Clarks Beach Wastewater Treatment Plant

Watercare

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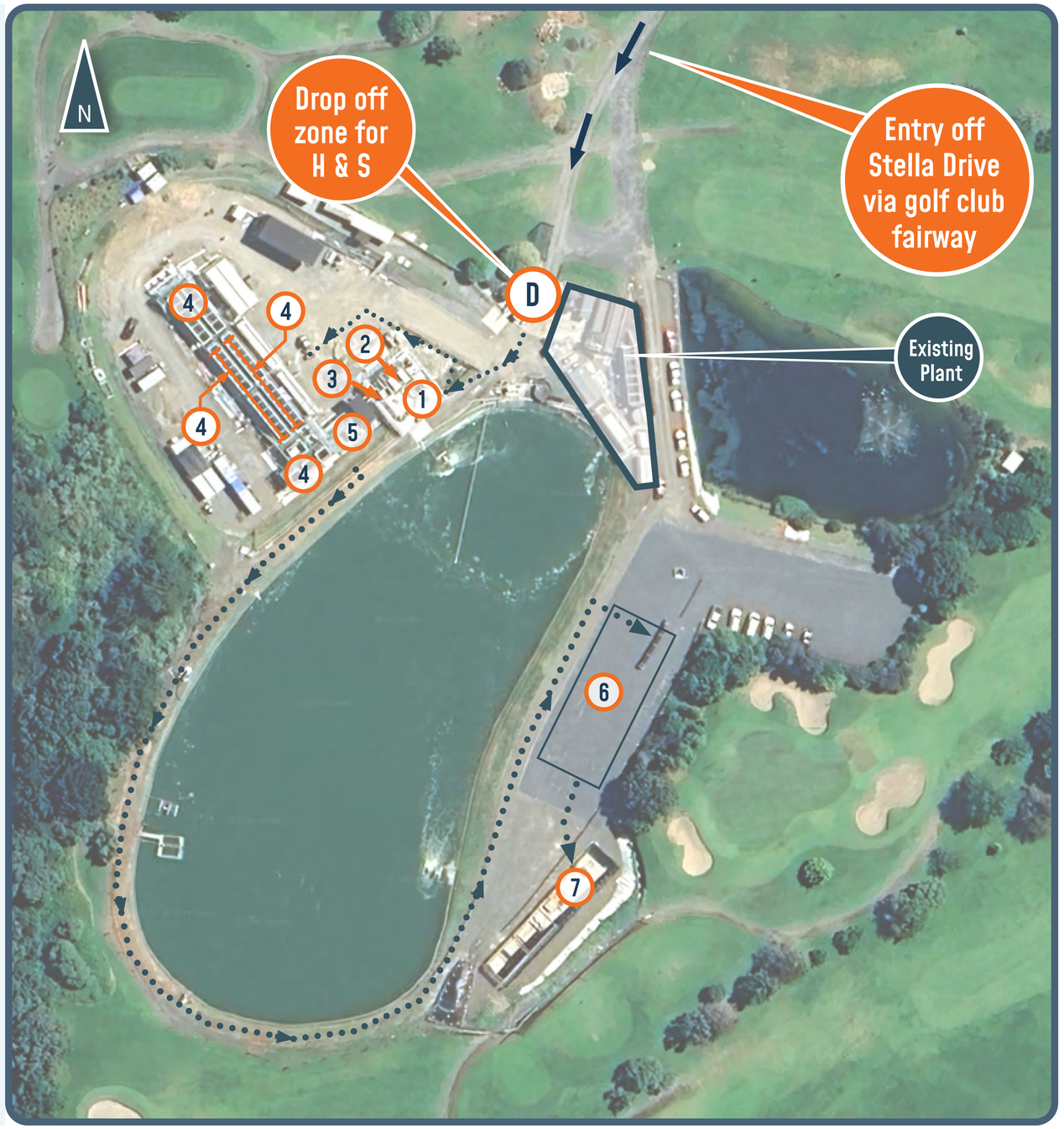


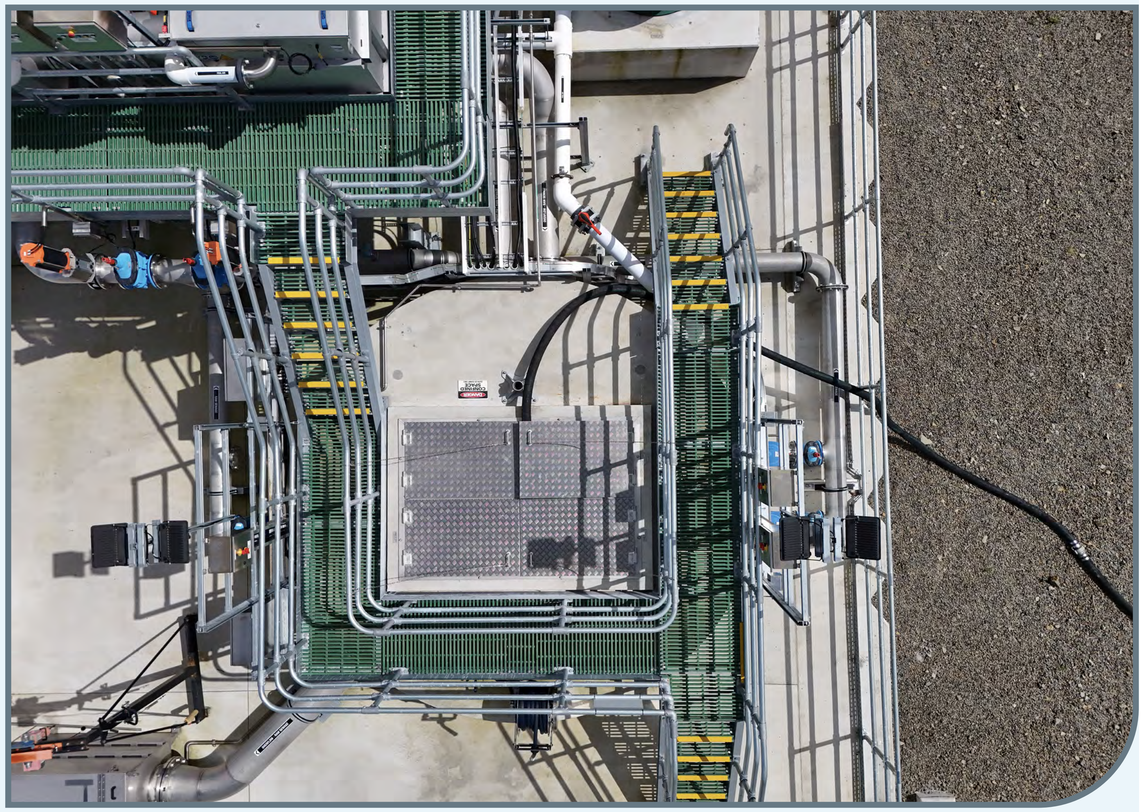
Clarks Beach Wastewater Treatment Plant

Inlet chamber

1

Wastewater from the Clarks Beach catchment enters the treatment plant through the inlet system. Flows from surrounding pump stations combine upstream of the plant before entering the inlet chamber, which pumps wastewater to the elevated screening system.

The inlet works are designed to direct normal flows toward the treatment process while providing a controlled overflow route for flows that exceed available treatment capacity. Under the permanent arrangement, excess screened wastewater will be diverted to the emergency and wet-weather storage system and returned to the inlet works for treatment when plant capacity becomes available.





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Clarks Beach Wastewater Treatment Plant

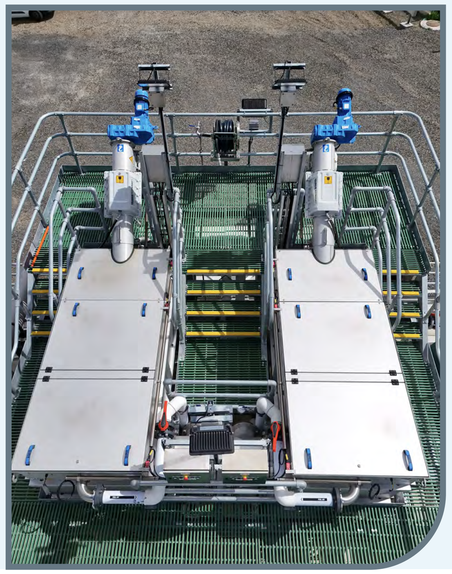
Drum screens

2

Wastewater pumped from the inlet pump station passes through two inclined rotary drum screens. These fine screens remove any rags, wipes and other debris greater than 2mm in size that could block or damage the downstream membrane aerated biofilm reactor (MABR) and membrane bioreactor (MBR) equipment.

The screens are installed at an elevated level so that screened wastewater can flow by gravity toward the flow-control weir and MABR splitter box. Screenings are collected and removed from site. The screening system is designed to operate automatically and adjust to increased amounts of screenings and grit that can occur during wet weather.





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Clarks Beach Wastewater Treatment Plant

Weir box

3

Following screening, wastewater passes to the flow-control weir, which regulates the flow directed toward the biological treatment process. Flow enters the membrane aerated biofilm reactor (MABR) splitter box, where it is divided between the two parallel MABR treatment trains. During flows that exceed the available capacity of the MABR and MBR treatment process, the excess screened wastewater will be diverted to wet weather and emergency storage under the future permanent tidal storage system.



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Clarks Beach Wastewater Treatment Plant

MABR and MBR aeration train

4

The main treatment stage uses a combined membrane aerated biofilm reactor (MABR) and membrane bioreactor (MBR) process. Screened wastewater is distributed between two parallel MABR trains, followed by aerobic and anoxic process tanks and MBR membrane units. The biological process removes biodegradable organic matter and nitrogen compounds, while the MBR membranes provide solids separation and retain activated sludge within the treatment process. Treated water, known as permeate, passes through the MBR membranes before being transferred to permeate storage for UV disinfection. The plant layout also allows for future expansion through the addition of a third MABR train.





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Clarks Beach Wastewater Treatment Plant

MABR and MBR aeration train

4A

Waste activated sludge generated by the biological process is removed from the treatment system to maintain the required concentration of biological solids within the treatment process. The current process includes transfer of waste activated sludge to the oxidation pond, which will soon be diverted to a temporary waste activated sludge processing facility.



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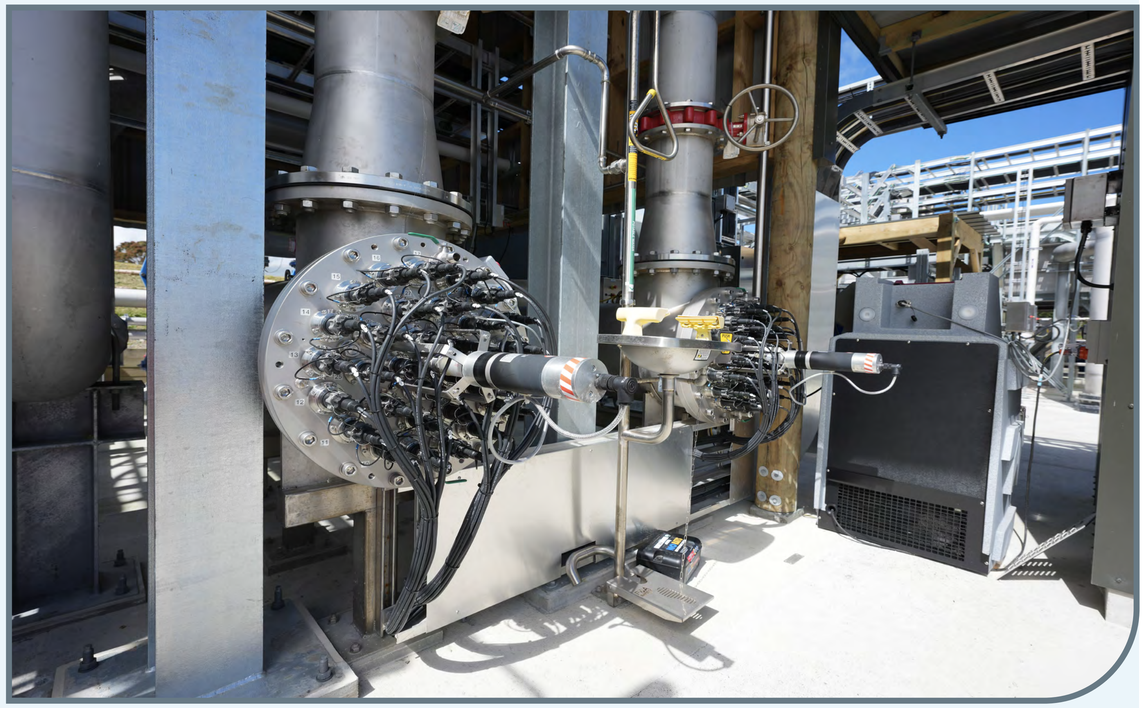
Clarks Beach Wastewater Treatment Plant

UV treatment

5

At the final stage of treatment, the wastewater passes through ultraviolet (UV) disinfection. UV light produces germicidal wavelengths, which render bacteria, viruses and protozoa incapable of reproducing and passing on infection. Unlike chemical disinfection, UV treatment does not add chemicals to the water. Instead, it renders pathogens harmless and ensures the treated water is safe for the environment, before it is pumped into the tidal storage system.





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Clarks Beach Wastewater Treatment Plant

Tidal storage bag

6

Once disinfected, the treated effluent is transferred to the temporary tidal storage system. Final effluent is stored in a 1,100m^3 temporary tidal storage bag until it is able to be discharged according to consent conditions relating to high-tide cycles. The permanent tidal storage system will comprise two 4,000m^3 concrete tanks located in the oxidation pond area. The broader permanent tidal-storage system will also receive treated effluent conveyed from Waiuku.





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Clarks Beach Wastewater Treatment Plant

Outfall discharge

7

During approved tidal discharge windows, treated effluent is released from tidal storage through the outfall system into the marine environment via an actuated valve. In the permanent arrangement a series of outfall discharge chambers will be constructed between the permanent tidal storage tanks and outfall discharge point to control the volume of treated effluent discharged during approved discharge windows.





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