

Whenuapai Wastewater Servicing Scheme Package 1 – Regional Consents

Assessment of Effects on the Environment

Prepared for Watercare Services Ltd

Prepared by Beca Limited

9 November 2023



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Revision History

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Glossary of Terms and Acronyms

Term	Description
AEE	Assessment of Effects on the Environment
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
BMP	Bat Management Plan
DSI	Detailed Site Investigation
ECBF	East Coast Bays Formation
EcIA	Ecological Impact Assessment
GSMCP	Groundwater and Settlement Monitoring and Contingency Plan
LMP	Lizard Management Plan
L/s	Litres per second
mRL	Metres Reduced Level, which is a calculated elevation in relation to a particular datum
NDC	Network Discharge Consent
NES:F	Resource Management (National Environmental Standards for Freshwater) Regulations 2020
NFMP	Native Fish Management Plan
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
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. 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.

Watercare is seeking regional resource consents for the construction, operation and maintenance of the proposed pipeline, pump station and associated infrastructure. This Assessment of Effects on the Environment (AEE) report has been prepared to support the application for regional resource consents.

The works are also subject to district consenting matters under Section 9 of the Resource Management Act (1991) (RMA). Watercare has given notice to Council of its requirement for a designation concurrently under a separate process¹.

The pipeline will be constructed by both trenched and trenchless methods. This will necessitate the removal of protected trees and riparian vegetation, along with the need to open trench and excavate within two wetlands at 23-27 Brigham Creek Road. Following construction, any protected vegetation removed will be replaced at a ratio of 1:1.5 or greater, and the disturbed areas of the wetlands reinstated, replanted, and recontoured to the original landform.

In addition, there is potential for temporary effects on the environment during construction, including erosion and sedimentation, changes to wetland hydrology and function, and injury or mortality of native fauna. Measures will be put in place to manage potential effects, including an Erosion and Sediment Control Plan (ESCP), a wetland recharge system to be monitored in accordance with a Wetland Monitoring and Reinstatement Plan, and fish, bat and lizard management plans. There is unlikely to be any significant effect on buildings or structures 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 and network utility operators.

An assessment of the relevant objectives and policies of the relevant statutory and non-statutory documents has been undertaken. This demonstrates that the Project has functional need to be in its location and will provide regional benefits and 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

¹ The updated Notice of Requirement was lodged with Council on 6 October 2023

place, it will have significant regional benefits associated with providing wastewater servicing capacity for the Whenuapai catchment, unlocking land for development.

1 Introduction

1.1 Purpose

This AEE has been prepared on behalf of Watercare Services Limited (Watercare) in accordance with Section 88 of the Resource Management Act 1991 (RMA). The AEE has been prepared to support 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. The full extent of the application site is outlined in Figure 1-1.

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/s². 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 stage³.

The Project includes the following five key components (see Figure 1-2):

² Dwelling number projections were calculated in Housing Infrastructure Fund Wastewater Servicing Detailed Business Case, 2018, and include dwellings on septic tank in 2018.

³ 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.

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 Roads⁴.

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

1.4 Summary of resource consents sought

Resource consent is required for a **Discretionary Activity** under the Auckland Unitary Plan: Operative in Part (AUP:OP) and National Environmental Standards : Freshwater (NES:F), pursuant to Section 9 (2), 13, 14 and 15 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 and a pump station within the beds of two wetlands, and associated land disturbance and vegetation removal.
- 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 47 protected trees will be removed from the riparian area, and approximately 47 protected trees in the riparian area will have root zones infringed. Approximately 1,710 m² of protected vegetation will be removed from the riparian area.
- Earthworks which exceed 10,000 m², including over 2,500 m² 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, 4, and 5)) (**Discretionary Activity**), for vegetation clearance, earthworks, and taking, damming, diversion and discharge of water within two natural wetlands for the purpose of constructing specified infrastructure.

⁴ 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.

1.5 Report structure

This report contains the following information:

- A description of the existing environment;
- A description of the proposed activities;
- 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 1-1. Full extent of the application site

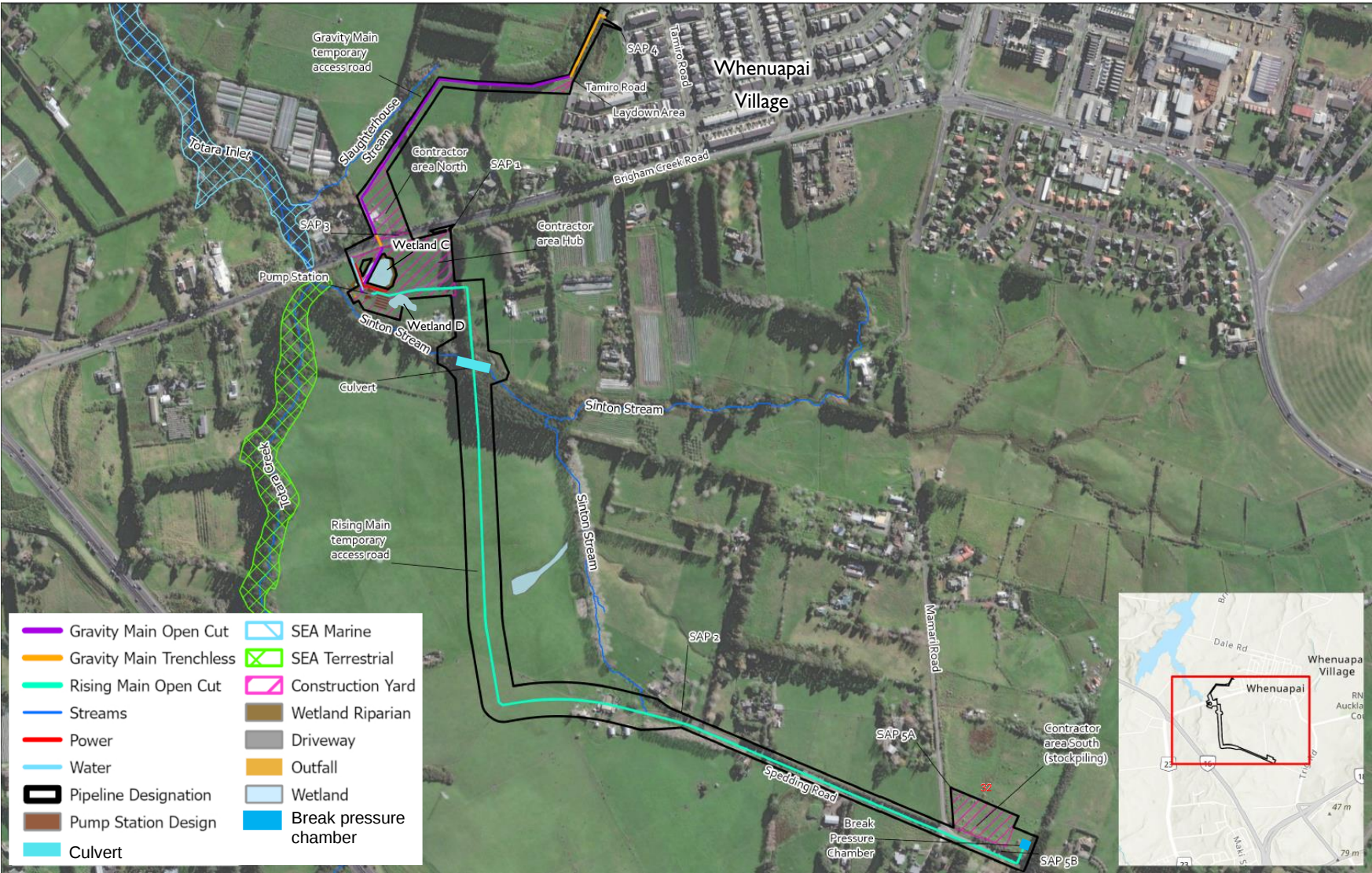


Figure 1-2. The Project – Location and Project overview

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 including relevant interests are provided in Appendix B.

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)

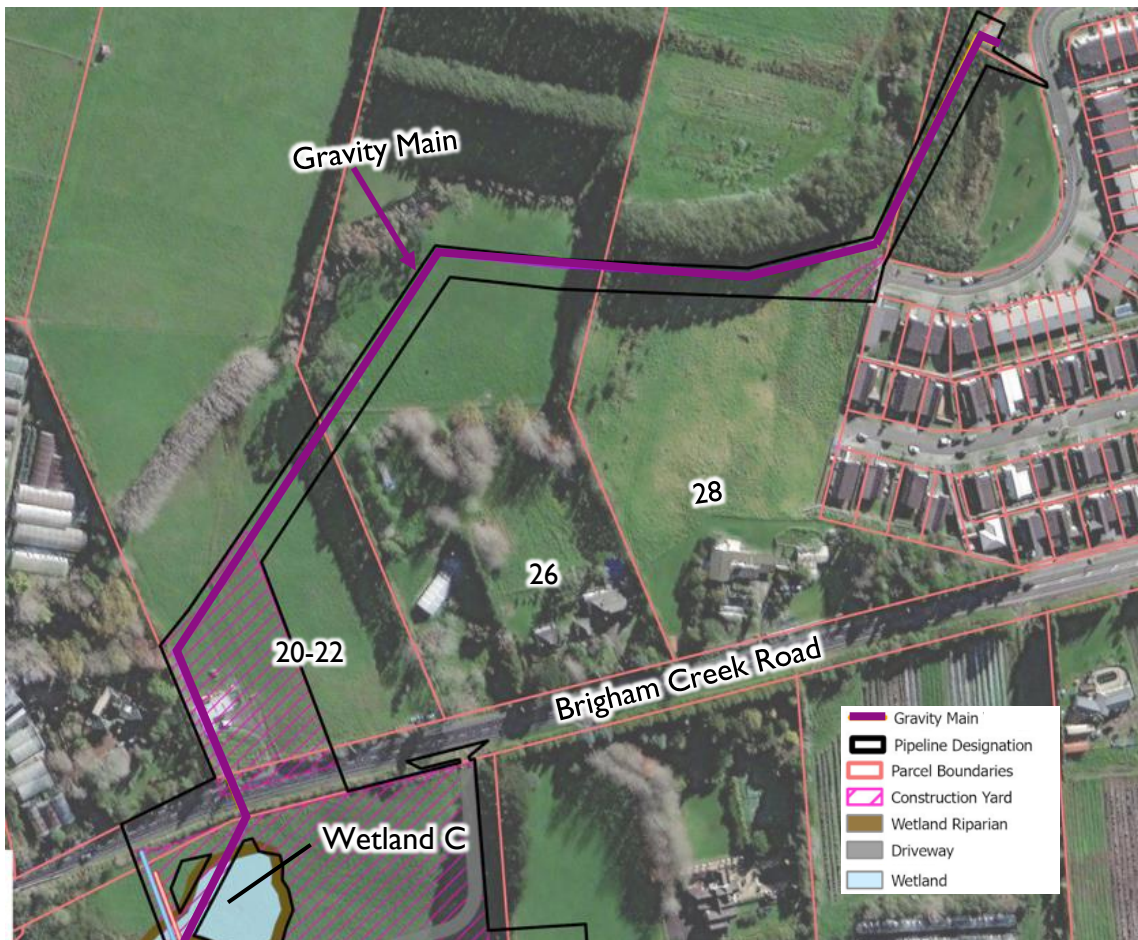


Figure 2-1. Gravity main project area (project extent outlined in black) (Source: Beca)

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.

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 including relevant interests are provided in Appendix B.

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

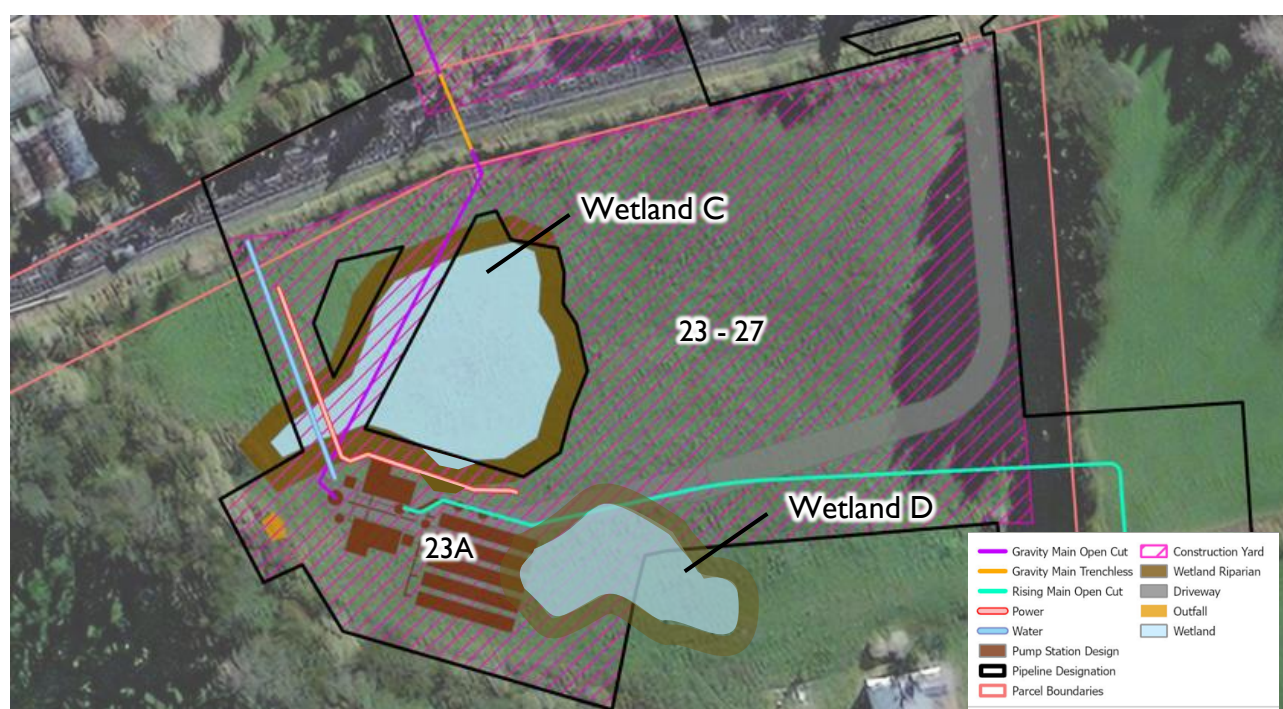


Figure 2-2. Pump Station area (designation boundary outlined in black) (Source: Beca)

Freshwater features within the Pump Station Project Area include Sinton Stream, a permanent stream which flows in a north west direction, Wetland C, and Wetland D (refer to Figure 2-2 and Figure 2-4). 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 including relevant interests (being any easements, covenants or consent notices) are provided in Appendix B.

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

Property Address	Legal Description	Area (ha)	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)
8 Spedding Road	SECT 1 SO 582220	0.15	Watercare

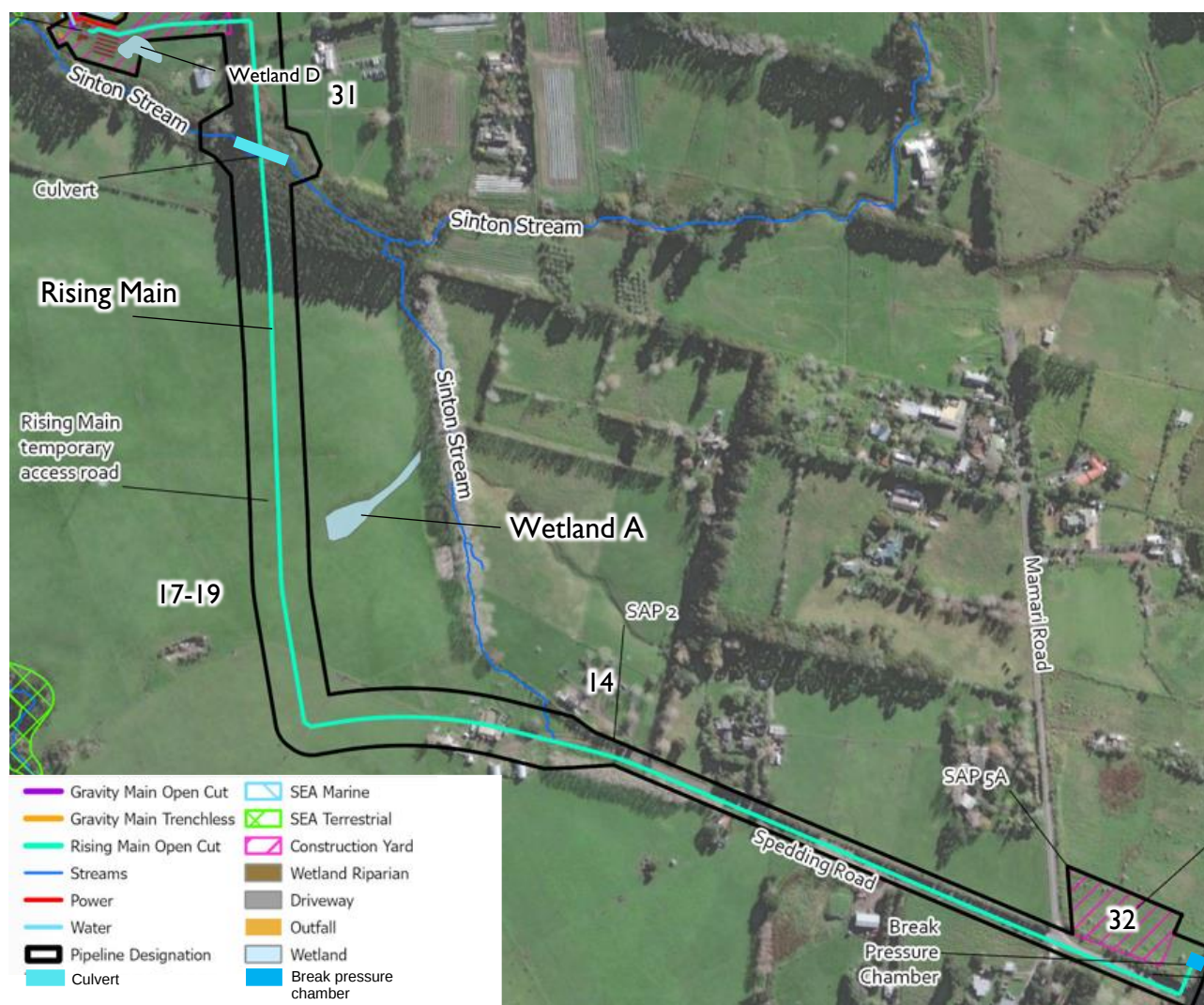


Figure 2-3. Rising main, culvert and break pressure chamber area

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, Wetland D to the south, 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	Future Urban Zone	- Stream - Overland Flow path 1% AEP Flood plain - Notice of Requirements, Brigham Creek Road Upgrade - Auckland Transport - Notice of Requirements, Alternative State Highway – Waka Kotahi
Brigham Creek Road	Road reserve	- Arterial Road Control - Notice of Requirements, Brigham Creek Road Upgrade - Auckland Transport - Notice of Requirements, Alternative State Highway – Waka Kotahi
23A Brigham Creek Road	Future Urban Zone	Nil
23-27 Brigham Creek Road	- Future Urban Zone - Business – Light Industry Zone	- Stream - Overland Flow path 1% AEP Flood plain - Notice of Requirements, Brigham Creek Road Upgrade - Auckland Transport - Notice of Requirements, Alternative State Highway – Waka Kotahi
31 Brigham Creek Road		
15-19 Spedding Road	Business – Light Industry Zone	- Stream - Overland Flow path 1% AEP Flood plain - Notice of Requirements, Spedding Road Upgrade - Auckland Transport
Spedding Road	Road reserve	Overland Flow path

Location	Zone	Overlays, controls, designations
		• Notice of Requirements, Spedding Road Upgrade - Auckland Transport • Notice of Requirements, Māmari Road Upgrade - Auckland Transport
32 Mamari Road	• Future Urban Zone	• Overland Flow path • Notice of Requirements, Spedding Road Upgrade - Auckland Transport • Notice of Requirements, Māmari Road Upgrade - Auckland Transport

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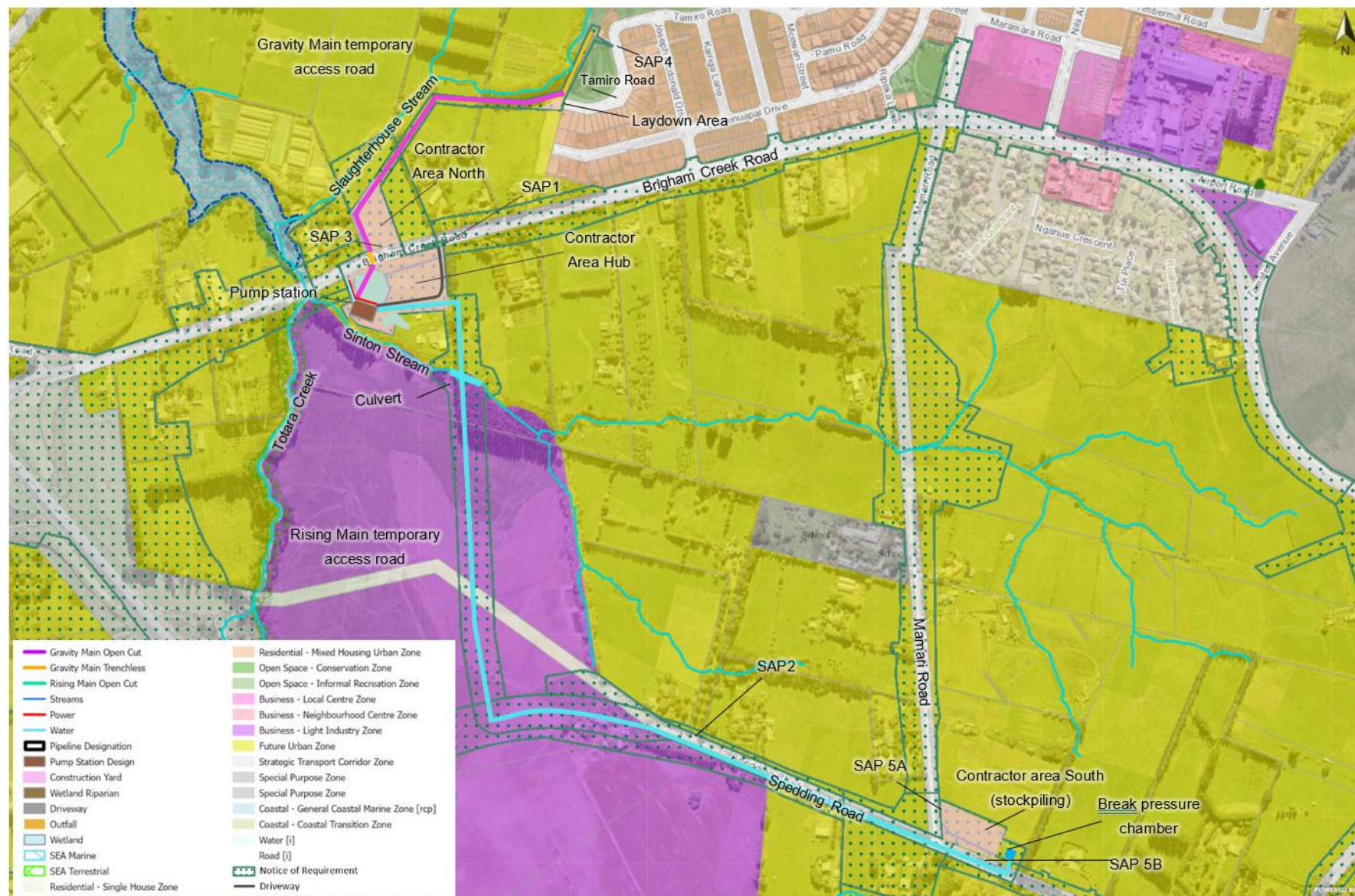


Figure 2-4. Relevant zones, controls and overlays applicable to the site under the AUP:OP ((Source: Auckland Council planning maps))

2.3 Ecological Features

The Ecological Impact Assessment (EclA) (Appendix C) 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 m². 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 to no suitable habitat for fauna. Overall, the wetland is assessed to have **low** ecological value.

2.3.4 Wetland D

Wetland D is located adjacent to the proposed pump station location and has established relatively recently due to the wetter-than-usual weather conditions experienced in Auckland over the last 7-8 months. The wetland had an area of 578 m² on 28th August 2023 and is ephemeral in nature with boundaries which expand and contract in size seasonally. Vegetation within the wetland is predominantly exotic species including soft rush, creeping buttercup, Yorkshire fog, and creeping bent (*Agrostis stolonifera*). The wetland area is highly modified and degraded, with limited to no suitable habitat for wetland birds. Overall, the wetland is assessed to have **low** ecological value.

2.3.5 Wetland A

Wetland A is located approximately 60 m to the east of the rising main and is approximately 1,178 m² 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 to no suitable habitat available for fauna. Overall, the wetland is assessed to have **low** ecological value.

2.3.6 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 Underlying geology and hydrogeology

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

The works area is underlain by undifferentiated alluvium of the Takaanini Formation (formerly referred to as Tauranga Group) for the northern section of the alignment. Pumiceous deposits of the Takaanini Formation occur near the surface for the remainder of the alignment. The Takaanini Formation 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 Takaanini Formation Alluvium above the ECBF. Takaanini Formation 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.

2.5 Contamination

A Detailed Site Investigation (DSI) has been prepared for the Project and is provided in Appendix E. The DSI includes the historic land use and potential for contamination in the area⁵.

Soil sampling results from sites along the alignment indicate that heavy metals are within naturally occurring background levels for volcanic and non-volcanic soils. Concentrations of hydrocarbons were detected below permitted activity levels in some shallow soils along the alignment, at levels commensurate with concentrations identified in soils within road carriageways.

Sampling results from groundwater 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.

It is considered that the detection of hydrocarbons below permitted activity levels and groundwater exceeding ANZECC screening criteria in three locations would cause less than minor adverse effects on the environment as follows:

- There were no concentrations of inorganic and/or organic compounds detected in soil samples above naturally occurring background concentrations or at concentrations that would impact groundwater, as contamination is confined at depths between 0 – 1.0.
- The ANZECC freshwater criteria apply at the point of discharge after reasonable mixing and if present at trace concentrations, the contaminants would be expected to be significantly diluted through this process.
- Groundwater dewatered during construction will be managed onsite using appropriate management controls.

2.6 Future environment

Oyster Capital Ltd has sought consent to extend the existing Spedding Road to meet Brigham Road between 23-27 and 31 Brigham Creek Road.

It is currently uncertain whether any Oyster Capital works will precede the works planned as part of this project. Therefore, project components have been designed to be constructed in either the existing or planned future environment. The effects of the project have been assessed against the existing environment.

⁵ Matters in relation to the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS) are addressed in the Notice of Requirement.

Sensitivity: General

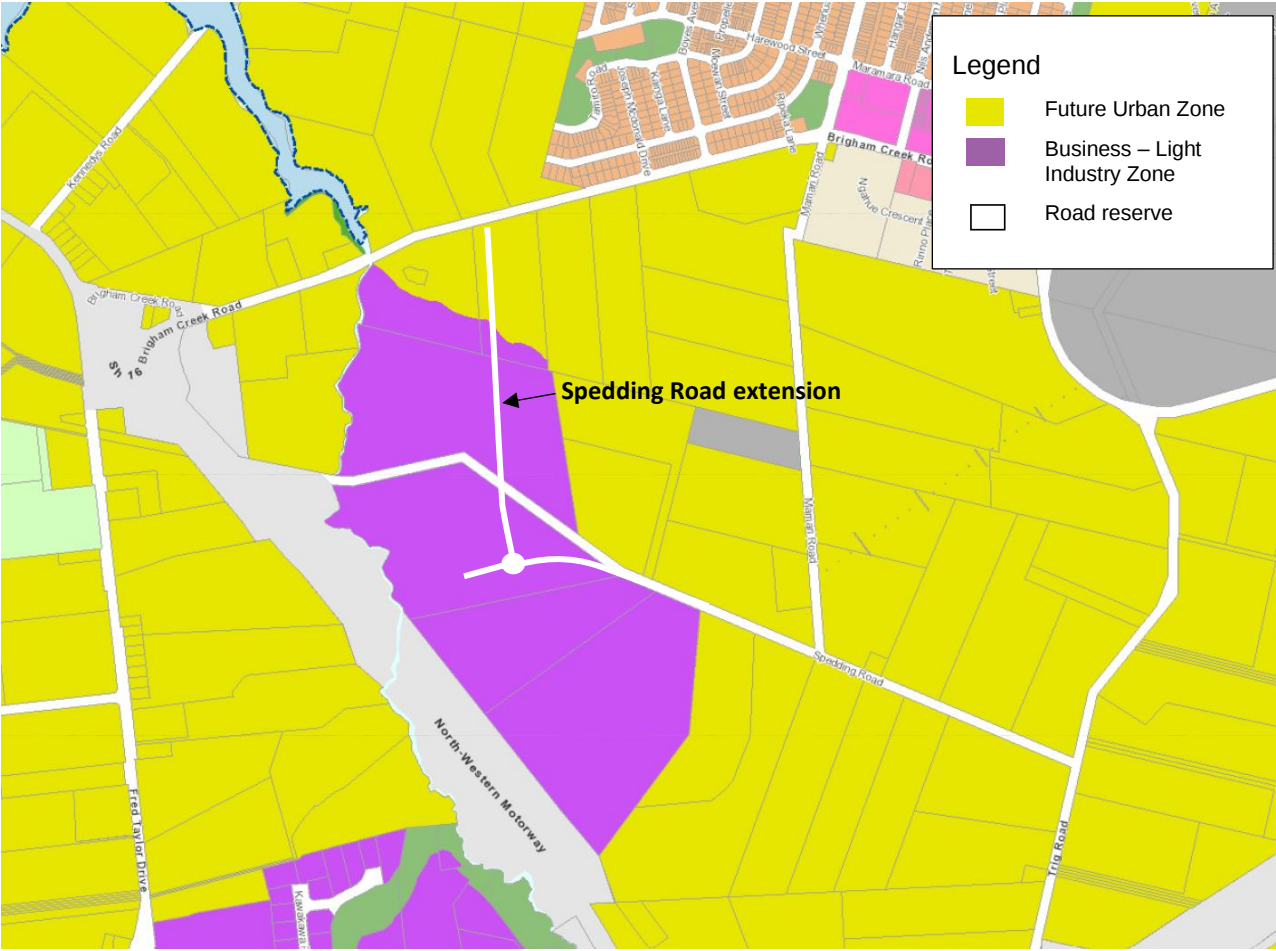


Figure 2-5. Proposed Spedding Road extension between existing Spedding Road and Brigham Creek Road

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 F.

3.1 Need for the Project

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.

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 3-1). 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.

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.

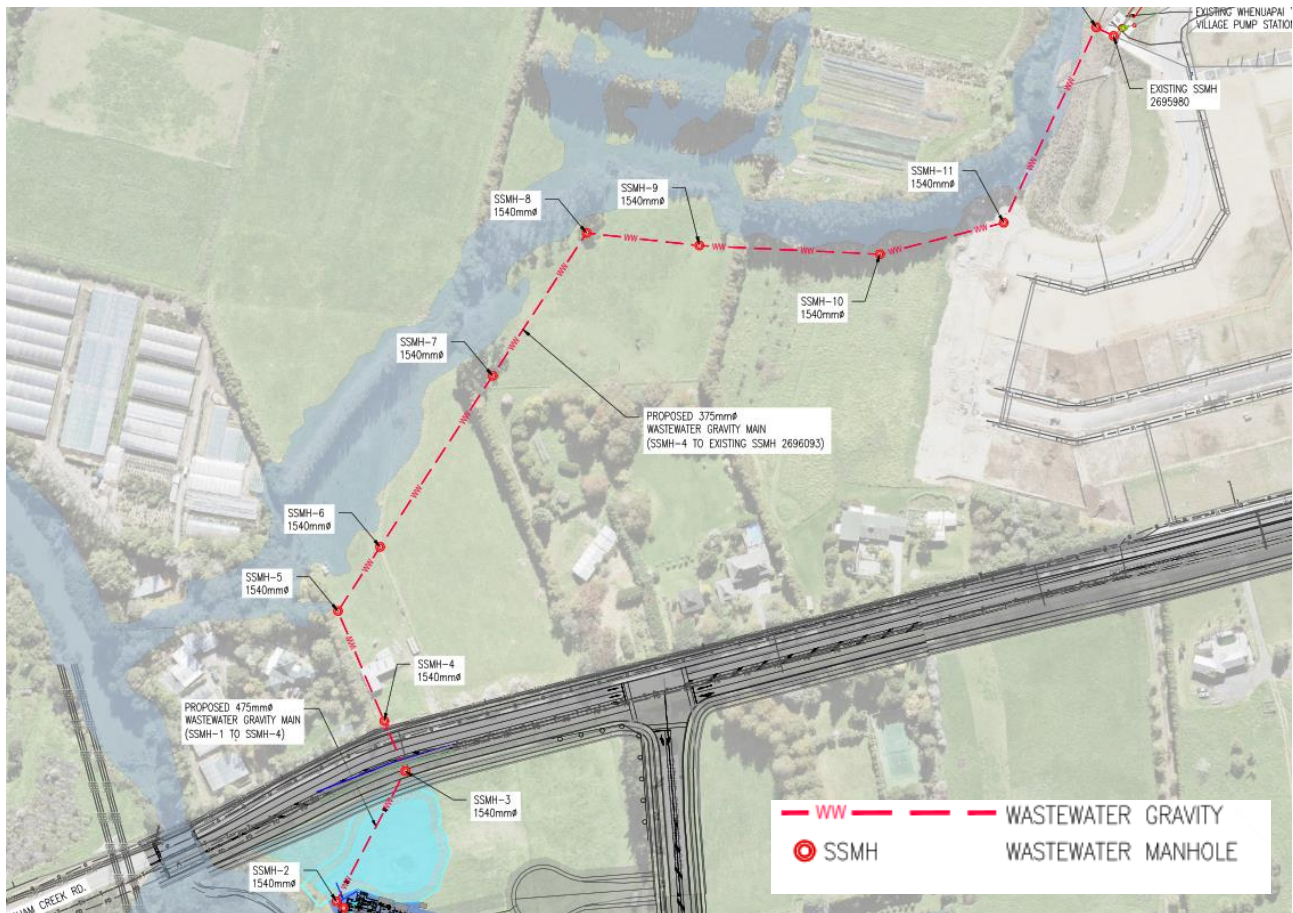


Figure 3-1. Gravity main works (snip from Drawing R0017910.004, WSP GHD, provided in Appendix A)

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 3-2). 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 overflow outfall structure discharging to Sinton Stream, including a wingwall, and 3 m of rip rap (see Figure 9). The emergency overflow outfall is located on land at the top of the stream bank.
- 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.

Sensitivity: General

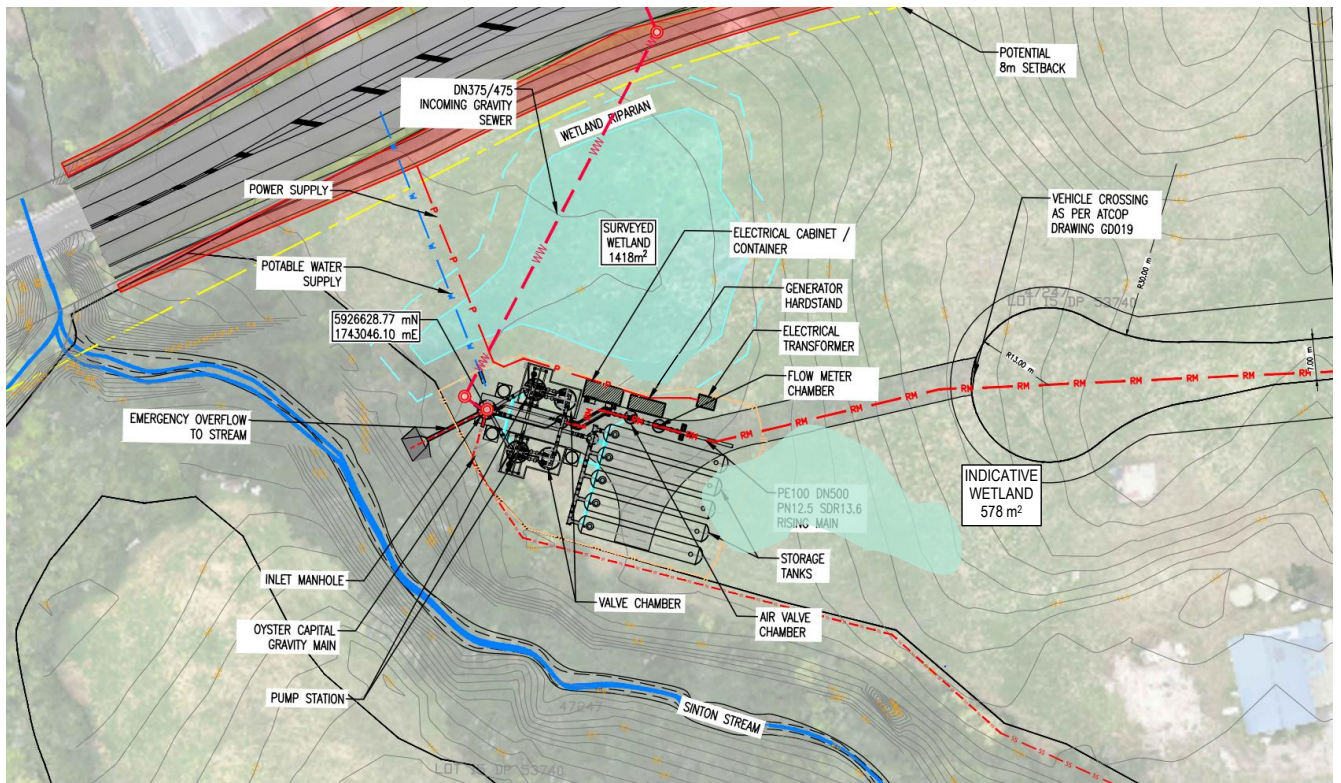


Figure 3-2. Pump station works (snip from Drawing 2013646.003, WSP GHD, provided in Appendix A)

An indicative landscape plan has been prepared and will be implemented following works at the pump station (see Figure 3-3 and Appendix A). A final planting plan will be provided prior to construction, and will include planting which is suitable for the Wetland D environment.

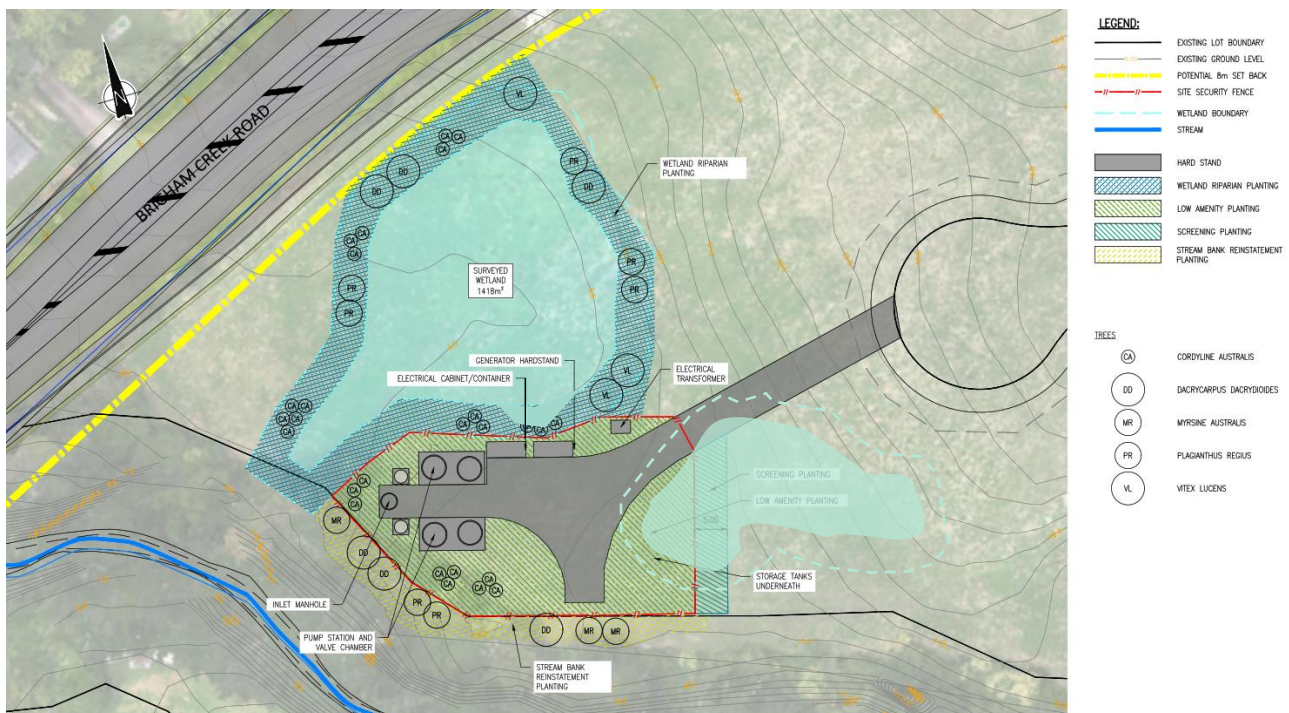


Figure 3-3. Indicative pump station landscape plan (snip from Drawing 2013646.001, WSP GHD, provided in Appendix A)

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 1-2). 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 2-5). 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:
 - 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.

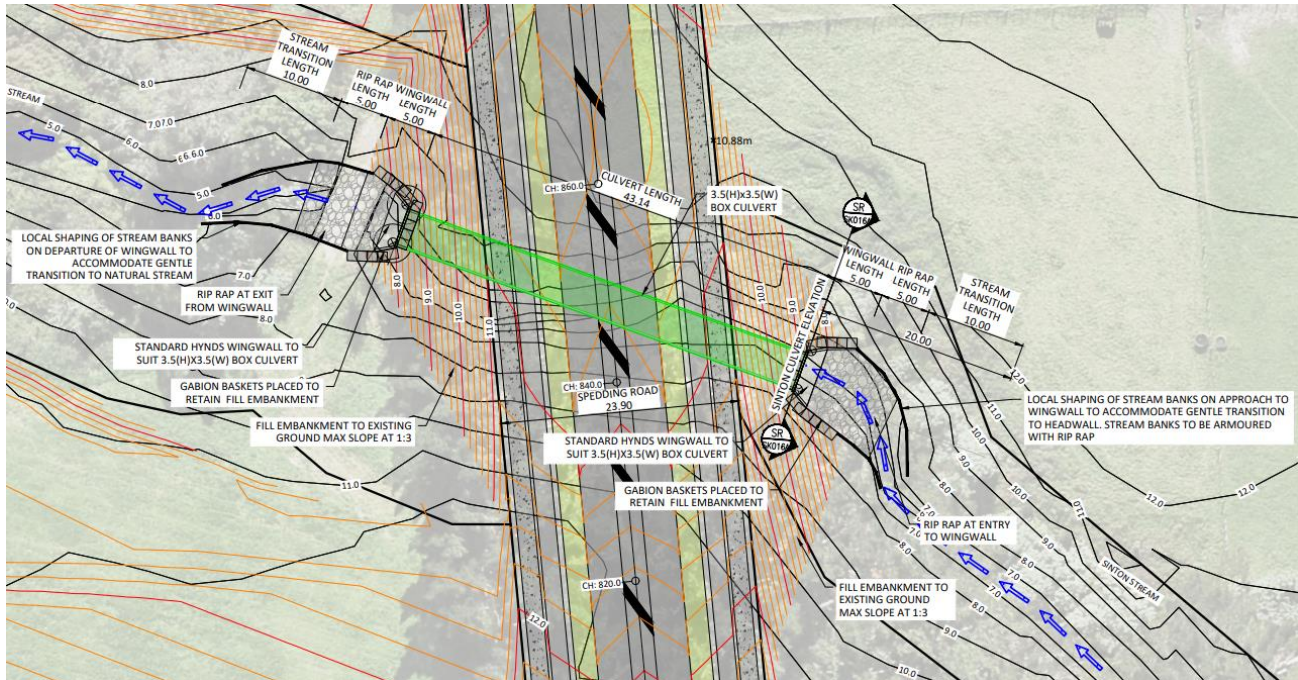


Figure 3-4. Sinton Stream Culvert (snip from Drawing SK016, Crang Civil Consulting Engineers, provided in Appendix A)

⁷ Culvert is sized to underlay Spedding Road extension, proposed as part of Oyster Capital Private Plan Change 69.

3.2.4 Break Pressure Chamber

The rising main will terminate at a break pressure chamber located at 32 Mamari Road (refer to Figure 3-5 and Figure 3-6).

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.

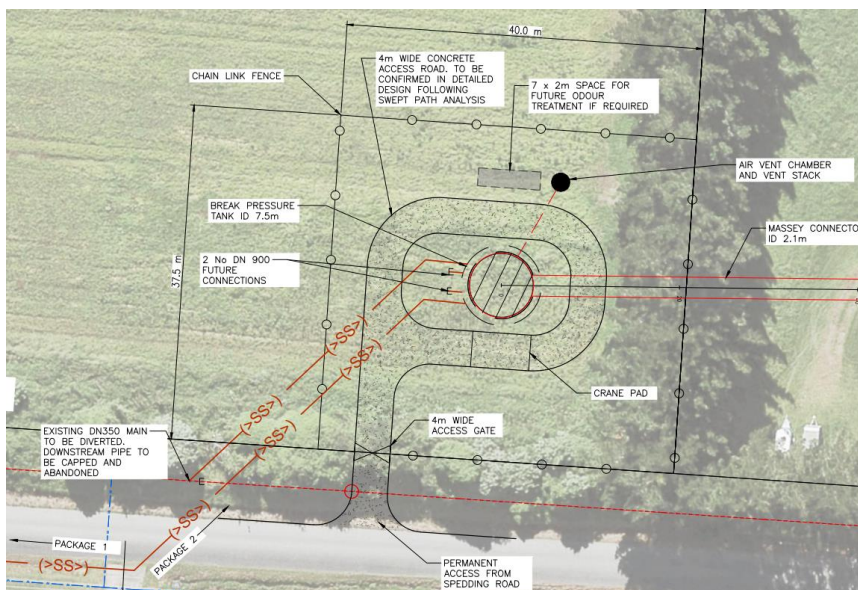


Figure 3-5. Plan view of the break pressure chamber (snip from Drawing 2013661.800, Mott MacDonald, provided in Appendix A)

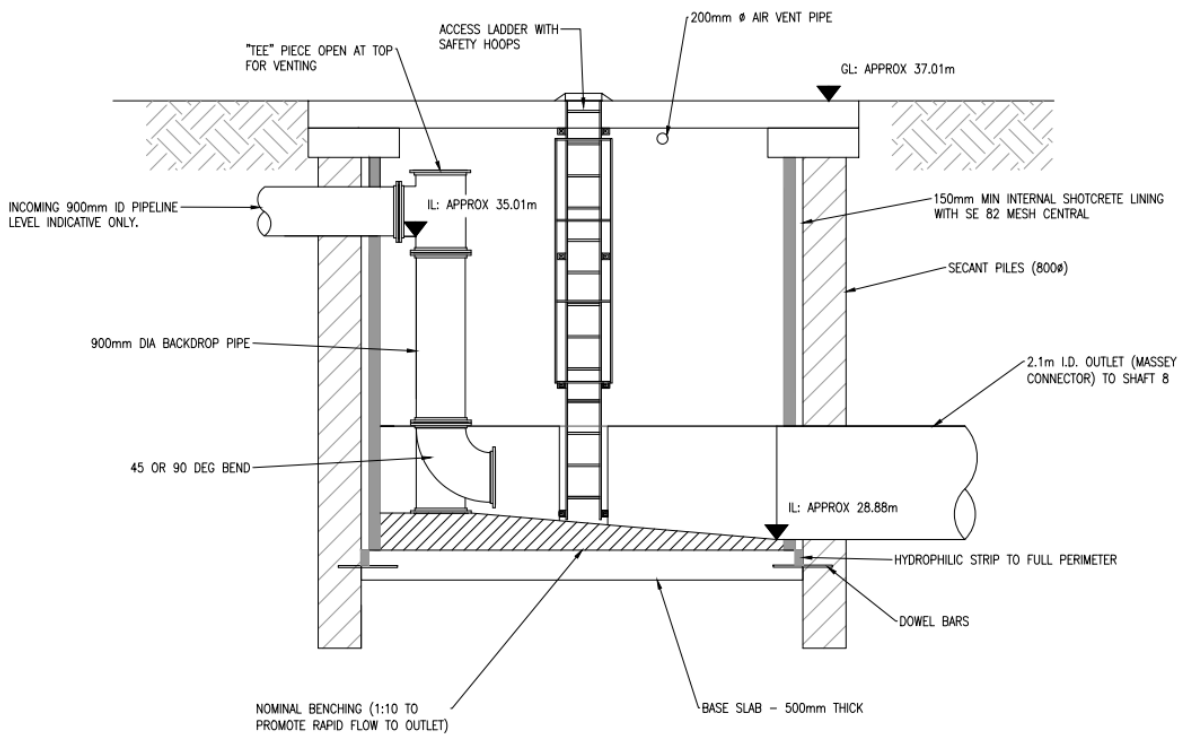


Figure 3-6. Cross section view of the break pressure chamber (snip from Drawing 2013661.801, Mott MacDonald, provided in Appendix A).

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.

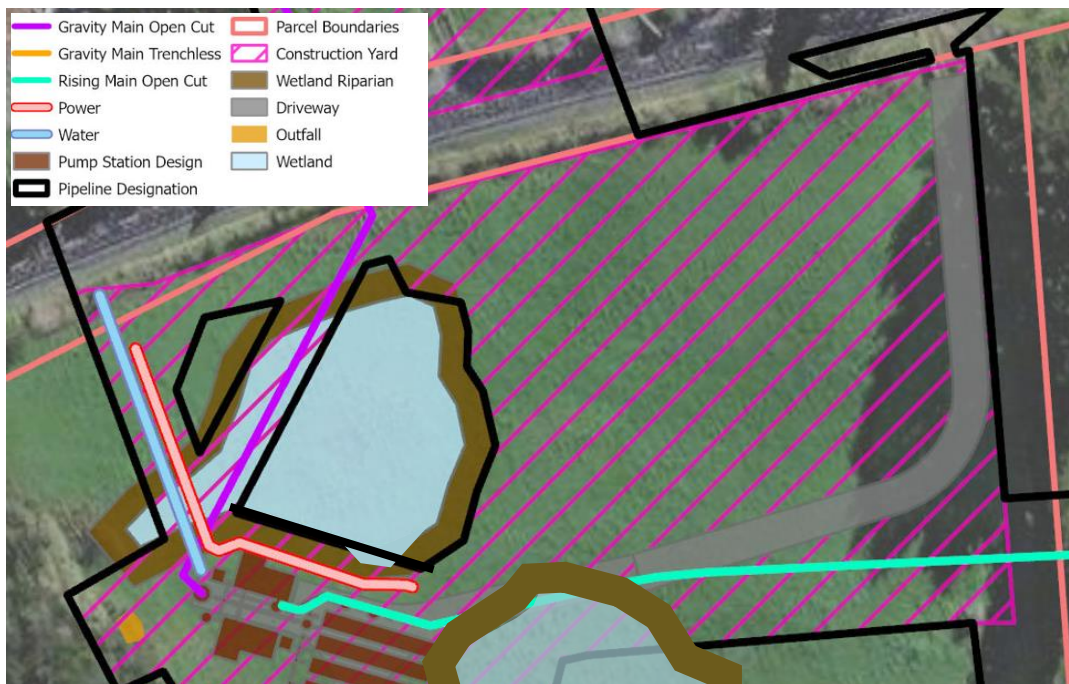


Figure 3-7. Permanent and temporary access to the pump station (shown in grey)

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 m³) 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 6.

4.1 Construction duration

The Project is expected to take approximately 30 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 areas⁸. 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 station⁹.

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 4-1)
- Contractor Area North to support the gravity main works (see Figure 4-2)
- Contractor Area Hub to support the pump station works (see Figure 4-3)
- Contractor Area South to support the rising main works (see Figure 4-4)

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.

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).

⁸ 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.

⁹ This will be disestablished if / when a permanent access is constructed as part of the Oyster Capital works.

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

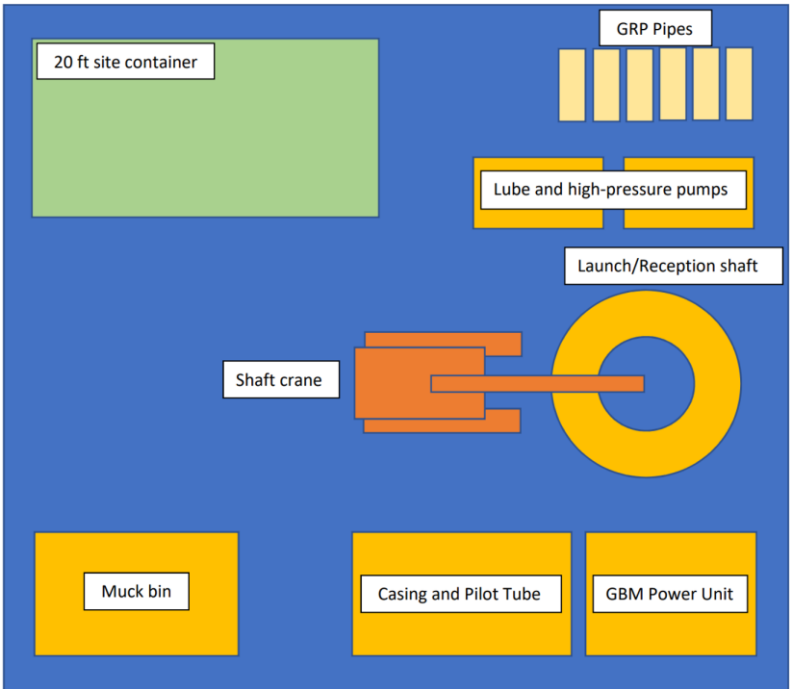


Figure 4-1. Approximate layout of the Tamiro Road stormwater embankment trenchless construction laydown area

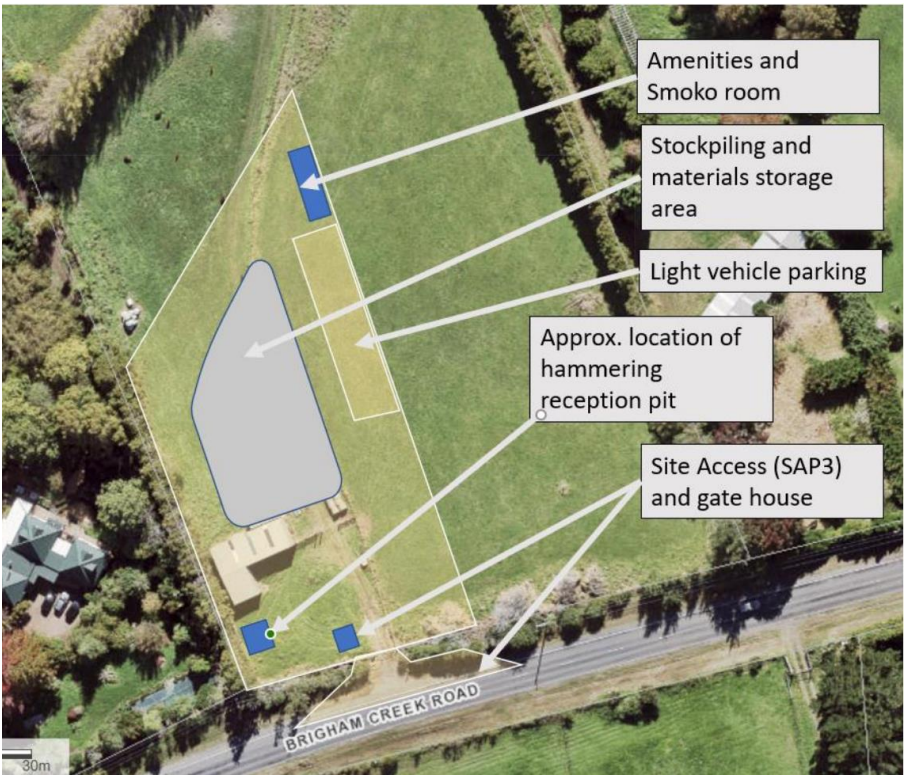


Figure 4-2. Contractor Area North – Approximate Layout



Figure 4-3. Contractor Area Hub Approximate Layout

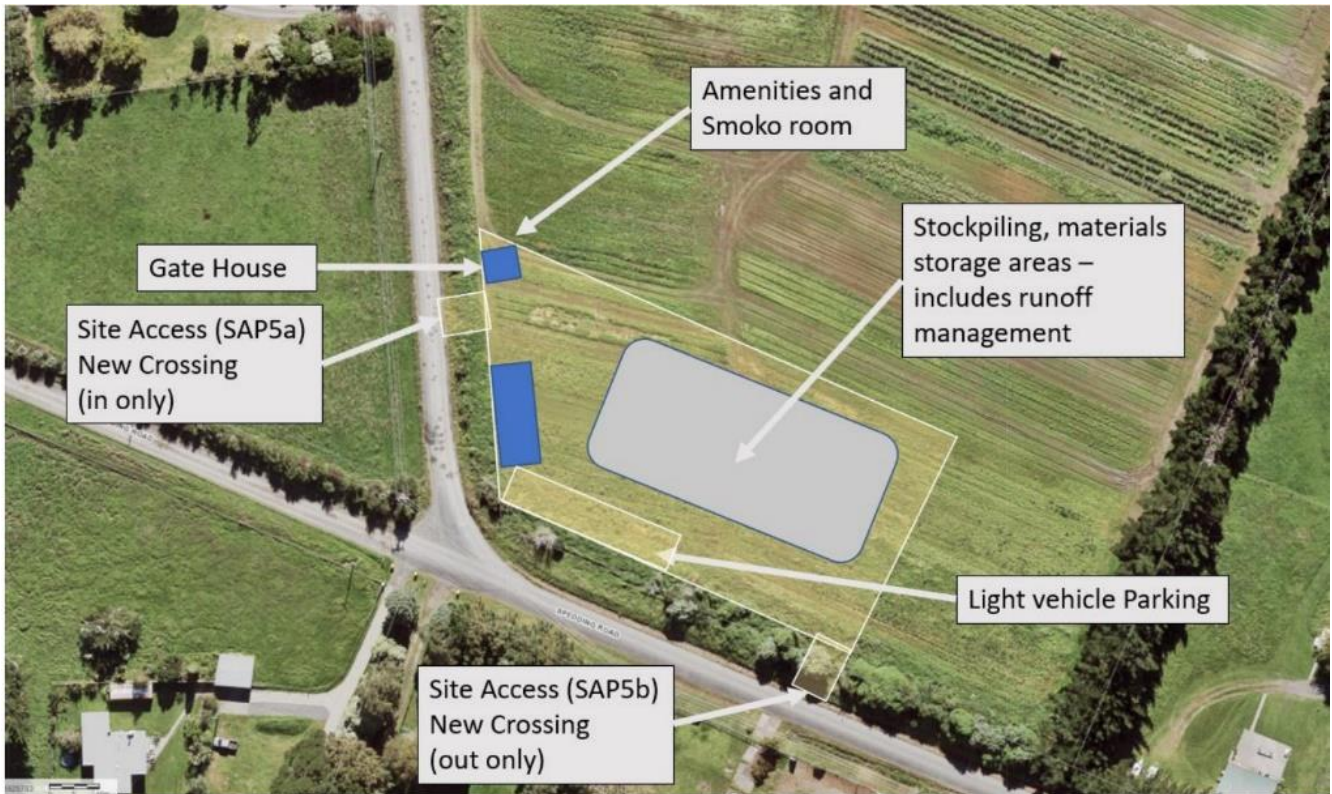


Figure 4-4. Contractor Area South – Approximate Layout

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 F.

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; and
- 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 30 months to complete.

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 be 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

Prior to excavations beginning a temporary sheet pile wall consisting of approximately 5 m long sheet piles will be installed around the southern boundary of the wetland (refer to Figure 4-5 below). The purpose of the sheet pile wall is to minimise the flow of groundwater from the wetland into the pump station construction area to the extent practicable. The sheet piles will be driven through the existing clay material and into the existing sandstone layer by approximately 0.5 m to 1 m, depending on the existing ground conditions. The sheet piles will be clutched together where possible (noting that this may not be possible in all locations due to the curved shape of the wetland perimeter). A temporary access road will be constructed to the south of the sheet piled wall.

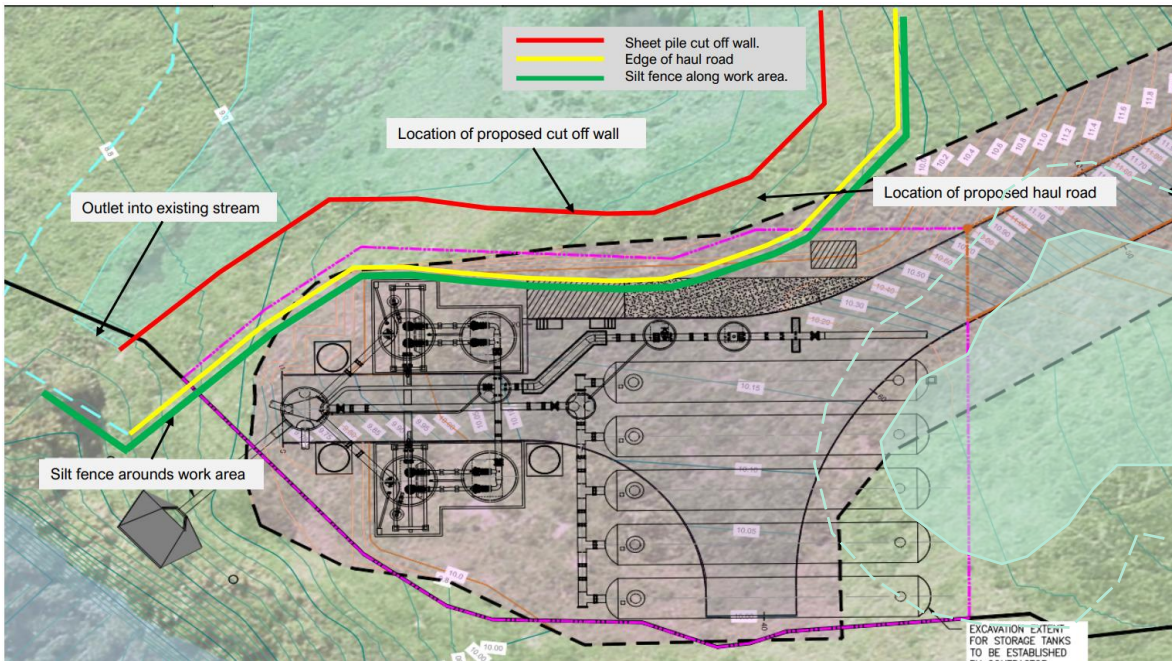


Figure 4-5. Sheet pile cut off wall.

Prior to excavations beginning, approximately 250 holes will be drilled into the underlying sandstone material over a period of approximately 28 days. This will enable the sandstone material to be more easily removed using a standard excavator. The holes will then be progressively backfilled with excavated material to minimise dewatering requirements.

Staged works will then commence to construct the inlet manhole and wet wells and connecting pipes. Excavation works for each component will proceed in two stages, including an outer excavation to a depth of approximately 3.5 m to remove the clay layer above the sandstone, followed by an inner excavation to excavate the sandstone layer to the design depth (including over excavation as required) (refer to Figure 4-6 and Figure 4-7 below).

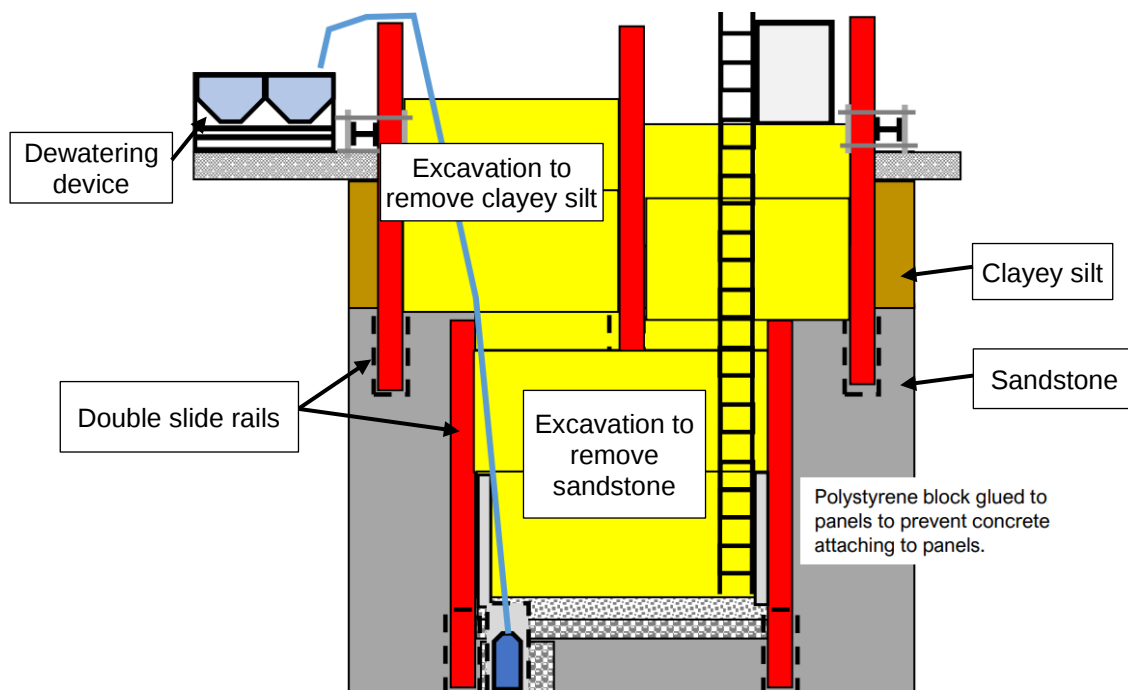


Figure 4-6. Staged excavations to install pump station inlet manhole and wet well components

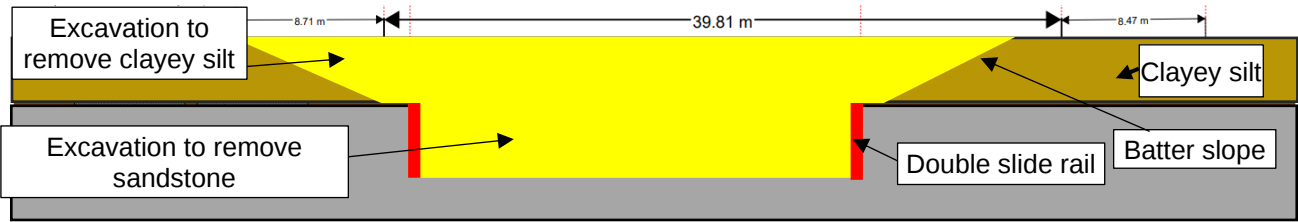


Figure 4-7. Staged excavations to install pump station storage tanks

For installation of the inlet and wet wells, both the outer and inner excavations will be supported by a dual double slide rail support system as illustrated in Figure 20 and Figure 4-8. For installation of the storage tanks, the outer excavation area will have a batter slope of generally 2:1, whilst the inner excavation area will be supported by double slide rails, as illustrated in Figure 4-7. An overall schematic of the earthworks is provided in Figure 4-9

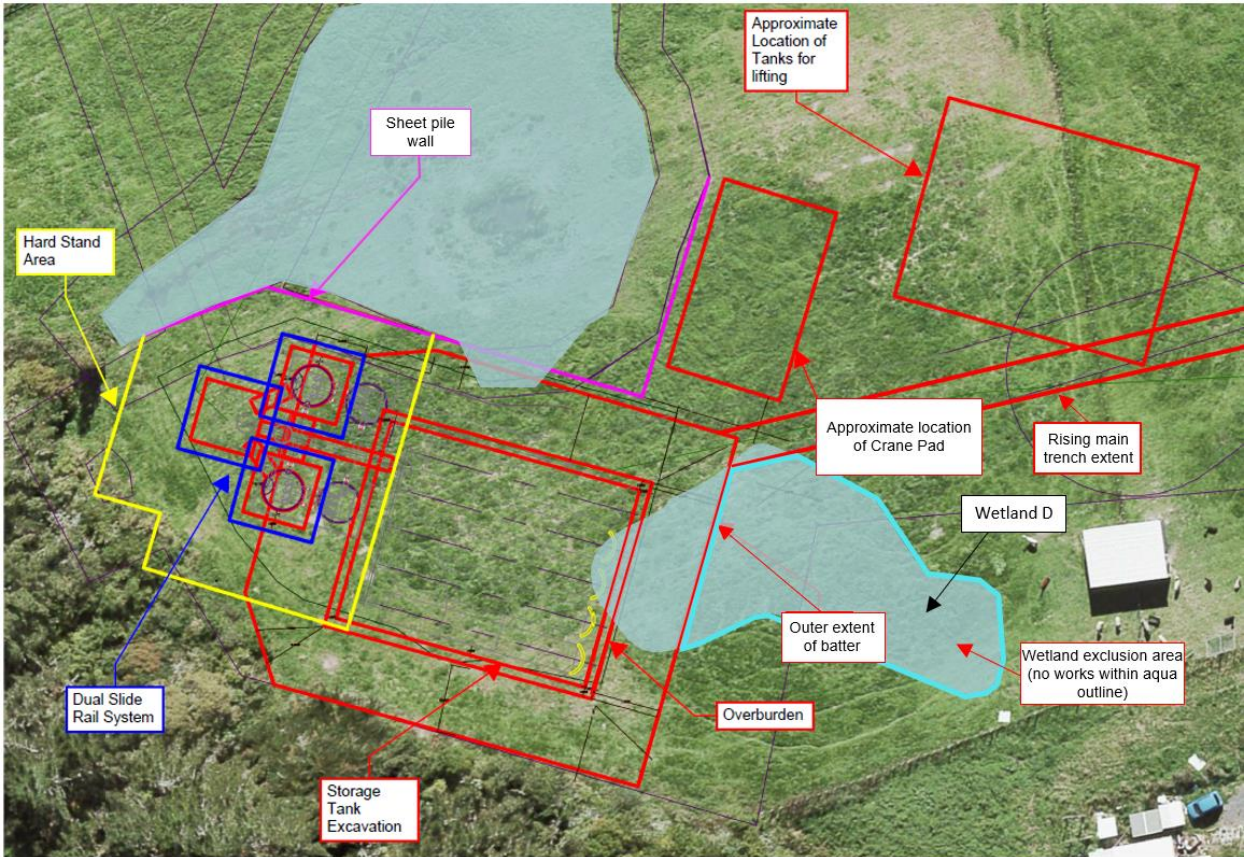


Figure 4-9, and the stages of excavations and design depths for each component (with allowance for over excavation as required) are provided in Table 2. Each stage will be opened and excavated, the pump station element will be constructed, then the stage will be partially or fully backfilled prior to opening the next stage.



Figure 4-8. Example of the double slide rail trench support system (Source: https://www.shorenz.co.nz/Double_Rail_Systems.php)

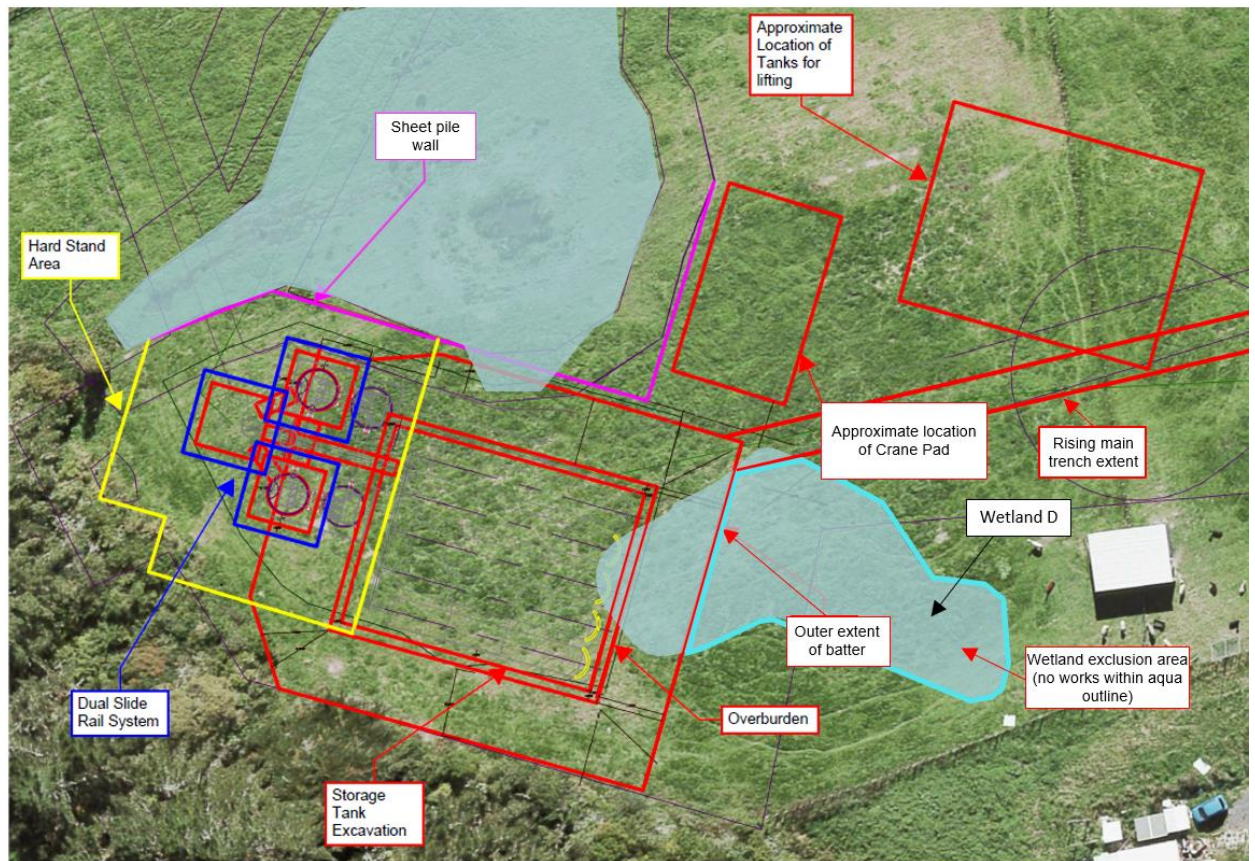


Figure 4-9. Overall schematic of earthworks

Table 2. Stages of excavation, construction, and backfilling for construction of the Pump Station site

Stage	Description	Days	Approx. Area (m ²)	Approx. Volume (m ³)	Approx. Depth (mbgl)	Comment
1	Drilling holes into sandstone	1-1.5 Months	N/A	N/A	N/A	Drill holes to design depth of each component to help in removal of sandstone material.
2	Inlet manhole	1.5 – 2 months	80	450	7.3	Inlet Manhole is completely backfilled before next excavation is commenced
3	Pump station 1	1 Month	80	500	9.5	PS1 is 100% backfilled before PS2 is commenced
5	Pump station 2	1 Month	80	500	9.5	PS2 is 100% backfilled before Storage Tank excavation is commenced.
6	Bulk excavation	15 days	2,000	5,200	3.5	Batter slopes will be stabilised with grass. Includes crane pad.
7	Storage tanks	119 days	550	2,000	7.2	Excavation for Storage Tanks.
8	Chambers	40 days	150	500	3.5	Individual excavations required for each of the chambers.
9	Backfill bulk excavation	10 days	2000	5,200	3.5	Reinstate to ground level
Total		30 months	3000	14,350	N/A	Total earthworks footprint does not increase, as earthworks area for excavations are within designation boundary.

Excavated material is proposed to be stockpiled locally to the pump station site within the Contractor Area Hub yard stockpiling area. Depending on the competence of the material, some material may be retained on site for backfilling, with the remainder of material carted off site for disposal at a clean fill site.

Dewatering for the pump station works will continue for up to 30 months.

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 Existing SSMH 2695980 and existing SSMH 2696093 at the existing Whenuapai Village pump station (refer Figure 3-1), 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 sections between the existing Whenuapai Village pump station and 28 Brigham Creek Road, and 20-22 and 23-27 Brigham Creek Road will also be trenched if trenchless construction methods fail (refer to Section 4.5 and Section 4.6 below). In general, 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 or slide rails used for support as 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 4-10. 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 4-11).



Figure 4-11. 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 4-12). 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 4-12), 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.

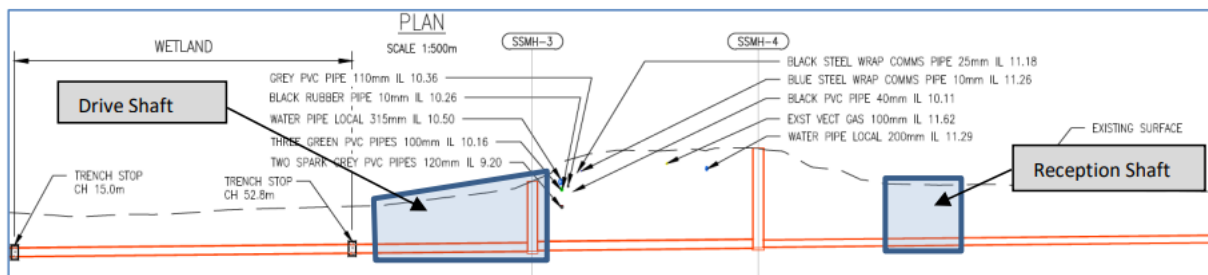


Figure 4-12. Indicative cross section of pipe hammering drive set up for the Brigham Creek Road works (Source: Brian Perry Civil)

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 4-13). The diversion channel will be used to provide stream base flows and fish passage during construction and will be in place for approximately 12 weeks.

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.

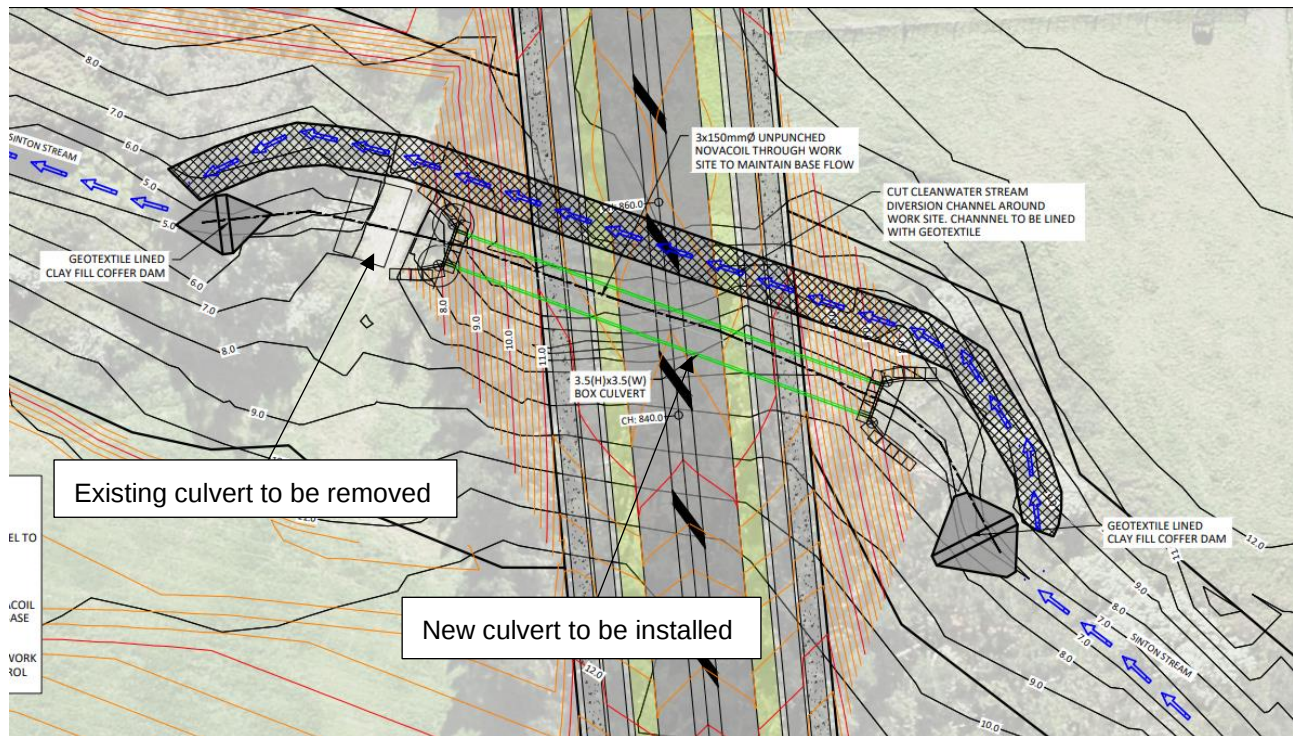


Figure 4-13. Temporary stream diversion plan for Sinton Stream culvert installation (snip from Drawing No. SK016B, Crang Civil Consulting Engineers, provided in Appendix A).

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

The works to install the gravity main, pump station and rising main will require removal of approximately 1,710 m² of non-pest vegetation from the riparian areas of Sinton Stream and Slaughterhouse Stream.

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

Table 6. Riparian vegetation alteration and removal required for works

Works		Gravity main	Pump Station	Rising main	Total
Trees and vegetation removed from the riparian margin	Non-pest trees >=6m in height	4	3	40	47
	Non-pest trees <6m in height	1	1	0	2
	Approximate area of non-pest riparian vegetation removal (m ²)	60	50	1,600	1,710
	Pest species trees	0	30	0	30

Works in root zone of trees in the riparian margin	43	4	N/A	47
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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	1,700
	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	3,000 m ²	14,350
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 approximate earthworks required*		N/A	47,000	38,000

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

5 Reasons for Consent

This section sets out the resource consents required for the project. An assessment of activities which can be undertaken as a Permitted Activity is provided in Appendix G.

5.1 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.

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 using trenched methods, and the pump station and rising main will be partially within Wetland D. A temporary hardstand area and access road is also required within the wetland works area in order to provide a stable works platform to excavate the trench and install the pipe. Installation of the pipe, and construction of the temporary hardstand and access road require land disturbance and vegetation removal within the bed of the wetland. Installing pipelines and pump stations 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 - up to 7 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 30 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.

Rule	Activity status	Comment
		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) Alteration and removal of greater than 50 m ² of vegetation and of trees greater than 6 m in height or 600 mm in girth from the riparian zone	Restricted Discretionary Activity	Approximately 1,710 m² non-pest vegetation will be removed from the riparian area, including 47 non-pest trees > 6 m in height, and 2 non-pest trees < 6 m in height. Works also include the disturbance of the root zones of 47 protected trees. Alteration and removal of non-pest trees from the riparian area, and removal of greater than 50 m² of non-pest vegetation 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 m² at any one time. Earthworks exceeding 2,500 m² 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 1,000m²), will exceed 2,500 m² at any one time. Earthworks exceeding 2,500 m² in the Sediment Control Protection Area require resource consent for a Restricted Discretionary Activity under Rule E26.5.3.2(A107).
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 m².

Rule	Activity status	Comment
		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).

5.2 National Environmental Standards for Freshwater (NES:F)

5.2.1 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.

An assessment of activities which can be undertaken as a Permitted Activity under the NES:F is provided in Appendix G.

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 the pump station and rising main in Wetland D; - 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 construction of the gravity main and rising main, and as part of the erosion and sediment control measures for the gravity main, pump station, and rising main works*; and - discharge of water within a 100 m setback of a natural wetland for the purposes of maintaining the hydrology of Wetland C and Wetland D during construction*.
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.		
45(5) The discharge of water into water within, or within a 100 m setback from, a natural inland wetland.		

** The taking and discharge of water will occur at the same time so that in conjunction, the activity is not anticipated to change the water level range or hydrological function of the wetland. Nevertheless, consent is sought as a precautionary approach.*

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

5.3 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.

5.4 Authorised Activities

Watercare holds a region wide wastewater network discharge consent (NDC) 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 proposed emergency overflow outfall to Sinton Stream is provided for by the NDC as it is located by the *Proposed Future Overflow Location N42* within the *Indicative Future Urban Area* (as shown in Figure 5-1 below).

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 in accordance with the requirements of the NDC. Watercare has also received Asset Owner Approval from Healthy Waters to discharge to the stream (refer to Appendix I).

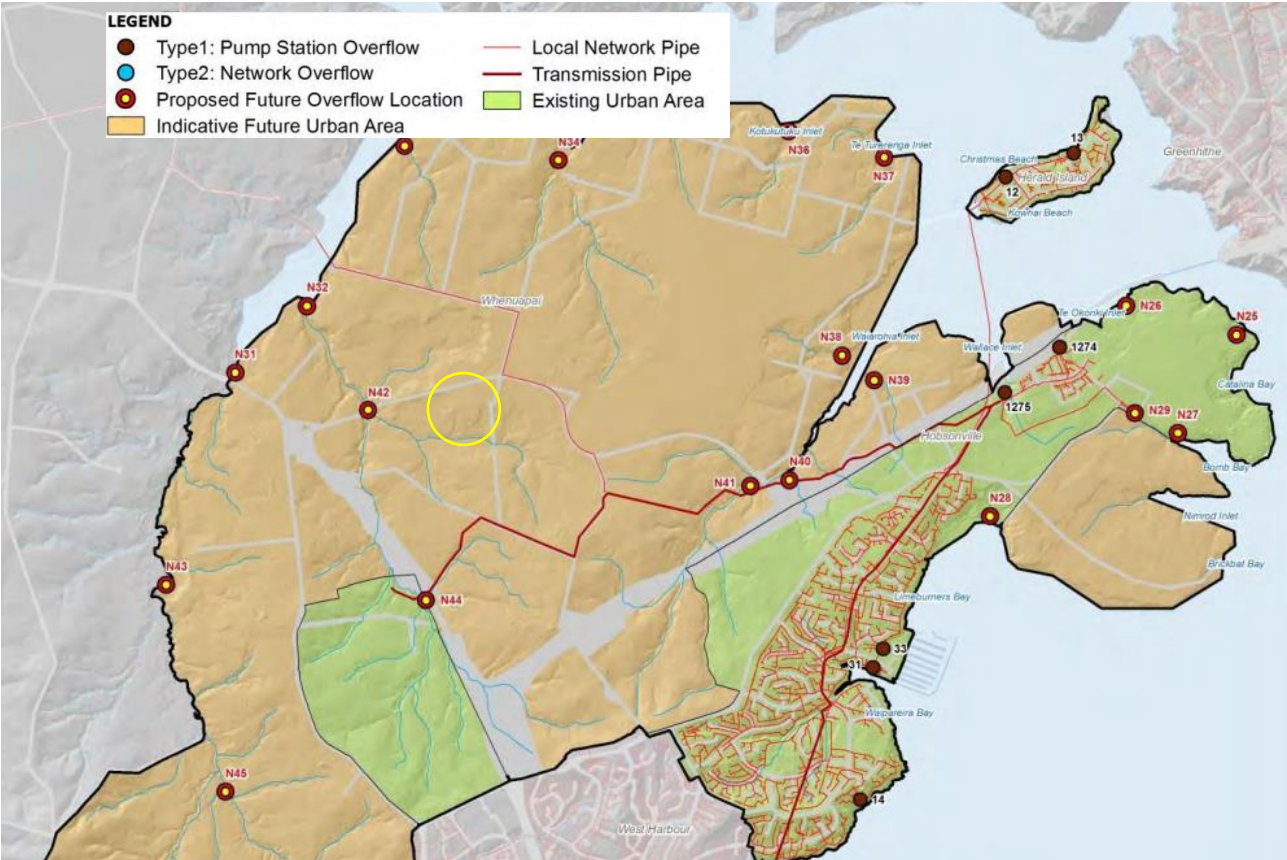


Figure 5-1. Map of the Existing Network and Indicative Future Urban Areas – Upper Harbour west Catchment (Source: NDC Consent Attachment 1: Maps of the Existing Network and Indicative Future Urban Areas)

6 Assessment of Effects on the Environment

6.1 Overview

Section 104(1)(a) and clause 2(3) of schedule 4 of the RMA require an assessment of the activity's effects on the environment. The detail of this assessment should correspond with the scale and significance of the effects that the activity may have on the environment.

The assessment in the following sections identifies and assesses the types of effects that may arise from the proposed works provided for under this application. This assessment also outlines the measures that Watercare proposes to avoid, remedy or mitigate any potential adverse effects on the environment.

This assessment draws on information provided in the technical reports contained within Appendices C – F and J – M and addresses the following effects:

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)

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

- Groundwater and Settlement Effects
- Arboricultural Effects
- Ecological Effects (discharge of sediment, removal of vegetation, dewatering, fauna impacts)
- Land Disturbance Effects

6.2 Positive effects

The proposed works have a number of 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).

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

6.3 Ecological Effects

An Ecological Impact Assessment has been undertaken for the project and is provided in Appendix C. It assesses the construction and operational impacts on streams, wetlands, and native fauna of the earthworks, vegetation removal, culvert installation, and dewatering activities. These effects are summarised in the following sections, with the details set out in Appendix C.

6.3.1 Streams

Earthworks

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

Earthworks are required within the riparian area of Sinton Stream to install the proposed 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 F. 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.

Riparian vegetation removal

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, the following replacement planting is proposed.

- The 5 trees removed from Slaughterhouse Stream to install the gravity main will be replaced with 8 trees, with replanting to be undertaken in the riparian area of 28 Brigham Creek Road;
- The 4 trees removed from Sinton Stream to install the pump station will be replaced with 8 trees as outlined in the indicative planting plan provided in application (refer DWG 2013649.001, Appendix A to the AEE);
- The approximately 40 trees over 1,600 m² to be removed from Sinton Stream to install the culvert will be replaced with an approximately 10-20 m wide planted riparian strip to a total area of 6,000 m² alongside the true right bank of Totara Creek, from the Sinton Stream confluence. The planting will align with that proposed in the Spedding Block – Stage 1 Application by Oyster Capital (refer to the Sinton Stream Culvert Compensation plan provided in Attachment K).

Reinstatement of plantings and the removal of any exotic weed species present will provide appropriate management and remediation of any vegetation loss during the works, and assist to improve and maintain the ecological and indigenous habitat functionality of the stream habitat. Over the medium to long term time scales, the plantings are expected to result in a net positive ecological enhancement of the riparian areas. In addition, it is considered that over the long term, the replacement plants will also provide environmental benefits for stormwater reduction and carbon sequestration.

With the mitigation measures in place, the overall level of effect of riparian vegetation removal is assessed to be low.

Culvert installation

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, an area which is 297 m long and 20 m wide on both sides of Sinton Stream below the culvert, and an area which is 247.5 m long and 10 m wide on the true left bank of Sinton A, will be replanted. These measures will provide for the health and well-being of the stream and enhance ecological connections and the habitat of the stream. The location and planting details are consistent with the Oyster Capital works (refer to Appendix J). 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.

6.3.2 Wetland C, Wetland D, and Wetland A

Construction of the pump station, and installation of the gravity main and rising main, will require temporary earthworks, groundwater diversion and dewatering, and vegetation removal within and within close proximity to Wetlands C and D. The effects of these works on Wetlands C, D and A are outlined in the sections below.

Wetland C

Earthworks in proximity to Wetland C has the potential to result in sediment discharge entering the wetland, temporarily degrading the wetland ecological values and functioning. To mitigate this, erosion and sediment controls will be installed around earthworks areas in line with GD05, including placement of bunting to prevent works from encroaching outside of the designated area as described in Section 6.6 below and the Erosion and Sediment Control Plan in Appendix F. Following construction, the disturbed areas will be reinstated. 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.

The earthworks and vegetation removal within and in proximity to the Wetland C also has the potential to alter hydrological conditions including influencing the vegetation communities and affecting the ecological value and functioning of the wetland during construction. In order to minimise the changes to the hydrology of Wetland C during construction, a sheet pile cut-off wall will be constructed around the northern edge of the pump station construction area (refer to Figure 4-5). This will impede the flow of groundwater from the wetland into the construction area, minimising potential drainage effects. Further, during construction, changes to hydrology will be minimised by recharging treated, dewatered groundwater from the excavations back into the wetland via a drip irrigation system. An adaptive management approach is proposed, with the system designed to maintain the winter extent of the wetland throughout the construction period. The condition of the wetland, including extent, vegetation communities, and soil moisture content, will be regularly monitored and the proposed irrigation adapted as required in accordance with the Wetland Monitoring and Reinstatement Plan (see Appendix K). During construction, if the vegetation communities and ecological value of the wetland show a 20% change from the baseline condition, further investigation into the potential causes will be undertaken, and recharge rate adjusted as required.

Once construction is complete, the disturbed areas of the wetland will be replanted with appropriate species to reinstate the ecological value and restore the functioning of the natural wetland. A Planting Plan with details of proposed planting to be completed in the riparian area of Wetland C is provided in Figure 3-3, and Drawing 2013649.001 in Appendix A. A further planting plan to cover proposed planting of the trenched area will be completed and submitted to Auckland Council prior to construction.

The EclA concludes that 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 either wetland 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 wetlands (Refer to Appendix D). Given this, any potential for alteration of hydrology because of the permanent occupation of the pipe has been assessed as negligible.

Overall, considering the proposed mitigation, monitoring and reinstatement, the EclA concludes that the values and functioning of the Wetland C habitat affected by construction will be sufficiently restored, with any residual impacts on Wetland C assessed to be very low.

Wetland D

As described in Section 2.3.4, Wetland D was identified during recent site investigations in August 2023 (refer EclA Appendix C) and further confirmed as a wetland in October 2023 (refer Appendix D). It has been assessed as an ephemeral wetland, which has formed and expanded due to the change in land use and abnormally high rainfall conditions over the last 7 to 8 months.

As with Wetland C, potential impacts on Wetland D during construction include: dewatering, with the potential for hydraulic conditions to be altered impacting the health of the wetland; and the physical excavation and disturbance within the wetland during construction.

During dewatering, it is proposed to undertake a similar adaptive management and monitoring approach as described previously for Wetland C, so as to maintain, as far as practical, the hydraulic conditions of the wetland during construction. The condition of the wetland, including extent (within the area not excavated), vegetation communities, and soil moisture content, will be regularly monitored and the proposed irrigation adapted as required in accordance with the Wetland Monitoring and Reinstatement Plan (see Appendix K). During construction, if the vegetation communities and ecological value of the wetland show a 20% change from the baseline condition, further investigation into the potential causes of the change will be undertaken. If the change in condition is caused by changes to wetland hydrology, then the rate of groundwater recharge into the wetland will be adjusted as required.

In terms of physical works, up to 140 m² of the wetland will require excavation in order to construct the pump station. Once construction is complete, the area above the storage tanks will be first capped with a low permeability layer to allow water to pool, followed by a permeable layer which allows for water infiltration. The exact materials will be confirmed by a geotechnical specialist prior to reinstatement works commencing (refer to the Wetland Monitoring and Reinstatement Plan in Appendix K for further information). The disturbed areas of the wetland replanted with appropriate species to improve the ecological value and restore the functioning of the natural wetland ecosystem. A planting plan will be completed and submitted to Auckland Council prior to construction.

Due to the extent of excavation within Wetland D, and potentially altered soil profile of reinstated soils, it is uncertain whether the proposed reinstatement measures will achieve the pre-development extent and value of this wetland post construction. Therefore it is proposed to undertake post-construction monitoring of the Wetland for a period of up to two years. If the pre-development extent and value of the wetland is not able to be achieved at the end of the monitoring period, then offset planting and restoration will be undertaken of the wetland at 32 Mamari Road, so that there will be no overall loss of extent and value of wetlands within the wider project area.

Wetland A

Wetland A is outside of the zone of influence of the works, such that no impact on Wetland A is anticipated.

6.3.3 Fauna

Fish

a. Injury or mortality of freshwater fish species

The proposed works to install the culvert within Sinton Stream have the potential to impact the native fish present in the stream either directly through injury or mortality, or indirectly through habitat degradation.

Sinton Stream contains several native fish species, including At-Risk species. 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.

b. Temporary reduction of fish passage

Construction of the culvert within Sinton Stream requires the stream to be temporarily diverted to create a dry working environment. The proposed stream diversion may temporarily reduce fish passage through the stream, 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, and where required implement a bat management plan (BMP). 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.

6.3.4 Summary

The proposed works have the potential to impact the freshwater environment of Sinton Stream, Wetlands C and D, and associated freshwater and terrestrial native fauna. This includes physically disturbing the stream and wetland areas, potentially impacting their hydraulic function, and potentially impacting a range of freshwater fish species and bats that have high ecological value. Without management there is potential for the proposed works to have moderate to high effects.

Mitigation and management measures have been proposed to minimise potential adverse impacts. This includes implementing the following mitigation measures:

- Native fish salvage and management plan
- Bat management
- Lizard management
- Bird management
- Wetland recharge, monitoring and reinstatement for Wetlands C and D
- Riparian planting
- Stream compensation

With the proposed effects management measures in place, the Ecological Impact Assessment concludes that the overall level of ecological effects of the proposed construction works will be low. The effects of the

works are therefore considered to be no more than minor, and will be able to be mitigated and managed appropriately.

6.4 Arboricultural effects

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

6.4.1 Summary of tree removals

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

- Removal of 43 protected trees from the riparian area of Sinton Stream, and 4 protected trees from the riparian area of Slaughterhouse Stream.
- 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.

6.4.2 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 with native species as outlined in 6.3.1 above. The location and timing of the replacement planting will be coordinated with Oyster Capital works where appropriate to avoid the need for future removal and replanting (refer to the Sinton Stream Culvert Compensation plan provided in Attachment K).

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 minimised 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.

6.4.3 Conclusion

Overall, it has been assessed that there are no significant individual trees that should be retained from the works areas.

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 less than minor, and will be able to be managed appropriately.

6.5 Groundwater settlement effects

A Geotechnical and Settlement Effects Report has been prepared for the project and is provided in Appendix D, 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 D). 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.

6.5.1 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.

6.5.2 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 <5 mm and a differential settlement of less than 1V:2000H (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.

6.5.3 Effects on underground services and roads

A number of underground services along Brigham Creek Road, and Brigham Creek Road itself, are within the zone of influence of trenchless construction works underneath Brigham Creek Road. The maximum total and differential settlements on third party underground services are assessed to be 18 mm and 1V:500H. At this level of total and differential settlement, the risk of damage to third party underground services is assessed to be low. The maximum total and differential settlements on Brigham Creek Road is assessed to be 28 mm and 1V:300H. Given that the existing roadway has already experienced movement resulting in some surface cracking and deformation, any effect and subsequent mitigation requirements for Brigham Creek Road during and following construction will be agreed in consultation between Auckland Transport (as the Asset Owner) and Watercare.

The existing water pipelines are owned by the applicant and effects on these are therefore not considered. As is standard practice, Watercare is required to gain Works Under or Works Over approval from asset owners prior to undertaking the works. Watercare will engage with the asset owners, including Auckland Transport, through this process to manage the risks, and establish suitable controls, including the specific monitoring and / or reinstatement requirements, for each asset.

6.5.4 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 low.
- The impact upon neighbouring groundwater bores is assessed to be negligible
- Any changes to base flows through Wetland C, and Sinton Stream, are likely to be low at most, and temporary so will return to baseline levels once dewatering is complete. No adverse effects from any changes to the base flow of Sinton Stream are anticipated. The effects of dewatering on the hydrology of the wetlands will be adaptively managed through a wetland recharge system, and monitored in accordance with the Wetland Monitoring and Reinstatement Plan as outlined in Section 6.3.2 and Appendix K.

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

A groundwater and settlement monitoring programme is proposed to be undertaken during construction to confirm the outcome of the assessment, and to monitor and manage any potential effects should they arise during dewatering. A Groundwater and Settlement Monitoring Plan has been developed for the project and is provided in Appendix M.

The Groundwater and Settlement Monitoring Plan proposes a number of settlement monitoring pins and ground monitoring points, accompanied by groundwater level monitoring. Alert and Alarm trigger levels are proposed, with the measures to be undertaken in the event that trigger levels are exceeded outlined below. The measures within the Groundwater and Settlement Monitoring Plan, including the location of settlement monitoring pins, will be confirmed with asset owners. A final Groundwater and Settlement Monitoring Plan will be prepared and provided to Council prior to construction.

6.5.5.1 Alert trigger levels:

- Council will be notified in writing within one working day of the trigger level being exceeded, with details of any actions being undertaken.
- All survey monitoring marks within 25 m of the affected monitoring marks will be surveyed to confirm the extent of deformation and exceedance of the Alert trigger.
- Monitoring data, as-built details and geology, will be reviewed, and compared against the assumptions made in the design analyses.
- A written report by a Chartered Professional Engineer will be submitted to Council for approval within one week of trigger level exceedance.
- If considered necessary, the monitoring frequency will be increased and / or a detailed contingency plan will be developed and submitted to Council

6.5.5.2 Alarm trigger levels:

In addition to the actions outlined above for alert trigger levels, the following actions will be undertaken in the event that Alarm trigger levels are exceeded:

- Further excavation or any other activity such as dewatering which has the potential to cause further deformations, will cease. Dewatering will not cease where this may result in the potential loss of ground instability in an excavation.
- A written report by a Chartered Professional Engineer which provides analyses of all monitoring data and any recommendations for remedial action will be submitted to Council for approval within one week of Alarm trigger level exceedance.
- Once approved by Council the recommendations shall be implemented.
- Dewatering and/or construction may be resumed only Auckland Council has given written approval for construction to continue.

6.5.5.3 Contingency Options

If any of the monitoring trigger levels are exceeded, the following additional contingency actions may also be undertaken, depending on the exact nature of the problem:

- In the event of building, culvert or ground deformation exceeding the monitoring trigger levels, actions may include one or more of reviewing pre-construction condition surveys followed by discussions with affected parties, groundwater injection, monitoring the rate of settlement, and checking public safety is maintained
- Contingency measures for the settlement of underground services shall be established with the asset owner

In addition, pre and post construction surveys are proposed to be carried out at 18 Brigham Creek Road.

6.5.6 Conclusion

Overall, it is considered that the potential for settlement as a result of groundwater dewatering is minimal, with only one property (18 Brigham Creek Road) 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 to the Groundwater and Settlement Monitoring Plan provided in Appendix M). Overall, it is considered that with these measures in place, potential groundwater diversion, dewatering, and ground settlement effects will be less than minor, and will be appropriately managed.

6.6 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.

6.6.1 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 F. This draft ESCP is intended to be updated by the contractor prior to commencement of construction, and once the final construction methodology has been confirmed. 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.

- 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.
- 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 F 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.
- Earth bunds, sandbags or similar within Sinton Stream to create a dry working area to install the culvert. The approach will depend on the flow volumes which are within the stream at the time of the works.
- 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.

6.6.2 Conclusion

Overall, with the above measures in place, the effects of the works will be no more than minor, and the works are able to be managed appropriately through the implementation of the ESCP.

6.7 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.

Without mitigation and management, the adverse effects of the proposed works will range from less than minor to more than minor. Mitigation and management measures are proposed to address potential adverse effects, including various management plans, monitoring activities, and re-instatement and re-planting of the project area following completion of work. With mitigation and management measures in place, the adverse effects associated with the project, including ecological effects, and temporary arboricultural, groundwater effects and land disturbance effects, will be less than minor on persons, and no more than minor on the environment.

7 Consultation and engagement

7.1 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 I.

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

7.2 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 (refer to Appendix I). 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.

7.3 Oyster Capital

Approximately 52 ha of future urban zoned land south of Brigham Creek Road was rezoned for light industrial use in March 2023 following a private plan change lodged by Oyster Capital.

Watercare has worked closely with Oyster Capital so that the new infrastructure is integrated with the future development. 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.

7.4 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	Working with Watercare on rental arrangement subject to valuation agreement.
26 Brigham Creek Road	24 Brigham Creek Limited	Gravity main through property	Support the project to service the site. Property agreement is currently being finalised with the landowner.
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. Property agreement is currently being finalised with the landowner.
31 Brigham Creek Road	Engkun Trustee Limited	Rising main through property	Support the project and provided written approval
32 Mamari Road	A. Nguyen, Y. Nguyen, M. Nguyen, C. Kelibitaka, & I. Ulm.	Rising main adjacent to property and construction yard	Support the project with formal lease agreement in place.

8 Notification Assessment

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

8.1 Public notification - Section 95A

Step 1: Mandatory public notification is required in certain circumstances

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)).

Step 2: If not required by step 1, public notification precluded in certain circumstances

Step 2 describes that public notification is precluded where all applicable rules and NES preclude public notification; or the proposal is only a controlled activity; or the proposal is for a restricted discretionary, discretionary, or non-complying boundary activity.

In this case, the applicable rules of the AUP and the NES-FW do not preclude public notification of the application, the activity does not have a controlled activity status and involves non-boundary activities. Public notification is not precluded under this step.

Step 3: If not precluded by step 2, public notification required in certain circumstances

Step 3 describes that where public notification is not precluded by step 2, it is required if a rule or NES requires public notification, or if the activity will or is likely to have adverse effects on the environment that are more than minor.

There are no relevant rules in the AUP or the NES-FW that require the application to be publicly notified. The AEE concludes that:

- The construction works will be temporary in nature.
- Groundwater effects on Wetlands C and D from dewatering can be adequately managed through an adaptive management approach involving groundwater recharge and an ongoing monitoring programme.
- Wetland D will be reinstated post-construction. If the pre-development wetland extent and values are not achieved 2 years after development is complete, then offset planting and restoration will be undertaken of an existing natural wetland at 32 Mamari Road to achieve no loss of wetland extent or values in the wider project area.
- 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.

Potential adverse effects will be avoided, remedied or mitigated through the methods outlined in Section 5 of this AEE report. With these management measures in place, the effects of the activity on the environment will be no more than minor.

Step 4: Public notification in special circumstances.

If an application has not been publicly notified as a result of any of the previous steps, under section 95A(9) RMA, the council is required to determine whether special circumstances exist that warrant it being publicly notified.

"Special circumstances" have been defined as "something...outside the common run of things which is exceptional, abnormal or unusual but less than extraordinary or unique. A special circumstance would be one which makes notification desirable despite the general provisions excluding the need for notification." (*Far North District Council v Te Runanga-a-Iwi o Ngati Kahu* [2013] NZCA 221 at [36]).

In this case, there are not considered to be any special circumstances existing that warrant the application being publicly notified. This is because the proposed activities, which include the construction of a pump station, break pressure chamber, pipelines and a culvert to service an area which is planned for urban development, are common activities for a network utility provider to undertake. The NPS:FM and NES:FW recognise the importance of infrastructure for enabling communities to provide for their wellbeing, and through the inclusion of Regulation 45 within the NES:FW, anticipate that there are instances in which infrastructure will be required to be located within and in proximity to wetlands. The AUP:OP recognises the importance of infrastructure through the objectives and policies of the Regional Policy Statement in Chapter B3. As the activities proposed within the application are common activities for network utility providers, which are anticipated and provided for within national direction, the regional policy statement and the regional plan, the application is not exceptional or unusual and does not present any special circumstances that warrant public notification.

Public notification conclusion

Having undertaken the tests in Section 95A, and as set out in the sections above, it is concluded that:

- Under step 1, public notification is not mandatory;
- Under step 2, public notification is not precluded;
- Under step 3, public notification is not required as it is not considered that the activity will result in effects which are more than minor; and
- Under step 4, there are no special circumstances which apply to the works.

It is therefore recommended that this application be processed without public notification.

8.2 Limited notification - Section 95B:

Step 1: certain affected groups and affected persons must be notified

Step 1 requires limited notification where there are any affected protected customary rights groups or customary marine title groups, or where there are affected persons to whom a statutory acknowledgement is made.

No such parties or persons will be affected by this proposal.

Step 2: if not required by step 1, limited notification precluded in certain circumstances

Step 2 describes that limited notification is precluded where all applicable rules and NES preclude limited notification; or the proposal is only a controlled activity; or the proposal is for a controlled activity (other than for the subdivision of land).

In this case, the applicable rules of the AUP: OP and the NES-FW do not preclude limited notification of the application, the activity does not have a controlled activity status and does not involve subdivision of land. Limited notification is not precluded under this step.

Step 3: if not precluded by step 2, certain other affected persons must be notified

Step 3 requires that, where limited notification is not precluded under step 2 above, a determination must be made as to whether any of the following persons are affected persons, and give notice to those persons:

- In the case of a boundary activity, whether an owner of an allotment with an infringed boundary is an affected person.

- In the case of any other activity, a person affected in accordance with section 95E.

The activity is not a boundary activity.

Under section 95E, a person is considered to be affected if the effects of the activity on that person are minor or more than minor (but not less than minor). In deciding who is an affected person under s95E:

- adverse effects permitted by a rule in a plan or NES may be disregarded;
- only those effects that relate to a matter of control or discretion can be considered (in the case of restricted discretionary or controlled activities);
- the adverse effects on those persons who have provided their written approval must be disregarded; and

Table 3 below identifies the properties and assets which are considered as being land within the site or on adjacent land, and whether the activity will result on effects which are minor or more than minor.

Table 3. Properties and assets which are within the works area or on adjacent land

Potentially affected party (property address / asset)	Potential effects which are minor or more than minor
Brigham Creek Estate Limited (18 Brigham Creek Road)	Nil identified
Nujud Aspell (20-22 Brigham Creek Road)	Nil identified
24 Brigham Creek Limited (26 Brigham Creek Road)	Nil identified
Natural Harmony Company Ltd (28 Brigham Creek Road)	Nil identified
Engkun Trustee Limited (31 Brigham Creek Road)	Nil identified
A. Nguyen, Y. Nguyen, M. Nguyen, C. Kelibitaka, & I. Ulm.(32 Mamari Road)	Nil identified
Vodafone New Zealand Ltd (Fibre Optic cable)	Nil identified
Vocus Group NZ Ltd (telecommunications cable)	Nil identified
Chorus New Zealand Ltd (telecommunication cable)	Nil identified
Vector Limited (gas line)	Nil identified
Auckland Transport (Brigham Creek Road)	Level of potential groundwater settlement effects to be determined by asset owner

As there are no persons or parties upon which the adverse effects will be minor or more than minor, there are no persons which are considered to be affected under Section 95(E).

Step 4: further notification in special circumstances

Step 4 requires the council to determine whether special circumstances exist in relation to the application that warrant notification of the application to any other persons not already determined as eligible for limited notification.

As set out in Section 8.1, there are no special circumstances warranting notification of the application to persons already determined as not eligible for limited notification. This is because the proposed works are for activities which are common for network utility providers to undertake, anticipated and provided for within national direction, the regional policy statement and the regional plan, and not exceptional or unusual.

Limited notification conclusion

Having undertaken the tests in Section 95B, and as set out in the sections above, it is concluded that:

- Under step 1, limited notification is not mandatory;
- Under step 2, limited notification is not precluded;
- Under step 3, limited notification is not required as no persons will be adversely affected by the works; and
- Under step 4, there are no special circumstances which apply to the works.

It is therefore recommended that this application be processed without limited notification.

9 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.

9.1 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.

9.1.1 Actual and potential effects on the environment

Permitted baseline

In accordance with sections 104(2) of the RMA, when forming an opinion for the purposes of subsection (1)(a), a consent authority may disregard an adverse effect of the activity on the environment if a national environmental standard or the plan permits an activity with that effect. This includes activities that form part of the proposal that could be undertaken as of right as well as other permitted activities that could be undertaken on the site, provided these are realistic activities which could be reasonably expected to be undertaken.

An assessment of activities which can be undertaken as a Permitted Activity is provided in Appendix G. In summary, permitted activities which can be undertaken for the project include:

- Discharge of groundwater onto or into land and / or into water for the purpose of dewatering trenches or other excavations (E4.4.1(A5))(AUP:OP), for the discharge of groundwater associated with excavation of the pump station and trenches;
- Dewatering or groundwater level control associated with a groundwater diversion permitted under the Unitary Plan (E7.4.1(A17))(AUP:OP), for dewatering of trenches, manholes, and air valve and connection chambers for a period of less than 30 days;
- Diversion of groundwater caused by any excavation or tunnel (E7.4.1(A27))(AUP:OP) for ground diversions associated with construction works which are exempt from standards 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;
- Wastewater facility that is for the primary purpose of pumping or transfer or storage of raw or partially treated wastewater (E14.4.1(A166))(AUP:OP) for construction of a pump station which has an emergency storage of 700 m³ within an enclosed tank, which is less than the permitted activity threshold of 4,000 m³, and a break pressure chamber which does not provide for wastewater storage;
- Pest plant removal (E26.3.3.1(A74))(AUP:OP), for removal of pest trees from the riparian area of Sinton Stream; and
- The placement and use of a culvert in, on, over, or under the bed of any river (Regulation 70)(NES:FW), which meets permitted activity standards.

As each of these activities can be undertaken as of right, any effects arising from these activities have been anticipated by the AUP: OP and the NES:FW.

Notwithstanding this, other consents are required to facilitate the construction and implementation of the Project as a whole, therefore the application does not rely on the permitted baseline, rather has assessed the effects and incorporates mitigation and management measures so that any effects of the Project as a whole on persons is less than minor, and no more than minor on the environment.

Existing environment

The effects of the Proposal must be assessed against the existing "environment". The "environment" in s104(1)(a) RMA includes:¹¹

- What exists in the environment at the time the application is considered, i.e. what you can see; and
- The future state of the environment as it might be modified:
 - by the utilisation of rights to carry out permitted activities under a district plan; and
 - by the implementation of resource consents which have been granted at the time a particular application is considered, where it appears likely that those resource consents will be implemented.

The existing environment has been set out in Section 2 of this report. 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, streamworks, works within wetlands, vegetation removal, and groundwater dewatering.

The following sections assess the project under Section 104.

9.1.2 Applications that relate to a wastewater network – section 104(2D)

When considering a resource consent application that relates to a wastewater network, as defined in section 5 of the Water Services Act 2021 (WSA 2021), Section 104(2D) requires that a consent authority:

- Must not grant the consent contrary to a wastewater environmental performance standard made under section 138 of that Act; and
- Must include, as a condition of granting the consent, requirements that are no less restrictive than is necessary to give effect to the wastewater environmental performance standard.

The application relates to a wastewater network under the WSA 2021, however there are no standards under s138 that apply as at the date of this application.

9.1.3 Section 104B - Determination of applications for discretionary or non-complying activities

Section 104B of the RMA states that a council, when considering an application for a resource consent for a discretionary activity or non-complying activity:

- may grant or refuse the application; and
- if it grants the application, may impose conditions under section 108.

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

9.2.1 National Policy Statement for Urban Development (NPS-UD)

The NPS-UD seeks to ensure that New Zealand has well-functioning urban environments that enable all people and communities to provide for their social, economic and cultural wellbeing, and for their health and safety, now and into the future. Policy 6 requires that when making planning decisions that affect urban environments, decision-makers have particular regard to the benefits of urban development that are

¹¹ Queenstown Lakes District Council v Hawthorn Estate Limited CA45/05.

consistent with well-functioning urban environments, and any relevant contribution that will be made to realising development capacity.

Comment:

Wastewater infrastructure is essential for providing for well-functioning urban environments. The Project is required to enable the development capacity of the Spedding Block, which was recently live zoned for industrial use through Plan Change 69, to be realised. More broadly, the project will provide the necessary wastewater infrastructure network to service up to 10,200 dwellings, thus unlocking land within the wider Whenuapai catchment for development. The Project is therefore a relevant contribution to realising the urban development capacity of Whenuapai.

9.2.2 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.

Comment:

The proposed works are required to increase capacity of the wastewater reticulation network in order 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 works require temporary access across Sinton Stream for construction access, and permanent access across Sinton Stream for the rising main. 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. The culvert has been designed to minimise the effects on freshwater habitats by providing for fish passage.

The proposed works have also 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 Wetland C 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. Due its recent formation and identification and ephemeral nature, effects on Wetland D have not practicably been able to be avoided. The effects have been minimised through minimising the construction footprint within the wetland, including the careful siting of cranes, material storage, and sediment control devices outside of the wetland.

The pump station has a functional and operational need to be in its proposed location adjacent to the wetlands as described in detail in Appendix N, and summarised below:

- The location of the pump station is centrally located and at one of the lowest parts of the catchment.
- As a gravity pump station, it is required to be at the lowest part of the catchment so as to maximise wastewater gravity flows to the pump station. This enables wastewater flows from the catchment to flow through the gravity pipework to the pump station and reduces the amount of pumping and the length of rising main which is required to reach the main trunk. The reduction in rising main length reduces the potential for septicity of the wastewater.
- Being centrally located enables the pump station to accept some future gravity flows from future pipelines and further removes the need for additional pump stations and utility network complexity.
- Wetlands and streams are naturally at the lowest part of the catchment therefore it is not unexpected that the pump station and gravity pipeline are located within proximity of these features.
- The pump station requires a suitable receiving environment nearby for an emergency overflow point. Therefore, it is necessary for it to be located within close proximity to a stream.

Overall, and as set out in Appendix N, there is functional need for the project to be located and operated in this environment, and given the significant improvements to the reduction in wastewater overflows as a result of the new infrastructure, the project is considered consistent with the objectives and policies set out in the NPS:FM.

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.

9.2.3 National Policy Statement for Indigenous Biodiversity (NPS:IB)

The NPS:IB applies to indigenous biodiversity in the terrestrial environment, and recognises that the health and wellbeing of people and communities are dependent of the health and wellbeing of indigenous biodiversity, and in return people have a responsibility to care for it and nurture it. The overall objective of the NPS:IB is to maintain indigenous biodiversity so that there is at least no overall loss in indigenous biodiversity, including by protecting and restoring indigenous biodiversity as necessary to achieve the overall maintenance of indigenous biodiversity, whilst providing for the social, economic and cultural wellbeing of people and communities now and in the future. The policies which are considered most relevant to the application include:

- Policy 3: A precautionary approach is adopted when considering adverse effects on indigenous biodiversity;
- Policy 8: The importance of maintaining indigenous biodiversity outside SNAs is recognised and provided for;
- Policy 10: Activities that contribute to New Zealand's social, economic, cultural, and environmental wellbeing are recognised and provided for as set out in this National Policy Statement; and
- Policy 14: Increased indigenous vegetation cover is promoted in both urban and nonurban environments.
- Policy 15: Areas outside SNAs that support specified highly mobile fauna are identified and managed to maintain their populations across their natural range, and information and awareness of highly mobile fauna is improved.

Comment:

Initial lizard and bat surveys will be undertaken at works sites to identify whether lizards and / or bats may be present. Where lizards or bats are detected at the site, an LMP and / or BMP will be developed and implemented. Vegetation clearance will be undertaken outside of bird nesting season, or surveyed for the presence of bird nests prior clearance. Riparian planting which is removed for the works will be replaced on a 1.5:1 ratio or greater, providing for an increase in indigenous vegetation cover in the medium to long term. As outlined in the Ecological Impact Assessment provided in Appendix C, a section of Sinton Stream at the confluence with Tōtara Creek and adjacent to the project footprint at 23-27 Brigham Creek Road is identified

as a Significant Ecological Area and is expected to meet the criteria for a Significant Natural Area. However, there are no works proposed within the SEA.

Overall, this approach provides a suitably precautionary approach to indigenous fauna management and will provide for the maintenance of indigenous biodiversity values across the works areas.

9.2.4 Auckland Unitary Plan: Operative in Part

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

Chapter B – Auckland Regional Policy Statement

The Regional Policy Statement in the AUP: OP identifies nine issues of regional significance for resource management in Auckland. The following are considered relevant to the application:

- Chapter B3 – Ngā pūnaha hanganga, kawekawe me ngā pūngao - Infrastructure, transport and energy;
- Chapter B6 – Mana Whenua; and
- Chapter B7 Toitū te whenua, toitū te taiao – Natural resources.

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. Overall, it is considered that the proposal will align with the objectives and policies in Chapter B3.

Chapter B6 Mana Whenua

Chapter B6 recognises that development and expansion of Auckland has negatively affected Mana Whenua, and that Mana Whenua participation in resource management decision-making is required to ensure a sustainable future for Mana Whenua and for Auckland as a whole. Objectives B6.2.1(1) and (2) and Policy B6.2.2(1) require that the principles of the Treaty of Waitangi / Te Tiriti o Waitangi are recognised and provided for in the sustainable management of natural and physical resources, and through Mana Whenua participation in resource management processes.

Comment:

Watercare has engaged with Mana Whenua on the Project since November 2019, including undertaking a project presentation and site visit with kaitiaki from Ngāti Whātua o Kaipara and Te Kawerau ā Maki, providing project updates, and providing the Ecological Impact Assessment to Ngā Maunga Whakahi o Kaipara. Watercare will continue to engage with Mana Whenua that have indicated an interest in the Project.

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), and minimising the extent of construction activities as far as practicable.

Installation of the gravity main through Wetland C 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.

Installation of the pump station storage tanks and rising main at the outer extents of Wetland D may have permanent effects if reinstatement of the wetland fails post-construction. However, as set out earlier, the works within Wetland D are necessary to provide wastewater services to the developing Whenuapai catchment, and have functional and operational need to be in the proposed location (refer to Appendix N for further information). The potential for permanent loss of extent will be minimised through groundwater recharge of the undisturbed section of wetland throughout construction to maintain wetland hydrology, and through reinstatement and planting of the disturbed section post construction. In the event that pre-development extent and values are not achieved at 2 years post construction, offset planting and restoration is proposed to be undertaken to 32 Mamari Road so that there is no loss of wetland extent or values across the wider project area.

Works will result in the loss and modification of approximately 63 m of natural stream channel. The works will 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. Works will be mitigated through restoration of a 544 m length of Sinton Stream and Sinton A Stream. With the mitigation proposed, it is considered that the proposal aligns with the objectives and policies in Chapter B7.

Chapter E Auckland-wide

Chapter E of the AUP: OP provides objectives, policies and rules which apply to activities Auckland-wide. The following are considered relevant to the application:

- Chapter E2 – Water quantity, allocation and use
- Chapter E3 – Lakes, rivers, streams and wetland
- Chapter E11 – Regional earthworks
- Chapter E15 – Trees in riparian areas
- Chapter E26 – Infrastructure

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, the distance of dewatering from buildings, and the proposed wetland recharge system, 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 has been proposed 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; and
- Policy 10: Planting of native vegetation in riparian areas and wetlands for the purpose of habitat establishment, restoration or enhancement is enabled.
- Policy 17: The loss of extent of natural inland wetlands is avoided, their values are protected, and their restoration is promoted, except where the regional council is satisfied that the activity is necessary for the purpose of the construction or upgrade of specific infrastructure which will provide significant national or regional benefits, has a functional need to be in that location, and the effects of the activity are managed through applying the effects management hierarchy.

Comment:

As described above, the pump station has been purposefully located in the south west portion of the site to avoid permanent adverse effects on Wetland C and D to the extent practicable. Due to the engineering requirements, management of the risk of works alongside existing cables within Brigham Creek Road, and the ground conditions within the wetlands, there is not considered to be a practicable alternative to installing the pipelines and pump station within the wetlands. However, the effects have been minimised the extent practicable, through limiting disturbance within the wetlands to the area and duration required, and the use of

sheet pile walls, recharge systems, and an ongoing monitoring and adaptive management programme to maintain wetland hydrology and function during construction.

Adverse effects will be remediated through reinstating and planting the wetlands with native wetland species once the works are completed. Effects on Wetland C will be temporary, with the extent and values expected to recover post construction, and the reinstatement and planting works expected to improve ecological values and restore the functioning of the natural ecosystem. Whilst effects on Wetland D are currently uncertain, if the reinstatement of the wetland does not recover to the predevelopment extent and values post construction then any lost extent and values will be offset through restoration and planting of an existing wetland located at 32 Mamari Road, which is approximately 1.1 km from Wetland D.

The proposed culvert is located within land which rezoned for light industrial use, and is consistent with the Spedding Block Precinct Plans within Chapter I616 of the AUP:OP. 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, riparian planting along Sinton 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 – Regional 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) and E11.2(2) 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. Policy E11.3(4) provides for land disturbance necessary for activities undertaken to provide for the needs of people and communities. Policy E11.3(2) seeks to manage disturbance to reduce adverse effects, including controlling the amount of land being disturbed at any one time. Policy E11.3(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 F), 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 47 protected trees from the riparian area, including removal of 40 pine trees located either side of Sinton Stream to install the rising main and culvert. After completion of the works, trees which are removed will be replaced with native vegetation at a ratio of 1 to 1.5 or greater. Planting to replace the removal of the 40 pine trees will align with that proposed in the Spedding Block – Stage 1 Application by Oyster Capital, avoiding the need for replacement planting to be removed in future once Oyster Capital works proceed, and enabling the ecological benefits of the replanting to be realised.

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 I Precincts

Chapter I of the AUP: OP provides objectives, policies and rules which apply to precinct. The following are considered relevant to the application:

- Chapter I161 – Spedding Block Precinct

Chapter I616 – Spedding Block Precinct

The purpose of the Spedding Block precinct is to facilitate the transition from semi-rural land uses to the development of a light industrial business area in an integrated and comprehensive manner. Objective I616.2(1) seeks that the Spedding Block Precinct is developed in a comprehensive and integrated way to facilitate the development of a business area with a primary light industrial land use function. Objective I616.2(5) seeks to provide for the health and well-being of streams and wetlands within the precinct to enhance these connections through riparian planting and restoration of degraded habitats.

Comment:

Watercare has worked with Oyster Capital to provide services to the development area in a way which is comprehensive and integrated with the precinct structure plan. The location of the pump station will enable the efficient connection of a future gravity main which services the development area. The rising main has been purposefully located within the Spedding Road corridor (as indicated in Precinct Plan 4 – Indicative road corridors and connections), which will provide accessibility for future maintenance and further development and upgrading of the pipe in the future. The location will also avoid crossing through the middle of potentially developable land. By locating within the Spedding Road corridor the pipe can cross Sinton Stream over the proposed culvert (as indicated in Precinct Plan 1 – reclamation, drainage and vegetation clearance required for Spedding Road construction), avoiding the requirement for a purpose-built pipe bridge which would introduce a weak point in the network and result in an additional area of stream disturbance during construction. The provision of wastewater services to the precinct will enable the land to be developed in a way which facilitates the development of a business area with a light industrial use function.

The riparian restoration planting set out in the application, and which is proposed to mitigate the installation of the Sinton Stream culvert and associated vegetation removal, is consistent with the measures proposed in the Spedding Block – Stage 1 application lodged by Oyster Capital in March 2023 (BUN60415234). This is consistent with the measures in *I616.9.2 Name: Precinct Plan 2 – stream and vegetation enhancements required for reclamation, drainage and vegetation clearance to enable the construction of Spedding Road (mitigation)* (refer to the Sinton Stream Culvert Compensation Plan provided in Attachment X).

In summary, trees removed from the riparian area of 31 Brigham Creek Road will be replaced with 6,000 m² of vegetation along a 10-20 m wide riparian strip along Totara Creek. The stream modification from the installation of the culvert will be mitigated through riparian planting, including an area which is 297 m long and 20 m wide on both sides of Sinton Stream below the culvert, and an area which is 247.5 m long and 10 m wide on the true left bank of Sinton A. These measures will provide for the health and well-being of the stream and enhance ecological connections and the habitat of the stream, and so is consistent with Objective I616.2(5).

The riparian margin of the wetland at 23-27 Brigham Creek Road will be planted (refer to Drawing 201369.001 in Appendix A for an indicative planting plan). The pump station has been purposefully located outside of Wetland C, with disturbance to Wetland D minimised to the extent practicable. Whilst there will be short term disturbance of the wetlands due to dewatering, earthworks, and vegetation removal, the disturbed area of the wetlands will be restored once the works are complete. If the extent and values of Wetland D are not able to be fully restored post construction, any loss will be offset at 32 Mamari Road. This will provide for the health and well-being of the wetlands by enhancing connections through riparian planting and restoring degraded wetland habitats within the project area. Overall, there is anticipated to be a net positive ecological outcome for the wetland.

9.3 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 of Wetland C 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.

9.4 Section 104(1)(b) – Other matters relevant and reasonably necessary to determine the application.

9.4.1 The Auckland Plan

The Auckland Plan is a 30 year spatial plan which provides broad direction to guide Auckland's growth and development in a way that aims to achieve key social, economic, environmental and cultural objectives. The Auckland Plan's Development Strategy identifies that Auckland's urban footprint will include newly established communities in future urban areas, with Whenuapai specified as an area which is expected to undergo a significant amount of housing and business growth over the short, medium term and long term. The Plan also recognises that bulk infrastructure, including wastewater, is essential in order for urban growth to occur, especially in future urban areas.

Comment:

The Whenuapai Wastewater Servicing scheme will provide essential bulk wastewater services to the recently live zoned Whenuapai area, and the wider catchment. This will help to unlock the development potential of this land, and enable urban growth to occur in accordance with the sequencing which is outlined in the Auckland Plan.

10 Conclusion

This AEE report has been prepared on behalf of Watercare to support the resource consent application 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. Adverse effects on persons are less than minor, whilst adverse effects on the environment are no more than minor.

During construction, there is potential for effects associated with 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 Wetland Monitoring and Reinstatement Plan, NFMP, LMP, BMP, 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.

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.



Appendix A – Design Drawings – GHD Limited and WSP Limited

B

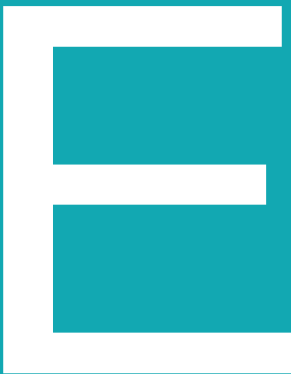
Appendix B – Records of Title



Appendix C – Ecological Impact Assessment (Beca)



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



Appendix E – Detailed Site Investigation (GHD Ltd)



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

G

Appendix G – Permitted Activity Assessment

Permitted Activities

A number of activities associated with the project can be undertaken as a permitted activity under the AUP:OP as detailed in Table P1 and Table P2.

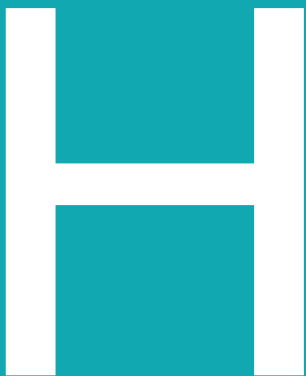
Table P3: Permitted activities under the AUP: OP (regional)

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 freshwater bodies, with discharge considered to be in accordance with best management practice to minimise the contaminants to the extent practicable. With these measures in place, groundwater quality in the area of the pumpstation indicates that dewatering water quality is likely to be acceptable for discharge to either the wetland or to Sinton Stream (refer to the Pumpstation Dewatering Discharge Water Quality Assessment provided in Appendix O for further details). 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	<u>Open trenching</u> 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	<u>Open trenching</u> 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 m³ of emergency storage within an enclosed tank, which is less than the permitted activity standard threshold of 4,000 m³ 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).

E26.3.3.1(A74) Pest plant removal	Works require removal of 30 pest trees from the riparian area of Sinton Stream to construct the pump station. Removal of pest species is a permitted activity under Rule E26.3.3.1(A74).
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Table P2. Assessment against the conditions of regulation 70(2) of the NES-FW.

Permitted activity standard	Comment
the culvert must provide for the same passage of fish upstream and downstream as would exist without the culvert, except as required to carry out the works to place, alter, extend, or reconstruct the culvert;	Met – Fish passage will be maintained due to the design of the 3,500 x 3,500 concrete box culvert, which contains a natural compacted clay bed, a meandering low flow channel, and no height / grade alterations.
The culvert must be laid parallel to the slope of the bed of the river or connected area;	Met – the culvert will be parallel to the slope of the bed of the stream.
The mean cross-sectional water velocity in the culvert must be no greater than that in all immediately adjoining river reaches;	Met – the proposed embedment and culvert width (being 1.3 x stream bandfull width) will prevent velocity increases that would otherwise occur if flows were constricted.
The culvert's width where it intersects with the bed of the river or connected area (s) and the width of the bed at that location (w), both measured in metres, must compare as follows: where $w \leq 3$, $s \geq 1.3 \times w$; and where $w > 3$, $s \geq (1.2 \times w) + 0.6$; and	Met – the average width of the stream at the location of the culvert is 1.92 m. The proposed culvert width is 3.5, which meets the required width.
The culvert must be open-bottomed or its invert must be placed so that at least 25% of the culvert's diameter is below the level of the bed; and	Met – the invert of the culvert will be set down 0.875m below the stream invert, which is 25% of the culvert height of 3.5m.
the bed substrate must be present over the full length of the culvert and stable at the flow rate at or below which the water flows for 80% of the time; and	Met – the culvert will contain a compacted clay substrate, which will be stable at the flow rate at or below which the water flows for 80% of the time.
The culvert provides for continuity of geomorphic processes (such as the movement of sediment and debris).	Met – soft bottom substrates will move through the low flow channel and establish a natural streambed, which will be consistent with the stream habitat upstream and downstream of the culvert. The low flow channel will slope up to the culvert walls to assist in the natural stream bed formation.



Appendix H – Network Discharge Consent (R/REG/2013/3743)



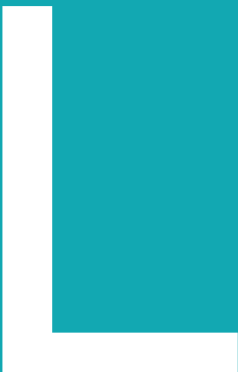
Appendix I – Records of Engagement

J

Appendix J – Sinton Stream Culvert Compensation Plan (Tonkin & Taylor
Ltd)

K

Appendix K – Wetland Monitoring and Reinstatement Plan (Beca Ltd)



Appendix L – Arboricultural Assessment (Arborlab Ltd)

M

Appendix M – Groundwater and Settlement Monitoring and Contingency
Plan (Tonkin & Tavor Ltd)



Appendix N – Functional Needs Assessment



Appendix O – Pumpstation Dewatering Discharge Water Quality
Assessment (Tonkin & Taylor Ltd)

