the potential risks of trenching in the vicinity of the Southern Cross internet cable and Brigham Creek Road.

The option of locating the alignment along Brigham Creek Road was discounted at an early stage, due to the potential risk associated with trenched construction in the vicinity of the Southern Cross internet cable. Watercare then considered two potential alignment options at the northern end of the pipeline, and six potential alignment options at the southern end of the pipeline, which are shown in Figure 27.

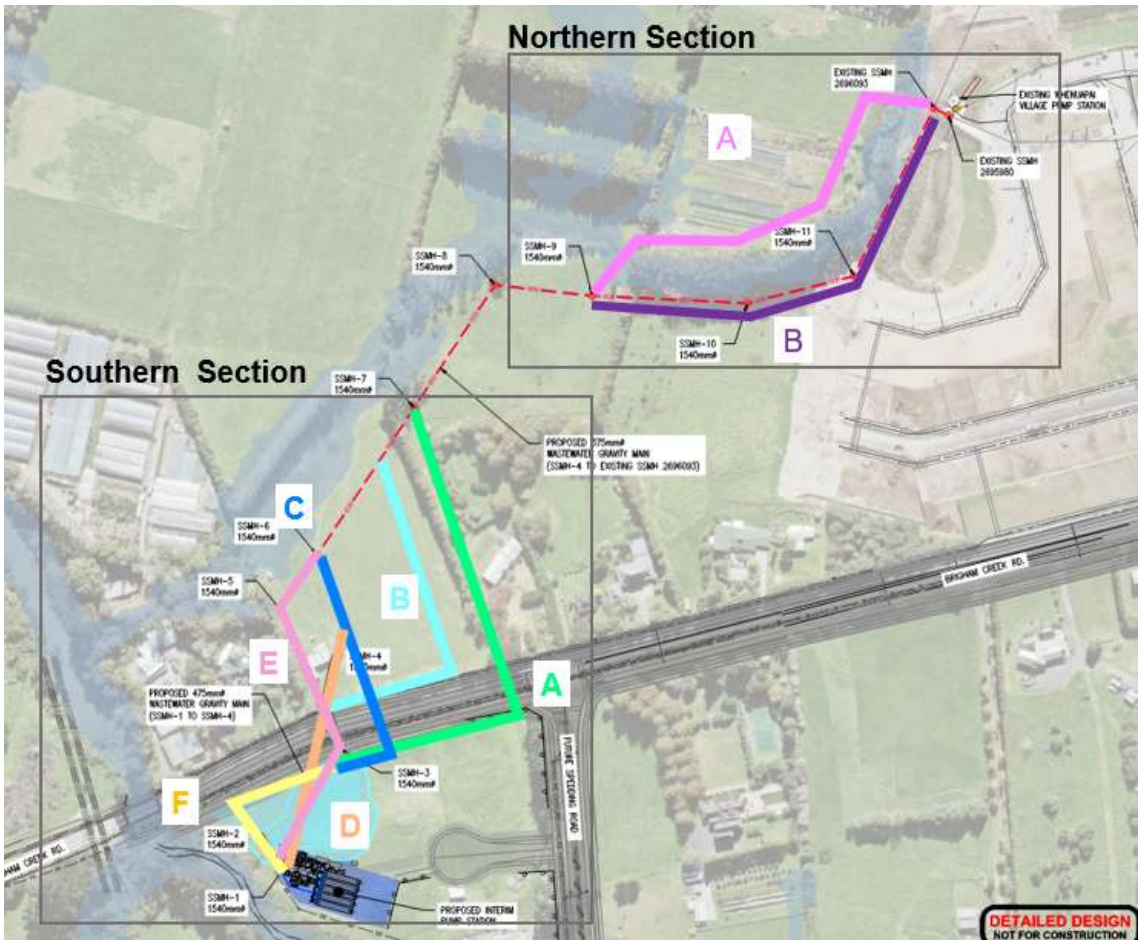


Figure 27. Alignment options (A-F) considered for gravity pipeline.

- **Option A** was selected for the northern section, as this option does not require stream crossings, and can be achieved through trenched or trenchless construction.
- **Option E** was selected for the southern section, as it can be achieved through trenched construction, minimises construction works along and underneath Brigham Creek Road, and avoids crossing through the middle of potentially developable land.

5.4.1 Design refinement of preferred gravity main option

The northern section of the alignment was then further refined to avoid the riparian yard of the stream, be located outside the flood plain, and minimise impacts on the stormwater embankment.

The southern section of the alignment was also refined to avoid the trees on the property boundary of 20-22 Brigham Creek Road, and to connect to the proposed pump station.

5.5 Rising main

Two potential options were considered at the northern and southern alignment of the rising main (see Figure 28)[9]. The options were assessed against the Project Objectives, including criteria related to coordination with existing and known planned development including the Oyster Capital Plan Change, and the ability to connect with future extensions to the wastewater network.

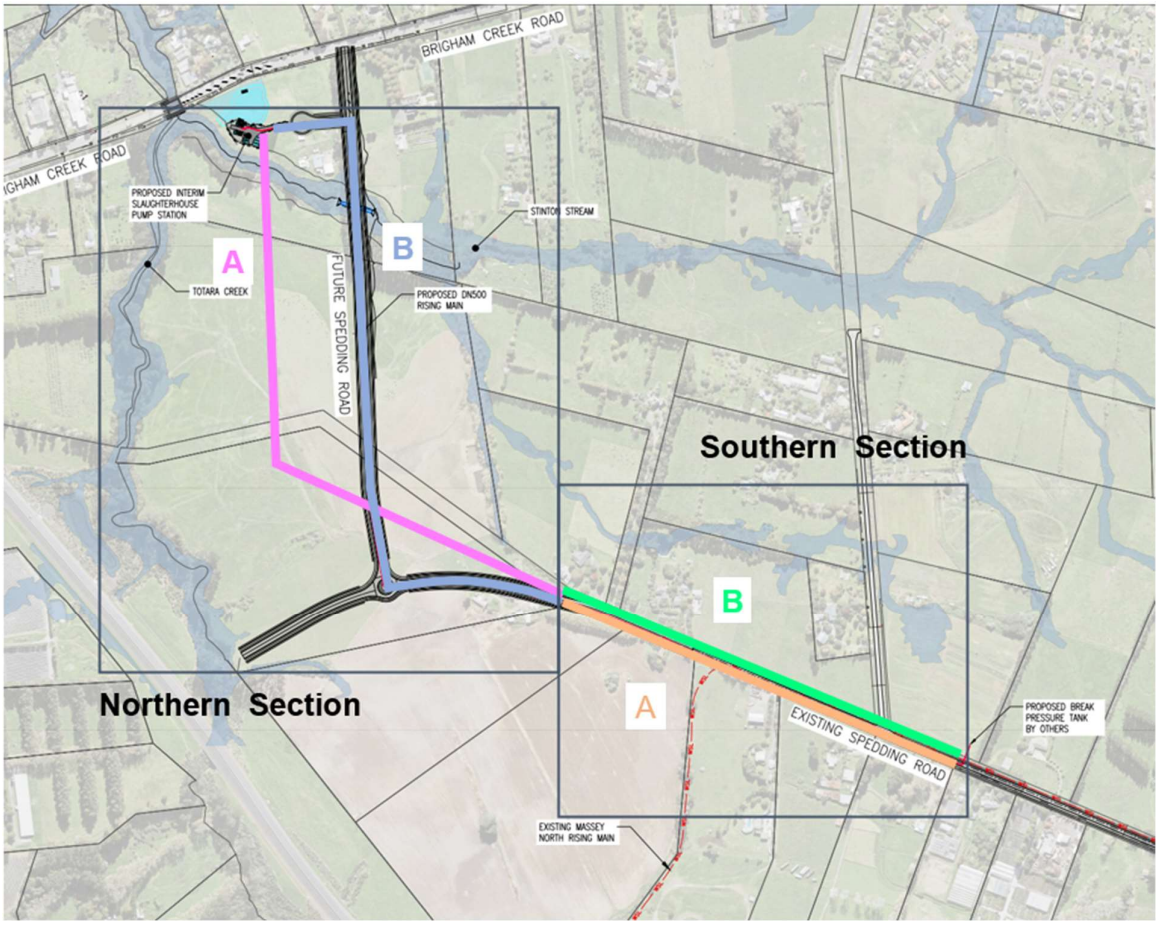


Figure 28. Alignment options considered for rising main pipeline.

Option B (blue line) at the northern section of the pipeline, and **Option A** (orange line), which is on the southern side of Spedding Road at the southern section of the pipeline, were confirmed as the preferred options for the alignment. Key reasons this alignment was selected is that it:

- Minimises the length of construction under overhead power lines which run along Spedding Road, which is a safety risk.
- Follows Oyster Capital's proposed future Spedding Road extension.
- Provides for future maintenance along the Spedding Road corridor.

5.6 Contractor and Laydown Areas

As discussed in Section 4.2, the Project requires three Contractor Areas and a laydown area, including:

[9] During the design and options assessment process the alignment of Spedding Road was extended southwards to incorporate a roundabout. As Option B was based around following the Future Spedding Road corridor, the amended alignment is considered to remain the same 'Option B'.

- Contractor Area North to support the gravity main works,
- Contractor Area Hub to support the pump station works,
- Contractor Area South to support the rising main works, and
- Laydown area to support the Tamiro Road Stormwater Embankment trenchless construction works.

One feasible option was considered for the Contractor Area Hub in the centre of the main construction work near the proposed pump station site with good access to the surrounding road network. This yard was sized to avoid temporary effects on the wetland as much as practical whilst providing sufficient space for a construction hub, truck ingress and ingress, equipment and laydown, and material stockpiling.

Two sites were considered for Contractor Area North and Contractor Area South (as well as alternative site access points). The options and preferred sites are shown on Figure 29 below.

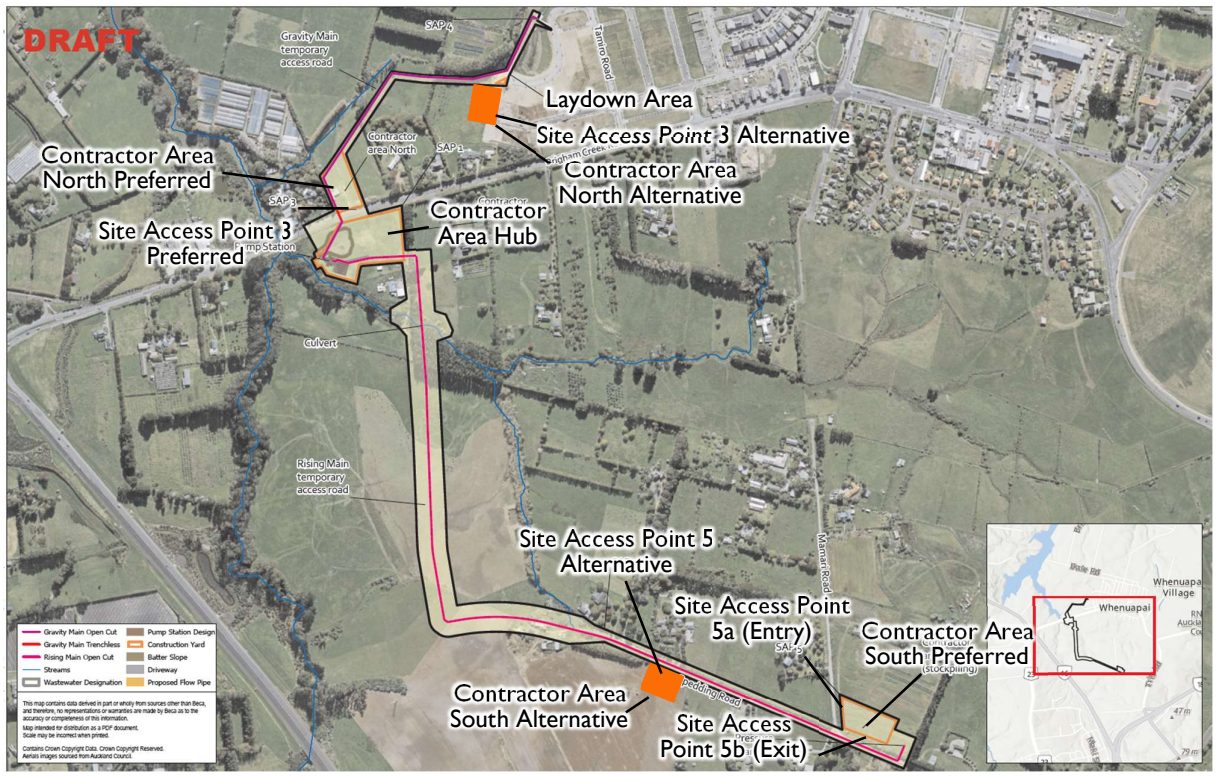


Figure 29. Proposed construction yards for the Project.

The preferred site for the Contractor Area North was selected because it enables heavy traffic to access the site from Brigham Creek Road, in close proximity to the gravity main work. The alternative site would require construction vehicles to access the site through smaller residential streets in Whenuapai Village, which would present a risk of complaints and safety risks.

The preferred site for the Contractor Area South was selected due to its location alongside the proposed break pressure chamber site, which enables the site to be used for both the Package 1 and 2 projects. The preferred site also provides two access crossing locations, which enable a one-way circuit to be set up on site and provides safer access for larger vehicles entering and exiting the site.

One feasible option was considered for the laydown area to support the trenchless construction works at Tamiro Road Stormwater Embankment, immediately adjacent to the works area. The laydown area is sized to provide sufficient space for the equipment necessary to undertake the works, a muck bin and materials storage area and a site container.

6 Notice of Requirement and Reasons for Consent

This section sets out the reasons for the Notice of Requirement and resource consents, and the activities which can be undertaken as permitted activities.

6.1 Notice of Requirement and Purpose of the Designation

The Notice of Requirement seeks a designation for a public work; being the construction, operation, and maintenance of new wastewater infrastructure (including a new pump station, rising main, gravity main and auxiliary works). Form 20 outlining the notice of requirement is provided in Appendix Q. The designation boundary to be sought is attached as Appendix B. A draft of the designation conditions proposed is provided in Appendix I. The designation boundary covers 90,180m^2 on properties listed in Table 8 below. Following construction, Watercare will pull back the designation in areas not required for ongoing maintenance, operation and upgrading of the wastewater infrastructure.

The matters which would otherwise trigger district consent under the AUP: OP pursuant to sections 9 (3), of the RMA, if a notice of requirement was not being sought, are summarised in Appendix P. These are included to assist Auckland Council in understanding the key matters that Watercare are seeking to be provided for by the designation.

Table 8. Legal descriptions of affected parcels, area, and landowner details of land covered by the designation

Address	Legal Description	Area (m^2)	Owner
Roundel Crescent (existing pump station)	LOT 809 DP 492005	135	Watercare
Tamiro Road (stormwater embankment)	LOT 812 DP 508816	1,142	Auckland Council
20-22 Brigham Creek Road	LOT 1 DP 51941	5,292	N. Apsell
23A Brigham Creek Road	SECT 1 SO 569103	1,264	Watercare
23-27 Brigham Creek Road	SECT 2 SO 569103	16,307	Brigham Land Limited Partnership (Oyster Capital)
26 Brigham Creek Road	LOT 2 DP 51941	2,147	24 Brigham Creek Road
28 Brigham Creek Road	LOT 3 DP 51941	2,210	Natural Harmony Company Ltd
31 Brigham Creek Road	LOT 14 DP 53740	7,505	Engkun Trustee Limited
15-19 Spedding Road	PT LOT 4 DP 24410, LOT 1 DP 24410, PT LOT 5 DP 24410	31,745	Clover Farms Whenuapai
32 Mamari Road	SECT 2 SO 582220*	4,894	A. Nguyen, Y. Nguyen, M. Nguyen, C. Kelibitaka, & I. Ulm.
	SECT 1 SO 582220*	1,500	Watercare

**The legal description of 32 Mamari Road was previously PT LOT 19 DP 6234432 Mamari Road was subdivided, and SECT 1 SO 582220 purchased by Watercare in August 2022. Updated Certificates of Title to reflect these changes are expected to be available in approximately December 2022.*

6.2 Outline Plan

Section 176A(2) states that an outline plan need not be submitted to the territorial authority if:

b) the details of the proposed public work, project, or work, as referred to in subsection (3), are incorporated into the designation;

The details required by section 176A(3) include:

a) the height, shape, and bulk of the public work, project, or work; and

b) the location on the site of the public work, project, or work; and

c) the likely finished contour of the site; and

d) the vehicular access, circulation, and the provision for parking; and

e) the landscaping proposed; and

f) any other matters to avoid, remedy, or mitigate any adverse effects on the environment.

The detailed information required under section 176A(3) (excluding the break pressure chamber) has been provided within this NoR application and, in accordance with section 176A(2)(b), an outline plan need not be submitted to Auckland Council prior to the works commencing.

Watercare propose to provide an Outline Plan (and seek any associated resource consents) specifically for the break pressure chamber once the information is available as part of the Package 2 project.

6.3 Regional Consents

Resource consent is required under the AUP: OP pursuant to sections 9 (2), 13 and 14 of the RMA and have been assessed as a **Discretionary Activity** as detailed in Table 9 below.

An assessment of activities which can be undertaken as a Permitted Activity is provided in Appendix P.

Table 9. Activities requiring regional consent under the AUP:OP

Rule	Activity status	Comment
E3.4.1(A1) Any activities in, on, under or over the bed of lakes, rivers, streams and wetlands not otherwise provided for	Discretionary Activity	The gravity pipeline will be installed within Wetland C and will be constructed using trenched methods, with associated land disturbance and vegetation removal. Installing pipelines within the bed of a wetland, with associated land disturbance and vegetation removal is not otherwise provided for, and requires consent as a Discretionary Activity under Rule E3.4.1(A1)
E3.4.1(A33) Culverts more than 30m in length	Discretionary Activity	The culvert to be installed within Sinton Stream will be 43m in length, with an additional 5m headwall at either side of the culvert. Culverts greater than 30m in length require resource consent as a Discretionary Activity under Rule E3.4.1(A33).
E7.4.1(A20) Dewatering not meeting permitted activity standards	Restricted Discretionary Activity	Dewatering will be required for the following durations: • up to 14 days for construction of manholes along the gravity alignment

Rule	Activity status	Comment
		• up to 10 weeks for the gravity main trenchless crossing at the Tamiro Road Stormwater Embankment • up to 8 weeks for the gravity main trenchless crossing at Brigham Creek Road • up to 6 months for the pump station • up to 4 weeks for construction of air valve chambers along the rising main alignment. Whilst peat has only been confirmed as present at the location of the Brigham Creek Road trenchless crossing, layers of peat are known to be present across the wider project area. Dewatering for a period of greater than 10 days in peat soils, and greater than 30 days in other soils, requires resource consent as a Restricted Discretionary Activity under Rule E7.4.1(A17)
E7.4.1(A27) Diversion of groundwater caused by an excavation	Restricted Discretionary Activity	Diversion of groundwater will be required for longer than 30 days and will result in the diversion of groundwater over a length of greater than 20 m at a depth of more than 2 m below groundwater level for the pump station, and Sinton Stream culvert works. The diversion of groundwater over a length of greater than 20 m more than 2 m below groundwater level does not comply with Standard E7.6.1.10(4), and therefore requires resource consent for a Restricted Discretionary Activity under Rule E7.4.1(A27).
E26.3.3.1(A77) Removal of greater than 50 m^2 of vegetation and trees greater than 6 m in height or 600 mm in girth from the riparian zone	Restricted Discretionary Activity	Works will require removal of approximately 44 protected trees from the riparian area of the Slaughterhouse Stream and Sinton Stream, over an area which is greater than 50 m^2. Removal of protected trees from the riparian area requires resource consent for a Restricted Discretionary Activity under Rule E26.3.3.1(A77).
E26.5.3.2(A106) Earthworks greater than 2,500 m^2 where the land has a slope equal to or greater than 10 degrees	Restricted Discretionary Activity	Earthworks required for construction of the culvert will be on land with a slope greater than 10 degrees, and will exceed 2,500 m^2 at any one time. Earthworks exceeding 2,500 m^2 on land with a slope greater than 10 degrees requires resource consent for a Restricted Discretionary Activity under Rule E26.5.3.2(A106).
E26.5.3.2(A107) Earthworks greater than 2,500 m^2 within the Sediment Control Protection Area other than for maintenance, repair, renewal, minor infrastructure upgrading	Restricted Discretionary Activity	The area of earthworks required for construction of the culvert, and Contractor Area Hub, which is within the Sediment Control Protection Area (within 50 m of a stream or wetland greater than 1,000m^2), will exceed 2,500 m^2 at any one time. Earthworks exceeding 2,500 m^2 in the Sediment Control Protection Area require resource consent for a Restricted Discretionary Activity under Rule E26.5.3.2(A107).

Rule	Activity status	Comment
E26.5.3.2(A102) Earthworks greater than 10,000 m^2 up to 50,000 m^2 where land has a slope less than 10 degrees outside the Sediment Control Protection Area other than for maintenance, repair, renewal, minor infrastructure upgrading	Controlled Activity	The area of earthworks required at any one time will be minimised to the extent practicable. Whilst the thresholds apply to the area and volume of work being undertaken at any one time at a particular location, given the proximity of the Contractor Area North and Contractor Area Hub, it is considered that earthworks open at any one time in the general location may exceed 10,000 m^2. Earthworks exceeding 10,000 m^2 outside the Sediment Control Protection Area require resource consent for a Controlled Activity under Rule E26.5.3.2(A107).

6.4 National Environmental Standards for Freshwater (NES:F)

6.4.1 Resource consents sought

The proposed infrastructure meets the definition of 'specified infrastructure' as defined in the National Policy Statement for Freshwater Management (NPS:FM). Specified infrastructure is defined as infrastructure that delivers a service operated by a lifeline utility. Watercare is a lifeline utility, as it is an entity which provides a wastewater or sewerage network (Civil Defence Emergency Management Act 2002, Schedule 1, Part B (4))[10]. As specified infrastructure, the project requires resource consent as a **Discretionary Activity** under the NES: F for the activities outlined in Table 10 below.

Table 10. Proposed activities which require resource consent under NES:F

Clause	Activity status	Comment
45(1) Vegetation clearance within, or within a 10 m setback from, a natural wetland for the purpose of constructing specified infrastructure.	Discretionary Activity	Resource consent is required under the NES:F as a **Discretionary Activity** in accordance with Clause 45, for: - vegetation clearance (45(1)) and earthworks within, and within a 10 m setback from a natural wetland (45(2)). This is required to construct the gravity main through Wetland C, and - temporary taking, damming and diversion of water within a 100 m setback of a natural wetland (45(4)). This is required for dewatering during construction of the pump station, during trenchless construction of the gravity main underneath Brigham Creek Road, and as part of the erosion and sediment control measures for the gravity main, pump station, and rising main works.
45(2) Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland for the purpose of constructing specified infrastructure.		
45(4) The taking, use, damming, diversion, or discharge of water within, or within a 100 m setback from, a natural wetland for the purpose of constructing specified infrastructure.		

[10] Refer Subpart 3.21 Definitions relating to wetlands and rivers of the National Policy Statement: Freshwater Management

6.5 National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS)

GHD has completed a DSI for the project area (refer Appendix G). The DSI concluded that whilst a number of HAIL sites are present across the works area, the concentrations of select inorganic and inorganic contaminants at those sites are below naturally occurring background levels.

Regulation 5(9) of the NESCS states that the regulations of the NESCS **do not apply** where a DSI demonstrates that any contaminants in or on a HAIL site are at, or below, background concentrations. As such, the regulations of the NESCS do not apply to the proposed works.

6.6 National Code of Practice for Utility Operators' Access to Transport Corridors (September 2016)

Works will take place within the road corridor and in proximity to existing services, including the Southern Cross internet cable.

Watercare is required to adhere to the requirements in the National Code of Practice for Utility Operators' Access to Transport Corridors (September 2016) (the Code), a legislated requirement under the Utilities Access Act 2010. The Code applies to the activities of all transport corridor managers and utility operators throughout New Zealand. It provides a nationally consistent and cooperative framework for corridor managers and utility operators, to manage transport corridors while also providing for the access rights of utility operators.

Under the Code, Watercare must take measures to ensure all existing Utility Structures that may be affected by the site construction are not damaged during the course of the work. Before undertaking works, Watercare must record the existing condition of all surfaces and above ground Utility Structures in the immediate vicinity of the work site. If damage is caused to any road, property or utility asset, Watercare must notify the Corridor manager and the respective Utility Operator of any damage caused and repairs must be undertaken as soon as practicable.

Chapter E26 of the AUP: OP refers to the Code under Standard E26.1.2 (1) Other relevant regulatory requirements and includes E26.2.5.1 (1)(b), the site must be reinstated in accordance with conditions specified in the National Code of Practice for Utility Operators' Access to Transport Corridors (2011), as a permitted activity standard for infrastructure activities within roads.

6.6.1 Corridor Access Request

Under the Code, Watercare (or its subcontractors) are required to apply for a Corridor Access Request (CAR) from Auckland Transport for all works undertaken with the road corridor. The CAR application is separate to the resource consent process and will be sought prior to commencement of construction works.

As part of the CAR process, each section of work will be required to have a traffic management plan (TMP) developed and submitted to Auckland Transport, to ensure that both traffic and contractors are able to operate safely and efficiently in the vicinity of the construction zone. The TMP includes traffic flows, detour routes, and signage; and is subject to approval by Auckland Transport. The TMP is prepared in consultation with public transport with regards to bus stop closures, temporary bus stops and bus detours, including school bus routes.

It should be noted that should Brigham Creek Road or Spedding Road be required to be closed, then this closure must be publicly advertised. This process is managed / coordinated by Auckland Transport to ensure consistency of advertising and that the required time frames are met.

6.7 Authorised Activities

Watercare holds a region wide wastewater network discharge consent for overflows to land and water, including wastewater discharges within the Indicative Future Urban Areas in Auckland that are to be serviced by future networks (consent number R/REG/2013/3743). Operational discharges from the emergency overflow outfall to Sinton Stream are authorised by this consent.

The site plan showing the proposed pump station and formal overflow point, and design drawings, have been provided to the Manager, Marc Butler, Senior Wastewater Specialist, Proactive Compliance, licencing and regulatory compliance (refer to Appendix K). Watercare has also received Asset Owner Approval from Healthy Waters to discharge to the stream (refer to Appendix K).

7 Assessment of Effects on the Environment

7.1 Overview

This section considers the actual and potential effects associated with the construction and operation of the Project. This section also outlines the proposed measures to avoid, remedy or mitigate any potential adverse effects on the environment.

Once in place, there will be a range of actual or potential permanent effects that will arise as a result of the project, which includes:

- Positive Effects
- Ecological Effects (in-stream habitat, section of Wetland C)
- Landscape and Visual Effects

In addition, there is a range of temporary effects that have the potential to arise during construction, this includes

- Groundwater and Settlement Effects
- Landscape and Visual Effects
- Arboriculture Effects
- Ecological Effects (discharge of sediment, removal of vegetation, dewatering, fauna impacts)
- Construction Noise Effects
- Land Disturbance Effects
- Construction Traffic Effects
- Land Subject to Instability

7.2 Positive effects

The gravity main, pump station, rising main and break pressure chamber are key components of the Whenuapai wastewater infrastructure network, which will service up to 10,200 dwellings to 2041, providing for future housing provisions to enable Auckland to continue to grow. The scheme is required to accommodate the wastewater needs of anticipated and future growth (refer to Section 1 and Appendix J).

Enabling urban development opportunities has positive community and economic benefits and will contribute towards alleviating the existing housing shortage in Auckland.

7.3 Ecological Effects

An Ecological Impact Assessment has been undertaken for the project and is provided in Appendix D. It assesses the construction and operational impacts of the earthworks, vegetation removal, and culvert installation on native fish, stream and wetland function, and terrestrial fauna. These effects are summarised in the following sections with the details set out in Appendix D.

7.3.1 Construction effects

Discharge of sediment to wetlands and streams

Earthworks in proximity to wetlands and streams have the potential to produce sediment discharges which can reduce water quality. High sediment concentrations can have adverse effects on aquatic ecology and wetland flora including smothering organisms, reducing the abundance and diversity of macroinvertebrates, and harming the fish population.

Earthworks within or in proximity to Wetland C include:

- Open trenching works to install the pipeline through the wetland, and
- Construction of the pump station and Construction Area Hub in proximity to the wetland.

Wetland C is currently in a degraded state and may not be able to effectively buffer sediment arising from the earthworks, which may temporarily degrade the ecological value and functioning of the wetland. To mitigate this, erosion and sediment controls will be installed around earthworks areas in line with GD05, including placement bunting to prevent works from encroaching outside of the designated area as described in Section 7.8 below and the Erosion and Sediment Control Plan in Appendix H. Following construction, the disturbed areas will be reinstated and recontoured to the original landform. With these measures in place, the impacts of discharge of sediment from earthworks the ecological value and functioning of Wetland C are expected to be low.

Earthworks within the riparian area of Sinton Stream are required to install the culvert. As described in Section 4.7, the stream will be temporarily diverted around the works area whilst the culvert is constructed in order to minimise the potential risk of sediment entering the stream. Further, Erosion and Sediment Controls will be installed around earthworks areas in line with GD05 as described in Section 7.8 below and the Erosion and Sediment Control Plan in Appendix H. In addition, works adjacent to the streams will be carried out, as far as practicable, during the earthworks season. With these measures in place, impacts of discharge of sediment from earthworks adjacent to Sinton Stream on water quality and aquatic ecology are expected to be low.

It is noted that Wetland A is considered to be outside of the zone of influence of the works. Therefore, no impact on Wetland A is anticipated.

Removal of vegetation from the riparian area of the wetland, the wetland, and the riparian areas of streams

Removal of riparian vegetation from the area surrounding Wetland C, and from within the wetland itself, will result in a loss in wetland values and functioning. This is required for the installation of the pipe. However, this loss is temporary, and the disturbed areas will be replanted with species appropriate to improve the ecological value and restore the functioning of the natural wetland ecosystem. A Planting Plan with details of planting to be completed in the riparian area of Wetland C is provided in Figure 10, and Drawing 2013649.001 in Appendix A. A further planting plan to cover planting of other areas will be completed and submitted to Auckland Council prior to construction. The planting of the disturbed areas of the wetland margins and wetland will sufficiently restore the values and functioning of the wetland habitat affected by construction through the wetland area, with any residual impacts on the wetland assessed to be very low.

Removal of the predominantly exotic riparian vegetation from Slaughterhouse Stream and Sinton Stream will decrease shading, temperature regulation, and organic inputs into the stream. The loss of the buffer function between surrounding land use and the stream may increase the potential for sediment to enter the stream and increase the likelihood of bank erosion until the riparian area is restored. To remediate the loss of riparian planting, replacement planting will be undertaken in the riparian areas along Slaughterhouse Stream and Sinton Stream in accordance with best practice guidelines. Due to the uncertainty of the post construction landscape at the Sinton Stream pine stand, the timing and location of the planting at this location will be undertaken in coordination with planned Oyster Capital works. The overall level of effect of vegetation removal is considered to be low.

Dewatering in proximity to Wetland C

The temporary diversion and dewatering of groundwater required for construction of the gravity pipeline and pump station may result in temporary hydrological changes to Wetland C. As the wetland expands and contracts based on hydrological conditions, it is expected to respond similarly to dewatering. As groundwater

will recharge once dewatering ceases, this is not anticipated to result in any long term effects on wetland hydrology.

Injury or mortality of freshwater fish species

Sinton Stream contains several native fish species, including At-Risk species. The proposed works have the potential to impact the native fish present in the stream either directly through injury or mortality, or indirectly through habitat degradation.

To mitigate potential adverse impacts on native fish a Native Fish Management Plan (NFMP) is proposed to be developed prior to works commencing and implemented during construction. The plan will detail the methodologies to salvage and safely relocate the fish out of the impact zone prior to works being undertaken, and likely involve isolating the impact reach using stop-nets, and a combination of trapping, slow dewatering, and sorting through dewatered material to capture and safely relocate fish outside of the works zone. The stop-nets will be retained within the stream until the works are completed, to ensure that no fish re-enter this section of the stream. The development and implementation of the NFMP will minimise adverse effects on native fish during the construction of the project, with the overall effect considered to be low.

Temporary reduction of fish passage

The temporary diversion of Sinton Stream is required to create a dry working environment during construction of the culvert. The proposed stream diversion may temporarily reduce fish passage, as the diversion may result in the temporary loss of in-stream functionality including riffles and pools which provide resting places for fish travelling upstream. Nevertheless, once the works are complete the stream will flow through the newly installed culvert which will provide similar substrate, stream gradient, and velocities as the natural stream channel with no permanent effects on fish passage anticipated.

Bats

The clearing of riparian vegetation along the Sinton and Slaughterhouse Stream riparian margin may affect terrestrial fauna habitat, including potential injury or mortality of roosting long-tailed bats and damage to bat roosts if present. To mitigate the potential impact a preliminary survey will be undertaken prior to removal of mature trees in the riparian area to determine if the trees provide suitable habitat for roosting. With the mitigation measures in place, the overall level of effect to bats is considered to be low.

Lizards

Removal of long grasses, and woody debris in riparian areas, has the potential to impact native lizard species. In order to mitigate this risk, an initial risk assessment will be undertaken by a suitably qualified herpetologist to assess the risk and likelihood of lizard presence/absence within the area of construction prior to the commencement of works. If native lizards are found to be present at site, a Lizard Management Plan will be prepared and implemented. With the mitigation measures in place, the overall level of effect to lizards is negligible.

Birds

Vegetation clearance within the riparian areas may result in the disturbance of birds, particularly if nesting is occurring. Where practicable, vegetation clearance will be undertaken outside of nesting season. Where this is not practicable, riparian areas planned for vegetation clearance will be surveyed for the presence of bird nests before clearance works begins by a suitably qualified ecologist in accordance with the Wildlife Act 1953. If indigenous birds are found nesting, clearance of the nesting tree shall be delayed until the residing chicks have fledged. With the mitigation measures in place, the overall level of effect to birds is considered to be negligible.

7.3.2 Permanent effects

Loss and disturbance to in-stream habitat

The culvert works within Sinton Stream, will result in the permanent loss of approximately 43 m of natural channel through installation of the culvert, and permanent modification of a further 20 m of channel through installation of headwalls and rip rap. To compensate this loss and modification, a 426 m reach (818 m^2) of Sinton Stream will be enhanced with riparian habitat features. This will improve and maintain the ecological and indigenous habitat functionality of the Sinton Stream freshwater environment. The location and planting details will be selected in coordination with Oyster Capital works to avoid the need for future removal / replacement, and provided to Council in a Stream Restoration Plan prior to commencement of works. This will achieve no net loss of ecological value at Sinton Stream and will likely result in an improved riparian area downstream over a medium-to-long term time scale.

Alteration to hydrology of Wetlands A & C

The permanent occupation of a 475mm diameter PVC pipe approximately 2.8 m beneath the ground level of Wetland C is unlikely to result in the loss of extent or value of Wetland C in the long term. Minor alteration of soil profile will occur but at a depth that will not alter the species composition or extent of wetland vegetation which is generally shallow rooted. The occupation of the pipe is also not anticipated to result in a material reduction in surface or groundwater flows through the wetland (T&T, 2022). The magnitude of a potential alteration of hydrology because of the permanent occupation of the pipe is negligible**.**

There is no effect to Wetland A is it is not within the zone of influence of any construction works.

7.3.3 Summary

The proposed works have the potential to impact Wetland C, the freshwater environment of Sinton Stream, and the native fauna residing in the stream. The effects of the disturbance to the Wetland habitat, and the loss and disturbance of the in-stream habitat of Sinton Stream have been assessed as high without management. In relation to fauna, Sinton Stream and the surrounding areas have a range of freshwater fish species and bats that have high ecological value. Without management there is potential for earthworks, streamworks, and vegetation removal to have moderate to high effects on these species.

Mitigation and management measures have been proposed to minimise potential adverse impacts during construction. This includes reinstatement and replanting of Wetland C, completing 426 m of stream compensation planting along the wider reaches of Sinton Stream, and implementing erosion and sediment controls and a Native Fish Management Plan during construction. Trees will be surveyed prior to removal to identify if they provide suitable bat roosting sites. Once the works are complete, it is proposed to replant the riparian margins of Sinton Stream and Slaughterhouse Stream with native vegetation (in coordination with future Oyster Capital works).

Overall, considering the mitigation measures in place, the potential effects of the works on ecology will be able to be mitigated and managed appropriately.

7.4 Landscape and Visual Effects

A Landscape and Visual Assessment Report has been prepared for the proposed works and is provided in Appendix E. The Landscape and Visual Assessment assesses the potential impacts of the works on the landscape attributes and values, visual amenity, and natural character of the project area.

7.4.1 Landscape attributes and values

Landscape effects will primarily be generated from land disturbance within the wetland, installation of a culvert including reshaping of stream banks within Sinton Stream, and removal of native and riparian

vegetation. Nevertheless, the area of wetland impacted by open trenching will be reinstated, including reinstatement of the land contours, and appropriate wetland planting will be established. As described in Section 7.3 and 7.4, landscape effects from the removal of riparian vegetation along Slaughterhouse Stream and Sinton Stream, and vegetation at the Tamiro Road stormwater embankment, will be mitigated through replacement planting. In addition, the area surrounding the pump station will be planted with low amenity planting, which once established will have a beneficial effect on the landscape attributes and values. Overall, once the works are complete, the effects on landscape attributes and values for the project area will range from localised moderate adverse effects (from the installation of the culvert within Sinton Stream), to very low or low beneficial effects at the pump station and wetland.

7.4.2 Effects on visual amenity

The long-term visual effects of the project works will be minimal as the pipeline is underground. The above ground elements of the pump station will be painted in recessive colours and further mitigated by amenity planting, and the culvert will not be particularly visible due to intervening vegetation and landform conditions. Overall, effects on visual amenity are considered to range from low adverse effects (from the views of the pump station and culvert), to very low beneficial effects (for views of the planted areas of the wetland).

7.4.3 Effects on natural character

A localised section of the natural character of Sinton Stream and Slaughterhouse Stream will be altered by the installation of the emergency overflow point and culvert, and through the removal of riparian vegetation. The effects of the emergency overflow point have been assessed to be low, as it is a relatively small structure on the upper embankment of the stream only. The new Sinton Stream culvert will have a clay substrate, which will provide a relationship to the existing natural clay channel bed, whilst the loss in value will be further mitigated by the removal of the existing culvert at 23-27 Brigham Creek Road. The effects of the removal of riparian vegetation will be mitigated through replacement planting (as described above). Overall, once works are complete, the adverse effects on the natural character of the localised portion of Sinton Stream are considered to range from moderate to very low.

7.4.4 Measures to avoid, remedy or mitigate potential adverse landscape effects

The following mitigation is proposed:

- The preparation of a site-wide planting plan prepared by a suitably qualified Landscape Architect and Ecologist, with input from relevant key stakeholders.
- Above ground structures of the pump station will be painted in recessive colours (i.e. dark greys and greens).

7.4.5 Conclusion

The works are located within the Future Urban Zone, and have been identified as suitable for urbanisation, including industrial uses. The land is currently the subject of a private plan change application by Oyster Capital to rezone the land for the intended light industrial use. The landscape and visual effects are localised to the works area and modification of the landscape and natural character values are considered an appropriate response in the context of a landscape which is planned to transition to an urban environment and will be appropriately managed and mitigated.

7.5 Arboricultural effects

The proposed works will require removal and works in close proximity to a number of protected trees. An Arboricultural Assessment (Appendix L) has been undertaken to identify any potential impacts on trees and recommend mitigation.

7.5.1 Summary of tree removals

In summary, the following relevant works impacting protected trees will be required:

- Removal of up to 94 protected trees across the project extent. This includes removal of 43 protected trees from the riparian area of Sinton Stream, and 1 protected tree from the riparian area of Slaughterhouse Stream.
- If trenchless construction at the Tamiro Road stormwater embankment fails due to encountering an underground obstruction, an additional 50 protected trees will be removed from the open space zone to enable open trenching through this area.
- Works in the root zone of up to 47 protected trees across the Project extent, including 43 protected trees in the riparian area of Slaughterhouse stream, and 4 protected trees in the riparian area of Sinton Stream.

7.5.2 Measures to avoid, remedy or mitigate potential adverse arboricultural effects

After the completion of works it is proposed to undertake re-planting to replace non-pest plants removed from the riparian margin, road reserve, and open space zone, with native species at a ratio of 1:1.5 (or by agreement with the Community Facilities arborist for trees in the road reserve and open space zone). The location and timing of the replacement planting will be determined in conjunction with Community Facilities and will be coordinated with Oyster Capital works where appropriate to avoid the need for future removal and replanting.

Appendix A of the Arborist Assessment provides a detailed set of appropriate works methods and tree protection measures that will be put in place to minimise potential adverse effects on protected trees during construction. These are summarised as follows:

- A works arborist will be engaged to manage the trees in the works area so that any potential adverse effects are minimise and mitigated.
- A pre-construction meeting will be undertaken prior to works to confirm areas where the works arborist will be on site for monitoring works, expected work timings and methodologies for works near trees, areas where imported mulch can be applied to assist with effects mitigation, which trees are to be removed and the removal methodology, site access and equipment storage, and auditing and reporting requirements.
- Tree removal will be undertaken by qualified arborists implementing modern arboricultural techniques.
- Measures to protect root zones will be employed, including that no chemicals or harmful fluids will be emptied or disposed of within any root zones, and machinery, structures and vehicles will be excluded from root zones unless kept on top of hard surfaces. Permeable areas will be protected with appropriate, fit for purpose, temporary load bearing surfaces.
- Specific measures will be in place to protect root zones during open trenching. Roots over 35mm in diameter will be retained where practicable. Once all alternatives to root removal are exhausted, roots measuring 80mm in diameter or less can be severed at the appointed arborists discretion.

7.5.3 Conclusion

Overall, it has been assessed that there are no significant individual trees that should be retained from the works areas. Native trees within the Tamiro Road stormwater embankment were planted relatively recently (in approximately 2017) and if they are required to be removed, will be replaced with similar species.

Consent is sought for works within the root zone of protected trees lining the riparian area of Slaughterhouse Stream as a ‘worst case’ scenario. However, as the trees are located on the northern side of the stream, it is considered unlikely that the roots from the trees extend underneath the stream bed and into works area, and the trees are unlikely to be affected by the works.

Overall, it is considered that with the proposed construction methodology and mitigation measures, including subsequent replacement planting, the potential effects of the works on vegetation will be able to be managed appropriately.

7.6 Groundwater settlement effects

A Geotechnical and Settlement Effects Report has been prepared for the project and is provided in Appendix F, which assesses the potential effects of groundwater diversion and dewatering during construction.

The following summarises the main conclusions of the Groundwater and Settlement Effects Report (Appendix F). Summaries of modelled reductions in groundwater levels, and maximum settlement levels, are provided in Table 6.1 to 6.9 of the Groundwater and Settlement Effects Report, and its Appendix A provides visualisations of the zone of influence overlaying aerial photos of the site.

7.6.1 Summary of relevant activities

Groundwater dewatering and diversion during construction activities, while temporary, have the potential to cause settlement which may damage buildings and/or underground services if not managed appropriately. Other adverse effects can include saline intrusion into aquifers, effects on neighbouring bores, and effects on water levels in nearby water bodies. These effects decrease with increasing distance from an excavation

The following activities are relevant to this effects assessment:

- Temporary dewatering and diversion will be required for greater than 10 days in order to construct the pump station, manholes, and air valves, and undertake trenchless construction works for the gravity main.
- Groundwater will also be temporarily diverted for a period of greater than 30 days to enable construction of the culvert in Sinton Stream.

7.6.2 Effects on buildings

Settlement caused by groundwater drawdown from construction of the trenchless works under Brigham Creek Road is predicted to result in a negligible to very slight risk of damage to the nearest dwelling at 18 Brigham Creek Road, with a maximum predicted settlement of <7 mm and a differential settlement of less than 1V:1000H (mm). This indicates that there is a possibility for non-structural superficial damage, such as small cracks that would not cause irreparable damage to the building.

All other buildings in proximity to the project works area have negligible risk of damage.

7.6.3 Effects on underground services

A number of underground services along Brigham Creek Road are within the zone of influence trenchless construction works underneath Brigham Creek Road. The maximum total and differential settlements are assessed to be 25 mm and 1v:600H respectively. At this level of total and differential settlement, the risk of damage to underground services is assessed to be low.

The existing water pipelines are owned by the applicant and effects on these are therefore not considered. As is standard practice, Watercare will engage with the remaining asset owners to manage the risks, and establish suitable controls, for each service.

7.6.4 Effects on the aquifer, neighbouring bores, and neighbouring water bodies

In relation to potential effects on the saline intrusion and the underlying aquifer, neighbouring bores and water bodies, the assessment concludes the following:

- The project is not located within the coastal environment so the risk of saline intrusion is unlikely.

- A closest bore is located approximately 140 m to the north west of Manhole 5 (refer to Figure 7). As drawdowns are very small (less than 0.5m) at distances greater than 100m from excavations, any effects will be low and temporary.
- Any changes to base flows through the wetland, and Sinton Stream, are likely to be low at most, and temporary so will return to baseline levels once dewatering is complete.

7.6.5 Measures to avoid, remedy or mitigate potential adverse groundwater and settlement effects

Whilst the assessment indicates that any potential effect will be minimal, and limited to potential non-structural superficial damage at 18 Brigham Creek Road, It is proposed to undertake a groundwater and settlement monitoring programme during construction to confirm the outcome of the assessment, and to monitor and manage any potential effects should they arise during dewatering. A preliminary Groundwater and Settlement Monitoring Plan has been developed for the project and is provided in Appendix M.

The preliminary Groundwater and Settlement Monitoring Plan indicatively proposes:

- 27 settlement monitoring pins to be located at 18 Brigham Creek Road, Brigham Creek Road (including the Brigham Creek Road culvert), and the pump station works area. Indicative alert and alarm levels are provided for each pin.
- Groundwater monitoring at 9 existing boreholes located across the works area.
- A pre and post construction building condition survey at 18 Brigham Creek Road.

The quantum and nature of the monitoring proposed in the preliminary Groundwater and Settlement Monitoring Plan will be confirmed in a final Groundwater and Settlement Monitoring and Contingency Plan (GSMCP), which is currently being developed and will be provided to Council prior to construction. The GSMCP will also include contingency measures to be undertaken should alert and alarm levels be exceeded.

7.6.6 Conclusion

Overall, it is considered that the potential for settlement as a result of groundwater dewatering is minimal, with only one property identified as having potential for minimal cosmetic damage with mitigation proposed in the form of a pre and post construction survey and monitoring. Network utilities will be engaged to manage risks to assets and establish suitable controls for each service.

Whilst effects are expected to be minimal, a range of monitoring is proposed during construction to confirm the outcome of the assessment (refer preliminary Groundwater and Settlement Monitoring Plan provided in Appendix M). This monitoring , and the procedures to be followed in the event of an alert or alarm level being triggered, will be confirmed in a final GSMCP which will be provided to Council prior to construction.

Overall, it is considered that with these measures in place, potential groundwater diversion, dewatering, and ground settlement will be appropriately managed.

7.7 Construction noise effects

During construction there is potential for noise and vibration to be generated at contractor areas and at trenched and trenchless construction sites.

A Construction Noise and Vibration Assessment for the project, including a draft Construction Noise and Vibration Management Plan (CNVMP), is provided in Appendix N. As works in the Brigham Creek and Spedding Road road reserve are permitted under Standard E25.6.29 (3)(a) and (d) (as a final CNVMP will be provided to Auckland Council prior to works commencing), this assessment focuses the effects of works undertaken outside of the road reserve.

7.7.1 Existing ambient noise levels

Existing ambient noise levels at 18 Brigham Creek Road which is close to Brigham Creek Road are likely to reach 70 dB L_{Aeq}.

7.7.2 Contractor Areas

At all contractor areas the noisiest construction activities include levelling and compacting the site for a period of approximately 4 to 5 weeks as part of the site establishment activities, and ongoing truck access to manage the spoil for a period of approximately 13 months. Noise levels are expected to range between 103-106 dB L_{Aeq}.

Contractor Area North is in close proximity to the dwelling at 18 Brigham Creek Road. Given the long-term nature of the noise generated at this location, a 2 m high acoustic screen will be installed along the western boundary of the works area. With this mitigation in place, the dwelling at 18 Brigham Creek Road is anticipated to experience noise levels of below 70 dB L_{Aeq} from the activities within the contractor area.

Contractor Area Hub and Contractor Area South are not in close proximity to neighbouring dwellings, therefore no specific mitigation measures are required.

7.7.3 Trenched and trenchless construction

During open trenching, trenches will be benched with trench shields used for support as required. However, where trench shields are not practicable, additional shoring such as sheet piles may be required. Where sheet piling is required, the noise generated by open trenching will range from 116 – 88 dB L_{Aeq}.

The noisiest activities associated with trenchless construction works at Brigham Creek Road and Tamiro Road Stormwater Embankment include sheet piling, pipe hammering (at Brigham Creek Road), and concrete trucks. Noise levels from trenchless construction works are anticipated to range from 116 – 97 dB L_{Aeq}.

Potential external noise levels

For both open trenching (where sheet piling is required) and trenchless construction, there is potential for noise at levels which may exceed permitted activity levels measured at the exterior of 7 dwellings[11], including:

1. 28 Joseph McDonald Drive (78 dB L_{Aeq})
2. 30 Joseph McDonald Drive (81 dB L_{Aeq})
3. 40 Tamiro Road (78 dB L_{Aeq})
4. 42 Tamiro Road (80 dB L_{Aeq})
5. 46 Tamiro Road (81 dB L_{Aeq})
6. 107 Whenuapai Drive, and (80 dB L_{Aeq})
7. 18 Brigham Creek Road[12] (78 dB L_{Aeq})

[11] There are two other properties identified in Table 6 of Appendix N. Works at 13 Spedding Road will occur within the road reserve, with a CNVMP the exceedance at this property is considered to be permitted. The dwelling at 17-19 Spedding Road is in the designation, owned by Oyster Capital, is not currently occupied, and will be removed to enable the future extension of Spedding Road.

[12] Noise levels at 18 Brigham Creek Road are assessed with the acoustic screen along the western boundary of the works area in place.

Where practical, it is proposed to use temporary noise barriers during construction where exceedances are predicted, and where they are expected to provided effective mitigation. Where noise walls are practical, noise from trenched and trenchless construction works will be reduced to be within the permitted construction noise levels (except at the dwelling 18 Brigham Creek Road, which may still experience an exceedance of 3 decibels where open trenching of the pipeline is in close proximity to the property boundary. This exceedance will be for a short duration, ie. less than 10 days). However, in some areas it may not be practical to install noise walls due to site topography and vegetation.

Potential internal noise levels

The potential internal noise levels of the 7 dwellings mentioned above have been estimated to give an idea of how the noise will be experienced by those living there. This is based on Table 7 of the Construction Noise and Vibration Assessment.

Construction activities may generate internal noise levels of around 50 to 60 dB LAeq at 4 dwellings:

1. 30 Joseph McDonald Drive
2. 42 Tamiro Road
3. 46 Tamiro Road, and
4. 107 Whenuapai Drive.

This range of internal noise level can be expected to result in some annoyance to the occupants of the neighbouring buildings, however, is generally acceptable for short periods of time, during daytime hours as is proposed here, given sections of the trench will be open for no longer than 10 days.

Construction activities may general internal noise levels that are considered ‘typically acceptable’ in the report at (40-50 dB L_{Aeq}) for the three remaining properties:

5. 28 Joseph McDonald Drive
6. 40 Tamiro Road, and
7. 18 Brigham Creek Road

7.7.4 Construction vibration

The assessment confirms that all construction vibration generated will comply with the permitted standards. There is no risk to cosmetic damage of any building along the project works. Whilst vibration levels of the vibro sheet piling and roller may exceed the AUP amenity level, this would only occur for a short period (ie. less than 3 consecutive days) and notice will be given to any occupied buildings within 50 m of the activity through the implementation of the Construction Noise and Vibration Management Plan (CNVMP).

7.7.5 Measures to avoid, remedy or mitigate potential adverse construction noise and vibration effects

In order to manage construction noise and vibration, the draft Construction Noise and Vibration Management Plan (CNVMP) is provided as part of the Noise and Vibration Assessment (refer to Appendix X) and will be finalised and implemented throughout the Project for all sites (including within the road reserve) (refer to Proposed Condition NV1-NV4 in Appendix I).

The finalised CNVMP will set out:

- The performance standards that must, where practicable, be complied with.
- Predicted noise and vibration levels for relevant equipment and/or activities.
- General construction practices, management and mitigation that will be used for the Project;
- Noise management and mitigation measures specific to activities and receiving environments
- Noise and vibration monitoring and reporting requirements
- Communication, consultation, and complaints response protocols.

- Procedures for review of the CNVMP throughout the works.

7.7.6 Conclusion

Given the nature of the project and the proximity of residential receivers, there will be some temporary construction noise effects at times during construction. Predictions show that these effects are likely to be reasonable with the implementation of appropriate procedures, installation of noise barriers, equipment selection and mitigation. It is considered that the implementation of a CNVMP represents the Best Practicable Option (BPO) for managing any potential noise effects during construction.

There are 7 dwellings identified where the construction noise standards will likely be exceeded by 5 decibels without mitigation. Noise barriers will be implemented where practicable, effects will be temporary and managed through the implementation of the CNVMP, in particular communication and consultation with affected residents.

Overall, it is considered that with these measures in place, potential construction noise and vibration effects will be appropriately managed.

7.8 Land Disturbance effects

Earthworks, where uncontrolled, have the potential to result in the mobilisation of sediment that can be discharged into wetland and stream environments, particularly where earthworks take place on steep slopes and within proximity to receiving waters. This could result in potentially harmful effects on habitat quality, water health, and substrate composition if not managed properly during construction.

7.8.1 Measures to avoid, remedy or mitigate potential adverse land disturbance effects

A draft Erosion and Sediment Control Plan (ESCP) has been prepared for this project and is included in Appendix H. This will be updated by the contractor prior to commencement of construction. The proposed measures are based on best practice erosion and sediment control in Auckland as set out in Auckland Council GD05: 'Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region' and include the following:

- Whilst the contractor will endeavour to complete earthworks during the Auckland Council's earthwork season (1st October – 30th April), it is likely this project will also be undertaken over the winter months. Where works are required between 1st May – 30th September, the contractor will apply to Auckland Council for winter works approval.
- Stabilised entranceways will be installed at points where the site is accessed from public roads, with entrances built and maintained in accordance with GD05.
- Earthworks will be staged and works areas progressively stabilised and reinstated in order to minimise the amount of sediment that may be generated, and reduce the chance of erosion. This will include conducting trenching in 100 m lengths.
- The Contractor Areas and laydown area will be stabilised with hardfill to minimise erosion and potential dirty water runoff.
- Dust control will be managed through the use of water spray as required.
- Topsoil will be stockpiled for reuse on site where appropriate. Spoil will be stockpiled temporarily at laydown areas, then removed progressively offsite to an approved fill facility. Any longer duration stockpiled soils will be covered and/ or stabilised to prevent erosion and the generation of dust.
- A range of sediment controls will be used including clean water diversions, dirty water bunds, sediment retention ponds, decanting earth bunds, and silt and super silt fences to provide treatment capacity of sediment laden discharge from the site (refer to Appendix H for details).

- Dirty water will be treated using a dewatering treatment device, which will be set up to allow passive discharge of treated water to a nearby watercourse, or to an established sediment retention device onsite.
- Bunting will be installed around the works area within Wetland C to prevent construction works occurring outside of the designated area.
- Monitoring and maintenance of all erosion and sediment controls during construction, as outlined in Section 9 of the ESCP.

Details of proposed measures which will apply to each specific project area are detailed in Section 8 of the ESCP and illustrated in the drawings in Appendix A of the ESCP. Proposed conditions are provided in Appendix I of the ESCP.

7.8.2 Conclusion

Overall, with the above measures in place, the works are able to be managed appropriately through the implementation of the ESCP.

7.9 Traffic effects

There is potential to disruption to the local transport network within the project area during construction and operation. This section considers the potential effects and identifies potential measures to mitigate these effects. The proposed measures have been developed following discussions with Auckland Transport. The full Traffic Impact Assessment is provided in Appendix O.

7.9.1 Potential construction effects

The Traffic Impact Assessment identifies that the highest truck generation will occur in June and July 2023, with works over the period anticipated to generate approximately 72 truck movements per day (1 way), or 12 trucks per hour. In addition, approximately 70 staff vehicles will access the site each day, including 45 vehicles travelling along Brigham Creek Road during the morning peak.

Overall, any potential impact from construction traffic on the surrounding network is considered to be negligible given the relatively low number of vehicles, and the high capacity of Brigham Creek Road, which is an arterial road. However, heavy vehicle movements entering and exiting the Contractor Area North and Contractor Area Hub have the potential to create disruption and safety issues on Brigham Creek Road, particularly during peak periods.

Visibility standards are met for the majority of construction site access points and route intersections, except at three sites:

1. The Trig Road / Spedding Road intersection
2. Site Access Point 1 (SAP 1) which is the main access to the Contractor Area Hub, and
3. The Spedding Road / Mamari Road intersection.

The sight distance shortfalls at the Trig Road / Spedding Road intersection and SAP 1 are 10% and 4% of the required distances respectively and are therefore not considered significant[13].

Visibility at the Spedding Road /Mamari Road intersection (from Mamari Road, looking east onto Spedding Road) also does not meet requirements due to roadside vegetation.

There are limited cycling and walking facilities in the areas around each site access point, excepting the access point at Tamiro Road Pump Station, which has footpath facilities. However, there are significant

[13] Auckland Transport is proposing to reduce the Brigham Creek Road speed limit to 60 km/h. If approved and implemented in November / December 2022 as proposed, the SAP 1 will meet visibility standards.

volumes of pedestrian and cyclist movements along Brigham Creek Road toward Whenuapai School and Whenuapai Kindergarten, and also on the shared path between Tamatea Avenue and Kauri Road. Overall the impact on the residents adjacent to the Site Access Points, and businesses and users of the road network has been assessed as low.

7.9.2 Potential traffic effects from maintenance and operation

During the operational phase, any potential impact on the surrounding road capacities, operation, nearby residents, pedestrian and cyclists will be negligible due to the low trip generation of approximately one vehicle per week to the installed works, for maintenance and inspection. No mitigation is considered to be required.

7.9.3 Measures to avoid, remedy or mitigate potential adverse traffic effects

A Construction Traffic Management Plan (CTMP) will be prepared by the contractor prior to construction being undertaken. This will identify how disruption to road users and adjacent residential properties and local activities will be minimised during construction.

The following outlines matters for particular consideration based on the assessed effects in 7.9.1 above:

General

- Local residents, businesses, schools, childcare centres and other stakeholders, will be kept informed of the construction times and progress via methods outlined in a communications and consultation plan.
- All construction vehicles and staff will be made aware of the surrounding environment and will be instructed to drive according to the conditions.

Contractor Areas

- Heavy vehicles will access Contractor Area North and Contractor Area Hub on a left in / left out basis
- Heavy vehicle movements on the Brigham Creek Road westbound lane will be avoided between 16:30 and 17:30 on weekdays
- Staff vehicles arriving to the Contractor Area Hub through SAP 1 during the morning peak will be monitored, and if any issues arise, then access for small vehicles will also be restricted to left in / left out.
  - If any near misses or potential safety issues are observed, then temporary speed limits will be introduced so that visibility requirements are met.
- Access to the Contractor Area South will include a 7 m wide entrance on Mamari Road, and a 6 m wide exit on Spedding Road
- Trucks will exit the Contractor Area South from SAP 5b on Spedding Road, and vegetation along Spedding Road will be trimmed to provide better visibility for general traffic.
- The Site Access Point to the Contractor Area North and Contractor Area will both be widened to 15 m to accommodate required vehicle tracking.
- Access to the Tamiro Road pump station will be via the existing vehicle crossing, which may also be widened to facilitate access.

Further works, including deceleration lanes to access Contractor Area North and Contractor Area Hub, and widening of the Spedding Road / Mamari Road intersection are being investigated. If these temporary measures are required, approval will be sought from Auckland Transport as required through the Corridor Access Request process.

Open trenching work in Brigham Creek Road

If installing the pipeline underneath Brigham Creek Road via trenchless methods fails and open trenching is required, then:

- Work will be completed so that one lane will be kept open for traffic, and approval will be sought from Auckland Transport through the Corridor Access Request (CAR) process to undertake the works.
- Works will only occur during the Christmas holiday period

7.9.4 Conclusion

Overall, with the above measures in place, the works can be managed appropriately through the implementation of the CTMP.

7.10 Potential effects on land which may be subject to land instability

The stream banks of Sinton Stream meet the definition of land which may be subject to land instability (as defined in Chapter J of the AUP:OP), as the localised slope of the stream bank exceeds 1V:3H.

The emergency overflow point is located on the upper stream bank and includes a concrete wingwall structure and rip rap to dissipate any discharges. The riprap apron has been designed as per the requirements for outlets under Auckland Council TR2013/018: '*Hydraulic energy management: inlet and outlet design for treatment devices*'. No exacerbation of any land instability is anticipated as a result of these works.. No scouring is anticipated to occur in an overflow event.

Works will also include open trenching in the vicinity of the Sinton Stream banks, and installation of a temporary stream diversion, and permanent culvert, within Sinton Stream. To manage the potential risk of trench collapse, trenches will be shored with sheet piles as required. The stream diversion will also be stabilised using sheet piles. Additional 'hold-back' piles will be used in higher sections as required. Gabion baskets will be placed around the edges of the wingwall to retain the fill embankment, and stream banks will be revegetated once works are complete, to stabilise the banks and reduce the risk of stream bank erosion. There will be no permanent and/or increased risk of land instability resulting from either the culvert installation or the proposed construction techniques, and no new hazards will be created as a result of the works.

7.11 Summary

Overall, the installation of the new gravity main, pump station and rising main will enable a significant positive benefit for the surrounding community through the provision of a wastewater system with sufficient capacity to support development in the Whenuapai catchment until 2041.

Mitigation and management measures are proposed to address potential adverse effects, these include various management plans, monitoring activities and re-planting of the project area following completion of work.

Adverse effects associated with the project are minor, including ecological effects, and temporary arboricultural, construction noise, transport, and groundwater effects. It is expected that these effects can be appropriately managed and mitigated.

8 Consultation and engagement

8.1 Mana Whenua

Watercare has an established process for engaging with mana whenua on projects and works within the Auckland region. This process includes early notification of works to be undertaken by Watercare which, do or are likely to, require resource consent.

Watercare provide a “Kaitiaki Managers Projects List” on a monthly basis to nominated representatives of all 19 Mana Whenua in the Auckland Council area being: Ngāi Tai Ki Tāmaki, Ngāti Maru, Ngāti Pāoa, Ngāti Rehua Ngātiwai ki Aotea, Ngāti Tamaoho, Ngāti Tamaterā Ngāti Te Ata, Ngāti Wai, Ngāti Whanaunga, Ngāti Whātua Ōrākei, Te Ahiwaru, Te Ākitai, Te Patukirikiri, Te Uri o Hau, Waikato Tainui, Te Kawerau ā Maki, Ngāti Whātua o Kaipara, Ngāti Manuhiri, Te Rūnanga o Ngāti Whātua.

A brief summary of each project is included in the list. Mana Whenua are invited to indicate which projects they have an interest in. Further information on the identified project or projects is then provided to those parties, followed by further engagement depending on the responses received.

The project was introduced on Watercare's Kaitiaki Managers Projects List in November 2019. Four Mana Whenua entities have registered their interests and sought further information on the project, being:

- Ngāti Whātua o Kaipara
- Te Kawerau ā Maki
- Ngāti Whanaunga
- Ngāti Te Ata.

Information on the proposed works was emailed to the above mana whenua following their expression of interest.

In addition to the Kaitiaki Managers Project List, the engagement process for the Project to date has included:

- A project presentation and site visit with kaitiaki from Ngāti Whātua o Kaipara and Te Kawerau ā Maki, the Project Manager and Resource Consent Planner in January 2020.
- Project updates as details changed from February 2020 onwards.
- Provision of the Ecological Impact Assessment to Ngā Maunga Whakahii o Kaipara.

The kaitiaki who attended the site visit have provided their support of the project. Whilst concerns were initially raised about the originally proposed pump station location at 14-16 Brigham Creek Road, due to the pump station emergency overflow point discharging to the CMA, and the requirement for the pipe bridge to cross Totara Creek twice, the pump station location has subsequently been moved to the proposed location at 23A Brigham Creek Road. Ngāti Whātua o Kaipara produced a Cultural Values Assessment for the Oyster Capital Plan Change, which is provided in Appendix K.

Watercare will continue to engage with mana whenua that have indicated an interest in the Project.

8.2 Auckland Transport

Watercare held a meeting with Auckland Transport on 26 January 2022 to discuss the project, and provided a copy of the draft Traffic Impact Assessment, including recommendations for the TMP on 6 May 2022. A copy of the meeting minutes, and correspondence with Auckland Transport, is provided in Appendix K. As the proposed works require works in the road reserve, formal approval will be sought from Auckland Transport through a Corridor Access Request prior to construction.

8.3 Healthy Waters

The proposed pump station at 23A Brigham Creek Road includes an emergency discharge overflow point (EOP) to Sinton Stream. Healthy Water was approached on the project and provided Asset Owner Approval for discharges into watercourses and other stormwater assets. In addition to the EOP approval, there were discussions in relation to the proposed works at the stormwater pond at Tamiro Road. Tony Cain and Danny Curtis from Healthy Waters were involved on the discussions and agreed with the proposal in principle. Further engagement was requested once the design and construction details are confirmed.

8.4 Auckland Council arborists

Arborlab Ltd (the project arborist) has provided the arboricultural assessment to Auckland Council's Urban Forestry Specialist outlining the proposed works to the trees and vegetation located within open space zones to seek Tree Owner Approval (ToA) for the proposed works. This approval will be provided to Auckland Council once it has been obtained.

8.5 Oyster Capital

A private plan change was lodged by Oyster Capital in 2020 to rezone approximately 52 ha of future urban zoned land south of Brigham Creek Road for light industrial use.

Watercare has worked closely with Oyster Capital throughout the plan change process to ensure the new infrastructure is well integrated with the plan change. In particular, the designated boundary for the rising main alignment is proposed to align with the future road corridor of Spedding Road. Watercare has shared the Design Package for the Project works with Oyster Capital under this same contractual arrangement, to ensure that the proposed works do not negatively affect the land use and/or development plans that they may have, avoid duplication of construction work being undertaken, and streamline the process.

Watercare have also entered into a contractual agreement with Oyster Capital that provides Watercare rights of entry and land use to undertake the construction works on the land that is owned by Oyster Capital.

8.6 Private landowners

The proposed infrastructure traverses a number of privately owned properties. Watercare have been engaged with the landowners affected by the works as outlined in Table 11.

Table 11. Watercare engagement with property owners affected by the works.

Address	Owner	Activity	Feedback received
18 Brigham Creek Road	Brigham Creek Estate Limited	Gravity main adjacent to property	Informed of project with reasonable support
20-22 Brigham Creek Road	Nujud Aspell	Gravity main through property and construction yard	Do not support the project. Concerns were raised on disruption caused by the works and question on the route selection process.
26 Brigham Creek Road	24 Brigham Creek Limited	Gravity main through property	Support the project to service the site.
28 Brigham Creek Road	Natural Harmony Company Ltd	Gravity main through property	Informed of project and are working with Watercare in providing access and reasonable support.
31 Brigham Creek Road	Engkun Trustee Limited	Rising main through property	Engagement through Oyster Capital and in the process of providing written approval.

8.7 Transpower

Watercare has engaged Transpower to understand their future plans for the area. Transpower confirmed that they were investigating the possible decommissioning and removal of the Albany-Henderson transmission line.

Watercare will continue to engage with Transpower on the feasibility and possible timeline in decommissioning and removal of the Albany-Henderson transmission line.

9 Notification Assessment

A territorial authority must decide whether to notify a resource consent or NoR under ss95A to 95F. The following section provides an assessment against these provisions.

9.1 Public notification - Section 95A

The application does not meet the criteria in Section 95A(3) that would otherwise require mandatory public notification, specifically:

- The applicant does not request this application be publicly notified (95A(3)(a)).
- The provisions of Section 95C are not relevant at this stage (95A(3)(b)).
- This application does not relate to exchange of recreation reserve land(95A(3)(c)).

In relation to Section 95A(4) the application is not precluded from public notification in accordance with the matters identified in Section 95A(5).

In relation to Section 95A(7) there are no relevant rules that require the application to be publicly notified. The AEE concludes that:

- The construction works will be temporary in nature.
- Effects on Sinton Stream and Wetland C will be temporary and able to be mitigated and managed through reinstatement and replanting following completion of the works.
- Erosion and sediment control measures will be installed in general accordance with GD05 to minimise potential for erosion or sediment entering the streams and wetlands present within the project area.
- Groundwater and settlement effects from dewatering can be adequately managed through engagement with network utilities owners, and a GSMCP.
- The effects of the works on the traffic network will be mitigated through restrictions on heavy vehicle movements, and the implementation of a CTMP.
- Any potential noise exceedances during construction will be temporary, limited to a small number of properties and can be appropriately managed through the implementation of a CNVMP.

Potential adverse effects will be avoided, remedied or mitigated through the methods outlined in Section 5 of this AEE report.

In relation to Section 95A(9) there are not considered to be any special circumstances existing that warrant the application being publicly notified.

9.2 Limited notification - Section 95B:

The application does not meet the following criteria:

- There are no protected customary rights or customary marine title groups affected by the work (Section 95B(2)).
- The proposed activity is not on or adjacent to, or may affect, land that is the subject of a statutory acknowledgment (section 95B(3)).
- Limited notification is not precluded pursuant to the criteria set out in section 95B(6).
- The application does not involve a boundary activity or prescribed activity in respect of section 95B(7).

For the purpose of giving limited notification of an application for a resource consent, a person can be considered an affected person if the consent authority decides that the activity's adverse effects on the person are minor or more than minor.

Whilst this is the case, and as described in Section 7, in general any potential effects of the project can be mitigated and managed appropriately, albeit that there may be some temporary, short term construction effects which may have minor effects on a handful of properties.

In consideration of potential effects that are minor or more than minor, as set out in Section 7 the noise and vibration assessment has identified 7 properties where construction noise standards will be likely be exceeded by 5 decibels for less than 20 days (see Table 12 below). The potential effect on these properties has been assessed as minor, however any effect will be temporary, short term and managed through the implementation of the CNVMP which is considered to be the best practicable option.

Should the Council decide to notify the NOR, given that noise is a district planning matter, then it is suggested that this be limited to those properties only.

Table 12. Properties with minor exceedances in construction noise

Address	Works	Potential Effect	Engagement summary
28 Joseph McDonald Drive	Works in proximity to property	Construction noise exceeding permitted activity standards if sheet piling required, and noise walls not practicable.	Engagement through CNVMP recommended No engagement prior to lodgement.
30 Joseph McDonald Drive	Works in proximity to property		
40 Tamiro Road	Works in proximity to property		
42 Tamiro Road	Works in proximity to property		
44 Tamiro Road	Works in proximity to property		
107 Whenuapai Drive	Works in proximity to property		
18 Brigham Creek Road	Trenching adjacent to property. NB: Contractor yard adjacent to property permitted activity with noise walls.	Construction noise exceeding permitted activity standards if sheet piling required, and noise walls not practicable.	Engagement has been undertaken with these properties. Correspondence has been received to support access and the application No formal APA received

The designation extent extends through several properties and landowner approval will be sought under the Local Government Act for works in these properties prior to construction commencing.

As set out in Section 7, in relation to regional matters, there are not considered to be effects that are minor or more than minor that would warrant limited notification in relation to the regional resource consents sought.

10 Statutory assessment

This section provides an analysis of the proposed activity against the relevant legislative framework and concludes by providing an assessment against Part 2 of the RMA.

10.1 S168A(3) Notice of Requirement

Section 168A(3) of the RMA sets out the matters need to be covered by the NoR and supporting AEE:

> *When considering a requirement and any submissions received, a territorial authority must, subject to Part 2, consider the effects on the environment of allowing the requirement, having particular regard to—*
>
> *a) any relevant provisions of—*
>
> *i) a national policy statement:*
>
> *ii) a New Zealand coastal policy statement:*
>
> *iii) a regional policy statement or proposed regional policy statement:*
>
> *iv) a plan or proposed plan; and*
>
> *b) whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work if—*
>
> *i) the requiring authority does not have an interest in the land sufficient for undertaking the work; or*
>
> *ii) it is likely that the work will have a significant adverse effect on the environment; and*
>
> *c) whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought; and*
>
> d) *any other matter the territorial authority considers reasonably necessary in order to make a decision on the requirement.*

10.1.1 Section 168A(3)(a) – relevant planning documents

An assessment of the proposed works against the relevant rules, objectives and policies of the applicable plans and regional policy statement has been provided Section 10.3 below. The assessment concludes that the proposal is consistent with the objectives and policies of the NPS:FM, the regional policy statement, and applicable sections of the AUP, as well as the purpose of the RMA.

10.1.2 Section 168A(3)(b) – alternatives assessment

A consideration of alternative sites, routes, or methods for undertaking the proposed works has been undertaken and is summarised in the Assessment of Alternatives provided in Appendix J and in Section 5 of the AEE. This demonstrates that a robust process has been undertaken in relation to identifying the nature and location of the proposed works.

In addition, Watercare has purchased several properties along the route, including the permanent pump station site and the break pressure chamber site. Watercare therefore has interest in the land for these parts of the project, sufficient to undertake the work without the need to undertake an alternatives assessment for these sites.

10.1.3 Section 168A(3)(c) – reasonably necessary to achieve project objectives

The proposed works and designation must be reasonably necessary for achieving the objectives for which the designation is sought. The Project Objectives of the Requiring Authority for which the designation is sought are:

1. *To provide additional capacity in the wastewater network for growth and development of the Whenuapai-Redhills catchment in a manner that:*
    a. *Protects public health;*
    b. *Optimises investment decisions, including being efficient, effective and financially responsible;*
    c. *Minimises private property development disruption*
    d. *Coordinates with existing and known planned development; and*
    e. *Integrates with the existing Watercare wastewater network.*
2. *To provide statutory protection for phase one of the Whenuapai and Redhills project to enable its construction, operation, and maintenance.*

Objective 1: Provision of additional capacity in the wastewater network for growth and development of the Whenuapai-Redhills catchment

As described in Section 4, significant development is occurring and planned to occur in the Whenuapai catchment, with the population of the catchment projected to increase from approximately 2,400 to 10,200, and concomitant wet weather wastewater flows projected to increase from 74 L/s to 320 L/s, by 2041.

The gravity main has been designed to deliver wastewater flows from Whenuapai Village to the proposed pump station at 23A Brigham Creek Road, alleviating capacity restrictions associated with the existing Riverhead rising main, and unlocking land for development. The pump station and rising main have been designed to provide sufficient capacity to receive and pump 320 L/s of wastewater flows into the Massey Connector and on to the Rosedale Wastewater Treatment Plant, which will provide sufficient capacity to service development within the Whenuapai Catchment to 2041.

Protect public health

Growth and development of the Whenuapai catchment requires a reticulated wastewater network with appropriate capacity, or otherwise there could be uncontrolled discharge of untreated wastewater into surface and coastal waterways which has the potential to result in adverse effects for public health.

The works have been sized for the population they are intended to service, and have backup generators to maintain system operation in the event of power failure. The scheme is therefore anticipated to result in zero or minimal overflows per year, in line with the regional network discharge consent requirements.

Overall, the works as proposed are considered reasonably necessary to achieve objective 1(a).

Optimise investment decisions, including being efficient, effective and financially responsible

As discussed in the Assessment of Alternatives report provided in Appendix J, the proposed alignment and pump station location have been designed and located to enable open trenching construction, minimise the depth of the pump station, and reduce the overall length of pipeline (in particular the rising main) to minimise capital and operational costs. The proposed alignment of the rising main avoids undulation, minimising the requirement for operational valves and chambers. By locating the stream crossing in a location which coordinates with planned Oyster Capital works, the proposed alignment avoids the expense of constructing

an additional pipe bridge to provide access for the pipe across the stream. The works as proposed are therefore considered reasonably necessary to achieve objective 1(b).

Minimise private property development disruption

As discussed in the Assessment of Alternatives report provided in Appendix J, the proposed alignment has been located to avoid crossing through the middle of potentially developable land, thus minimising private property development disruption. The works as proposed are therefore considered reasonably necessary to achieve objective 1(c).

Coordinate with existing and known planned development

As outlined in Section 2.7 of this AEE, Oyster Capital has lodged a private plan change to rezone ~52 ha of future urban zoned land south of Brigham Creek Road for light industrial use. Watercare has designed the alignment of the gravity main, pump station and rising main to coordinate with the development proposed in the plan change. This includes locating the pipeline along the proposed route of the Spedding Road extension to provide for efficient maintenance of the infrastructure in future and selecting an alignment which avoids crossing through developable land. The pipeline provides access for the wastewater pipe across Sinton Stream via the culvert proposed to underlay the Spedding Road extension (or if this project precedes Oyster Capital development, constructing the culvert to a size which accommodates the planned Spedding Road extension). The works as proposed are therefore considered reasonably necessary to achieve objective 1(d).

Integrate with the existing Watercare wastewater network

The location of the pump station has been strategically placed to efficiently connect to other catchments if required in future. The rising main will connect with a future package of works (Package 2), the Northern Interceptor and the Rosedale Wastewater Treatment Plant. The works as proposed are therefore considered reasonably necessary to achieve objective 1(e).

Taking all this into account, overall it is considered that the works associated with the project are reasonably necessary to provide additional capacity in the wastewater network to accommodate growth and development in the Whenuapai catchment, and to achieve Objective 1.

Objective 2: To provide statutory protection for phase one of the Whenuapai and Redhills project to enable its construction, operation, and maintenance.

The designation provides a statutory mechanism to protect the proposed locations of project components. The use of the designation mechanism will provide certainty to the community of the proposed location of the works, and provide route protection for the works to avoid any as yet unsignalled development along the route which may disrupt Watercare's ability to proceed with the works. In addition, the designation provides for operation and maintenance changes to the works in the future. As such, it is considered that the designation is reasonably necessary to achieve Objective 2.

10.1.4 Section 168A(3)(d) – other matters

In addition, the National Environmental Standard Freshwater (NESF) is considered to relevant under Section 168A(3)(d). The NESF sets out the rules and requirements of the NPS-FM (discussed below). The relevant provisions of this document have been considered and have been used to informed design responses and supporting information requirements to accompany this report.

10.2 Section 104 – Consideration of applications

Section 104 of the RMA sets out the matters which a consent authority must have regard to, subject to Part 2 of the RMA, when considering an application for resource consent. With respect to this project, the relevant parts of section 104 include:

- Any actual and potential effects on the environment of allowing the activity;
- Any relevant provisions of a national policy statement, a coastal policy statement, regional policy statements and plans; and
- Any other matter the consent authority considers relevant and reasonably necessary to determine the application.

The actual and potential effects on the environment of allowing the activity are set out in Section 5 of this report. In summary, the potential effects relate primarily to earthworks, tree works and placement of infrastructure in natural hazard areas.

The following sections assess the project under Section 104.

10.3 Section 104(1)(b) – Relevant Planning Documents

10.3.1 National Policy Statement for Freshwater Management 2020 (NPS:FM)

The overarching concept of the NPS:FM is Te Mana o te Wai, which refers to the fundamental importance of water, and recognises that protecting the health of freshwater protects the health and well-being of the environment. Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community. In line with Te Mana o te Wai, the NPS:FM has the objective of ensuring that natural and physical resources are managed in a way that prioritises the health of water bodies first, the health needs of people second and the ability of people and communities to provide for their well-being third. Policies considered most relevant to the project include:

- Policy 1: Freshwater is managed in a way that gives effect to Te Mana o te Wai;
- Policy 6: There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted;
- Policy 7: The loss of river extent and values is avoided to the extent practicable.
- Policy 9: The habitats of indigenous freshwater species are protected.
- Policy 15: Communities are enabled to provide for their social, economic, and cultural wellbeing in a way that is consistent with this National Policy Statement.

The proposed works are required to increase capacity of the wastewater reticulation network inorder to respond to growth and development that is signalled within the Whenuapai catchment. This is essential for managing wastewater flows, and particularly in reducing potential emergency overflows. The new wastewater reticulation is expected to reduce any potential emergency overflows to less than 2 per year, aligned with Watercare's network discharge consent and consistent with the policies of the NPS.

The proposed works have been designed to minimise permanent effects on the natural wetlands within the project works area. Specifically, the pump station has been purposefully sited to avoid the loss of the natural wetland within 23-27 Brigham Creek Road. Whilst open trenching through the wetland to install the gravity main will temporarily affect wetland values, the wetland will be reinstated and restored once works are complete with a net beneficial effect for wetland values in the medium to long term.

The works require temporary access across Sinton Stream for construction access, and permanent access across Sinton Stream for the rising main. Access across Sinton Road will also be required in future for the proposed Spedding Road extension, if the private plan change lodged by Oyster Capital is approved. The

rising main is proposed to be located underneath the future Spedding Road extension, including crossing Sinton Stream via the culvert proposed by Oyster Capital to enable efficient future maintenance and integrate with future land use.

As such, it is considered that the works have been designed to provide for the wellbeing of the community, in a way that is consistent with the policies set out in the NPS:FM.

10.3.2 Auckland Unitary Plan: Operative in Part

The relevant objectives and policies of the AUP: OP are assessed below.

Chapter B – Auckland Regional Policy Statement

Chapter B3 Ngā pūnaha hanganga, kawekawe me ngā pūngao - Infrastructure, transport and energy

Chapter B3 highlights that the quality of the environment and the well-being of people and communities are affected by choices about the management of, and investment in infrastructure. Objective B3.2.1(2) requires the benefits of infrastructure are recognised, including providing essential services for the functioning of communities, businesses, and industries, enabling economic growth, providing for public health, safety and well-being of people and communities, and protecting the quality of the natural environment. Objective B3.2.1(3), and Policies B3.2.2(1), (6) require development of infrastructure to be enabled, including in areas with natural resources, whilst avoiding where practicable, or otherwise remedying, mitigating, and managing adverse effects on the quality of the environment. Policy B3.2.2(3) provides for the locational requirements of infrastructure, in particular the functional need to be located in areas with natural and physical resources that have been scheduled in the AUP:OP.

Comment:

The project involves increasing the capacity of the wastewater network in the Whenuapai catchment, providing essential services for the functioning of communities, businesses and industries. The network will enable land zoned for future urban use to be rezoned for business purposes, enabling economic growth. Adverse effects from the project will be avoided, mitigated and managed through the measures outlined in Section 5 of this report and the conditions proposed.

Chapter B7 Toitū te whenua, toitū te taiao – Natural resources

Chapter B7 identifies that pressures on natural resources need to be managed for environmental, social, economic and cultural wellbeing. Objective B7.3.1(2) and Policy B7.3.2(4) seeks that the loss of freshwater systems are minimised, and avoided except where it is necessary to provide for the health and safety of communities, growth and development, or infrastructure, no practicable alternative exists, and mitigation measures including off-site works are implemented to address the adverse effects arising from the loss in freshwater system functions and values. Policy B7.4.2(5) seeks that establishment of structures within streams and wetlands is limited to those that have a functional need or operational requirement to be located there. Policy B7.4.2(8) requires use and development to minimise and manage the discharge of sediment into freshwater by requiring land disturbing activities to use industry best practice and standards appropriate to the nature and scale of the land disturbing activity, and the sensitivity of the receiving environment.

Comment:

The project design has sought to avoid the loss of wetland extent to the extent practicable by purposefully siting the pump station in the southwestern corner of 23-27 Brigham Creek Road (now 23A Brigham Creek Road). Installation of the gravity main through the wetland at 23-27 Brigham Creek Road is not expected to result in permanent adverse effects, with recontouring and replanting of the wetland once works are completed anticipated to restore and enhance the wetland.

Works will result in the loss of approximately 43 m of natural channel length, and modification of a further 28 m of the stream. The works are considered to provide the wastewater infrastructure necessary for urban growth, protecting the health and safety of the community by providing sanitation services and reducing the risk of wastewater overflows into the environment. The works are necessary to provide for the growth and development of the Whenuapai catchment, and in the context of the future development planned for the area, it is considered that there is no practicable alternative. Works will be mitigated through restoration of a 426 m length of the stream.

Chapter E2 Water quantity, allocation and use

The objectives and policies of Chapter E7 Taking, using, damming and diversion of water and drilling are contained within Chapter E2 Water quantity, allocation and use. Policy E2.3(7) requires the take of groundwater from any aquifer demonstrates that ground settlement that may cause distress resulting from the take is avoided, remedied or mitigated.

Comment:

As outlined in Section 7.6, due to the temporary nature of the take and the distance of dewatering from buildings, groundwater dewatering and diversion is not expected to cause any material effects on the stream, wetland, or buildings in the vicinity of works. Watercare will work with the asset owners of underground services which are in proximity to the works, to establish suitable controls, and manage the risks to each service. In addition, a GSMCP will be developed to monitor groundwater drawdown, surface settlement, and building settlement, with Alert and Alarm levels, and suitable contingency actions. The project is therefore considered to be consistent with the objectives and policies of Chapter E2.

Chapter E3 Lakes, river, streams and wetlands

The objectives and policies of Chapter E3 acknowledge the importance of the beds of streams and wetlands for the protection of ecology and biodiversity.

Objectives and policies considered most relevant to the project include:

- Objective 2: Streams and wetlands are restored, maintained or enhanced
- Objective 3: Significant residual effects on streams and wetlands which cannot be avoided, remedied or mitigated are offset
- Objective 4: Structures in the stream which have a functional or operational need to be in that location are provided for
- Objective 5: Activities in streams and wetlands are managed to minimise adverse effects.
- Policy 2: Adverse effects on streams and wetlands are avoided where practicable, or remedied or mitigated, and where appropriate, streams and wetlands are restored or enhanced
- Policy 4: Offsets should be located as close as possible to the subject site
- Policy 7: The placement of structures in streams and any associated diversion of water is provided for where there is no practicable alternative, the structure is designed to the minimum size necessary, and the structure is necessary to provide access across a stream and / or associated with infrastructure.
- Policy 9: Excavation in a wetland is provided for where there is no practicable alternative, where the activity is required for the development of infrastructure, and where the disturbance avoids significant adverse effects and avoids, remedies or mitigates other adverse effects on Mana Whenua values.
- Policy 10: Planting of native vegetation in riparian areas and wetlands.

As described above, the pump station has been purposefully located in the south west portion of the site to avoid permanent adverse effects on the wetland. Due to the engineering requirements of gravity mains, and management of the risk of works alongside existing cables within Brigham Creek Road, there is not considered to be a practicable alternative to installing the gravity main through the wetland. However, any adverse effects from construction within the wetland are considered to be temporary, as the wetland will be

reinstated and planted with native wetland species once the works are completed. This is expected to improve the ecological value of the wetland, and to restore the functioning of this natural ecosystem.

The proposed culvert is located within land which is considered suitable for urbanisation, with a private plan change lodged to rezone the land for light industrial use. The proposed plan change proposes an extension of Spedding road to meet Brigham Creek Road between 23-27 and 31 Brigham Creek Road, including crossing Sinton Stream via a culvert installed in Sinton Stream. As outlined in Section 7.2.1, in the context of the future plans for the area, particularly the planned alignment of the Spedding Road extension, there is no practicable alternative to Watercare constructing the proposed culvert. The culvert is required to provide access across the stream for construction, the rising main, and avoid rework in future should the Oyster Capital works proceed. The culvert has been designed to the minimum size necessary for the proposed Spedding Road extension in consideration of the proposed road corridor and the oblique angle at which the proposed road corridor will approach and cross the stream.

Nevertheless, a length of 426 m of stream will be restored to mitigate the loss. The culvert has been designed in accordance with the regulations of the NPS:FM to provide for fish passage and protect the habitat values of the stream.

Chapter E11 & E12 – Regional and district earthworks

The objectives and policies for Chapter E26.5 Network utilities and electricity generation – Earthworks all zones and roads - regional are contained within Chapter E11 Land disturbance – Regional.

Chapter 11 recognises that land disturbance is an essential prerequisite for the construction of infrastructure, and that the adverse effects of land disturbance can be reduced through the application of best practice land management techniques. Objectives E11.2(1), E11.2(2), and E12.3(1) seek that land disturbance is undertaken in a manner that avoids, remedies or mitigates adverse effects on the environment, and protects the safety of people. Policies E11.3(4) and E12.3(3) provide for land disturbance necessary for activities undertaken to provide for the needs of people and communities. Policies E11.3(2) and E12.3(2) seek to manage disturbance to reduce adverse effects, including controlling the amount of land being disturbed at any one time. Policies E11.3(6) and E12.3(6) requires that earthworks are designed and undertaken in a manner that ensures the stability and safety of surrounding land. Policy E11.3(7) requires land disturbance that will likely result in the discharge of sediment laden water to a surface body to demonstrate sediment discharge has been minimised, and adverse effects avoided, to the extent practicable.

Comment:

Any land disturbance will be undertaken in accordance with the Erosion and Sediment Control Plan (Appendix H), which sets out best practice erosion and sediment control measures to be followed during construction. Works will be progressively closed and stabilised to minimise the amount of earthworks open at any one time. Trenches will be supported with trench shields or shored with sheet piles where required. Sinton Stream will be temporary diverted around the works area, with the diversion sheet piled and lined with geotextile to provide stability and support to the stream banks.

Construction traffic management measures will be in place to manage the potential impacts of the works on the transport network and people, including measures to mitigate the potential for disruption and safety concerns.

Chapter E15 – Trees in riparian areas

The objectives and policies for Chapter E26.3 Network utilities and electricity generation – Vegetation management in riparian areas are contained within Chapter E15 Vegetation management and biodiversity. Chapter E15 recognises vegetation, including vegetation in riparian areas, provide a range of ecosystem services. Objective E15.2(1), Policy E15.3(1), and Policy E15.3(2) seek to protect vegetation in riparian

margins and wetlands to maintain ecosystem services and indigenous biological diversity values, whilst providing for appropriate development. Policy E15.3(7) seeks to manage adverse effects from developing infrastructure, recognising that it is not always practicable to locate or design infrastructure to avoid areas with indigenous biodiversity values.

Comment:

The project works require removal of 44 protected trees from the riparian area, including removal of 40 pine trees located either side of Sinton Stream in order to install the rising main and culvert. After completion of the works, replacement planting will be undertaken at a ratio of 1 to 1.5.

As the majority of trees required to be removed are in the same location as the proposed Spedding Road extension, the replanting location will be selected in coordination with Oyster Capital Works. This will avoid the need for replacement planting to be removed in future if the private plan change is accepted and enable ecological benefits of the replanting to be realised.

Chapter E16 – Trees in open space zones

Chapter E26 recognises trees in open space zones are an important public asset which need to be managed appropriately. Objective E16.2(1) and Policy E16.3(2) seeks that trees which contribute to cultural, amenity, landscape and ecological values are protected and managed. Policy E16.3(3) encourages the use of indigenous trees and vegetation for planting.

Comment:

The proposed design was refined to minimise vegetation removal in the open space zone through the use of trenchless construction methods under the Tamiro Road Stormwater Embankment. Nevertheless, if trenchless construction fails and open trenching is required, the vegetation which is removed will be replaced on a 1:1.5 basis with appropriate indigenous species.

Chapter E25 – Noise and Vibration

Chapter E25 seeks to manage the impacts of noise and vibration on sensitive receivers whilst allowing for construction activities to take place in a controlled and sensible manner. Objective E25.2(1) requires that people are protected from unreasonable levels of noise and vibration, whilst Objective E25.2(4) and Policies E25.3(2) and E25.3(10) seeks that construction activities that cannot meet noise standards are enabled, whilst avoiding, remedying or mitigating adverse effects where practicable.

Comment:

This proposal has sought to minimise any temporary adverse construction noise effects through mitigation measures and the implementation of a CNVMP. This is considered the best practicable option for the management of noise arising from construction activities. The construction activities will occur during general working hours, and mitigation measures such as noise barriers will be implemented wherever possible. Overall, the proposal is consistent with the objectives and policies of Chapter E25.

Chapter E26 – Infrastructure

Infrastructure is critical to the social, economic, and cultural well-being of people and communities and the quality of the environment. This section provides a framework for the upgrading of infrastructure. Objectives E26.2.1(3) - (5) and (9), and Policies E26.2.2(1) – (6) seek to enable development of infrastructure to provide for people and communities, public health and safety, the functioning of businesses, economic growth, and growth and development, whilst avoiding, remedying or mitigating adverse effects. When providing for development of infrastructure, Policy E26.2.2(2) directs decision makers to recognise the functional and operational needs, location, route and design needs and constraints, the complexity and interconnectedness

of infrastructure services, and the role infrastructure plays in servicing existing, consented and planned development.

Comment:

As outlined above, the project involves development of the wastewater network between the existing Tamiro Road pump station in Whenuapai Village, and the proposed break pressure chamber at 32 Mamari Road, within the Whenuapai catchment. The scheme will increase the capacity of the wastewater network to provide for planned development within the catchment. Provision of additional wastewater capacity in the network will unlock land for development, including land for residential, business, and industrial use.

The route and locations of the project components have been determined given the engineering requirements, including site topography and catchment configuration, and the need to reduce construction risks, including risks associated with construction alongside a highly trafficked road, and risk of service strikes to critical infrastructure buried within the road corridor. The project routes and components have also been purposefully located and designed to integrate with other infrastructure planned within the catchment, including the future road network and associated culvert proposed as part of the private plan change lodged by Oyster Capital.

Chapter E27 – Transport

Chapter E27 seeks to manage the impacts of activities on the transport network. Objective E27.2(4), and Policies E27.3(20) and (21) require that vehicle crossings and associated access is safe and efficient, and minimises potential conflicts between vehicles, pedestrians, and cyclists on the adjacent road network.

Comment:

Vehicles will access the Contractor Area North and Contractor Area Hub via existing vehicle crossings, which will be widened to allow for vehicle tracking. In order to provide for safe and efficient access and minimise the potential for conflicts, heavy vehicles will access the Contractor Area North and Contractor Area Hub on a left in / left out basis and be restricted during the PM peak. As set out in the application, prior to works the Contractor will obtain Corridor Access Request from Auckland Transport for all works in the road corridor.

10.4 Part 2 – Purpose and Principles

The Purpose of the RMA, set out in Section 5, is to promote the sustainable management of natural and physical resources, which includes enabling *"people and communities to provide for their social, economic, and cultural wellbeing."* This must be achieved in the context of Section 5(2), in particular the responsibility of (c) for *"avoiding, remedying, or mitigating any adverse effects of activities on the environment."*

The broader principles of the RMA are set out in Sections 6 – 8 of the RMA. Matters of particular relevance to this application include:

> *Section 6(a) – the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development,*
>
> *Section 7(f) – maintenance and enhancement of the quality of the environment.*
>
> *Section 8 – take into account the principles of the Treaty of Waitangi*

The project will achieve the sustainable management of natural and physical resources and is therefore consistent with Part 2 of the RMA for the following reasons:

- The project will enable the provision of appropriate wastewater services within the Whenuapai catchment, which will enable the community to continue to provide for their social, economic and cultural wellbeing.

- Adverse effects on the environment from the construction of the project have been carefully considered, will be avoided where possible (for example avoiding the loss of permanent wetland extent by locating the pump station in the south western corner of the site), with other adverse effects being remedied or mitigated so that adverse effects on the environment are appropriately managed.
- The provision of wastewater infrastructure which provides capacity to receive wastewater flows from planned development, and in this way reduce the risk of future network overflow of untreated wastewater into the environment
- Mana Whenua have been engaged on the project as outlined in Section 7 of this AEE report.

11 Conclusion

This AEE report has been prepared on behalf of Watercare to support the resource consent application and NoR for the installation of a new gravity main, pump station, culvert, rising main, and break pressure chamber between the existing Tamiro Road pump station, and 32 Mamari Road, Whenuapai.

An assessment of effects on the environment has been undertaken for the project and this has concluded that any adverse effects from the project will be avoided, mitigated or remedied.

During construction, there is potential for effects associated with noise and vibration, traffic disruption, land disturbance, groundwater dewatering, vegetation removal and effects on streams and wetlands in the area. The construction methodology and design has been refined in the first instance to avoid potential effects, including where necessary the use of trenchless methodologies, and where this has not been possible mitigation and management measures will be implemented through a range of construction management plans. This includes a CNVMP, TMP, Native Fish Management Plan, GSMCP, and ESCP.

The works have been specifically designed to coordinate with the future development proposed with Oyster Capital. In particular, the alignment of the rising main runs beneath the future Spedding Road extension. In doing this, the alignment of the pipeline will not restrict future development potential of the adjacent land and reduce potential construction/disruption effects (such as in the construction of the culvert). Proposed replanting and restoration following the completion of the works, and in coordination with the future development in the area, is expected to bring positive ecological and amenity effects to the area.

Once completed the project will provide significant benefits, by providing sufficient wastewater capacity to enable growth and development within the Whenuapai catchment to 2041.

The proposed work is reasonably necessary to achieve Watercare's objectives for the Project, and an appropriate assessment of alternatives has been carried out. A statutory assessment has been undertaken that demonstrates that the proposal is consistent with the relevant provisions of the RMA and the AUP:OP and NES:F. In addition, Watercare has engaged with interested Mana Whenua groups and other stakeholders and potentially affected parties on the project and will continue to engage with these groups through detailed design and construction.

Overall, the works will have significant benefits for the Whenuapai area through the provision of safe and efficient wastewater services to the area and enabling further urban development in the area whilst minimising adverse environmental effects, with any potential adverse effects largely temporary and able to be appropriately mitigated or managed.

A

Appendix A – Design Drawings – GHD Limited and WSP Limited

B

Appendix B –Designation Boundary

C

Appendix C – Records of Title

D

Appendix D – Ecological Impact Assessment (Beca Ltd)

E

Appendix E – Landscape and Visual Assessment (Boffa Miskell Ltd)

F

Appendix F – Groundwater and Settlement Effects Report (Tonkin & Taylor Ltd)

G

Appendix G – Detailed Site Investigation (GHD Ltd)

H

Appendix H – Erosion and Sediment Control Plan (Beca Ltd)

I

Appendix I –NoR Conditions

J

Appendix J – Assessment of Alternatives

K

Appendix K – Records of Engagement

L

Appendix L – Arboricultural Assessment (Arborlab)

M

Appendix M – Preliminary Groundwater and Settlement Monitoring Plan (Tonkin & Taylor Ltd)

N

Appendix N – Noise and Vibration Assessment (Marshall Day Acoustics Ltd)

O

Appendix O – Traffic Impact Assessment (Beca Ltd)

P

Appendix P – District Matters and Permitted Activities

District Matters and Permitted Activities

The matters which would otherwise trigger district consent under the AUP: OP pursuant to sections 9 (3), of the RMA, if a notice of requirement was not being sought, are summarised in Appendix P. These are included to assist Auckland Council in understanding the key matters that Watercare are seeking to be provided for by the designation.

Table P1. Activities which would otherwise trigger district consent under the AUP:OP.

Rule	Activity status	Comment
E25.4.1(A2) Construction noise greater than permitted levels	Restricted Discretionary Activity	The anticipated construction noise and vibration levels are assessed in the Construction Noise and Vibration Assessment provided in Appendix N. The assessment identifies that construction noise may, at times, not comply with the levels permitted by the AUP:OP. Construction noise which exceeds permitted activity standards requires resource consent for a Restricted Discretionary Activity under Rule E25.4.1(A2).
E26.2.3.1(A57) (C1.9(2)) Ventilation facilities greater than 2.5 m in height	Restricted Discretionary Activity	The break pressure chamber will include a vertical 200 mm diameter vent stack which will be at least 3 m in height. Ventilation facilities which are greater than 2.5 m in height do not meet standard E26.2.5.2(3)(a) and require resource consent for a Restricted Discretionary Activity under Rule C1.9(2).
E26.4.3.1(A92) Tree alteration or removal of any tree greater than 4m in height and / or greater than 400 mm in girth (open space zone)	Restricted Discretionary Activity	If trenchless methods fail, open trenching through the Tamiro Road Stormwater Embankment will require removal of vegetation over approximately 1,300 m^2. Whilst most vegetation removed will be 3 – 4 m in height, conservatively, up to 50 trees may be between 4 m and 6 m in height (as set out in the Arborist Assessment in Appendix M). Removal of trees greater than 4 m in height in the open space zone requires resource consent under E26.4.3.1(A92)
E26.5.3.1(A97) and (A97A) and C1.9(2) Earthworks greater than 2500 m^2 and 2500 m^3, including earthworks greater than 10 m^2 and 5 m^3 in the riparian yard	Restricted Discretionary Activity	The area of earthworks for the project will exceed 2,500 m^2 and 2,500 m^3 at any one time. The works to install the culvert, and emergency outfall, will require disturbance of greater than 10 m^2 and 5 m^3 in the riparian yard of Sinton Stream. Earthworks greater than 2,500 m^2 and 2500 m^3 require resource consent for a Restricted Discretionary Activity under Rule E26.5.3.1(A97) and (A97). Earthworks greater than 10 m^2 and 5 m^3 within the riparian yard of a stream require resource consent for a Restricted Discretionary Activity under Rule C1.9(2).
E27.4.1(A6) Use of an existing vehicle crossing where a Vehicle Access Restriction applies under E27.6.4.1(1) to service a change of activity type, and where a building is constructed.	Restricted Discretionary Activity	The existing vehicle crossing at 23-27 Brigham Creek Road will be used to provide maintenance access to the pump station from Brigham Creek Road (an arterial road). Use of an existing vehicle crossing where a vehicle access restriction applies to service a change of activity type requires resource consent under Rule E27.4.1(A6).

Rule	Activity status	Comment
E36.4.1(A56) Infrastructure in the 1% AEP floodplain and on land which may be subject to instability	Restricted Discretionary Activity	Works include construction of a pipeline within the 1% AEP floodplain, and on land subject to instability adjacent to Sinton Stream. Infrastructure on land which is subject to instability and within the 1% AEP floodplain requires resource consent under Rule E36.4.1(A56).

A number of activities associated with the project can be undertaken as a permitted activity under the AUP:OP as detailed in Table P2 and Table P3.

Table P1. Permitted activities under the AUP: OP (district)

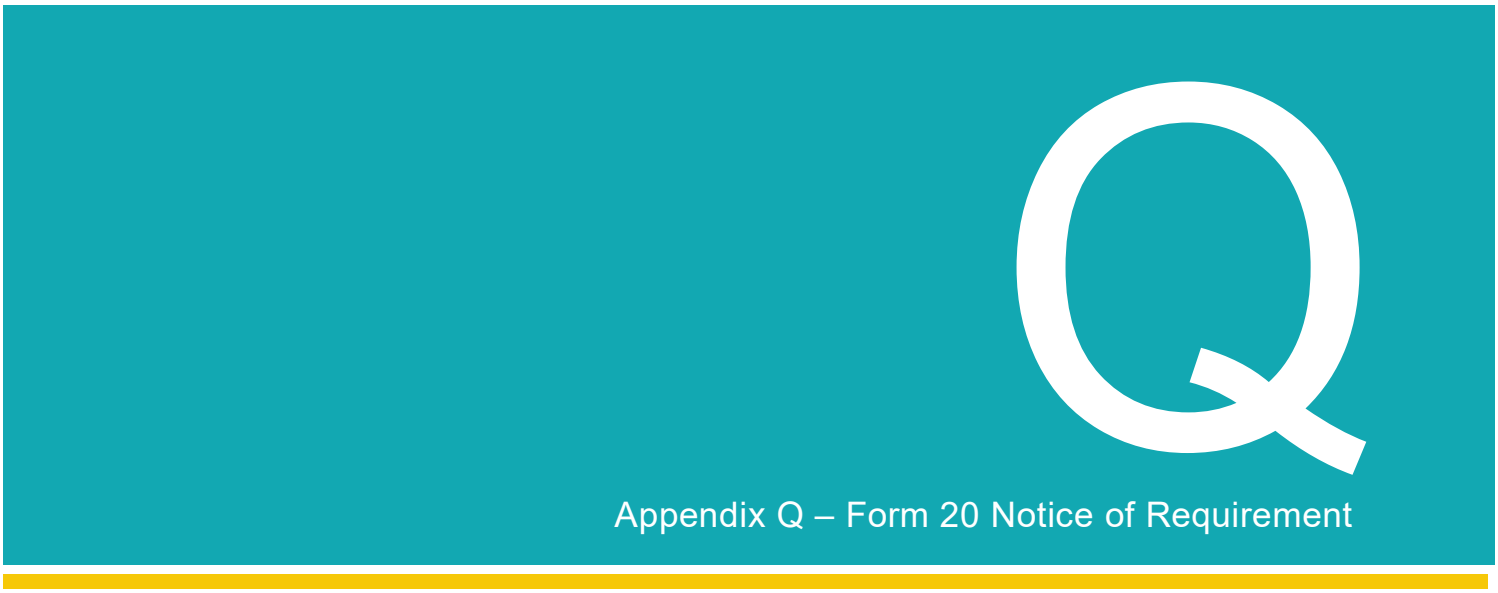
Rule	Comment
E25.4.1(A2) Activities which exceed permitted activity standards (vibration)	Vibration arising from construction activities is expected to meet permitted activity standards in Table E25.6.30.1 as assessed in the Construction Noise and Vibration Assessment provided in Appendix N.
E26.2.3.1(A49) Underground pipelines and ancillary structures for the conveyance of wastewater	Underground pipelines, and ancillary structures (such as scour valves) for the conveyance of wastewater are a permitted activity under Rule E26.2.3.1(A49).
E26.2.3.1(A52) Wastewater pump stations which do not comply with standards in the future urban zone	The pump station is predominantly underground. The above ground building area is approximately 50 m^2, including an electrical transformer, electrical switch room, 3 x dome carbon filters, and 2 x gantry cranes. The gantry cranes are 4 m high. Pump stations with an above ground building area of > 30 m^2, and structures which are > 2.5 m in height, in the future urban zone, are a permitted activity under Rule E26.2.3.1(A52).
E26.2.3.1(A56) Wastewater outfalls and ancillary structures	Wastewater outfalls and ancillary structures are a permitted activity under Rule E26.2.3.1(A56).
E26.2.3.1(A57) Ventilation facilities and manholes.	The pump station will contain an air valve. Ventilation facilities and manholes which comply with standards are a permitted activity under Rule E26.2.3.1(A57).
E26.4.3.1(A87) Works within the protected root zone by trenchless methods	Works to construction the gravity pipeline beneath the Tamiro Road Stormwater Embankment will be at a depth of at least 800 mm. Excavation undertaken by trenchless methods at a depth of at least 800 mm below ground level are a permitted activity under Rule E26.4.3.1(A87).
E26.4.3.1(A90) Tree trimming or removal on roads adjoining rural zones and on roads adjoining the Future Urban Zone	Works require the removal of a number of trees from Brigham Creek Road and Spedding Road. The properties adjacent to the road are Future Urban Zone. Removal of trees on roads adjoining the Future Urban Zone is a permitted activity under Rule E26.4.3.1(A90).
E26.4.3.1(A91) Tree alteration or removal of any tree less than 4 m in height and / or less than 400 mm in girth (open space zone	If trenchless methods fail, open trenching through the Tamiro Road Stormwater Embankment will require removal of vegetation over approximately 1,300 m^2. Most vegetation removed will be less than 4 m in height. Removal of trees less than 4 m in height in the open space zone is a permitted activity under Rule E26.4.3.1(A91).

E40.4.1(A20) Temporary activities associated with building or construction (including structures and buildings that are accessory activities), for the duration of the project, or up to 24 months, whichever is the lesser.	Three construction yards and 1 laydown area, will be established to support the works, and remain in place for approximately 16 months. To facilitate access to the works, two existing vehicle crossings onto Brigham Creek Road (an arterial road) will be widened, and new vehicle crossings will be established to Mamari Road and Spedding Road. Temporary activities associated with building or construction which are in place for up to 24 months are a permitted activity under Rule E40.4.1(A20).

Table P3: Permitted activities under the AUP: OP (regional)

Rule	Comment
E4.4.1(A5) Discharge onto or into land and/or into water for the purpose of dewatering trenches or other excavations	Whilst groundwater concentrations of copper and zinc, and nickel, were reported above the 95% and 80% Australia and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC guidelines) respectively, ANZECC guidelines are intended to be applied after reasonable mixing in the receiving water body. The contaminants would be expected to be significantly diluted through this process, and after reasonable mixing, will result in rendering freshwater unsuitable for consumption by farm animals, a change in the natural pH of the water by more than 1 pH unit, or any significant adverse effect on aquatic life. Extracted groundwater will be treated via the use of sediment ponds or sediment tanks prior to discharging to existing waterways, with discharge considered to be in accordance with best management practice to minimise the contaminants to the extent practicable. Discharge onto or into land and / or into water for the purpose of dewatering trenches or other excavations is a permitted activity under E4.4.1(A5).
E7.4.1 (A17) Dewatering or groundwater level control associated with a groundwater diversion permitted under the Unitary Plan	*Open trenching* A Groundwater Assessment has been completed for the Project (Appendix C). This assessment confirms that the trenched works can comply with standard E7.6.1.6 as the water take will not be geothermal water, the water take will be less than 30 days and will only occur during construction.
E7.4.1(A27) Diversion of groundwater caused by any excavation (including trench) or tunnel	*Open trenching* The ground diversions associated with the trenched construction are exempt from Standards E7.6.1.10(2)-(6) because the trenchless works will be less than 1.2m in diameter and the trenched works will be progressively opened, closed and stabilised with each section remaining open for no longer than 10 days.
E14.4.1(A166) Wastewater facility that is for the primary purpose of pumping or transfer or storage of raw or partially treated wastewater	The pump station and break pressure chamber are wastewater facilities which are for the primary purpose of pumping and transferring raw wastewater. The pump station provides for 700 m^3 of emergency storage within an enclosed tank, which is less than the permitted activity standard threshold of 4,000 m^3 under E14.6.1.24, whilst the break pressure chamber does not provide for wastewater storage. Wastewater facilities which are for the primary purpose of pumping or transfer of raw or partially treated wastewater are a permitted activity under Rule E14.4.1(A166).

Sensitivity: General



Form 20 Notice of Requirement by Watercare Services Limited under Section 181 of the Resource Management Act 1991

To: Auckland Council
135 Albert Street
Auckland Central
1010

From: Watercare Services Limited
73 Remuera Road
Remuera, Auckland
1050

Watercare Services Limited gives notice of its requirement for a new designation for a public work; being the construction, operation, and maintenance of new wastewater infrastructure (including a new pump station, rising main, gravity main and auxiliary works) in Whenuapai, Auckland.

The site to which the requirement applies is as follows:

The sites the NOR applies to are shown in the designation drawings, attached as Appendix B of the Assessment of Environmental Effects (AEE) (Drawings GIS-4219201-1, GIS-4219201-2, and GIS-4219201-3). The site and surrounding environment are described in Section 2 of the AEE.

The nature of the proposed public work is:

The proposed work relates to the construction, operation and maintenance of Package 1 of the Whenuapai Wastewater Servicing Scheme, including:

1. A **Gravity Main Pipeline** (approximately 700m long and 375 – 475 mm in diameter) between the existing Whenuapai Village Pump Station on Tamiro Road and the Pump Station
2. A **Pump Station** at a point where the Whenuapai and Redhills Catchments meet at 23A Brigham Creek Road, with an emergency overflow outfall to the Sinton Stream.
3. A **Rising Main** (approximately 1.5km long and 500 mm in diameter) between the Pump Station and a proposed new break pressure chamber on Mamari Road.
4. A **Culvert** (approximately 63 m long including wing wall and rip rap) to provide access for the rising main across Sinton Stream.
5. A **Break Pressure Chamber** located on corner of Mamari and Spedding Roads.

Details of the proposed work are provided in Section 3 of the attached AEE. Drawings showing the proposed works are provided as Appendix A of the AEE.

The nature of the proposed conditions that would apply are:

The proposed conditions that would apply to the works to be authorised by the designation are set out in Appendix I of the AEE. These draft conditions specify the process for reviewing the designation area, the detail that must be included in the management plans proposed, and the process for certification of the plans.

The effects that the public work will have on the environment, and the ways in which any adverse effects will be mitigated, are:

Potential permanent adverse effects including:

- Landscape and visual effects associated with the new above ground infrastructure.

Potential temporary adverse effects associated with construction including:

- Earthworks, noise and vibration, traffic and transport, vegetation removal, and general disruption.

There are a range of other potential effects which relate to regional planning matters, including stream works and effects on wetland. These effects, including proposed mitigation, are addressed in the regional consent applications set out below

Whilst there is anticipated to be some temporary effects during construction, the assessment of effects on the environment has concluded that these effects can be appropriately managed through the implementation of a range of construction management plans.

There are significant positive effects associated with the new infrastructure once in place, forming an important component of the Whenuapai Wastewater Servicing Scheme to provide for future urban growth in the area.

Details of the environmental effects of the proposed work and how these will be mitigated are provided in Section 6 of the attached AEE.

Alternative sites, routes, and methods have been considered to the following extent:

An alternatives assessment has been undertaken to determine both the need for the Project itself, and the location of the Project works. This is described in detail in Section 4 of the AEE.

The public work and alteration to designation are reasonably necessary for achieving the objectives of the requiring authority because:

The Whenuapai Wastewater Servicing Scheme (the Project) has the following specific objectives:

1. To provide additional capacity in the wastewater network for growth and development of the Whenuapai-Redhills catchment in a manner that:
    a. Protects public health;
    b. Optimises investment decisions, including being efficient, effective and financially responsible;
    c. Minimises private property development disruption
    d. Coordinates with existing and known planned development; and
    e. Integrates with the existing Watercare wastewater network.
2. To provide statutory protection for phase one of the Whenuapai and Redhills project to enable its construction, operation, and maintenance.

As set out in Section 8 of the attached AEE, the Project and the designation are reasonably necessary for achieving Watercare's objectives.

The following resource consents are needed for the proposed activity and have been applied for:

In addition, regional resource consents are being sought from Auckland Council concurrently to this application under the Auckland Unitary Plan (AUP), and National Environmental Standards for Freshwater (NESF). The consents sought relate to earthworks, vegetation alteration and removal, disturbance and new structures in a stream, disturbance and new structures within a natural wetland, and groundwater dewatering and diversion. The full list of resource consents are described in Section 6 of the attached AEE.

The following consultation has been undertaken with parties that are likely to be affected:

Consultation undertaken and the outcomes of that process are described in Section 7 of the attached AEE.

Watercare Services Limited attaches the following information required to be included in this notice by the district plan:

AEE report: Whenuapai Wastewater Servicing Scheme Phase 1 – Notice of Requirement and Application for Resource Consent

- Appendix A: Design Drawings
- Appendix B: Designation Boundary
- Appendix C: Records of Title
- Appendix E: Landscape and Visual Assessment
- Appendix G: Detailed Site Investigation
- Appendix H: Erosion and Sediment Control Plan
- Appendix I: Proposed Conditions
- Appendix J: Assessment of Alternatives
- Appendix K: Records of Engagement
- Appendix L: Arboricultural Assessment
- Appendix N: Noise and Vibration Assessment
- Appendix O: Traffic Impact Assessment
- Appendix P: Permitted Activity Assessment

Date: 28 October 2022

Address for service of applicant:

Beca Limited
21 Pitt Street
Auckland Central, Auckland, 1010

Attention: Sarah MacCormick
Telephone No.: 09 300 9772
Email: sarah.maccormick@beca.com