

# Hokitika Wastewater Upgrade Project

## Options Assessment Framework

### 1 Introduction

Identifying and assessing alternative options is a requirement of the Resource Management Act (RMA) and also the New Zealand Coastal Policy Statement (NZCPS) for discharges into the Coastal Marine Area (CMA). This report outlines the 'sieving' process that will be used to assess individual components and potential wastewater schemes. It will be used to inform and seek agreement from decision makers prior to assessment taking place. The report outlines the proposed process, assessment criteria, and defines the parameters and rationale for assessment. It also includes a summary of the options development process and long list of options that were identified for each component of the wastewater scheme to provide context for the assessment process.

The key outcome of the assessment process is to identify a wastewater treatment scheme that provides the Best Practicable Option (BPO), as defined in the RMA, for Hokitika; that is, an option that provides the most benefit, is affordable and prevents or minimises any adverse effects on the environment<sup>1</sup>.

This assessment process on a BPO needs to fully integrate with the business case process as outlined in the Indicative Business Case report (Nov 2021).

### 2 Summary of Options Development Process

An options development workshop was held on 24<sup>th</sup> November 2021 to identify potential options for the wastewater scheme. Improvements to Hokitika's WWTP focused on three key elements:

- the treated wastewater receiving environment,
- the location of the wastewater treatment plant, and
- wastewater inputs management.

The correlation between each of these 'base scheme elements' are shown in Figure 1 and discussed in the following sections. As part of the assessment process, options for each of the base scheme elements will be combined to develop a long list of total schemes. Note the collection, network and conveyance of wastewater to the treatment plant is out of scope for this project and is not being considered as part of the scheme (with the exception of transferring the wastewater to the new WWTP) .

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<sup>1</sup> <https://www.legislation.govt.nz/act/public/1991/0069/latest/DLM235252.html>

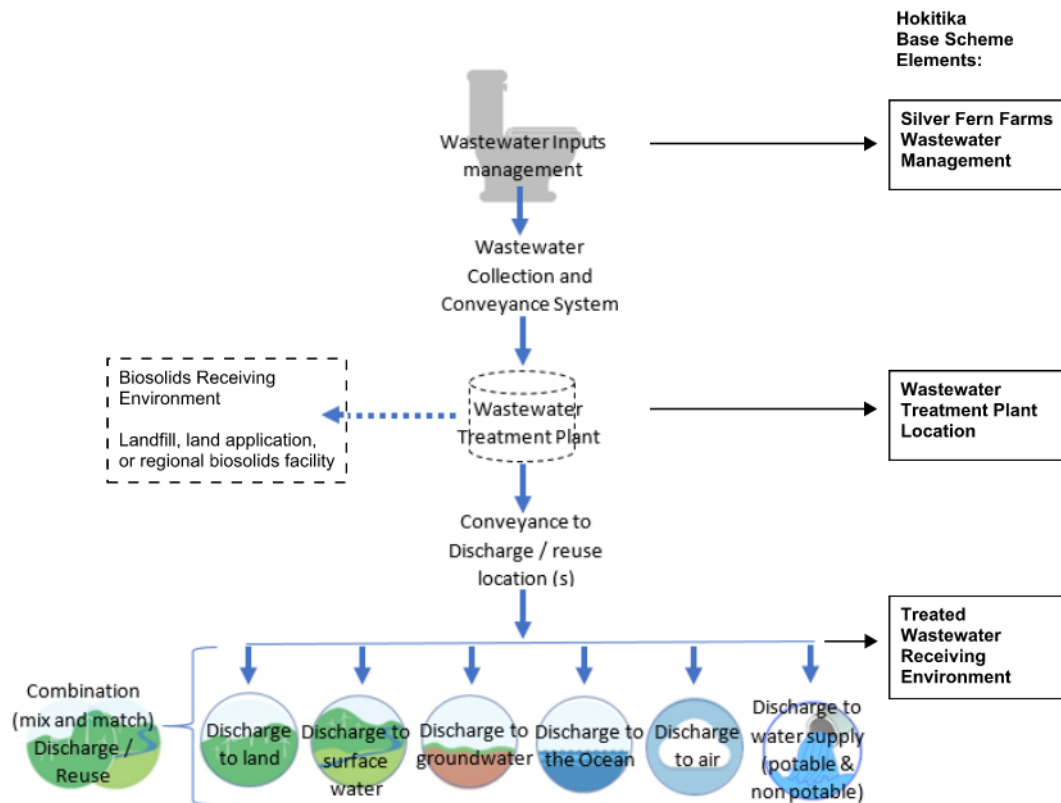


Figure 1: Hokitika Wastewater Base Scheme Elements

## 2.1 Treated Wastewater Receiving Environment (and Minimum Level of Treatment)

The location where treated wastewater re-enters the environment (e.g., ocean, land, river, re-use) also defines the *minimum* level of treatment needed when assessed on an “environmental effects basis”, therefore these two elements can be combined. There are two main considerations when determining the minimum level of treatment on this basis for a particular receiving environment location: the sensitivity of the receiving environment and its ability to assimilate the treated wastewater without significant adverse effects; and proximity to the public and the associated risk of illness (either through direct contact or the consumption of food or water). Note, in some cases stakeholders and Councils have decided to provide a higher level of treatment than the minimum needed from an effects-based assessment. Scheme enhancement options for a higher level of treatment than the minimum will be considered following development of a long list of Base Scheme Options (see Section 2.4).

In some circumstances an option may have two receiving environments; for example, a land discharge option may have insufficient land area to accept all the wastewater especially in wetter/winter periods, so would use an ocean or river as a secondary receiving environment. The secondary environment could be used in conjunction with the primary environment (i.e., split flows) or the system could alternate between the two environments depending on the conditions (e.g., summer / winter or wet weather / dry weather modes). In this study, the receiving environment that receives the most treated wastewater is designated as the *primary* receiving environment and any other supplementary receiving environment is designated as the *secondary* receiving environment.

Five potential wastewater receiving environment options were identified during the workshop as follows:

- Tasman Sea,
- Hokitika River,
- Land,
- Groundwater,
- Treated Wastewater Reuse.

## 2.2 Wastewater Treatment Plant Location

The current WWTP location has been identified as a key issue due to its proximity to the coastline and risk from flooding and coastal erosion. Therefore, selecting a new WWTP location is an important element to be considered. Whilst ideally the new WWTP location would be located close to the chosen receiving environment (see above), treated wastewater can be pumped from the WWTP to the discharge location if needed, so this becomes a cost issue and so the discharge location may not be the most important driver in site selection.

Seven potential locations for Hokitika's WWTP were identified during the workshop as follows:

- Existing WWTP Location
- West of Airport
- Airport
- East of Airport
- Blue Spur Area
- Transfer Station
- South side of Hokitika River

## 2.3 Wastewater Input Management

Opportunities to reduce the quantity or improve the quality of wastewater entering the WWTP can also be considered. Initiatives to reduce water use in the community can reduce the volume of wastewater that needs to be treated, while actions that can improve the quality of wastewater (such as pre-screening and other pre-treatment techniques for industrial wastewater) can reduce the level of treatment required.

### 2.3.1 Opportunities within the Community

Initiatives identified during the workshop to reduce water use in the community include the following:

- Water meters. And associated user pays approach.
- Water efficient household plumbing, e.g., water efficient shower heads.
- Infiltration and Inflow reduction programmes. (*work on this is underway already*)

Other initiatives that would promote efficient use of domestic water could include:

- Subsidising water efficient measures.
- Pressure control/reduction in the reticulated water supply.
- Low pressure wastewater collection schemes.

### 2.3.2 Opportunities associated with Industrial Wastewater

Silver Fern Farms meat processing plant is currently the primary industrial contributor of wastewater to the Hokitika WWTP. The wastewater from the processing plant makes up a large proportion of the total flow and contaminant load to the WWTP. Therefore, the way the Silver Fern Farms wastewater is managed will have a large impact on a new WWTP process design and cost.

Currently the Silver Fern Farms wastewater is discharged into the sewer network, just prior to the treatment ponds, following preliminary on-site treatment. The Silver Fern Farms wastewater characteristics are different to domestic wastewater, in that it has a much higher strength, and most of the waste generated from the plant does not contain human waste. Therefore, there is an opportunity to manage this waste in a more efficient and cost-effective way than through the domestic WWTP. This has been done in other coastal communities in New Zealand with large wet industries, whereby the non-human industrial waste is managed and treated separately from the domestic waste.

Options for managing industrial wastewater inputs from Silver Fern Farms were identified during the workshop as follows:

- Status Quo
- Enhanced Pre-Treatment
- Diversion to Combined Ocean Outfall
- Diversion to Separate Ocean Outfall

## 2.4 Base Scheme Enhancements

There are opportunities to enhance the potential base schemes to form additional sub-options. Examples of potential enhancements to the base wastewater schemes include:

- **Enhanced Level of Wastewater Treatment**

As described in the previous section, the receiving environment location defines the minimum level of treatment needed to avoid adverse effects on the environment and public health, when the assessment is based on an environmental effects basis. Enhanced levels of treatment (above the minimum) may be desirable (for example, to future-proof against tighter consent standards, to provide flexibility for future water reuse, or in response to community expectations to “do more than the minimum”).

- **Enhanced Biosolids<sup>2</sup> Management**

Currently sludge (the by-product of wastewater treatment) is stored in the base of the WWTP ponds for around 20 years before the ponds need to be de-sludged. Sludge is removed from the ponds, dewatered and disposed of to a landfill. While this process is likely to form part of the base scheme options to manage sludge (“business as usual”), enhanced biosolids management strategies may be desirable. These would involve treating sludges to specified stabilisation and contaminant levels that classify the product as a biosolid. Improving how biosolids are managed provide more flexibility for disposal/reuse and contribute to reducing greenhouse gas emissions from landfill disposal (or to recover energy through anaerobic digestion).

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<sup>2</sup> Note: The term “biosolids” is used for sludges that have been treated to minimum stabilisation, pathogen and contaminant standards as described in Guidelines for Beneficial Use of Organic Materials on Productive Land (Water NZ, 2017).

# 3 Options Assessment Process

The options assessment process uses a 'sieving' approach to eliminate options from the long list to ultimately define a preferred 'best practicable option' for Hokitika's wastewater scheme. The options assessment process consists of the following processes which are shown diagrammatically in Figure 2 below and described below. A schematic layout of how the assessment process would work is then shown in Figure 3.

1. **Identify Base Scheme Elements Long List** – a long list of base scheme elements is identified for each of the three key elements: the treated wastewater receiving environment, the location of the wastewater treatment plant, and wastewater inputs management.
2. **Carry out Fatal Flaw Assessment** – the long list for each base scheme element will be assessed to eliminate options that have a clear and significant defect that prevents the option from being considered further. Any uncertainties should not result in the elimination of a potential element at this stage; further investigation of potential options should be undertaken before it is eliminated at this stage or a later stage. The outcome of this process is a short list of options for each of the three elements.
3. **Develop Base Scheme Options Long List** – short listed scheme elements are combined to form a long list of base scheme options. Note: only combinations of elements that deliver feasible and coherent schemes will be developed, rather than a complete list of every potential scheme.
4. **Consider additional Base Scheme Enhancements** – additional enhancement options and variations will be considered to produce a complete long list of compiled scheme options.
5. **Carry out Traffic Light Assessment** – an initial comparative assessment of each scheme against multiple criteria will be undertaken based on how well each scheme option meets the relevant criterion. The criterion uses the 'traffic light colours of red, orange or green to display if the option fails to meet criterion, marginally meets criterion or meets criterion well. Options that do not perform well (i.e., receive substantial red scores) will be eliminated. The outcome of this stage is a short list of potential wastewater schemes. Detailed investigation and further evaluation of the shortlisted schemes will be undertaken prior to the next stage of assessment.
6. **Carry out Multi Criteria Analysis (MCA)** – the MCA is a decision aiding tool. This stage uses defined scores to assess the performance and feasibility of each shortlisted scheme against agreed criteria. Weightings will be applied to each criterion and incorporated into the assessment to differentiate between the importance or significance of the criteria. Sensitivity testing will also be applied to determine the influence of weighted criterion on the outcome of the assessment. The outcome of this stage is a **preferred option** for Hokitika's wastewater scheme.
7. **Consider the Compiled Scheme Options against the Best Practicable Option (BPO) definition** – In parallel with the Traffic Light Assessment and the MCA, the Potential Wastewater Schemes would be considered in the context of the BPO as defined in Section 2 of the Resource Management Act (RMA) as follows:
  - The BPO is the best method for preventing or minimising the adverse effects of a discharge on the environment having regard to —*
  - a) *the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
  - b) *the financial implications, and the effects on the environment, of that discharge option when compared with other options; and*
  - c) *the current state of technical knowledge and the likelihood that the option can be successfully applied.*Applying an RMA lens over the scheme selection process will help align the business case outcomes with RMA requirements and support a resource consent application.

The criteria for each stage of assessment have been developed by the project team for presentation to the Oversight Subcommittee and Technical Working Group for further refinement and agreement.

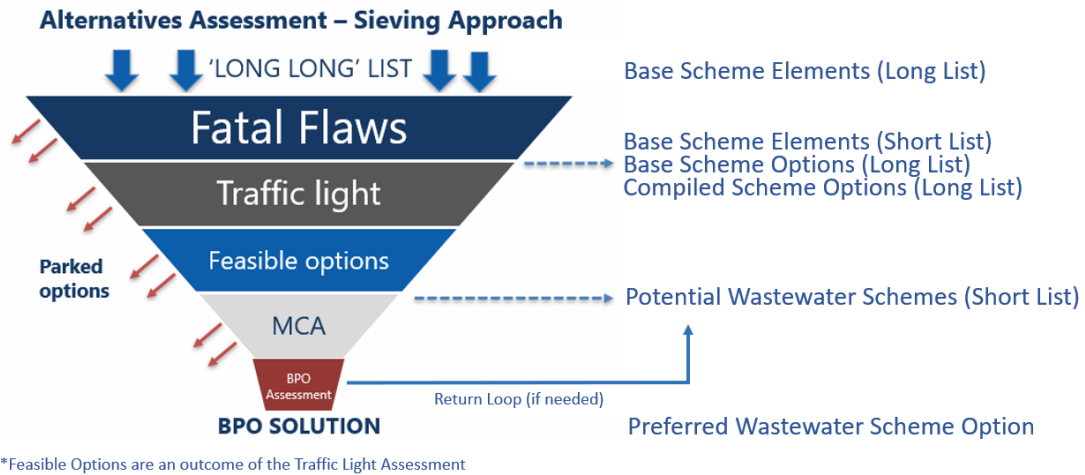
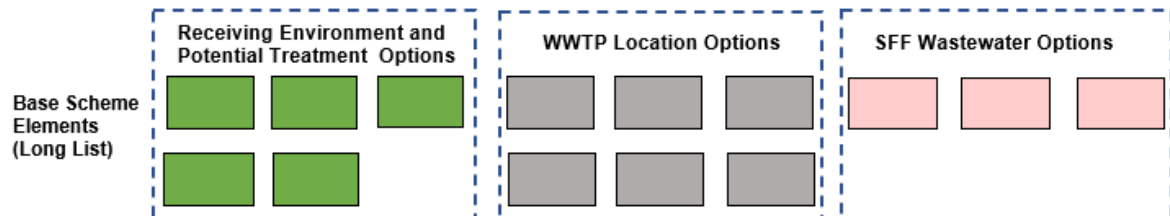
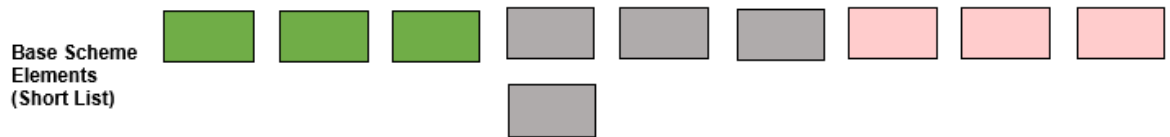


Figure 2: Assessment of Alternatives – Sieving Approach

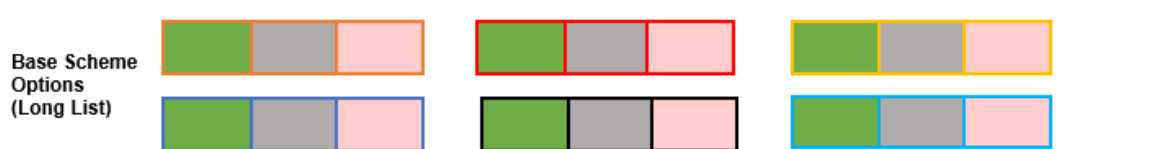
1. Identify Base Scheme Elements Long List



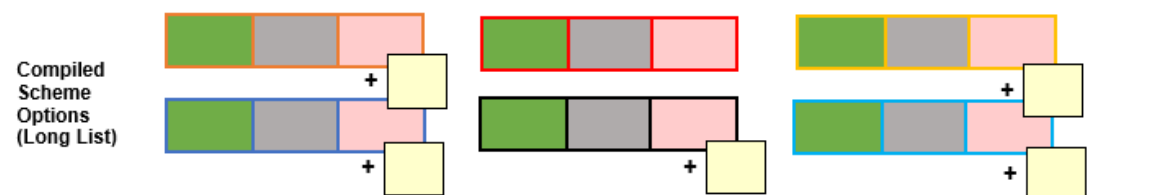
2. Carry out Fatal Flaw Assessment



3. Develop Base Scheme Options Long List



4. Consider additional Base Scheme Enhancements



5. Carry out Traffic Light Assessment



6. Carry out Multi Criteria Analysis (MCA)

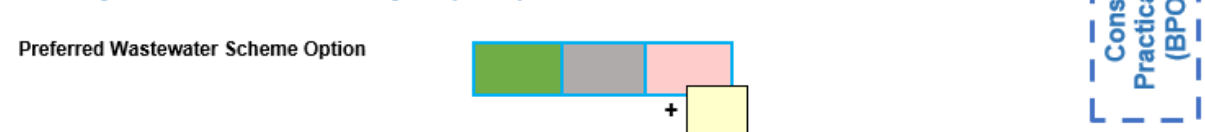


Figure 3: Options Assessment Process – Schematic Layout

# 4 Assessment Process

This section defines the criteria that will be used in each stage of the assessment process, as well as the scoring parameters and rationale for assessment. Criteria have been developed based on the project business case investment objectives, minimum service requirements (the 'must haves' identified in the technical workshop in October 2021), the four wellbeings as defined in the Local Government Act 2002, and the business case 'critical success factors'. A summary of the criteria used at each stage of the assessment is provided in Table 4-1 below. In the table a 'Y' indicates the criterion is included, and an 'N' indicates that criterion is not included in that assessment stage. Identification of criterion to exclude from the fatal flaw assessment process is carried out in Section 4.1.

**Table 4-1: Summary of criteria used at each stage of the assessment process**

Scope	Criterion	Assessment stage		
		Fatal Flaw Assessment	Traffic Light Assessment	MCA
<b>Investment Objectives</b>	Avoid discharge of treated human waste directly to natural water bodies.	Y	Y	Y
	Meet regulatory standards for treated wastewater contaminants	N	Y	Y
	Minimise risk of climate change impacts on the wastewater system.	Y	Y	Y
<b>Minimum Service Requirements</b>	Public health risk	Y	Y	Y
	Alignment with the planning framework	Y	Y	Y
	Constructability	Y	Y	Y
	GHG emissions / Carbon footprint	N	Y	Y
	Infrastructure and technology	Y	Y	Y
<b>Four Wellbeings</b>	Māori cultural	Y	Y	Y
	Natural environment	Y	Y	Y
	Social and community	N	Y	Y
	Economic development and growth	Y	Y	Y
<b>Critical Success Factors</b>	Affordability	N	N	Y
	Technical feasibility	N	N	Y

## 4.1 Fatal Flaw Assessment Criteria

The purpose of the fatal flaw assessment is to eliminate element options that cannot be achieved or pose a significant risk such that the option is not worth pursuing. Fatal flaws may relate to aspects that cannot be consented under the RMA, where property cannot be acquired, or where unresolvable legal challenges may arise. Options that are highly difficult or expensive are not considered fatal flaws and should remain in the mix and be scored appropriately.

Fatal flaw screening is based on what we know at this initial assessment stage. For some criterion, there is insufficient data or uncertainty at this initial assessment stage, and these criteria have been excluded from the fatal flaw assessment. A description of the fatal flaw criteria (and the rationale for excluding potential criterion from this stage of the assessment) is provide in Table 4-2 below.

**Table 4-2: Fatal Flaw Assessment Criteria**

Scope	Potential criterion	Description (and rationale for exclusion where relevant)	Use as Fatal Flaw Assessment criterion?
Investment Objectives	Avoid discharge of treated human waste directly to natural water bodies.	<ul style="list-style-type: none"> <li>Option results in direct discharge of treated human waste to natural water bodies, with no mitigation possible (e.g., Papatūānuku land passage or wetland).</li> </ul>	Yes
	Meet regulatory standards for treated wastewater contaminants.	<ul style="list-style-type: none"> <li>Option does not produce the right level of treatment to meet regulatory standards.</li> <li><b>As the regulatory standard is dependent on the receiving environment, this criterion can only be used to screen complete WWTP schemes, not individual elements.</b></li> </ul>	No
	Minimise risk of climate change impacts on the wastewater system.	<ul style="list-style-type: none"> <li>Option is exposed to significant natural hazards and climate change posing an unacceptable risk from coastal erosion, inundation and flooding.</li> </ul>	Yes
Minimum Service Requirements	Public health risk	<ul style="list-style-type: none"> <li>Option will result in a significant increase in public health risk.</li> </ul>	Yes
	Alignment with the planning framework	<ul style="list-style-type: none"> <li>Option does not align with the requirements of the statutory. planning instruments that apply to the option meaning consents are very difficult or impossible to secure.</li> </ul>	Yes
	Constructability	<ul style="list-style-type: none"> <li>Option has insufficient land area.</li> <li>Option is unsuitable for site conditions (e.g., topography, geology, soil, groundwater conditions).</li> <li>Any other known property impacts e.g., land is highly unlikely to be obtained, unacceptable impacts on property.</li> </ul>	Yes
	GHG emissions / Carbon footprint	<ul style="list-style-type: none"> <li>Option will generate unacceptable level of carbon emissions.</li> <li><b>Unlikely to have specific knowledge on carbon footprint for each option so criterion should be excluded from this stage.</b></li> </ul>	No
	Infrastructure and technology	<ul style="list-style-type: none"> <li>Technology is unreliable, unproven, unavailable or is not easily operated or maintained on the West Coast.</li> <li>Option cannot accommodate upgrades to meet future standards.</li> </ul>	Yes



Scope	Potential criterion	Description (and rationale for exclusion where relevant)	Use as Fatal Flaw Assessment criterion?
Four Wellbeings	Māori cultural	<ul style="list-style-type: none"> <li>Option is unacceptable to Mana whenua cultural and spiritual values?</li> </ul>	Yes
	Natural environment	<ul style="list-style-type: none"> <li>Option poses potentially significant adverse effects on the natural environment (e.g., air and water quality, terrestrial and aquatic ecology, soils, visual amenity values).</li> </ul>	Yes
	Social and community	<ul style="list-style-type: none"> <li>Option is unacceptable socially, resulting in visual, noise or amenity impacts.</li> <li>Option poses an unacceptable adverse effect on social and community values, such as future land use, recreational activities, food gathering.</li> <li><b>Unlikely to be defined at the initial stage of the assessment so should be excluded from the fatal flaw assessment.</b></li> </ul>	No
	Economic development and growth	<ul style="list-style-type: none"> <li>Option is unable to cater for current or projected resident and tourist populations and industrial activity.</li> <li>Option lacks flexibility for future staging and is likely to constrain growth (within District Plan limits) and economic development in the region.</li> </ul>	Yes

## 4.2 Traffic Light Assessment Criteria

Following the fatal flaw assessment, the remaining shortlist of scheme elements will be combined, with enhancements added as applicable to create a long list of potential wastewater schemes. These schemes will be screened use a comparative 'traffic light' assessment, where options that are not feasible or are unlikely to achieve the desired outcomes or benefits of investment will be eliminated. The outcome of this stage is a short list of potential wastewater schemes that will be further investigated and progressed to the MCA assessment stage. The assessment criteria and parameters for the 'traffic light scoring' for each criterion are provided in Table 4-3 **Error! Reference source not found.** below.

**Table 4-3: Parameters for Traffic Light Assessment 'scoring'**

Item	Criterion	Description	Assessment Description		
			Meets Criterion Well	Marginally Meets Criterion	Fails to Meet Criterion
1	<b>Avoid discharge of treated human waste directly to natural water bodies.</b>	How well does the option avoid discharge of treated human waste directly to natural water bodies?	Option does not discharge treated human waste directly to natural water bodies	Option may discharge treated human waste directly to natural water bodies but can be mitigated (e.g., via Papatūānuku channel)	Option discharges treated human waste directly to natural water bodies
2	<b>Meet regulatory standards for treated wastewater contaminants (in terms of RMA effects assessments).</b>	To what extent does the option meet the required regulatory standards for treated wastewater contaminants?	Option meets regulatory standards	Option may not meet all regulatory standards but the effect of the non-compliance is moderate / can be appropriately mitigated	Option does not meet regulatory standards which results in a significant adverse effect that cannot be avoided, remedied or mitigated
3	<b>Minimise risk of climate change impacts on the wastewater system.</b>	To what extent does the option minimise the risk of exposure from climate change /natural hazard impacts?	The option is not unduly exposed to natural hazard and / or climate change risks.	The option is moderately exposed to natural hazard or climate change risks, but they can be appropriately avoided or mitigated.	The option is highly exposed to natural hazard and / or climate change risks which cannot be appropriately avoided or mitigated.
4	<b>Public health risk</b>	How well does the option minimise the public health risks associated with wastewater treatment?	Meets all public health standards and guidelines plus adds multiple barriers	Option may not minimise public health risks but can be mitigated	Option is not expected to minimise public health risks
5	<b>Alignment with the planning framework</b>	How well does the option align with the provisions of the relevant planning framework?	The option is consistent with the planning framework, and the consent process is likely to be straightforward	There is some misalignment between the option and the planning framework, but no fatal flaws that cannot be addressed	The option is contrary to the planning framework in multiple ways, and consents are unlikely to be secured

Item	Criterion	Description	Assessment Description		
			Meets Criterion Well	Marginally Meets Criterion	Fails to Meet Criterion
6	<b>Constructability</b>	How straightforward is construction of the scheme in relation to site conditions, receiving environment and property impacts?	Site conditions are favourable, and the construction process is likely to be straightforward	Site conditions may present some challenges, but these are likely to be overcome or mitigated	Site conditions are complex and are likely to be too challenging to pursue option
7	<b>GHG emissions / Carbon footprint</b>	Relative assessment of whole-of-life carbon footprint (embodied plus operational emissions)	Significantly reduced carbon footprint relative to current	Reduced carbon footprint relative to current	Similar or increased carbon footprint relative to current
8	<b>Infrastructure and technology</b>	To what extent does the option use reliable, proven, practical technology, that can be operated and maintained on the West Coast.  And does the option have the flexibility to accommodate upgrades to meet future standards?	Option uses reliable, proven and available technology, and can be operated and maintained on the West Coast.  Option can easily accommodate upgrades to meet future standards	Option uses proven technology but would require upskilling of operators and can be maintained on the West Coast.  Option can accommodate upgrades to meet future standards	Option uses new relatively unproven technology or requires highly skilled operators or high operator input and requiring input from outside the West Coast.  Option cannot accommodate upgrades to meet future standards
9	<b>Māori cultural</b>	To what extent does the option recognise the partnership between the Crown (WDC) and Mana whenua (local iwi)?  To what extent is the option likely to have adverse impacts on Mana whenua cultural and spiritual values?	Option aligns well with local iwi cultural and spiritual values as articulated by Mana whenua. Rangatiratanga of the Crown and Mana whenua is achieved.	Option is cognisant of local iwi cultural and spiritual values but the adverse effects on those values cannot be avoided completely but can be somewhat mitigated.	The option is offensive and contradictory to local iwi cultural and spiritual values and significant adverse effects cannot be avoided or suitably mitigated and is not mana enhancing to either partner.
10	<b>Natural environment</b>	How well does the option avoid or minimise adverse effects on the natural environment (e.g., air and water quality, terrestrial and aquatic ecology, soils, visual amenity values)?	Option is likely to avoid significant adverse effects and result in only minor effects on the natural environment	Option is likely to result in moderate effects, but these can be suitably mitigated	Option is likely to result in significant adverse effects which cannot be suitably remedied or mitigated

Item	Criterion	Description	Assessment Description		
			Meets Criterion Well	Marginally Meets Criterion	Fails to Meet Criterion
11	<b>Social and community</b>	To what extent does the scheme effect social and community values such as amenity values, noise odour and visual impacts, and/or effect future land use, recreational activities and food gathering?	Option likely to provide enhanced / positive long-term effects on social or community values	Option likely to have no net effect on social or community values, or a moderate effect that can be suitably remedied or mitigated.	Option likely to have significant adverse effects on social or community values that cannot be avoided, remedied or mitigated.
12	<b>Economic development and growth</b>	How well will the option support the population and economic growth, with flexibility to accommodate future growth?	Option easily upgradable to accommodate additional growth capacity	Option may provide some flexibility for additional growth capacity	Option does not provide flexibility for additional growth capacity

## 4.3 Multi Criteria Analysis (MCA) Criteria

The final stage of assessment is to evaluate the shortlisted schemes using a Multi-Criteria Analysis (MCA) process. MCA's are used in a wide range of infrastructure projects to assist in decision making. The process is commonly used to assess different options against both quantitative and qualitative criteria.

Decisions are informed by ranking the overall performance of options, which is achieved by assigning scores to each option against the agreed criteria. Both business case and RMA criteria from the traffic light assessment have been brought through to the MCA screening for consistency, although the investment objectives have been combined into a single criterion as all options should achieve these by this stage of the assessment. Additional business case criteria (referred to as 'critical success factors') have also been included, covering affordability and technical feasibility. Note, two criteria that form part of the business case process have been excluded to avoid 'double counting' as these have been captured by other criteria:

- **Value for money:** Affordability and value for money have been combined into a single 'Affordability / Financial' criterion as they assess similar factors.
- **Supplier capacity and capability:** this criterion captures how well does the option match the ability of potential suppliers to deliver required services. This criteria forms part of the 'Infrastructure and Technology' criterion, which captures whether the option use reliable, proven and practical technology and is operationally resilient.

Scores for each criterion have been defined ranging from 1 to 5, where 1 means the option fails to meet or align with the criterion, whereas 5 strongly supports or aligns with the criterion. This MCA process occurs once significant further evaluation and investigation of the shortlisted schemes is undertaken. This means some scores for the same schemes may vary as more information becomes available.

The contribution that each criterion gives to the sum of scores for an option is weighted to reflect the decision makers' beliefs about the relative importance of the different criterion (refer to sensitivity analysis in Section 4.3.1). The assessment criteria and parameters for scoring are provided in Table 4-4 below.

**Table 4-4: Multi Criteria Analysis (MCA) Criteria**

Scope	Business case critical success factors	Description	Business Case and RMA Criterion	Score	Assessment description for each criterion
Investment Objectives		How well does the option support the agreed investment objectives and align with or meet the agreed minimum service and four wellbeings requirements?	<ul style="list-style-type: none"> <li>• Investment objectives (combined)</li> </ul>	5	Strong Support
				4	Good support
				3	General support
				2	Weak support
				1	Fails to support
Minimum Service Requirements	Strategic fit and business needs	How well does the option support the agreed investment objectives and align with or meet the agreed minimum service and four wellbeings requirements?	Each criterion to be separately assessed: <ul style="list-style-type: none"> <li>• Public health risk</li> <li>• Alignment with the planning framework</li> <li>• Constructability</li> <li>• GHG emissions / carbon footprint</li> <li>• Infrastructure and technology</li> </ul>	5	Strong alignment
				4	Good alignment
				3	General alignment
				2	Weak alignment
				1	Fails to align

Scope	Business case critical success factors	Description	Business Case and RMA Criterion	Score	Assessment description for each criterion
Four Wellbeings			Each criterion to be separately assessed: <ul style="list-style-type: none"> <li>• Māori cultural</li> <li>• Natural environment</li> <li>• Social and community</li> <li>• Economic development and growth</li> </ul>	5	Strong alignment
				4	Good alignment
				3	General alignment
				2	Weak alignment
				1	Fails to align
Critical Success Factors	Potential affordability	How affordable is the option?  Relative assessment of whole of life costs of the options as represented by the Net Present Value (NPV).	<ul style="list-style-type: none"> <li>• Affordability / Financial (ranking)</li> </ul>		Rank lowest NPV cost (5) to highest NPV cost (1)
	Potential achievability	How well is the option likely to be delivered?  What is the degree of engineering complexity?  How easy will it be to design, construct and manage the option?  Can the option be delivered within the required timeframe?	<ul style="list-style-type: none"> <li>• Technical Feasibility</li> </ul>	5	The design, construction and management of the option is straightforward.
				4	The design, construction and management of the option is relatively straightforward.
				3	Option is uncomplicated but there may be some challenges in design, construction or management, which can be overcome.
				2	Option somewhat complex and will be challenging to design, manage and/or construct.
				1	Option is complex and will be challenging to design, manage and/or construct.

### 4.3.1 Sensitivity Analysis

In general, some criteria are considered more important than others. Sensitivity analysis uses weightings to reflect beliefs about how important a particular criterion is compared to other criteria and to test areas of uncertainty. Applying different weightings scenarios is useful to consider the impact of different uncertainties and to test whether different scenarios would lead to a different option being selected.

Typically, weightings range from 1 (low) to 10 (highest), with weighted scores combined to provide an overall score for each option. Different weighting scenarios are tested to see how the score changes and whether this may influence the option that is selected. Weighting scenarios are agreed prior to the options scoring MCA assessment.

In discussion with (assessment parties TBC) the following scenarios were tested (as outlined in Table 4-5– to be agreed later).

- Partner/Stakeholder agreed weighting: Investment objectives are more highly weighted, while other criteria have the lowest weighting
- Scenario 1: Each set of assessment criteria is equally weighted
- Scenario 2: xx (TBC)
- Scenario 3: xx (TBC)

**Table 4-5: Sensitivity analysis scenarios**

Assessment Criteria	Example of weighting	Partner/ Stakeholder agreed weighting	Scenario 1: (Equal weighting)	Scenario 2: (weighting to be decided)	Scenario 3: (weighting to be decided)
Investment objectives	9				
Public health risk	10				
Alignment with the Planning Framework	8				
Constructability	6				
GHG emissions / Carbon footprint	7				
Infrastructure and technology	4				
Māori cultural	8				
Natural environment	9				
Social and community	3				
Economic development and growth	5				
Affordability / Financial (ranking)	6				
Technical Feasibility	4				

## 4.4 Best Practicable Option (BPO) Criteria

In parallel with the MCA assessment, the Potential Wastewater Schemes (Short List) would be considered in the context of the BPO as defined in Section 2 of the Resource Management Act (RMA). The project team will apply an RMA lens over the MCA process which will help align the business case outcomes with RMA requirements and ultimately support resource consent applications.

The BPO definition as per the RMA is:

*The BPO is the best method for preventing or minimising the adverse effects of a discharge on the environment having regard to —*

- a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
- b) the financial implications, and the effects on the environment, of that discharge option when compared with other options; and*
- c) the current state of technical knowledge and the likelihood that the option can be successfully applied.*

## 4.5 Preferred Wastewater Scheme Option

The outcome of the assessment process is a Preferred Option for a wastewater scheme.

## 4.6 Going Forward, Next Steps

At this point, the project team will meet with the Oversight Subcommittee to agree on the next steps, including the community consultation process, Local Government Act procedures e.g., long term plan and annual plan procedures, trade waste management, funding, procurement options etc. It is noted however that with Central Government's proposed three-waters reorganisation, then depending on the program, a number of these activities may be incorporated in the new entity's roles.