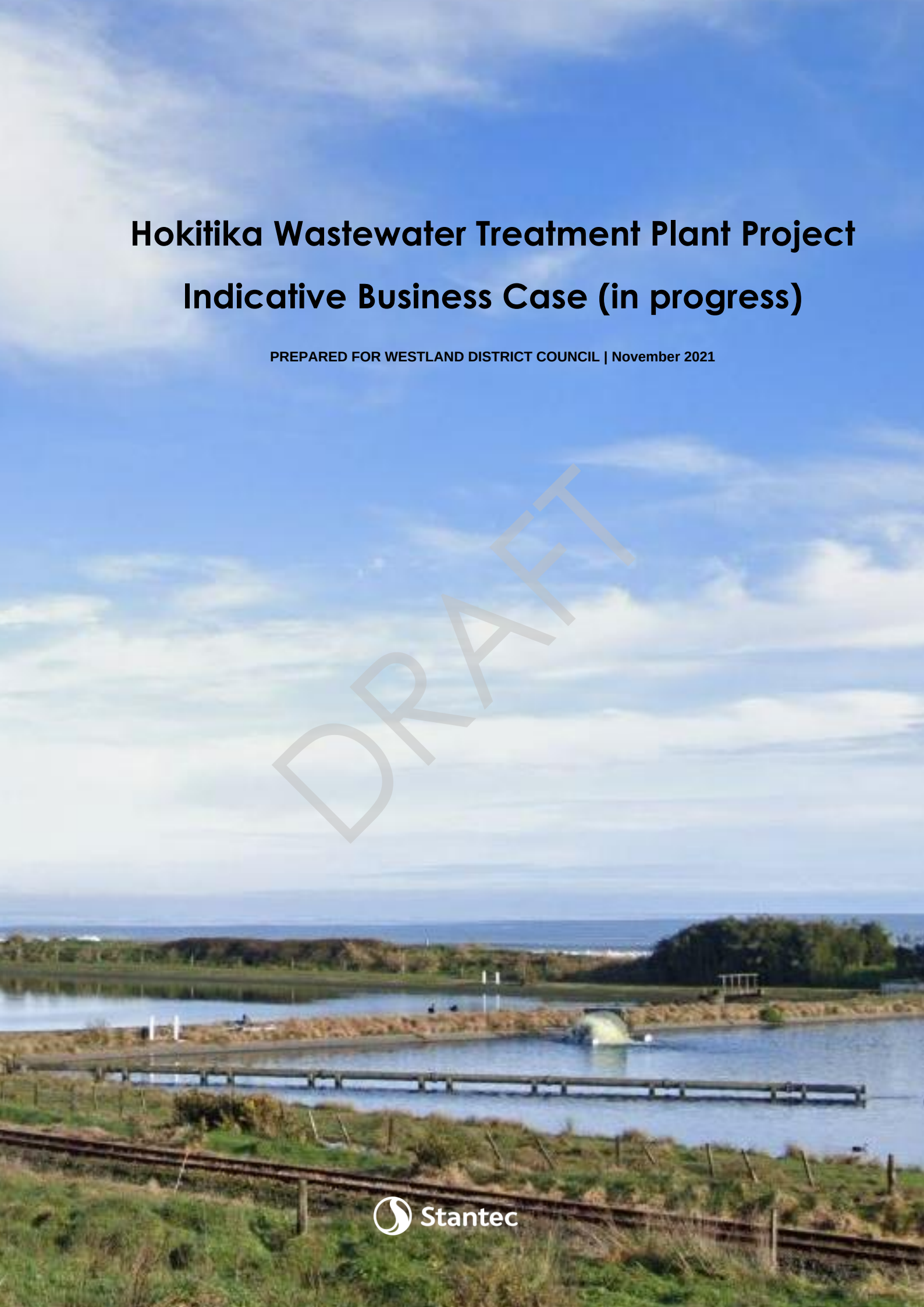
Hokitika Wastewater Treatment Plant Project

Indicative Business Case (in progress)

PREPARED FOR WESTLAND DISTRICT COUNCIL | November 2021



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Executive Summary

To be completed at end of Indicative Business Case (IBC) stage.

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1 Introduction

This Indicative Business Case focuses on the treatment and discharge of wastewater from Hokitika township. The project aims to "*improve health, environmental and cultural outcomes by delivering a fit for purpose, resilient wastewater treatment system".*

1.1 Purpose

The purpose of this Indicative Business Case is to:

- confirm the strategic context and fit of the proposed investment
- confirm the need to invest and the case for change
- identify a wide range of potential options (high level)
- assess a short-list of potential options
- recommend a preferred solution that balances desired outcomes and offers value for money

The business case process uses a five-case structure to systematically determine whether the investment proposal:

- is supported by a compelling case for change - the 'strategic case'
- optimises value for money - the 'economic case'
- is commercially viable - the 'commercial case'
- is financially affordable - the 'financial case', and
- is achievable - the 'management case'.

1.2 Background

1.2.1 Location and Description

Hokitika's existing wastewater treatment plant (WWTP) has been in operation since 1973. It is located 2.7 km north of Hokitika between State Highway 6 and the coastal marine area as shown in Figure 1. It consists of an inlet works structure, two waste stabilisation ponds (previously referred to as oxidation ponds), and an elevated outfall pipeline discharging directly to the beach or surf zone (depending on tide and beach condition), that treats the wastewater from the town's resident population of 4000 and the trade waste stream from the Silver Fern Farms meat processing works.

Figure 1: Map showing WWTP in relation to Hokitika township

1.2.2 Description of the Hokitika Pond Treatment System

In New Zealand waste stabilisation ponds are a commonly used method of treating domestic sewage as they provide a low-cost and effective system for the treatment of wastewater. They are especially suitable for small to medium-sized communities and are often the sole form of wastewater treatment.

In the waste stabilisation ponds, algae and wind action introduce oxygen to the pond surface to promote biological processes to treat the wastewater before the treated wastewater is discharged to the coastal marine area. Wastewater solids settle to the pond bottom, where they partially digest anaerobically and accumulate as digested sludge. The sludge builds up over time necessitating removal at approximately 15-year intervals. Figure 2 outlines the processes at work in the Hokitika ponds (modified from Figure 1-1 in the Water New Zealand Good Practice Guide for Waste Stabilisation Ponds).

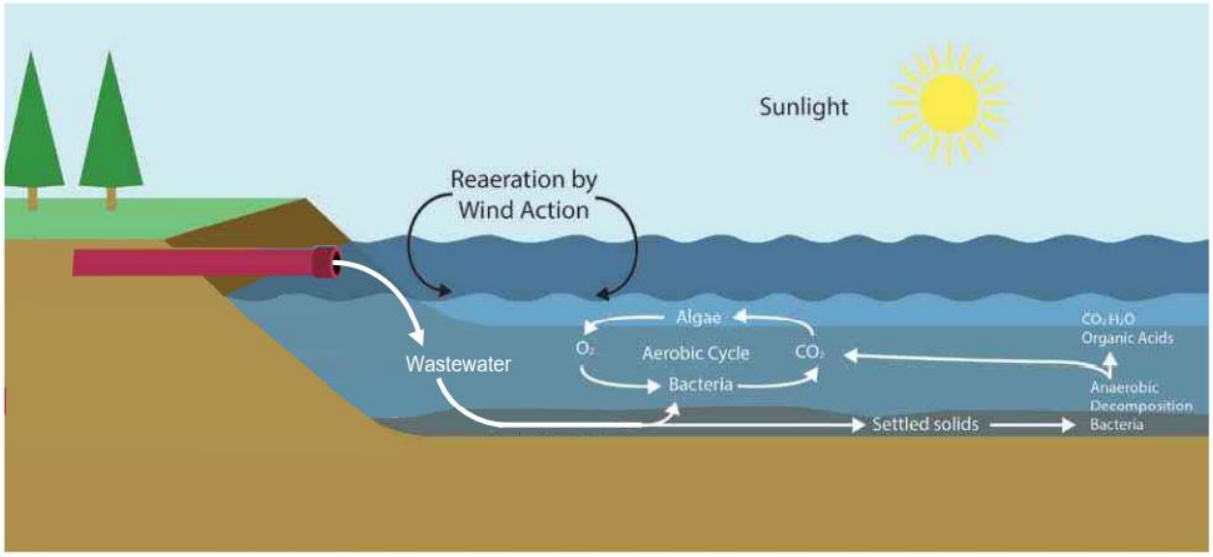

Figure 2: The processes at work in the Hokitika waste stabilisation ponds

1.2.3 Consents Held

WDC holds two resource consents for the current WWTP, authorising the discharge of treated wastewater to the coastal marine area, and the discharge of contaminants (mainly odour) to air from the WWTP. The consents were issued in April 2016 and are due to expire in April 2026. These consents will need to be replaced, or an alternative wastewater treatment and disposal scheme selected, designed, consented, constructed and commissioned well in advance of the expiry date of the existing consents. Any new scheme will need to take into account significant changes in regulatory standards since the current scheme was consented. It is anticipated that compliance standards regarding the receiving environment (i.e., where discharged wastewater enters the environment) will strengthen in the near future, meaning the current system may not meet new standards.

1.2.4 Investigations to Date on Future Options for Discharge

WDC has previously investigated costs for future options for discharge of treated wastewater for the Hokitika area, on the basis that the existing outfall would need replacement in a future upgrade. This included considering whether it would be more cost-effective to work with Westland Milk Products on their planned ocean outfall project and share costs or remain independent.

In 2019 Westland Milk Products offered WDC the opportunity to join in with their proposed ocean outfall scheme to discharge treated wastewater. The proposed outfall would extend 800 metres out to sea. The community was consulted through the 2019/20 Annual Plan process, with two options presented:

- Option 1 - Partner with Westland Milk on the Ocean Outfall project (overall cost to WDC: $1.9m, plus maintenance cost of approx. $15,000 per year)
- Option 2 – Wait until the Resource Consent is due to expire.

The community supported Option 1, and WDC agreed to partner with Westland Milk to co-fund the ocean outfall project at a cost of $1.9M to WDC. However, after tendering the cost of the project increased to $3.37 million. WDC undertook another review of alternative methods of wastewater discharge and consulted with the community through the Annual Plan 2020/2021 process (in May 2020), and presented two potential options:

- Option 1 - Increased cost of Westland Milk Products project- $3.77 million, plus $50,000 maintenance and compliance cost of $30,000 per year
- Option 2 - Alternative options, approximate cost $4.5 – $12 million.

Feedback indicated the community preferred Option 2. Following the hearing to consider submissions to the Draft Annual Plan 2020/2021, WDC resolved to investigate a land-based option for the future disposal of Hokitika wastewater, in place of the ocean outfall pipeline option.

Westland Milk Products' new ocean outfall was completed in mid-2021, however provision for a future connection has been retained, allowing for WDC to use the pipeline if needed as part of any future upgrade to WDC's WWTP. In 2020, WDC received $6.9m from the Department of Internal Affairs (DIA) Three Waters Stimulus Funding Delivery Plan and earmarked a portion of the funding towards assessing options for the Hokitika WWTP.

1.2.5 Legislative Change

This project is being undertaken during a period of legislative change. Central government is leading a reform of the three waters sector (of which wastewater is a component) which will reframe how water is managed in New Zealand, from the source to the receiving environment. The three waters reform will place greater emphasis on stewardship to ensure the health and well-being of the water is protected and human health needs are provided for before enabling other uses of water. New Zealand's primary environmental statute, the Resource Management Act 1991 is also due to be replaced, starting from late 2021. Combined with a range of national policy statements and national environmental standards (refer to 2), the new legislation will place greater emphasis on maintaining and enhancing the quality of our built and natural environments, including requirements to improve the management of effects from infrastructure such as wastewater treatment schemes.

2 The Strategic Case – Making the Case for Change

2.1 Strategic Context

2.1.1 Overview of Partner Organisations

There are two partner organisations involved in this project: WDC and Poutini Kāi/Ngāi Tahu. A summary of their aims, relevant core activities and interest in the project is provided in Table 1 below.

Table 1: Overview of partner organisations for the Hokitika WWTP Project

Partner	Aims	Core Activities	Interest in project
Poutini Kāi/Ngāi Tahu	Poutini Kāi/Ngāi Tahu aims to uphold mana whenua. Poutini Kāi/Ngāi Tahu desire to be involved in the planning and decision-making with regard to the Hokitika WWTP.	One of the core functions of Poutini Kāi/Ngāi Tahu is to represent Tāngata Whenua in statutory decision-making processes.	Poutini Kāi/Ngāi Tahu representatives form part of the Oversight Subcommittee for this project. In 2015 Poutini Kāi/Ngāi Tahu requested consideration of land-based discharge as part of their support for the replacement of the WWTP consents.
Westland District Council (WDC)	To meet the current and future needs of communities, by providing infrastructure, local public services and regulatory functions. In relation to this project, WDC aims to provide Hokitika with a reliable, effective and sustainable wastewater scheme.	To implement the Health Act 1956 by providing wastewater services to improve, promote and protect public health. To deliver on WDC's obligations under the Local Government Act 2002 and the Resource Management Act 1991.	To protect public health and the environment by providing Hokitika with a new wastewater treatment plant and disposal system, in a way that achieves social, cultural, environmental and economic wellbeing.

An Oversight Subcommittee, consisting of an equal number of Poutini Kāi/Ngāi Tahu and Westland District Council (WDC) representatives has been set up to provide a co-governance framework for the project. This honours the 2018 Manatu Whakaaetanga (Partnership Agreement) Mō (between) Te Rūnanga o Ngāti Waewae, Te Rūnanga o Makaawhio together known as Poutini Kāi/Ngāi Tahu and WDC.

The agreement sets out the framework for an ongoing relationship with Mana Whenua of Westland to strengthen the partnership. A goal is to provide mechanisms to assist Poutini Kāi/Ngāi Tahu Papatipu Rūnanga to participate in Council policy, planning, and other decision-making processes. The partnership agreement relates to the geographical area defined as Westland District as set out in Figure 3 below.

This WWTP project provides an opportunity to recognise the needs of the local community and bring greater awareness of local Māori tikanga in relation to the management of wastewater.

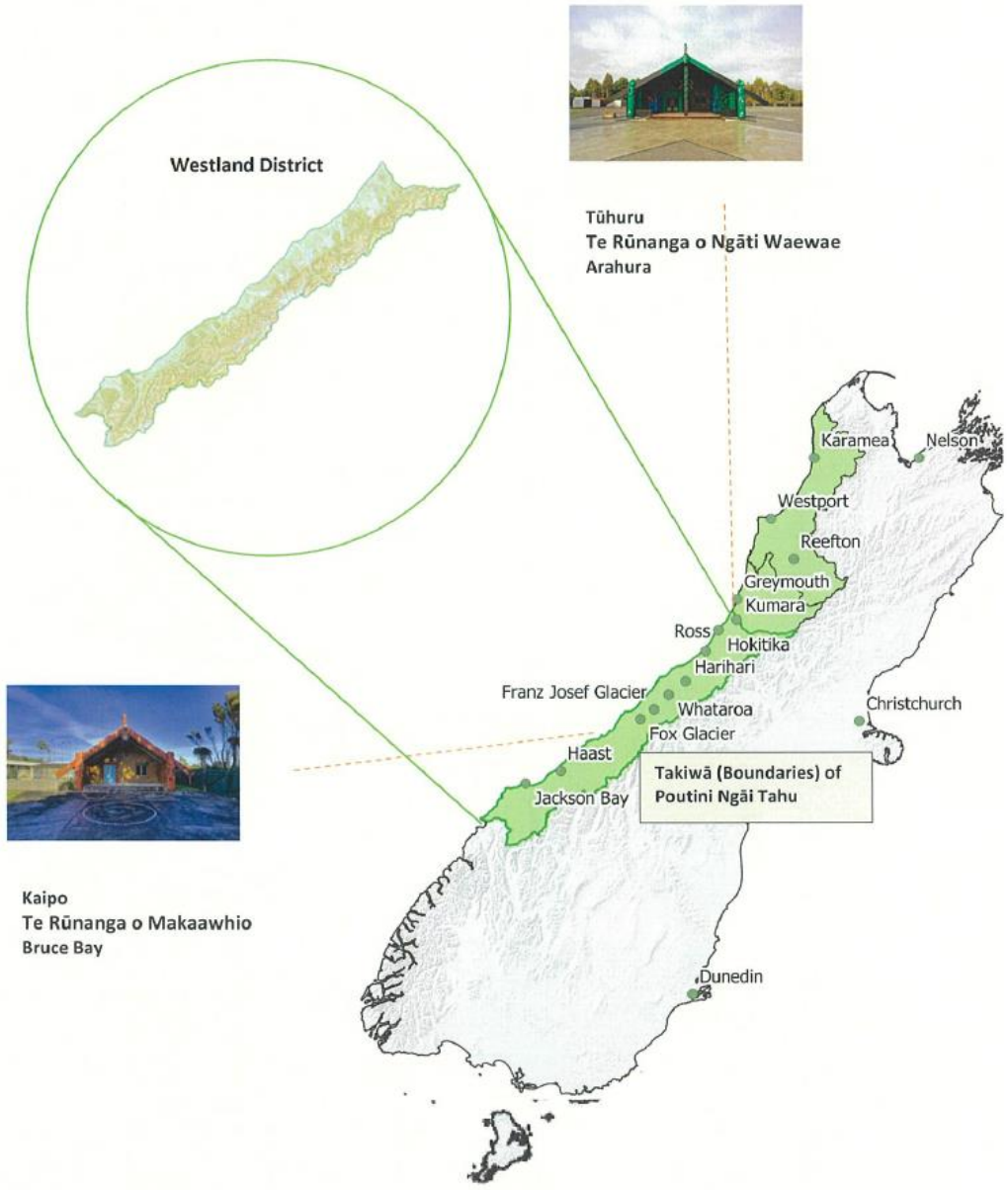

Figure 3: Westland District

2.1.2 Overview of Key Stakeholders

A key stakeholder in the project is the West Coast Regional Council (WCRC) which will be the consent authority for the resource consents needed for building and operating the wastewater treatment plant. The WCRC also provides and maintains agreed levels of flood and erosion protection for West Coast communities and communicates natural hazard risks to communities.

Other key stakeholders include the Department of Conservation (DOC), Community and Public Health (CPH), and the Department of Internal Affairs (DIA).

2.1.3 Alignment to Existing Strategies, Policies and Plans

This section explains how the proposed project aligns with relevant national, regional and local strategies, policies and plans. As described previously, this project is being undertaken during a period of legislative change at a time when the Resource Management Act 1991 (RMA) and the Three Waters sectors are undergoing significant reform.

A summary of the current (and known proposed) strategies, policies and plans that align with this project is provided in Table 2 below.

Table 2: Relevant National, Regional and Local strategies, policies and plans

Strategy/ Policy/ Plan	Purpose and relevance
National Strategies, Policies and Plan	
Health Act 1956	Requires local authorities to improve, promote and protect public health within the district, including the provision of wastewater services.
Resource Management Act (RMA) reforms 2020	The reform of the Resource Management Act (RMA) will see the current statute replaced by the Natural and Built Environments Act, the Strategic Planning Act, and the Climate Adaptation Act. The first section of this is intended to be presented to Parliament in December 2021, with the intention of the new Acts taking effect from 2022. It is expected that there will be a substantial transition period where existing provisions prepared under the RMA will continue to have legal weight for some time.
Draft Natural and Built Environment Act (2021)	The Draft Natural and Built Environment Act will place greater emphasis on the principles of Te Tiriti o Waitangi by improving recognition of Te Ao Māori and Te Tiriti. The purpose of the Act includes reference to Te Oranga o te Taiao in the Act's purpose with the intention being to encapsulate the intergenerational importance of the health and well-being of the natural environment. WDC are required 'to give effect to' the principles of Te Tiriti.
National Policy Statement for Freshwater Management 2020	The National Policy Statement for Freshwater Management 2020 (NPSFM) sets an objective and a series of policies requiring and guiding local government to manage fresh water in an integrated and sustainable manner. The NPSFM is founded on the principle of Te Mana o te Wai, a concept that recognises the importance of water to life and wellbeing, and that protecting the health of fresh water safeguards the health and wellbeing of people and the environment. Te Mana o te Wai is based on six principles, which embody sustainable management of fresh water, and which align with the hierarchy of obligations that prioritises: (a) The health and wellbeing of water bodies and freshwater ecosystems (b) The health needs of people; and (c) The ability of people and communities to provide for their social, economic and cultural wellbeing.
Strategic Planning Act (in development)	The Strategic Planning Act will require WDC to develop a long term regional spatial strategy in partnership with central government and mana whenua. The spatial plan will need to consider whether land will be suitable for development or will need to be protected or improved. It also requires local authorities to identify new infrastructure requirements (e.g., wastewater treatment infrastructure) and determine whether infrastructure is vulnerable to climate change effects and natural hazards such as earthquakes.
Climate Change Adaptation Act (in development)	The Climate Change Adaptation Act will address the complex legal and technical issues associated with managed retreat and funding and financing adaptation to the effects of climate change.

Strategy/ Policy/ Plan	Purpose and relevance
New Zealand Coastal Policy Statement 2010	The New Zealand Coastal Policy Statement (NZCPS) 2010 provides a policy framework to achieve the purpose of the RMA in the Coastal Marine Area (CMA). The NZCPS provides *inter alia* guidance for the use and protection of coastal resources in New Zealand, including for the discharge of treated human sewage to the coastal environment. The NZCPS and the RMA require that there is adequate consideration of alternative methods, sites and routes for the discharge of any contaminant; and that any proposals to discharge contaminants to the CMA take tangata whenua values and the effects on them into account.
Resource Management (National Environmental Standards for Freshwater) Regulations 2020	The National Environmental Standards for Freshwater 2020 (NES-F) is intended to regulate activities that could result in a potential adverse effect on fresh water. The NES-F sets out requirements specifically in respect of protecting wetlands, streams, connectivity of aquatic habitats, and farming practices that may affect water quality.
Three Waters Reform programme 2018	The Three Waters Reform programme will transfer the obligation of managing three waters service delivery from local government to a number of larger multi-regional entities.
Taumata Arowai-Water Services Regulator Bill 2020	The Taumata Arowai-Water Services Regulator Bill was introduced in 2020 with the purpose of establishing a new regulatory body to manage this change. Taumata Arowai begins operating in late 2021 with an initial goal of improving the environmental performance of wastewater networks by reviewing water standards and best practice guidelines.
Local Government Act 2002	Requires territorial authorities to conduct a detailed assessment of the provision of wastewater services within their districts which must include a description of how wastewater is disposed of within the district. The assessment should also outline any potential or existing health or environmental impacts relating to wastewater.
West Coast Regional Council Strategies, Policies and Plans	
West Coast Regional Policy Statement 2020	The West Coast Regional Policy Statement (RPS) sets out a broad set of objectives supported by policies that support the management of the West Coast region's natural and physical resources under the RMA. The provisions of all other plans in the West Coast region (regional and district plans) must be consistent with the RPS to ensure that the objectives are achieved. The RPS policies hold considerable weight in RMA decision making processes and will be taken into account in any resource consent processes associated with the WWTP option.
Regional Coastal Plan (under review 2021)	The Regional Coastal Plan (RCP) is the WCRC's framework for managing the effects of activities in the Coastal Marine Area (seaward of mean high-water springs). The RCP implements the New Zealand Coastal Policy Statement and will be instrumental in the consideration of any activities or wastewater management options that involve interacting with the coastal marine area.
Regional Land and Water Plan 2014	The Regional Land and Water Plan (RLWP) sets out objectives, policies and rules for managing the use, development and protection of land and freshwater resources in the West Coast region. The provisions of this plan will be directly relevant to informing any wastewater management options that involve the use of, or affect land (including vegetation), soil or freshwater resources. The rules of the RLWP will be particularly important in determining which consents are needed for any given scheme.

Strategy/ Policy/ Plan	Purpose and relevance
Regional Air Quality Plan 2001	The Regional Air Quality Plan sets out the WCRC's objectives for managing the region's air quality and describes policies and rules necessary to achieve those objectives. Other non-regulatory methods are also set out in the plan. The rules give effect to the policies of the plan, and in turn the RMA, in a manner consistent with the RPS. Activities such as discharges of contaminants to air, including odour require resource consent under this plan, and will be a consideration in the development of the WDC's WWTP options.
Draft Te Tai o Poutini Plan	Te Tai o Poutini Plan is a combined district plan that covers the West Coast and is put together by a joint committee made up of representatives from WDC, WCRC, Te Rūnanga o Ngāti Waewae and Te Rūnanga o Makaawhio. This plan is in its formative stages and has not yet been notified so has no legal effect at this point. A draft plan is currently intended to be issued for public comment in 2022 and has a five-year long development programme. The final form of the plan is likely to influence the consents needed for the future WWTP option development.
Westland District Council Strategies, Policies and Plans	
Westland District Plan 2002	The Westland District Plan sets objectives, policies and rules that define how land may be used and how land-based resources such as soil and built environments can develop. The plan anticipates the appropriate use, development and protection of the district's land and resources, including the development, use and effects of Community infrastructure.
Te Kahui o Poutini Long-term Plan 2021-2031	The WDC Te Kahui o Poutini Long-term Plan (LTP) 2021-2031 outlines Council's investment priorities for the 10-year period and how they will be delivered and funded. The LTP includes extra funding is to develop an acceptable solution to wastewater disposal in Hokitika with funding allocated over the next five years for renewal.
Wastewater Activity Management Plan 2021-2031	The WDC Wastewater Activity Management Plan (AMP) 2021-2031 identifies the provision and management of wastewater collection, treatment and disposal services for residents and businesses whose properties are connected to a public wastewater network within Westland District. The key issues for managing the wastewater assets identified in the plan are the implications and uncertainty of the Government's three waters reforms.
Draft Thirty Year New Zealand Infrastructure Plan 2021	The Draft Thirty Year New Zealand Infrastructure Plan 2021 changes the infrastructure focus from a consideration of assets to examining what is desired in terms of outcomes over time. The Plan sets a strategic direction in Emission Reduction Plans (ERPs) that indicates public sector infrastructure investment programmes must be compatible with meeting New Zealand's international commitments on carbon emissions. Measures to support this direction should: a. Include full consideration of non-built solutions in all business cases. b. Require assessment of carbon emissions in all business cases. c. Require the use of a cost of carbon compatible with international commitments on carbon emissions within all cost benefit analysis.

2.2 Case for Investment

A facilitated problem definition workshop was held in September 2021 to identify the problems with Hokitika's WWTP, as well as identify potential opportunities and benefits of addressing these problems. Representatives from WDC and local iwi representatives attended the workshop. Following the workshop, problem statements were developed and agreed by participants as follows:

- Problem 1 - Hokitika's wastewater treatment ponds discharge directly to sea which is unacceptable to the community for health, environmental and cultural reasons
- Problem 2 - Hokitika's existing treated wastewater discharge consent expires in 2026 and will not be renewed meaning inaction will result in a non-compliant wastewater treatment system
- Problem 3 - The wastewater treatment plant is located close to the coast and is vulnerable to climate change impacts, threatening its long-term viability.

In addition to the problems, two potential opportunities were also identified:

- Improve regulation of tradewaste disposal
- Use technology to increase automation and monitoring.

An investigation into the available evidence has been undertaken to verify the problem statements and identify any evidence gaps. The evidence to support each problem is presented below.

2.2.1 Problem 1

Hokitika's wastewater treatment ponds discharge directly to sea which is unacceptable to the community for health, environmental and cultural reasons

Hokitika's WWTP discharges treated wastewater directly onto the intertidal zone of the beach via an elevated pipeline, just under three kilometres north of Hokitika township (refer to Figure 4).

Figure 4: Hokitika WWTP outfall

Public Health

The wastewater discharge resource consent requires WDC to monitor water quality contaminants at the outfall site, as well as two mixing zone boundaries located 200 metres north and south of the ocean outfall to manage potential public health risks. The consent establishes trigger values for E coli and enterococci as follows:

- 28,000 E. coli/100mL at outfall
- 280 enterococci/100mL at the two mixing zone boundaries (200m north and south of outfall).

If these levels are exceeded, weekly monitoring at all three sites is required for one month. The resource consent also establishes monitoring of other environmental effects such as changes in colour, oil or grease films, scums or foams, changes in species composition or tainting or rendering shellfish or fish unsafe for human consumption. WDC has a higher benchmark than that required for consenting, monitoring the levels of contaminants to mitigate potential health risks including biological oxygen demand (BOD), suspended solids, ammonia nitrogen, nitrate-nitrogen and faecal coliforms.
Figure 5 and Figure 6 below shows the outputs from WDC's monitoring data between July 2020 to August 2021, as required for their wastewater discharge resource consent. The data reveals that E.coli levels were below the consented levels at all times, however the level of enterococci exceeded the consented level in June 2021, with a reading of 400 cfu/100mL (consent trigger value is 280 cfu/mL).

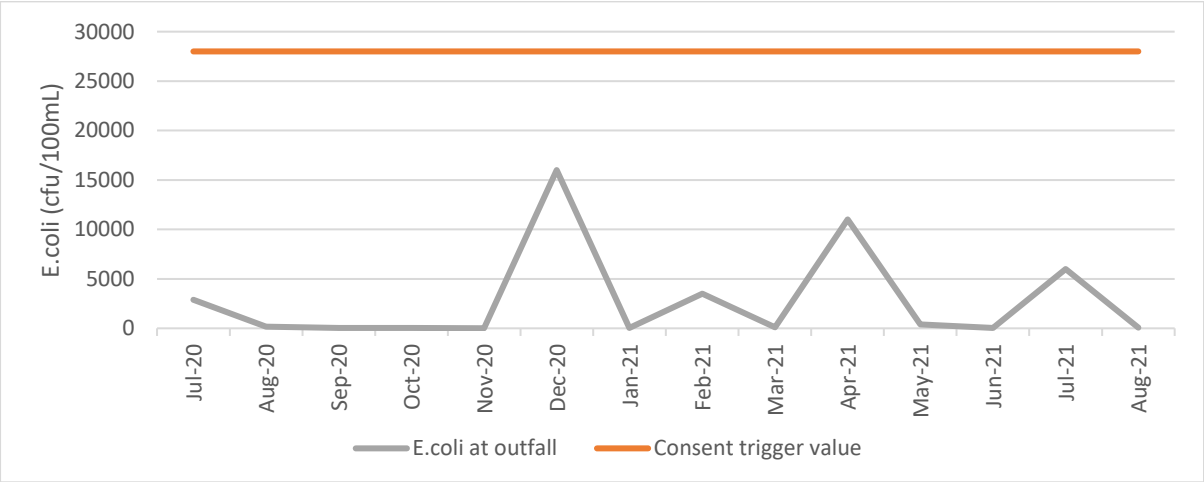

Figure 5: Monitoring of E.coli at WWTP Outfall

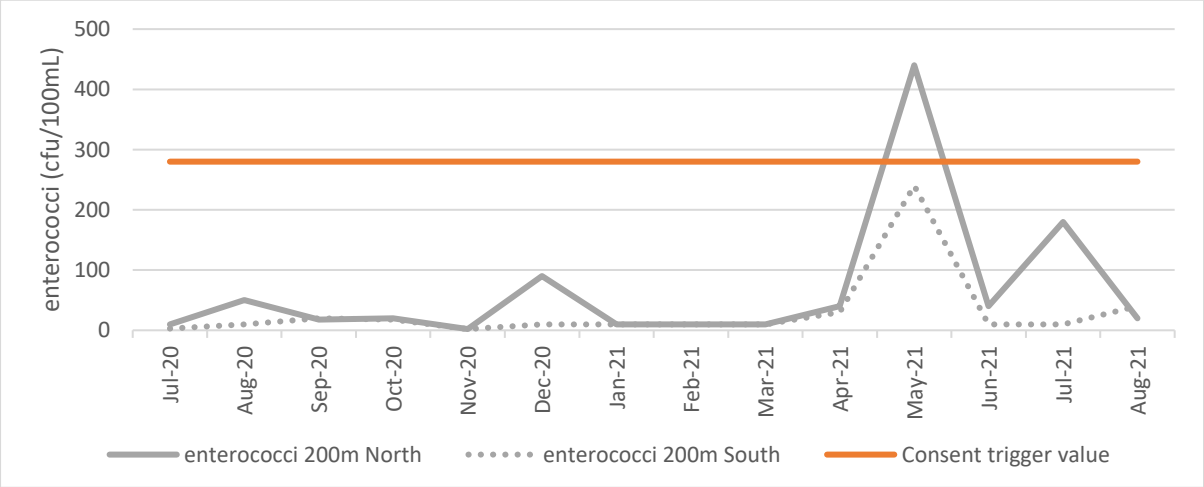

Figure 6: Monitoring of enterococci at Mixing Zone boundaries

In its current state, the outfall pipe is directly accessible to the public and there is potential for direct contact with treated wastewater and exposure to pathogens. There is also a potential health and safety risk given the outfall consists of an elevated structure which people can walk on or beneath.

Other key concerns highlighted in submissions from the community include consistent issues with odour from the ponds and the poor visual amenity of the ponds at a key gateway to Hokitika. The WDC Wastewater AMP (2021-2031) notes "*The one public expectation regarding wastewater that Council is aware of is a desire for there to be less odour from the Hokitika wastewater oxidation ponds. Historically, this has affected property owners in the immediate vicinity. Since aerators were installed on the Hokitika Wastewater Oxidation Ponds in mid-2018 the frequency of complaints has decreased. "*

Environment

Depending on the tide, beach and sea conditions, the current outfall location may provide poor dilution and mixing. As such, the receiving environment around the outfall may be adversely affected by the discharge (e.g., by sediment deposition, nutrient impacts, colour and clarity of the water).

Cultural

From a Māori tikanga perspective, it is considered offensive to discharge human waste to waterways, even when it has been treated. In Māori tikanga, human waste requires rāhui and this needs to be converted (i.e., whakanoa) prior to water contact. Passage through soil or a land element (Papatūānuku) can transform the treated wastewater from rāhui to noa, depending on the specific site and situation.

Representatives of Poutini Ngāi/Kāi Tahu have been in active dialogue with WDC for many years with the consistent message that the mixing of wastewater and freshwater/coastal waters is culturally offensive and iwi have expressed a strong preference for the exploration of a land-based treatment option. In their 2015 submission to WDC's draft Long Term Plan 2015-2025, Poutini Ngāi Tahu stated "*We expect a Council commitment to remedy the district's wastewater issues as a priority and that steps are being taken towards land-based treatments*."

2.2.2 Problem 2

Hokitika's existing treated wastewater discharge consent expires in 2026 and will not be renewed meaning inaction will result in a non-compliant wastewater treatment system

The WDC holds two resource consents which authorise discharges from the Hokitika WWTP. The resource consents are:

- RC-2015-0141-01: To discharge treated sewage effluent to the Coastal Marine Area (CMA), via an ocean outfall pipeline, from the sewage oxidation ponds
- RC-2015-0141-02: To discharge contaminants (mainly odour) to air associated with the operation of the sewage oxidation ponds.

While both resource consents expire in April 2026, it is the discharge of treated wastewater to sea that is considered unacceptable and is the focus of this problem statement.

Discharge to the Coastal Marine Area

In 2015, WDC prepared and lodged an application to replace the treated wastewater discharge permit to enable the continued discharge of wastewater from Hokitika. The resource consent application included a programme of works that provided details on WDC's intentions in relation to making continued improvements to the existing treatment and disposal system. As a result of discussions with representatives of Te Rūnanga o Ngāti Waewae the proposed programme was amended so that it included a commitment to consider alternatives to the disposal of wastewater into the sea.

Te Rūnanga o Ngāti Waewae supported the 10-year term for the consent because they had been reassured by WDC that progressive improvements and additional discharge option considerations would be occurring during this time. However, Poutini Ngāi/Kāi Tahu have repeatedly identified through consultation their *"strong preference for land-based treatment options due to the fact that the mixing of wastewater and freshwater/coastal waters is extremely culturally offensive"*. In their submission to the LTP 2015-25 Poutini Ngāi/Kāi Tahu stated: *"The kaitiaki role of mana whenua is fundamental to their relationship with the environment. It is the intergenerational responsibility and right of mana whenua to take care of the environment and resources upon which they depend. The responsibility of kaitiakitanga is twofold: first, there is the ultimate aim of protecting mauri; and second, there is the duty to pass the environment to future generations in a state that is as good as, or better than, the current state."*

It is noted that mana whenua have repeatedly objected to the current system through the consent process.

While the existing treatment ponds and outfall meet the existing resource consent condition, wastewater discharge standards are expected to become more stringent due to changes in legislation. In particular, the 2020 National Policy Statement on Freshwater Management requires local government to manage fresh water in an integrated and sustainable manner. It establishes the principle of Te Mana o te Wai; a concept that prioritises the health and wellbeing of water bodies and freshwater ecosystems, recognising that protecting the health of fresh water safeguards the health and wellbeing of people and the environment.
With the expiry of the consent for the discharge of treated wastewater in April 2026, a new consent will be required. Section 105(1) of the RMA requires a consent authority to have regard to:

(a) The nature of a discharge and the sensitivity of the receiving environment to the associated adverse effects of the discharge;
(b) The reasons for the applicant's choice to discharge to that environment; and
(c) Any possible alternative methods of discharge, including discharging into any other receiving environment.

This business case provides the pathway to investigate alternatives in a robust and comprehensive manner. WDC is working in partnership with Poutini Ngāi/Kāi Tahu mana whenua to ensure that options for managing Hokitika's wastewater will be undertaken in awareness of the matters raised by mana whenua and the community.

2.2.3 Problem 3

The wastewater treatment plant is located close to the coast and is vulnerable to climate change impacts, threatening its long term viability

The Hokitika WWTP is located between State Highway 6 and the sand dunes of the coastline. KiwiRail's Hokitika railway line runs alongside the highway, adjacent to the WWTP. The strip of land between the highway and the foreshore has been developed as grazing pastures and this was the land use prior to the WWTP being established in 1973. The ponds that form the WWTP were built by constructing gravel embankments between the beach dune ridge and higher ground by the railway line.

The location of the WWTP means it is at significant risk from natural hazards, including coastal erosion and coastal flooding (inundation).

Coastal Erosion

Coastal erosion along Hokitika's coastline has been a problem for many years[1]. A 1992 report[2] provides an outline of the historic problems with coastal erosion along the West Coast, including in the vicinity of Hokitika township and WWTP. A rock groyne was constructed at the northern end of the WWTP in 1991 to manage the ongoing risks of coastal erosion, and scattered rock protection has been placed to the south of the WWTP, along the front of the sand dunes[3]. A storm in March 1992 severely damaged the WWTP ocean outfall.

While coastal environments are dynamic, continually changing under the action of waves, winds and currents, there is increasing concern about coastal erosion in the region. Recent monitoring of Hokitika's coastline has been undertaken near the township due to concerns from property owners (refer to Figure 7). The monitoring shows up to 3.69 metres of erosion over a six-week period between July 2021 (blue line) and August 2021 (green line). Hokitika township is investing in coastal protection works including a sea wall and rock protection to adapt to erosion risks. However, there are many examples of issues of coastal erosion along the West Coast, highlighting the risk of climate change to property, townships and infrastructure.

[1] West Coast Regional Council (1984). Hokitika Beachfront Sea Erosion. www.wcrc.govt.nz/repository/libraries/id:2459ikxj617q9ser65rr/hierarchy/Documents/Publications/Natural%20Hazard%20Reports/Westland%20District/Hokitika/Hokitika%20Beachfront%20Sea%20Erosion%20Report%20Aug%201984.pdf
[2] Benn, J. L. and Neale, D. M. (1992). A report on coastal hazards in the West Coast region, South Island, New Zealand. www.wcrc.govt.nz/repository/libraries/id:2459ikxj617q9ser65rr/hierarchy/Documents/Publications/Natural%20Hazard%20Reports/West%20Coast/Coastal%20Hazards%20in%20West%20Coast%20Region%20Benn%20and%20Neale%201992.pdf
[3] Westland District Council (2015). Hokitika Wastewater Treatment Plant. Prepared by Opus International Consultants Ltd.

Figure 7: Monitoring of coastal erosion at Hokitika township in 2021[4]

The increasing frequency of extreme weather events and sea level rise as a result of climate change will exacerbate the risks of coastal hazards in the future. Mapping undertaken by WCRC highlights the future coastal erosion risk in Hokitika. NIWA have advised that in general, adaptation actions like building new seawalls or other protections to mitigate coastal flooding may not be the best long-term solution.[5] The Ministry for the Environment (MfE) also advises that communities and Councils need to ensure knowledge of the increasing future risk and evolving consequences are embedded in key public decisions now[6].

Coastal Flooding

Coastal flooding (inundation) can occur during very high tides and is often exacerbated by storm surges. Recent research has identified that coastal flooding that might currently only happen once every hundred years on average could increase to at least a five-yearly event within just two to three decades as a result of climate change impacts[5].

Given the proximity of Hokitika's WWTP to the shoreline means the plant and ocean outfall are at risk of damage as a result of inundation and storm surge. In their overview of climate change projections for the West Coast, the MfE states that "*…infrastructure may face increased risk from coastal erosion and inundation, increased storminess and sea-level rise*[7]*."* This poses a significant risk for the Hokitika's WWTP which is adjacent to the coastline, as well as the ocean outfall structure itself which discharges into the Tasman Sea.

[4] Westland District Council (2021). Council meeting agenda – 14 September 2021. https://www.wcrc.govt.nz/repository/libraries/id:2459ikxj617q9ser65rr/hierarchy/Documents/Council/Meetings%2C%20Agendas%20and%20Minutes/Council%20Meetings/2021/Agenda/Council%20%26%20RMC%20Agenda%2014%20Septemeber%202021.pdf

[5] NIWA (2021). Coastal flooding likely to be main driver for adaptation. https://niwa.co.nz/news/coastal-flooding-likely-to-be-main-driver-for-adaptation

[6] Ministry for the Environment (2017). Preparing for coastal change. A summary of coastal hazards and climate change guidance for local government. https://environment.govt.nz/assets/Publications/Files/coastal-hazards-summary.pdf

[7] Ministry for the Environment (2018). Climate change projections for the West Coast Region. https://environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-west-coast-region/#what-could-this-mean-for-the-west-coast

2.2.4 Benefits of Investment

In addition to problems, participants at the problem definition workshop also identified project benefits. While a number of benefits were identified, the two main benefits of investment are summarised below:

- **Recognise and acknowledge Te Mana o te Wai:** This benefit acknowledges the need to prioritise the health and wellbeing of water bodies and freshwater ecosystems. This benefit was further defined as: "*Fulfilling kaitiaki obligations to protect the mauri of the water and care for the environment for the benefit of present and future generations.*"
- **Improve resilience to climate change:** A key benefit of investing in a WWTP for Hokitika is to ensure it is less vulnerable to the impacts of climate change and provides a long-term wastewater treatment solution for the town.

2.2.5 Investment Objectives

Three project investment objectives were identified that were derived from the project benefits statements. These were agreed by participants at the technical workshop in October 2021 and will form part of the criteria used to assess potential options in the Economic Case.

- **Investment Objective 1:** Avoid discharge of human waste directly to natural water bodies.
- **Investment Objective 2**: Meet regulatory standards for treated wastewater contaminants (e.g., organic pollutants, nutrients, pathogens, microplastics, pharmaceuticals).
- **Investment Objective 3:** Minimise risk of climate change impacts on the wastewater treatment system.

2.2.6 Investment Logic Map

An Investment Logic Map (ILM) provides the link between the agreed problems and benefits and investment objectives. It is a simple flowchart that aims to summarise the story of investment on a single page. The ILM for the Hokitika WWTP project is shown in Figure 8 below.

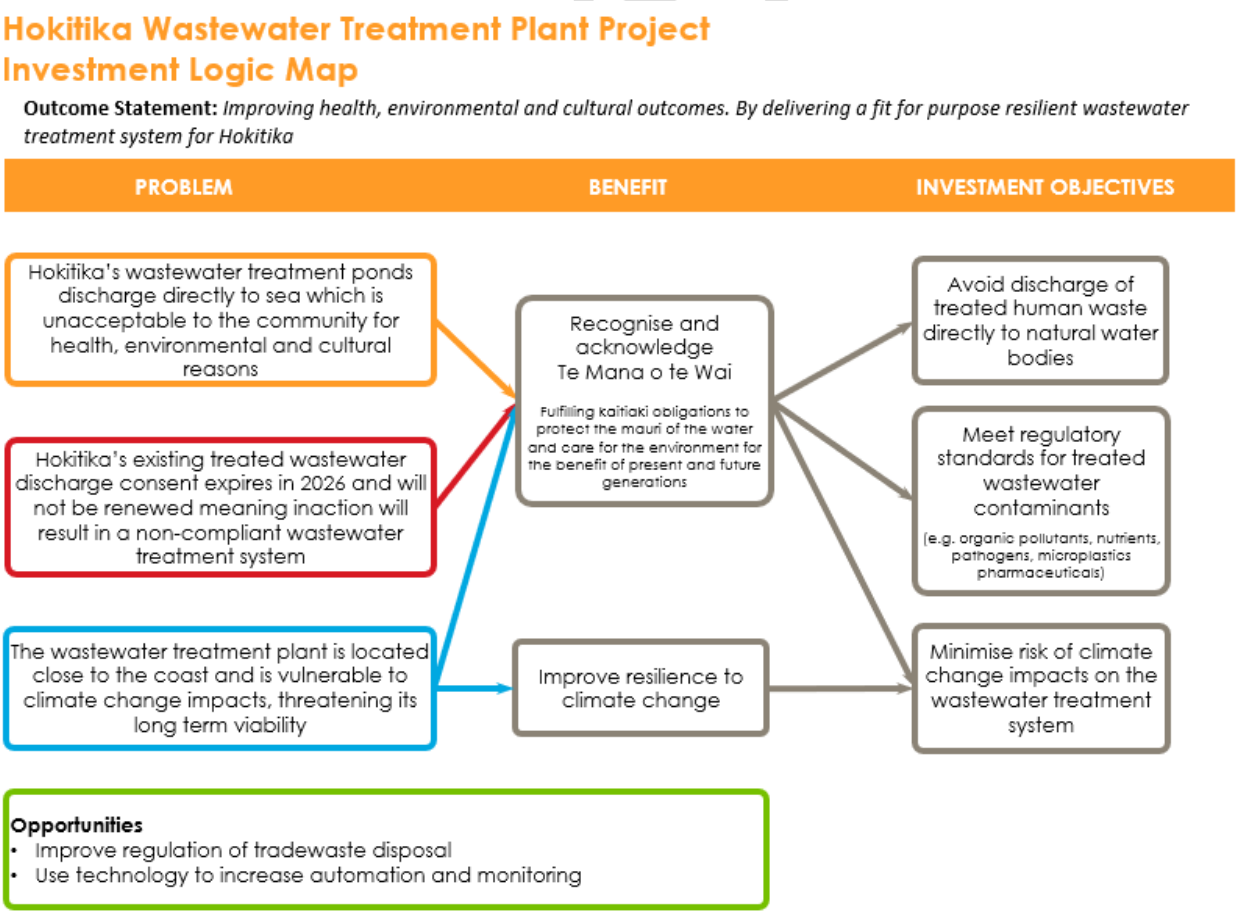

Figure 8: Investment Logic Map

2.3 Existing Arrangements and Business Needs

During October 2021 a technical workshop was held with local iwi representatives and staff from WDC and WCRC. The purpose of the workshop was to confirm the problems, benefits and investment objectives, define the scope of what the investment needs to deliver, and understand potential project risks, constraints and dependencies.
Table 3 below summarises the existing arrangements (current state) and confirms what each partner needs the investment to deliver (desired future state).

Table 3: Existing Arrangements and Business Needs

Investment Objective 1	**Avoid discharge of human waste directly to natural water bodies**
Existing arrangements	Discharge of wastewater to sea is through an outfall pipe located on the beach. The resource consent for this discharge expires in April 2026 and will not be replaced without investigation of alternative discharge options. The community was consulted twice through the Annual Plan process and supported exploring alternative options at an approximate cost of between $4.5 – $12 million. Poutini Ngāi Tahu presented a submission that detailed their repeated opposition to discharge of human waste to water. It was confirmed in the Adopted Annual Plan 2020/2021 that WDC would investigate a land-based option for the future disposal of Hokitika wastewater, in place of the ocean outfall pipeline option.
Business needs	The community and WDC need an effective, long term wastewater treatment solution for the town. The preference is to provide a system that does not discharge treated wastewater directly to a natural water body. However, all alternatives will need to be considered in the Economic Case.
Investment Objective 2	**Meet regulatory standards for treated wastewater contaminants (e.g., organic pollutants, nutrients, pathogens, microplastics, pharmaceuticals)**
Existing arrangements	Wastewater is currently treated using low-cost stabilisation ponds. Wastewater solids settle to the pond bottom, where they partially digest anaerobically and accumulate as digested sludge.
Business needs	A wastewater treatment system that has capacity to meet new level of service requirements for discharge over the lifespan of the system and meets future consent requirements. The treatment plant will have a minimum design life of 50 years. The current minimum standards for water treatment are under review and are expected to become increasingly stringent. The plant needs to have capacity to receive and treat wastewater in line with regulations as they change and will continue to evolve throughout the expected design life.
Investment Objective 3	**Minimise risk of climate change impacts on the wastewater treatment system**
Existing arrangements	Hokitika has a long history of coastal erosion with repeated phases of damage to coast-front properties and infrastructure. The WWTP ponds are located very close to the sea. MfE predicts that infrastructure on the West Coast may face increased risk from coastal erosion and inundation as a result of increased extreme weather events such as storms and sea-level rise. NIWA has identified that coastal flooding that might currently only happen once every hundred years on average could increase to at least a five-yearly event within just two to three decades.
Business needs	A wastewater treatment plant that is resilient to the impacts of climate change and provides a long-term wastewater treatment solution for the town.

2.4 Potential Business Scope and Key Service Requirements (Technical)

The potential business scope and key service requirements were discussed by participants at the October 2021 technical workshop. The purpose of defining the scope is to clearly outline the minimum requirements (i.e., 'must haves') of what the WWTP must deliver and achieve. Furthermore, elements that are out of scope were also confirmed.

Key service (minimum) requirements:

- Elevate the **mauri** of water and the environment.
- Protect the **public health** of the community and visitors.
- Treat the wastewater to the minimum standard to **gain resource consent.**
- Serve the **current Hokitika sewered areas.**
- Receive and treat **septage from unsewered areas** in the district.
- Provide for forecast population and tourism **growth**.
- Provide for **current connected industries.**
- Have a **design life** of 50 years.
- Be **resilient** to natural hazards (e.g., flooding, climate change, coastal erosion, seismic events, storm events).
- Be able to be designed, consented, constructed and commissioned by **2026.**
- Minimise adverse effects on **amenity values** (e.g., odour / visual / noise etc).
- Use **proven technology** that can be operated and maintained in the West Coast area.
- Affordability – must be affordable for the community to build and operate.
- Carbon footprint – no current policy. Desire is to reduce carbon footprint compared to existing scheme.
- Existing ponds – to be de-sludged and retired/repurposed.
- Retain existing stock effluent & campervan waste facility.

Out of scope:

- Sewer network improvements (except if required for new WWTP location).
- Private on-site effluent systems.

To inform the development of options, there are a number of service requirements that can be varied. They relate to treatment standards, the contributing reticulated sewer area, design population, industrial load, and the ability for future upgrades to provide an increased level of treatment.

The Do Minimum/Base Case is that a new WWTP would meet minimum requirements for resource consents and approvals, sludge would meet landfill requirements, the contributing reticulated sewer area would be as it currently is, and the design population would be based on the current population plus a low growth allowance. The reticulated industrial load would remain as it does now and there would be little scope for future upgrades to achieve an increased level of treatment.

Table 4 below details the potential scope for the variable service requirements, ranging from a business-as-usual scenario to a maximum scope scenario.

Table 4: Potential Scope – Variable Elements of WWTP

Elements	Business as Usual	Minimum	Intermediate	Maximum
Treatment Standards - Wastewater	Basic pond treatment	Meets minimum requirements for resource consents and approvals	Exceeds minimum requirements.	Achieves NZ-leading treatment standards.
Treatment Standards - Residuals	Sludge stored in base of ponds.	Sludge meets landfill requirements.	Meets Class B biosolids standard allowing restricted reuse.	Meets Class A biosolids standard allowing unrestricted reuse.
Contributing reticulated sewer area	Current sewer network	Current sewer network	Current sewer network plus provision for identified future growth areas (as per Spatial Plan).	Intermediate scope plus provision for outlying settlements / areas.
Design Population	Current population only (residential and tourism)	Current plus low growth allowance	Current plus medium growth allowance	Current plus high growth allowance
Industrial Load - reticulated	Current industries only	Current industries only	Current plus allowance for growth	
Ability to Upgrade in Future for Increased Level of Treatment	Limited	Little scope for future upgrades.	Easily upgradable in future to increase level of treatment.	

2.5 Main Benefits

Stakeholders identified the benefits at a workshop in October 2021, and these are shown as monetary and non-monetary benefits in Table 5 and Table 6 below.

Table 5: Analysis of potential benefits that can be expressed in monetary terms

Main benefits	Who benefits?	Direct / Indirect?	Description
WWTP is more resilient	All, WDC	Indirect	A more resilient WWTP will reduce the likelihood that WDC needs to carry out significant and costly unplanned work to protect or repair/replace the WWTP as a result of damage due to natural hazard events.
Economic / population growth is catered for	All	Direct	The new WWTP will allow Hokitika to grow and prosper into the future.
WWTP has a lower carbon footprint	All	Indirect	WWTP's produce greenhouse gas emissions. Reducing emissions is a potential benefit of a new WWTP, which may reduce Council's future carbon tax obligations. Reducing greenhouse gas emissions also strengthens the reputation of WDC, shows leadership and aligns with government policy.
Reduce reactive maintenance costs	All	Direct	A new WWTP will reduce reactive maintenance, and costs associated with this.

Main benefits	Who benefits?	Direct / Indirect?	Description
Improved monitoring	All	Direct	Improved monitoring of influent and treated wastewater will provide improved treatment performance, enable proactive operation and maintenance, and demonstrate compliance with required treatment standards.
Potentially lower operational costs depending on the solution	All, WDC	Direct	Depending on the scheme adopted, operational costs could be lower if the proposed solution costs less to operate.

Table 6: Analysis of potential benefits that can be expressed in non-monetary terms

Main benefits	Who benefits?	Direct / Indirect	Description
Public health is protected	All	Direct	An improved wastewater treatment and discharge system will protect the public from health risks of the wastewater in particular for recreation and food gathering in the beach and coastal marine area.
Mauri of the water is being sustained	All	Direct	Recognising and acknowledging Te Mana o te Wai as a key focus for the project will ensure the mauri of the water is being sustained.
Environment is protected	All	Direct	An improved wastewater treatment and discharge system will result in a minimal adverse effect on the environment and associated ecosystems (in particular water quality and associated flora and fauna).
Reduced visual impact from WWTP	All	Direct	Minimising the visual impact of the new WWTP will benefit the community and will enhance visitors' impressions of the amenity of the entrance to Hokitika.
Cultural, social, recreational	All	Direct, Indirect	The adverse effects of the current WWTP scheme on the community's cultural, social and recreational values may be reduced or avoided by an alternative scheme.
Reputational / community relationships	All, WDC	Direct	The WWTP upgrade process and outcome will positively enhance WDC's reputation and community relationships.
Mana of haukāika and Mana of WDC grows	All, WDC	Direct	The status of haukāika (home people) and of WDC is enhanced.

2.6 Main Risks

Risks arise from uncertain events that either improve or undermine the achievement of benefits. The main risks that might create, enhance, prevent, degrade, accelerate or delay the achievement of the investment objectives are identified and described in Table 7 below.

Table 7: Main Risks to achievement of the Investment Objectives

Main risk	Consequence (HML)	Likelihood (HML)	Comments and Risk Management Strategy
Difficulty in finding suitable locations for WWTP and / or land discharge area.	H	H	Identifying potential sites that are technically feasible and potentially available takes time. The process of identifying alternative options and locations has commencing early, minimising this risk.
Difficulty in purchasing land or obtaining easements.	H	H	Negotiating and settling purchase and easement agreements with landowners takes time. This business case process has commenced five years before the consent expires, providing time to undertake this process. A comprehensive alternatives assessment is also essential, both for designating land for wastewater management purposes, and for the resource consent process. It is also essential if WDC needs to take a compulsory purchase pathway to acquire land to achieve an outcome.
Opposition from Neighbours.	H	H	Likely opposition from neighbours to any proposed new WWTP or land discharge site(s). Concerns could include loss of amenity, environmental, public health impacts and effects on property values. To manage this risk, selection of potential sites will aim to maximise isolation and / or mitigation options to reduce potential neighbour issues. Mitigation measures will be provided in the proposal to address potential effects. In addition, a communication strategy and an engagement and consultation programme will be developed to listen to neighbours' concerns and keep them informed on progress and involved.
Impacts from 3 Waters Reforms on project direction and governance.	H	M	Manage by following a proven business case process, that provides an audit trail of project decision making to avoid any new water authority revisiting decisions.
Regulatory (RMA reform, environmental standards).	H	M	Obtain and use expert advice on any changing regulations to ensure design/consenting decisions consider and take account of regulatory changes and ongoing guidance that might be provided.
Opposition from stakeholders and community on preferred option	H	H	Risk includes: - Full or partial opposition from stakeholders on matters that cannot be addressed. - Public perception that the process is happening in isolation from the community. Limited community involvement at this stage. Ensure consultation/engagement strategy provides meaningful opportunities for engagement, and that concerns are accommodated where appropriate. Effectively inform and engage stakeholders and the public at suitable points throughout the process.
Natural hazards	H	H	Design to appropriate standards to mitigate risks.

Main risk	Consequence (HML)	Likelihood (HML)	Comments and Risk Management Strategy
Silver Fern Farms – high percentage contribution to and impact on the scheme	H H H H	L H M M	1. Costs of proposed scheme (capital and operating) are too high and uneconomic for SFF's operation causing delays, potential plant closure or redesign of scheme. 2. SFF decide to withdraw from the scheme late in the project resulting in redesign and delays. 3. SFF closes completely or scales down post commissioning resulting in excess capacity and potential financial shortfall. 4. SFF exceed consented trade waste loads into the new WWTP causing reduced performance or consent non-compliance. Risk management strategies include: - Involve SFF early in the process. - Investigate opportunities for onsite pre-treatment. - Investigate opportunities for separating industrial and human wastewater (separate trade waste sewer) and treating separately. - Negotiate a trade waste consent with SFF with appropriate monitoring, charging and non-compliance conditions.
Cost	H	M	Affordability. Regulatory approval costs as well as construction and ongoing operational costs. Likely to impact the project.
Governance approvals – political risk	H	M	Election in 2022 that may lead to political risks for the project, such as having to relitigate direction of the project.
Reputational risks	H	L	Subcommittee – may be dissent/ disagreement. Need communications to be endorsed. Project comms and engagement plan sets out strategy and responsibilities, including approval of engagement activities and, media and public communications.

2.7 Key Constraints and Dependencies

A constraint is a limitation imposed by proposal (e.g., land use, geology or the environment), while a dependency relates to an external influence on the project (e.g. external factors or actions of others). A list of the potential project constraints and dependencies is shown in Table 8 below.

Table 8: Key Project Constraints and Dependencies

Constraints	Notes
Budgetary constraint	Fixed figure amount in LTP. Cost exceeding this will require further annual plan consultation and additional cost to ratepayers.
Finding right location	Could be on private land.
Time	Consent runs out April 2026. Need plant designed and commissioned at least 6-12 months prior. Must select preferred option early, including time for consultation. Allow time for concept design to consent requirements can be identified. Allow adequate time to undertake comprehensive site investigations (including seasonally constrained assessments) early, for the design to be amended if necessary, and for engagement and consenting to be completed in time for construction and commissioning. If the expiring consent needs extending to allow for this, application must be lodged at least 6 – 8 months before expiry.
Right type of land, size, willing seller	Natural wetland not a suitable location for treatment. If using a wetland at part of the treatment system, it will need to be a constructed wetland. While land with a forest canopy can hold greater water volume (capacity), Hokitika has no such areas resulting in higher volumes of runoff.
Climate	The West Coast has high rainfall, which impacts on feasibility of land options. A large area of land with sufficient wet weather storage capacity (or an alternative approved disposal pathway) is needed as on days of heavy rainfall it is not possible to irrigate.
Geology	Land with suitable subsurface geology is needed to ensure the ground has the ability to receive wastewater.
Dependencies	**Notes and Management Strategies**
Minimum level of treatment	The level of treatment is dependent on the receiving environment's capacity to assimilate e.g., long ocean outfall into the Tasman Sea requires a lower level of treatment than discharge to land or inland waterways. Key for design of plant and for engagement and consenting strategy.
Silver Fern Farms	SFF is a significant contributor to Hokitika's WWTP (at least 50% of the load).
Location of the new WWTP will potentially have some impact on the network	The location of the new WWTP will require some changes to how the wastewater is conveyed to that location e.g., additional pump stations and rising mains, and possibly some pumping changes with the network itself.
Landfill capacity	A dependency of the project is the ability of the landfill to reconfigure layout / adapt practices to take a steady stream of sludge as opposed to 15 yearly bulk deposits. This would accelerate filling of the landfill as need to cover each deposit.

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