

# TE KAUWHATA WASTEWATER TREATMENT PLANT

## DISCHARGE OPTIONS CONCEPT DESIGN COST ESTIMATE & REPORT

Prepared for Watercare Services Limited  
Prepared by Beca Limited

9 August 2024



Creative people together transforming our world

### Revision History

Revision No	Prepared By	Description	Date
A	Shannon Duxfield	Draft Version - For Internal Beca Review & Comment	08-08-2024
B	Shannon Duxfield	Final Version - For Internal Beca Review & Comment	08-08-2024
C	Shannon Duxfield	Final Version	09-08-2024

### Document Acceptance

Action	Name	Signed	Date
Prepared by	Shannon Duxfield		08-08-2024
Verified by	Henry van de Wall/ Mark Wilson		08-08-2024
Approved by	Garrett Hall		09-08-2024
on behalf of	Beca Limited		

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# 1 Executive Summary

The following optioneering cost estimates have been prepared for Watercare Services Ltd for the three discharge options for Te Kauwhata Wastewater Treatment Plant, Te Kauwhata. The estimated costs included in this report are high-level, indicative assessments which have been developed solely for the purpose of comparing and evaluating the options proposed for the wastewater discharge .

This estimate has been prepared for the purposes of providing Watercare Services Ltd an understanding of the capital cost requirements needed (at a project delivery level) for each option. We note the estimate included within should not be relied upon as absolute/final, used for funding applications or final investment decisions. Further investigation and design is generally recommended to confirm the project scope requirements and provide definition to other elements of consequential work that may be required as part of the project.

The estimated costs included in this report have been built-up using benchmarked cost data from Beca's historical cost archives and, other recently delivered wastewater treatment projects regionally.

In preparing this estimate, Beca has adopted risk based estimating principles to provide estimates with a level of confidence. The purpose of risk based estimating is to account for varying factors that influence the final cost outcome of any project (e.g. lack of scope definition, uncertainty, complexity/difficulty, external market factors, etc). Please note that a quantitative risk analysis (QRA) has not been prepared for this estimate however, class based accuracy ranges have been adopted to determine sensible levels of risk provisioning on a deterministic basis, relative to the current stage.

Detailed below is our executive summary of cost for the options proposed for this project:

Summary of Cost	OPTION 1- Discharge to Waikato River	OPTION 2- Discharge to Lake Waikare	OPTION 3- Enhanced Discharge at existing WWTP site
Item Description	Total NZD (\$)	Total NZD (\$)	Total NZD (\$)
Physical Works (Construction)	15,884,000	13,530,000	958,000
Project/Non-Construction Costs (includes geotech, investigations, assessments, design, tender evaluation & construction monitoring)	1,348,000	1,160,000	127,000
<b>Total Base Estimate - P5 (Lower Bound Range)</b>	<b>17,232,000</b>	<b>14,690,000</b>	<b>1,085,000</b>
Procurement Risk (5%)	862,000	735,000	55,000
Design Development and Scoping Risk (15%)	2,585,000	2,203,000	163,000
Construction Contingency (10%)	1,723,000	1,469,000	108,000
<b>Total Expected Estimate - P50 (Mean Assessment)</b>	<b>22,402,000</b>	<b>19,097,000</b>	<b>1,411,000</b>
Funding Risk/Management Reserve (30%)	6,721,000	5,730,000	424,000
<b>Total Project Estimate - P95 (Upper Bound Range)</b>	<b>29,123,000</b>	<b>24,827,000</b>	<b>1,835,000</b>

Note: All costs exclude Goods & Services Tax (GST) and escalation. Further detail relating to the above assessment is outlined in Section 6 of this report and in the Appendices section.

This assessment is generally considered to be a **Class 5 estimate with a level of accuracy of -30% (P5) to +50% (P95)**. Please note that the estimate class is generally derived by the maturity of design information available, relative to the project stage. We also note that accuracy and certainty/confidence ranges have been collectively assessed to derive risk provisioning for this project. The confidence ranges used for this estimate are as detailed below:

- **Base Estimate (P5)** is the lower-bound, base cost of knowns  
(i.e. 5% level of confidence that the final out-turn cost will not exceed this value)
- **Expected Estimate (P50)** is the likely/expected final cost  
(i.e. 50% level of confidence that the final out-turn cost will not exceed this value)
- **Project Estimate (P95)** is the upper-bound, pessimistic assessment  
(i.e. 95% level of confidence that the final out-turn cost will not exceed this value)

We also recommend that the following points are considered when reviewing the results and findings of this report:

- That the adopted estimating framework/work break-down structure is reviewed in terms of appropriateness for communicating the financial requirements for business case and/or board level
- That all non-construction/project related costs and noted estimate exclusions/assumptions are reviewed, considered and understood. Where items are required (but have been excluded), the project cost estimate should be adjusted accordingly.
- That all project risks and opportunities are considered jointly in the strategy for meeting budget target. Please note that opportunities (e.g. reductions in form/location/type/specification/scope or construction methodology, etc) have not been considered in this assessment.
- That the investment plan strategy considers funding risk between the P50 & P95 ranges (e.g. 100% funded or 1/2, 1/5, 1/10, 1/20) recognising that not all projects will exceed the P50 range.
- Recognition of potential optimism bias's that may come into effect when interpreting/using the estimated costs for internal reporting purposes (e.g. leaving off contingency provisions).
- That consideration is given to the fact that the project is at an early stage of development and therefore, a significant degree of the cost estimate is based on interpretation and professional judgement, particularly in respect of performance and quality. At this stage of the cost estimation process, this can lead to variances in assessed scope, cost and allocation of risk. As there is limited design information available, the project team may also have a variable understanding of the project requirements. Where cost differences occur, professional experience and judgement should be exercised to confirm whether there is opportunity to shape the project in a manner that provides a cost envelope that is achievable.

## 2 Introduction

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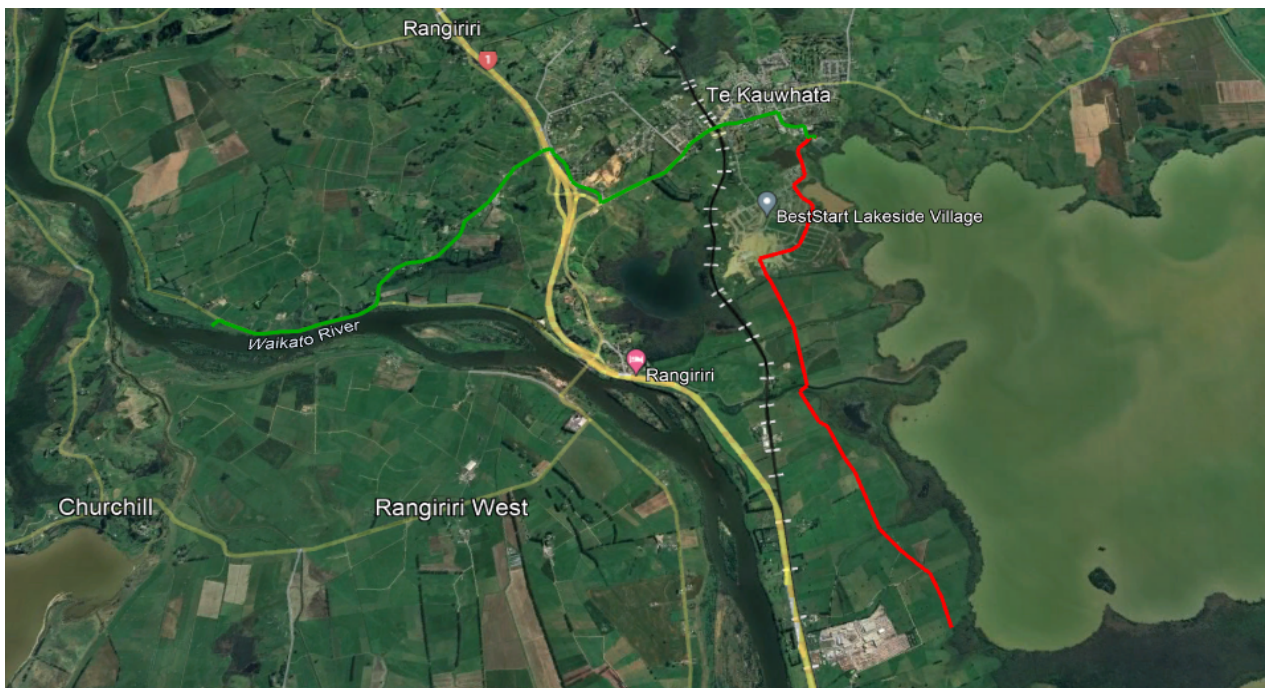
Beca has been engaged by Watercare Services Ltd, to provide optioneering cost estimates for the discharge options proposed at the existing Te Kauwhata Wastewater Treatment Plant located in Te Kauwhata. The results and recommendations developed in this report are intended to assist Watercare Services Ltd in assessing estimated costs for the proposed options as outlined in the report scope section. Please note that the estimated costs developed within this assessment are based on the quantities and assumptions developed by the Wastewater Process team. We generally advise caution with respect to interpretation of cost inclusion and recommend that the detail of the report is read to fully understand the level of reliance and use/application of the costs provided.

### 3 Report Scope

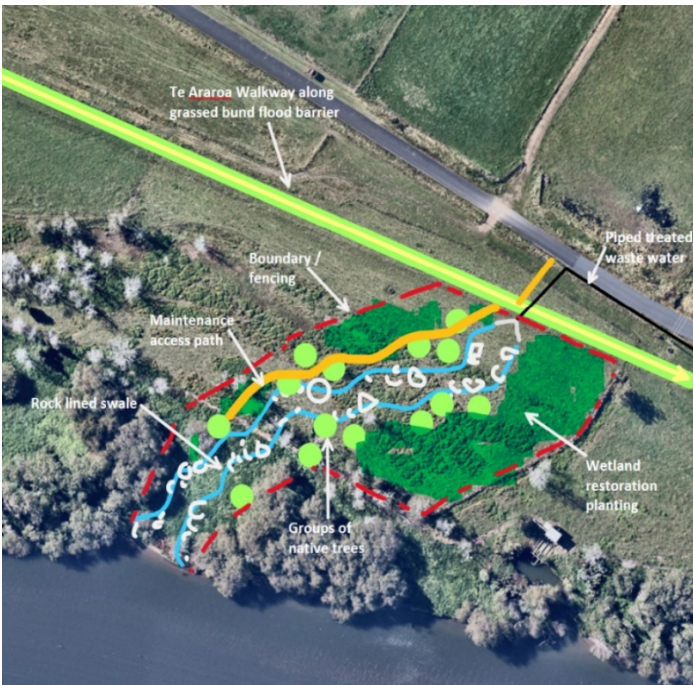
The report scope generally covers the following:

Scope Description	OPTION 1- Discharge to Waikato River	OPTION 2- Discharge to Lake Waikare	OPTION 3- Enhanced Discharge at existing WWTP site
Temporary works	✓	✓	✓
New discharge section	✓	✓	✓
Pipelines	✓	✓	
Pump station	✓	✓	
Directional Drilling as outlined in assumptions	✓	✓	
Service Relocations	✓	✓	
Provisional Traffic Management allowance	✓	✓	
Reinstatement	✓	✓	

Option 1: Shown in **Green** below, Option 2 shown in **Red** below



- Option 1: Disposal - MBR treated wastewater to Waikato River:





- Option 2: Disposal - MBR treated wastewater to Waikare Lake



- Option 3: Disposal - Enhanced Discharge at the existing WWTP Site



## 4 Report Objectives

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This report sets out to achieve the following objectives:

- Provide clarity and context to the expected capital cost requirements for each option to deliver the project (expected and pessimistic forecasts).
- Establish a common estimation framework that captures all relevant costs to the project (i.e. direct & indirect - defined & undefined)
- Provide definition to the scope of work assessed for the purposes of assessing/allocating risk and contingency provisions.
- Advise important aspects of the assessment including the basis of estimate (in terms of design information or market enquiry relied on), estimate class adopted for assessment and, the purpose/use/reliance of the final estimate deliverable.
- Level all cost assessment work to a specific reference date for inflation modelling.
- Provide clarity and context to the project funding requirements (inclusions & exclusions).
- Establish a comprehensive baseline for comparing other development proposals.

## 5 Report Methodology

### 5.01 Risk Based Estimation

In preparing this estimate, Beca have adopted risk based estimating principles to provide estimates with a level of confidence. The purpose of risk based estimating is to account for varying factors that influence the final cost outcome of any project (e.g. lack of scope definition, uncertainty, complexity/difficulty, external market factors, etc). We note that this report references 'accuracy range' throughout to describe the cost deviation from the Expected Estimate (P50). Estimation accuracy and confidence ranges have different means of defining cost deviation (e.g. design maturity versus quantitative risk analysis) however, for simplicity, these variables have been treated equally to derive risk/contingency values for this assessment.

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What we know	<b>Physical Works Estimate (Construction)</b>	All costs relating to the physical construction of the project including all direct trade works and indirect works such as the main contractors preliminary & general / off-site overheads and profit.
	+	
	<b>Project/Non Construction Costs</b>	All costs relating to internal management, consultation, business case development, investigation, planning, design, engineering, consenting, property acquisition, etc.
	=	
	<b>Base Estimate (P5)</b>	The collection of all known physical works and project related costs. The Base Estimate (P5) is the lower bound, base cost of knowns (i.e. 5% level of confidence that the final out-turn cost will not exceed this value).

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What we don't know - Dealing with the unknowns	+	
	<b>Assessed Risk</b>	The quantified risk provisions to be included for the project (i.e. 'known unknowns') based on general experience, quantitative risk analysis (Monte Carlo), single line risk assessment ranges (Hong Kong method), estimate classification relative to design maturity.
	=	
	<b>Expected Estimate (P50)</b>	The collection of known and assessed unknowns. The Expected Estimate (P50) is the likely/expected final cost (i.e. 50% level of confidence that the final out-turn cost will not exceed this value)
	+	
	<b>Contingency/Funding Risk</b>	An additional financial provision to provide for uncertainty (i.e. 'unknown knowns') in relation to the estimate inputs and project related threats/opportunities.
	=	
	<b>Project Estimate (P95)</b>	The Project Estimate (P95 - Also referred to as the 95th Percentile Estimate) is the upper-bound, pessimistic assessment (i.e. 95% level of confidence that the final out-turn cost will not exceed this value)

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### 5.02 Estimation Methodology Generally

Our estimates will generally be prepared using a combination of high level and detailed estimating principles (i.e. cost per functional area, cost per elemental item, cost resourcing, first principals, etc) for the key scope items identified. These estimates will be valued using historical project records and tender returns, budget quotes from suppliers for specialist plant and equipment, industry rates sourced from public sector data-bases (i.e. QV Cost Builder) and Beca's own general experience.

### 5.03 Estimation Accuracy

The estimate accuracy range is an indication of the degree to which the final cost outcome for a given project may vary from the estimated cost. Accuracy is expressed as a +/- percentage range around the point of estimate after the application of contingency, with a stated level of confidence that the actual cost outcome would fall within this range. As the level of project definition increases the expected accuracy of the estimate generally improves, as indicated by the reduced +/- range.

Please note estimation accuracy is the anticipated deviation around the 'Expected Estimate' (P50) range. On this basis, the upper bound limit (e.g. +50%) represents the 'Project Estimate' (P95) range. The lower bound limit (e.g. -30%) represents the 'Base Estimate' (P5) range.

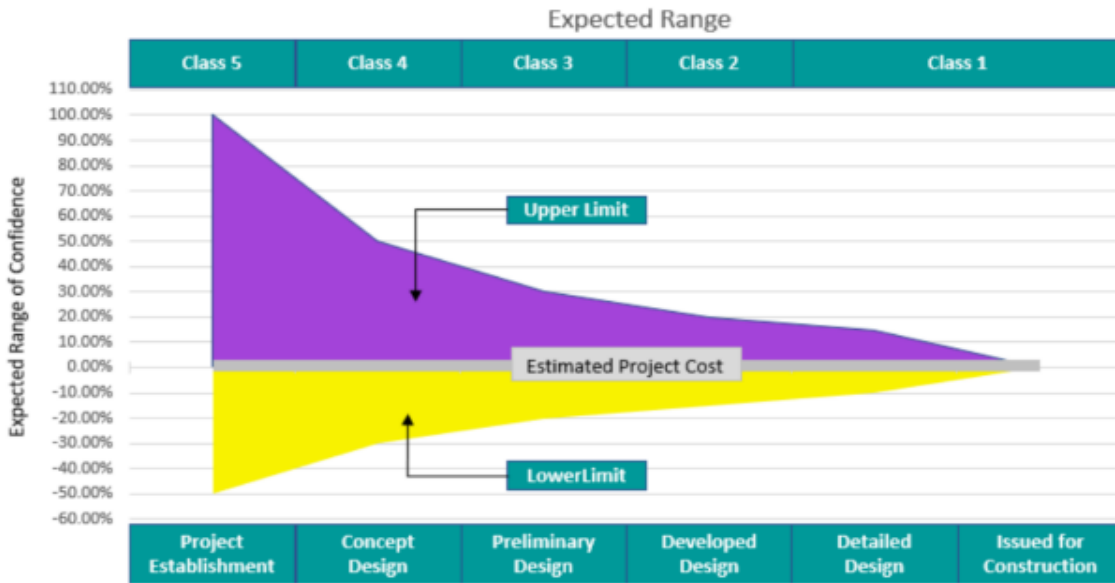


Figure 2: A typical estimate range envelope (For illustration purposes only)

This accuracy range highlights the following unknown risks that can impact the project that are difficult to predict or value. As the project gets closer to tender this range will reduce to reflect the level of confidence in the design and information available and level of risk. These risks could include (but are not limited to) the following:



## 5.04 Estimation Classification System

The following table provides a brief outline of the Cost Estimate Classification System that has been adopted for this assessment (Note: Table sourced from ACE International - Cost Estimate Classification System - For Building & General Construction Industries - 05-12-2012):

ESTIMATE CLASS	Primary Characteristic	Secondary Characteristic		
	MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES Expressed as % of complete definition	END USAGE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical variation in low and high ranges <sup>[a]</sup>
Class 5	0% to 2%	Functional area, or concept screening	SF or m <sup>2</sup> factoring, parametric models, judgment, or analogy	L: -20% to -30% H: +30% to +50%
Class 4	1% to 15%	or Schematic design or concept study	Parametric models, assembly driven models	L: -10% to -20% H: +20% to +30%
Class 3	10% to 40%	Design development, budget authorization, feasibility	Semi-detailed unit costs with assembly level line items	L: -5% to -15% H: +10% to +20%
Class 2	30% to 75%	Control or bid/tender, semi-detailed	Detailed unit cost with forced detailed take-off	L: -5% to -10% H: +5% to +15%
Class 1	65% to 100%	Check estimate or pre bid/tender, change order	Detailed unit cost with detailed take-off	L: -3% to -5% H: +3% to +10%

Note: [a] The state of construction complexity and availability of applicable reference cost data affect the range markedly. The +/- value represents typical percentage variation of actual cost from the cost estimate after application of contingency (typically at a 50% level of confidence) for given scope.

This assessment is generally considered to be a **Class 5 estimate with a level of accuracy of -30% (P5) to +50% (P95)**. Please note that the estimate class is generally derived by the maturity of design information available, relative to the project stage. We also note that accuracy and certainty/confidence ranges have been collectively assessed to derive risk provisioning for this project.

## 6 Results/Findings

### 6.01 Summary of Cost

Ref	Item Description	OPTION 1- Discharge to Waikato River	OPTION 2- Discharge to Lake Waikare	OPTION 3- Enhanced Discharge at existing WWTP site
		Total NZD (\$)	Total NZD (\$)	Total NZD (\$)
A1	Temporary Works	70,000	70,000	45,000
A2	Disposal			
A2-1	- New Discharge Section	961,000	961,000	747,000
A2-2	- Pipeline	11,669,000	9,679,000	0
A2-3	- Pump Station	411,000	455,000	0
A3	Service Relocations	20,000	20,000	0
A4	Traffic Management & Temporary Works	Included	Included	Included
A5	Testing & Commissioning/ Asbuilts	Included	Included	Included
A6	Main Contractors Preliminary & General & Profit (includes on and offsite overheads)	2,753,000	2,345,000	166,000
<b>A</b>	<b>Total Physical Works Estimate</b>	<b>15,884,000</b>	<b>13,530,000</b>	<b>958,000</b>
B1	Client Management Costs (3%)	Excluded	Excluded	Excluded
B2	Geotechnical Investigation & Survey	30,000	30,000	15,000
B3	Further Assessment Work	10,000	10,000	7,500
B4	Investigation Work	10,000	10,000	7,500
B5	Detailed Design	1,271,000	1,083,000	77,000
B6	Procurement & Tender Evaluation	10,000	10,000	10,000
B7	Construction Monitoring & Contract Administration	14,000	14,000	7,000
B8	Practical Completion/ Producer Statements etc	3,000	3,000	3,000
B9	Insurances	CWI Included	CWI Included	CWI Included
B10	Sunk Costs to Date	Excluded	Excluded	Excluded
<b>B</b>	<b>Total Project/Non-Construction Costs</b>	<b>1,348,000</b>	<b>1,160,000</b>	<b>127,000</b>
	<b>Total Base Estimate - P5 (A + B)</b>	<b>17,232,000</b>	<b>14,690,000</b>	<b>1,085,000</b>
C1	Procurement Risk (5%)	862,000	735,000	55,000
C2	Design Development and Scoping Risk (15%)	2,585,000	2,203,000	163,000
C3	Construction Contingency (10%)	1,723,000	1,469,000	108,000
<b>C</b>	<b>Total Assessed Risk/Contingency</b>	<b>5,170,000</b>	<b>4,407,000</b>	<b>326,000</b>
	<b>Total Expected Estimate - P50 (A + B + C)</b>	<b>22,402,000</b>	<b>19,097,000</b>	<b>1,411,000</b>
D1	Funding Risk/Management Reserve (30%)	6,721,000	5,730,000	424,000
<b>D</b>	<b>Total Funding Risk/Management Reserve</b>	<b>6,721,000</b>	<b>5,730,000</b>	<b>424,000</b>
	<b>Total Project Estimate - P95 (A + B + C + D)</b>	<b>29,123,000</b>	<b>24,827,000</b>	<b>1,835,000</b>

Note: All costs exclude Goods & Services Tax (GST) and escalation.

## **6.07 Escalation/Inflation**

We note the following points in relation to escalation provisions for this project:

- Where supplier, contractor, consultant costs have been advised (but are out of date), these have been updated to reflect today's expected value using indices provided by the NZ Institute of Economic Research (NZIER).
- Escalation/inflationary provisions are as stated in the cost summary of this report
- The impacts of escalation/inflation is expected to be significant on any project. We generally recommend that inflation is calculated to the mid-point of construction to account for costs incurred over this period.

## **6.08 Project Benchmarking**

The applied rates have generally been built-up using first principles basis, for labour, plant and material resources required to complete the work including indicative costs for specialist contractors and/or suppliers. These elements have been benchmarked against similar projects, although a general comparison is not always possible due to difference of the overall project scope and complexity.

## **6.09 Value Management Opportunities**

The following Value Management Opportunities have been identified with the current scheme:

- Not reviewed

## **6.10 Programme**

This estimate is based on the following construction programme assumptions:

- Not reviewed

## **6.11 Procurement**

This estimate is based on the following construction procurement assumptions:

- Not reviewed



## 6.12 Project Risks

We note that a detailed Quantitative Risk Assessment has not been prepared for this project. A high level assessment of the P50/95 risk provisioning has been made based on perceived uncertainty on the scope of work required and risks expected, relative to the information provided. Should the client wish to adopt the estimated costs for anything other than its specified use (as noted in the executive summary) then it is highly recommended that the 95th Percentile Estimate range (i.e. pessimistic bias) be used to account for scope and risk uncertainty in the project.

A detailed risk review has not been undertaken however, the following project risks have been identified with the current scheme:

- Conceptual design level information.
- Disruption of existing services and working around existing services.
- The project price is based on limited scope of design - methodology of installation and weather mitigation will impact outturn cost
- Scoping risk as identified above.
- Procurement / low market appetite, etc.
- Overheated construction market limiting resource availability, resulting in prolonged programme and/or inflated costs.
- Pandemic and conflict related economic pressures (e.g. shortages of raw materials and rising fuel costs).
- Prolonged delivery programme.
- Unexpected ground or site conditions.
- Low contracting capability and/or availability locally to deliver the work resulting in premiums for mobilising from other regions.
- Natural events (adverse weather, earthquake, tsunami, etc).

## 6.13 Estimate Assumptions

Our estimate of cost is based on the following working assumptions:

- The works will be procured under competitive bid scenario via local building contractors (Generally - In the absence of a defined procurement strategy).
- Unrestricted access to carry out the works.
- The works will be undertaken under normal working hours.
- The works will be undertaken concurrently. No allowance has been made in our estimate for staged
- The works will be carried out by a Single Main Contractor. No allowance has been made for multiple contracts.
- Piping allowed to be directional drilled over 4.5m deep and where there are highway, railway, culvert or stream crossings, all other pipe trenched
- Higher market interest and competition is expected due to economic slow down.
- Assumed reinstatement of 2x driveways per 100m for town areas and 2x driveways per 500m for rural areas
- Directional Drilling Pits allowed every 200m in areas where we have allowed directional drilling
- Allowance for entry and exit pits have been included based on the depth required for directional drilling
- The pit allowances include for an access track for the plant
- Footpaths assumed 1m wide
- An allowance has been included for the pump station and storage based on a similar size project.
- It has been assumed that no protection of existing services is required
- Provisional Traffic Management allowance included, require further information to understand the full scope required.

## 6.14 Estimate Exclusions

Our estimate of cost excludes the following:

- Goods & Services Tax (GST).
- Escalation provisions.
- All sunk design & engineering costs to date.
- Maintenance and renewal works to existing adjacent assets.
- All ancillary client operational costs including (but not limited to) staff & accommodation insurance, legal, accounting, financing, marketing & sales, etc.
- Services identification, protection and/or relocation work.
- Acceleration costs or out of hours working.
- Noise mitigation works.
- Remediation of special ecological areas (if any).
- The impacts of extraordinary events such as (but not limited to) global pandemic, world conflict, earthquake, tsunami, etc.
- All hard/soft operational services & energy costs.
- Working in difficult ground conditions (i.e. rocks, boulders, cobbles, timber, etc).
- Seismic upgrade work.
- All other exclusions specifically noted in the cost estimate and covering summary.
- Environmental compliance
- Service relocations
- Consents and easements
- Legal fees
- Land acquisition costs
- Client insurances
- Specimen trees

## 7 Recommendations

We recommend that Watercare Services Ltd reviews the scope of work included and, all associated assumptions and exclusions relevant to this assessment, to fully familiarise with the basis of estimate.

This estimate has been prepared for the purposes of providing Watercare Services Ltd an understanding of the capital cost requirements needed (at a project delivery level) for each option. We note the estimate included within should not be relied upon as absolute/final, used for funding applications or final investment decisions. Further investigation and design is generally recommended to confirm the project scope requirements and provide definition to other elements of consequential work that may be required as part of the project.

The following summary of costs forms the bases of our recommendation:

Summary of Cost	OPTION 1- Discharge to Waikato River	OPTION 2- Discharge to Lake Waikare	OPTION 3- Enhanced Discharge at existing WWTP site
Item Description	Total NZD (\$)	Total NZD (\$)	Total NZD (\$)
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<b>Total Expected Estimate - P50 (Mean Assessment)</b>	<b>22,402,000</b>	<b>19,097,000</b>	<b>1,411,000</b>
Funding Risk/Management Reserve (30%)	6,721,000	5,730,000	424,000
<b>Total Project Estimate - P95 (Upper Bound Range)</b>	<b>29,123,000</b>	<b>24,827,000</b>	<b>1,835,000</b>

Note: All costs exclude Goods & Services Tax (GST) and escalation. Further detail relating to the above assessment is outlined in Section 6 of this report and in the Appendices section.

We also recommend that the following points are considered when reviewing the results and findings of this

- That the adopted estimating framework/work break-down structure is reviewed in terms of appropriateness for communicating the financial requirements for business case and/or board level
- That all non-construction/project related costs and noted estimate exclusions/assumptions are reviewed, considered and understood. Where items are required (but have been excluded), the project cost estimate should be adjusted accordingly.
- That all project risks and opportunities are considered jointly in the strategy for meeting budget target. Please note that opportunities (e.g. reductions in form/location/type/specification/scope or construction methodology, etc) have not been considered in this assessment.
- That the investment plan strategy considers funding risk between the P50 & P95 ranges (e.g. 100% funded or 1/2, 1/5, 1/10, 1/20) recognising that not all projects will exceed the P50 range.
- Recognition of potential optimism bias's that may come into effect when interpreting/using the estimated costs for internal reporting purposes (e.g. leaving off contingency provisions).
- That consideration is given to the fact that the project is at an early stage of development and therefore, a significant degree of the cost estimate is based on interpretation and professional judgement, particularly in respect of performance and quality. At this stage of the cost estimation process, this can lead to variances in assessed scope, cost and allocation of risk. As there is limited design information available, the project team may also have a variable understanding of the project requirements. Where cost differences occur, professional experience and judgement should be exercised to confirm whether there is opportunity to shape the project in a manner that provides a cost envelope that is achievable.

## 8 Reference Documentation

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Our estimate is based on the following documentation:

- Beca - Te Kauwhata Wastewater Treatment Plant Discharge email with quantities provided by Water Team - dated 31.07.2024
- Beca - Outlet Structure email - Dated 31.07.2024
- Beca - Te Kauwhata WWTP Alignment Options Drawings Package - Dated 06.08.2024
- Beca - Te Kauwhata Wastewater Discharge Environmental Enhancements- Concept Landscape Design Package - Dated 31.05.24

## 9 Definitions

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The following definitions apply to this assessment:

- **Main Contractor Preliminary & General (P&G)** otherwise known as On-Site Overhead costs has been included to cover items such as site supervision / management, site offices, stores, hoardings, amenities, plant, cranes, temporary works etc.
- **Main Contractor Off-Site Overheads and Profit (OH&P)** has been included to cover the cost of the Main Contractor's Business operational costs, such as executive management, accounts, quality and health & safety systems and company profit.
- **Construction Contingency** is a risk contingency to cover the cost of variation claims made by the contractor during the construction phase of the project. This contingency is integral to the estimated outturn cost and should be separately monitored during the construction phase. It is estimated based on the current project scope, exclusive of any client driven scope changes.
- **Design Development** is integral to the estimate total and covers the ongoing development of the established brief. This allowance also captures errors/omissions and refinement of estimate assumptions made in the absence of documented construction details.
- **Scoping Risk** is a contingency provision that covers significant scope uncertainty in the proposed scheme. Typical examples of application may include for additional work that cannot be seen and accurately assessed (e.g. work below ground) or work that has significant access/disruption/reinstatement requirements due to difficult location.
- **Procurement Risk** is a contingency provision that covers the market response to projects with high levels of scope uncertainty. This allowance is intended to cover projects that may attract low interest from the market place (and therefore higher cost by default); cost loading over above normal industry expectation and/or prolonged programme as a result of perceived difficulty.
- **Funding Risk** is a final statistical provision that is intended to provide additional confidence to the final expected out-turn cost. This allowance is used to form a pessimistic bias of the expected final cost (i.e. 95th Percentile Cost Estimate) meaning that the estimate has a 95% level of confidence that the final project out-turn cost will not exceed this value.
- **Expected Estimate (P50)** - This estimate represents the statistical mean value with a defined level of confidence that the final project out-turn cost will not exceed the mean value.
- **95th Percentile Estimate (P95)** - The Expected estimate plus an allowance for Funding Risk Contingency. This estimate represents the statistical 95th percentile value with a level of confidence/pessimistic bias that the final project out-turn cost will not exceed this value. The additional financial provisions included in the 95th Percentile Estimate provide for uncertainty in relation to the estimate inputs, the early lifecycle and the project related threats/opportunities.
- **Annualised Cost** - The operational cost (renewals and/or maintenance) which is averaged across the period of analysis
- **Capital Cost** - Cost to purchase the site, design, tender and construct a facility.
- **Operational Cost** - Cost of maintaining and operating the facility over a discrete term. These are typically defined as hard/soft services (described below) and energy/infrastructure costs.
- **Hard Services** - Building maintenance (preventative and corrective) including servicing of

- **Soft Services** - Property management consisting of cleaning, security, landscape maintenance, IT services, concierge, caretaker, insurances, rates, etc.
- **Energy** - The cost of fuel and energy required to run the facility (e.g. heating, cooling, power, water, gas and other special services etc).
- **Life Expectancy** - Assessment of the usable operational life of the asset (usually expressed in functional 'elements').
- **Element** - Individual part of an asset (e.g. substructure, roof, internal finishes, services, etc).
- **Maintenance** - Regular/routine upkeep of the asset element/component. Including washing, painting, minor repairs, servicing, etc.
- **Renewal** - Periodic renewal or refurbishment of an individual element/component when it has reached the end of it's economic life (e.g. replacement of roof coverings when corroded beyond repair or replacement of air-conditioning units when they can no longer be maintained).
- **Replace/Replacement** - When an entire asset has deteriorated to the point where it is deemed uneconomical to renew the individual elements. Full replacement involves the full demolition and clearance of the asset followed by the replacement with a new asset/facility.
- **Run-down** - The time period between when an asset is identified as needing to be demolished and replaced is defined as the 'run-down period'. Minimal maintenance, essentially to rectify any health and safety issues only, is carried out during this period (to reduce costs).
- **Assessment Period** - Time period assessed for this study. The life cycle analysis will calculate the lifespan remaining for each element/component within the prescribed period (usually 30-50 years).
- **Assessment Standards** - The principles employed as part of this assessment assume the asset is maintained at optimum operating levels meaning that suitable, timely and preventative maintenance is undertaken to maintain the asset.
- **Condition Grade** - Assessment of current condition, the amount of deterioration and life remaining in the asset (or element) – Refer to Condition Grading System (table above).
- **Capital Replacement Value (CRV)** - The physical work required to replace the buildings and site infrastructure. Cost includes for direct construction costs, main contractors overheads and profit margins.



## 10 Limitations

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This report is commensurate to the level of technical information available at the time of the assessment undertaking. We therefore advise absolute caution in the use/application of the reported figures for anything other than its intended use.

In preparing this report we have acted solely in our capacity as Quantity Surveyors therefore, our comments in this report should not be construed as legal, insurance, tax, engineering, planning, construction or any other specialist advice, irrespective of whether Beca is capable of providing such advice. In particular, but without limiting any other statement in this report, our review comments on any such matters have been restricted to identifying whether there are any aspects that appear to be unusual, based on our experience as qualified Quantity Surveyors.

The preparation of this report does not imply in any way that Beca has audited the financial statements, management accounts, engineering or other records. Where another party has supplied information for use in this report, it is assumed to be reliable.

This report has been prepared by Beca on the specific instructions of our Client. It is solely for our Client's use for the purpose for which it is intended in accordance with the agreed scope of work. Any use or reliance by any person contrary to the above, to which Beca has not given its prior written consent, is at that person's own risk.

This report must be read in its entirety and no portion of it should be relied on without regard to the report as a whole, especially the assumptions, limitations and disclaimers set out in the estimate notes and elsewhere in the report.

While Beca believes that the use of the assumptions in the report are reasonable for the purposes of this study, Beca makes no assurances with respect to the accuracy of such assumptions and some may vary significantly due to unforeseen events and circumstances.

In preparing this estimate, Beca has relied on the accuracy, completeness and currency of the information provided, therefore is not responsible for the information provided, and has not sought to independently verify it. To the extent that the information is inaccurate or incomplete, the opinions expressed by Beca may no longer be valid and should be reviewed.

Beca reserves the right, but not the obligation, to review all calculations included or referred to in this report and, if considered necessary, to revise its opinion in the light of any new or existing information.

This cost estimate has been developed solely for the purpose of comparing and evaluating options. They cannot be used for budget-setting purposes as common elements between options may have been omitted and/or the works not fully scoped. A functional design should be undertaken if a budget estimate is required.

A

## Option 1: Discharge to Waikato River - Cost Estimate

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## Option 1: Discharge to Waikato River

Estimate Detail							
Ref	Item Description	Calculation	Quantity	Unit	Rate	Sub-Total	Total
	<b>Key Metric Data</b>						
	<b>New PS to pump MBR effluent to Waikato River</b>						
1.00	<b>Reference Documentation:</b>						
1.01	Email Shaun Le Grange 31/07/24						
1.02	Concept visualisations Will Gumbley 24/07/24						
1.03	Te Kauwhata WWTP Alignment Options Drawings Package 06/08/24						
2.00	<b>Temporary Works</b>						
2.01	Establishment - site set out, service location/relocation, temporary fencing, silt control, site lay down area/facilities, security and plant machinery delivery		1.00	LS	50,000	50,000	
2.02	Disestablish offsite - remove plant machinery, remove site laydown area/facilities, silt control, temporary fencing and install new fencing.		1.00	LS	20,000	20,000	
	<b>Sub Total Temporary Works</b>						<b>70,000</b>
3.00	<b><u>New Discharge section</u></b>						
3.01	Headwall (concrete and connections)		1.00	LS	5,000	5,000	
3.02	Rock Lined channel 2m wide - geosynthetic liner, larger rocks (incl excavation)		300.00	m	385	115,500	
3.03	Planting with Natives		20,000.00	m2	30	600,000	
3.04	Allowance for access track for maintenance, gravel		300.00	m	126	37,800	
3.05	New pest proof fencing		400.00	m	500	200,000	
3.06	Standard vehicle access gates		1.00	LS	3,000	3,000	
4.00	<b><u>Pipeline - Rising Main</u></b>						
4.01	Traffic Management (Provisional)		1.00	Sum	745,000	745,000	
4.02	New PE 450 OD PE100 SDR17 Waste Water Service Pipeline - 3.0m deep (Trenched)		2,550.00	m	882	2,249,993	
4.03	New PE 450 OD PE100 SDR17 Waste Water Service Pipeline - 4.5m deep (Trenched)		916.00	m	1,246	1,141,199	
5.00	<b><u>Pipeline - Falling Main</u></b>						
5.01	New PE 500 OD PE100 SDR17 Waste Water Service Pipeline - 3.0m deep (Trenched)		1,882.00	m	882	1,660,583	
5.02	New PE 500 OD PE100 SDR17 Waste Water Service Pipeline - 4.5m deep (Trenched)		1,490.00	m	1,246	1,856,317	
5.03	New PE 500 OD PE100 SDR17 Waste Water Service Pipeline - 6.0m deep (Trenched)		430.00	m	1,335	574,033	
5.04	New PE 500 OD PE100 SDR17 Waste Water Service Pipeline - 7.5m deep (Trenched)		198.00	m	1,485	294,030	

Estimate Detail							
Ref	Item Description	Calculation	Quantity	Unit	Rate	Sub-Total	Total
6.00	<b>Pipe - Directional Drilling</b>						
6.01	New PE 450 OD PE100 SDR17 Waste Water Service Pipeline - 3.0m deep (Directionally drilled)		200.00	m	1,010	201,960	
6.02	New PE 450 OD PE100 SDR17 Waste Water Service Pipeline - 6.0m deep (Directionally drilled)		114.00	m	1,247	142,204	
6.03	New PE 450 OD PE100 SDR17 Waste Water Service Pipeline - 7.5m deep (Directionally drilled)		150.00	m	1,485	222,750	
6.04	New PE 500 OD PE100 SDR17 Waste Water Service Pipeline - 4.5m deep (Directionally drilled)		46.00	m	1,129	51,916	
6.05	New PE 500 OD PE100 SDR17 Waste Water Service Pipeline - 6.0m deep (Directionally drilled)		90.00	m	1,247	112,266	
6.06	Allowance for entry & exit pits for directional drilling		5.00	No.	150,000	750,000	
7.00	<b>Pipeline Ancillaries</b>						
7.01	PE Bends		32.00	No.	3,000	96,000	
7.02	Pipeline Tie-ins		2.00	LS	10,000	20,000	
7.03	Air valves chamber (incl all ancillary items) -3m deep		5.00	No.	60,000	300,000	
7.04	Air valves chamber (incl all ancillary items) -4.5m deep		3.00	No.	70,000	210,000	
7.05	Air valves chamber (incl all ancillary items) -6.0m deep		1.00	No.	140,000	140,000	
7.06	Scour valves chamber (incl all ancillary items) - 3m deep		2.00	No.	45,000	90,000	
7.07	Scour valves chamber (incl all ancillary items) - 4.5m deep		2.00	No.	55,000	110,000	
8.00	<b>Reinstatement</b>						
8.01	Verge Reinstatement		5,966.00	m2	45	270,916	
8.02	Footpath Reinstatement		1,500.00	m2	79	118,800	
8.03	Driveway Reinstatement - Concrete		60.00	No.	3,000	180,000	
8.04	Reinstatement of Base Course		2,310.00	m2	30	69,300	
8.05	Reinstatement of Wearing Course		2,310.00	m2	20	46,200	
8.06	Allowance for line marking & signage		1.00	LS	15,000	15,000	
9.00	<b>Pump Station</b>						
9.01	22kW pumps		2.00	No.	35,375	70,750	
9.02	Mech + electrical install to last (2men 5days, plant 5days)		1.00	LS	6,000	6,000	
9.03	VSDs		2.00	LS	17,688	35,375	
9.04	Mini switchboard for motor starters + PLC (assume micrologix)		1.00	LS	25,000	25,000	
9.05	Pump station slab with shed (total span garage or similar) approx size 100m2		1.00	LS	30,000	30,000	
9.06	Valving and pipework (SS) - 2 x KGVS (100NB), 2 x NRVs, 2 x PRVs		1.00	LS	12,200	12,200	
9.07	Flowmeter + 2 x PTS, 2 x Pressure switches		1.00	LS	15,000	15,000	
9.08	LV cabling		50.00	m	150	7,500	
9.09	Hose points and drainage		1.00	LS	10,000	10,000	
9.10	PE Storage Tanks 30,000L		2.00	No.	45,000	90,000	
9.11	Access road		492.00	m2	150	73,800	
9.12	Ground Reclamation		178.00	m2	200	35,600	
10.00	<b>Service Relocations</b>						
10.01	Service relocations		1.00	LS	20,000	20,000	
10.02	Rounding		1.00	LS	11	11	
	<b>Sub Total Disposal</b>						<b>13,061,000</b>
11.00	<b>Main Contractors Preliminary &amp; General / Off-Site Overheads &amp; Profit</b>						
11.01	Main Contractors Preliminary & General (Construction Management)	13,131,000	13,131,000	LS	12%	1,575,720	
11.02	Main Contractor Off-Site Overheads & Profit	14,706,720	14,706,720	LS	8%	1,176,538	
11.03	Rounding		1.00	LS	742	742	
	<b>Sub Total Contractors P&amp;G/Oversite Overheads and Profit</b>						<b>2,753,000</b>
	<b>Total Physical Works</b>						<b>15,884,000</b>

Estimate Detail							
Ref	Item Description	Calculation	Quantity	Unit	Rate	Sub-Total	Total
12.00	<b>Consultant Fees (Design/Engineering) / Consents (Cost to Complete)</b>						<b>1,348,000</b>
12.01	Geotechnical Investigation	1.00	1.00	LS	30,000	30,000	
12.02	Further Assessment Work	1.00	1.00	LS	10,000	10,000	
12.03	Investigation Work	1.00	1.00	LS	10,000	10,000	
12.04	Detailed Design	1.00	8%	%	1,270,720	1,270,720	
12.05	Procurement & Tender Evaluation	1.00	1.00	LS	10,000	10,000	
12.06	Construction Monitoring & Contract Administration	4.00	4.00	month	3,500	14,000	
12.07	Practical Completion/Producer Statements, etc	1.00	1.00	LS	3,000	3,000	
12.08	Rounding Adjustment	1.00	1.00	LS	280	280	
	<b>Total Base Estimate</b>						<b>17,232,000</b>
13.00	<b>Contingency</b>						<b>5,170,000</b>
13.01	Procurement Risk (5%), Design Development and Scoping Risk (15%), Construction Contingency (10%)	0.00	17,232,000	LS	30.00%	5,169,600	
13.02	Rounding Adjustment	1.00	1.00	LS	400	400	
	<b>Total Expected Estimate</b>						<b>22,402,000</b>
14.00	<b>Funding Risk /Management Reserve</b>						<b>6,721,000</b>
14.01	Funding Risk/Management Reserve (30%)		22,402,000	LS	30.00%	6,720,600	
14.02	Rounding Adjustment	1.00	1.00	LS	400	400	
	<b>Total Project Estimate (P95)</b>						<b>29,123,000</b>

# B

## Option 2: Discharge to Lake Waikare - Cost Estimate

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## Option 2: Discharge to Lake Waikare

Estimate Detail							
Ref	Item Description	Calculation	Quantity	Unit	Rate	Sub-Total	Total
	<b>Key Metric Data</b>						
	<b>New PS to pump MBR effluent to Lake Waikare</b>						
1.00	<b>Reference Documentation:</b>						
1.01	Email Shaun Le Grange 31/07/24						
1.02	Concept visualisations Will Gumbley 24/07/24						
1.03	Te Kauwhata WWTP Alignment Options Drawings Package 06/08/24						
2.00	<b>Temporary Works</b>						
2.01	Establishment - site set out, service location/relocation, temporary fencing, silt control, site lay down area/facilities, security and plant machinery delivery		1.00	LS	50,000	50,000	
2.02	Disestablish offsite - remove plant machinery, remove site laydown area/facilities, silt control, temporary fencing and install new fencing.		1.00	LS	20,000	20,000	
	<b>Sub Total Temporary Works</b>						<b>70,000</b>
3.00	<b><u>New Discharge section</u></b>						
3.01	Headwall (concrete and connections)		1.00	LS	5,000	5,000	
3.02	Rock Lined channel 2m wide - geosynthetic liner, larger rocks (incl excavation)		300.00	m	385	115,500	
3.03	Planting with Natives		20,000.00	m2	30	600,000	
3.04	Allowance for access track for maintenance, gravel		300.00	m	126	37,800	
3.05	New pest proof fencing		400.00	m	500	200,000	
3.06	Standard vehicle access gates		1.00	LS	3,000	3,000	
4.00	<b><u>Pipeline - Rising Main</u></b>						
4.01	Traffic Management (Provisional)		1.00	Sum	630,000	630,000	
4.02	New PE 450 OD PE100 SDR17 Waste Water Service Pipeline - 3.0m deep (Trenched)		787.00	m	882	694,409	
4.03	New PE 450 OD PE100 SDR17 Waste Water Service Pipeline - 4.5m deep (Trenched)		739.00	m	1,246	920,683	
4.04	New PE 450 OD PE100 SDR17 Waste Water Service Pipeline - 6.0m deep (Trenched)		250.00	m	1,335	333,740	
5.00	<b><u>Pipeline - Falling Main</u></b>						
5.01	New PE 500 OD PE100 SDR17 Waste Water Service Pipeline - 1.5m deep		1,416.00	m	671	949,527	
5.02	New PE 500 OD PE100 SDR17 Waste Water Service Pipeline - 3.0m deep (Trenched)		668.00	m	882	589,410	
5.03	New PE 500 OD PE100 SDR17 Waste Water Service Pipeline - 4.5m deep (Trenched)		1,806.00	m	1,246	2,250,005	
5.04	New PE 500 OD PE100 SDR17 Waste Water Service Pipeline - 6.0m deep (Trenched)		110.00	m	1,335	146,846	

Estimate Detail							
Ref	Item Description	Calculation	Quantity	Unit	Rate	Sub-Total	Total
6.00	<b>Directional Drilling</b>						
6.01	New PE 500 OD PE100 SDR17 Waste Water Service Pipeline - 3.0m deep (Directionally drilled)		200.00	m	1,010	201,960	
6.02	New PE 500 OD PE100 SDR17 Waste Water Service Pipeline - 4.5m deep (Directionally drilled)		600.00	m	1,129	677,160	
6.03	Allowance for entry & exit pits for directional drilling		8.00	No.	120,000	960,000	
7.00	<b>Pipeline Ancillaries</b>						
7.01	PE Bends		22.00	No.	3,000	66,000	
7.02	Pipeline Tie-ins		2.00	LS	10,000	20,000	
7.03	Air valves chamber (incl all ancillary items) -3m deep		2.00	No.	60,000	120,000	
7.04	Air valves chamber (incl all ancillary items) -4.5m deep		4.00	No.	70,000	280,000	
7.05	Air valves chamber (incl all ancillary items) -6.0m deep		1.00	No.	140,000	140,000	
7.06	Scour valves chamber (incl all ancillary items) - 4.5m deep		1.00	No.	55,000	55,000	
8.00	<b>Reinstatement</b>						
8.01	Verge reinstatement		4,176.00	m2	45	189,632	
8.02	Footpath Reinstatement		1,600.00	m2	79	126,720	
8.03	Driveway Reinstatement - Concrete		60.00	No.	3,000	180,000	
8.04	Reinstatement of Base Course		2,640.00	m2	30	79,200	
8.05	Reinstatement of Wearing Course		2,640.00	m2	20	52,800	
8.06	Allowance for line marking & signage		1.00	LS	15,000	15,000	
9.00	<b>Pump Station</b>						
9.01	60kW pumps		2.00	No.	50,000	100,000	
9.02	Mech + electrical install to last (2men 5days, plant 5days)		1.00	LS	6,000	6,000	
9.03	VSDs		2.00	LS	25,000	50,000	
9.04	Mini switchboard for motor starters + PLC (assume micrologix)		1.00	LS	25,000	25,000	
9.05	Pump station slab with shed (total span garage or similar) approx size 100m2		1.00	LS	30,000	30,000	
9.06	Valving and pipework (SS) - 2 x KGVS (100NB), 2 x NRVs, 2 x PRVs		1.00	LS	12,200	12,200	
9.07	Flowmeter + 2 x PTS, 2 x Pressure switches		1.00	LS	15,000	15,000	
9.08	LV cabling		50.00	m	150	7,500	
9.09	Hose points and drainage		1.00	LS	10,000	10,000	
9.10	PE Storage Tanks 30,000L		2.00	No.	45,000	90,000	
9.11	Access Road		492.00	m2	150	73,800	
9.12	Ground reclamation		178.00	m2	200	35,600	
10.00	<b>Service Relocations</b>						
10.01	Service relocations		1.00	LS	20,000	20,000	
10.02	Rounding		1.00	LS	508	508	
	<b>Sub Total Disposal</b>						<b>11,115,000</b>
11.00	<b>Main Contractors Preliminary &amp; General / Off-Site Overheads &amp; Profit</b>						
11.01	Main Contractors Preliminary & General (Construction Management)	11,185,000.38	11,185,000.38	LS	12.00%	1,342,200	
11.02	Main Contractor Off-Site Overheads & Profit	12,527,200.43	12,527,200.43	LS	8.00%	1,002,176	
11.03	Rounding		1.00	LS	624	624	
	<b>Sub Total Contractors P&amp;G/Oversite Overheads and Profit</b>						<b>2,345,000</b>
	<b>Total Physical Works</b>						<b>13,530,000</b>



Estimate Detail							
Ref	Item Description	Calculation	Quantity	Unit	Rate	Sub-Total	Total
12.00	<b>Consultant Fees (Design/Engineering) / Consents (Cost to Complete)</b>						<b>1,160,000</b>
12.01	Geotechnical Investigation	1.00	1.00	LS	30,000	30,000	
12.02	Further Assessment Work	1.00	1.00	LS	10,000	10,000	
12.03	Investigation Work	1.00	1.00	LS	10,000	10,000	
12.04	Detailed Design	1.00	8%	%	1,082,400	1,082,400	
12.05	Procurement & Tender Evaluation	1.00	1.00	LS	10,000	10,000	
12.06	Construction Monitoring & Contract Administration	4.00	4.00	month	3,500	14,000	
12.07	Practical Completion/Producer Statements, etc	1.00	1.00	LS	3,000	3,000	
12.08	Rounding Adjustment	1.00	1.00	LS	600	600	
	<b>Total Base Estimate</b>						<b>14,690,000</b>
13.00	<b>Contingency</b>						<b>4,407,000</b>
13.01	Procurement Risk (5%), Design Development and Scoping Risk (15%), Construction Contingency (10%)	14,690,000	14,690,000	LS	30.00%	4,407,000	
13.02	Rounding Adjustment	1.00	1.00	LS	0	0	
	<b>Total Expected Estimate</b>						<b>19,097,000</b>
14.00	<b>Funding Risk /Management Reserve</b>						<b>5,730,000</b>
14.01	Funding Risk/Management Reserve (30%)	19,097,000	19,097,000	LS	30.00%	5,729,100	
14.02	Rounding Adjustment	1.00	1.00	LS	900	900	
	<b>Total Project Estimate (P95)</b>						<b>24,827,000</b>



### Option 3: Enhanced Discharge at the existing WWTP Site - Cost Estimate

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### Option 3: Enhanced Discharge at the existing WWTP Site

Estimate Detail							
Ref	Item Description	Calculation	Quantity	Unit	Rate	Sub-Total	Total
	<b>Key Metric Data</b>						
	Enhanced Discharge at the existing WWTP Site						
1.00	<b>Reference Documentation:</b>						
1.01	Email Shaun Le Grange 31/07/24						
1.02	Concept visualisations Will Gumbley 24/07/24						
1.03	Te Kauwhata WWTP Alignment Options Drawings Package 06/08/24						
1.04	Te Kauwhata Wastewater Discharge Enhancements Concept Landscape Design Package 31/05/24						
2.00	<b>Temporary Works</b>						
2.01	Establishment - site set out, service location/relocation, temporary fencing, silt control, site lay down area/facilities, security and plant machinery delivery		1.00	LS	35,000	35,000	
2.02	Disestablish offsite - remove plant machinery, remove site laydown area/facilities, silt control, temporary fencing and install new fencing.		1.00	LS	10,000	10,000	
	<b>Sub Total Temporary Works</b>						<b>45,000</b>
3.00	<b>New Discharge section</b>						
3.01	Site Preparation - weed removal, clearing of trees		28,000.00	m2	5	140,000	
3.02	Headwall (concrete and connections)		0.00	LS	5,000	0	
3.03	Rock Lined channel 2m wide - geosynthetic liner, larger rocks (incl excavation)		60.00	m	385	23,100	
3.04	Planting with Natives (infill area already planted with natives)		28,000.00	m2	15	420,000	
3.05	Amenity Planting along street edge and WWTP entrance		2,500.00	m2	15	37,500	
3.06	Allowance for access track for maintenance, gravel		1,000.00	m	126	126,000	
3.07	New pest proof fencing		0.00	m	500	0	
3.08	Standard vehicle access gates		0.00	LS	3,000	0	
4.00	<b>Service Relocations</b>						
4.01	Service relocations		0.00	LS	0	0	
4.02	Rounding		1.00	LS	400	400	
	<b>Sub Total Disposal</b>						<b>747,000</b>
5.00	<b>Main Contractors Preliminary &amp; General / Off-Site Overheads &amp; Profit</b>						
5.01	Main Contractors Preliminary & General (Construction Management)	792,000.00	792,000.00	LS	12.00%	95,040	
5.02	Main Contractor Off-Site Overheads & Profit	887,040.00	887,040.00	LS	8.00%	70,963	
5.03	Rounding		1.00	LS	-3	-3	
	<b>Sub Total Contractors P&amp;G/Oversite Overheads and Profit</b>						<b>166,000</b>
	<b>Total Physical Works</b>						<b>958,000</b>

Estimate Detail							
Ref	Item Description	Calculation	Quantity	Unit	Rate	Sub-Total	Total
6.00	<b>Consultant Fees (Design/Engineering) / Consents (Cost to Complete)</b>						<b>127,000</b>
6.01	Geotechnical Investigation	1.00	1.00	LS	15,000	15,000	
6.02	Further Assessment Work	1.00	1.00	LS	7,500	7,500	
6.03	Investigation Work	1.00	1.00	LS	7,500	7,500	
6.04	Detailed Design	1.00	8%	%	76,640	76,640	
6.05	Procurement & Tender Evaluation	1.00	1.00	LS	10,000	10,000	
6.06	Construction Monitoring & Contract Administration	2.00	2.00	month	3,500	7,000	
6.07	Practical Completion/Producer Statements, etc	1.00	1.00	LS	3,000	3,000	
6.08	Rounding Adjustment	1.00	1.00	LS	360	360	
<b>Total Base Estimate</b>							<b>1,085,000</b>
7.00	<b>Contingency</b>						<b>326,000</b>
7.01	Procurement Risk (5%), Design Development and Scoping Risk (15%), Construction Contingency (10%)	1,085,000	1,085,000	LS	30.00%	325,500	
7.02	Rounding Adjustment	1.00	1.00	LS	500	500	
<b>Total Expected Estimate</b>							<b>1,411,000</b>
8.00	<b>Funding Risk /Management Reserve</b>						<b>424,000</b>
8.01	Funding Risk/Management Reserve (30%)	1,411,000	1,411,000	LS	30.00%	423,300	
8.02	Rounding Adjustment	1.00	1.00	LS	700	700	
<b>Total Project Estimate (P95)</b>							<b>1,835,000</b>