

CABRA
LAND & PROPERTY DEVELOPMENT

INFRASTRUCTURE REPORT FOR WHENUAPAI EAST PRIVATE PLAN CHANGE

SINTON ROAD & CLARKS LANE, WHENUAPAI

Document Record

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1. Executive Summary

Capture Land Limited have been engaged by Cabra Developments Limited to assess infrastructure capacity for a proposed Private Plan Change – Whenuapai East Precinct for seven properties located on Clarks Lane and Sinton Road in Whenuapai.

The proposed Plan Change is to rezone the area currently from Future Urban Zone (**FUZ**) under the Auckland Unitary Plan (**AUP**) to Residential - Mixed Housing Urban with a lower intensity Residential - Mixed Housing Suburban along the coastal edge. The property at 17A Clarks Lane is proposed to be rezoned Open Space – Informal Recreation for use as a future neighbourhood park.

The report assesses the following infrastructure elements and requirements to support the land being rezoned and developed into residential housing, in accordance with Auckland Council standards.

- Earthworks
- Sediment & Erosion Control
- Roothing
- Stormwater
- Wastewater
- Water Supply
- Utility Services

This report should be read in conjunction with the Plan Change application documents.

2. Site Description

The proposed Plan Change area includes seven adjacent properties located on Sinton Road and Clarks Lane in Whenuapai. The individual property details are outlined in Table 1 and location shown in Figure 1.

The land is zoned Future Urban under the Auckland Unitary Plan (AUP).

Owner	Site Address	Appellation	Area (Ha)	Record of Title (RT)
Cabra Developments Ltd	15 Clarks Lane	Lot 2 DP 92753	3.3955	NA 49B/640
Huifeng Lu & Hong Du	17 Clarks Lane	Section 2 SO 532984	2.4174	895996
Auckland Council	17A Clarks Lane	Section 1 SO 532984	0.4000	895995
Cabra Developments Ltd	10 Sinton Road	Lot 25 Allot 2	2.7291	NA 762/294
GRP Properties Ltd	12 Sinton Road	Lot 7 DP 57408	2.4610	NA 12C/167
Cabra Developments Ltd	14 Sinton Road	Lot 8 DP 57408	2.3674	NA 12C/168
Cabra Developments Ltd	16 Sinton Road	Lot 9 DP 57408	2.8758	NA 12C/169

Table 1 – Plan Change Properties



Figure 1 – Plan Change Area - Yellow extent (Cabra land shown with orange infill)

The current land use for the sites is rural residential, with all sites having dwellings apart from 17A Clarks Lane, which has been acquired by Auckland Council for the purpose of recreational reserve. The sites are predominantly in grass with scattered vegetation and hedgerows. Most of the vegetation is exotic apart from a few natives, as confirmed by the Arboricultural Assessment and Ecological Impact Assessment.

The topography of the site is relatively flat to mildly sloping in a southeast to northwest direction from the road to the coastal edge. There are embankments along the coastal edge of approximately 2m - 4m in height.

The areas of ecological significance within the site are a permanent watercourse and natural inland wetland located along the boundary of 15 and 17 Clarks Lane. There are two short sections of intermittent streams on 12 and 14 Sinton Road. A detailed Ecological Assessment of the Plan Change area has been undertaken by Viridis Environmental Consultants and a copy of their features map is shown in Figure 2.



Figure 2 – Plan Change Area - Yellow extent

3. Proposed Development

The proposed Plan Change is to rezone the area currently from FUZ under the AUP to Residential - Mixed Housing Urban with a lower intensity Residential - Mixed Housing Suburban zone along the coastal edge. Refer to proposed zone map shown in Figure 3.

The residential development yield will be determined by future resource consent applications. The Neighbourhood Plan prepared by Boffa Miskell indicates the PPC may deliver an estimated yield of 500-600 dwellings across the precinct.

Boffa Miskell have undertaken a yield assessment based on the Medium Density Residential Standards (MDRS), if this applies at the time of decision-making, and determined 500-600 dwellings across the precinct is within the estimated yield under MDRS.

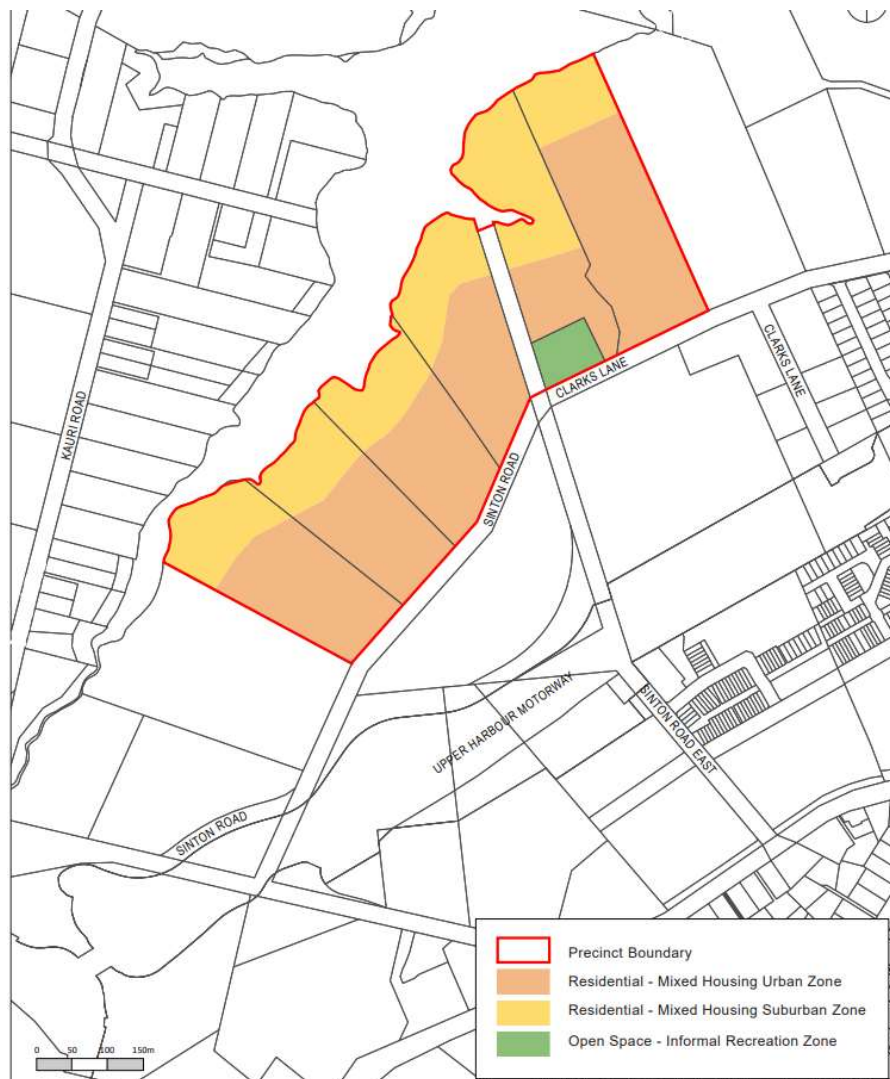


Figure 3 – Proposed Zone Map- Plan Change Area shown with red extent

4. Earthworks

4.1 Bulk Earthworks

It is anticipated earthworks will be required over the extent of the proposed residential areas to create suitable gradients over the site, to facilitate roading and access, infrastructure servicing and building platforms.

Based on the flat to moderate sloping topographical of the area, we do not anticipate large scale land modification with maximum cuts and fills expected to be generally less than 1m.

The extent and volume of earthworks will be determined in the future when each site is designed, and Resource Consents applied for. It is anticipated both District and Regional Land-use Consents will be required when each development site is undertaken in the future.

4.2 Geotechnical Assessment

Geotechnical investigations on 10, 14 and 16 Sinton Road and 15 Clarks Lane have been completed by ENGEO Limited.

The ENGEO investigation findings generally concur with the published geological mapping. East Coast Bays Formation residual soils were typically encountered over the northern portions of the sites investigated, with Takaanini Formation (formerly named Puketoka Formation) alluvial soils encountered through the central and southern portions of the sites. The residual soils typically comprised stiff to hard silt and clay soils that generally increase in strength with depth, while the alluvial soils comprised interfingering layers of sands, silts and clays with occasional organic soil and peat lenses. Soil strengths within the alluvium were variable with depth but generally ranged from stiff to hard.

Groundwater was measured across the sites at hand auger borehole locations on the day of drilling, and during the CPT progression. The data indicates that groundwater levels vary across the area and are influenced by soil strata, proximity to overland flow paths or water courses, and proximity to the coastline. Groundwater may be expected within 5 m of the ground surface across much of the site area.

The investigations identified the following:

- **Soil Classification** – Class C – Shallow Soil Sites in line with NZS 1170.5.2004.
- **Seismic Hazards** – no known active faults located within the sites and based on topographic and lithologic data, risk from earthquake-induced regional subsidence / uplift, ground lurching, and seiches are considered negligible at the site.
- **Expansive Soils** – Classification of M (moderately) expansive with respect to NZS 3604.

ENGEO concluded, based on the findings of the existing ENGEO geotechnical reports for properties within the PPC area, as well as this desktop study of the wider peninsula area for context, we have not identified geohazards, which would be likely to preclude future conversion of this area to residential land use provided that the normal geotechnical investigation, analysis and design process is followed. The geohazards identified in this assessment are typical of land development in the Auckland region and are able to be addressed through conventional engineering design approaches.

4.3 Coastal Hazard Assessment

A coastal hazard assessment has been prepared by SLR Consulting New Zealand for the proposed Plan Change area. Key recommendations being:

- Coastal inundation resulting from extreme storm tides is not generally considered to be an issue with regard to the project area, under both current day and future sea level rise scenarios over the next 100+ years.

- The risk to the project area from a tsunami is considered to be very low.
- Site-specific calculations of shoreline retreat undertaken as part of this assessment have identified a current day slope settlement distance of approximately 4-10m. Future maximum cliff regression potential was found to be in the order of 14.6m (15 Clarks Lane), 17.1m (10 Sinton Road), 17.9m (14 Sinton Road) and 16.2m (16 Sinton Road) measured inland from the slope toe over the 100-year planning horizon. It is recognised that based on this very conservative cliff regression scenario (i.e. 1% exceedance probability), erosion is not expected to encroach within the area of the future residential development (given the 20m esplanade reserve that is required to be taken from MHWS) as a result of the Plan Change.

The assessment concluded the overall risk to the subject site from coastal hazards is considered low.

4.4 Earthworks Management

The management of earthworks is an important part of ensuring adverse effects on the surrounding environment are less than minor, particularly in locations proximate to coastal and stream environments. Regional and/or district land use consents will be required at resource consent stage, noting that parts of the site are within the Sediment Control Protection Area requiring additional consideration of mitigation. The key aspects and proposed mitigation measures to manage the earthworks are outlined in Table 2.

Potential Effect	Mitigation Measures (to be confirmed at resource consent stage)
Sediment Discharge	• Implement GD05 sediment & erosion controls • Complete work within earthworks season – 1st Oct to 30th April • Implement flocculation treatment onsite for better efficiency • Limiting exposed area and stage construction • Progressive stabilisation of completed areas • Monitor controls and site prior and during rain events
Dust	• Implement dust control during earthworks • Watering haul tracks and exposed areas • Stabilising stockpiles with straw mulch & seed to establish grass cover • Limiting exposed area and staging construction • Progressive stabilisation of completed areas
Noise	• Earthworks & construction activity to comply with noise limits setout in AUP (OP) Standard E25.6.27 & assessed in accordance with New Zealand Standard 6803:1999 for Acoustics – Construction Noise • Restrict construction hours to - Weekdays (Monday to Friday): 7:30am – 6:00pm - Saturday: 7:30am – 6:00pm - Sundays or Public Holidays: no works
Vibration	• Monitoring onsite

	• Compliance with limits set out in Table 1 of German Standard DIN 4150 Part 3:1986 “Structural Vibration in Buildings – Effects on Structures” • Selection of the correct plant for the operation
Traffic	• Prepare Construction Traffic Management Plan • Implement approved Traffic Management • Obtain Road Controlling Authority approvals

Table 2 – Earthworks Management

4.3 Earthworks Operation

All earthwork activities must be carried out in general accordance with the requirements of NZS 4431, Auckland Council Infrastructure Development Code and an Earthworks Specification prepared by a Chartered Professional Geotechnical Engineer.

The Earthworks Specification should cover the following items:

- Site clearance and preparation including topsoil stripping and stockpiling.
- Geotechnical stabilisation works
- Subsoil drainage installation.
- Cut to fill earthworks operations.
- Fill materials and testing requirements.
- Earthworks finishing and respread of topsoil; and,

Monitoring and supervision will be required during the construction phase to ensure compliance is achieved with the specification and certification provided in the form of a Geotechnical Completion Report.

5. Erosion & Sediment Control

Erosion and sediment controls for the development will need to be designed, constructed and monitored in accordance with Auckland Council Guidance Document 2016/005 - Erosion and Sediment Control Guideline for Land Disturbing Activities (GD05). The controls will need to be installed prior to the commencement of any earthworks on the site and maintained for the full duration of the works. The anticipated controls for the development are as follows, to be confirmed at resource consent stage:

- Stabilised Site Entrances.
- Silt Fences.
- Cleanwater diversion bunds/channel.
- Dirty water diversion bunds/channel.
- Sediment Retention Pond (SRP), with rain activated flocculation devices.
- Decanting Earth Bunds (DEB), with rain activated flocculation devices.
- Contour drains.

- Rapid stabilisation methods, such as, geotextiles, straw mulch, hydroseeding etc.

The sensitivity of the receiving coastal environment will require an adaptive erosion and sediment control plan and appropriate measures in place to achieve high sediment treatment and efficiencies.

6. Contamination

ENGEO has undertaken environmental assessments of the properties at 10, 14 and 16 Sinton Road and 15 Clarks Lane in 2023 and 2024.

The report identified the following potential activities which are included on the Hazardous Activities and Industries List (HAIL1). The following activities are considered potentially have occurred on all or some of the sites and Remediation Action Plan's (RAP) were prepared for each lot:

- HAIL ID A10: Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds. Areas of cropping / vineyard.
- HAIL ID G5: Waste disposal to land. Areas where dumping of domestic waste was identified.
- HAIL ID I: Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment. Use of lead-based paints and asbestos on buildings. Burn piles. Use of small volumes of fuel / oil.

ENGEO have concluded that, the Plan Change assessment is not intended to replace the need for a PSI and / or DSI for 12 Sinton Road and 17 / 17A Clarks Lane during future redevelopment.

ENGEO did not identify historical activities which would be likely to preclude future conversion of this area to residential land use from a contamination perspective, provided that the relevant provisions of the NESCS and the AUP (Chapter E30 Contaminated Land) are followed when the change in land use occurs.

7. Rooding

A detailed Integrated Transport Assessment (**ITA**) has been prepared by Commute in consultation with Auckland Transport and NZTA for the proposed Plan Change area.

The ITA assesses the impact of rezoning the land on the wider transport network.

7.1 Existing Rooding Network Upgrades

The ITA in consultation with Auckland Transport, has identified rooding upgrades are required to support the Plan Change, which are outlined in Table IX.10.1 of the Whenuapai East precinct provisions. Refer to Table 3 below.

Table IX.10.1 Road Function and Required Design Elements

Road name	Proposed role and function of road in Precinct area	Minimum road reserve width ¹	Total no. of lanes	Design speed	Median	Cycle provision	Pedestrian provision	Bus route
Clarks Lane / Sinton Road roundabout	N/A	N/A	1 circulating lane	30 km/h _g approach speed	N/A	Northern side (shared path)		No
Sinton Road upgrade	Local	No change (20m)	2	30 km/h _g	No	Northwestern side (3m shared cycle footpath)		No
Clarks Lane upgrade between roundabout and eastern end of Precinct	Local	No change (20m)	2	30 km/h _g	No	Northern side (3m shared cycle footpath)		No
Clarks Lane between east of Precinct and Ockleston Landing (footpath upgrade only)	Local	No change (20m)	Footpath only – no change to number of lanes	N/A	N/A	No	Southern side (1.8m footpath)	N/A
Clarks Lane upgrade (north/south - Worker's Cottages) (footpath upgrade only)	Local	No change (20m)	Footpath only – no change to number of lanes	N/A	N/A	No	Eastern side (1.8m) to connect with Clarks Lane Footbridge	No
Unformed Road (north of Sinton Road)	Local	20m	2	30 km/h _g	No	Western side (3m shared cycle footpath)		No

Table 3 – Road Function & Required Design Elements

7.2 Proposed Rooding Network

The Plan Change area will require an extension of the existing public roading network to service the future proposed residential development. The configuration and layout of the roading network will be determined at the future subdivision design stage, which will consist of public local roads and private accessways.

The roading network will be developed in accordance with Auckland Transport's TDM and Auckland Council AUP.

8. Stormwater

8.1 Existing

The majority of the Plan Change area drains overland to the coastal Waiarohia Inlet. There is no public stormwater network within the vicinity of the site and the only stormwater features are a permanent watercourse (culverted under Clarks Lane) and natural inland wetland between the boundary of 15 and 17 Clarks Lane and two short sections of intermittent streams on 12 and 14 Sinton Road – refer to Figure 2.

The upper catchment boundary for the stormwater catchment is SH18, apart from the permanent watercourse which extends to the southeastern side of SH18 via a culvert under the motorway.

Due to the small upper catchment area, there is limited flooding within the Plan Change area with the only area identified, being confined to the permanent watercourse as shown in Figure 4.

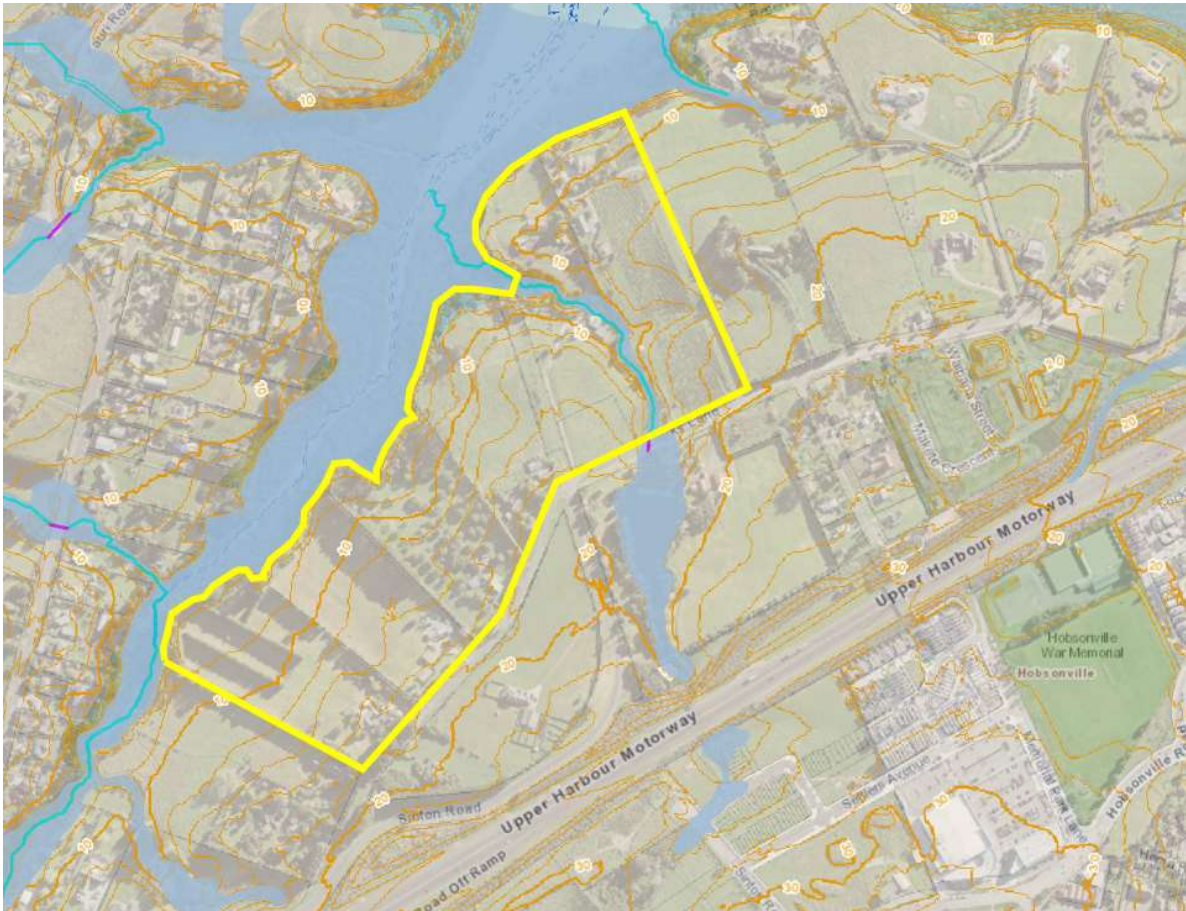


Figure 4 – Auckland Council GIS Floodplain – Plan Change Area shown with yellow extent

8.2 Stormwater Proposal

A Stormwater Management Plan (SMP) was prepared by 4Sight Consulting Ltd for Healthy Waters for the wider Whenuapai area as part of Auckland Council's Plan Change 5. The SMP was approved by Healthy Waters in support of PC5, however was never adopted as PC5 was withdrawn.

Capture has prepared a new SMP just for the Plan Change area which details the proposed mitigation measures and requirements to ensure the effects of stormwater has less than minor effects on the downstream receiving environments. The SMP recommendations are consistent with the PC5 SMP and align with Auckland Council AUP, Stormwater Code of Practice and Guidance Document GD01. These are:

- **Design Approach** - All subdivisions and development must apply an integrated stormwater management/water sensitive design approach through all phases of development, from planning through to construction.
- **Stormwater Assets** - All public stormwater assets shall be designed and constructed in accordance with best industry practice and to accommodate Maximum probable development (MPD) for the contributing catchment.

- **Flooding** - New flood risk is not created; and existing flood risk is not increased and where possible, is reduced. Overland flow paths are retained where possible or redirected down roads and public access areas and clear of proposed residential lots.
- **Streams/Natural Wetlands** - Intermittent and permanent streams and natural wetlands are retained, enhanced and protected from the adverse effects of development and stormwater runoff.
- **Coastal Yards** - The coastal environment is protected from erosion from stormwater discharges in accordance with Auckland Council Technical Report 2013/018 (TR18).
- **Hydrology** - Changes to natural hydrology are minimised in areas where developments discharge to permanent or intermittent streams and wetlands. Aquifer recharge and stream baseflows are retained. SMAF 1 control is applied to the area.
- **Water Quality** - Water quality impacts on streams and the coastal environment are minimised and water quality is enhanced through treatment devices designed in accordance with GD01.

A meeting with Healthy Waters representatives was held on the 18th of July 2024 to discuss the stormwater proposal and management for the Private Plan Change. The SMP has been finalised based on consultation with Healthy Waters and approval of the SMP is sought for adoption under Auckland Councils Regionwide Stormwater Network Discharge Consent (NDC).

8.3 SMAF Mitigation

A SMAF 1 Flow Control is proposed over the Plan Change area for mitigation of effects arising from increased stormwater flows generated by the development, when discharged to permanent stream. The AUP requirements for SMAF 1 are 5mm retention and 95th percentile storm for detention volumes.

Stormwater devices designed and constructed in accordance with GD01 will be implemented to provide compliance with Auckland Council AUP Table E10.4.1 - SMAF 1 requirements. GD01 recommended devices are outlined in Figure 5 and will be finalised at resource consent stage.

Mitigation requirement (Auckland Unitary Plan)	Stormwater management requirement and aim	Devices providing this mitigation
Stormwater management - flow: SMAF 1 and 2: Provide retention (volume reduction) of at least 5 mm runoff depth.	Retention: To protect streams and recharge groundwater.	- Rainwater tanks (with reuse) - Bioretention devices (unlined) - Living roofs - Pervious paving (unlined) - Infiltration devices.
Stormwater management - flow: - SMAF 1: Provide detention and a drain-down period of 24 hours for the difference between the pre- and post-development runoff volumes from the 95th percentile, 24-hour rainfall event minus the 5 mm retention - SMAF 2: Provide detention and a drain-down period of 24-hours for the difference between the pre- and post-development runoff volumes from the 90th percentile, 24-hour rainfall event minus the 5 mm retention.	Detention: To protect streams.	- Pervious pavements - Bioretention devices - Wetlands - Ponds (dry and wet) - Rainwater tanks.

Figure 5 – GD01 Table 10 – SMAF Mitigation to support AUP requirements

8.4 Water Quality Treatment

Water quality treatment of impervious areas is proposed in compliance with GD01. GD01 provides a variety of treatment devices as shown in Figure 6. Devices to be confirmed at resource consent stage.

Mitigation requirement (Auckland Unitary Plan)	Stormwater management requirement and aim	Devices providing this mitigation
Stormwater management – quality: Provide treatment of the water quality flow or volume.	Water quality mitigation: To protect water quality.	- Bioretention devices - Swales - Wetlands - Ponds (where specific design is agreed with Auckland Council).

Figure 6 – GD01 Table 10 – Water Quality Mitigation to support AUP requirements

8.5 Stormwater Reticulation

A primary stormwater network will be required in accordance with AC SWCoP to direct runoff from roads and lots to appropriately designed outlet structures. The reticulation will be sized for the 10% AEP storm with allowance for 2.1 degrees climate change and discharge to the receiving environment via rock stabilised dispersal outlets designed in accordance with Auckland Council's technical report, TR 2013/018 *Hydraulic Energy Management: Inlet and Outlet Design for Treatment Devices*.

Possible locations of the outlets have been shown on the Precinct Plan, and the final location and design will be confirmed at resource consent stage.

The primary stormwater network will be vested to Auckland Council.

8.6 Secondary Flowpaths

Secondary overland flow paths will need to be provided for larger storm events, up to the 1% AEP including 3.8 degrees climate change. These should be confined to road and reserve areas where possible and not within private residential lots.

The entry and exit points of existing secondary flow paths should be retained where possible to minimise impacts on upstream or downstream properties.

A Flood Hazard Risk Assessment has been prepared in accordance with AUP E36.9 requirements and is included in the SMP.

8.7 Floodplains

As mentioned previously, there is minimal flooding within the Plan Change area, with the floodplain being confined to the existing permanent watercourse between 15 and 17 Clarks Lane.

No works are proposed within the extent of the existing floodplain, which is within the proposed 20m esplanade reserve, and the development will not create any adverse flooding impacts as the downstream receiving environment is a coastal outlet.

9. Wastewater

9.1 Existing

There is no existing public wastewater infrastructure within the Plan Change area. The closest public networks are to the east of the Plan Change in Ockleston Landing and to the south in Brigham Creek Road.

The reticulation in Ockleston is a gravity network that discharges under SH18 via a 400mm diameter pipeline.

The reticulation in Brigham Creek Road is a gravity network (315mm diameter) that discharges to Brigham Creek Wastewater Pump Station (WWPS).

9.2 Wastewater Proposal

Four servicing options for the Plan Change and future wider contributing catchment areas have been developed in consultation with Water Acumen (on behalf of the applicant) and Watercare Services Limited (**WSL**).

These options are detailed in the Wastewater Servicing Strategy Memo prepared by Water Acumen, which is included in Appendix A, and are summarised as follows:

- **Option 1** – Two new wastewater pump stations discharging to the existing gravity reticulation in Ockleston Landing.
- **Option 2** - Two new wastewater pump stations discharging to the existing 560mm rising main from Brigham Creek WWPS in Sinton Road.
- **Option 3** - Two new wastewater pump stations discharging to the existing 315mm diameter gravity reticulation on Brigham Creek Road.
- **Option 4** – Area serviced via a pressure sewer system – this option has not considered as WSL do not favour the adoption of pressure sewer.

As outlined in Options 1 to 3, two new wastewater pump stations are required to service the Plan Change area. These are required due to the site topography of the area sloping down towards the coastal edge. The future lots will be serviced via new public wastewater gravity reticulation which will discharge to the two proposed pump stations. The preliminary pump station locations are shown on Figure 5 (and indicated on Precinct Plan 1); however, the final location will be determined during the Resource Consent phase for the development.

The reticulation and pump stations will be constructed in accordance with WSL Engineering Code of Practice and vested to WSL.

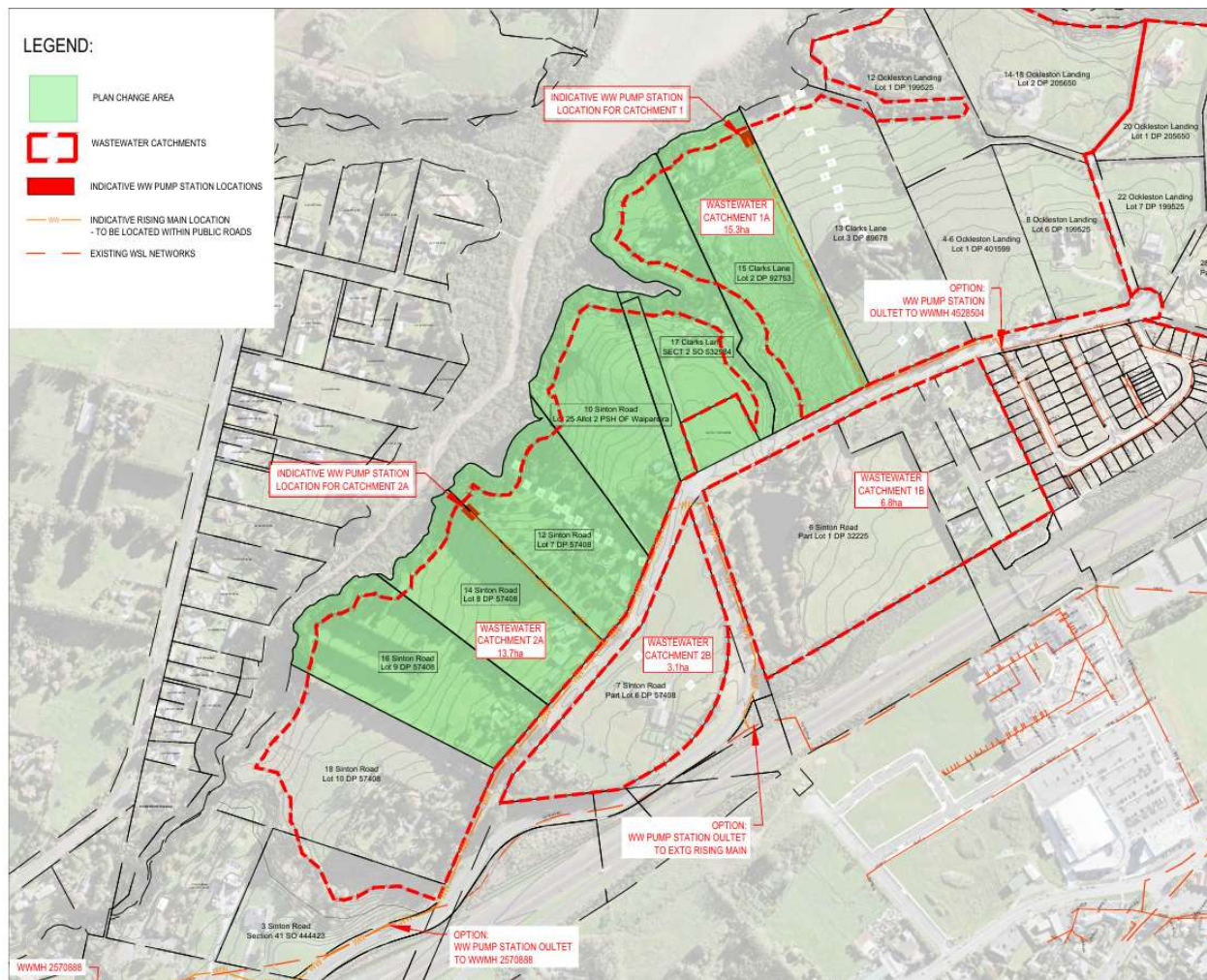


Figure 5 – Wastewater Servicing Plan – Plan Change Area shown in green

9.3 Consultation

An extensive amount of consultation has been undertaken with WSL regarding servicing the plan change area. The initial consultation was undertaken back in 2021 as part of PC5 and then more recent consultation regarding a Fast Track application (now abandoned), and finally, on servicing the private Plan Change area.

An online meeting was held with WSL on 15th May 2024 (Lars Fog and Charvee Angurala) to discuss the options outlined in the Water Acumen report. WSL have provided a water and wastewater capacity assessment letter addressing the proposed servicing requirements in support of the plan change, which is included in Appendix B. As outlined in the letter, Options 1 and 3 are WSL preferred wastewater servicing options, with details to be worked through at resource consent stage.

WSL letter states any local wastewater upgrades are the responsibility of the developer and new infrastructure shall provide capacity for the wider catchment as per below. The WSL letter states:

“Any upgrades to the local wastewater network necessary to service the proposed plan change area will need to be carried out by the developer. The developer shall also give consideration to, and provide for in any necessary upgrades, the whole of the catchment area that may be serviced by these upgrades.

The developer shall, as part of any resource consent applications for the proposed plan change area, propose suitable upgrades to provide capacity for the likely maximum development within the plan change area and any further catchment which may rely on these upgrades. While the memo suggests that the upgrade details are discussed at EPA stage, the applicant shall propose sufficient upgrades to ensure that there is adequate wastewater capacity as detailed above, at resource consent stage.”

Consultation with WSL confirms there are various options for servicing the plan change area. The preferred and final servicing solution will be developed in consultation with WSL through the future Resource Consent and Engineering Plan Approval stages.

10. Water

10.1 Existing

There is existing public water infrastructure along the road frontage of the Plan Change area, which consists of a 100mm loop principal main within Clarks Lane and a 63mm dead end ridermain in Sinton Road.

10.1 Water Proposal

The water servicing option for the Plan Change and future wider contributing catchment areas have been developed in consultation with Water Acumen (for the applicant) and WSL.

These options are detailed in the Wastewater Servicing Strategy Memo prepared by Water Acumen, which is included in Appendix A, and are summarised as follows:

- **Option 1** – Extension of existing local network in Sinton Road.
- **Option 2** – Connection to 355mm diameter pipe in Brigham Creek Road

Both options require an extension to the existing reticulation to provide residential supply and fire fighting supply. The existing 63mm riderman along Sinton Road will be upgraded to a principal main to achieve the required flow capacity for both residential demand and firefighting. The size of the new principal main will be based on hydrant flow testing and determined at resource consent stage.

10.2 Consultation

An online meeting was held with WSL on 15th May 2024 (Lars Fog and Charvee Angurala) to discuss water servicing as outlined in the Water Acumen report.

WSL agree with the servicing option proposed and have advised that there are no capacity restraints in the wider water network to cater for the Plan Change development. A copy of WSL water and wastewater capacity assessment letter supporting the Plan Change application is included in Appendix B.

WSL letter states any local water upgrades are the responsibility of the developer and new infrastructure shall provide capacity for the wider catchment as per below.

Any upgrades to the local water supply network necessary to service the proposed plan change area will need to be carried out by the developer. The developer shall also give consideration to, and provide for in any necessary upgrades, the whole of the catchment area that may be serviced by these upgrades.

The developer shall, as part of any resource consent applications for the proposed plan change area, propose suitable upgrades to provide capacity, including fire flow requirements, for the likely maximum development within the plan change area and any further catchment which may rely on these upgrades.

The memo discusses two potential options to service the plan change area with water. Option 2 considers that the plan change area is serviced from the 355 DN water main in Brigham Creek Road via a suitably sized water main up to Clarks Lane. Watercare considers that there are major benefits in adopting option 2 discussed in the memo, and is happy to discuss the relevant sizing of the upgrades at resource consent stage.

WSL confirm they support Option 2 set out in the memo. The final design solution will be developed in consultation with WSL through the future Resource Consent and Engineering Plan Approval stages.

11. Utility Services

11.1 Power

There are existing overhead power networks within Clarks Lane and Sinton Road that can be extended to service the future residential lots within the Plan Change.

11.2 Fibre

There is an existing underground fibre network within Clarks Lane can be extended to service the future residential lots within the Plan Change.

11.3 Street Lighting

The sections of Clarks Lane and Sinton Road which are proposed to be upgraded to a residential roading standard will require street lighting to be installed in accordance with Auckland Transport's TDM.

All new roads and long private accessways will require street lighting in accordance with Auckland Transport's TDM.

12. Proposed Precinct Provisions

We have reviewed the proposed precinct provisions for the Private Plan Change and are in support of the infrastructure standards listed below.

- IX.6.1.2 Transport Infrastructure
- IX.6.1.3 Road Design
- IX.6.1.4 Water and Wastewater Infrastructure
- IX.6.1.5 Coastal Esplanade Planting and Public Access
- IX.6.1.8 Stormwater Management

The infrastructure requirements, upgrades and construction timing will be determined at the future resource consent stages for the plan change area.

13. Conclusion

As outline in the report and within the supporting SMP, there are no capacity or infrastructure constraints to restrict the rezoning of the proposed Plan Change area from AUP Future Urban to Residential - Mixed Housing Urban with a lower intensity Residential - Mixed Housing Suburban along the coastal edge. The proposed precinct provisions are suitable as they ensure the necessary infrastructure will be designed and delivered in a manner that is integrated with urban land use and development. The upgrades required to service the plan change can be delivered without compromising existing or planned Watercare projects, including the Northern Interceptor, nor the upstream Whenuapai Wastewater Packages 1 or 2.

The Plan Change area can be serviced with appropriately designed infrastructure in accordance with Auckland Council Code of Practice for Land Development.

The implementation of appropriate engineering devices and construction standards in accordance with Auckland Council Standards, Guidance Documentation and best practises will enable the land to be developed in a manner that creates less than minor effects on the receiving environment.

Appendices

Appendix A – Water Acumens Wastewater and Water Servicing Strategy Memo

WA Ref: WA/022

Date: 7 June 2024

To: Tom Lemon, Capture Land Ltd

cc: Duncan Unsworth, Cabra Developments Ltd; Hannah Edwards, Forme Planning Ltd

From: Robert White

Re: Sinton Road and Clarks Lane, Whenuapai – Water and Wastewater Servicing.

Sinton Road and Clarks Lane, Hobsonville

Private Plan Change Area:

Cabra Developments Ltd is seeking a Private Plan Change for 10, 12, 14 & 16 Sinton Road and 15, 17 & 17A Clarks Lane, comprising 16.6462 ha.

Site	ha
15 Clarks Lane	3.3955
17 Clarks Lane	2.4174
17A Clarks Lane	0.4000
10 Sinton Road	2.7291
12 Sinton Road	2.461
14 Sinton Road	2.3674
16 Sinton Road	2.8758
	16.6462

Table 1: Plan Change Area - Lots

The area is proposed to be Residential – Mixed Housing Urban and Residential - Mixed Housing Suburban, along with 17A Clarks Lane to be zoned Open Space.

The sites are part of larger catchments as detailed below.

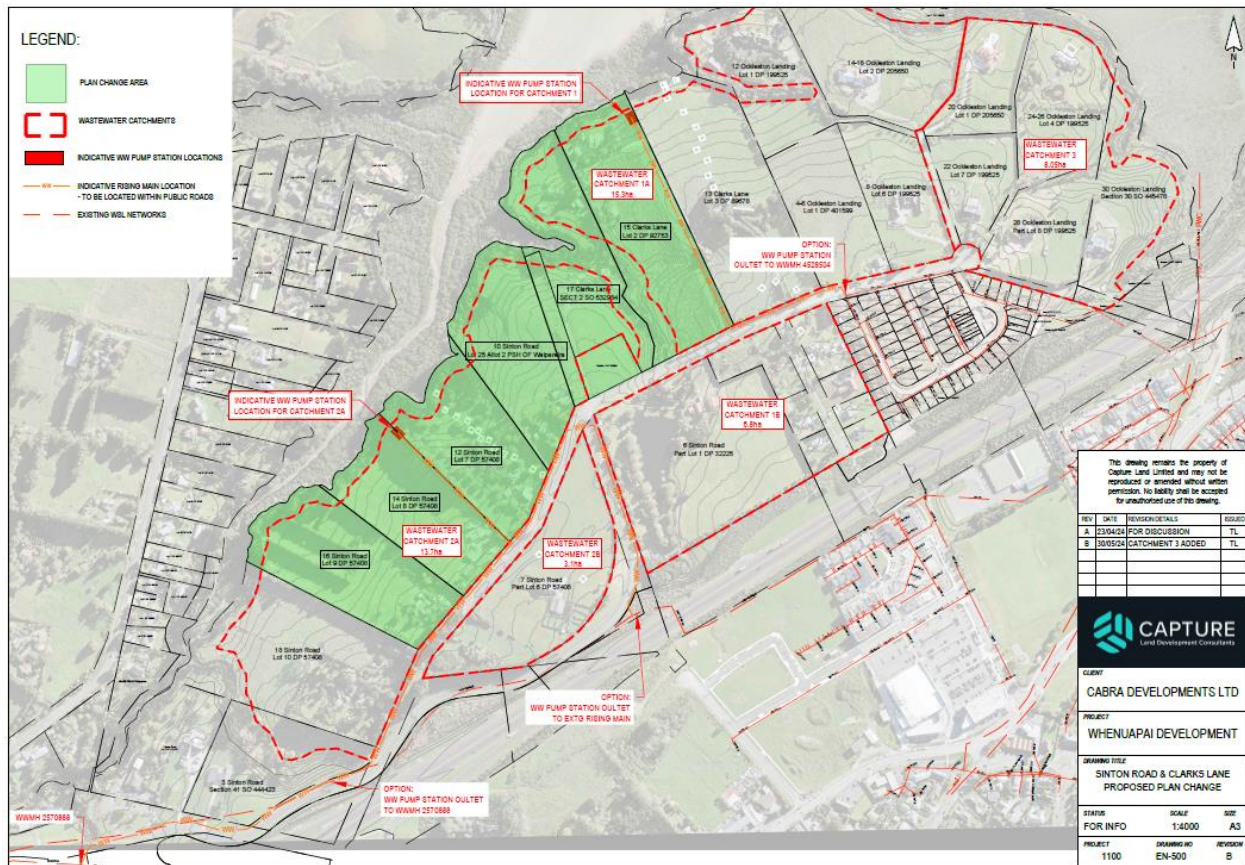


Figure 1: Sinton Road and Clarks Lane – Wider Wastewater Catchment - Drawing No. EN-500

Drawing No. EN-500 is also attached as Annex A.

Provisional Catchments

Provisional catchments are as detailed below:

	Houses	ha	Houses/ha
Catchment 1A	400	15.30	26.14
Catchment 1B	175	6.80	25.74
Catchment 2A	355	13.70	25.91
Catchment 2B	80	3.10	25.81
Catchment 3	210	8.05	26.09

Table 2: Catchment Areas / Provisional DUE

The above table has been based on approximately 26 DUE / ha. for concept design purposes.

Wastewater

Watercare's comments (Letter dated 23 November 2022 - Watercare application number: CON-155536)

Wastewater:

- **15 Clarks Lane** - would require a pumping station which is not just for the proposed development but for the entire catchment (needs to meet the long term needs of the catchment), this pumping station will need to be constructed by the developer of the proposed development. Please note the current proposed connection to the 150mm may not end up being the connection point for the proposed development due to network capacity as this will depend on the final determined flow rate of the pumping station.
- **10 and 16 Sinton** - the developer must co-ordinate with the developments happening around this site rather than having another pump station because it is not ideal to have too many pump stations as part of our network. Solution should be optimised to meet long term catchment needs.

Design Criteria

The design criteria are adopted from The Auckland Code of Practice for Land Development and Subdivision Water and Wastewater Code of Practice for Land Development and Subdivision Chapter 5: Wastewater, 5.3.5 Design criteria.

Table 5.1.1 – Design residential design wastewater flow allowance and peaking factors

Residential property type	Design wastewater flow allowance	Design wastewater peaking factors	
	Litres per person per day (L/p/d)	Peaking factor: Self-Cleansing Design Flow (Normal PDWF)	Peaking factor: Peak Design Flow (PWWF or Exceptional PDWF)
Up to three storey residential development	180	3.0	6.7
High-rise residential (or mixed-use) buildings four storeys and above	180	3.0	5.0

Design Populations / Flow projections

Scheme Overview

It is proposed that the wider catchment would be serviced via gravity feeding into three wastewater pump station located at:

- 16 Sinton Road (Catchments 2A + 2B = 435 DUE)
- 15 Clarks Lane (Catchment 1A + 1B = 575 DUE)
- 20 – 24 Ockleston Landing (Catchment 3 = 235 DUE)

Note: Dwelling Unit Equivalents (DUE) as identified above should be considered provisional and are likely to change, but not to an extent that would alter the concept design.

	Houses	P/house	L/p/day	ADWF L/s	pf	PWWF L/s		ha	Houses/ha
Catchment 1A	400	3	180	2.5	6.7	16.8		15.3	26.14
Catchment 1B	175	3	180	1.1	6.7	7.3		6.8	25.74
						24.1			
Catchment 2A	355	3	180	2.2	6.7	14.9		13.7	25.91
Catchment 2B	80	3	180	0.5	6.7	3.4		3.1	25.81
						18.2			
Catchment 3	210	3	180	1.3	6.7	8.8		8.05	26.09

Table 3: Catchment Areas Flows / Provisional DUE/ha

Existing Wastewater Infrastructure

There is an existing 150 PVC-U gravity Sewer in Ockleston Landing that joins to a 400 GRP that passes under SH18 and feeds into Hobsonville Pump Station.

There is also the 560 rising main from Brigham Creek Wastewater Pump Station (WWPS) that crosses SH18 north east of the Brigham Creek Road off Ramp.

Brigham Creek WWPS is located within 161 Brigham Creek Road, to the west of the plan change area.

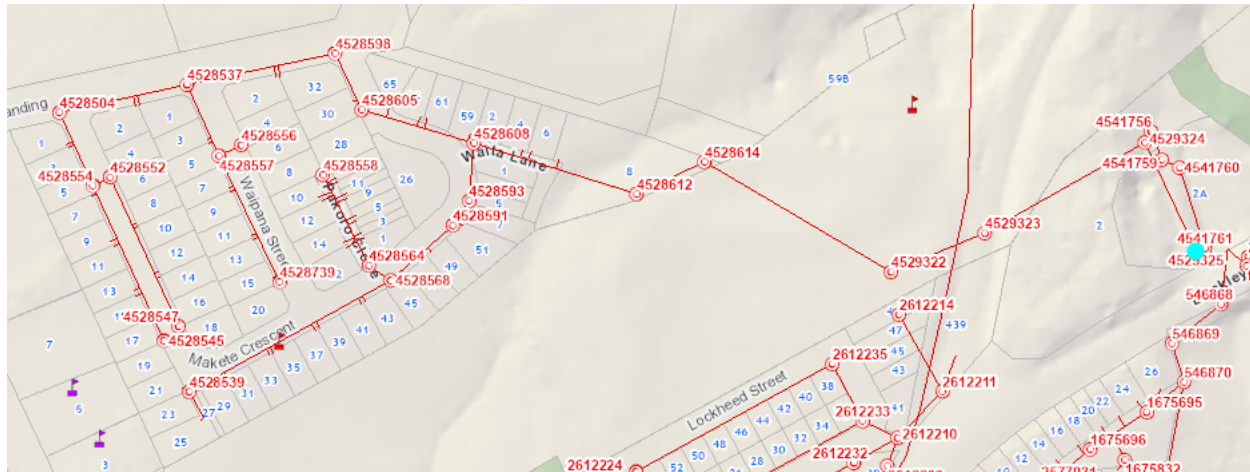


Figure 2: Ockleston Landing – existing network sewer

Available Capacity in the existing system is as follows:

Manhole	Manhole IL	Drop	Length	Diameter	Fall 1:	Full Pipe	Connected		Theoretical Available Capacity (L/s)
	(mRL)	(m)	(m)	(mm)		L/s	DUE	PWW F (L/s)	
4528504	20.36								
		1.16	66	150	56.90	23.60	19	0.80	22.80
4528537	19.2								
		0.48	75	150	156.25	14.10	28	1.17	12.93
4528598	18.72								
		0.2	31	150	155.00	14.20	32	1.34	12.86
4528605	18.52								
		1.15	58	150	50.43	24.90	34	1.42	23.48
4528608	17.37								
		3.42	85	150	24.85	35.70	72	3.02	32.69
4528612	13.95								
		5.05	37	150	7.33	63.30	72	3.02	60.29
4528614	8.9								
		1.67	107	400	64.07	260.00	85	3.56	256.44
4529322	7.23								
		2.3	91.2	400	39.65	332.00	85	3.56	328.44
4529324	4.93								
		0.64	59.2	400	92.50	217.00	85	3.56	213.44
4529325	4.29								

Table 4: Ockleston Landing – existing network sewer capacity.

Calculations as based on the Colebrook-White equation ($ks=0.6\text{mm}$) and full pipe condition (as an approximation of 80% full capacity).

Downstream Infrastructure

The Watercare downstream wastewater transmission infrastructure (560 rising main from Brigham Creek WWPS, Hobsonville WWPS, Northern Interceptor and Rosedale WWTP) is understood to have capacity to accept the additional flows.

Future Development Stages

The preferred option would be developed in agreement with Watercare and developed through the future Resource Consent and Engineering Plan Approval (EPA) stages.

Wastewater Option 1

The future pump stations would be anticipated to connect to the existing gravity network as detailed below:



Figure 3: Ockleston Landing – potential future connection points

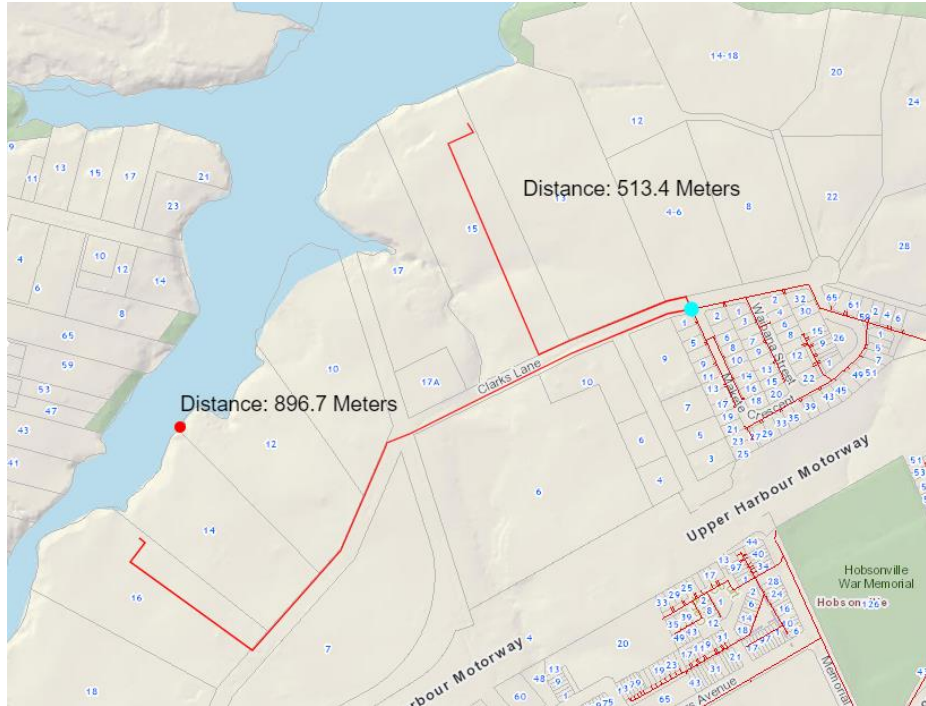


Figure 4: Scheme Overview – Option 1

Solid Line = Rising Main
Dashed Line = Gravity Sewer
Dot = WW Pump Station

Catchment 2

The option is based on constructing the Wastewater Pump Station (WWPS) on 16 Sinton Road with a rising main connection to manhole 4528504 in Ockleston Landing.

Concept design is as follows:

Rising Main:

- 160DN PE100 SDR11 / PN16
- 900m long

Pump Duty

- Initial
 - 12.2 L/s @ 27m pump head (0.9m/s in rising main)
- Ultimate
 - 18.2 L/s @ 37m pump head (1.35m/s in rising main)

Catchment 1

The option is based on constructing the Wastewater Pump Station (WWPS) on 15 Clarks Lane with a rising main connection to manhole 4528504 in Ockleston Landing.

Concept design is as follows:

Rising Main:

- 160DN PE100 SDR11 / PN16
- 525m long

Pump Duty

- Initial
 - 12.2 L/s @ 23m pump head (0.9m/s in rising main)
- Ultimate
 - 24.1 L/s @ 38m pump head (1.8m/s in rising main)

Gravity

The existing gravity line is shown to have an available capacity of ~12.9 L/s. As such, the initial stage of either Catchment 1 or Catchment 2 WWPS could be connected to the existing infrastructure, but an upgrade (duplication) would be required before both WWPS are connected.

To service the full catchment of either Catchment 1 or Catchment 2, the 150 gravity sewer needs to be upgraded or duplicated. On this basis, it is proposed that both pump stations would discharge to the same point, with the existing gravity sewer duplicated with a pipe sized to accommodate the two pump stations and Catchment 2.

Provisional calculations identify a 250 ID gravity sewer would be required to service the ultimate flows.

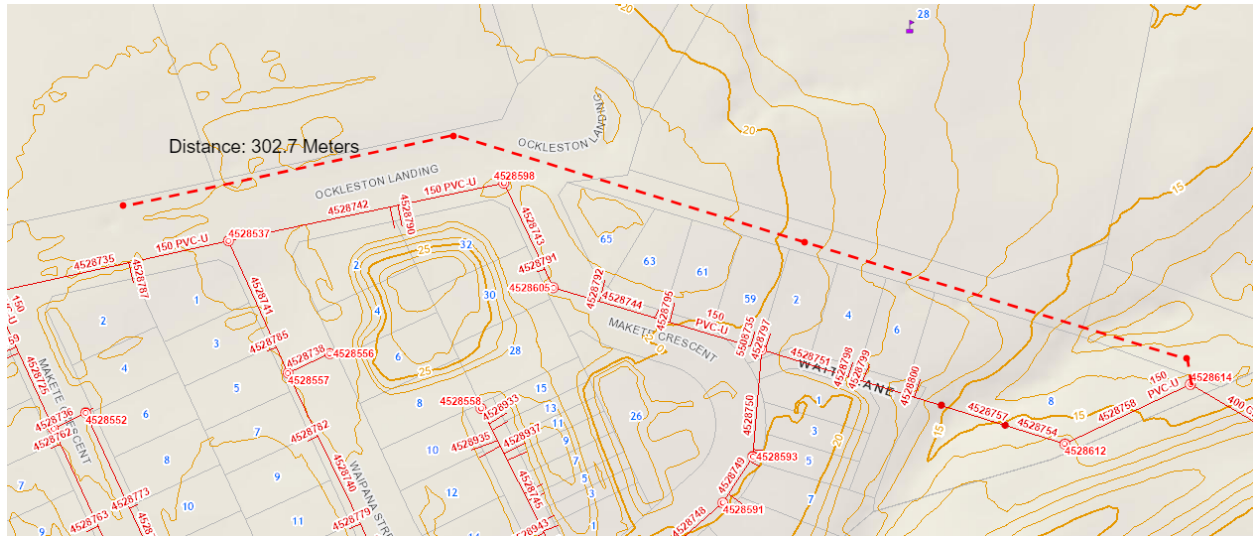


Figure 5: Gravity Sewer duplication – Ockleston Landing

The combined ultimate capacity from the two WWPS is ~42.3 L/s.

The final two lengths of existing sewer pipes that would need to be upgraded or duplicated are located in private property and therefore the developer would be required to enter into agreements with the respective landowners to construct the proposed sewer line within their property.

An alternative option to upgrading the existing pipes is to construct a new gravity line from manhole 4628614 back up to Ockleston Landing through 30 Ockleston Landing as shown in Figure 5. Landowners' approval of 30 Ockleston Landing would be required.

Wastewater Option 2

Option 2 would see the two rising mains connect into the existing 560 rising main immediately north of the motorway crossing.

The connection point is approximately 450m from the end of the 560 rising main section. Assuming an increase in flow from 300 to 350 L/s (adopting $K_s=0.6$) increases the pump head (of the Brigham Creek WWPS) by approx. 1.3m. This is considered to have negligible effect on the pumps.

Additionally, there is potential that this section of rising main to be abandoned with the Northern Interceptor Phase 2 tunnel is constructed along the southern side of SH18. This would allow the existing 560 rising main to discharge directly into the Interceptor Tunnel immediately on crossing the motorway

Two routes are available as below, with either both new rising mains connecting at the same point, immediately before the crossing of SH1 or separately, the 16 Sinton Rd WWPS connecting into the 560 rising main ~300m earlier in Sinton Road.

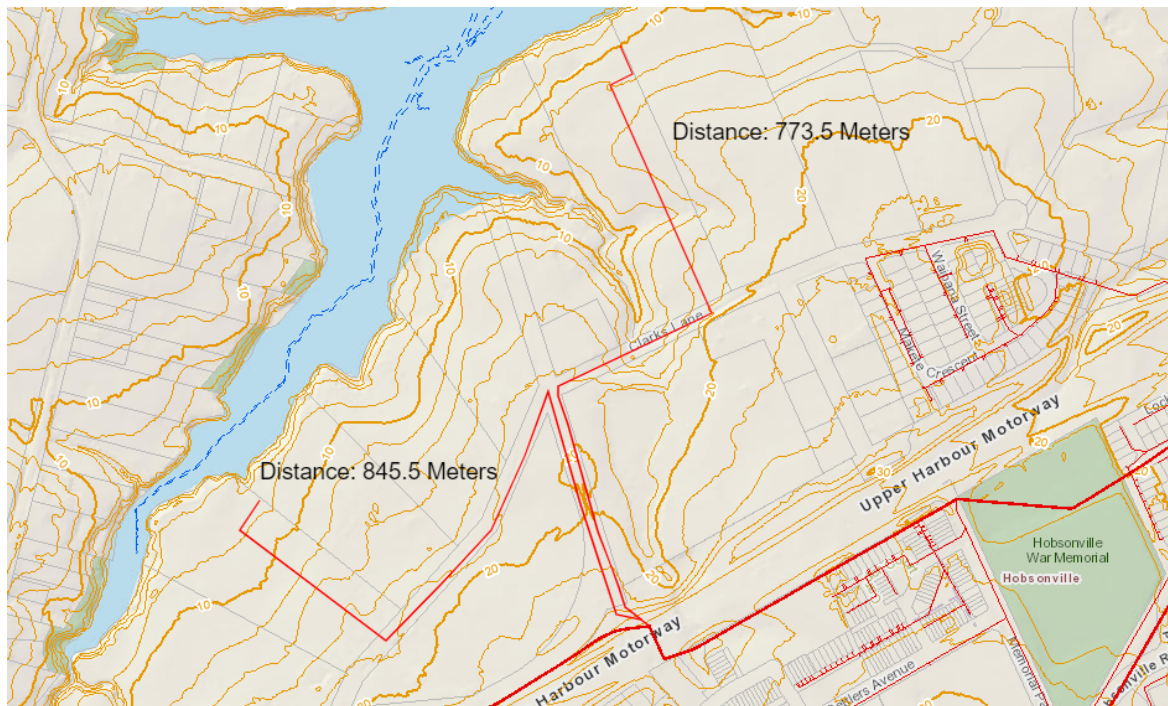


Figure 6: Option 2a - Connection immediately before SH1 crossing – route 1.

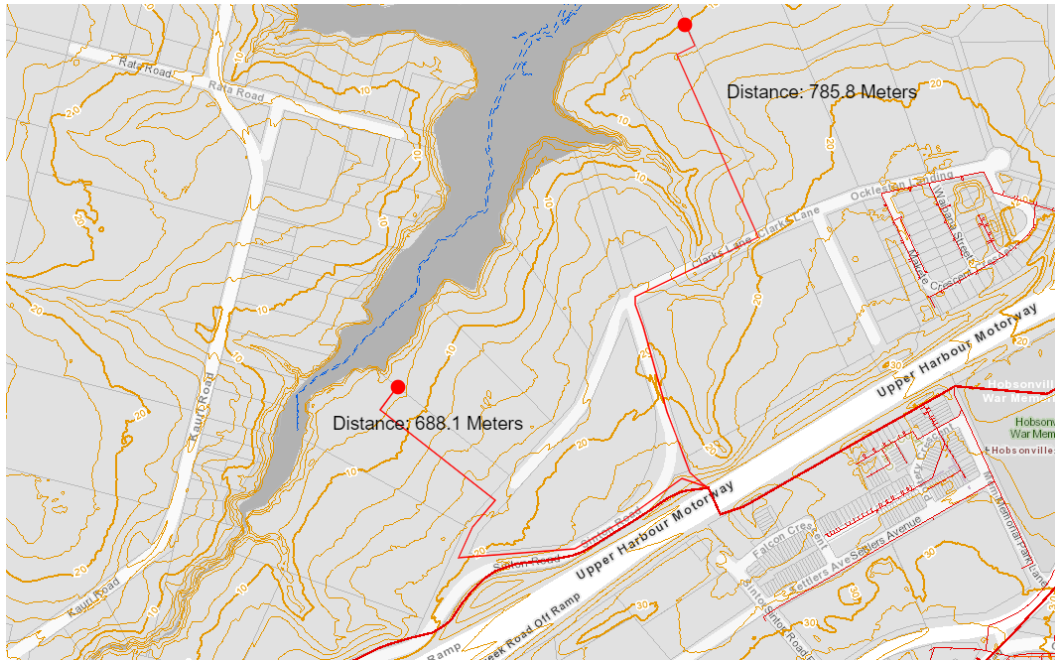


Figure 7: Option 2b - Connection immediately before SH1 crossing – route 2.

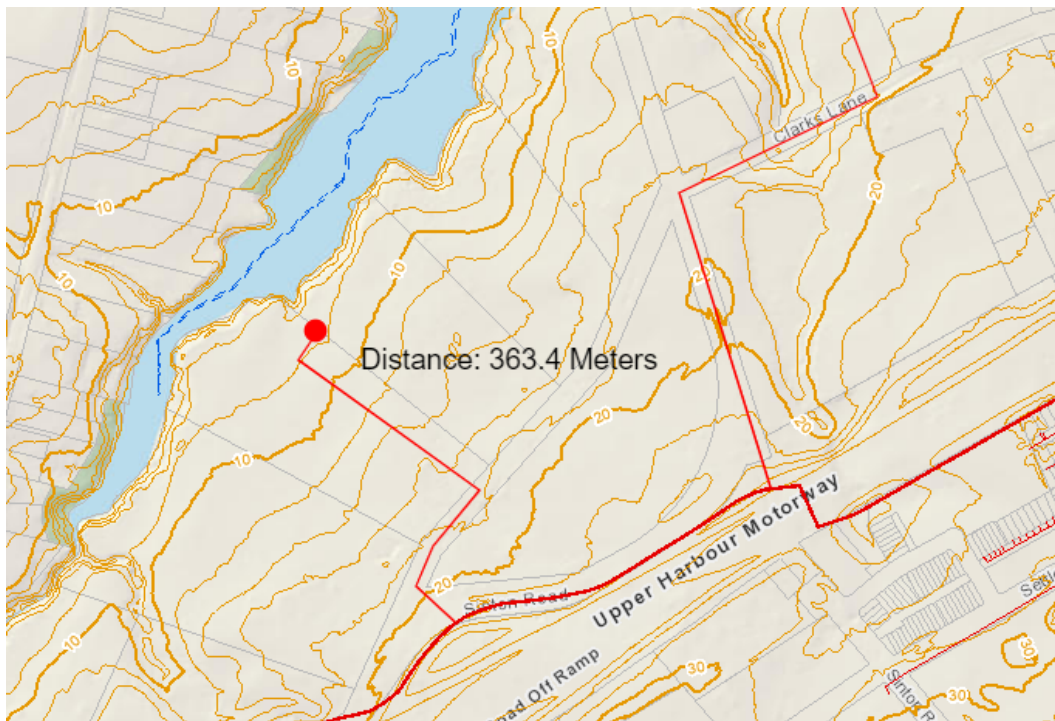


Figure 8: Option 2c - Separate connections Sinton Road and immediately before SH1 crossing.

Catchment 2

The option is based on constructing the Wastewater Pump Station (WWPS) on 16 Sinton Road with a rising main connection to the existing rising main immediately north of the motorway crossing, as previously detailed.

Concept design (2a) is as follows:

Rising Main:

- 160DN PE100 SDR11 / PN16
- 850m long

Pump Duty

- Initial
 - 12 L/s @ 30m pump head (0.9m/s in rising main)
- Ultimate
 - 18.2 L/s @ 41m pump head (1.35m/s in rising main)

Catchment 1

The option is based on constructing the Wastewater Pump Station (WWPS) on 15 Clarks Lane with a rising main connection to the existing rising main immediately north of the motorway crossing, as previously detailed.

Concept design (2a) is as follows:

Rising Main:

- 160DN PE100 SDR11 / PN16
- 780m long

Pump Duty

- Initial
 - 12.2 L/s @ 30m pump head (0.9m/s in rising main)
- Ultimate
 - 24.1 L/s @ 52m pump head (1.8m/s in rising main)

Wastewater Option 3

Option 3 is to convey flows to Brigham Creek WWPS.



Figure 9: Option 3 – Connection to Brigham Creek WWPS.

Catchment 2

The option is based on constructing the Wastewater Pump Station (WWPS) on 16 Sinton Road with a rising main connection to a new gravity manhole in proximity to 3 Sinton Road.

A new gravity sewer approx. 200m long, would link the rising main to the existing gravity sewer to Brigham Creek WWPS.

Concept design is as follows:

Rising Main:

- 160DN PE100 SDR11 / PN16
- 650m long

Pump Duty

- Initial
 - 12.2 L/s @ 28m pump head (0.9m/s in rising main)
- Ultimate
 - 18.2 L/s @ 35m pump head (1.35m/s in rising main)

Catchment 1

The option is based on constructing the Wastewater Pump Station (WWPS) on 15 Clarks Lane with a rising main connection to a new gravity manhole in proximity to 3 Sinton Road.

Concept design is as follows:

Rising Main:

- 180DN PE100 SDR11 / PN16
- 1,200m long

Pump Duty

- Initial
 - 15.4 L/s @ 32m pump head (0.9m/s in rising main)
- Ultimate
 - 24.1 L/s @ 46m pump head (1.4m/s in rising main)

Wastewater Option 4

Option 4 is based on adopting pressure sewer system.

This type of topography is ideally suited to pressure sewer system. Rather than multiple network wastewater pump stations, and deep gravity pipelines, each property has its own pump. This provides a significant cost saving to the land developer with a significantly reduced up front carbon cost.

Adopting a pressure sewer system is also well suited to non-comprehensive development, with different lots being developed separately at different times.

It is acknowledged that Watercare do not favour the adoption of pressure sewer systems and adopt a private ownership model which adds additional operational issues.

The option is not being proposed at this time.

Water

Watercare's comments (Letter dated 23 November 2022 - Watercare application number: CON-155536)

Water supply:

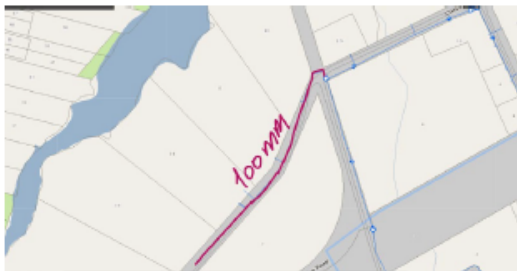
- **For the proposed development @15 Clarks LN Hobsonville 0618**

The existing network (100 mm) has the capacity to provide the required demand as well as the fire flow of FW2.

- **For the proposed developments @10 &16 Sinton Road**

The rider main doesn't have the capacity to supply the developments

We will need the 50 mm rider main upgraded to a pipe with an internal diameter of 100mm, See snip below for the upgrade option



Existing Water Infrastructure

It is noted that the existing water pipes in Sinton Road and Clarks Lane are shown as 100 AC pipes.

Proposed water infrastructure upgrade

Fire hydrant flow tests and dynamic hydraulic modelling have not been undertaken at this stage. Both would be undertaken as part of the detailed design stage and would form part of the Engineering Plan Approval (EPA) submission. The recommended option would be confirmed at this stage.

Two concept options have been identified:

- Option 1: As per Watercare letter dated 23 November 2022
- Option 2: Connection to 355DN in Brigham Creek Road

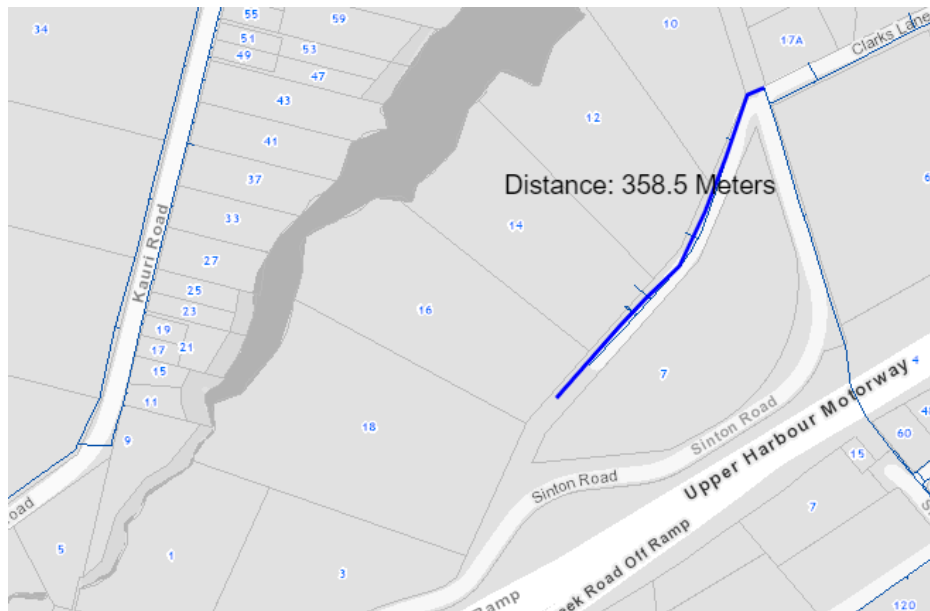


Figure 10: Option 1 – Extension of existing local network to 16 Sinton Rd

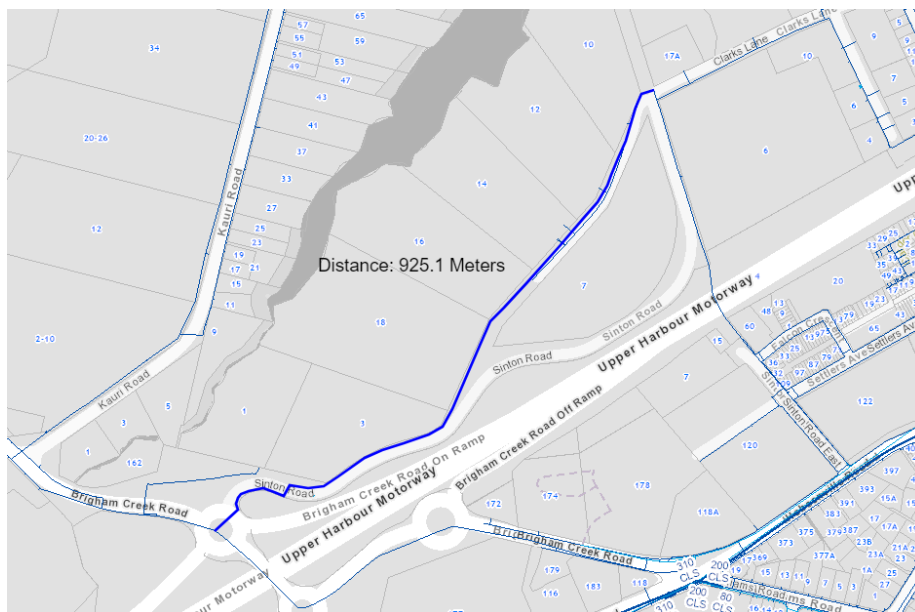


Figure 11: Option 2 – Connection to 355 DN pipe in Brigham Creek Rd (~925m)

Design Criteria

The design criteria are adopted from The Auckland Code of Practice for Land Development and Subdivision Water and Wastewater Code of Practice for Land Development and Subdivision Chapter 6: Water

6.3.5.3 Peak flows

Water demands vary on a regional basis depending on a variety of climatic conditions and consumer use patterns. Watercare will provide historically based demand information appropriate for design.

Where peak demands are required for the design of a distribution system, the value shall be calculated from the following formulae:

Peak Day Demand (over a 12-month period) = Average Day Demand x PF

Unless specified otherwise by Watercare:

- (a) PF = 1.5 for populations over 10,000;
- (b) PF = 2 for populations below 2,000.
- (c) Interpolated between 1.5 and 2 for populations between 10,000 and 2,000

Peak Hourly Demand = Average Hourly Demand (on peak day) x PF (over a 24-hour period)

Unless specified otherwise by Watercare, the peaking factor shall be 2.5

6.3.5.4 Head losses

The head loss through the local network pipes and fittings at the design flow rate for peak day - peak hour, shall be less than:

- (a) 5 m/km for DN ≤150;
- (b) 3 m/km for DN >150.

6.3.5.6 Minimum water demand

[. . .]

Demand estimation shall be based on:

- (a) Daily consumption of 220 L/p/day;
- (b) [. . .]
- (c) Firefighting demands as specified in SNZ PAS 4509;
- (d) The network shall be designed to maintain appropriate nominated pressures for both peak demand (average daily demand in L/s x peaking factor) and firefighting demand scenarios. These figures should be applied to mains of 100 mm diameter or greater. Mains less than 100 mm in diameter can be sized using the multiple dwellings provisions of AS/NZS 3500.1 table 3.2.
- (e) Occupancy of schools, hospitals and commercial buildings must be confirmed on a case-by-case basis. See (f) to (h) below. The design occupancy rates for residential properties and apartments shall be as per table 6.1.a below:

Table 6.1.a - Design residential occupancy allowances

Number of bedrooms	Occupancy for design purposes (i.e. people)
2-4	3

Sinton Road Demand

Sinton Road						
Water						
	Dwellings (DUE)	People / DUE	People	L/p/day	m ³ /day	
Proposed	435	3	1305	220	287.1	
	435		1305		287.10	m ³ /day
					2.00	pf
			Peak Day	574.20	m³/day	
Peak Day Demand						
	10000		1.5			
	1305		2			
	2000		2			
	People	L/p/day	pf	m ³ /day	L/s	
Average	1305	220		287.1	3.3	
Peak Day			2.00	574.2		
Peak Hour			2.50			
	Combined		5.00		16.6	L/s
60% Peak Demand					10.0	
Fire Flow	FW2				25.0	
					35.0	L/s
				50%	17.48	L/s

A single 100 ID main is not considered sufficient to meet the peak hour / peak day demand, nor meet the fire flow requirements.

However, the option to connect to the 355 in Bringham Creek Road and linking this to the existing 100 main at the intersection of Clarks Lane and Sinton Road, provisionally with a 180 DN PE100 SDR13.6 pipe is anticipated to meet the requirements and strengthen the existing supply infrastructure.

As previously mentioned, fire hydrant flow and pressure tests and hydraulic modelling would be undertaken at Engineering Plan Approval (EPA) stage to confirm the required pipe diameters.

The preferred option would be developed in agreement with Watercare and developed through the future Resource Consent and Engineering Plan Approval (EPA) stages.

Conclusions and Recommendation

Options to service the plan change area for both water and wastewater have been identified and are feasible.

Wastewater

A number of options have been identified, at a concept design level, to service the plan change area.

	Option 1	Option 2	Option 3
Rising Main 1 – Length (m)	525	780	1,200
Rising Main 1 – Diameter DN (mm)	160	160	180
Rising Main 2 – Length (m)	900	850	650
Rising Main 2 – Diameter DN (mm)	160	160	160
Gravity Pipe Length (m)	310	0	200
Total Pipe Length	1425 + 310 1,735	1,630	1,850

Table 5: Wastewater servicing options.

The required upgrades would be undertaken by the developer and are not dependant on any future upgrades being undertaken by Watercare.

An online meeting was held with Watercare on Wednesday 15 May (Lars Fog and Charvee Angurala), where the options were discussed.

Watercare have advised that there are no capacity restraints in the downstream wastewater transmission infrastructure and that the proposed development area can be serviced without additional upgrades.

Watercare indicated that their preferred option was Option 1 with pipe duplication, however, options would be further developed in agreement with Watercare and developed through the future Resource Consent and Engineering Plan Approval (EPA) stages.

Water

Water infrastructure in the area can be extended to service the plan change area. It is anticipated that this will include linking the 355 water main in Brigham Creek Road to the existing 100 water main at the intersection of Sinton Road and Clarks Lane.

An online meeting was held with Watercare on Wednesday 15 May (Lars Fog and Charvee Angurala) where the options were discussed. It was confirmed that no Watercare funded upgrades were required to serve the plan change area.

The preferred option would be developed in agreement with Watercare and developed through the future Resource Consent and Engineering Plan Approval (EPA) stages.

Fire hydrant flow and pressure tests and hydraulic modelling would be undertaken at Engineering Plan Approval (EPA) stage to confirm the required pipe diameters.

ANNEX A



Appendix B – Watercare Services Development Assessment

Tom Lemon
Capture Land Limited
14 Tamariki Avenue
Orewa, 0931

16/07/2024

Dear Tom,

Re: Your request for an assessment of water and wastewater capacity

Address: **10, 12, 14 & 16 Sinton Road, 15 & 17 Clarks Lane, Whenuapai**

Watercare application number **CON-226978**

This assessment is independent of the Auckland Council consenting process. This letter does not constitute a pre-approval from Watercare.

In your application you requested information from Watercare regarding the capacity in the water and wastewater systems to service a proposed plan change area covering the following properties:

- 10 Sinton Road (2.7291 Ha)
- 12 Sinton Road (2.4610 Ha)
- 14 Sinton Road (2.3674 Ha)
- 16 Sinton Road (2.8758 Ha)
- 15 Clarks Lane (3.3955 Ha)
- 17 Clarks Lane (2.4174 Ha)

The proposed plan change seeks to rezone the land within the identified sites, from Future Urban Zone to primarily Residential – Mixed Housing Urban Zone. The total plan change area is stated to be 16.2462 hectares.

Future Development Strategy

The proposed plan change area is located in the Whenuapai East Future Urban Area which is not anticipated under Auckland Council's Future Development Strategy 2023-2053 (FDS) to be urbanised until 2035+.

Watercare's bulk infrastructure programme is planned, funded and sequenced in accordance with the Auckland Council Development Strategy (previously the Future Urban Land Supply Strategy 2017 and more recently the FDS), the Auckland Council Growth Scenario (previously i11v6 and more recently AGSv1), and the Auckland Unitary Plan.

Watercare does not support out of sequence development that would impact Watercare's ability to deliver its planned infrastructure programme or result in reprioritisation or reallocation of funding in the 30 year Watercare AMP.



Fault line

24 hours

09 442 2222

Free text 3130

faults@water.co.nz

Yield Calculations

The water and wastewater technical memo (the memo) has assumed an average dwelling density of 26 per hectare. While the memo does not define the total expected dwellings within the plan change area, separate Watercare development forms submitted by the applicant shows a total of 392 expected dwellings.

Watercare understands that the yield calculation of 26 dwellings per hectare was determined as part of a previous Fast Track Consenting application. The applicant shall carry out any necessary local wastewater network upgrades required to provide capacity for their proposed development. The scale of any local network upgrades will be determined at resource consent stage.

Water supply

There are some capacity constraints in the existing local water supply network. Any upgrades to the local water supply network necessary to service the proposed plan change area will need to be carried out by the developer. The developer shall also give consideration to, and provide for in any necessary upgrades, the whole of the catchment area that may be serviced by these upgrades.

The developer shall, as part of any resource consent applications for the proposed plan change area, propose suitable upgrades to provide capacity, including fire flow requirements, for the likely maximum development within the plan change area and any further catchment which may rely on these upgrades. While the memo suggests that the upgrade details are discussed at EPA stage, the applicant shall propose sufficient upgrades to ensure that there is adequate water supply capacity as detailed above, at resource consent stage.

The memo discusses two potential options to service the plan change area with water. Option 2 considers that the plan change area is serviced from the 355 DN water main in Brigham Creek Road via a suitably sized water main up to Clarks Lane. Watercare considers that there are major benefits in adopting option 2 discussed in the memo, and is happy to discuss the relevant sizing of the upgrades at resource consent stage.

Wastewater

There are some capacity constraints in the existing local wastewater network. Any upgrades to the local wastewater network necessary to service the proposed plan change area will need to be carried out by the developer. The developer shall also give consideration to, and provide for in any necessary upgrades, the whole of the catchment area that may be serviced by these upgrades.

The developer shall, as part of any resource consent applications for the proposed plan change area, propose suitable upgrades to provide capacity for the likely maximum development within the plan change area and any further catchment which may rely on these upgrades. While the memo suggests that the upgrade details are discussed at EPA stage, the applicant shall propose sufficient upgrades to ensure that there is adequate wastewater capacity as detailed above, at resource consent stage.

The memo discusses a number of options that could be considered for servicing the plan change area.

Option 1, which includes two pumping stations servicing the plan change area, both connecting into the existing Ockelston Landing network, is considered a viable option. This option will require the Ockelston landing network to be upgraded sufficiently to provide the necessary capacity for both the plan change area

and the wider catchment which may connect into this upgraded network. The upgrade would be required up to the 400mm GRP sewer under the Upper Harbour motorway.

Option 2 considers two pumping stations within the plan change area each connecting directly into the 560mm PE rising main from Whenuapai Pumping Station (PS 68). This is a transmission (bulk) pumping station and rising main and Watercare operations are not in favour of direct connections to transmission network. In addition to this PS 68 may be limited in capacity until the Whenuapai Packages 1 and 2 projects are completed, and then again when the flows from Riverhead increase due to increased development within Riverhead, Kumeu and Huapai.

Option 3 considers pumping all the wastewater from the proposed plan change area back to PS 68 and then using PS 68 to transfer the flows to the Hobsonville Peninsula pumping station (PS 70). This options viability is linked to the capacity of PS 68. PS 68 currently services flows from Whenuapai village, Massey North pumping station and the flows from Riverhead, Kumeu and Huapai. PS 68 is also likely to service the Whenuapai Business Park plan change area. The applicant shall consider the current flows from PS 68 as well as the short term future flows and the long term future flows.

Option 4 is based on adopting a pressure sewer system for the plan change area. Watercare do not favour the adoption of pressure sewer systems and considers that the private ownership model adds additional operational issues.

It should be noted that all of the above options discharge into the transmission (bulk) network at PS 70. PS 70 currently discharges to the Mangere wastewater treatment plant, but with the completion of the northern interceptor stage 1, will be able to pump to both Mangere and Rosedale treatment plants. The applicant shall demonstrate that the connection of this plan change area does not compromise the ability of PS 70 to service its catchment and will not require any planned works at the pumping station to be brought forward to service this plan change area.

All infrastructure and pumping stations are to be sized to allow for full natural catchment buildout. The consenting of any new overflows from the proposed pumping stations, along with any required consultation and potential mitigation of effects, is the responsibility of the developer.

Yours Sincerely



Ameya Bhiwapurkar
Development Engineer | Developer Services