

Information Agenda

Date: Friday, 5 September, 2025

Elected Members: His Worship the Mayor Vince Cocurullo
Cr Gavin Benney
Cr Nicholas Connop
Cr Ken Couper
Cr Jayne Golightly
Cr Phil Halse
Cr Deborah Harding
Cr Patrick Holmes
Cr Scott McKenzie
Cr Marie Olsen
Cr Carol Peters
Cr Simon Reid
Cr Phoenix Ruka
Cr Paul Yovich

For any queries regarding this meeting please contact
the Whangarei District Council on (09) 430-4200.

1. Information Reports**1.1 Hikurangi Wastewater Treatment Plant update****3****2. Public Excluded Business**

Hikurangi Wastewater Treatment Plant Update

Agenda: Information Agenda
Publish date: 5 September 2025
Reporting officer: Simon Charles (Wastewater Manager)

1 Purpose / Te Kaupapa

To provide an update on the status of the Hikurangi Wastewater Treatment Plant (WWTP), including recent developments, current configuration, proposed technological solutions, and planned physical works.

2 Executive Summary

The Hikurangi Wastewater Treatment Plant (WWTP) has faced compliance challenges since the failure of its membrane filtration system in April 2018. Despite efforts to restore the original system, structural issues and technological limitations led to its decommissioning. Since then, the plant has not met its resource consent conditions.

To address this, a comprehensive upgrade has been undertaken, including the installation of a new inlet screen, pond reconfiguration, and the adoption of the Anolyte disinfection system—a sustainable, non-toxic technology already in use at other New Zealand WWTPs. These upgrades have significantly improved effluent quality, with notable reductions in Total Suspended Solids (TSS), cBOD, and E.coli levels.

The plant operates under an expired resource consent (as of 30 June 2025). A new consent application is in progress, incorporating cultural impact assessments and proposing a TSS limit aligned with pond-based treatment capabilities. Future plans include constructing a rockfall effluent discharge system to meet both environmental and cultural expectations, particularly those of Māori communities who advocate for land-based discharge methods.

The plant is currently operating above its design capacity to test system resilience and optimize performance. Continued improvements and reconsenting efforts aim to bring the WWTP back into full compliance while respecting environmental sustainability and cultural values.

3 Background / Horopaki

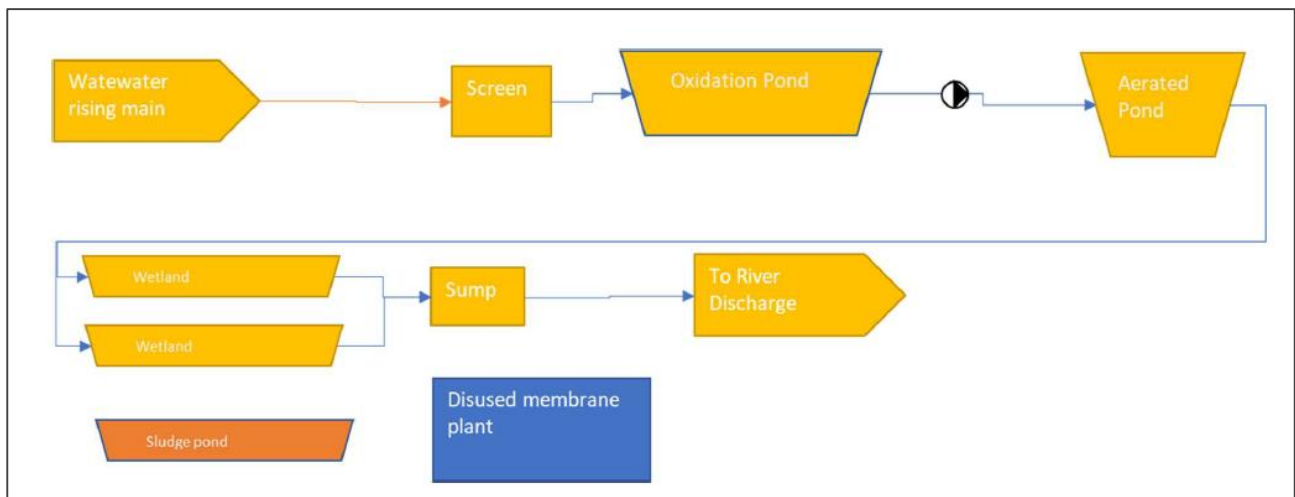
The Hikurangi WWTP previously operated with a membrane filtration unit to achieve tertiary treatment standards. However, the system failed in April 2018 and has not complied with resource consent conditions since. The membrane building was eventually demolished due to structural concerns. Attempts to restore the membrane system between 2019–2020 were unsuccessful, prompting a reassessment of treatment options.

4 Discussion / Whakawhiti kōrero

Location of WWTP



Existing Wastewater Treatment Plant Configuration:



- A new inlet screen was installed in April 2021 (Infrastructure Acceleration Funded); commissioning has only recently been completed as this was dependent upon the balance of the plant reconfiguration.
- The plant underwent monitoring and assessment by Aquaero NZ and BPO NZ to identify process inefficiencies and develop a sustainable solution.

The technologies that were assessed are shown in Table 3.1.

Factors considered included, but were not limited to:

- Economically achievable infrastructure cost.
- Ongoing running costs.
- Carbon footprint.
- Use of non-toxic chemicals.
- No dangerous goods handling.
- No toxic metal coagulants.
- No imported membranes.
- Low energy.
- No imported UV lights requiring annual replacement.

In the end, we decided to implement an Anolyte system at this plant.

The Anolyte technology uses Electrolyzed Water Generators (EWG) to produce a product called ANK Neutral Anolyte which is an effective disinfectant and water sanitizing agent.

The EWGs electrolyze a salt brine solution combined with water and pass it through a patented ceramic membrane to produce two separate solutions, and one of them is the disinfectant Anolyte which is a pH neutral and fast-acting sanitizer. Although the pH neutral Anolyte produced is non-toxic to humans, plants, fish and animals and is fully biodegradable, it is toxic to pathogens including viruses, bacteria, fungus and moulds.

The Anolyte disinfection system is currently being used at the Omaha WWTP in Auckland and Maketu WWTP in the Bay of Plenty. On the whole a much more environmentally sustainable system in all other aspects.

During the consenting of this plant, indications were that Northland Regional Council (NRC) would be expecting a Total Suspended Solids (TSS) limit of 10 mg/l. We have argued that a pond system is not a membrane plant. A pond system cannot achieve the TSS levels of a membrane plant without a very large polishing pond and that overall, given the environmentally sustainable it was considered that increasing the TSS limit for the plant slightly is a better choice for a community of the size of Hikurangi.



Table 3.1 Technology Selection:

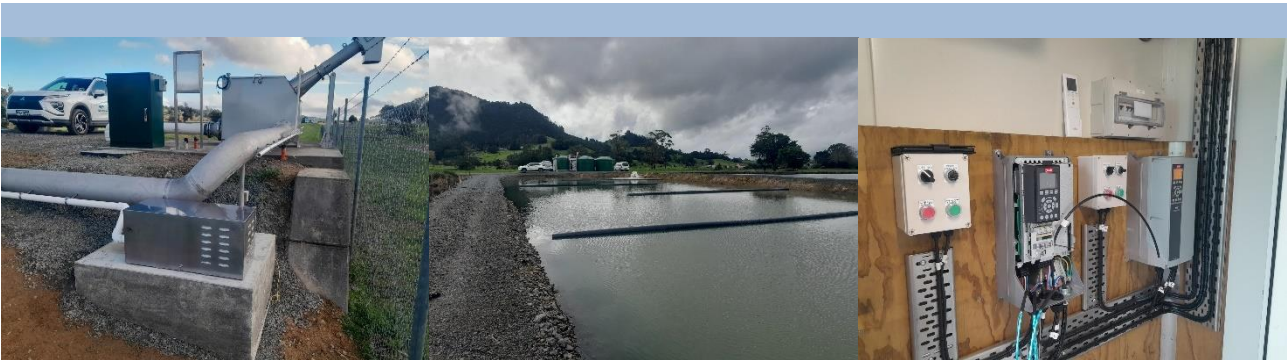
Technology	Function	Effectiveness	Estimated cost	Notes
SBR activated sludge + UV disinfection	Remove TSS and BOD5	Effluent < 10 mg/L <u>Ecoli <200 cfu/100ml</u>	\$15 Mil for SBR \$600K for UV	High operating cost, still non-compliance (including civil work)
Electrocoagulation	Solids removal & disinfection	TSS, BOD5 < 10 <u>Ecoli <200 cfu/100ml</u>	+\$500,000 + pilot	Pilot test required, heavy metal in the sludge
UV disinfection	Remove <u>Ecoli</u>	<u>Ecoli <200 cfu/100ml</u>	\$600K	TSS, BOD still non-compliance Not room for physical works
Baffling the Aeration Pond	Improve BOD5 and TSS	TSS and BOD5 < 20mg/L	\$50K	Phase 1
Anolyte dosing	Disinfection & Algae removal	E Coli < 200 cfu/100 mL	\$120 K	Phase 1
<u>Desludge</u> wetland	Improved treated effluent	Treated effluent shall be significantly improved	**	Phase 2 Including rock gallery for effluent discharge

** Costings based on 2021 estimates. At the time, desludging costs were yet to be confirmed; sludge disposal consent required.

Physical Works Completed:

Phase 1 & 2:

- Completion of inlet screen installation.
- Pond reconfiguration
- Installation of s:scan automated quality monitoring equipment.
- Anolyte disinfection system.
- Piping and electrical works.
- Entering into an agreement with the neighbouring property owner to construct a temporary storage basin on their land.
- Application for resource consent to remove aged sludge.



Inlet screen

Pond reconfiguration

Motor Control Centre – controls anolyte dosing, flow metering, monitoring equipment



Piping and electrical works



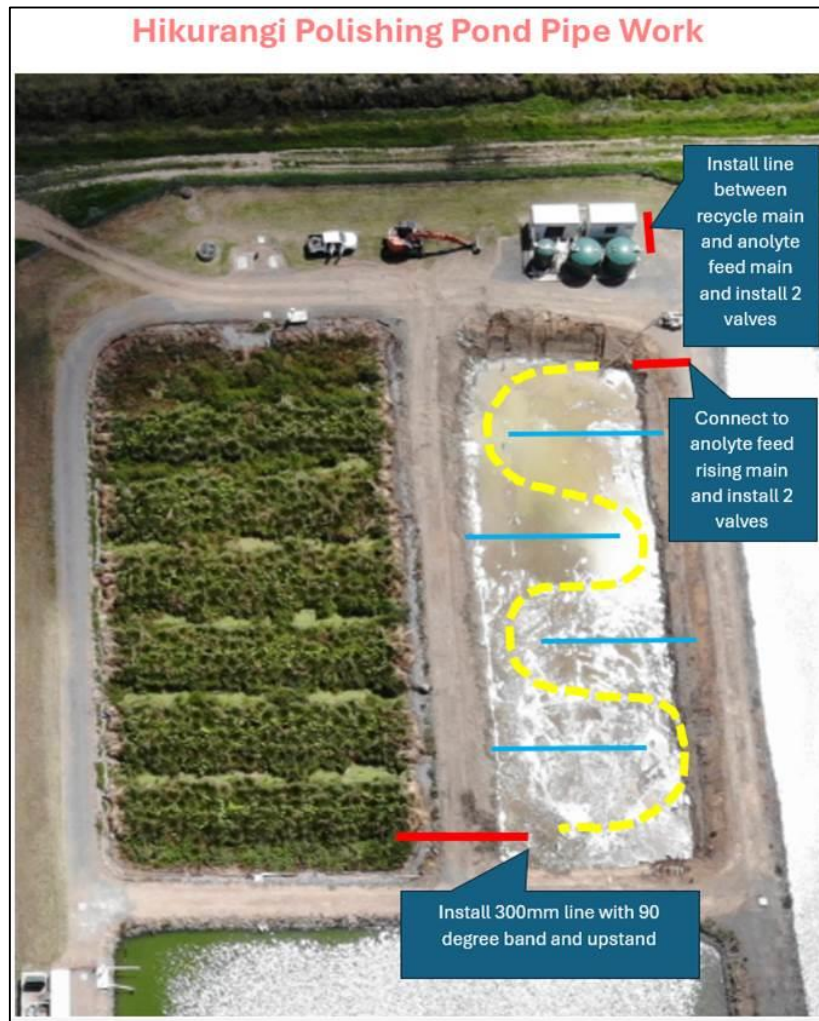
Preparation of temporary storage basin



Removal of floating wetlands – small section to remain

Phase 3:

- Completed the design and procured a contractor through a robust tendering process to convert the existing abandoned wetland area into a “polishing pond”.



- Preparation of a Resource Consent Application for the continued operation of the WWTP and discharges to land, ground and air. The current resource consent expired on 30 June 2025 and will need to be re-consented. It is unlikely the treated effluent will meet the original consent conditions designed for the membrane plant. This work is ongoing. We are waiting for the Cultural Impact Assessment that is being prepared by local Hapū to be completed.

Future Phase:

- Installation of rockfall effluent discharge.

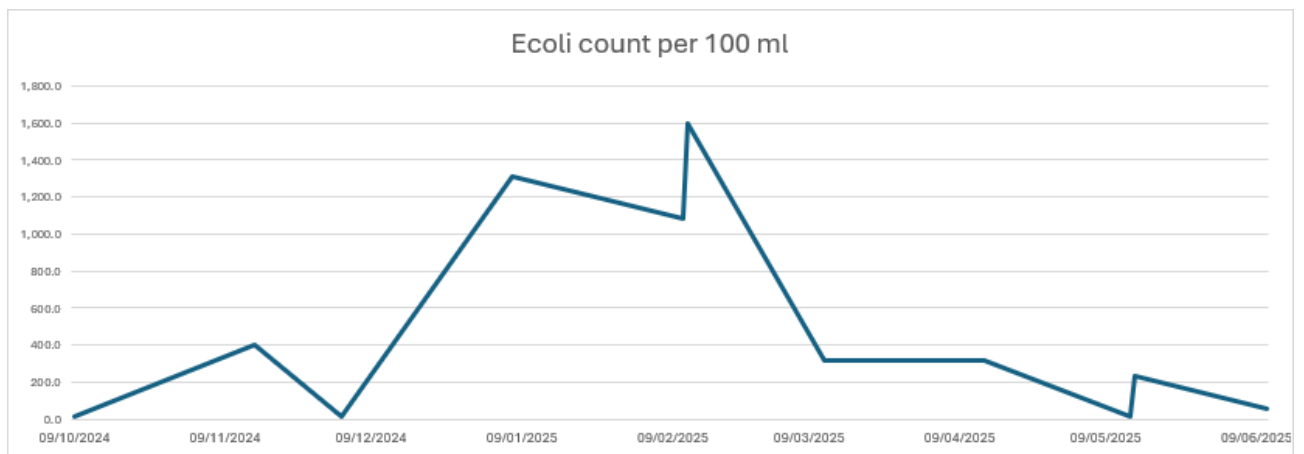
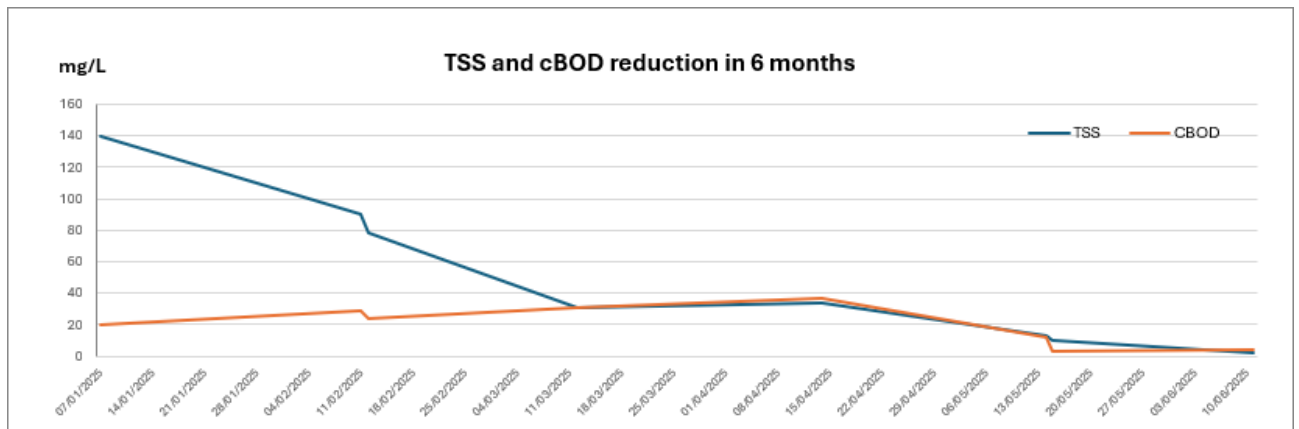
Māori communities generally **oppose the direct discharge of treated or untreated wastewater into freshwater** or coastal waters, regardless of treatment level. This opposition stems from the **sacredness of water** and the belief that water bodies have their own **mauri** (life force), which can be degraded by pollutants. Māori often advocate for **land contact methods**—such as wetlands, **rock-lined channels**, or soil infiltration systems—that allow wastewater to be spiritually and biologically cleansed before entering natural systems. Construction of a rockfall effluent discharge is seen as more respectful to **Papatūānuku** (Earth Mother) and aligns with **kaitiakitanga** (guardianship) principles.

Quality improvements

The upgrades that we have made to the plant to date have already had a positive outcome.

After completing the construction of the polishing pond, we observed significant reductions in TSS and cBOD concentrations within the treated effluent. E.coli also showed the same positive trend. Currently, we're operating the system at a significantly higher flow rate (1000 m³/d) than its design capacity (530 m³/d). This high flow rate allows us to thoroughly test the system's capabilities under high load and create additional storage in our primary pond, which was very full during Cyclone Tam. Over the next few weeks, we will be gradually optimizing the system to enhance its performance.

See the graphs below showing both TSS and Ecoli number count.



5 Financial/budget considerations / Ngā pānga pūtea/tahua

Estimated costs for proposed technologies range from \$50K to \$15M depending on the solution.

Costs to date for phases 1, 2 and 3 are as per tables below.

Wastewater Treatment Plant Capital Works Projects 2020 - 2021						
Project	Description	Budget	Actual Cost	Criticality	Rasied Date	Completed Date
Hikurangi WWTP upgrade 3 Waters	Install inlet screen	\$100,000	\$22,414	1	30/08/2020	
	Replace effluent flow meter	\$12,000	\$9,300	1	30/08/2020	20/03/2021
	Install monitoring equipment	\$50,000	\$33,364	1	30/08/2020	28/06/2021
	Remove Building	\$20,000	\$17,813	1	30/08/2020	20/06/2021
00648 Available \$100000	Total	\$112,000	\$31,715			

Wastewater Treatment Plant Capital Works Projects 2021 - 2022						
Project	Description	Budget	Actual Cost	Criticality	Rasied Date	Completed Date
Hikurangi WWTP upgrade 3 Waters	Install inlet screen	\$100,000	\$74,327	1	30/08/2020	
	General upgrade surveying drawings	\$10,000	\$3,808	1	30/08/2020	
	General upgrade drainage	\$10,000	\$33,915	1	30/08/2020	
	Potable water supply	\$10,000	\$239	1	30/08/2020	
	Buildings	\$50,000	\$628	1	30/08/2020	
00648 Available \$324000	Total	\$100,000	\$112,916			

Wastewater Treatment Plant Capital Works Projects 2022 - 2023						
Project	Description	Budget	Actual Cost	Criticality	Rasied Date	Completed Date
Hikurangi WWTP upgrade 3 Waters	General	\$50,000	\$519,270	1	30/08/2020	
00648 Available \$324000	Total	\$50,000	\$519,270			

Wastewater Treatment Plant Capital Works Projects 2023 - 2024						
Project	Description	Budget	Actual Cost	Criticality	Rasied Date	Completed Date
Hikurangi WWTP upgrade 3 Waters	General	\$50,000	\$132,583	1	30/08/2020	
00648 Available \$324000	Total	\$50,000	\$132,583			

Wastewater Treatment Plant Capital Works Projects 2024 - 2025						
Project	Description	Budget	Actual Cost	Criticality	Rasied Date	Completed Date
Hikurangi WWTP upgrade	Polishing pond - final stage	\$100,000	\$0	1		
Hikurangi WWTP upgrade	General	\$0	\$79,724	1		
Ruakaka pond 1 desludge	Desludge pond 1	\$0	\$2,113	1		
00743 Available \$324000	Total	\$100,000	\$81,837			

Wastewater Treatment Plant Capital Works Projects 2020 - 2025						
Project	Description	Budget	Actual Cost	Criticality	Raised Date	Completed Date
Hikurangi WWTP upgrade	Engineering Fees		\$446,184	1		
Hikurangi WWTP upgrade	WIP – Work completed but still to be claimed		\$317,516	1		
Total Cost to Date			\$1,959,537			

Future Phase costs are yet to be confirmed.

6 Attachments / Ngā Tāpiritanga

None