



Drinking Water, Wastewater and Sanitary Services Assessment Review 2021/22

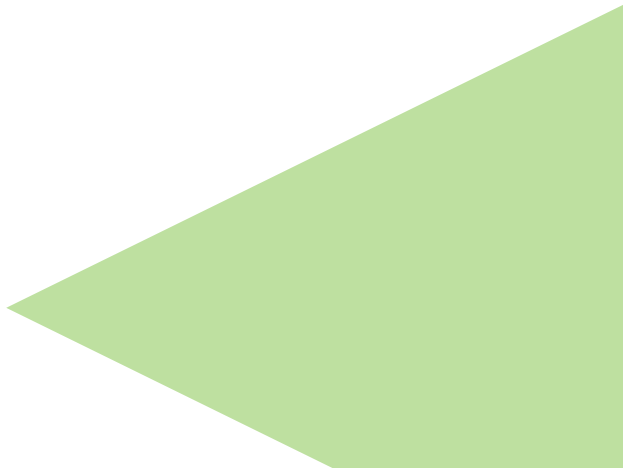
June 2022



Kaipara te Orakakui

KAIPARA
DISTRICT

Two Oceans Two Harbours





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Table of contents

Executive Summary.....	1
Key changes since the previous assessment.....	1
Recommendations.....	2
General.....	2
Water supply.....	2
Wastewater.....	3
Stormwater.....	4
Sanitary services – public toilets.....	5
Sanitary services – cemeteries and crematoria.....	5
Introduction.....	6
Local Government Act 2002 requirements.....	7
Health Act 1956 definition of sanitary works.....	11
Future state of the three waters system.....	11
June 2022 Update.....	13
Climate Change.....	15
Background on the Kaipara district.....	15
Population.....	16
Communities.....	17
Water supply.....	19
Overview - public water supply schemes.....	20
Public water supply schemes assets.....	20
Community Outcomes – public water supply schemes.....	20
Service levels for public water supply schemes.....	21
Measuring performance.....	21
Public water supplies water take resource consents.....	22
Small water supply schemes owned, operated or managed by Council.....	23
Raw water supply agreement.....	23
Public water supplies quality standards compliance.....	24
2020-2021 Annual report on drinking-water quality.....	24
Water safety plans.....	26
Current risks and issues with the public water supply schemes.....	26
Key risks and issues.....	26
Raw water connections.....	27
Ruawai Water Supply Scheme.....	27
Community water supply schemes (excluding Council owned public schemes).....	30
Current risks and issues with community drinking water supply schemes (excluding Council-owned public schemes).....	35



Key risks and issues	35
Private drinking water supplies.....	36
Quality – private drinking water supplies	36
Key risks and issues	40
Adequacy Assessment.....	41
Public drinking water supply schemes.....	41
Community drinking water supply schemes (excluding Council-owned public schemes).....	41
Private drinking water supplies.....	41
Wastewater	43
Overview – public wastewater schemes	44
Public wastewater schemes assets	44
Service levels for public wastewater schemes ¹¹	45
Measuring performance	45
Public wastewater schemes resource consents.....	45
Resource consent non-compliance issues	47
Te Kopuru wastewater scheme	47
Kaiwaka wastewater scheme.....	47
Dargaville wastewater scheme.....	47
Wastewater network discharges	48
Small wastewater treatment facilities owned, operated or managed by Council	48
Current risks and issues with the public wastewater schemes.....	51
Risks and issues ¹⁶	51
Community wastewater schemes (excluding Council public schemes).....	53
Private onsite wastewater systems.....	53
Rural Settlements Infrastructure.....	53
Septage Disposal	58
Adequacy Assessment.....	58
Public wastewater schemes.....	58
Community wastewater schemes (excluding Council-owned public schemes).....	59
Private onsite wastewater systems.....	59
Stormwater.....	60
Overview – public stormwater schemes.....	61
Dargaville stormwater system	62
Ruawai stormwater system.....	62
Public stormwater schemes assets.....	69
Service levels for public stormwater schemes	69
Level of Service.....	69
Measuring performance	69



Public stormwater schemes resource consents.....	70
Resource consent non-compliance issues	70
Current risks and issues with the public stormwater schemes.....	71
Risks and issues ¹⁵	71
Risks and issues – Dargaville urban flood protection scheme.....	71
Risk and issues – Ruawai urban flood protection scheme.....	72
Public health risks and issues with the public stormwater schemes.....	72
Adequacy Assessment.....	72
Dargaville.....	72
Ruawai.....	74
Baylys Beach.....	76
Te Kopuru.....	76
Kaiwaka.....	76
Mangawhai.....	76
District.....	77
Sanitary services – public toilets.....	78
Overview public toilets.....	79
Other facilities.....	79
Public toilets assets.....	79
Service levels for public toilets.....	81
Measuring performance	81
Non-compliance issues.....	81
Current risks and issues with the public toilets	82
Risks and issues.....	82
Adequacy Assessment.....	82
Sanitary services – cemeteries and crematoria.....	83
Overview	84
Cemeteries assets.....	84
Crematoria Assets	84
Service levels for cemeteries and crematoria.....	84
Cemeteries and crematoria resource consents	85
Current risks and issues with cemeteries and crematoria.....	85
Risks and issues.....	85
Adequacy Assessment.....	85
Appendix A – Communities by category	86



List of tables

Table 1 – Census 2018 Kaipara district population statistics	16
Table 2 – List of communities by category.....	17
Table 3 – Public water supplies performance measures.....	21
Table 4 – Public water supplies water take resource consents	22
Table 5 – Small water schemes resource consents	23
Table 6 – Supplier: Kaipara District Council – Annual Report on Drinking-water Quality 2018-2019.....	25
Table 7 – Public water supplies water safety plans.....	26
Table 8 – Register of Water Suppliers – Kaipara district.....	31
Table 9 – Point-of-use and Point-of-entry Devices and an Indication of their Effectiveness Against Various Contaminants.....	38
Table 10 – Public wastewater schemes performance measures.....	45
Table 11 – Public wastewater schemes resource consents.....	45
Table 12 – Small wastewater systems resource consents	50
Table 13 – Private Onsite Wastewater Risk Assessment.....	57
Table 14 – Public stormwater schemes performance measures.....	69
Table 15 – Public stormwater schemes resource consents.....	70
Table 16 – Public toilets performance measures	81
Table 18 – Council-owned cemeteries.....	84

List of figures

Figure 1 – Water services entities – overview	14
Figure 2 – Usually Resident Population of Kaipara, Kaipara excluding Mangawhai, and Mangawhai.....	16
Figure 3 – Public water supply schemes.....	20
Figure 4 – Ruawai Water Supply Scheme Supply Bores.....	28
Figure 5 – Public wastewater schemes.....	44
Figure 6 – Public stormwater schemes	61
Figure 7 – Dargaville and Surrounds Predicted Future Coastal Flooding.....	64
Figure 8 – Dargaville Predicted Future Coastal Flooding	65
Figure 9 – Mangawhai Heads Predicted Future Coastal Flooding.....	66
Figure 10 – Mangawhai Village Predicted Future Coastal Flooding	67
Figure 11 – Ruawai and Surrounds Predicted Future Coastal Flooding	68
Figure 12 – Dargaville Current-day Coastal Flooding (CFHZ 0).....	73
Figure 13 – Ruawai Current-day Coastal Flooding (CFHZ 0).....	75
Figure 14 – Residents' satisfaction with public toilets	81



Executive Summary

From 2021, the *Local Government Act 2002* (LGA), as amended due to the enactment of the *Water Services Act 2021*, now require councils to assess drinking water, wastewater and other sanitary services at least once every three years. This being a departure to the previous requirement to assess 'from time to time' in accordance with Part 7 of the LGA. Sanitary services include public toilets, cemeteries, and crematoria.

An assessment of drinking water services is not limited to only services provided by the Kaipara District Council (Council) and must include:

- a) communities that receive drinking water services from the territorial authority or other local government organisation; and
- b) communities that do not receive drinking water services from the territorial authority or other local government organisation; and
- c) all types of water supply arrangements, including communities (and households within those communities) that do not receive drinking water services supplied by network reticulation.

The purpose of an assessment of wastewater and other sanitary services is to assess, from a public health perspective, the adequacy of wastewater and other sanitary services available to communities within a territorial's district in light of:

- a) the health risks to communities arising from any absence of, or deficiency in, the services; and
- b) the quality of the services currently available to communities within the district; and
- c) the current and estimated future demands for any of those services; and
- d) the actual or potential consequences of stormwater and sewage discharges within the district.

Kaipara District Council's last water and sanitary services assessment (now referred to as drinking water, wastewater and other sanitary services) was undertaken in 2006. The relevant sections of the LGA have been amended, and there have also been changes to the services provided within the Kaipara district since the last assessment. Hence, it is now considered appropriate to undertake a review of the 2006 assessment.

Overall the assessment indicates that Council-supplied drinking water, wastewater and other sanitary services are generally adequate to meet the needs of the communities they serve. These services are also capable of being upgraded to meet forecast future demands driven by growth, expected changes in use, effects of climate change, and new or amended legislative requirements. Where deficiencies or risks have been identified, recommendations have been included below as options to address these risks.

Residents in non-reticulated communities also appear to be adequately serviced by their own private systems subject to further improvements noted below.

Key changes since the previous assessment

Key changes since the previous water and sanitary services assessment include:

Current status	Previous status
All drinking-water supplied by Council's water supply schemes is compliant with the Drinking-water Standards New Zealand (DWSNZ).	Dargaville, Mangawhai, Ruawai, Glinsk Gully and Maungaturoto Water Supply Schemes did not fully meet the requirements of the DWSNZ.
All of Council's water supply schemes have current water take resource consents.	Water take resource consents for Maungaturoto, Mangawhai, and Ruawai Water Supply Schemes had expired (note: applications for new water take consents for some of these schemes had been lodged).
The Mangawhai Wastewater Scheme has been constructed and commissioned.	The Mangawhai community was relying on private onsite wastewater treatment and disposal systems. Assessment was that there were elevated levels of public health risk and adverse environmental impact, and the implementation of a reticulated community wastewater scheme was at an advanced planning stage.



Current status	Previous status
All of Council's wastewater treatment plants have current discharge resource consents.	Discharge resource consents for the Dargaville, Kaiwaka, Maungaturoto, and Maungaturoto Railway Village Wastewater Treatment Plants had expired (note: applications for new resource consents for some of these facilities had been lodged).
Kaipara District Council <i>Wastewater Drainage Policy</i> [September 2016] and the <i>Kaipara District Wastewater Drainage Bylaw 2016</i> [September 2016] have been adopted.	These were recommendations in the previous assessment.
Council has implemented a WOF programme for private onsite wastewater systems within the defined coverage area (as per the <i>Kaipara District Wastewater Drainage Bylaw</i>).	This was a recommendation in the previous assessment.
Climate change predictions and associated legislative requirements are key issues.	Was not recognised as a key issue at the time of the previous assessment.
The district is generally experiencing a higher growth rate.	Other than Mangawhai and Kaiwaka, the rest of district was predicted to experience low growth rates.
Central government's Three-waters reform.	Was not an issue at the time of the previous assessment.

Recommendations

General

- i. Council should continue to provide reticulated drinking water services, wastewater and stormwater drainage services where these schemes currently exist, and in accordance with its proposed improvement programmes.
- ii. Council should continue to provide public toilets and cemeteries services (sanitary services) where they currently exist, and in accordance with its proposed improvement programmes.
- iii. Council should continue its engagement, in conjunction with its neighbouring Northland councils, with central government regarding the government's current 'three waters' reform on how to improve the regulation and supply arrangements of drinking-water, wastewater and stormwater, the associated new acts, and Taumata Arowai (water services regulator).
- iv. Council should progress its climate change work programme as set out in Council's *Kaipara Ki Tua Climate Smart Strategic Framework* including understanding how climate change, from a public health perspective, may adversely affect the adequacy of drinking water, wastewater and other sanitary services available to communities within the district.

Water supply

Public drinking water supply schemes

- i. Council should give priority to finalising, implementing and ensuring on-going reviews of Water Safety Plans for Council's schemes. Priority should be given to the schemes with the highest number of connections commencing with Dargaville.
- ii. Council should progress investigations and resource consent applications for a new water take resource consent for the Dargaville Water Supply Scheme (Ahikiwi raw water take), and for renewing the water take consent for the Glinks Gully Water Supply Scheme.
- iii. Council should progress investigations to develop a strategy and identify options to ensure security of its raw water supplies, and to improve the resilience of the water supply scheme assets.
- iv. Council should programme to negotiate a replacement raw water supply agreement with the owner of the privately owned Baldrock Road (Brooklands Irrigation Scheme) water storage reservoir, or identify an alternative raw water source to augment the Maungaturoto Water Supply Scheme's raw water supply.



- v. Council should progress the resolution of the rural extraordinary raw water connections being used inappropriately as drinking-water supplies.
- vi. Council should continue to regularly remind the rural property users provided with extraordinary raw water connections via warnings on their water bills that the raw water is untreated and not suitable for use as drinking-water, and is supplied solely for agricultural purposes.
- vii. Council should implement the recommended measures to ensure a pragmatic approach to the sustainable long-term operation of the Ruawai water supply scheme to mitigate the risk of saline intrusion.
- viii. Council should reconsider the provision of a reticulated drinking water supply scheme for Mangawhai as growth continues in the community including consultation with the community to figure out how they would fund the implementation of the preferred solution.

Community drinking water supply schemes (excluding Council-owned public schemes)

- i. Aranga Beach, Rehutai Road, and Kaiwaka Water Supply Group – Council should notify Taumata Arowai that there is insufficient evidence to determine the adequacy of these drinking water services to meet the respective supplier's statutory obligations, and that their associated potential risks to the communities served by these schemes are unknown.
- ii. Turiwiri Water Supply Scheme – Council should periodically monitor this privately owned scheme to ensure the households connected to the scheme continue to be provided with drinking water.

Private drinking water supplies

- i. Council should implement an ongoing education programme to highlight the risks and to promote good practice and sound maintenance by dwelling occupants to mitigate the public health risks associated with private drinking water supply systems for individual households.
- ii. Council should ensure appropriate water quality preventative measures and treatment systems for individual households to ensure the water is potable (i.e. is safe to drink and complies with the drinking water standards) are required to be installed for all new builds not connected to a public water supply scheme.
- iii. Council should complete the installation of an additional water supply point for tanker-delivered water suppliers in Maungatūroto to assist with meeting peak demand during periods of drought.
- iv. Council should support the proposal by Te Tari Taiwhenua Department of Internal Affairs (DIA) to provide the infrastructure (through a DIA-funded pilot project for marae) to supply drinking water to the Waikaraka Marae, and a truck filler for the Kaihu community and water carriers outside the Marae grounds as the preferred option supported by the Marae to address the water shortages that occur during droughts for the non-reticulated community of Kaihu.

Non-drinking reticulated water supplies

- i. Council should implement an ongoing education programme to highlight the risks and to promote good practice regarding the Tinopai (two schemes) and Matakōhe reticulated non-drinking water supply schemes.

Wastewater

Public wastewater schemes

- i. Council should progress investigations and applications for renewing the discharge resource consents for the Dargaville, Kaiwaka, Glinks Gully, and Maungatūroto Railway Village Wastewater Treatment Plants.
- ii. Council should progress resolution of the Dargaville, Kaiwaka and Te Kopuru Wastewater Treatment Plants' non-compliance issues.
- iii. Council should progress investigations to assess the capacity of the key elements of the wastewater schemes and develop a programme to upgrade where required to accommodate growth.
- iv. Council should continue its acquisition of wastewater network discharge consents (as required under *Rule C.6.2.1 Discharge from a pump station or pipe network* of the NRC's *Proposed Regional Plan for*



Northland) as this is a discretionary activity. This will include investigations to assess the level of stormwater inflow/infiltration in the wastewater schemes.

- v. Council should develop a strategy to minimise and manage any wastewater network discharges to support resource consent applications for network consents (linked to iii & iv. above).
- vi. Council should continue the implementation of a condition assessment programme.
- vii. Council should continue to undertake periodic condition assessments of the Mangawhai Wastewater Treatment Plant to ensure proactive renewal of its key assets.
- viii. Council should continue its investigation of the options to mitigate any discharge exceedances from the Tinopai Campground's wastewater system during wet weather events due to infiltration.

Private onsite wastewater systems

- i. Council should undertake an investigation to support a community wastewater scheme in Paparua to enable Council to consult with the community to figure out how they would fund the implementation of the preferred solution.
- ii. Council should construct the Spring Street Project to provide a reticulated wastewater system connecting to the Dargaville Wastewater Scheme, including connecting the individual properties to the new system.
- iii. Council should continue with the monitoring and enforcement of Council's Wastewater Drainage Bylaw 'WOF' maintenance and performance inspection & approval programme for onsite wastewater systems to ensure the systems are appropriately maintained and operated, and ensuring any non-complying systems are remediated. The private onsite wastewater risk assessment will assist the Council officers to manage this programme.
- iv. Council should liaise with the Northland Regional Council to ensure an appropriate freshwater/beach water sampling programme throughout the district to monitor the incidence and level of potential contamination.

Stormwater

Public stormwater schemes

- i. Council should prepare new Stormwater Catchment Management Plans (SWCMP) in areas subject to growth or with known historical issues including Kaiwaka, Dargaville, Mangawhai, Te Kopuru, Baylys Beach, Maungatūroto and Paparua.
- ii. Council should develop hydrological models for specific areas of the stormwater networks in Mangawhai, Kaiwaka, Dargaville, Te Kopuru, Baylys Beach, Maungatūroto and Paparua.
- iii. Council should model infrastructure requirements in Dargaville and Mangawhai for flood susceptible areas under increasing rain intensity and river levels (flooding and tidal) because of climate change.
- iv. Council should create overland flow maps for the entire district.
- v. Council should complete the condition assessment of the urban stopbanks.
- vi. Council should complete Closed Circuit Television (CCTV) condition assessments in Kaiwaka, Maungatūroto, Paparua, Te Kopuru and Baylys Beach so asset conditions can be used in the renewals' strategy.
- vii. Council should complete CCTV condition assessments in Whakapirau, Tinopai, and Pahi (Glinks Gully, Kelly's Bay, Ruawai, Pouto and Matakoho as necessary).
- viii. Council should develop a better understanding of the current Dargaville stopbanks and floodgate assets, the risks faced from flooding and the options available by completing an investigation to build a comprehensive understanding of the boundary between river and land in the Dargaville urban area with special consideration for protection of life, property, and business from flooding, and including an options assessment to develop the scope and cost of required future projects.
- ix. Council should undertake the proposed improvements to the Dargaville – Awakino Point East and Raupo stopbanks.
- x. Council should complete modelling of the Raupo land drainage infrastructure requirements considering predicted increasing rainfall intensities and sea level rise due to climate change, and work with the Raupo Drainage Committee to investigate further protection measures including raising of stopbank levels and water storage/retention as possible adaptation response options.



- xi. Council should finalise the Stormwater Bylaw and/or Policy.

Sanitary services – public toilets

- i. Council should continue its programme of renewing and providing additional public toilets.
- ii. Council should complete the resolution of upgrading the holding tank serving the public toilet at Aranga.

Sanitary services – cemeteries and crematoria

- i. Council should continue to develop its cemeteries as and when required to provide supporting infrastructure such as internal access roads and paths, and to prepare the available spare land within the cemeteries in preparation for future burial plots.



Introduction

Until 2021, the *Local Government Act 2002* (LGA) required councils to assess water and sanitary services from time to time. The enactment of the *Water Services Act 2021* included amendments to the LGA which includes the requirement to conduct an assessment of drinking water, wastewater and sanitary services at least once every three years¹. The last water and sanitary services (now referred to as drinking water, wastewater and other sanitary services) assessment was undertaken in 2006.

Part 7 of the LGA sets out the specific obligations for territorial authorities to assess drinking water, wastewater and sanitary services, and the purpose of those assessments.

Wastewater services includes sewerage, treatment and disposal of sewage, and stormwater drainage. Sanitary services include public toilets, cemeteries, and crematoria.

An assessment of drinking water services is not limited to only services provided by the Kaipara District Council (Council) and must include:

- i. communities that receive drinking water services from the territorial authority or other local government organisation; and
- ii. communities that do not receive drinking water services from the territorial authority or other local government organisation; and
- iii. all types of water supply arrangements, including communities (and households within those communities) that do not receive drinking water services supplied by network reticulation

Territorial authorities need not consider within an assessment drinking water services that are owned or operated by the Crown.

The purpose of an assessment of wastewater and other sanitary services is to assess, from a public health perspective, the adequacy of wastewater and other sanitary services available to communities within a territorial's district in light of:

- a) the health risks to communities arising from any absence of, or deficiency in, the services; and
- b) the quality of the services currently available to communities within the district; and
- c) the current and estimated future demands for any of those services; and
- d) the actual or potential consequences of stormwater and sewage discharges within the district.

The relevant sections of the LGA have been amended to align with the *Water Services Act 2021*, the *Water Services Act 2021* has been enacted, and there have also been changes to the services provided within the Kaipara district since the last assessment. Hence, it is now considered appropriate to undertake a review of the 2006 assessment.

The drinking water, wastewater and other sanitary services assessed are:

'Water' services

- Drinking water supply;
- Wastewater services; and
- Stormwater drainage.

Sanitary services

- Public toilets;
- Cemeteries; and
- Crematoria.

This assessment has a public health focus and needs to be read in conjunction with other documents that form part of Council's *Long Term Plan Mahere Wa Roa 2021-2031* including activity management plans and the Infrastructure Strategy. These documents set out in more detail the description and analysis of each of the service areas. Consequently, this assessment provides a broad overview of each service area rather than detailed description.

¹ Waters Services Act 2021, s125(3)(a) & s125(2)(g)



Local Government Act 2002 requirements

Part 7 of the Local Government Act 2002 (LGA) sets out the specific obligations for local authorities to assess drinking water, wastewater and sanitary services, and the purpose of those assessments as follows (note that the LGA has been amended to align with the *Water Services Act 2021*):

Part 7

Specific obligations and restrictions on local authorities and other persons

123 Outline of Part

This Part contains provisions that set out specific obligations and restrictions on local authorities and other persons as follows:

- a) the obligation to assess water and sanitary services and the purpose of those assessments:
- b) the obligations and restrictions on local authorities and other persons in relation to the delivery of water services:
- c) specific restrictions on disposal of parks, reserves, and endowment properties, including provision for the protection of parks and reserves from disposal:
- d) a requirement that, if a public library is provided, the residents of the district must be entitled to free membership.

Subpart 1 – Specific obligations to make assessments of drinking water, wastewater, and sanitary services and to ensure communities have access to safe drinking water

124 Interpretation

In this Part,—

assessment,—

- a) in relation to drinking water,—
 - i. means an assessment of drinking water services available to communities in the district of the territorial authority, including private and community-owned or community-operated drinking water supplies; but
 - ii. does not include assessments in relation to domestic self-suppliers; and
- b) in relation to wastewater and other sanitary services,—
 - i. means an assessment of wastewater services and other sanitary services available to communities in the district of the territorial authority; but
 - ii. does not include assessments in relation to individual properties

domestic self-supplier has the meaning given in [section 10](#) of the Water Services Act 2021

drinking water has the meaning given in [section 6](#) of the Water Services Act 2021

drinking water services means the supply of drinking water to communities to the point of supply of each dwelling house and commercial premise to which drinking water is supplied

local government organisation means a local authority, council-controlled organisation, or subsidiary of a council-controlled organisation, that provides water services

point of supply has the meaning given in [section 13](#) of the Water Services Act 2021

sanitary services has the same meaning as sanitary works in [section 25\(1\)\(a\), \(b\), \(d\), \(h\), and \(i\)](#) of the Health Act 1956

sufficient quantity, in relation to the drinking water supplied to a point of supply, has the meaning given in [section 25](#) of the Water Services Act 2021



Taumata Arowai means Taumata Arowai—the Water Services Regulator established under [section 8](#) of the Taumata Arowai—the Water Services Regulator Act 2020

wastewater services means sewerage, treatment and disposal of sewage, and stormwater drainage.

125 Requirement to assess drinking water services

- 1) A territorial authority must inform itself about the access that each community in its district has to drinking water services by undertaking an assessment of drinking water services in accordance with this section.
- 2) An assessment of drinking water services must—
 - a) identify each community that receives a drinking water service; and
 - b) describe the nature of existing drinking water services to the community; and
 - c) describe the characteristics of the community; and
 - d) assess the extent to which the community is currently receiving, and will continue to receive, a sufficient quantity of drinking water, including a consideration of—
 - i. the community's existing access to drinking water services; and
 - ii. any reasonably foreseeable risks to the community's access to drinking water services in the future; and
 - iii. the current and estimated future demands for drinking water services within the community; and
 - e) describe the safety and quality of drinking water currently being supplied to the community, using information collected and made available by Taumata Arowai and any other organisations that the territorial authority considers relevant; and
 - f) identify and assess any other public health risks relating to the drinking water services supplied to the community; and
 - g) include an assessment of wastewater and sanitary services in accordance with section 128; and
 - h) based on the assessment under paragraphs (b) to (g),—
 - i. assess the consequences if the community loses access to drinking water services in the future, or is provided with drinking water services that are deficient in any way, including the implications for that community's public health; and
 - ii. outline a plan to provide for the community's ongoing access to drinking water services.
- 3) A territorial authority must conduct an assessment of drinking water services under subsection (2)—
 - a) at least once every 3 years, which may be carried out when other assessments are carried out or at different times; or
 - b) at an earlier date than required by paragraph (a), if the territorial authority is made aware of concerns about the access that a community has to drinking water services.
- 4) A territorial authority must provide opportunities for any person to alert the territorial authority at any time to concerns about a community's access to drinking water services.
- 5) For the purposes of this section,—
 - a) references to assessments include—
 - i. assessing a service for the first time; and
 - ii. reviewing and updating an existing assessment:
 - b) the scope of each assessment must include—
 - i. communities that receive drinking water services from the territorial authority or other local government organisation; and
 - ii. communities that do not receive drinking water services from the territorial authority or other local government organisation; and
 - iii. all types of water supply arrangements, including communities (and households within those communities) that do not receive drinking water services supplied by network reticulation:

- c) territorial authorities need not consider within an assessment drinking water services that are owned or operated by the Crown:
- d) an assessment may be carried out by the territorial authority, or undertaken on its behalf (whether in whole or in part) by another appropriate organisation, including an iwi or Māori organisation.

126 Requirements following assessment of community drinking water service

- 1) On completion of an assessment of a community drinking water service, a territorial authority must—
 - a) make the assessment available to the public on an Internet site maintained by or on behalf of the territorial authority; and
 - b) provide Taumata Arowai with a copy of the assessment in electronic form.
- 2) A territorial authority must also notify Taumata Arowai about—
 - a) any suppliers of drinking water services that are, or appear to be, failing to meet the supplier's statutory obligations or are at risk of doing so; and
 - b) any other matters of concern arising from the assessment, including potential risks to communities affected by the assessment that relate to—
 - i. any absence of, or deficiency in, a drinking water service; or
 - ii. a drinking water supplier that is at risk of ceasing to provide a service.
- 3) A territorial authority must also consider the findings and implications of the assessment in relation to—
 - a) the territorial authority's current and future infrastructure strategy and long-term plan; and
 - b) the territorial authority's district plan prepared under the Resource Management Act 1991; and
 - c) the territorial authority's broader duty to improve, promote, and protect public health within its district in accordance with section 23 of the Health Act 1956.

127 Duty to ensure communities have access to drinking water if existing suppliers facing significant problems

- 1) Subsection (2) applies if—
 - a) a territorial authority's or Taumata Arowai's assessment of a drinking water supply is that the supplier (not being the territorial authority) is facing a significant problem or potential problem with any of its drinking water services, and the territorial authority has notified Taumata Arowai of those concerns and discussed them with Taumata Arowai; or
 - b) Taumata Arowai requires the territorial authority to take action under subsection (2).
- 2) If this subsection applies, a territorial authority must—
 - a) work collaboratively with the supplier, the consumers of the supply, and Taumata Arowai to identify, as the circumstances allow and within a time frame determined by Taumata Arowai, 1 or more of the following:
 - i. an immediate solution to the problem:
 - ii. a temporary solution to the problem:
 - iii. a long-term, permanent solution to the problem; and
 - b) ensure that drinking water is provided to the affected consumers, on a temporary or permanent basis, if—
 - i. the supplier is unable to continue to provide a service that meets the statutory requirements; and
 - ii. an alternative solution is not readily available, or cannot be agreed by the parties involved within the time frame determined by Taumata Arowai.
- 3) For the purposes of this section,—
 - a) a **significant problem or potential problem** includes where—
 - i. a drinking water supplier has persistently failed to comply with legislative requirements; or



- ii. there is a serious risk to public health relating to the drinking water services provided by a drinking water supplier; or
 - iii. a drinking water supplier has ceased to operate a drinking water service, or is, in Taumata Arowai's opinion, at significant risk of ceasing to operate a service:
- b) if a territorial authority is obliged to ensure access to drinking water, the territorial authority may consider a range of options to fulfil its obligation, including—
- i. taking over the management and operations of the drinking water service, on a temporary or permanent basis:
 - ii. ensuring drinking water continues to be provided through alternative supply arrangements:
- c) nothing in paragraph (b) obliges a territorial authority to provide the supply via a reticulated network:
- d) if a territorial authority takes over the management and operations of a drinking water service on a permanent basis, the territorial authority, Taumata Arowai, the former supplier, and (if relevant) the affected consumers must work together to determine how to deal with—
- i. any assets and liabilities that may relate to the service; and
 - ii. any legal or other issues that may affect the territorial authority's ability to manage and operate the service, such as access to the land on, or beneath which, assets are situated; and
 - iii. how the territorial authority might be compensated for the costs incurred in taking over responsibility for the service:
- e) a territorial authority may charge for any drinking water services that are provided to affected consumers, and may recover its costs from the previous supplier, but, when making decisions about future charges and funding arrangements, the territorial authority must—
- i. take reasonable steps to ascertain and consider the financial circumstances facing the affected consumers; and
 - ii. consider the range of funding sources provided for in its revenue and financing policy, including the potential use of general rates; and
 - iii. on request, demonstrate that it has considered those factors.
- 4) See also [subpart 12](#) of Part 2 of the Water Services Act 2021 (statutory management and transfer of operations).

127 Information required in assessment of sanitary services

[Repealed]

128 Requirement to assess wastewater and other sanitary services

- 1) A territorial authority must assess the provision within its district of—
 - a) wastewater services; and
 - b) other sanitary services.
- 2) The purpose of an assessment under subsection (1) is to assess, from a public health perspective, the adequacy of wastewater services and other sanitary services available to communities within a territorial authority's district, in light of—
 - a) the health risks to communities arising from any absence of, or deficiency in, the services; and
 - b) the quality of the services currently available to communities within the district; and
 - c) the current and estimated future demands for any of those services; and
 - d) the actual or potential consequences of stormwater and sewage discharges within the district.
- 3) One type of service may be assessed in conjunction with another type of service.

128 Process for making assessments

[Repealed]

129 Extent of information in assessments

[Repealed]

Health Act 1956 definition of sanitary works

Section 25(1)(a), (b), (d), (h), and (i) of the *Health Act 1956* defines **sanitary works** as:

- 1) For the purposes of this section, the term **sanitary works** means—
 - a) drainage works, sewerage works, and works for the disposal of sewage;
 - b) waterworks;
 - d) sanitary conveniences for the use of the public;
 - h) cemeteries;
 - i) crematoria;

and includes all lands, buildings, machinery, reservoirs, dams, tanks, pipes, and appliances used in connection with any such sanitary works.

Future state of the three waters system

Following on from the government's Havelock North Inquiry² into the Havelock North water supply contamination incident in August 2016, the government announced its intention to review how to improve the regulation and supply arrangements of drinking water, wastewater and stormwater (three waters) to better support New Zealand's prosperity, health, safety and environment. The initial findings of the review were consistent with many of the Havelock North Inquiry's findings, and raised broader questions about the effectiveness of the regulatory regime for the three waters, and the capability and sustainability of water service providers.

The November 2018 Cabinet Paper³ on the future state of the three waters system sets out a road map for decisions on the future state of the three waters (drinking water, wastewater, and stormwater). The paper states the following problem definition and case for change:

The best evidence available indicates there are system-wide challenges facing the three waters, and the response will need to be system-wide, from source to tap and back again.

In many parts of the country, communities cannot be certain that drinking water is safe. The events that led to the Havelock North contamination, along with the findings of the subsequent Inquiry, have demonstrated that the existing system does not adequately safeguard against the risk of catastrophic contamination incidents, or drive improving compliance with the drinking water standards. The Inquiry into Havelock North Drinking Water observed there is little understanding amongst the New Zealand public about the large numbers of people who become ill every year by consuming unsafe drinking water.

Council wastewater systems are facing similar system-wide challenges. Wastewater plants are impacting on freshwater and coastal water quality, and sewage overflows are occurring at a frequency that is no longer acceptable for communities, particularly for Māori. In many regions, regional councils do not (and are not required to) publish sufficient information to provide assurance about the impact of wastewater services on the environment. If comprehensive information were available, it is likely many hidden problems would become exposed.

There are challenges facing council stormwater services, but their nature (and the options for responding to them) is different to those facing drinking water and wastewater, in large part because stormwater is an open system that is closely associated with roading and urban land use. There is a lack of good quality information about the condition of stormwater infrastructure and its susceptibility to climate change.

² Report of the Havelock North Drinking Water Inquiry: Stage 2 – December 2017

³ Future state of the three waters system – Cabinet Paper – November 2018



Hard data and evidence of the extent of problems is variable and, in some cases, limited, which is in itself evidence of a wider systemic issue. However, the following problems exist across all of the three waters:

- *funding and financing to upgrade infrastructure* lies at the heart of the problems facing the three waters. While the challenges manifest in different ways for different councils, it is clear they increase as community size decreases. For many smaller councils, there is no clear way forward given the scale of the challenges. It is also clear that the funding and financing challenges are significantly larger for wastewater than for drinking water;
- *capability challenges* sit hand in hand with funding and financing challenges. Again, the challenges increase as population size decreases. Many smaller rural and provincial councils face a greater struggle to access and retain the specialist skills required to operate and maintain infrastructure, and make the complex risk assessments required to safeguard public health and the environment. Smaller councils by nature have smaller teams, with wider and more general skill sets than specialists;
- *regulation* is weak across the three waters system. Both drinking water and environmental regulation exhibit inadequate stewardship, and compliance, monitoring and enforcement practices. There is no formal system of economic regulation in place to ensure that consumers' long-term interests are protected, or that services are value for money.

Ministers would report back to Cabinet with detailed policy proposals for regulation of the three waters, to enable drafting of legislation to commence in these areas:

- *drinking water*: system-wide reform of regulation of drinking water, along with a new risk management regime for sources of drinking water;
- *wastewater*: targeted change to environmental regulation of wastewater, aimed at lifting its environmental performance within the existing framework of the Resource Management Act 1991;
- *wastewater and stormwater*: measures to give greater transparency to the operation of wastewater and stormwater systems, and to promote better practice;
- *regulatory institutional arrangements*: the institutions (regulatory bodies) that would give effect to the above reforms, and oversight and stewardship arrangements for drinking water and environmental regulation.

The 1 July 2019 Government Cabinet Paper: *Strengthening the Regulation of Drinking Water, Wastewater and Stormwater* (CAB-19-MIN-0332) and accompanying report *Strengthening the Regulation of Drinking Water, Wastewater and Stormwater* reinforced the obligation territorial authorities have, to inform themselves about the supplies of drinking water to communities across their districts – including all non-council supplies, except those owned/operated by the Crown and domestic self-suppliers.

The *Water Services Act 2021* repealed Part 2A of the *Health Act 1956* and replaced it with a stand-alone act to regulate drinking water. There are also amendments to the *Local Government Act 2002* and amendments to other acts, including a discrete amendment to the *Resource Management Act 1991*.

The purpose of the *Water Services Act 2021* is:

3 Purpose of this Act

- 1) The main purpose of this Act is to ensure that drinking water suppliers provide safe drinking water to consumers by—
 - a) providing a drinking water regulatory framework that is consistent with internationally accepted best practice, including a duty on drinking water suppliers to—
 - i. have a drinking water safety plan; and
 - ii. comply with legislative requirements (such as drinking water standards) on a consistent basis; and
 - b) providing a source water risk management framework that, together with the [Resource Management Act 1991](#), regulations made under that Act, and the National Policy Statement for Freshwater Management, enables risks to source water to be properly identified, managed, and monitored; and



- c) providing mechanisms that enable the regulation of drinking water to be proportionate to the scale, complexity, and risk profile of each drinking water supply.
- 2) This Act has the following additional purposes:
 - a) to establish a framework to provide transparency about the performance of drinking water, wastewater, and stormwater networks and network operators; and
 - b) to provide mechanisms that build and maintain capability among drinking water suppliers and across the wider water services sector; and
 - c) to establish a framework for the continuous and progressive improvement of the quality of water services in New Zealand.

A second, complementary act, the *Taumata Arowai – Water Services Regulator Act 2020* (gained Royal Assent 06 August 2020), sets out Taumata Arowai’s objectives, general functions, and operating principles, and establishes Taumata Arowai as a Crown agent – to oversee the drinking water sector nationally.

The *Water Services Act 2021* amended, amongst others, parts of the *Local Government Act 2002*, the *Building Act 2004*, the *Health Act 1956*, the *Resource Management Act 1991*, the *Taumata Arowai – Water Services Regulator Act 2020*, the *Building Regulations 1992*, the *Camping-Grounds Regulations 1985*, and the *Food Regulations 2015* primarily focusing on drinking water.

June 2022 Update

The Department of Internal Affairs, in partnership with the Steering Committee, released analysis and modelling to advance the evidence base informing the case for change for the Three Waters Reform Programme.

The four reports that have been released further demonstrate the need for reform and its potential benefits, and address some of the important questions raised by local government members through recent engagements.

The reports include analysis of the economic benefits of reform by the Water Industry Commission of Scotland (WICS), independent reviews of WICS’ methodology by Farrierswier and Beca, and an analysis of the effects of the proposed reform on the economy and affected industries by Deloitte.

The reports highlight the huge investment required over the next 30 years to ensure that New Zealanders have access to safe drinking water and our wastewater and stormwater networks achieve good environmental outcomes.

The reports point to the opportunities that reform will provide in reducing the costs of water services compared to the status quo. They also indicate the substantial economic benefits the reforms would deliver.

The Government has decided to pursue an integrated and extensive package of reform to the current system for delivering three waters services and infrastructure. The package comprises the following core components⁴:

- establish four statutory, publicly-owned water services entities to provide safe, reliable and efficient water services;
- enable the water services entities to own and operate three waters infrastructure on behalf of the communities they serve, enabling them to access cost-effective finance from capital markets to invest in maintaining and upgrading that infrastructure;
- provide for ongoing public ownership of the new water services entities by local authorities, and statutory provisions that protect against future privatisation;
- establish independent, competency-based boards to govern each water services entity;
- set a clear national policy direction for the three waters sector, including expectations relating to the contribution by water services entities to any new spatial/resource management planning processes;

⁴ Department of Internal affairs – Transforming the system for delivery three water services – Summary of proposals [June 2022] ([www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-reform-programme-2022/\\$file/Three-waters-reform-case-for-change-and-summary-of-proposals-15-June-2022.pdf](http://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-reform-programme-2022/$file/Three-waters-reform-case-for-change-and-summary-of-proposals-15-June-2022.pdf))

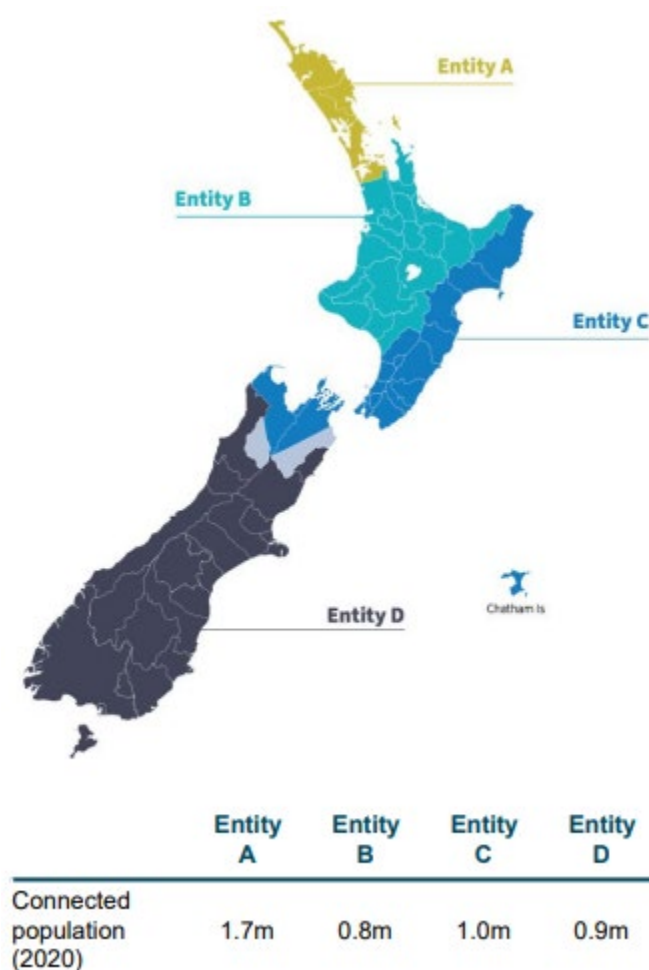
- establish consumer protection mechanisms and an economic regulation regime to ensure efficient service delivery and to drive the achievement of efficiency gains.

The reforms are being progressed through a comprehensive suite of legislation, the first component of which is the *Water Services Entities Bill* (the Bill) introduced to the House on 2 June 2022 and had its first reading on 7 June 2022.

The Bill establishes four publicly owned water services entities that will provide safe, reliable, and efficient water services in place of local authorities. It contains the ownership, governance, and accountability arrangements relating to those entities, and provides for transitional arrangements during an establishment period. The entities will begin delivering these services on 1 July 2024.

The Bill will be followed by further legislation to provide for the specific powers, functions, and responsibilities of the entities, economic regulation and consumer protection, and details relating to the transfer of assets, liabilities, and employees from local authorities to new water services entities

Figure 1 – Water services entities – overview⁵



Entity A is proposed to include Auckland, Far North, Kaipara and Whangarei districts.

The Government will continue to work closely with its local government and treaty partners on some of the details to give the reforms the best chance of success, to ensure the new water service entities can efficiently and effectively commence operations by no later than 1 July 2024.

⁵ Department of Internal affairs – Central/Local Government Three Waters Reform Programme
[www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-reform-programme/\\$file/water-services-entities-overview-30-june-2021.pdf](http://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-reform-programme/$file/water-services-entities-overview-30-june-2021.pdf)



Climate Change

Kaipara District Council agrees with the scientific evidence that shows climate change is having tangible effects on the district’s environment, which will escalate in the future⁶.

Kaipara is already experiencing the impacts of Climate Change. In recent years Council has had to impose significant water restrictions on its communities due to low river levels and conditions. Those communities reliant on tank water have run out more frequently, and experience a long wait for re-fill through the water tanker delivery service. Experts advise droughts will increase, so Council knows it needs to focus on securing water supply as a priority. Likewise the evidence of sea level rise is undisputable, and in Kaipara this will have an impact on communities that border waterways within the next 10 years, so Council is building stopbanks to protect this valuable land and those communities.

The effects of climate change, from a public health perspective, have the potential to adversely affect the adequacy of water and other sanitary services available to communities within the district. Council has identified the need to progress its baseline work on climate change.

Over the next ten plus years, Council will undertake adaptation planning with its communities to develop long-lasting approaches that are good for the community and good for nature. Council has commenced with its coastal communities because the impacts of climate change are projected to be more intense in these areas.

Adaptive pathways planning is Council’s preferred approach to community adaptation planning. With adaptive pathways planning communities are intimately involved in developing adaptation plans for their places.

Council’s *Kaipara Ki Tua Climate Smart Strategic Framework* guides and brings together Council’s climate change work programme. It sets out Council’s programme which includes development and adoption of a Climate Smart Policy, and a Climate Action Plan with goals and timeframes.

In connection with this framework, Council is undertaking the following related work over the next three years:

Council work	Council owner	Years	How we will align
Flood management, stopbank and stormwater system improvements	Infrastructure	2021+	Adaptive Pathways projects will bring in flood management, stopbank and stormwater system improvements considerations. Adaptive Pathways decided strategies will actively inform future decisions on flood management, stopbank and stormwater system works.
Water supply connection improvements	Infrastructure	2021+	Business case and options analysis will follow Climate Smart Policy on climate change considerations. Adaptive Pathways decided strategies will actively inform future decisions on water connections.

This work will help Council to understanding how climate change may, from a public health perspective, adversely affect the adequacy of drinking water, wastewater and other sanitary services available to communities within the district.

Background on the Kaipara district

The Kaipara district is one of the few districts that stretches from the west coast to the east coast, from Ripiro Beach in the west to Mangawhai Heads in the east. Much of the district is in the low hills around the

⁶ Kaipara District Council Long Term Plan Consultation Document 2021 Mahere Roa Pukapuka Akoako 2021



northern shores of the Kaipara Harbour, a large natural harbour which opens to the Tasman Sea and includes an extensive network of inland waterways.

The roughly triangular district stretches from a thinning of the North Auckland Peninsula south of Kaiwaka in the southeast, to the Waipoua Forest in the northwest, and from there extending down the west coast to the Kaipara Harbour entrance at Pouto. The district is bisected by the Northern Wairoa River and its tributaries, which flow into the northern end of the Kaipara Harbour.

The district includes the larger towns of Te Kopuru, Dargaville, Ruawai, Matakoho, Paparua, Maungatūroto, Kaiwaka and Mangawhai, as well as the rural area which surrounds them.

The population is largely rural, living in small settlements scattered amongst the rolling hills or nestled on the shores of the harbour.

Population

From the 2018 Census, the Kaipara district had a total population of 22,869 people usually living in the district, which was an increase of 3,909 people, or 21 percent, since the 2013 Census. This is less than one percent of New Zealand’s population.

The district had a total of 12,231 dwellings, with 8,844 occupied dwellings, 3,186 unoccupied dwellings, and 204 dwellings under construction.

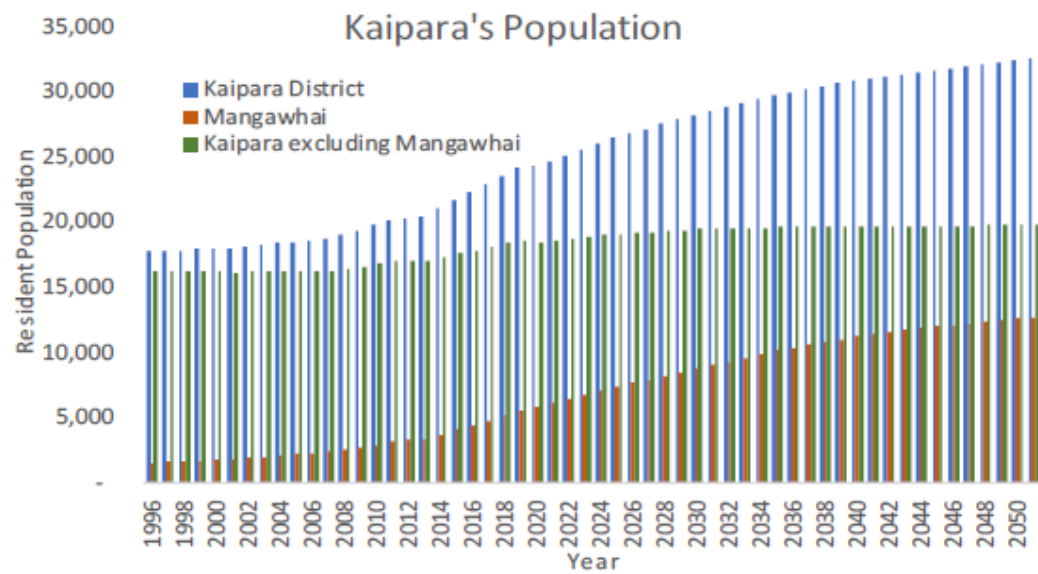
Table 1 – Census 2018 Kaipara district population statistics

Kaipara district	Census Population						
	1986	1991	1996	2001	2006	2013	2018
Total	16,994	17,049	17,369	17,457	18,135	18,960	22,869

The district’s 2020 population is estimated at 25,200 and this is projected to grow to 26,839 in 2026, 28,523 in 2031, and 32,551 in 2051⁷.

Most of Kaipara’s growth has been focused around Mangawhai and the southeast of the district, those parts which are closest to Auckland. This trend is expected to continue, with the Mangawhai population projected to increase from 6,086 in 2021 to 7,630 in 2026, 9,040 in 2031, and approx. 12,718 in 2051.

Figure 2 – Usually Resident Population of Kaipara, Kaipara excluding Mangawhai, and Mangawhai



⁷ Kaipara District Council Infrastructure Strategy draft February 2021

Communities

Table 2 lists the communities around which assessments have been based, categorised according to the type of water and wastewater services that they are reliant upon. Outside these areas the assessments include a generic coverage for rural areas.

Table 2 – List of communities by category

Community Category 1	
Water	Reticulated
Wastewater	Reticulated

Dargaville

Maungatūroto

Glinks Gully

Community Category 2	
Water	Private
Wastewater	Reticulated

Kaiwaka

Te Kopuru

Mangawhai

Mangawhai Heads ¹

¹ The Mangawhai Heads Campground, Woods Street shops, and a few domestic properties on route (total 18 connections) are serviced by a public reticulated water supply scheme.

Community Category 3	
Water	Reticulated
Wastewater	Private Onsite

Ruawai

Baylys Beach ²

² Part of the Baylys Beach community has a private communal reticulated wastewater system.

Community Category 4	
Water	Private
Wastewater	Private Onsite

Kaitui / Waipoua / Waikara

Tokatoka / Naumi / Whenanui

Aranga / Donnellys Crossing

Parahi / Reiha

Kaihu

Ararua

Omamari

Matakohe

Mamaramui / Maropiu

Taipuha / Mareretu

Mangatu / Tutamoe / Waimatenui

Paparaoa

Waihue / Kairara / Avoca / Parore

Pahi

Awakino Point ³ / Dargaville East

Brynderwyn



Tangowahine	Huarau
Kirikopuni / Tangiteroria	Marohemo
Mt Wesley / Mahuta	Bickerstaffe Rd ⁴
Turiwiri ⁵ / Arapohue / Bradley's Landing	Batley / Tanoa
Pukehuia / Omana	Whakapirau
Redhill/Aratapu	Tinopai
Te Maire	

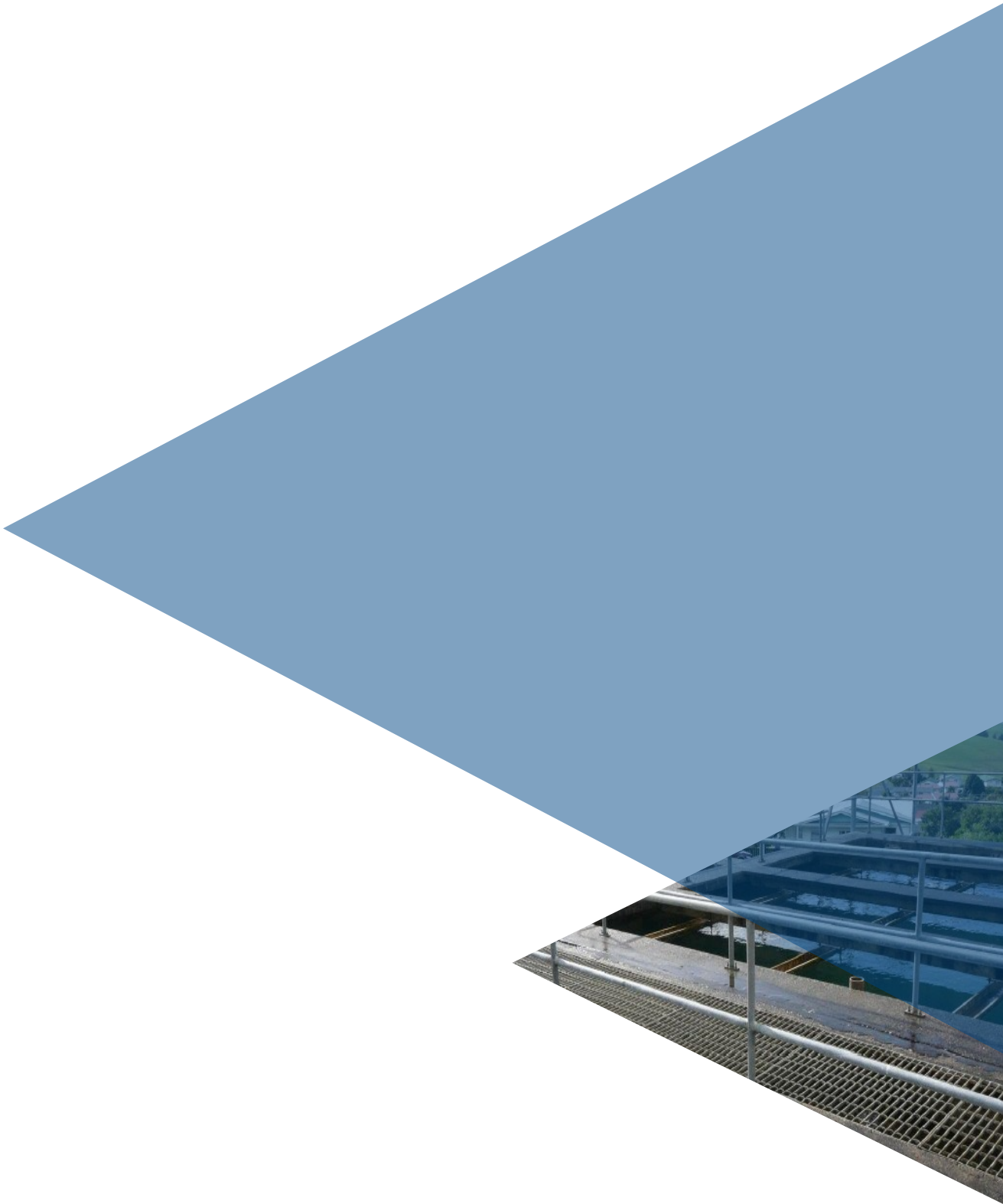
³ Some of Awakino Point has drinking water supplied to the Racecourse from the Council-supplied drinking water scheme.

⁴ Some of Bickerstaff has drinking water supplied from the Council-supplied drinking water scheme.

⁵ Some of Turiwiri has drinking water supplied from the Council-supplied drinking water scheme.



Water supply

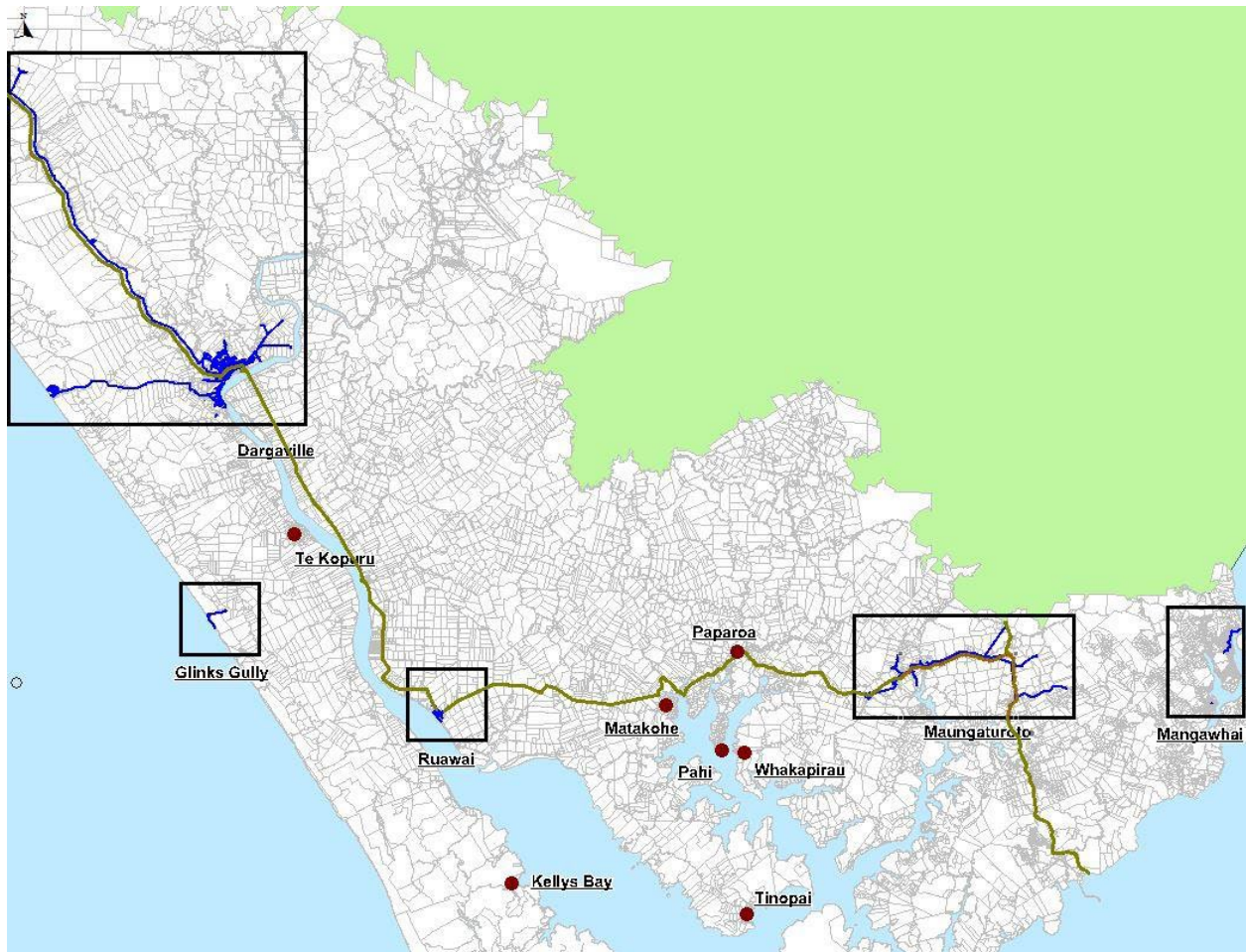


Overview - public water supply schemes

Council owns and operates five public reticulated drinking water supply schemes in the Dargaville (including Baylys Beach), Glinks Gully, Ruawai, Maungatūroto and Mangawhai Heads (part) communities, by collecting raw water, treating it and piping it to properties for use by households. The purpose of the service is to help to protect public health by providing readily accessible potable water to the serviced communities.

In addition Council supplies raw water (i.e. untreated water) to rural property owners adjacent to the Dargaville and Maungatūroto raw water mains for agricultural uses only (extraordinary supply). Council also supplies raw water to Fonterra in Maungatūroto under a separate bulk water supply agreement.

Figure 3 – Public water supply schemes



Public water supply schemes assets

The assets⁸ associated with the five public reticulated water supply schemes in Kaipara include:

- 5 water treatment plants;
- 118 km of reticulated piping;
- 44 km of raw water mains;
- 3,583 water connections; and
- 5,266 water meters, fire hydrants & valves.

Community Outcomes – public water supply schemes

The Community Outcomes that the water supply delivers are:

⁸ Kaipara District Council Water Supply Strategic Activity Management Plan 2021-2031 [February 2021]



Community Outcome	We do this by...
Climate smart	<ul style="list-style-type: none"> Considering water conservation and water security when future planning.
Healthy environment	<ul style="list-style-type: none"> Providing clean water supply to our communities.

Service levels for public water supply schemes

Measuring performance

Table 3 – Public water supplies performance measures

Measure	LTP Year 1 Target 2021/2022	LTP Year 2 Target 2022/2023	LTP Year 3 Target 2023/2024
The extent to which Council's drinking water supply complies with part 4 of the DWSNZ (bacteria compliance criteria) - Mandatory.	Dargaville, Maungatūroto, Ruawai, Glinks Gully and Mangawhai. All schemes must be compliant	Dargaville, Maungatūroto, Ruawai, Glinks Gully and Mangawhai. All schemes must be compliant	Dargaville, Maungatūroto, Ruawai, Glinks Gully and Mangawhai. All schemes must be compliant
The extent to which Council's drinking water supply complies with part 5 of the DWSNZ (protozoal compliance criteria) – Mandatory.	Dargaville, Maungatūroto, Ruawai, Glinks Gully and Mangawhai. All schemes must be compliant	Dargaville, Maungatūroto, Ruawai, Glinks Gully and Mangawhai. All schemes must be compliant	Dargaville, Maungatūroto, Ruawai, Glinks Gully and Mangawhai. All schemes must be compliant
The percentage of real water loss from our networked reticulation system (average for total network of all schemes)*.	≤28%	≤28%	≤27%
Median response time for attendance for urgent call-outs; from the time the local authority receives notification to the time that service personnel reach the site.	≤2 hours	≤2 hours	≤2 hours
Median response time for resolution of urgent call-outs; from the time the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.	≤48 hours	≤48 hours	≤48 hours
Median response time for attendance for non-urgent call-outs; from the time the local authority receives notification to the time that service personnel reach the site.	≤3 hours	≤3 hours	≤3 hours
Median response time for resolution of non-urgent call-outs; from the time the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.	≤3 days	≤3 days	≤3 days
Total number of complaints about drinking water quality e.g. clarity, odour, taste, pressure or flow and continuity of supply. Expressed per 1,000 water connections.	≤40	≤39	≤38
Total number of complaints received by Council about Council's response to any of	≤40	≤39	≤38



Measure	LTP Year 1 Target 2021/2022	LTP Year 2 Target 2022/2023	LTP Year 3 Target 2023/2024
these issues. Expressed per 1,000 water connections.			
Water take consents:	100% compliance with Northland Regional Council consents.	100% compliance with Northland Regional Council consents.	100% compliance with Northland Regional Council consents.
The average consumption of drinking water per day per resident within Kaipara district. Average calculated by the billed metered consumption (m ³) x 1,000 divided by the number of connections x 365 x 2.5 (occupancy rate).	Dargaville – 275 Maungatūroto – 340 Ruawai – 130 Glinks Gully – 52 Mangawhai – 230	Dargaville – 275 Maungatūroto – 340 Ruawai – 130 Glinks Gully – 52 Mangawhai – 230	Dargaville – 275 Maungatūroto – 340 Ruawai – 130 Glinks Gully – 52 Mangawhai – 230
Major capital projects are completed within budget.	Achieved when completed at or below budget	Achieved when completed at or below budget	Achieved when completed at or below budget

* Real water loss is calculated by subtracting the meter readings and 'other components' from the total water supplied to the networked reticulation system.

Public water supplies water take resource consents

Table 4 – Public water supplies water take resource consents

Consent	Consent No.	Expiry	Limits	Notes
Dargaville – Waiparataniwha Stream	AUT.030845.01.01	30 June 2048	4,465 m ³ /day	There shall be no cessation of stream water flow over any of the three intake structures as a result of the exercise of the consent.
Dargaville – Kaihu River at Rotu	008134.01	30 June 2033	83 L/sec; 7,200 m ³ /day; 2,628,00 m ³ /year	Limits to water take when the Kaihu River flow drops below 755 L/sec.
Dargaville – Waiatua Water Storage Reservoir	98 8369 (01 – 05)	30 June 2033	To store up to 600,000 m ³	Linked to 'Rotu' consent 008134.01 above.
Glinks Gully – unnamed tributary of the Tasman Sea & 3 bores	7944 (01 – 02)	31 May 2022	100 m ³ /day	Water rationing or cessation may occur when stream flow ≤ 5 L/sec.
Ruawai – 3 bores	CON20010218701	10 June 2030	450 m ³ /day. 73,000 m ³ /year	Cessation may occur if the level of chloride concentration in water delivered is >220 g/m ³ .
Maungatūroto – unnamed tributaries of the Pukekaroro Stream (Cattlemount)	9888 (01)	06 June 2039	2,650 m ³ /day	Exercise shall be in accordance with the operative Maungatūroto Water Supply System Management Plan.
Maungatūroto – unnamed tributary of the Piroa Stream	AUT.007582.01.03	31 May 2039	11.6 L/sec; 1,000 m ³ /day	The exercise of this consent shall not result in the flow of the unnamed tributary of the Piroa Stream being reduced below the following: (a) An average of 11 litres per second per day; and



Consent	Consent No.	Expiry	Limits	Notes
				(b) A minimum of 9 litres per second. Exercise shall be in accordance with the most recent version of the Maungatūroto Water Supply System Management Plan that also includes the water supplied from the Brooklands Irrigation Scheme.
Mangawhai – bore	CON200108032.01	30 Nov 2025	<u>1 Dec to 31 March:</u> 110 m ³ /day; Ave. 75 m ³ /day; Total 9,075 m ³ . <u>1 Apr to 30 Nov:</u> 70 m ³ /day; Ave. 55 m ³ /day; Total 10,980 m ³ . <u>1 Apr to 31 Mar:</u> Total 20,055 m ³	Council to supply water to 3 property owners if they cannot access groundwater from their existing bores.

Small water supply schemes owned, operated or managed by Council

These facilities service campgrounds and public toilets:

- a) Taharoa Domain – Kai Iwi Lakes (Pine Beach and Promenade Point) campgrounds;

Table 5 – Small water schemes resource consents

Consent	Consent No.	Expiry	Limits	Notes
Lake Taharoa for campground, Kai Iwi Lakes – Promenade Point	CON20122977001	31 July 2028	The rate of taking shall not exceed: 50 m ³ /week being any 7 consecutive days; nor 765 m ³ /year.	The reticulation system and components shall be maintained in good working order to avoid or minimise leakage and wastage.
Lake Taharoa for campground, Kai Iwi Lakes – Pine Beach	CON20080470201 (01 -03)	31 July 2028	The total quantity of water taken shall not exceed: 45 m ³ /day; nor 6,750 m ³ /year	The reticulation system and components shall be maintained in good working order to avoid or minimise leakage and wastage.

Raw water supply agreement

Council has a bulk water supply agreement with a landowner authorising Council to take raw water from a privately owned water storage reservoir (Brooklands Dam) on Baldrock Road to augment the Maungatūroto Water Supply Scheme's raw water supply, particularly during dry periods when the consented stream-fed raw water supplies become restricted. This agreement allows Council to take up to 270,000m³ per year.

During the 2020 drought, this private water storage reservoir had insufficient raw water stored to supply Council's allocated volume. It is estimated that only 25% of the 270,000m³ was available for Council's use.

This agreement expires in April 2034 and Council will be required to either negotiate a new agreement with the owners, or identify an alternative raw water source to provide additional raw water for the Maungatūroto water supply scheme to ensure continuity of at least the current level of service.



Public water supplies quality standards compliance

Part 2A of the *Health Act 1956*, and the drinking-water standards promulgated thereunder provide the primary mechanisms for protecting the health and safety of people and communities by promoting adequate supplies of safe and wholesome drinking water from all drinking-water supplies. The *Health Act* protects drinking water at all stages of the drinking water supply process from the raw source through to supply to consumers.

The *Health Act* provides for the Minister of Health to issue or adopt drinking-water standards. The Minister of Health gazetted the *Drinking-water Standards for New Zealand 2005 (Revised 2018)* (DWSNZ) which updated the 2008 DWSNZ standards following the Government Inquiry into the Havelock North Drinking-Water Outbreak.

During the reporting period, the Ministry of Health prepared and submitted the *Health (Drinking Water) Amendment Bill* to Cabinet. The *Health (Drinking Water) Amendment Act 2019* received the Royal assent on 31 July 2019 and entered into force on 1 August 2019.

Changes to the Act include removal of a prescribed three-year consultation period, strengthened requirements for suppliers to comply with the DWSNZ, changes to the definition of “all practicable steps”, removal of examples of source protection (to be replaced with Ministry guidelines), a requirement for suppliers to ensure water safety plans (WSP) are implemented in accordance with the agreed timetable and to manage and control critical points identified in their WSPs, and changes to the appointment criteria of drinking-water assessors.

In December 2018, the Minister of Health made a number of urgent and minor changes to the Standards, issuing the current Standards to supersede the *Drinking-water Standards for New Zealand 2005 (Revised 2008)*. The current Standards came into force on 1 March 2019. The changes include a requirement to monitor total coliforms, a requirement to carry out enumeration testing for *Escherichia coli* (*E. coli*) and total coliforms, changes to the protozoal log removal Standard, and other minor and editorial changes.

The DWSNZ define the minimum quality standards for drinking-water in New Zealand and the two themes of the standards are:

- a) the maximum acceptable values (MAVs) or water quality standards, which define the quality specifications for all drinking-water; and
- b) the compliance criteria, which specify monitoring requirements and remedial actions to be followed when a transgression of a MAV occurs.

2020-2021 Annual report on drinking-water quality

The Director General of Health prepares and publishes a report on drinking-water each year, which includes information about the quality of drinking water, including whether that drinking water is potable, and the compliance or non-compliance of drinking-water suppliers with the *Health Act 1956* and the *Drinking-water Standards for New Zealand 2005 (Revised 2018)* (DWSNZ).

The most recent report⁹ discusses drinking-water compliance for the 485 registered networked drinking-water supplies that served populations of more than 100 people from 1 July 2020 to 30 June 2021. It describes the compliance of these supplies with the drinking-water requirements of the *Health Act 1956* and the extent to which they met the DWSNZ.

Information is not gathered for supplies serving less than 101 people, self-supplies or water carriers. This means that the water supplies serving 18 percent of the total population of New Zealand or 921,000 people are not included in the report, although registered suppliers receive individual reports which include these smaller sites.

The report covers:

- a Ministry of Health summary on the events in the reporting period
- compliance with the Act; and

⁹ Annual Report on Drinking-water Quality 2020-2021 – Ministry of Health [published online March 2022]

- compliance with the Standards.

The following table, extracted from the *Appendix 1: Water supply compliance* of the Ministry of Health's Annual Report on Drinking-water Quality 2020-2021, provides information on Council's public water supplies, and whether they complied with the relevant sections of the *Health Act* and the relevant standards within the DWSNZ:

Table 6 – Supplier: Kaipara District Council – Annual Report on Drinking-water Quality 2018-2019

Dargaville				Population: 4,683
Health Act: Complied	Standards: Bacterial Met	Protozoal: Met	Chemical: Met	

The water supply uses surface water, is treated with coagulation, filtration and UV and is chlorinated.

Kaihū-Dargaville^A				Population: 324
Health Act: Not complied	Standards: Bacterial Not met	Protozoal: Not met	Chemical: Met	

The water supply uses surface water, without disinfection. A permanent boil-water notice was in place during the reporting period.

Kaihū-Dargaville failed to meet drinking-water monitoring requirements for the supply and did not take all appropriate actions to protect public health after an issue was discovered. It therefore failed to comply with the Health Act (sections 69Y and 69ZF).

Kaihū-Dargaville failed the bacteriological Standards because it did not attempt compliance. It failed the protozoal Standards because it did not attempt compliance.

Mangawhai Heads				Population: 200
Health Act: Complied	Standards: Bacterial Met	Protozoal: Met	Chemical: Met	

The water supply uses ground water, is treated with filtration and UV and is chlorinated.

Maungatūroto				Population: 980
Health Act: Complied	Standards: Bacterial Met	Protozoal: Met	Chemical: Met	

The water supply uses surface water, is treated with coagulation, filtration and UV and is chlorinated.

Ruawai				Population: 426
Health Act: Complied	Standards: Bacterial Met	Protozoal: Met	Chemical: Met	

The water supply uses ground water, is treated with filtration and is chlorinated.

^A The public water supply scheme serving the Dargaville & Baylys Beach communities has a raw water main approximately 24km long. Council has historically permitted approximately 100 adjacent rural landowners along its route from the raw water intakes to the Dargaville Water Treatment Plant to connect and take raw water for agricultural uses only (e.g. stock water, washing down of milking sheds, etc.). This is the 'Kaihū-Dargaville' water supply scheme referred to in the abovementioned Table 5 that was never intended as a potable water supply scheme.

From the above it is clear that Council's water supply schemes have complied with the relevant sections of the *Health Act* and the relevant DWSNZ.

With regard to the 'Kaihū-Dargaville' scheme, this was never intended as a separate drinking-water supply scheme and Council asserts that this is in fact part of the Dargaville Water Supply Scheme. Indeed, s69G *Interpretation of the Health Act 1956* defines a *rural agricultural drinking-water supply* as:

'rural agricultural drinking-water supply means—

- a) a large, medium, minor, small, or neighbourhood drinking-water supply from which 75% or more of the water supplied—
 - i. is used for the purposes of agriculture; and
 - ii. does not enter a dwellinghouse or other building in which water is drunk by people or other domestic and food preparation use occurs; but
- b) does not include that part of a drinking-water supply that uses a single connection to provide water to—
 - i. a town; or



- ii. a village or other place with a permanent population of 50 people or more that is used primarily for residential purposes'

As this raw water main is part of the drinking-water supply that provides water to Dargaville (a town), it cannot be separately defined as a rural agricultural drinking-water supply scheme i.e. it forms part of the Dargaville Water Supply Scheme. Council's position is that it should be removed from the Ministry of Health's register as a separate drinking-water supply scheme.

Water safety plans

All drinking-water suppliers providing drinking-water to over 500 people must develop and implement a water safety plan to guide the safe management of their supply. A water safety plan is a tool to help suppliers identify, manage and minimise risks.

Table 7 – Public water supplies water safety plans

Scheme	Connections	Status
Dargaville including Baylys Beach	2,782	–New Water Safety Plan completed
Maungaturoto	447	New Water Safety Plan completed
Ruawai	251	Water safety plan expired – Council currently updating to MoH framework
Glinks Gully	85	Water safety plan not required, However Council is developing a WSP for this site.
Mangawhai Heads	18	Water safety plan not required. However Council is developing a WSP for this site.

Council programmed to complete the updating of its water safety plans for Dargaville and Maungaturoto to the Ministry of Health's () framework in December2021, with the rest programmed to be completed by November 2022.

Current risks and issues with the public water supply schemes

Key risks and issues¹⁰

- **Security of water supply sources** is a big issue for Kaipara for a raft of reasons:
 - Climate Change - we need to ensure that we have adequate water supplies to safeguard from the effects of climate change. Council will need to do in depth investigations and optioneering on our existing water supplies and how they are going to be affected as Northland is looking to get drier overall with some periods of heavier rainfall. Kaipara is currently predominantly dependant on stream flows for water supply, and these will no longer be sufficient to support the current townships moving forward and there will need to be a significant change to ensure security of water for the future. Kaipara will need to look at more water harvesting infrastructure now and into the future across the district.
 - Public Health - there are initiatives coming from central government that are paying attention to the health of waterways in terms of the National Policy Statement (NPS) for fresh water and others, the revised standards for drinking-water, and the new requirements for the preparation of Water Safety Plans;
 - Growth - we need to ensure we have security of supply to support growth within our townships identified in our spatial plans. Where possible council will be looking to access any opportunities raised by developers and other entities with access to external funding.

¹⁰ Water Supply Strategic Activity Management Plan 2021-2031 [February 2021]

- Economic development - we need to ensure that there is security of supply to support the current economic base within our townships and to allow for growth in our economic sectors, support for post-harvest infrastructure within Kaipara (Dargaville, Ruawai especially);
- **Resilience of water distribution assets** – our current infrastructure is aged and in quite a few cases it has neared or bypassed its current useful life, especially in Dargaville. There are over \$24m of pipe assets that are in very poor condition and need replacing. We have constant issues with our water networks and a lot of our current infrastructure breaks and leaks. This causes issues in the loss of potable water and greater stress on our supply chain and treatment plant.
- **Water quality** is especially important to the community not just for water to be potable but to be drinkable (wholesome) as well. It helps with the feeling in the community that it is a good place to be and it is good for public health and growth-related infrastructure.
It is also hard to keep up to standard when treatment and supply systems come under pressure;
- **Water pressure** – this issue is a big one for growth, economic development, and public health. It facilitates all three and links in with security of supply and resilience of distribution assets. There is a minimum pressure requirement at each property and a needed minimum water pressure and supply at the hydrants within a township. It allows for and facilitates growth whilst also protecting public health and providing security through firefighting supply; and.
- **Responding to issues** in a timely manner is important because it helps with customer focus and satisfaction, the fact that someone raises an issue and then it is dealt with helps with the public view that not only are they being listened to, but that we are taking issues within our network seriously. It also helps with security of supply and other things as it ensures that leaks are fixed as soon as possible so that water is not lost from the system or a greater issue is caused by the leak.

Raw water connections

As advised above, the public water supply scheme serving the Dargaville & Baylys Beach communities has a raw water main approximately 24km long. Historically, Council has permitted adjacent rural landowners along its route from the raw water intakes to the Dargaville Water Treatment Plant to connect and take raw water for agricultural uses only (e.g. stock water, washing down of milk sheds, etc.) as an extraordinary supply. This is the 'Kaihū -Dargaville' water supply scheme and has never been intended as a potable water supply scheme.

Similarly, the public water supply scheme serving the Maungatūroto community has a raw water main approximately 8km long, and Council has also permitted adjacent rural landowners along its route from the raw water intakes to the Maungatūroto Water Treatment Plant to connect and take raw water for agricultural uses only as an extraordinary supply.

Council's records show a total of 93 raw water connections (extraordinary supplies) serving 66 properties adjacent to these two raw water mains. A sanitary survey by Council identified 13 of these raw water connections had been illegally connected to supply water to dwellings on these properties i.e. they were using the raw water as a 'potable' water supply which is not authorised by Council and also presented a health risk. Council has been working with the affected property owners to disconnect these raw water supplies from the dwellings and to provide an alternative source of potable water (such as a roof-fed rainwater tank supply), and five connections remain to be resolved (at the time of writing).

Council also supplies raw water to Fonterra in Maungatūroto under a separate bulk water supply agreement.

Ruawai Water Supply Scheme

Raw water for the Ruawai Water Supply Scheme is sourced from a wellfield comprising three (with now two active as one has been decommissioned) production bores located along Westlake Street approximately 30m from the Northern Wairoa River.

Council is authorised by resource consent CON20010218701 to take up to 450 m³/day and 73,000 m³/year for public water supply.

The wellfield also includes a multi-level piezometer installation (BH4) which is screened at three separate depth intervals, and a fourth, deeper production bore (BH5) which is yet to be commissioned.

Figure 4 – Ruawai Water Supply Scheme Supply Bores



To prevent saline contamination, the Northland Regional Council (NRC) has the right to require the Consent Holder (KDC) to cease the taking of groundwater from any or all the bores at all such times as the chloride concentration in water delivered by any of the bores is greater than 220 g/m^3 (elevated chloride concentrations indicate a presence of saline intrusion).

Given severe drought conditions across the Northland Region during summer and autumn 2019-20, the NRC commissioned specialists (Land Water People Ltd. [LWP]) to undertake a review of potential saline intrusion risk in the Ruawai Aquifer, with a particular focus on abstraction for the KDC Ruawai water supply¹¹. The following summarises the outcomes of the investigation:

- The Ruawai Aquifer Management Zone hosts two separate aquifer systems.
- A low permeability unconfined aquifer up to 30 metres thick underlies the entire Ruawai Plain. This aquifer is recharged by infiltration of local rainfall and exhibits significant interaction with the local land drainage system.
- Water quality in the unconfined aquifer is highly variable. Along the margins of the Wairoa River and Kaipara Harbour, groundwater exhibits elevated salinity. This salinity reflects the low topographic elevation of this area, with inland movement of brackish waters potentially exacerbated by hydrological effects of the land drainage system.
- Across inland parts of the Ruawai Plain, the unconfined aquifer becomes increasingly saline with depth.
- A confined aquifer is hosted in deeper sediments overlying basement rocks across central and western parts of the Ruawai Plain. This aquifer is separated from the unconfined aquifer by an

¹¹ Ruawai Aquifer Saline Intrusion Risk Assessment – Land Water People Ltd. (LWP) [May 2020]

aquitard comprising a thick layer of low permeability sediments. Water quality characteristics in the confined aquifer are distinct from those observed in the unconfined aquifer.

- Both groundwater levels and groundwater quality indicate a majority of recharge to the confined aquifer at Ruawai originates from the Pouto Peninsula. Increased salinity toward the base of the confined aquifer near Ruawai township is interpreted to reflect discharge of connate water from underlying basement rocks.
- Elevated salinity in the unconfined aquifer is a naturally occurring phenomenon due to a combination of geology, topography and hydrology. Based on currently available data it is not possible to identify risks of salinisation at specific locations across the unconfined aquifer, other than to observe that it may increase during drought periods due to limited recharge and higher rates of groundwater abstraction. Groundwater of relatively poor quality is a naturally occurring phenomenon throughout this aquifer.
- The low permeability of the aquitard and upward hydraulic gradient limit the potential for brackish waters in the unconfined aquifer to adversely affect water quality in the confined aquifer at Ruawai during individual drought events. However, historical water quality data exhibit temporal variations in groundwater quality in the primary KDC duty bore (BH2) in response to an extended period of below normal rainfall and groundwater levels between 2011 and 2016. Over this period, both electrical conductivity (EC) and Chloride concentrations exhibited a progressive increase of up to 40%. This trend reversed in response to a period of above normal rainfall during 2017 and 2018. These medium-term changes in aquifer salinity are inferred to reflect 'up-coning' of saline water from the base of the aquifer into the capture zone of BH2.
- Given temporal water quality response observed in KDC BH2, the confined system in the vicinity of the KDC bore field appears evenly balanced with current/historical abstraction so extended 'dry periods' only result in gradual changes in salinity over multiple years. However, this balance could be altered in the future by factors such as increases in the rate of abstraction, the screen depth of supply bores and prolonged drought conditions over consecutive winters, all of which may result in more rapid changes in salinity than historically observed.
- It is recommended that a two-tier system of trigger levels is established for the KDC supply bores.
- It is also recommended that NRC supplement existing monitoring of groundwater levels and quality in the Ruawai Aquifer and initiate further investigations to better quantify processes influencing aquifer salinity, including effects resulting from projected sea level rise.
- Investigation and sealing of existing free-flowing artesian bores is identified as one of the most effective mechanisms likely to assist ongoing sustainable management of the groundwater resource.

Considering the above, the NRC has recommended to KDC the following measures are implemented as a pragmatic approach to sustainable long-term operation of the KDC Ruawai water supply:

- Continuous monitoring of groundwater levels in BH1 and BH2 should continue, with regular calibration checks of relative groundwater levels, cleaning, maintenance and data processing.
- Continuous monitoring of electrical conductivity (EC) in the primary duty bore (BH2), including regular calibration checks, cleaning, maintenance and data processing. EC monitoring should also be enabled on any other bores used for regular duty in the future.
- Establishment of interim EC trigger levels (TL1) to provide advance warning of groundwater quality outside of a nominated range. Exceedance of TL1 triggers would initiate a hydrogeological review to identify the potential cause and significance of the observed changes. Given the limited data available for the KDC wellfield, suggested interim EC triggers include (based on the historical record):
 - an increase of greater than 10% in monthly average EC over any (rolling) 12-month period,
 - EC in BH2 greater than 65 mS/m.
- Once sufficient data is available a review of the interim EC trigger level (TL1) should be undertaken. An initial groundwater level trigger (TL1) should also be established once sufficient monitoring data is available.
- The review of the interim TL1 triggers should also be extended to include establishment of secondary groundwater level and EC triggers (TL2). Exceedance of TL2 thresholds would initiate



measures to actively mitigate potential adverse effects on water quality specified in a bore field contingency management plan. Such measures could include rotating bore duty, increasing the frequency of water level and quality monitoring in all bores to weekly and, if necessary, active demand management.

- Regular inspection and maintenance of production bores. Previous investigations (e.g. SKM 2006) have highlighted deterioration in the condition of steel bore casings in what is likely to be a highly corrosive environment. Failure of bore casings has the potential to provide a pathway for brackish water to enter the deep aquifer (due to drawdown associated with current abstraction). Bores that are unused or in poor condition should be securely grouted.

The work mentioned on the last recommendation from the 2006 SKM report has been completed with bore 3 closed and bores 1 and 2 re-sleeved and grouted.

Community water supply schemes (excluding Council owned public schemes)¹²

In accordance with sections 69J, 69K and 69L of the Health Act 1956, water suppliers, other than self-suppliers, must be registered.

Section 69J requires the Director General of Health to maintain a Register of drinking-water suppliers and supplies. The Register records information such as the name of the supply and the contact details of the supplier. The size of the supply whether it is neighbourhood (serving 25-100 people), small (serving 101-500 people), minor (serving 501-5000 people), medium (serving 5001-10,000 people) or large supply serving more than 10,000 people. Whether it is a networked, bulk or specified self-supply as well as the source or sources of water for that supply.

A self-supplier is a water supplier who owns a drinking-water supply that is exclusively used to supply water to one property that is also owned by that person; or one or more buildings that are also owned by that person. Specified self-suppliers supply water to community-purpose buildings owned by them.

Sections 69K and 69L require Water Carriers to be registered and their registration renewed annually.

The following table lists the registered Kaipara district water suppliers:

¹² Drinking-water Register for New Zealand – Environmental Science and Research Limited (ESR)



Table 8 – Register of Water Suppliers – Kaipara district

Drinking Water Register - Kaipara district					
Networked supplies serving 25 or more people (2019 Edition printed April 2019)					
Supplier Code	Supplier Name/ID	Address	Community	Source	Size/Category
ARA004	Aranga Beach - 466	632 Maunganui Bluff Road, RD 6 Dargaville 0376	Aranga Beach	G00456 Maunganui Bluff Spring	Neighbourhood Networked Supply
BRY001 (KDC)	Brynderwyn Maungatūroto - 186	Private Bag 1001 Dargaville	Brynderwyn Maungatūroto - 186	Cattlemount Stream/Spring V2 Piroa Stream V2	Neighbourhood Networked Supply
DAR002 (KDC)	Dargaville - 186	Private Bag 1001 Dargaville	Dargaville - 186	Kaiha Catchment Streams V1 Kaihu River, Rotu Intake	Minor Networked Supply
GLI001 (KDC)	Glinks Gully - 186	Private Bag 1001 Dargaville	Glinks Gully - 186	Redhill Rd Spring	Neighbourhood Networked Supply
KAI007 (KDC)	Kaihu-Dargaville - 186	Private Bag 1001 Dargaville	Kaihu-Dargaville - 186	Kaihu Catchment Streams V2	Small Networked Supply
MAN003 (KDC)	Mangawhai Heads - 186	Private Bag 1001 Dargaville	Mangawhai Heads - 186	Mangawhai Heads Bore	Small Networked Supply
MAU001 (KDC)	Maungatūroto - 186	Private Bag 1001 Dargaville	Maungatūroto - 186	Boldrock Dam Brynderwyn Cattlemount Stream/Spring V1 Piroa Stream V1	Minor Networked Supply
RUA001 (KDC)	Ruawai - 186	Private Bag 1001 Dargaville	Ruawai - 186	Ruawai Bores	Small Networked Supply
KAI011	Kaiwaka Water Supply Group - 573	PO Box 42 Kaiwaka	Kaiwaka	Kaiwaka	Neighbourhood Networked Supply
REH001	Rehutai Road, Rehutai - 681	RD 7 Dargaville	Rehutai Road, Rehutai	Rehutai Road Bore, Rehutai	Neighbourhood Networked Supply



Water carriers registered in Kaipara

Carrier Code	Owner	Location	Reg Expiry	Extraction Zones
WC00110	Dargaville Water Carriers Ltd	Dargaville	18-Feb-2020	Dargaville Town
WC00412	Huband Contractors Ltd	Paparoa	1-Nov-2019	Bream Bay Maungatūroto Whangarei
WC00414	JCs Water Supply	Maungatūroto	18-Dec-2019	Magical Mangawhai Water
WC00280	Kevin Reid Contracting Ltd	Ruawai	29-May-2013	Dargaville Town
WC00258	LBM Services	Dargaville	19-Mar-2014	Kaihu-Dargaville
WC00312	Mangawhai Contractors and Water Boy	Kaiwaka	14-Aug-2018	Mangawhai contractor Zone
WC00116	Mangawhai Water Ltd	Wellsford	8-Mar-2019	Mangawhai Welldrilling & Water Wellsford/Te Hana
WC00261	Patrick Smales Water Carrier	Dargaville	18-May-2012	Dargaville Town
WC00307	RP Dickens	Maungatūroto	2-Oct-2013	Maungatūroto Railway Maungatūroto
WC00276	Ruawai Transport Ltd	Pahi	7-Jun-2018	Dargaville Town
WC00275	TC Windust	Dargaville	30-Nov-2011	Dargaville Town Ruawai

Networked supplies serving fewer than 25 people

None on record.

Specified self-supplies (at 24 April 2019)

PHU	Supplier Name	Supplier Address	City / Town	Supply Name	Supply Size	Source
Northland DHB	Aranga School	3966 SH 12, RD 6	Dargaville	Aranga School	Neighbourhood	Rainwater: Aranga School Roof
Northland DHB	Arapohue School	RD 10, Mititai Road	Dargaville	Arapohue School	Neighbourhood	Rainwater: Arapohue School Roof



Specified self-supplies (at 24 April 2019)

PHU	Supplier Name	Supplier Address	City / Town	Supply Name	Supply Size	Source
Northland DHB	Kaihu School	RD 3	Dargaville	Kaihu School	Neighbourhood	Surface water: Kaihu Streams for Kaihu School
Northland DHB	Kaiwaka School	33 Mangawhai/Kaiwaka Rd, RD 1	Kaiwaka	Kaiwaka School	Small	Rainwater: Kaiwaka School Roof
Northland DHB	Mangawhai Beach School	Main Rd	Mangawhai	Mangawhai Beach School	Neighbourhood	Rainwater: Mangawhai Beach School Roof
Northland DHB	Matakohe School	c/- Post Office	Matakohe	Matakohe School	Neighbourhood	Rainwater: Matakohe School Roof
Northland DHB	Otamatea Marae	c/- Tanoa Rd, RD 1	Maungatūroto	Otamatea Marae	Neighbourhood	Rainwater: Otamatea Marae Roof
Northland DHB	Pananawe Marae	c/- Waipoua Forest Settlement, Waipoua	Dargaville	Pananawe Marae	Neighbourhood	Rainwater: Pananawe Marae Roof. Surface water: Waipoua River
Northland DHB	Paparoa School	PO Box 15	Paparoa	Paparoa School	Neighbourhood	Rainwater: Paparoa School Roof
Northland DHB	Parirau Marae	87 Tana Road, RD 2	Matakohe	Parirau Marae	Neighbourhood	Rainwater: Parirau Marae Roof
Northland DHB	Pouto School	RD 1	Te Kopuru	Pouto School	Neighbourhood	Groundwater: Pouto School Bore. Rainwater: Pouto School Roof
Northland DHB	Pukearunga Kohanga Reo	PO Box 76	Paparoa	Pukearunga Kohanga Reo	Neighbourhood	Rainwater: Pukearunga Kohanga Reo Roof
Northland DHB	Small Poppies	8 Kaiwaka-Mangawhai Road	Kaiwaka	Small Poppies ECE, Kaiwaka	Neighbourhood	Rainwater: Small Poppies ECE Roof
Northland DHB	Tangiteroria School	SH 14	Tangiteroria	Tangiteroria School	Neighbourhood	Rainwater: Tangiteroria School Roof
Northland DHB	Tangowahine School	RD 2	Dargaville	Tangowahine School	Neighbourhood	Rainwater: Tangowahine School Roof
Northland DHB	Te Kopuru School	PO Box 20, Northon Street	Te Kopuru	Te Kopuru School	Small	Rainwater: Te Kopuru School Roof



Specified self-supplies (at 24 April 2019)

PHU	Supplier Name	Supplier Address	City / Town	Supply Name	Supply Size	Source
Northland DHB	Tinopai School	RD 1	Matakohe	Tinopai School	Neighbourhood	Rainwater: Tinopai School Roof
Northland DHB	Department of Conservation (Dargaville)	Private Bag 1002	Dargaville	Trounson Kauri Park	Neighbourhood	Groundwater: Trounson Kauri Park Bore
Northland DHB	Waihaua Marae	RD 1, Arapaoa Rd	Matakohe	Waihaua Marae	Neighbourhood	Rainwater: Waihaua Marae Roof
Northland DHB	Waikara Marae	333 Waikara Road, Aranga, RD 6	Dargaville	Waikara Marae	Neighbourhood	Groundwater: Waikara Marae Spring
Northland DHB	Waipoua HQ and Camp Ground	1 Waipoua River Road, RD 6	Dargaville	Waipoua HQ and Camp Ground	Neighbourhood	Surface water: River at Waipoua HQ



In addition to the above, Council is aware of the following communal networked water supplies in the Kaipara district:

- Tinopai – stream-fed non-drinking water supply scheme supplying the campground toilets and washing machine, operated by the Tinopai Hall Committee.
The Tinopai Hall Committee has advised:
 - the scheme does not supply drinking water;
 - the scheme’s water is untreated;
 - the scheme’s supply has a sediment filter;
 - the scheme has no connections to any dwellings;
 - the scheme supplies water to the Hall toilets, public toilets, and the campground’s washing machine and hose tap for washing boats etc.
- Tinopai – stream-fed (same stream as above) non-drinking water supply scheme supplying a number of residential properties, operated by the Tinopai Water Supply.
The Tinopai Water Supply has advised:
 - the scheme’s water is untreated;
 - the scheme has 54 residential connections not connected to any dwelling’s drinking water supply;
 - households are advised annually that the water is not drinking water; and
 - the water is used for toilets, garden irrigation, and washing of boats, cars etc.
- Matakoho – bore-fed non-drinking water supply scheme supplying the Museum, cemetery toilets and a trough, operated by the Museum. No details regarding this scheme have been provided.
- Turiwiri Water Supply – privately owned scheme that provides water to three dairy properties and seven households. The scheme is supplied by drinking water from the public Dargaville Water Supply Scheme to the initial property i.e. Council is not a drinking water supplier to the third parties beyond the initial property supplied as it does not have control and responsibilities beyond the point of supply to the initial property.
The owners of the initial property have previously approached Council with the intention of selling the portion of the private water supply system from its connection with the public scheme to the initial property however, Council declined to proceed with this purchase.

Current risks and issues with community drinking water supply schemes (excluding Council-owned public schemes)

Key risks and issues

- The Ministry of Health (via the Northland District Health Board) has been unable to provide any data to confirm whether the three small privately owned and independently operated communal networked drinking water supply schemes in the Kaipara District listed on the MoH’s Drinking-water Register (i.e. Rehutai Road, Kaiwaka Water Supply Group, and Aranga Beach) comply with the Drinking-water Standards, but has advised that the Kaiwaka Water Supply Group’s scheme is being decommissioned as a drinking-water supply scheme. It is understood that this scheme may still be used to provide non-drinking water e.g. for external use.
- Taumata Arowai’s Public Register of Drinking Water Supplies includes some of the information that registered drinking water suppliers provide to Taumata Arowai about their supplies. Some drinking water supplies may not yet appear on the public register as Taumata Arowai is still working to confirm details of some of the almost 2,000 supplies that were transferred to Taumata Arowai from the Ministry of Health.
No further information regarding compliance with the Drinking-water Standards is available on Taumata Arowai’s Public Register of Drinking Water Supplies for the three small privately owned and independently operated communal networked drinking water supply schemes (i.e. Rehutai Road, Kaiwaka Water Supply Group, and Aranga Beach) in the Kaipara District listed on the MoH’s Drinking-water Register.



Private drinking water supplies

The remaining communities, not supplied by either Council or community-owned drinking water supply schemes, are not serviced by reticulated drinking water supply schemes with most domestic dwellings using roof-collected rainwater systems stored in tanks, or from private bores. Water supplies may be supplemented in summer by tanker-delivered water and/or abstraction from streams/springs. Limited investigations indicate that water consumption rates are relatively low, reflecting the conservation ethic applying in a tank-oriented supply system.

Given the moderate/high annual rainfalls (1,100 – 1,400 mm for the most part), roof-collected rainwater tank-based systems will be adequate in cases where the roof area and tank/s capacity are appropriately sized to service the number of occupants. However, in droughts, and/or where there are higher than average levels of occupation, particularly high summer levels of occupation, deficits may occur.

Quality – private drinking water supplies

The risk of disease arising from roof-collected rainwater consumption can be low, providing the water is visibly clear, has little taste or smell and, importantly, the storage and collection of rainwater is via a properly maintained storage tank and roof catchment system.¹³ However, a number of national and international studies have shown that the microbiological quality of roof-collected rainwater can be poor, often failing to meet standards.

Rainwater collected and stored in domestic tanks will often contain a range of micro-organisms from one or more sources. While many will be harmless, the safety of roof-collected rainwater will depend on excluding or minimising the presence of enteric pathogens.

In addition, rural roof water can be contaminated with chemicals in spray drift, from smoke from chimneys and external fires, from nearby trees, and from the storage materials of the tanks.

Once the rainwater lands its quality will be affected by the roof, guttering and storage system, and how these are operated and maintained.

Problems associated with rainwater catchment systems and components generally include lack of maintenance, inadequate disinfection of the water, poorly designed delivery systems and storage tanks, and failure to adopt physical measures to safeguard the water against contamination. This may reflect the notion that rain is a relatively pure source of water and it may be related to the fact that in many rural areas, the availability of sufficient water for households seems to be a bigger issue than water quality. Irrespective of how roof-collected rainwater is used, the water quality is dependent on implementing a sensible maintenance programme.

Microbiological problems

Rainwater collected and stored in domestic tanks will often contain a range of micro-organisms from one or more sources. While many will be harmless, the safety of roof-collected rainwater will depend on excluding or minimising the presence of enteric pathogens. Enteric pathogens include types of bacteria such as *Salmonella* and *Campylobacter* and protozoa such as *Cryptosporidium* and *Giardia*. The likely sources of these pathogens can be faecal material deposited by birds, frogs, lizards, rodents, possums, insects, and dead animals, either in the gutters or in the tank itself, or arriving as wind-blown aerosols.

The microbiological quality of drinking-water is commonly measured by testing for *Escherichia coli* (*E. coli*), or alternatively thermo-tolerant coliforms (sometimes referred to by the less accurate term, faecal coliforms), as indicators of faecal contamination and hence the possible presence of enteric pathogens.

The following references help to illustrate the possibly levels of contamination of roof-collected rainwater stored in domestic tanks¹⁴:

¹³ Guidelines for Drinking-water Quality Management for New Zealand – Ministry of Health [June 2019]

¹⁴ Guidelines for Drinking-water Quality Management for New Zealand: Chapter 19: Small, Individual and Roof Water Supplies – Ministry of Health [May 2019]



- i. A study by Dennis (2002) on 60 roof-collected rainwater samples from South Wairarapa, where approximately 60 percent of the households use roof water, revealed *E. coli* transgressions in all samples on at least one occasion during a three-month period.
- ii. In a study by Sedouch (1999) on 100 roof-collected rainwater samples from the lower half of the North Island, only 18 percent of samples were found to comply with the *Drinking-water Standards for New Zealand* (DWSNZ) and 40 percent of samples were found to have failed badly with very high *E. coli* counts (> 150 per 100 mL).
- iii. Of 125 roof-collected rainwater samples from rural Auckland districts analysed between 1996 and 1998, 56 percent had faecal coliform levels that would have exceeded the 1993 WHO drinking water guidelines (Simmons et al 2001a).
- iv. Savill et al (2001) found the presence *Campylobacter* in 5 percent of roof water samples collected from rural locations in the North Island. In a 621 case-control multi-centre analysis of gastroenteritis induced by *Campylobacter* study in New Zealand, Eberhart-Phillips et al (1997) found that consumption of roof-collected rainwater was associated with a threefold greater risk of campylobacteriosis than that of non-consumers. In New Zealand an estimated 237 cases (2 percent) of campylobacteriosis was likely to be explained by the consumption of rainwater.
- v. In March 2006 three cases of legionella (causing one death) in a small community in south Auckland (Beachlands) were identified, resulting from three different household water supplies. These were found to have been contaminated with *L. pneumophila* SG1. The water supplies were all untreated roof-collected rainwater systems. Filters attached to taps were also contaminated.

Water treatment systems for individual households

Water treatment systems for individual households, designed, operated & maintained correctly, further reduce the public health risks. Water treatment systems for individual households fall into two main groups:

- Point-of-entry (POE), where the water is treated 'at the gate' or boundary.
- Point-of-use (POU), which is usually associated with the kitchen tap, commonly installed under the sink. Sometimes they are installed under the bathroom basin as well. If POU rather than POE is used, the potential risk exists of drinking water from the wrong tap.

The following table¹⁴ provides an indication of various point-of-use and point-of-entry treatment devices and an indication of their effectiveness against various contaminants:



Table 9 – Point-of-use and Point-of-entry Devices and an Indication of their Effectiveness Against Various Contaminants

Contaminant	Activated carbon (1)	Boiling (4)	Ceramic candle (2)	Cartridge filtration (2)	Home distillation (13)	Reverse osmosis (8)	Water softener (7, 8)	Ultra-filtration (8)	Ultraviolet light (6)	Calcium filtration (9)	Oxidising systems (16)
Arsenic (11)	P	N	N-G	N-G	M-Ex	G-Ex	G (7)	N-G	N	P-G	
Bacteria	N (1)	Ex (4)	P-G	P	Ex	M	N-P	M	Ex (6)	P	
Boron	N	N	N	N	Ex	N	Ex	N	N	N	
Carbon dioxide/corrosivity	P	G	N	N	M	P	P	N	N	G-Ex	
Colour	M (3)	N	N	N	Ex	G	P	P-M	N	N	
Hardness	P	M (5)	N	N	Ex	P-M	G (7)	P	N	N	
Iron, soluble	P	N	N	N	Ex	G	G-Ex (7)	M	N	P-M	G
Manganese, soluble	P	N	N	N	Ex	G	G (7)	M	N	P-M	G
Nitrate	P	N	N	N	Ex	G	G (7)	P	N	N	
Protozoa cysts/oocysts	G (2)	Ex (4)	G-Ex	G (2)	Ex	Ex	N	Ex	G (15)	P (10)	
Taste and odour	G-Ex (3)	M (12)	N	N	M	M	P	P	N	P	M
Turbidity (14)	M	N	P-M	P-G	Ex	Ex	M	Ex	N	P	
Viruses	N (1)	Ex (4)	P	P	Ex	Ex	P-M	Ex	P-Ex (15)	P	

Terms used in table:

Ex	excellent removal, where equipment is in good condition	G	good removal to an acceptable level
M	moderate removal, constituent may still give a problem	P	poor performance, most of constituent levels unaffected
N	no removal at all		

Notes:

Activated carbon filters can be either POE or POU.

Boiling, ceramic candle, cartridge filtration, home distillation, reverse osmosis tend to be used as POU systems.

Water softening, ultra-filtration, ultraviolet light, calcium filtration, and oxidising systems tend to be used for POE treatment.

See Chapter 9, section 9.7.2.4 for brief comments related to removal of cyanotoxins.



Explanatory notes:

- 1 Activated carbon filters should not be used for water containing biological contaminants unless there is a subsequent reliable disinfection stage. Activated carbon can act as a growth medium for micro-organisms. WHO (2003) states in Chapter 12.4 that Health Canada, the US Environmental Protection Agency (EPA), the US Consumer Product Safety Commission and the Italian government have all, at one time or another, proposed banning activated carbon filters used in home drinking-water treatment devices because of the growth of Heterotrophic Plate Count (HPC) bacteria on the carbon media and subsequent rises in HPC counts in the filtered water. After further study, however, all four decided against banning the filters. At Health Canada, the decision was made following consultations with stakeholders and was based on the absence of evidence of any illness linked to such devices. This decision was taken with the proviso that the manufacturers and distributors of activated carbon filters agree to take steps to help prevent the use of these devices on microbially unsafe waters or waters of unknown quality. In addition to growth on the carbon filter, it was shown that the filter media of some new commercial filters were already contaminated with bacteria and moulds even before being installed in homes.
- 2 Either plain or activated carbon cartridge-type filters or ceramic candles can remove protozoa (oo)cysts, provided the nominal particle retention size of the filter is 1 micron or less. However, see note 1 above. Some candle filters are impregnated with a bactericide. NZS 4348 (1995) covers the requirements for protozoa removal. WHO (2009) discusses ceramic filters, and some other treatment processes.
- 3 Activated carbon will eventually become saturated with contaminants. The carbon must then be replaced or the contaminants will start returning to the water, often at a higher concentration than in the original water.
- 4 Jugs with automatic cut-out are suitable; do not hold the cut-out switch down manually. Non-automatic jugs should be allowed to boil for a minute.
- 5 Boiling hard water removes some of the hardness (the carbonate, or temporary hardness). The hardness not removed forms a scale on the heating element making the element less efficient and advances its time of failure.
- 6 Ultraviolet disinfection becomes less effective if anything shields the microbiological contaminants from the ultraviolet light. Dissolved iron, manganese, natural organic matter (colour), or turbidity will all make UV disinfection less effective. Keep these constituents low or remove them before the water passes through the UV appliance. Treating dirty water also necessitates a lot of lamp cleaning.
- 7 Water softeners use ion exchange resins that can selectively remove specified chemicals from a range of chemical contaminants if the appropriate resins are chosen. They are available as cation, anion and mixed bed exchangers. Cation exchangers usually remove calcium hardness, replacing it with sodium. General purpose resins (mixed bed) are often not suitable for drinking-water treatment, and they tend to remove everything from the water (see note 13). A resin has been developed that removes tannin, so can be used for colour removal. See Chapter 13 for further information.
- 8 While some treatment methods work well for some contaminants, they can be upset by the presence of others. For example, ion exchange, reverse osmosis, and nanofiltration, are capable of effectively removing a range of contaminants. However, when fouled with excess turbidity and bacterial growths, their performance efficiency can fall off dramatically and they can break down. Bacteria can grow in these systems when they are not in regular use, thereby contaminating the drinking-water. Reverse osmosis and nanofiltration need daily flushing to prevent this. Reverse osmosis nearly always has an activated carbon filter upstream, and this can grow bacteria too. RO may not be appropriate in water-short areas because up to 80 percent may be wasted.
- 9 The calcium in the filter device is in the form of calcium carbonate, marble or dolomite; these dissolve, quite rapidly in some waters. Akdolite (a heat-treated dolomite) is a common brand used in New Zealand.
- 10 These calcium filter devices are of variable effectiveness depending upon exact details of filter.
- 11 Filtration processes remove arsenic if it is particulate; soluble forms require strong-base anion exchange or reverse osmosis. The ion exchange process removes most anions, replacing them with chloride; this could make the water corrosive.
- 12 Boiling will remove odours, but not necessarily taste. The chemicals that give rise to taste are not as volatile as odour chemicals.
- 13 Most people consider distilled water (and deionised water) to be insipid, and it does not provide many of the common minerals that are needed in the daily diet. Distillation requires considerable electricity usage, nearly 1 kilowatt-hour per litre.
- 14 Turbidity removal usually depends on the size of the particles that give rise to the turbidity. These can range from visible particles to very fine colloids.
- 15 The effectiveness of disinfection of viruses by UV light depends on the type of virus that is in the water. UV light only inactivates bacteria effectively if the dose is reliably high and the water clean. UV disinfection installations can inactivate protozoa effectively if they have been tested to NSF55 or DVGW. UV systems that meet the NSF standard (Class A) can be found at the website: <http://nsf.com/Certified/DWTU/>.
- 16 Oxidising systems cover a range of products from small ozone generators, greensand filters, to a variety of propriety products. Most oxidising systems will cause the iron and manganese to become particulate, so that they can then be filtered out. Most cells in Table 19.3 have not been filled in because of the variety of products available. They will range from being not very effective, to products like ozone that can also inactivate bacteria, viruses, protozoa, remove taste and odours, and maybe even reduce the colour. Small-scale package ozonation equipment is available that could be suitable for treatment of small water supplies. However, ozone is not widely used because of the high power requirements, complexity of the equipment, and relatively high capital cost.



Preventative measures & corrective actions for minimising contamination

Ongoing education, good practice, and sound maintenance by dwelling occupants is recommended to reduce the public health risks associated with private water supply systems.

Preventive measures and corrective actions for minimising contamination of roof-collected rainwater include:

- Use a clean impervious roof made from non-toxic material.
- Remove and replace with approved materials any items containing toxic products (e.g. lead paints, flashings, nails, etc.).
- Keep roof catchments clean and clear of moss, lichen, debris and leaves.
- Keep roof catchments clear of overhanging vegetation as branches provide roosting points for birds and can provide access for small animals such as rodents, cats and possums.
- Inspect gutters regularly and clean if necessary. Disconnect the pipe(s) that feed the water tank before cleaning the gutters. Exercise care when cleaning gutters; ensure the ladder is secure and avoid going anywhere near overhead power lines or better still have the power disconnected before cleaning the gutters.
- If appropriate, install removable gutter guards and/or screens as well.
- Ensure that chimneys within or adjacent to roof water collection areas are of sufficient height to minimise the settlement of ash or residues on the roof and in the gutters.
- Use a coarse filter (leaf slide) and first foul flush device to intercept water entering the tank. Any roof water collection area, by virtue of its location, susceptible to undue contamination with organic material, dust, ash, sand, salt or airborne chemical residue, should have a first flush diversion system installed.
- Clean gutters, tank inlets and screens every three to four months.
- In the event of any weed or chemical spraying in an adjacent location, advise the contractor that the roof is used to collect drinking water, and that there must be no over-spraying. Obtain a guarantee from the contractor that pesticides that present a health risk will not be used.
- Prevent access by small animals, birds and mosquitoes into rainwater storage tanks by screening all tank inlets as well as overflows, and keep access hatches closed.
- Prevent entry of surface run-off from areas other than roof catchment into below-ground tanks (see below). Tank roofs must be secure and the sides and bottom of the tank should be sealed to prevent egress.
- Inspect tanks annually and if necessary have tanks cleaned out professionally (tank desludging, cleaning and replenishing).
- If tank contamination by faecal material is apparent the supply should be disinfected.
- Ensure that tank taps or draw-off pipes are at least 100 mm above the tank floor, or use a floating arm draw off valve.
- Do not use roof water if it is likely to be contaminated by smoke, soot or fumes from a nearby industrial process without checking its safety.

Key risks and issues

- No specific sampling and testing of private water supplies has been undertaken to quantify the extent of the public health risk in the district. However, the risk was assessed based on comparable studies undertaken elsewhere in New Zealand and they indicate a likelihood that some of the private water supplies present a public health risk to the users.
- The extent of private water supply systems in the district with inadequate preventive measures and corrective actions for minimising contamination of roof-collected rainwater (or other non-secure sources of raw water) is unknown.
- Properties have inadequate onsite storage to reliably provide water during periods of drought.
- During periods of drought, suppliers who deliver tanker-delivered water may not be able to meet the demands of the communities with private water supplies.



Adequacy Assessment

Public drinking water supply schemes

Council's public drinking-water supplies all have sufficient capability to provide potable water i.e. the drinking-water meets the requirements of the *Drinking-water Standards for New Zealand 2005 (Revised 2018)*, and sufficient capacity to meet current peak levels of demand (excludes drought conditions).

However, some of the water supply schemes do not have sufficient raw water supply capacity to meet current peak levels of demand during prolonged dry periods or periods of drought. This issue has been recognised by Council, along with the increased risk as a result of climate change. Council will need to undertake in-depth investigations and optioneering on its existing drinking-water supplies and including how they may be affected as a result of climate change to develop a strategy and identify options to improve and protect the security of water supply for the present and future e.g. more water harvesting infrastructure now and into the future across the district.

This strategy and optioneering will include how the public drinking-water schemes will need to be improved to meet any future demand, and will need to take into account any changes in standards as a result of the *Water Services Act* once the three-waters reform has been finalised and any associated acts enacted or amended.

Council is currently applying for a water-take resource consent from the Kaihu River for its existing Ahikiwi Pump Station (previously proposed to be abandoned). This pump station has been used during periods of drought with the raw water-take generally authorised by the NRC under s329 *Water shortage direction* of the *Resource Management Act*. This new water-take consent would provide certainty regarding its use and provide a back-up raw water supply during droughts.

Council investigated alternative options for raw water security in line with other government initiatives such as the Northland Water Storage Project etc. It is carrying out preliminary studies on the Waiatua Dam for winter storage use. Council's Infrastructure Strategy²⁴ also identifies water security and supply management options for Mangawhai, Maungaturoto and Kaiwaka.

For the coastal areas of Glinks Gully and Baylys Beach, the increase in demand during peak holiday periods has put pressure on the public water supply systems resulting in Glinks Gully and Baylys Beach occasionally getting supplementary treated water carted to their respective reservoirs (managed by Council) to meet the peak demand.

Some portions of the water supply schemes may also not meet the minimum fire-fighting requirements. These issue would be addressed as the network is renewed over time, or upgraded to meet growth-related demand.

Community drinking water supply schemes (excluding Council-owned public schemes)

The adequacy of any privately owned community reticulated drinking-water supply schemes (i.e. excluding the Council-owned public schemes) is unknown.

Private drinking water supplies

Based on the studies mentioned above, it is likely that within the district there are unacceptable levels of contamination of roof-collected rainwater (or other sources of non-secure raw water such as streams or shallow bores) stored in domestic tanks i.e. the water does not comply with the *Drinking-water Standards for New Zealand (DWSNZ)*.

In droughts, and/or where there are higher than average levels of occupation, particularly high summer levels of occupation, water storage deficits may occur. These will typically be resolved through measures such as:

- Using supplementary water sources (bore, stream or tanker-delivered water).
- Practising stringent water demand reduction/conservation practices, especially in long dry summer periods (e.g. restricting toilet flushes, taking shorter showers, reduced or termination of garden watering, etc.).



- Installing additional tank storage capacity.

Mangawhai is the largest coastal community in the Kaipara district that experiences significant population increases during summer and is serviced predominantly by privately owned water supplies (mainly roof-collected rainwater systems stored in tanks). Prolonged droughts have resulted in instances where tanker-delivered water suppliers have been unable to meet the demand from the Mangawhai community to fill their low or empty water tanks. This is exacerbated when Watercare restricts the tanker-delivered water suppliers from drawing water from the Wellsford public water supply scheme (closest supply point for tanker-delivered water suppliers servicing Mangawhai) due to water restrictions.

Council has programmed to install an additional supply point for tanker-delivered water suppliers in Maungatūroto (programmed for completion in 2022) to assist with meeting peak demand during periods of drought.

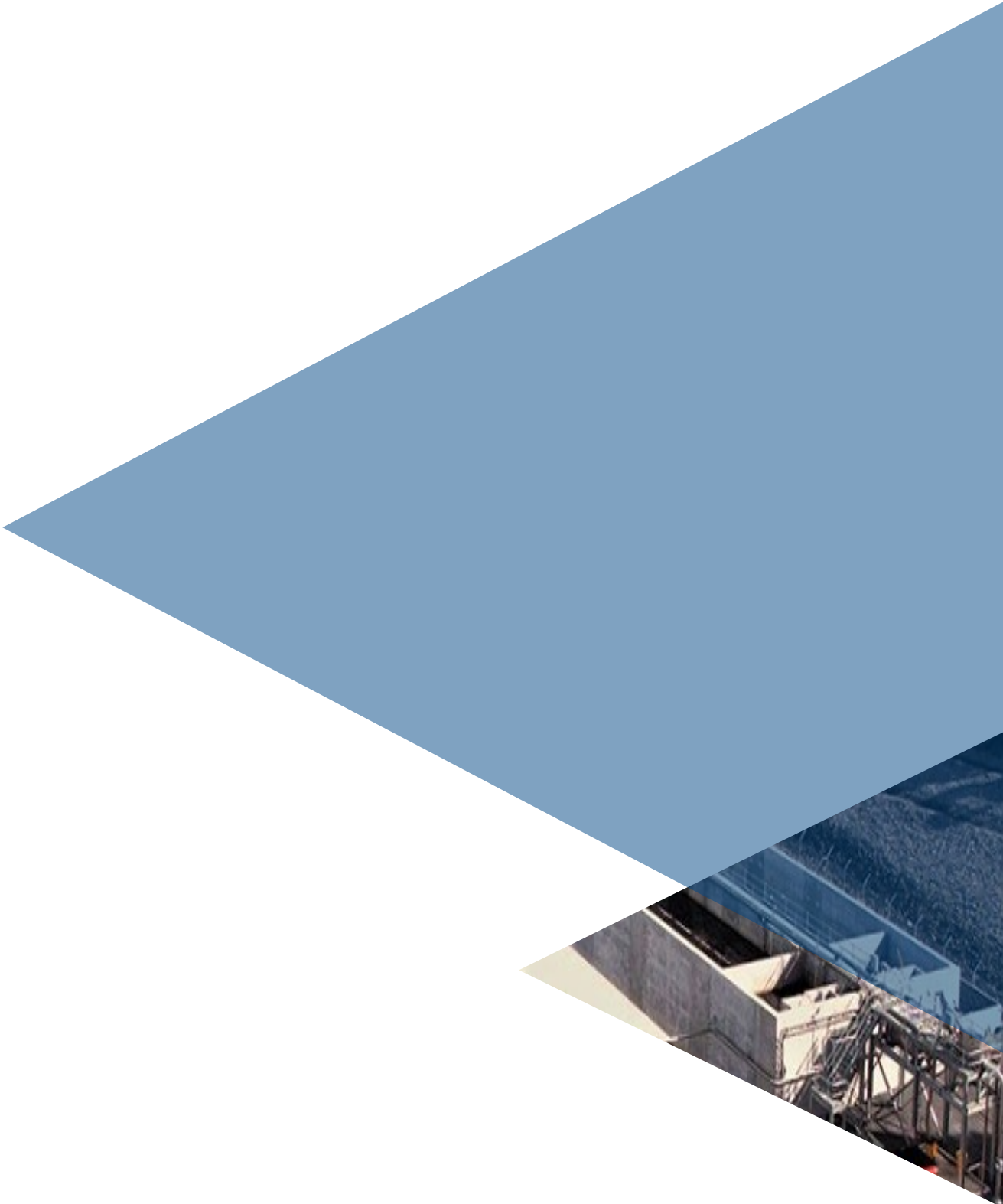
A water treatment plant is proposed to be constructed through a DIA-funded pilot project for marae to supply water to the Waikaraka Marae, a truck filler for the Kaihu community and water carriers outside the marae grounds¹⁵. A Council option was rejected by the Marae in favour of a DIA-funded option. This project seeks to address the water shortages that occur during droughts for the non-reticulated community of Kaihu.

Council has committed to investigate the option of extending the Whangārei district water supply system to Mangawhai as a potential tank filler site¹⁵.

¹⁵ Kaipara District Council Long Term Plan Mahere Wa Roa 2021-2031 – Additional Information



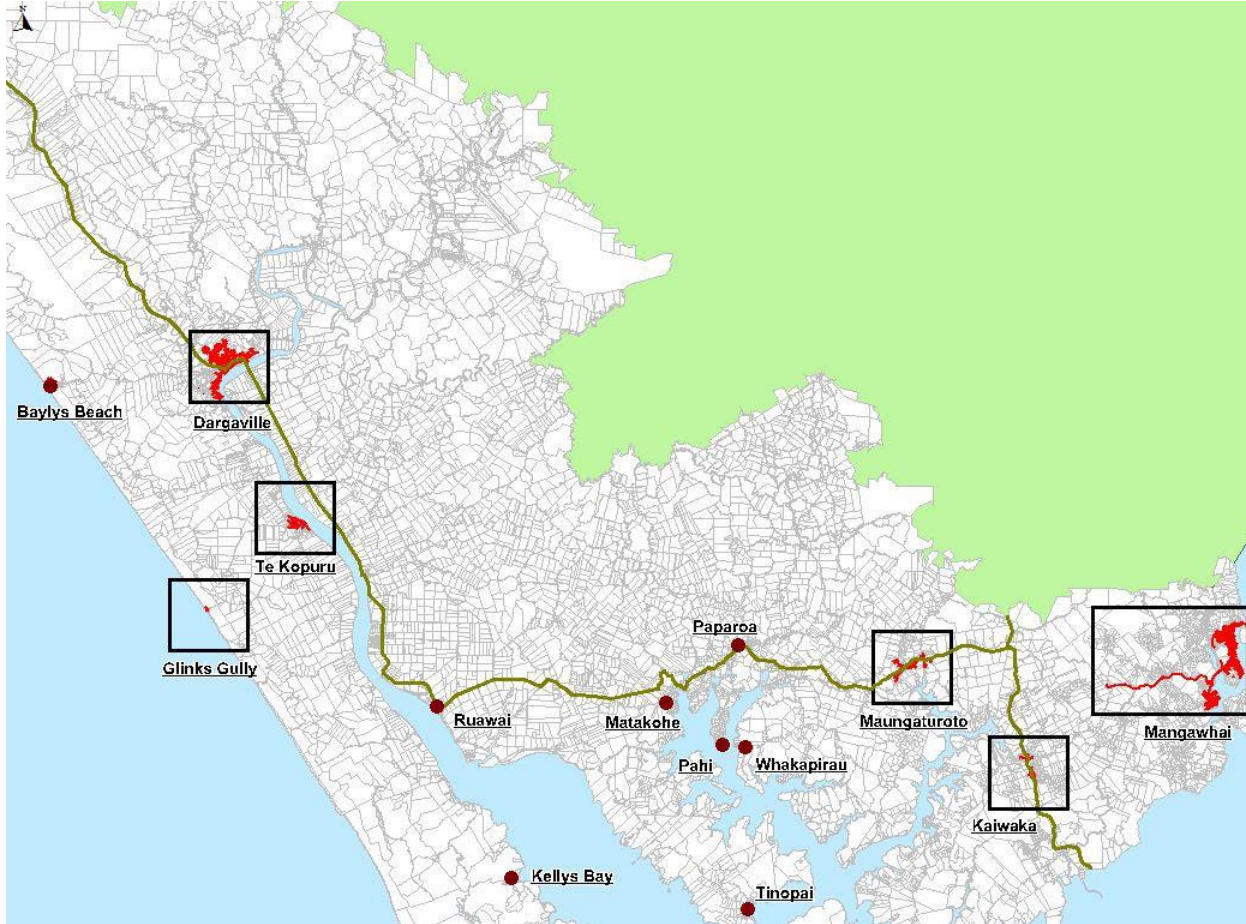
Wastewater



Overview – public wastewater schemes

Council owns and operates six public reticulated wastewater schemes in the Dargaville, Te Kopuru, Glinks Gully, Maungatūroto, Kaiwaka and Mangawhai communities. The wastewater systems collect and treat wastewater and then discharge it into surrounding environments in a sustainable, environmentally friendly manner. The purpose of the service is to protect public and environmental health.

Figure 5 – Public wastewater schemes



In addition to these community schemes, there are a number of smaller wastewater treatment facilities owned, operated or managed by Council. These facilities generally service campgrounds and other community facilities:

- Taharōa Domain – Kai Iwi Lakes (Pine Beach and Promenade Point) campgrounds;
- Pahi Domain campground;
- Tinopai campground; and
- Ruawai public toilet wastewater system.

Public wastewater schemes assets¹⁶

The assets associated with the six public reticulated wastewater schemes in Kaipara include:

- 7 wastewater treatment plants;
- 1 subsurface disposal field;
- 1 surface irrigation field (farm);
- 31 network pump stations;
- 113 km of reticulated gravity mains;
- 38 km of rising (pressure) mains; and
- 1,645 access chambers.

¹⁶ Kaipara District Council Wastewater Strategic Activity Management Plan 2021-2031 [Final Draft July 2020]

Service levels for public wastewater schemes¹⁶

Measuring performance

Table 10 – Public wastewater schemes performance measures

Measure	LTP Years 1 to 3 Target 2021/2022 to 2023/2024
The number of dry weather sewage overflows from Council's sewerage systems, expressed per 1,000 sewerage connections to that sewerage system. The resource consent provides for severe weather events and power failure exceptions.	≤1
Where Council attends to sewage overflows resulting from a blockage or other fault in the territorial authority's sewerage system, the following median response times apply: Attendance time: from the time that the territorial authority receives notification to the time that service personnel reach the site (Department of Internal Affairs measure).	≤2 hours
Where Council attends to sewage overflows resulting from a blockage or other fault in the territorial authority's sewerage system, the following median response times apply: Resolution time: from the time that the territorial authority receives notification to the time that service personnel confirm resolution of the blockage or other fault.	≤48 hours
The total number of complaints received by Council about sewage odour. Expressed per 1,000 sewerage connections.	≤10
The total number of complaints received by Council about sewerage system faults e.g. blockages, breaks. Expressed per 1,000 sewerage connections (Department of Internal Affairs measure).	≤27
The total number of complaints received by Council about Council's response to issues with its sewerage system. Expressed per 1,000 sewerage connections (Department of Internal Affairs measure).	Year 1 ≤50 Year 2 ≤48 Year 3 ≤46
The number of: abatement notices, infringement notices, enforcement orders and convictions received by Council in relation to its resource consents for discharge from its sewerage systems.	0
Major capital projects are completed within budget.	Achieved

Public wastewater schemes resource consents

Table 11 – Public wastewater schemes resource consents

Consent	Consent No.	Expiry	Discharge	Compliant
Dargaville WW Discharge Consent	200203666 (01 – 03)	30 June 2022	Discharge to land adjacent to the Northern Wairoa River, but may discharge to the river when discharge rate exceeds 116 L/sec. Monthly ave. ≤ 3,200 m ³ /day; Max. 10,000 m ³ /24-hour period. <u>Quality:</u> cBOD – median ≤ 40 g/m ³ ; Total SS ≤ 80 g/m ³ ; Total Kjeldahl Nitrogen ≤ 80 g/m ³ ; Faecal coliforms ≤ 20,000 per 100 ml.	Some instances of non-compliances



Consent	Consent No.	Expiry	Discharge	Compliant
Glinks Gully WW Discharge Consent	AUT.007231 (01 – 02)	31 July 2024	Discharge to land via a soakage bed system. Max. 15 m ³ /day. <u>Quality:</u> The wastewater from each dwelling shall receive treatment in an appropriately sized septic tank.	Yes
Kaiwaka WW Discharge Consent	CON200401116 (01 – 03)	31 Oct 2022	Discharge to the Pukekaroro Stream. Max. ADWF 60 m ³ /day. <u>Quality:</u> Faecal coliforms – rolling median using 5 most recent samples ≤ 5,000 per 100 ml; Faecal coliforms – rolling 90% using 10 most recent samples ≤ 10,000 per 100 ml; Total cell count of all known toxin producing algae ≤ 11,500 cells/ml and/or total concentration ≤ 2.3 µg/L; Four-day ave. concentration of total ammoniacal nitrogen ≤ limits specified in table.	Previously some instances of non-compliances. Reviewing performance following recent upgrade of the WWTP.
Maungatūroto WW Discharge Consent	CON200101115 (01 – 04)	30 Sept 2032	Discharge to the Wairau River limited to 2 hours after high tide. Max. ADWF 250 m ³ /day; Max. WWF 1,000 m ³ /day; Max. WWF extreme rainfall 1,200 m ³ /day. <u>Quality:</u> E.coli – rolling median ≤ 2,000 per 100 ml; E.coli – rolling 90% ≤ 6,000 per 100 ml; Four-day ave. concentration of total ammoniacal nitrogen ≤ limits specified in table.	Yes
Maungatūroto Railway Village WW Discharge Consent	AUT.005087 (01 – 03)	30 Sep 2025	Discharge to an unnamed tributary of the Pahi River. Max. 4 m ³ /day. <u>Quality:</u> Faecal coliforms – rolling median using 5 most recent samples ≤ 5,000 per 100 ml; Faecal coliforms ≤ 10,000 per 100 ml.	Yes
Te Kopuru WW Discharge Consent	CON200901102 (01 – 03)	30 June 2044	Discharge to the Wairoa River. Max. ADWF 110 m ³ /day. <u>Quality:</u> BOD ₅ median ≤ 25 g/m ³ ; BOD ₅ 90% ≤ 50 g/m ³ ; Total SS median ≤ 30 g/m ³ ; Total SS 90% ≤ 100 g/m ³ ; E.coli median ≤ 10,000 per 100 ml; E.coli 90% ≤ 40,000 per 100 ml; Total ammoniacal nitrogen median ≤ 10 g/m ³ ;	Some instances of non-compliances



Consent	Consent No.	Expiry	Discharge	Compliant
			Total ammoniacal nitrogen 90% ≤ 25 g/m ³ .	
Mangawhai WW Discharge Consent	AUT.014969 (01, 04 & 05)	30 Sept 2042	Discharge to land via surface irrigation at Lincoln Downs; Annual irrigation rate ≤ 5,000 m ³ /ha; Inflow at the WWTP ≤ 5,500 m ³ /day; Min. 110,00 m ³ dam for the storage of treated effluent required. <u>Quality:</u> TDS average ≤ 500 mg/L; Total Nitrogen average ≤ 30 mg/L; Total Phosphorous average ≤ 15 mg/L; Total SS average ≤ 10 mg/L; cBOD ₅ average ≤ 10 mg/L; E.coli median ≤ 10 MPN; E.coli 90% ≤ 100 MPN.	Yes

Resource consent non-compliance issues

Te Kopuru wastewater scheme

The Te Kopuru Wastewater Treatment Plant (WWTP) at times exceeds its total ammoniacal nitrogen limit as set out in the resource consent authorising the discharge of treated effluent from the WWTP.

Council has recently installed a new aerator to provide increased aeration of the WWTP's oxidation pond to address this non-compliance issue. Further monitoring will be required to assess whether this fully resolves the issue.

Kaiwaka wastewater scheme

The Kaiwaka WWTP has at times exceeded its treated effluent faecal coliforms limits as set out in the resource consent authorising the discharge of treated effluent from the WWTP. Council has recently installed a package membrane treatment plant to provide additional treatment capacity downstream of the oxidation pond. Recent monitoring indicates that the WWTP is now compliant however, Council will need to monitor the performance of the upgraded WWTP over a longer period to provide certainty that this upgrade has fully resolved the issue.

The Kaiwaka WWTP's resource consent expires on 31 October 2022 and Council has provided funds in its LTP 2021-2031 to apply for a new resource consent. This application process will also identify the level of treated effluent required, an assessment of the effects on the environment including public health risks, and whether any further upgrades to the WWTP would be required to meet the proposed conditions of a new resource consent and address any identified public health risks.

Dargaville wastewater scheme

The Dargaville WWTP has not been complying with some of the limits in its resource consent, most likely due to the excessive build up of sludge in its primary oxidation pond. Council awarded a contract in 2020 to desludge this pond and this contract is programmed for completion by the end of 2021. The desludging of the pond will effectively reinstate the treatment plant's design treatment capacity which should help to alleviate these non-compliance issues.

The Dargaville WWTP's resource consent expires on 30 June 2022 and Council has provided funds in its LTP 2021-2031 to apply for a new resource consent. This application process will also identify the level of treated effluent required, an assessment of the effects on the environment including public health risks, and whether



any further upgrades to the WWTP would be required to meet the conditions of a new resource consent and address any identified public health risks.

Wastewater network discharges

Rule C.6.2.1 *Discharge from a pump station or pipe network – discretionary activity* of the *Proposed Regional Plan for Northland* [Appeals Version – August 2020] states:

‘The discharge of treated wastewater from a wastewater treatment plant into water or onto or into land, and any associated discharge of odour into air resulting from the discharge, are discretionary activities.’

Essentially, discharges (spills) from a wastewater network are non-complying unless authorised by way of a network resource consent issued by the Northland Regional Council (NRC). They are also a potential public health risk.

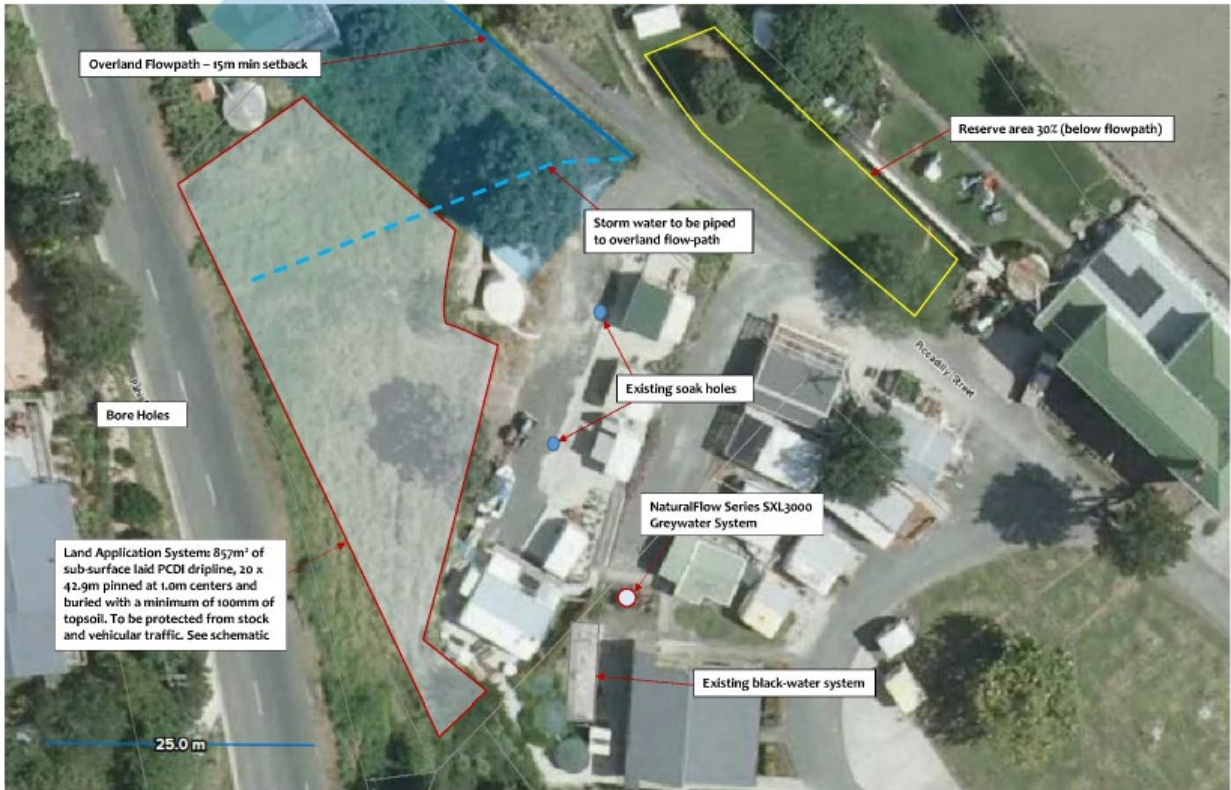
As stated in the *Wastewater Risks and issues* section below, inflow/infiltration (I/I) is a known issue and the ‘NRC is known to be concerned about the extent and frequency of wastewater overflows’.

Council will need to apply for network consents to authorise any network discharges. An assessment of effects and a strategy to minimise and manage any network discharges will need to be developed to support these consent applications. The proposed system capacity models, I/I management strategy, flow monitoring, and renewals programme are essential to identifying an affordable and pragmatic strategy to minimise and manage any network discharges to minimise associated potential public risks and support any consent applications.

Small wastewater treatment facilities owned, operated or managed by Council

These facilities service campgrounds and public toilets:

- a) Taharoa Domain – Kai Iwi Lakes (Pine Beach and Promenade Point) campgrounds;
- b) Pahi Domain campground;



DATE DRAW: 07.08.2017
 PREPARED BY: Dean Hoyle
 REVISED: Ken Hoyle

SITE LAYOUT PLAN:
 Dave Wilson
 680 Pahi Road
 Pahi
 SEC 1 SO 69001 SECS 21 22 261
 #####Ha

SCALE:
 1:30.5
 @A3

c) Tinopai campground; and



ISC Wastewater Treatment Plant
 Tinopai Camp Grounds and Hall

Page 1 of 1
 Ref: 0510734

Scale: approx 1:750
 Date: 17/10/06

d) Ruawai public toilet wastewater system.

Table 12 – Small wastewater systems resource consents

Consent	Consent No.	Expiry	Discharge	Compliant
Taharoa Domain – Pine Beach WW Discharge Consent	CON2008047021 (02 & 03)	31 July 2028	Discharge to land: Max. 37.5 m ³ /day <u>Quality</u> As a minimum the wastewater treatment and disposal system shall be in general accordance with the location & design of the Innoflow Technologies NZ Ltd. drawings and DWK drawings. There shall be no ponding of wastewater within, or surface runoff of any contaminants from the effective downslope land treatment area.	Yes
Taharoa Domain – Promenade Point public toilets	N/A	N/A	Holding tank only – pumped out as required.	N/A
Pahi Domain WW Discharge Consent	AUT.003780 (01 to 03)	28 Feb 2028	Discharge to land via 3 disposal bores: Max. 9.0 m ³ /day <u>Quality</u> As a minimum all wastewater shall be treated within a dual chamber septic tank with effluent filter and an upward flow gravel filter prior to being discharged to land via 3 disposal bores, with no bore being greater than 2.4 metres deep. There shall be no change to the location of the disposal bores as installed at the commencement of this consent. The effluent filter installed on the outlet of the septic tank shall screen suspended solid particles greater than 3.5 millimetres in diameter from the wastewater. Prior to 1 December 2018, an automated distribution system shall be installed and maintained that sequentially loads treated wastewater to each deep bore.	Yes
Tinopai WW Discharge Consent	AUT.002772 (01 & 02)	01 Sept 2027	Discharge to land via min. 600m irrigation line: Max. 1.8 m ³ /day <u>Quality</u> As a minimum all wastewater shall be treated and disposed of via a system that is of similar design, size and location shown on the Innoflow Technologies NZ Ltd. drawing. The treated wastewater shall be discharged to land via a minimum 600 lineal metres of irrigation line that has pressure compensating drip emitters.	Yes, however some discharge exceedances during wet weather events due to infiltration. Council is currently looking to remedy this.



Consent	Consent No.	Expiry	Discharge	Compliant
			<p>The treated wastewater shall not be applied at an areal loading rate greater than 3.0 litres per square metre per day.</p> <p>The irrigation lines shall at all times be covered y mulch, soil or an appropriate alternative to a minimum depth of 100mm.</p>	

Current risks and issues with the public wastewater schemes

Risks and issues¹⁶

- **System Capacity** – none of the KDC wastewater systems have hydraulic models or an overall assessment of the capacity of the various key elements that make up the systems. This generates a number of issues including:
 - Unknown capacity for growth to occur and difficulty approving extensions when impact on downstream system is unknown;
 - With the extent of renewals increasing it is critical to ensure that correct capacity is provided for future growth through that process;
 - Extent to which infiltration and inflow is present, what issues are associated with excessive Inflow and Infiltration (I/I) and how growth can be accommodated if I/I is reduced;
 - Pump station capacity relative to demand, ability to manage peak flows and what, if any, emergency capacity would optimally be required;
 - Capacity constraints within reticulation system, particularly pipes that are serving an arterial role;
 - Treatment capability relative to consent requirements and growth capacity. This also highlights fundamental limitations of the simple pond systems relative to likely future consent requirements; and
 - ability to charge development contributions when balance of current and growth capacity not known.

The proposed system capacity studies are to obtain an overview of these issues for the subject schemes. This may lead to future more detailed studies being required.

Given the relatively small size of most of the schemes the actual extent of the network needing to be properly modelled is expected to be relatively small with large parts of the network able to be simply specified by minimum pipe sizes. The studies will therefore focus on key elements and identifying the main constraints.

To be effective these studies will require reliable flow measurement in both dry and wet weather flow situations, and this may require the installation of temporary flow gauging.

Schemes proposed for inclusion in first three years are Mangawhai, Dargaville, Glinks Gully, Maungatūroto, and Kaiwaka.

Dargaville is driven mainly by renewal considerations and management of pump stations and WWTP.

Kaiwaka is driven partially by growth considerations but also by consent renewal in 2022.

Maungatūroto is driven by growth considerations.

Glinks Gully is driven by consent renewal in 2024 and consideration of whether the scheme should be extended and potential for needing to renew the seepage beds.

Mangawhai is driven by significant growth considerations and the impact on the plant and disposal area \$10 million dollars of upgrades identified in 2021/31 Long-term Plan to bring the capacity of the treatment plant up to a capacity of 5,000 connections (or equivalent).

- **Infiltration and Inflow Management** – many of the KDC schemes experience containment issues during wet weather and this is a clear indicator that Inflow and Infiltration (I/I) is present.

This will be contributed to by the age of the networks and the low-lying nature of several of them.

NRC is known to be concerned about the extent and frequency of wastewater overflows. The WaterNZ National Performance Review indicates that the Dargaville system has the highest number of overflows per 1,000 properties of any reported. The accuracy and validity of this measure is however highly suspect and will be confirmed with the next review.

Some of the problem may be caused by pipes and pump stations simply being too small for the connected demand and the system capacity studies above will provide some indication of such situations.

Council has commenced the acquisition of a wastewater network discharge consent (as required under *Rule C.6.2.1 Discharge from a pump station or pipe network* of the NRC's *Proposed Regional Plan for Northland*) as this is a discretionary activity. This will include options on how best to mitigate and to manage any unplanned discharges from the wastewater network.

- **Oxidation Ponds** – Dargaville, Te Kopuru, Maungatūroto and Kaiwaka all utilise oxidation ponds in various formats. These systems are cheap and simple to operate however have their limitations in relation to the extent and type of treatment that they can provide. While daily costs are low the periodic desludging costs can be considerable and are considered to be an Operational cost.

KDC will propose a study that will align with the system capacity study with a specific focus on providing a view on the ongoing viability of oxidation ponds as a treatment process, what can be done to optimise their performance and providing a future outlook on necessary maintenance and upgrading.

- **Kaiwaka Consent Renewal** – the Kaiwaka discharge consent expires in 2022. This funding provides for initial scoping of the process for renewal and gathering of information that will contribute to that process.
 - **Specific Discharge Non-compliance** – some of the WWTPs regularly have periods of non-compliance with specific requirements of their discharge consents. With oxidation ponds this can be difficult to manage as they are biological systems without key adjustable controls other than aeration.

A specific issue at this time is ammoniacal nitrogen at Te Kopuru and a study is provided to identify the cause and propose remedies.

- **Condition Assessment** – the KDC systems comprise a mix of pipes of varying diameters, gravity/pressure, materials, ages, criticalities and operating environments. All of these factors influence the effective working life of the pipe and the drivers for renewal.

Given the costs involved in renewals as the major driver of capital expenditure, it is important that KDC has good information to both predict when renewal might be required (long-term planning) and justifying the actual renewals to be undertaken (short-term planning).

Condition assessment is a key tool for both these disciplines and for gravity pipes it is typically CCTV based, while pressure pipes utilise a range of technologies.

- **Mangawhai WWTP** – the Mangawhai WWTP is very different to all other KDC WWTPs in relation to the extent and nature of the technology utilised. Much of the electrical equipment has a relatively short life expectancy and therefore renewal expenditure is both large and frequent. Added to the required renewals are the upgrades to the plant required to meet the constant level of growth in connected properties. Currently the plant is identified to reach capacity in 2028/2032 (approx.).

A valuation base renewal forecast indicates renewal of \$1.5 million being required over the next 10 years.

The study is intended to focus on the renewal profile of the plant and review the actual condition of the subject equipment to determine if the life expectancy used for valuation purposes can effectively be utilised for renewal planning. It is hoped that lives can be extended but the WWTP is a hostile environment for much of this equipment and this cannot be a guaranteed outcome.

- **Valuation, SAMP updating and LoS Review** – these are time-bound processes that need to be provided for during the three years of the LTP.

Community wastewater schemes (excluding Council public schemes)

There are a number of privately owned and operated communal wastewater systems within the district, the largest in Baylys Beach serving a residential subdivision of approximately 88 properties. These generally require discharge consents from the Northland Regional Council who is responsible for ensuring compliance with these resource consents, and thereby mitigating public health and environmental risks.

Private onsite wastewater systems

Rural Settlements Infrastructure

Several of Kaipara's smaller villages and settlements, and also including clusters on the fringes of the larger settlements, which have historically developed using more self-sufficient methods such as onsite septic systems are at risk of possibly reaching a point where some of these systems may be failing (e.g. onsite concrete tanks and pipes are possibly cracking, and/or the disposal fields are failing). If so, then this may be causing the receiving environment (i.e. groundwater, creeks and beaches) to become contaminated with untreated wastewater especially during high rainfall events.

If this was demonstrated to be an issue, Council and the community would need to work through options to address this situation. Options could include retrofitting new onsite treatment systems and/or disposal fields, and considering the installation of a Council-owned reticulated wastewater scheme to service any affected community although this would most likely only be viable if there was a larger scale problem.

Kaipara District Council Wastewater Drainage Policy [September 2016]

Section 16 *Operation and maintenance of onsite wastewater treatment systems* of Council's Wastewater Drainage Policy is relevant to onsite wastewater systems, and states:

- 16.1** The risk to public health and to the environment of poorly operating private onsite wastewater treatment systems needs to be minimised.
- 16.2** Council will implement a WOF programme. This will include a maintenance and performance inspection and approval programme for onsite wastewater treatment systems throughout the district. This programme will include minimum information required for building consent applications, inspection and maintenance requirements and ongoing reporting requirements to Council. Property owners will be responsible for ensuring inspection and maintenance requirements are carried out (refer to s12 of the Wastewater Drainage Bylaw).
- 16.3** Policies in the District Plan state that in conjunction with NRC, the District Plan seeks to ensure that activities do not affect Sensitive Receiving Environments and provide appropriate management, including wastewater and stormwater systems to ensure that discharges do not result in adverse effects on sensitive receiving environments. Council will also use its Wastewater Policy and Bylaw to ensure activities do not discharge wastewater in a manner that adversely affects the environment and public health.
- 16.4** Onsite wastewater treatment systems have to comply with the requirements in Schedule B of the Bylaw. Upon adoption of this Policy, Council shall begin a programme of inspection of onsite systems within the coverage areas in the Kaipara District:
- The coverage area being-
- 1) all Residentially zoned land, as identified in the Kaipara District Plan; and
 - 2) all land irrespective of zoning where –
 - i. the area falls within 300m of the mean high water springs along the coast (east/west coasts); or
 - ii. an area within 300m of the mean high water springs of the coastal marine area (as defined in the Resource Management Act 1991) of a harbour (Mangawhai and Kaipara Harbours); or



iii. an area located within 300m of the margins of the Kai Iwi Lakes.

16.5 *During the next review of the Wastewater Drainage Policy and Wastewater Bylaw consideration will be given as to whether or not to extend the coverage area to which the onsite wastewater inspection and maintenance regime will apply. This could potentially lead to the whole District being covered by this policy and the Wastewater Drainage Bylaw.*

If through the inspection and maintenance regime it is found that there is a high number of effluent nuisances, cross connection issues (between Stormwater and wastewater systems), or other issues affecting the effective operation of on site wastewater systems, this may trigger the need to review the coverage area of the Bylaw. The review would include a public consultation process, prior to any decision to extend the area being made.

Council will put in place monitoring at selected sites to help gauge how well the Bylaw is working and to help determine if the coverage area needs to be extended. If the results of monitoring suggest the coverage area should be extended a public consultation process will need to be undertaken prior to a final decision being made.

16.6 Inspections will be carried out by a suitably qualified person with inspections and/or maintenance being carried out at no more than three-yearly intervals; or at any lesser interval if recommended by the manufacturer and/or system designer; or less than three years if Council considers necessary in cases where Council is aware that any onsite system may not be compliant with Schedule B of the Bylaw or may be causing a "nuisance".

16.7 Inspections and maintenance undertaken by a suitability qualified person will be organised by the owner/owners of the premises served by the onsite wastewater treatment system at the owner/owners cost.

16.8 After each inspection, the suitably qualified person will complete a report on the onsite wastewater system, for the property owner to provide to Council.


16.9 If from the report Council finds that the system is compliant with Schedule B of the Bylaw, Council will notify the owner and note the date for the next inspection. A copy of this notification will be sent to NRC.

16.10 If from the report Council determines that the system is not compliant with the required standards, owners may be contacted by either NRC (for major failure) or KDC (for minor failures) of what corrective actions need to be taken.

This may include:

- a) where the "private drain" from the "premises" can lawfully be required to connect to a public wastewater system pursuant to s459 of LGA74, serve notice requiring connection under s459(1) of the Act (or under the *Building Act 2004*); or
- b) where the "private drain" from the premises cannot lawfully be required to connect to a public wastewater system, Council will notify the owner outlining the repairs required for their system to comply with Schedule B of the Bylaw and when the repairs have been completed the owner will advise Council and a further inspection will be made at the owners' cost. The system shall be deemed to remain compliant with Schedule B of the Bylaw until the repairs or upgrades have been completed or for a period of three months, whichever is the lesser.

16.11 There will be no duplication between Northland Regional Council's monitoring requirements and the Kaipara District Council Wastewater Drainage Bylaw requirements. Where an onsite wastewater system owner has a Resource Consent from the Regional Council, the requirement to comply with the Bylaw maybe waived where the Regional Council Consent Conditions have higher or same requirements than the Bylaw. In these circumstances the monitoring reports from the Northland Regional Council will be deemed appropriate to show compliance with the bylaw. Where the Northland Regional Council monitoring reports are not deemed appropriate then an assessment under the Wastewater Drainage Bylaw will need to be undertaken. This will be determined on a case by case basis. The Kaipara Council will work with the Regional Council to remove any duplication in process.



16.12 Council will use the Kaipara District Wastewater Drainage Bylaw 2016 to ensure compliance with the Kaipara District Council Wastewater Drainage Policy.

Kaipara District Wastewater Drainage Bylaw 2016 [September 2016]

The *Kaipara District Wastewater Drainage Bylaw 2016* (Bylaw) gives effect to the *Kaipara Wastewater Drainage Policy 2016*. The Bylaw imposes requirements on:

- a) persons connected to a public wastewater system, who are to operate and maintain “private connection works” and protect the public wastewater system from damage and misuse that has the potential to create a nuisance and adversely affect the environment and public health.
- b) owners of onsite wastewater treatment systems in the Kaipara district to ensure that private onsite wastewater disposal systems are installed, operated, repaired or extended, and is done so under the required standards of KDC, and that they are assessed and maintained at regular intervals as required under the WOF programme.
- c) Requiring connection to a Council wastewater system where available where onsite systems are creating a nuisance or are adversely affecting the environment

Part B – Onsite wastewater disposal systems of the Bylaw is relevant to onsite wastewater disposal systems. However, Part B only applies to all types of onsite wastewater disposal systems within the coverage area (refer 16.4 in Kaipara District Council Wastewater Drainage Policy [September 2016] above for a definition of the coverage area).

Item 12.1 of the Bylaw states:

“All onsite wastewater treatment systems in the coverage area shall be subject to a maintenance and performance inspection and approval programme”;

Item 12.2 states:

“Council will notify property owners one month prior, when maintenance and inspections are due on their onsite wastewater system”;

and Item 12.3 states:

“Council requires that every onsite wastewater disposal system of a septic tank or similar type system, be inspected and maintained by property owners at periods of not more than three yearly intervals, or otherwise in accordance with the manufacture or designer’s maintenance recommendations”.

Kaipara District Wastewater Drainage Bylaw 2016 - Monitoring

Council’s records indicate there are approximately 1,500 properties within the coverage area. Of the 636 letters sent to property owners for the 2020/2021 financial year requesting their report from a suitably qualified person to demonstrate that their disposal systems have been assessed and/or maintained in accordance with the Bylaw, only 16% required a second follow-up letter.

Since mid-2020, Council’s monitoring officer has attended three septic tank failures, of which all three have been repaired. Failures of onsite disposal fields are minimal with only two being identified, and one of these since remedied.

General comments reported by the suitably qualified persons undertaking the inspections of the onsite systems reveal that minor issues identified during the inspections are mostly remedied on the day or shortly thereafter.

Specific risks or issues with onsite wastewater systems that have been identified are reported below.

Private onsite wastewater risk assessment

The potential sources of risk to public health from onsite wastewater disposal systems come from untreated (or partially treated) wastewater which contains high concentrations of micro-organisms, many of which may be pathogenic to humans. For the purposes of the assessment, a desk-top risk analysis was undertaken covering each of the larger communities with onsite wastewater systems. This accounted for the following factors, which serve as a guide to the effectiveness of these systems and their potential to cause problematic contamination:



- Number and concentration of small-sized lots i.e. under 1,000 m², and in the range 1,000 – 2,000 m².
- Soil drainage characteristics: smaller lots may not have sufficient area for disposal by soakage, especially where drainage is poor.
- Reticulated water connection: generally results in higher water use and more effluent for the wastewater system to handle.
- Proportion of new onsite wastewater systems: new systems with secondary treatment features produce higher quality effluent and so pose a lesser contamination risk.
- Proximity to a water body, especially where this is subject to recreational use, surface water or groundwater takes.
- Seasonal occupation: if a dwelling is mainly occupied only in summer when ground soakage is better, the potential for problems is less than when occupied year-round.



Table 13 – Private Onsite Wastewater Risk Assessment

Community	No. of Lots in size Range (ha)		Total lots	Soils/ Soakage	Reticulated Water	Seasonal Occupation	Proximity to Waters for Recreation	Concentration of Lots	Risk Priority	Rank
	< 0.1	0.1 - 0.2								
Aranga	8	31	39	Variable	No	Yes	Yes	Low/Med	2880	7
Omamari	35	13	48	Very good	No	Yes	Yes	Medium	864	10
Baylys Beach	127	50	177	Good	Yes	Yes	Yes	High	15552	3
Kellys Bay	28	8	36	Very good	No	Yes	Yes	Low/Med	576	11
Pouto Point	20	7	27	Good	No	Yes	Yes	Low/Med	1152	9
Tinopai	93	68	161	Poor	Part	Yes	Yes	Medium	15552	3
Ruawai	153	87	240	Fair/poor	Yes	No	Yes	Med/High	82944	1
Paparoa	37	47	84	Fair/poor	No	No	No	Low/Med	2304	8
Pahi	31	78	109	Poor	No	Yes	Yes	Med/High	10368	5
Whakapirau	41	32	73	Poor	No	Yes	Yes	Med/High	6912	6
Mangawhai - capable to connect + 'pockets'	174	234	408	Fair/poor	No	Some	Yes	Med/High	23040	2

* The Mangawhai township properties are mostly serviced by a Council-owned public wastewater scheme. However, some pockets of properties are not serviced, and some properties are able to connect but are still utilising private onsite wastewater systems.



Dargaville

Council has identified that a cluster of properties in Spring Street just south of Dargaville have developed on land which is not suitable for septic systems¹⁵. Council has provided funds in its LTP 2021-2031 to construct the Spring Street Project to provide a reticulated wastewater system connecting to the Dargaville Wastewater Scheme, including connecting the individual properties to the new system.

Paparoa

Council's regulatory team is aware of specific issues in Paparoa associated with failing septic systems, which predominantly affects the commercial area¹⁵.

Council will undertake an investigation to support a community wastewater scheme in Paparoa. Once this investigation has been completed, Council will consult with the community to determine how they would fund the implementation of the preferred solution.

Septage Disposal

Septic tank sludge mainly from onsite wastewater systems throughout the Kaipara district is collected by private contractors and disposed at various facilities. There are no known septage disposal facilities with the Kaipara district and all septage is disposed of at trade waste-type facilities outside the district e.g. Whangarei Wastewater Treatment Plant.

Adequacy Assessment

Public wastewater schemes

Council's public wastewater schemes all have sufficient capacity to service their respective catchments, and sufficient capacity to meet current peak levels of demand.

Exceptions are the Dargaville, Te Kopuru and Kaiwaka Wastewater Treatment Plants:

- **Dargaville** – the discharge resource consent expires on 30 June 2022 and Council has provided funding to apply for a new resource consent. This application process will identify options to ensure compliance with the new consent including an allowance for growth.
- **Kaiwaka** – the discharge resource consent expires in 2022 and Council has provided funding for initial scoping of the process for renewal and gathering of information that will identify options to ensure compliance with the new consent including an allowance for growth.
- **Te Kopuru** – the study into the issue of elevated ammoniacal nitrogen at the treatment plant will identify the cause and propose remedies. The programmed addition of a new aerator may resolve the issues.

Some of the wastewater schemes' reticulation systems do not have sufficient hydraulic capacity to meet current peak wet-weather levels of demand during storm events which at times results in sewage overflows. This issue has been recognised by Council, along with the increased risk as a result of climate change. Council is proposing to undertake system capacity studies to obtain an overview of these issues (this may lead to more detailed studies being required in the future).

These system capacity studies will also include how the public wastewater schemes will need to be improved to meet any future growth-related demand, and will need to take into account any changes in standards as a result of the *Water Services Bill* once the three-waters reform has been finalised and any associated acts enacted or amended.

The Mangawhai Wastewater Scheme has been identified as requiring upgrades to accommodate growth-related demand. The treatment plant is currently being upgraded to provide additional capacity, and options to provide additional disposal capacity are being investigated. Council's Infrastructure Strategy identifies principal management options for a new disposal solution for the Mangawhai Wastewater Scheme.



Community wastewater schemes (excluding Council-owned public schemes)

The privately owned and operated communal wastewater systems generally require discharge consents from the Northland Regional Council who is responsible for ensuring compliance with these resource consents, and thereby mitigating public health and environmental risks.

The Northland Regional Council has advised that they are not aware of any significant wastewater discharge non-compliance issues.

Private onsite wastewater systems

Other than the few areas where specific issues have been identified, the monitoring of the onsite wastewater systems under Council's *Kaipara District Wastewater Drainage Bylaw 2016* indicates that the onsite wastewater systems are generally operating satisfactorily indicating a low public health risk.

The on-going monitoring and enforcement of Council's Wastewater Drainage Bylaw 'WOF' maintenance and performance inspection & approval programme for onsite wastewater systems will ensure the systems are appropriately maintained and operated, and ensure any non-complying systems are identified and remediated. The Private onsite wastewater risk assessment above will assist the Council officers to manage this programme.

Any freshwater/beach water sampling programme undertaken by the Northland Regional Council would also highlight any incidences and levels of potential contamination.



Stormwater



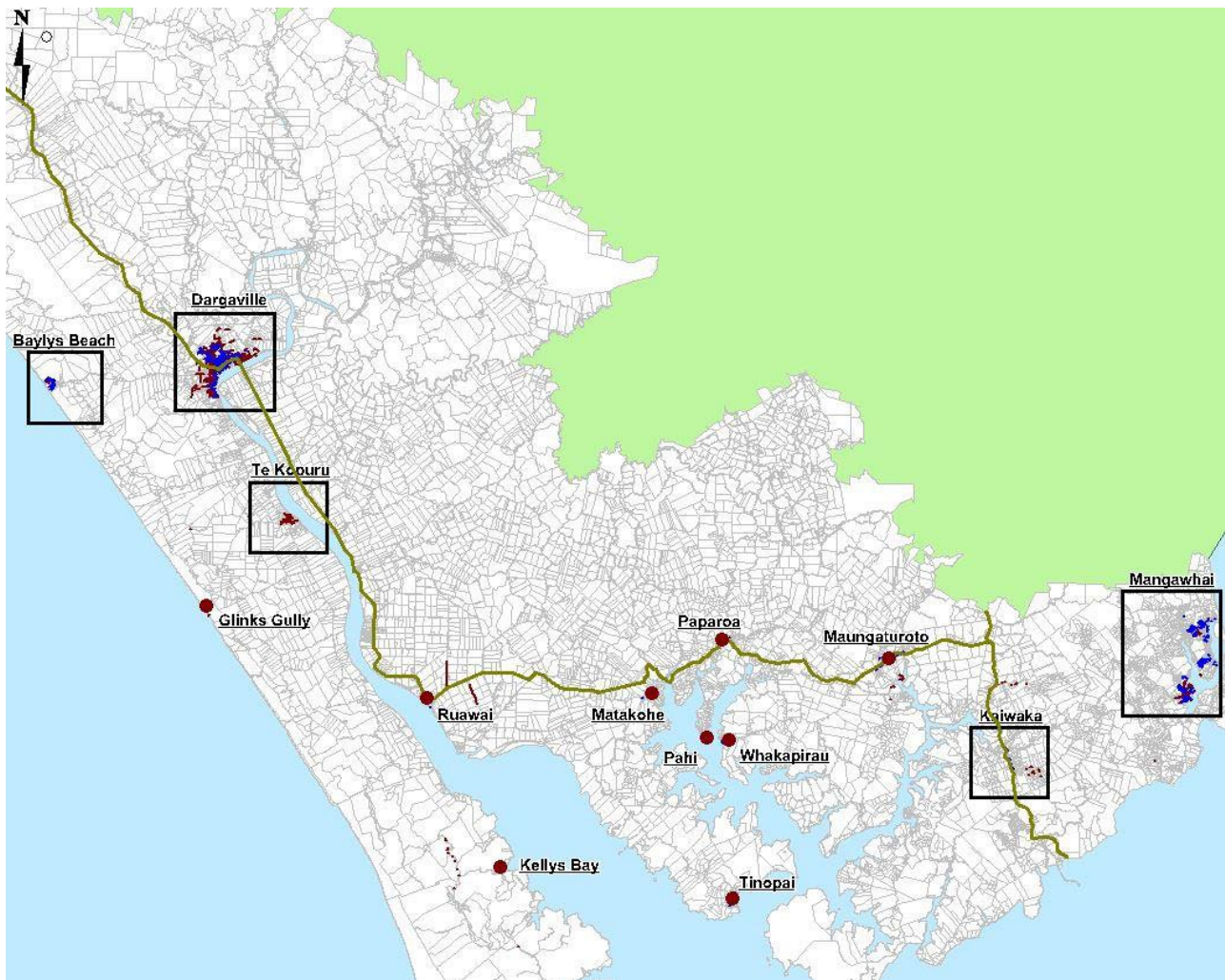
Overview – public stormwater schemes

Council operates five community stormwater schemes for Dargaville, Baylys Beach, Kaiwaka, Mangawhai and Te Kopuru using a mixture of open drains and underground pipes. The location of each of these communities within Kaipara district is illustrated in Figure 6. These townships all have piped urban stormwater networks of varying scales. Rural areas and the smaller townships are currently serviced primarily by the roading infrastructure department. Stormwater systems predominantly incorporated into the road network are provided in Glinks Gully, Kelly's Bay, Pahi, Whakapirau, Tinopai, Paparoa, Matakohē and Maungatūroto. The Ruawai scheme is operated under the Raupo Land Drainage scheme.

In providing stormwater systems, Council's aim is to protect people, dwellings, private property and public areas from flooding by providing a stormwater system that meets the LoS set out in the Kaipara District Council Stormwater Strategic Activity Management Plan, and to discharge stormwater and collect contaminants in a manner that protects the environment and public health.

Council's approach to stormwater management is to minimise the impacts on the built environments by reducing adverse effects from stormwater runoff on the environment. The stormwater network is progressively developing, and management requirements will need to be continuously reviewed to ensure the assets are maintained appropriately.

Figure 6 – Public stormwater schemes



The provision of sustainable stormwater systems is about finding a balance between maintaining and enhancing natural watercourses, and providing stormwater networks to enable urbanisation to occur while



collecting and treating stormwater runoff from the effects of urbanisation prior to it entering the receiving environment waters such that they are not detrimentally affected.

Council manages the impact of urban growth and development on the stormwater infrastructure and receiving environment through the application of Stormwater Catchment Management Plans (SWCMP) and planning provisions set out in the District Plan. Council currently has SWCMPs for the Dargaville and Baylys areas of the district, and a SWCMP is currently being developed for Mangawhai as the previous version was finalised in 2005.

Stormwater drainage protects our communities, infrastructure, and public places from flooding by discharging stormwater and collecting contaminants to minimise adverse effects from rain, runoff, and high tides. Stormwater drainage on state highways is managed by Waka Kotahi NZ Transport Agency (NZTA).¹⁷

Dargaville stormwater system

Dargaville is also protected from flooding and tidal inundation from the adjacent Northern Wairoa, Awakino and Kaihu Rivers via a flood protection system of stopbanks. Stormwater outlets discharging to these rivers include floodgates to prevent back-flooding when the rivers are high. These urban stopbanks and floodgates are administered and maintained within the Dargaville urban area through the stormwater programme.

The Dargaville urban area is recognised to be flood-prone, on account of factors including:

- Low-lying topography adjacent to the Northern Wairoa and Kaihu Rivers.
- Tidal influences, particularly when combined with low barometric pressures and wind backing-up the tide.
- Flood flows from the upper catchments of the Northern Wairoa and Kaihu Rivers.
- Local runoff collected by the Dargaville stormwater system not being able to be discharged when the Northern Wairoa and Kaihu Rivers are running high.
- Under-capacity in the piped stormwater network.

The different types of flooding can be characterised as follows:

- Local Flooding: Occurs more frequently, mainly when short-duration, high-intensity rainfall events combine with high tides – in such cases the stormwater cannot discharge to the rivers because the floodgates are closed and there is insufficient local storage on the floodplains to prevent flooding in the lower-lying urban areas.
- River Flooding: Occurs quite infrequently when the river levels rise above the stopbanks, resulting in widespread flooding which takes a considerable time to drain back to the river via the stormwater pipes once the river levels have subsided.

The effects of predicted climate change would exacerbate the above.


Ruawai stormwater system

Stormwater drainage for the Ruawai township is provided as part of the Raupo Drainage District land drainage scheme covering the Ruawai flats. The scheme is overseen by the Raupo Drainage Committee, which is a committee of the Council. Relevant information on the scheme can be summarised as follows¹⁸:

- The scheme comprises a network of drains, canals, flood-gates, stop-banks and a pump station.
- The areas protected are as follows:
 - SH12 to Greenhill Road: 4.96 ha
 - Molloy Road to Dunn Road: 2.705 ha
 - SH12 to Whitcombe Road: 3.4 ha
 - Dunn Road: 1.176 ha
 - Whitcombe Reserve: 4.32 ha
- The committee is responsible for maintenance of the scheme works, covering:

¹⁷ Kaipara District Council Long Term Plan Mahere Wa Roa 2021-2031 – Activity Statements - Stormwater

¹⁸ Kaipara District Council Water & Sanitary Services Assessments 2006 [WRCG Ltd.]

- 
- drain clearance
 - weed spraying
 - floodgate maintenance
 - stopbank maintenance
 - Administration and maintenance costs are recovered through an annual land drainage targeted rate.

As far as can be ascertained, there are no incidences in recent times of serious flooding in the Ruawai township.

Northland Regional Council coastal flooding maps

The Northland Regional Council (NRC) has developed coastal flooding maps that show areas that may be prone to coastal flooding over 50- and 100-year timeframes. The coastal flooding maps show four different scenarios:

- **Current day** (CFHZ 0): areas currently susceptible to coastal flooding in a 1-in-100-year storm event with no allowance for sea level rise.
- **50-year projection** (CFHZ 1): areas susceptible to coastal flooding in a 1-in-50-year storm event, with a projected sea-level rise of 0.6m by 2080.
- **100-year projection** (CFHZ2): areas susceptible to coastal flooding in a 1-in-100-year storm event, with a projected sea-level rise of 1.2m by 2130.
- **100-year 'rapid sea level rise'** projection (CFHZ 3): areas susceptible to coastal flooding in a 1-in-100-year storm event, with a sea-level rise scenario of 1.5m by 2130. This is representative of a high-emissions scenario where more rapid rates of sea level rise occur due to dynamic ice sheet instabilities.

The maps were developed based on technical assessments and modelling undertaken by different consultants who are experts in their field. Two major variables influence the coastal flood hazard zones: the size of a given storm event, and the amount of sea level rise. The severity of a coastal storm can be described in terms of its likelihood (e.g. a 'one in one-hundred-year storm'). How quickly sea level rise happens is related to global greenhouse gas emissions, and the levels used are based on recommendations from the Ministry for the Environment.

It is important to note that the modelling has been undertaken using the existing stopbanks. The extent of the predicted flooding would be mitigated if improvements to the existing flood protection stopbanks were implemented e.g. stopbanks raised, additional stopbanks constructed, stormwater pumping systems constructed, etc.

The following figures show the extent of possible future coastal flooding/inundation of Dargaville, Mangawhai and Ruawai¹⁹ (note these do not include localised stormwater flooding predictions):

¹⁹ Northland Regional Council Coastal Flood Maps on-line browser [June 2022] www.nrc.govt.nz/environment/river-flooding-and-coastal-hazards/natural-hazard-map-portal/



Figure 7 – Dargaville and Surrounds Predicted Future Coastal Flooding



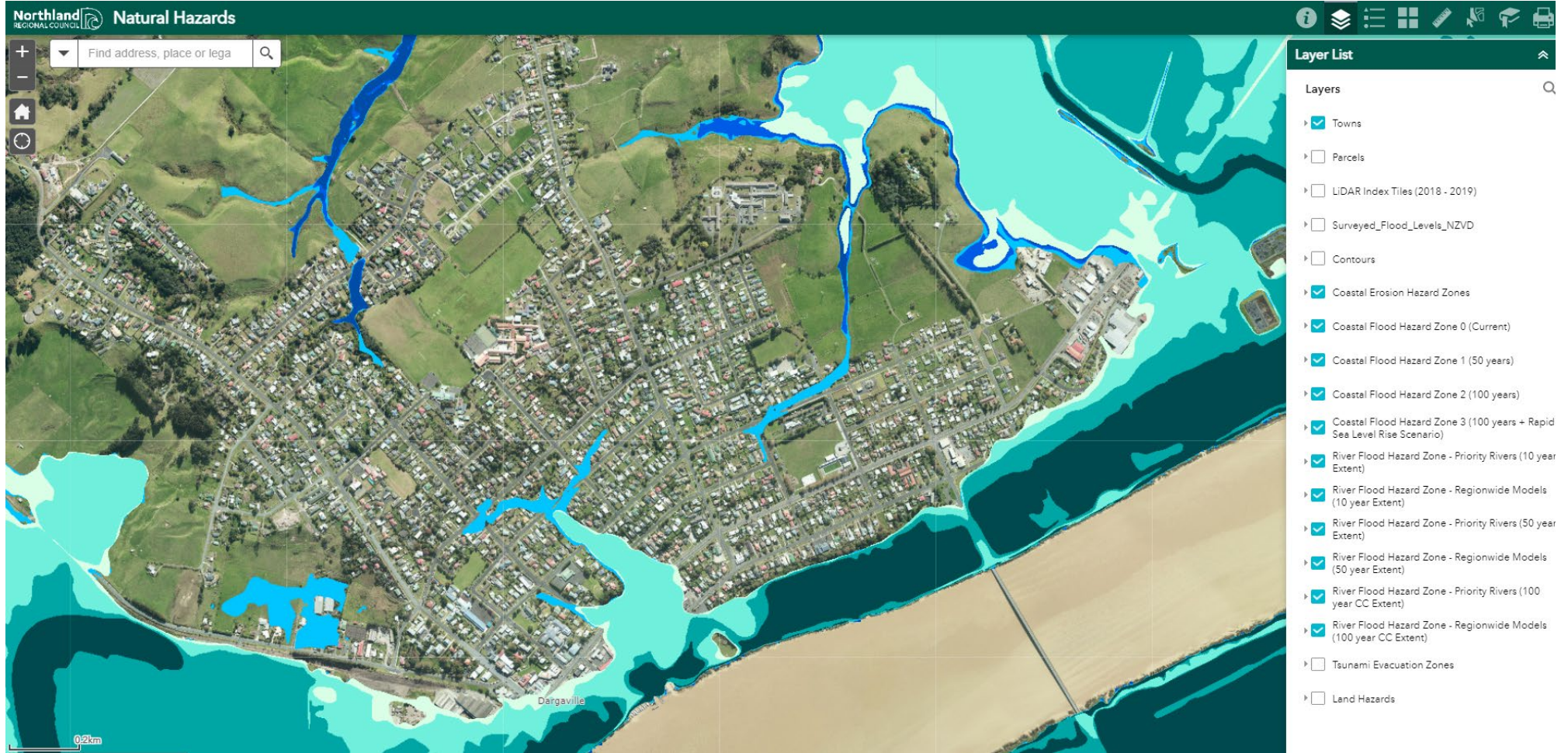
Current day (CFHZ 0): areas currently susceptible to coastal flooding in a 1-in-100-year storm event with no allowance for sea level rise.

50-year projection (CFHZ 1): areas susceptible to coastal flooding in a 1-in-50-year storm event, with a projected sea-level rise of 0.6m by 2080.

100-year projection (CFHZ2): areas susceptible to coastal flooding in a 1-in-100-year storm event, with a projected sea-level rise of 1.2m by 2130.

100-year 'rapid sea level rise' projection (CFHZ 3): areas susceptible to coastal flooding in a 1-in-100-year storm event, with a sea-level rise scenario of 1.5m by 2130. This is representative of a high-emissions scenario where more rapid rates of sea level rise occur due to dynamic ice sheet instabilities.

Figure 8 – Dargaville Predicted Future Coastal Flooding



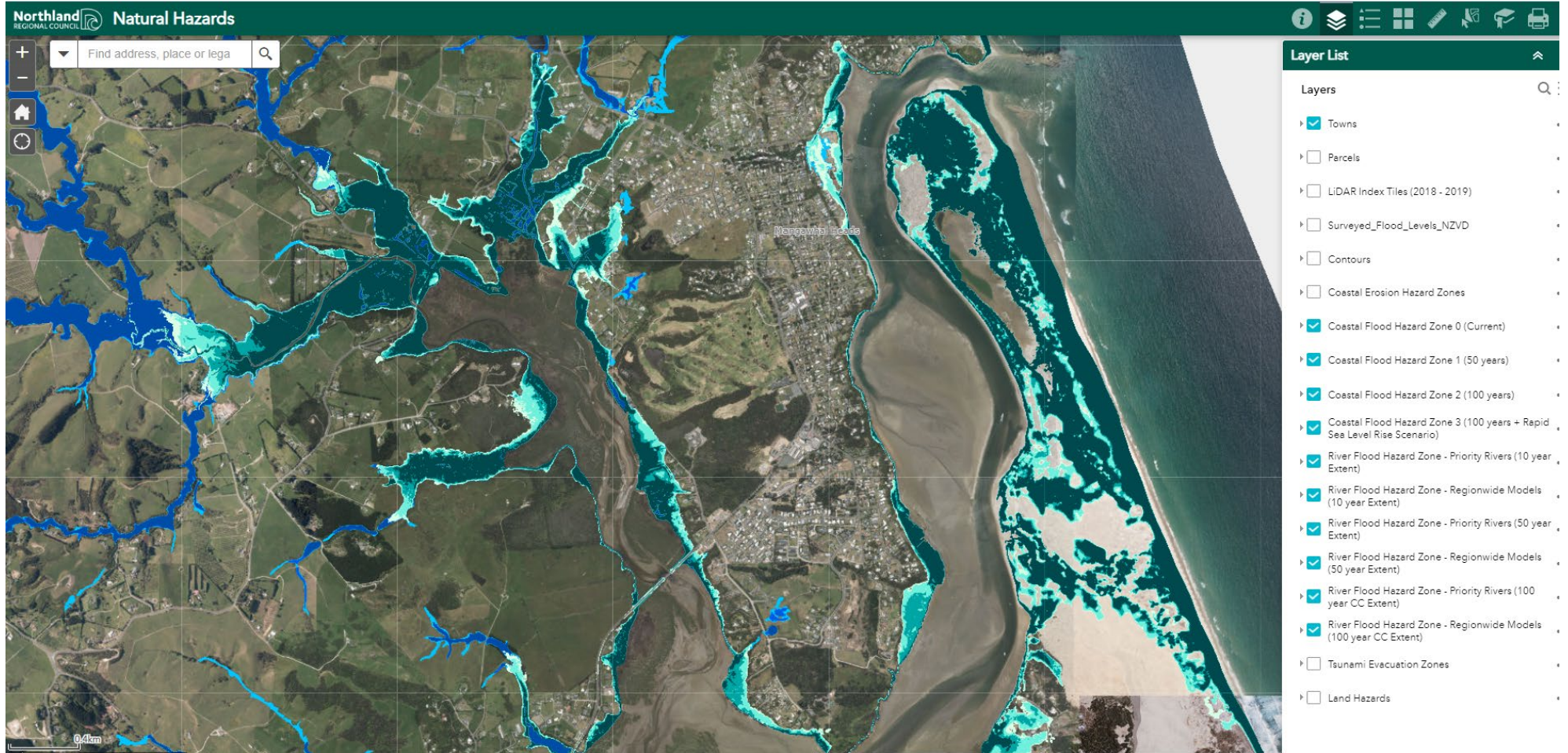
Current day (CFHZ 0): areas currently susceptible to coastal flooding in a 1-in-100-year storm event with no allowance for sea level rise.

50-year projection (CFHZ 1): areas susceptible to coastal flooding in a 1-in-50-year storm event, with a projected sea-level rise of 0.6m by 2080.

100-year projection (CFHZ2): areas susceptible to coastal flooding in a 1-in-100-year storm event, with a projected sea-level rise of 1.2m by 2130.

100-year 'rapid sea level rise' projection (CFHZ 3): areas susceptible to coastal flooding in a 1-in-100-year storm event, with a sea-level rise scenario of 1.5m by 2130. This is representative of a high-emissions scenario where more rapid rates of sea level rise occur due to dynamic ice sheet instabilities.

Figure 9 – Mangawhai Heads Predicted Future Coastal Flooding



Current day (CFHZ 0): areas currently susceptible to coastal flooding in a 1-in-100-year storm event with no allowance for sea level rise.

50-year projection (CFHZ 1): areas susceptible to coastal flooding in a 1-in-50-year storm event, with a projected sea-level rise of 0.6m by 2080.

100-year projection (CFHZ2): areas susceptible to coastal flooding in a 1-in-100-year storm event, with a projected sea-level rise of 1.2m by 2130.

100-year 'rapid sea level rise' projection (CFHZ 3): areas susceptible to coastal flooding in a 1-in-100-year storm event, with a sea-level rise scenario of 1.5m by 2130. This is representative of a high-emissions scenario where more rapid rates of sea level rise occur due to dynamic ice sheet instabilities.

Figure 10 – Mangawhai Village Predicted Future Coastal Flooding



Current day (CFHZ 0): areas currently susceptible to coastal flooding in a 1-in-100-year storm event with no allowance for sea level rise.

50-year projection (CFHZ 1): areas susceptible to coastal flooding in a 1-in-50-year storm event, with a projected sea-level rise of 0.6m by 2080.

100-year projection (CFHZ2): areas susceptible to coastal flooding in a 1-in-100-year storm event, with a projected sea-level rise of 1.2m by 2130.

100-year 'rapid sea level rise' projection (CFHZ 3): areas susceptible to coastal flooding in a 1-in-100-year storm event, with a sea-level rise scenario of 1.5m by 2130. This is representative of a high-emissions scenario where more rapid rates of sea level rise occur due to dynamic ice sheet instabilities.

Figure 11 – Ruawai and Surrounds Predicted Future Coastal Flooding



Current day (CFHZ 0): areas currently susceptible to coastal flooding in a 1-in-100-year storm event with no allowance for sea level rise.

50-year projection (CFHZ 1): areas susceptible to coastal flooding in a 1-in-50-year storm event, with a projected sea-level rise of 0.6m by 2080.

100-year projection (CFHZ2): areas susceptible to coastal flooding in a 1-in-100-year storm event, with a projected sea-level rise of 1.2m by 2130.

100-year 'rapid sea level rise' projection (CFHZ 3): areas susceptible to coastal flooding in a 1-in-100-year storm event, with a sea-level rise scenario of 1.5m by 2130. This is representative of a high-emissions scenario where more rapid rates of sea level rise occur due to dynamic ice sheet instabilities.

Public stormwater schemes assets

The assets associated with the five public stormwater schemes in Kaipara include²⁰ (excludes the Dargaville flood protection system of stopbanks and flood gates):

Community	Pipelines (m)	Open drains (m)
Baylys Beach	4,222	10
Dargaville	36,479	24,391
Kaiwaka	2,098	262
Mangawhai	29,760	7,741
Te Kopuru	1,370	3,918
Total	82,833	70,652

Service levels for public stormwater schemes

Level of Service

- To provide systems in urban areas with the capacity to drain water from normal rainfall events and cope with a 1 in 50-year rain event so that habitable floors are protected, and public areas drain in a timely manner.
- Respond in a timely manner when habitable floors are threatened;
- Where stormwater drainage systems exist, to comply with resource consent conditions; and
- Services to customers will be reliable and dependable.

Note: It is to be noted that Council does not manage stormwater drainage on State Highways. Stormwater drainage management does not include floodwaters from rivers or land drainage.

This LoS mitigates public health risks associated with stormwater drainage.

Measuring performance

Table 14 – Public stormwater schemes performance measures

Measure	LTP Years 1 to 10 Targets 2021/2022 to 2030/2031
Network System adequacy For each flooding event, using a maximum of 1:50 year (Annual Event Probability 2%), the number of habitable floors affected. (Expressed per 1,000 properties connected to the district's stormwater system.)	<10
Response time The median response time in an urgent flooding event (defined as an event is where a habitable floor is reasonably at risk of being effected P1), measured from the time that the Council (or subcontractor) receives notification to the time that service personnel reach the site.	<2 hours for urgent events
Customer satisfaction The number of CSR received regarding single network issues (however reasonably defined) per year/1,000 properties. This includes all CSR that relate to SW infrastructure whether directed to the contractor or individual council staff member.	<18
Discharge compliance Abatement notices, infringement notices, enforcement orders, convictions.	0

²⁰ Kaipara District Council Stormwater Strategic Activity Management Plan 2021-2031 – Final Draft [August 2020]

Measure	LTP Years 1 to 10 Targets 2021/2022 to 2030/2031
Positive Environmental Outcomes Water sensitive design, green infrastructure, low carbon design and construction, resilient network.	As defined in the Stormwater CMP or Emissions Targets

Public stormwater schemes resource consents

Table 15 – Public stormwater schemes resource consents

Consent	Consent No.	Expiry	Discharge	Compliant
Pahi stormwater discharge	AUT.012388 (01 – 03)	28 Feb 2052	Discharge stormwater at three locations. <u>Quality:</u> As per Condition 3.	Yes
Mangawhai stormwater discharge	AUT.002111 (01 – 03)	01 June 2052	The stormwater network shall be in general accordance with the MWH drawings “Mangawhai Stormwater Catchment Management Plan” sheet Number 1 to 31, date 15/04/2015. <u>Quality:</u> As per Conditions 15 & 16.	Yes
Mangawhai Heads (Surf Club) stormwater discharge, Jellicoe Channel	NLD 02 9526	30 Sept 2036	The Consent Holder shall ensure that the works are constructed in general accordance with Duffill Watts & King Ltd Drawing Number 344, Sheet 1 1/10/01. <u>Quality:</u> As per Conditions 4 & 5.	Yes
Dargaville urban stopbanks	NLD 00 9046 (01 – 02)	30 April 2035	The Consent Holder shall ensure that the works are constructed in general accordance with Duffill Watts & King Ltd Drawing Number 120442/1613, Sheets 1 – 9. <u>Quality:</u> As per Conditions 2 & 3.	Yes
Dargaville urban stopbanks (timber wall)	NLD 00 9063 (01 – 02)	30 April 2035	The Consent Holder shall ensure that the works are constructed in general accordance with Duffill Watts & King Ltd Plan Number 23002/1613, Sheets 1 – 3. <u>Quality:</u> As per Conditions 5 & 6.	Yes

Resource consent non-compliance issues

No non-compliance issues have been identified.



Current risks and issues with the public stormwater schemes

Risks and issues²⁰

- **Level of Service (LoS) versus Feasibility** – The construction and maintenance costs of infrastructure upgrades to meet a set level of service is beyond the means of the community to afford. Targeted rates for small communities do not enable good network management;
- **Contamination of Urban Watercourses** – Urban stormwater runoff has the potential to adversely impact the receiving environment, stakeholders and users;
- **Contamination of Rural Watercourses** – Rural stormwater runoff is likely to have a different contaminant profile than that from the urban areas. Depending on land use rural runoff potentially has elevated levels of nitrogen and phosphates than urban stormwater, due to fertiliser usage and animal husbandry;
- **Climate Change** – Increasingly, climate change effects, particularly increased rainfall intensity and sea level rise will challenge the resilience and capacity of the network;
- **Flooding Direct Impact** – Urban catchments create a greater amount of impervious coverage (such as roads, roofs, and paved areas) than would be seen in the natural environment. Runoff is generated quicker from paved areas and can result in overland flow paths and localised flooding, which can damage property and increase the risk to life;
- **Network Resilience and Capacity not supported by a holistic design** – Historical focus on grey infrastructure has not gained the district the potential advantages of water sensitive design;
- **Stormwater Infiltration** – Studies of the stormwater network in Dargaville and Mangawhai have found stormwater leaking into the wastewater system;
- **Infrastructure not maintained to the correct standard** – Base infrastructure maintenance and renewals have been under resourced leaving capacity and resilience issues. Green infrastructure devices have been poorly catalogued and maintained;
- **Future growth** – The spatial plans have identified the likely growth areas in Kaipara. Fast growth without good infrastructure planning has in some cases such as Mangawhai left deficit in funding and LoS provision;
- **Public safety** – Public safety is at the forefront of network operations – some assets however have an inherent risk; and
- **Asset data** – Many aspects of the asset management system still require improvement.


Risks and issues – Dargaville urban flood protection scheme

As noted above Dargaville is also protected from flooding and tidal inundation from the adjacent Wairoa, Awakino and Kaihu Rivers via a flood protection system of stopbanks. The stormwater outlets discharging to these rivers include floodgates. As such these stopbanks and flood gates essentially form part of Dargaville's stormwater system.

The associated risks and key issues related to the flood protection scheme that form part of Dargaville's stormwater system include²¹:

- **Climate Change** – Climate change is the leading risk to the existing land drainage districts and how they function – this puts into question the cost of future protection and where Council's responsibilities lie to continue the same or greater level of service;
- **Sea Level Rise** – Sea Level Rise, whilst a symptom of Climate Change is its own risk, this will put pressure not only on the ability of the stopbanks to keep water out, but also the ability for existing districts to drain effectively when the floodgates do not have the ability to stay open for the same amount of time; and
- **Land Drainage and Stormwater Catchment Maps** – Whilst the land drainage district boundaries and the integrated networks were constructed to a high standard in the past, with the advances in technology and mapping it has highlighted how much is still unknown or not

²¹ Kaipara District Council Flood Protection and Land Drainage Strategic Activity Management Plan 2021-2031 - Final Draft [August 2020]



appropriately captured in the existing districts. This must be sorted out to ensure that the appropriate responses are undertaken for climate change and sea level rise.

Council has also identified that failure of the floodgates is a key risk (identified as one of the main issues in the 1999 flood event) and this has been mitigated with a programme of robust quarterly checks (previously these were only yearly checks).

Risk and issues – Ruawai urban flood protection scheme

As noted above Ruawai is included within the Raupo Drainage District and therefore protected from flooding and tidal inundation by the Raupo Drainage District's land drainage stopbanks, canals and floodgates.

The associated risks and issues related to the flood protection scheme that form part of Ruawai's stormwater system are listed above. Council's level of service relative to Ruawai is:

- Stopbanks are 2.6m above Mean Sea Level leaving 0.5m above extreme high tide for the Raupo area.

Public health risks and issues with the public stormwater schemes

The two key public health risks and issues associated with the stormwater systems are:

- **Flood Hazard:** When and where the capacity of the stormwater system is inadequate to handle the runoff from storm events, surface flooding occurs. Whereas stormwater systems serving new developments will typically match the current design standards (i.e. primary stormwater systems in rural and residential areas designed to accommodate the 20% AEP event, and secondary flow paths designed for a 1% AEP event with an additional freeboard of 100mm²²), in practice the capacity across the systems is variable. In the following situations, floods may pose a risk to the public:
 - where flooding affects habitable floors;
 - cases where there is deep and/or fast-flowing flood water in areas that the public often traverse.
- **Stormwater Contamination:** Normally, contaminants will generally include litter, sediment, and contaminants of vehicular origin (e.g. rubber from tyre wear, copper from brake wear, hydrocarbons, etc.). However, in the event that the sewerage system overflows, typically during large wet-weather storm events where inflow/infiltration increases sewage flows, stormwater may contain pathogen contaminants of sewage origin i.e. with regard to public health risks associated with the stormwater systems, there is an interdependency with the wastewater assessments as a result of sewage overflows in storm events possibly polluting stormwater.

Adequacy Assessment

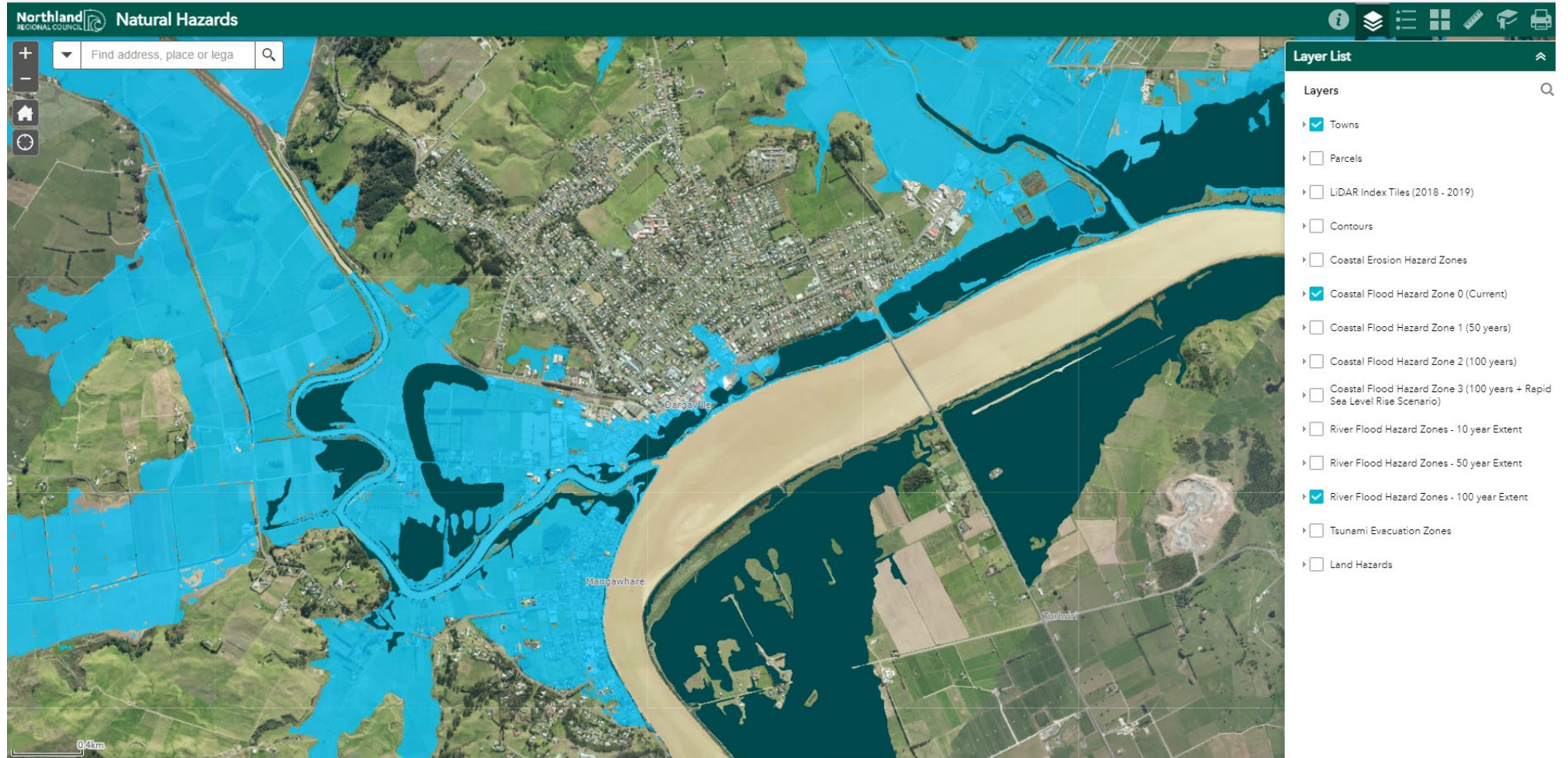
Dargaville

As noted above the Dargaville urban area is recognised to be flood-prone, and the effects of predicted climate change would exacerbate this. The NRC's coastal flooding assessment has assessed the level of current-day flooding and inundation in a 1-in-100-year storm event. The assessment is based on current sea levels for the coastal inundation assessment (CFHZ 0) however, the river flooding assessment does include an allowance for sea level rise i.e. the extent of the river flooding, particularly in the lower-lying areas, is conservative. The following is a map providing a graphical visual of this coastal flooding assessment (note this does not include localised stormwater flooding predictions):

²² Kaipara District Council Engineering Standards 2011 – Section 6 Stormwater Drainage



Figure 12 – Dargaville Current-day Coastal Flooding (CFHZ 0)





The NRC's coastal flooding assessment has predicted the future level of flooding and inundation in a 1-in-100-year storm event, with a sea level rise scenario of 1.5m by 2130 (CFHZ 3), and presented maps providing a graphical visual of this flooding assessment (refer Figure 8 – Dargaville Predicted Future Coastal Flooding).

This level of flooding and inundation would pose reasonably significant public health risks in these areas flooded/inundated due to the flood hazard, and also contaminated stormwater due to sewerage system overflows.

Dargaville is subject to flooding due to either very high tides in the Northern Wairoa River, overtopping stopbanks, and/or ponding in high-intensity, short-duration storm events, due to the local stormwater network being undersized in some parts of the town, or larger storm events coinciding with high tides resulting in stormwater being unable to discharge due to closed floodgates.

The 2015 Dargaville SWCMP²³ identified 40 properties as being potentially at risk of flooding, and seven projects identified that would mitigate these risks.

Council has identified that²⁰:

The impacts of climate change and sea level rise on the existing networks and future growth needs to be investigated and any negative effects need to be mitigated as much as practicable, through design of growth network, current capacity, existing flood protection/land drainage measures, and the possibility of future flood protection/land drainage districts.

Increasing challenges to the low-lying infrastructure in Dargaville and Mangawhai will need to be met with innovative solutions so LoS can be maintained. Increased focus on water sensitive design and green infrastructure will play a big part in these solutions. Focus on flood protection devices in low-lying areas of Dargaville and Mangawhai is critical.

The completion of a new Dargaville Stormwater Catchment Management Plan taking into account climate change and recent flooding and sea level rise information provided by the NRC would clarify the issues and options to allow Council to make an informed decision on the preferred option to manage these risks, including a 'defend or retreat' decision regarding issues of sea level rise and associated coastal inundation. Any areas of localised stormwater flooding would also be identified.

As a first step in understanding the current Dargaville stopbanks and floodgate assets, the risks faced from flooding and the options available, Council has committed to undertake an investigation¹⁵ to build a comprehensive understanding of the boundary between river and land in the Dargaville urban area with special consideration for protection of life, property, and business from flooding, and an options assessment that gives a starting point for discussions with the public and possible funding agencies, with special consideration to what level of service can be delivered and what the costs would be.

Completing the condition assessment of the Dargaville urban stopbanks would also add value to the overall risk assessment.

A significant project identified in Council's Infrastructure Strategy²⁴ is the improvements to the Dargaville – Awakino Point East stopbanks.

Ruawai

The NRC's coastal flooding assessment has assessed the level of current-day flooding and inundation in a 1-in-100-year storm event. The assessment is based on current sea levels for the coastal inundation assessment (CFHZ 0). The following is a map providing a graphical visual of this coastal flooding assessment (note this does not include localised stormwater flooding predictions):

²³ Kaipara District Council Stormwater Management Plan Dargaville 2015 - Opus

²⁴ Kaipara District Council Long Term Plan Mahere Wa Roa 2021-2031 – Infrastructure Strategy



Figure 13 – Ruawai Current-day Coastal Flooding (CFHZ 0)





The NRC's coastal flooding assessment has predicted the future level of flooding and inundation in a 1-in-100-year storm event, with a sea level rise scenario of 1.5m by 2130 (CFHZ 3), and presented maps providing a graphical visual of this flooding assessment (refer Figure 11 – Ruawai and Surrounds Predicted Future Coastal Flooding).

This level of flooding and inundation would pose significant public health risks in the Ruawai township due to the flood hazard, and also contaminated stormwater due to contamination from onsite sewerage systems.

Augmenting the Raupo Drainage Scheme's land drainage flood protection system to maintain a level of service of ensuring stopbanks are 2.6m above Mean Sea Level leaving 0.5m above extreme high tide for the Raupo area (includes the Ruawai township) would help to mitigate this risk. Associated modelling of land drainage infrastructure requirements taking into account predicted climate change-induced increasing rainfall intensities and sea level rise is required.

Council will work with the Raupo Drainage Committee to investigate further protection measures including raising of stopbank levels and water storage/retention as possible adaptation response options.

Baylys Beach

The 2015 Baylys Beach SWCMP²⁵ identified that the majority of residential properties have been built clear of the existing gullies and are therefore not at risk of flooding associated with rainfall. However, eight properties were identified as being potentially at risk of flooding, and two projects identified that would mitigate these risks.

The completion of the Baylys Beach Stormwater Catchment Management Plan would clarify the issues and options including the extent and effects of stormwater flooding to allow Council to make an informed decision on the preferred option to manage the risks.

Te Kopuru

The completion of the Te Kopuru Stormwater Catchment Management Plan would clarify the issues and options including the extent and effects of stormwater flooding to allow Council to make an informed decision on the preferred option to manage the risks.

Kaiwaka

The completion of the Kaiwaka Stormwater Catchment Management Plan would clarify the issues and options including the extent and effects of stormwater flooding to allow Council to make an informed decision on the preferred option to manage the risks.

Mangawhai

The NRC's coastal flooding assessment has predicted the future level of coastal inundation in a 1-in-100-year storm event, with a sea level rise scenario of 1.5m by 2130 (CFHZ 3), and presented maps providing a graphical visual of this flooding assessment (refer Figure 9 – Mangawhai Heads Predicted Future Coastal Flooding and Figure 10 – Mangawhai Village Predicted Future Coastal Flooding). Note that the effects of stormwater flooding from any natural watercourses/rivers have not been included in this assessment by the NRC.

This level of coastal inundation would pose reasonably significant public health risks in these areas flooded/inundated due to the flooding hazard as a result of coastal inundation, and also contaminated stormwater due to sewerage system overflows. Any increase in sea levels would also likely exacerbate upstream stormwater flooding due to reduced hydraulic gradients.

²⁵ Kaipara District Council Stormwater Management Plan Baylys Beach 2015 - Opus



The Mangawhai Town Plan Stormwater Infrastructure Strategy²⁶ identified a series of stormwater management recommendations, and also the need to develop a SWCMP for Mangawhai.

Council has identified that²⁰:

The impacts of climate change and sea level rise on the existing networks and future growth needs to be investigated and any negative effects need to be mitigated as much as practicable, through design of growth network, current capacity, existing flood protection/land drainage measures, and the possibility of future flood protection/land drainage districts.

Increasing challenges to the low-lying infrastructure in Dargaville and Mangawhai will need to be met with innovative solutions so LoS can be maintained. Increased focus on water sensitive design and green infrastructure will play a big part in these solutions. Focus on flood protection devices in low-lying areas of Dargaville and Mangawhai is critical.

The completion of the new Mangawhai Stormwater Catchment Management Plan taking into account climate change and the recent sea level rise information provided by the NRC would clarify the issues and options, including the extent and effects of stormwater flooding, to allow Council to make an informed decision on the preferred option to manage these risks.

District

The completion of the Maungatūroto and Paparoa Stormwater Catchment Management Plans will clarify the issues and options including the extent and effects of stormwater flooding in these communities to allow Council to make an informed decision on the preferred options to manage the risks.

The potential public health risks associated with stormwater are judged to be as follows:

- Flooding: KDC has no records of significant flooding occurring in any of the communities covered in this part of the assessment.
- Contamination of Stormwater:
 - in watercourses by effluent seepage from onsite wastewater systems (where applicable): with the possible exception of Paparoa and Spring Street just south of Dargaville, none of the communities exhibit evidence of problem-levels of contamination.
 - other contaminants: with the possible exception of settlements on SH12, due to the combination of relatively low levels of urbanisation and traffic, no problem-levels of contaminants are expected.

As a consequence, except where communities are covered separately above, the environmental and public health risks of flooding and stormwater contamination are judged as being no more than minor. This aside, nuisance-level flooding is occurring in some communities and, based on the findings from analyses as part of preparing stormwater catchment management plans, the costs of rectification are to be identified.

The controls via Council's Engineering Standards, District Plan, the Resource Management Act, and the proposed Stormwater Bylaw and/or Policy managing the effects of growth would ensure the impacts of growth do not significantly increase public health risks.

²⁶ Mangawhai Town Plan Stormwater Infrastructure Strategy April 2017 - Stantec



Sanitary services – public toilets



Overview public toilets

Council provides over 30²⁷ public toilets within civic areas and reserves across the Kaipara district. The public toilets are provided in areas of high demand and/or sensitive environments e.g. parks, boat ramps and playgrounds, and are compliant and fit for purpose.

Operation and maintenance of Council's toilets is contracted out (included in the Maintenance of Parks, Reserves and Recreational Facilities contract).

Other facilities

The Department of Conservation (DoC) operates public toilets in the Kauri Coast area at Trounson Kauri Park, Waipoua Forest, and Matakohe/Paparoa. Details are as listed in the table below:

LOCATION	
Area	Site
Trounson Kauri Park Campground	Campsite
Trounson Kauri Park Walk	Amenity Area
Waipoua Forest Campground	Campsite
Waipoua Forest Visitor Centre	Visitor Centre
Sterling Road, Matakohe/Paparoa	DoC reserve

No in-depth survey has been undertaken to identify all of the toilet facilities in commercial premises throughout Kaipara district that may be available for public use. However, from local knowledge, it is likely that toilets in the following premises would be available for use by customers, and possibly to visitors where there are no public toilets in the vicinity:

- Petrol stations
- Cafes and restaurants
- Supermarkets
- Community centres
- Shopping centres
- Medical centres
- Hotels and bars
- Schools
- Libraries
- Sports venues
- Churches
- Hospitals
- Museums and art galleries
- Other: e.g. SPCA, Ambulance, Fire Stations, etc.

Public toilets assets

LOCATION (sites)	Water Source	Effluent Disposal
A. DARGAVILLE (6):		
Jaycee Park	Mains	Reticulated
Band Rotunda	Mains	Reticulated
Selwyn Park	Mains	Reticulated

²⁷ Kaipara District Council Open Spaces and Facilities Strategic Activity Management Plan 2021-2031 – Final Draft [February 2021]

LOCATION (sites)	Water Source	Effluent Disposal
Harding Park	Mains	Reticulated
Totara Street	Mains	Reticulated
Mount Wesley Cemetery	Mains	Septic
B. MANGAWHAI (7):		
Mangawhai Heads	Mains	Reticulated
Mangawhai Village	Tank	Reticulated
Mangawhai MAZ toilets	Tank	Reticulated
Mangawhai Sellars reserve	Tank	Reticulated
Mangawhai Community Park Historic Village	Tank	Reticulated
Alamar Crescent	Mains	Reticulated
Lincoln Street	Tank	Reticulated
C. DISTRICT (20):		
Maunganui Bluff	Stream	Septic
Omamari Beach	Tank	Septic
Chases Gorge	Mains	Septic
Glinks Gully	Mains	Reticulated
Kellys Bay	Tank	Septic
Ruawai	Mains	Septic
Whakapirau	Tank	Septic
Paparoa Village Green	Tank	Septic
Maungatūroto	Mains	Reticulated
Kaiwaka	Mains	Reticulated
Te Kopuru	Tank	Reticulated
Pahi	Tank	Septic
Tinopai	Tank	Septic and treatment
Batley	Tank	Septic
Pouto Marine Hall	Tank	Septic
Pouto New	No water	Composting
Kai Iwi Lakes - Pine Beach A Block	Lake	Septic and treatment
Kai Iwi Lakes - Promenade Point	Lake	Holding tank
Kai Iwi Lakes - B Block	Lake	Septic and treatment
Lake Waikare	Lake	Holding tank

Council also maintains toilets available for public use at the Woods Street shops in Mangawhai, and at Matakōhe.

A condition assessment of the toilets was carried out in 2019 and this has provided sound knowledge of this asset group.



Service levels for public toilets

Through Council’s Annual Customer Surveys, the Community aspirations and feedback includes:

- More reserves and open space facilities – upgrading toilets to ensure they are accessible, are safe to use, fit for purpose and meet consent conditions.

Based on the Levels of Service (LoS) drivers the following changes in LoS are proposed: Improve customer expectations:

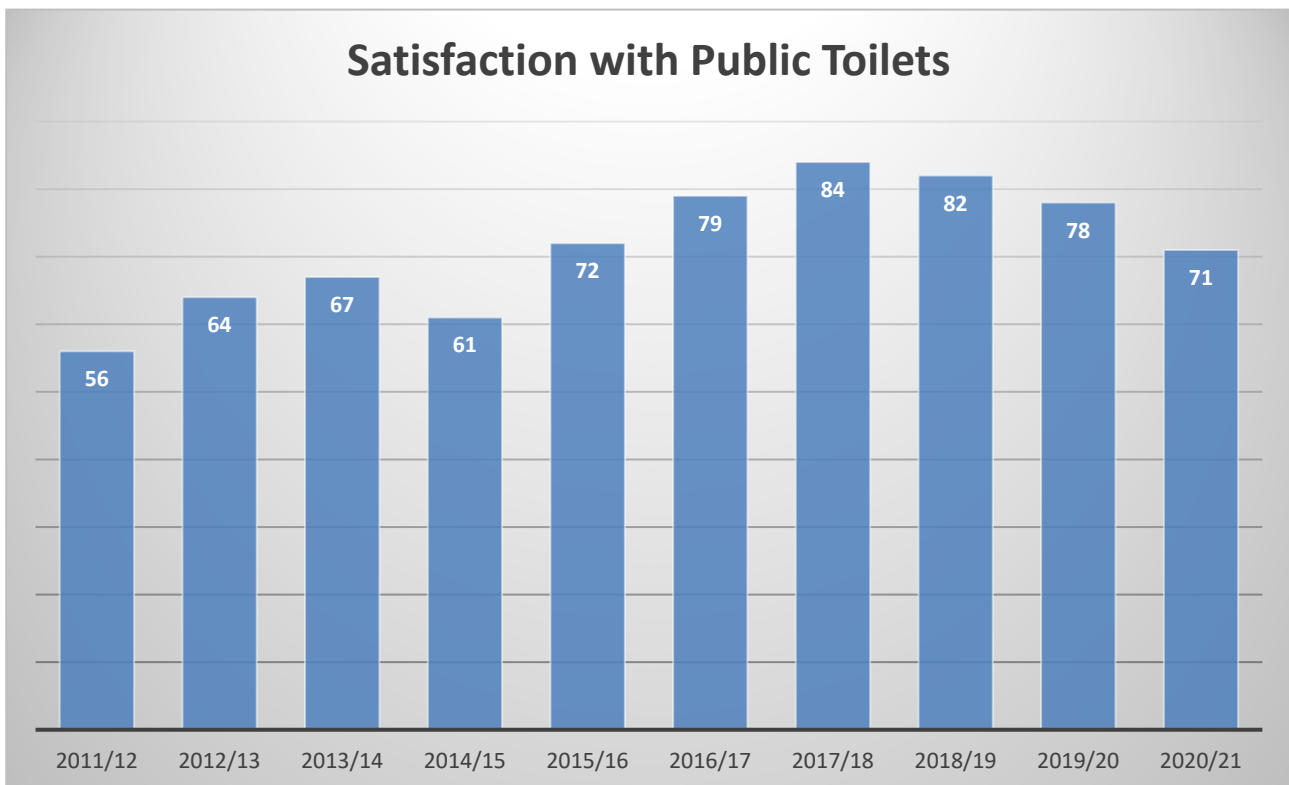
- Toilets are accessible, safe to use and fit-for-purpose - Implement a toilet renewal programme.

Measuring performance

Table 16 – Public toilets performance measures

Measure	LTP Years 1 to 10 Target 2021/2031
Percentage of residents who are very satisfied or satisfied with the district’s public toilets. Measured by: Residents’ Survey	≥70%
Compliance with Resource consent conditions. Wastewater/Water take consents	No abatement notices received

Figure 14 – Residents' satisfaction with public toilets



Non-compliance issues

The holding tank serving the public toilet at Aranga requires upgrading and Council is reviewing options to resolve this issue.



Current risks and issues with the public toilets

Risks and issues

- Community groups maintain some of the public toilets. The *Health and Safety at Work Act 2015* may add additional cost to services provided by community groups and/or may affect the amount of work they can do.
- Catering for tourists – the number of tourists and visitors to the Northland region is growing and will continue to grow in the future with developments such as the Hundertwasser Art Centre and revitalisation of the Twin Coast Discovery Route, both identified in the Tai Tokerau Economic Action Plan, coming on stream. The Stakeholder Engagement Workshops identifies that a lack of tourist facilities such as toilets, rest/viewing areas etc. may reduce the experience of visitors on the Twin Coast Discovery Route and its byways.

Adequacy Assessment

Considered in combination, the following facts suggest that the existing public toilet facilities are adequate, thereby ensuring that public health is suitably protected:

- The public toilets are strategically placed, that is at:
 - commercial areas;
 - beaches;
 - reserves and sports grounds;
 - DOC facilities (including campsites).
- Within commercial facilities, new toilet facilities are required to meet the numbers prescribed by the NZ Building Code.
- There is no evidence on Council's records as to the existing toilets being overtaxed (i.e. no more than isolated complaints by residents or visitors).

In summary, the following observations can be made in respect to public health issues arising from the public toilets throughout the Kaipara District:

- Adequacy in relation to number/location:
 - Present: evidence points to existing facilities being adequate.
 - Future: KDC and DOC policies are considered to satisfactorily ensure that future needs will be met.
- Design: all units meet acceptable safeguards of minimal environmental impact.
- Operation and maintenance: KDC practices meet appropriate standards to safeguard public health.
- Overall: the existing facilities are of adequate quantity and quality, as are arrangements for assessing future needs and Council's programme for additional toilets. Consequently, it is assessed that public health is adequately protected.



Sanitary services – cemeteries and crematoria



Overview

Council owns seven cemeteries (excludes closed cemeteries). Three of these cemeteries are operated by the community with support from Council.

Cemeteries assets

Council cemeteries include:

- Mt Wesley New;
- Old Mount Wesley;
- Mount Wesley RSA;
- Redhill;
- Arapohue;
- Tokatoka;
- Mangawhai;
- Kaiwaka;
- Tutamoe.

These exclude the Harding Family Cemetery as this is included in Pou Tu o Te Rangi Harding Park, as well as privately owned cemeteries such as those owned and managed by churches, or Māori urupa (cemeteries) which are typically managed by the local marae committees.

Table 17 – Council-owned cemeteries

Cemetery Name	Available Area (ha)	Available Burial Plots
Mount Wesley New	6.5	11,700
Redhill*	0.2	360
Arapohue	2.3	4,140
Tara Road (Mangawhai West)*	1.4	2,520
Kaiwaka*	1.1	1,980
TOTAL	11.5	20,700^A

Note: * Council-owned but operated by the community.

^A Excludes pre-paid plots and double-depth plots

As well as the Council-owned cemeteries, the following church/other cemeteries in the district have been identified (note however that this list should not be construed as comprehensive):

- Maungatūroto (three cemeteries);
- Haurau;
- Matakoho.

No details have been sourced as to the current numbers of annual burials at these cemeteries, if any, or the available space, but they are thought to cater for only a modest fraction of the burials in the district.

Crematoria Assets

Council does not have any crematoria in its district. As a result, any cremations are generally carried out at one of the crematoria in either Whangarei or Auckland (especially the North Shore).

Service levels for cemeteries and crematoria

- Council provides cemeteries within its district to meet the district's requirements;
- Council operates its cemeteries in accordance with *Part 7 – Cemeteries and Crematoria* of Council's *Consolidated General Bylaw 2020*;
- Council operates its cemeteries in accordance with the *Burial and Cremation Act 1964*;

- Council responds to requests for the digging of burial grave sites within two days' notice of burial.

The Whangarei District Council has recognised the demand for cremations from the Kaipara District and has sufficient capacity to cater for them²⁸.

Cemeteries and crematoria resource consents

Resource consents for the Council-owned cemeteries are not required as the cemetery sites are designated in the Kaipara District Plan.

Current risks and issues with cemeteries and crematoria

Risks and issues

The most significant risks and issues are²⁷:

- If levels of funding are reduced the ability of the organisation to maintain and enhance current levels of service may be compromised.
- The frequency and severity of extreme weather events may result in greater damage to Council administered public open space.
- Damage to assets and consequential health and safety risks to users, staff, and Contractors.
- As we develop new facilities this has the effect of increasing operational expenditure, if this is not allowed for then maintenance of facilities may suffer causing additional costs to bring these facilities back to a useable state.
- Community volunteers play a role in the care and development of our parks and reserves. The new Health and Safety at Work Act 2015 may add additional cost to services done by volunteers and may affect the amount of work they can do.

Note: these risks and issues are included in the Reserves and Open Space risks and issues.

Adequacy Assessment

Section 4(1) of the *Burial and Cremation Act 1964* states: 'It shall be the duty of every local authority, where sufficient provision is not otherwise made for the burial of the bodies of persons dying within its district, to establish and maintain a suitable cemetery'.

The average mortality rate in the Kaipara District over the 2016 to 2020 five-year period was 203 deaths per year²⁹. This is estimated to increase to approximately 220 deaths per year in 2031. Allowing for 40% of the deaths to be buried in cemeteries within the Kaipara District (balance estimated to be either cremated, or buried in non-Council owned cemeteries), this would require a current capacity of 81 burials per year, and increasing to 88 burials per year in 2031.

Council's cemeteries have an estimated capacity of approximately 21,000 burial plots. This provides significant spare capacity and is adequate to service the district for many years.

The Whangarei District Council has recognised the demand for cremations from the Kaipara District and has sufficient capacity to cater for them. In conjunction with the crematorium in Auckland (North Shore), it is anticipated that there is sufficient capacity at these crematoria to meet the district's needs for the foreseeable future.

²⁸ Whangarei District Council Sanitary Assessment Crematoria and Cemeteries 2012

²⁹ Statistics NZ



Appendix A – Communities by category

Community Category 1	
Water	Reticulated
Wastewater	Reticulated
Dargaville	
Maungatūroto	
Glinks Gully	

Community Category 2	
Water	Private
Wastewater	Reticulated
Kaiwaka	
Te Kopuru	
Mangawhai	
Mangawhai Heads ¹	

¹ The Mangawhai Heads Campground, Woods Street shops, and a few domestic properties on route are serviced by a public reticulated water supply scheme.

Community Category 3	
Water	Reticulated
Wastewater	Private Onsite
Ruawai	
Baylys Beach ²	

² Part of the Baylys Beach community has a private communal reticulated wastewater system.



Community Category 4	
Water	Private
Wastewater	Private Onsite
Kaitui / Waipoua / Waikara	Tokatoka / Naumi / Whenanui
Aranga / Donnellys Crossing	Parahi / Reiha
Kaihu	Ararua
Omamari	Matakohe
Mamaranui / Maropiu	Taipuha / Mareretu
Mangatu / Tutamoe / Waimatenui	Paparoa
Waihue / Kairara / Avoca / Parore	Pahi
Awakino Point / Dargaville East	Brynderwyn
Tangowahine	Huarau
Kirikopuni / Tangiteroria	Marohemo
Mt Wesley / Mahuta	Bickerstaffe Rd
Turiwiri / Arapohue / Bradley's Landing	Batley / Tanoa
Pukehuia / Omana	Whakapirau
Redhill/Aratapu	Tinopai
Te Maire	