

18 September 2023


Sent via email to 

Dear ,

REQUEST FOR OFFICIAL INFORMATION – RELEASE OF INFORMATION

Thank you for your request for information held by the Queenstown Lakes District Council (**QLDC**).
On 7 September 2023 you requested the following information under the Local Government Official Information and Meetings Act 1987 (**LGOIMA**):

- The Detailed Business Case prepared for the Kingston Housing Infrastructure Fund 2018.

QLDC response

Please see the documents in this link:

- [Kingston HIF Detailed Business Case](#)

We trust this response satisfactorily answers your request.

Kind regards,




Senior Official Information Advisor



HOUSING INFRASTRUCTURE FUND

DETAILED BUSINESS CASE – KINGSTON

11 April 2018



Produced in conjunction with:

rationale >

IMPROVING INFRASTRUCTURE OUTCOMES

HG HARRISON
GRIERSON

WT PARTNERSHIP

Document Title:

Kingston Housing Infrastructure Fund – Detailed Business Case

Prepared for:

MBIE

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Glossary

Abbreviation	Term
BAU	Business as usual
DBC	Detailed Business Case
DWSNZ	Drinking Water Standards New Zealand
IBC	Indicative Business Case
HIF	Housing Infrastructure Fund
ILM	Investment Logic Map
KPI	Key Performance Indicator
KVL	Kingston Village Limited
KVSZ	Kingston Village Special Zone
LINZ	Land Information New Zealand
LTP	Long Term Plan
MBIE	Ministry of Business, Innovation and Employment
MBR	Membrane Bio-Reactor
MCA	Multi Criteria Analysis
MSQA	Management, Surveillance and Quality Assurance
NPS	National Policy Statement
NZTA	New Zealand Transport Agency
ORC	Otago Regional Council
PBC	Programme Business Case
PC	Plan Change
QA	Quality Assurance
QC	Quality Control
QLDC	Queenstown Lakes District Council
RLTP	Regional Land Transport Plan
RMA	Resource Management Act
SBR	Sequencing Batch Reactor
SH (#)	State Highway (number)
SHA	Special Housing Area
TLA	Territorial Local Authorities
UDC	Urban Development Capacity

Executive Summary

Queenstown Lakes District Council (QLDC) is working with the Ministry of Business Innovation and Employment (MBIE) to progress three projects aimed at delivering critical housing infrastructure.

This Detailed Business Case (DBC) seeks formal approval to invest \$44.9 million (\$41.7 million in 2018\$) to provide infrastructure that will unlock developable land for 950 residential units in Kingston and service the existing 225 lots. Of the \$44.9 million required, \$36.0 million is proposed to be funded through the Housing Infrastructure fund and the remainder will be funded by QLDC. This case builds on an Indicative Business Case that was completed and endorsed into the detailed planning stage in June 2017.

The case for change

Queenstown Lakes district is experiencing significant growth and the local supply chain is struggling to satisfy the demand for more houses.

The shortage of houses in Frankton and Queenstown has led to soaring prices, which cause many people to live in nearby satellite communities and commute to work in Queenstown.

Due to the physical constraints of lakes and mountains, much of the land between the commuting areas and Queenstown is undevelopable and there are few locations remaining that are suitable for residential development. Kingston is one of these towns that is suitable for further development.

While Kingston township has appropriately zoned land for development and provides a more affordable housing market for commuters to fast-growing Queenstown, further development in Kingston is currently limited by the lack of supporting 3 Waters infrastructure (water supply, wastewater and stormwater).

In Kingston, all properties currently run onsite water supply and wastewater disposal systems and there is no stormwater system in place. There are significant environmental and public health risks associated with continuing with the status quo, as well as the limitations it has on growth. Kingston requires 3 Waters infrastructure to grow in addition to improving the future health and wellbeing of the current population.

To enable the future development of 950 new dwellings in Kingston, new 3 Waters infrastructure is required.

The Economic Case

Detailed assessment and testing of a wide range of alternatives and options has confirmed that the preferred programme is to provide 3 Waters systems for both the Kingston township and the Kingston Village Limited (KVL) development. It includes 3 Waters solutions that meet QLDC standards and are capable of servicing 1175 dwellings. This also includes the 225 existing dwellings within Kingston township, which currently have individual water and wastewater systems.

The preferred programme will deliver consistently well across all three investment objectives. Expected outcomes are shown in Section 8.

The 3 Waters infrastructure will include the following features¹:

Water Supply

- Extended bore field from the single test bore that currently exists to the east of Kingston.
- New water take consent.
- New water treatment plant on a site to the northeast of the bore field.
- New water storage reservoir adjacent to the new water treatment plant (storage will meet minimum flow, fire capacity FW3 (180 m³), reserve (24 hr)).
- Trunk water main from the storage reservoir to the western end of the township, with a connection to the KVL development
- Reticulation within Kingston township (partially HIF funded for growth portion)

¹ Plans showing the proposed 3 waters infrastructure are included in Appendix 5

Wastewater

- New wastewater treatment plant to the south of the KVL development, near the state highway (bespoke SBR to provide tertiary treatment including nutrient removal and disinfection).
- New land disposal area south of the proposed township extension.
- A new wastewater discharge consent will be required and land disposal with a cut-and-carry management regime has been assumed.
- New pump stations in the existing township and associated rising main and falling mains.
- Gravity reticulation within Kingston township, some areas may require a pressure system due to ground constraints (partially HIF funded for growth portion).

Stormwater

- Two trunk mains (with capacity for the 100 Year ARI event) from the KVL development to Lake Wakatipu.
- Enlarged surface channel from the KVL development to Lake Wakatipu at the western end of the existing township.
- Three new outlets to Lake Wakatipu.

The Financial Case

Costs

The preferred programme is estimated to cost \$44.9 million with a drawdown of \$36.0 million. The high-level breakdown is outlined below.

DBC	HIF (950 Dwellings)	Existing Township (225 dwellings)	Total
Headworks	\$34.4m	\$7.1m	\$41.5m
Kingston Reticulation	\$1.6m	\$1.8m	\$3.4m
Total	\$36.0m	\$8.9m	\$44.9m

Activity	Total	Drawdown
Water Supply	\$9.2m	\$7.0m
Wastewater	\$28.5m	\$22.3m
Stormwater	\$7.2m	\$6.7m
Total	\$44.9m	\$36.0m

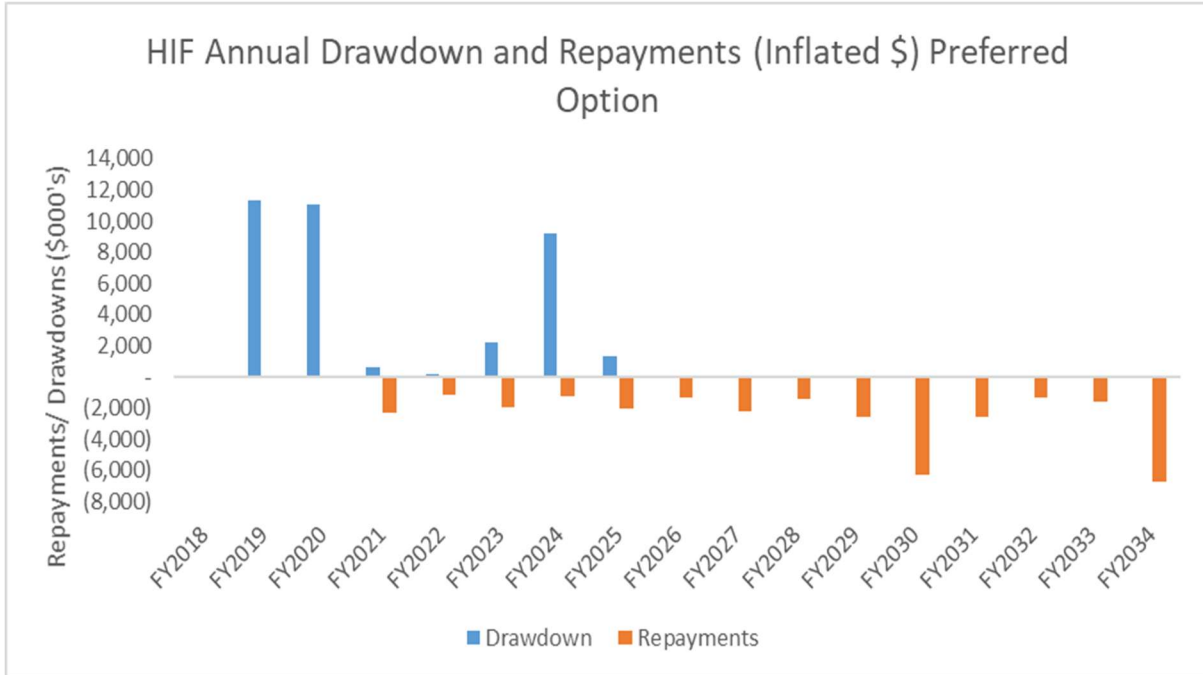
Affordability by dwelling

Affordability analysis has been undertaken to demonstrate the indicative cost per dwelling, as shown below. It is important to note that the indicative targeted rates will be applied in addition to the lump sum fee.

Dwellings	HIF (950 dwellings)	Existing Township (225 dwellings)
Indicative Targeted Rate	\$1,000 p.a. (25-yr)	\$1,000 p.a. (25-yr)
Indicative Lump Sum	<u>Plus:</u> \$6,110	<u>Plus:</u> \$12,876
Operating Cost (dwelling/annum)	\$808	\$808

Drawdown and repayment

The drawdown and repayment schedule is shown below. This is displayed in a larger format as a table in section 9.8.



Council affordability

QLDC’s recent 10-year plan development clarifies where the affordability challenges exist for the Council and what they mean for this project. With a proposed delivery programme three times the size of anything this Council has previously delivered, debt will play a large role. Current indications show that QLDC will reach its debt limits towards the middle of the proposed 10-year plan investment cycle and, based on this situation, the interest to revenue ratio will become a key consideration. With this in mind, the interest free nature of the HIF funding stands to provide QLDC significant benefit during this challenging time.

The Commercial Case

This case outlines what is required in the deal to successfully deliver the project; Schedule 2A in Section 10.2 provides a snapshot of how this will be done. In summary, QLDC will lead delivery of the headworks and KVL will manage the internal infrastructure delivery.

It will be important to ensure that the work is packaged in a way that gives it a reasonable scale and, therefore, a strong market interest. For this reason, consideration is being given to wrapping the Kingston water infrastructure developments up with other treatment plants required by QLDC to give the market a sizeable contract to pursue.

The Developer Agreement between QLDC and KVL is well progressed. QLDC and KVL are working towards a signed agreement by the end of March 2018. QLDC will then commit to expenditure in alignment with and only when KVL shows evidence of subdivision progress (such as consents, detailed design, construction contracts). The agreement does not need full Council approval, only CEO signature.

The consenting strategy will aim to gain approvals in a timely manner to prevent delays to construction activities. QLDC will prepare consents immediately for water take and discharge and have been in discussion with ORC regarding these. The KVL land is already zoned for the housing development, and the developer is in the process of preparing a resource consent application for the first subdivision stage of 190 lots.

It is expected that all headworks infrastructure can be installed without the specific need to purchase property, while recognising the need to provide adequate contributions or credits for the land the developers provide.

Any final contributions or rates will be calculated on actual costs. QLDC will arrange lease agreements or easements with the owners of private property, and approvals to occupy will be obtained from local government or national bodies through whose land any pipeline shall pass.

The strategy, framework and plan for managing change, contracts and risk will be founded on QLDC's established quality, risk, contract and cost management policies and procedures, which are based on the Government Rules of Sourcing. QLDC has consistently demonstrated its ability to procure and deliver technically challenging water and wastewater projects in partnership with the private sector, including the Lake Hayes water and wastewater scheme, Project Pure, and the recently completed Shotover wastewater treatment plant.

The Management Case

QLDC will apply a comprehensive system of controls, management reporting, audit and assurance processes throughout the development and implementation of the Kingston infrastructure projects.

Three levels of assurance will be applied to this project as part of wider governance arrangements for HIF projects in the Queenstown Lakes district. A governance/steering group will look across the HIF projects from a strategic district and investment perspective and Kingston-specific project control and project delivery groups will oversee the project implementation².

Issues will be identified by the Project Manager and raised with the Project Control Group (PCG). The PCG will then monitor the issue and prescribe management actions via the relevant Project Manager. Any departures from scope, performance expectations or disputes not resolved at project delivery or control group level will be escalated to governance level for consideration.

Project benefits have been well defined, and the Kingston-specific benefits and their proposed realisation dates are shown below.

Benefit	KPI	Measure	Target and date
Improved housing affordability	More low-cost houses	% of new houses less than 65% of the average sales price	40% by 2027/28
Efficient and effective housing supply	Reduced infrastructure costs	Infrastructure costs per dwelling	\$14,000 ³ by 2017/18
	Accelerated supply of housing	Number of new sections with resource consent	950 by 2025/26
		Number of new houses with code of compliance	950 by 2027/28

A preliminary programme of works, including pre-implementation is included in Appendix 11. The key dates are shown here.

Activity	Target Date
Resource Consents lodged by QLDC for water/wastewater	May 2018
Construction of headworks	March 2019 – Dec 2019
Release Stage 1 sections to market	April 2020

² Refer to the Management Case in Section 11 for the Terms of Reference for each group.

³ \$14,000 is Queenstown's average Development Contribution for transportation and 3 waters (taken from the QLDC Policy on Development Contributions and Financial Contributions)

Introduction

This Detailed Business Case is QLDC's formal request to obtain a \$36.0 million HIF loan to support a total investment of \$44.9 million that will provide infrastructure to unlock developable land for 950 dwelling equivalents in Kingston and to service the existing 225 lots.

The business case process is organised around a five-case structure designed to systematically ascertain that 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'.

After the Indicative Business Case was endorsed into the detailed planning phase in June 2017, this Detailed Business Case (DBC) seeks to:

- identify the investment option that optimises value for money
- prepare the investment proposal for procurement
- plan the necessary funding and management arrangements for the successful delivery of the project, and
- to seek agreement to approach the market with a request for proposals and finalise the arrangements for implementation of the project.

PART A: THE STRATEGIC CASE FOR CHANGE

2 Background

2.1 Strategic assessment and alignment

Queenstown is experiencing significant growth and the supply chain is struggling to satisfy the demand for more houses. The shortage of houses in Frankton and Queenstown has led to soaring prices, which cause many people to live in nearby satellite communities and commute to work in Queenstown. Due to the physical constraints of lakes and mountains much of the land between the commuting areas and Queenstown is undevelopable and there are few locations remaining that are suitable for residential development. Kingston is one of the towns that is suitable for further development.

While Kingston township provides a more affordable housing market for commuters to fast-growing Queenstown, further development in Kingston is currently limited by the lack of infrastructure. To enable the future development of 950 new dwellings in Kingston, new 3 Waters infrastructure is required.

QLDC is facing funding constraints and will need to rely on borrowing in order to deliver the substantial capital programme included in their Ten-Year Plan⁴. The growth portion of the Capital Programme will be largely funded by development contributions in the long run, but must be funded primarily by debt in the first instance. Some of this debt will be via the Housing Infrastructure Fund to allow QLDC to prepare for anticipated growth and to direct development activities in specific areas (such as Kingston). This allows for QLDC to spread the cost of large infrastructural projects over the expected life of the asset.

2.2 Supporting work completed to date

Many investigations and other supporting work have been completed in the development of this detailed business case for Kingston, including:

- Review of QLDC policies, Long Term Plan and Infrastructure Strategy.
- Review of preliminary engineering performed by the developer's engineer.
- Refinement of the preliminary engineering design and performance of borehole flow tests and soil infiltration tests to progress the design.
- Risk Workshop, Risk Register and pricing of risk contingency
- Meetings with key stakeholders including NZTA, ORC and Kingston residents.
- Update of cost estimates for the detailed design and construction.
- Draft agreement between MBIE and QLDC on the terms and conditions of the funding.
- Draft agreement between QLDC and the Developer on the terms and conditions of the funding and infrastructure design and construction.
- Preliminary liaison with local power company PowerNet.

Previous studies that are of relevance in support of this Kingston DBC are summarised in Table 1.

⁴ Taken from QLDC Ten-Year Plan 2018-2028 draft consultation document

Table 1: Strategic Alignment

Strategy/Plan	Key Objectives	Alignment
QLDC Kingston 2020 (2003)	A town serviced by its own water and sewerage system.	✓ This will allow Kingston to grow to the critical mass needed to support affordable servicing.
QLDC Plan Change 25 (now incorporated in the QLDC District Plan)	To provide sustainable reticulated sewage and water infrastructure that serves the Kingston Village Special Zone (KVSZ), and to provide effective management of stormwater through the use of a system of open swales throughout the Zone.	✓ This project will enable the development of KVSZ.
QLDC Affordable Housing Strategy (June 2005)⁵	To increase access to quality, affordable housing that is integrated into the community.	✓ Whilst Kingston is not in the main Queenstown Urban Area it is one of the closest areas where affordable housing will be possible for workers in Queenstown.
QLDC Growth Management Strategy 2007	Growth is located in the right places: Growth of the smaller outer lying towns (including Kingston) is to be encouraged to a point where critical mass (around 800 to 1,000 dwellings) for affordable servicing is reached.	✓ This will allow Kingston to grow to the critical mass needed to support affordable servicing.
QLDC Long Term Plan 2015	High performing infrastructure and services that: <ul style="list-style-type: none"> • meet current and future user needs and are fit for purpose; • are cost-effectively & efficiently managed on a full life-cycle basis; • are affordable for the District. 	✓ The Plan identifies the need for a new water supply scheme in Kingston, allocating funding in 2020/21 ✓ The availability of HIF funding would make it affordable sooner.
QLDC 2015-2045 Infrastructure Strategy	Provide reliable drinking water that is safe to drink.	✓ The need for new water and wastewater schemes already identified in Kingston and the projected increase in development.
Financial Strategy (LTP 2015-Vol 2)	To provide goods and services for community and social benefit rather than for a financial return.	✓ Yes. The intention of this project will embody this objective.
Kingston HIF Funding: 3-Waters Indicative Business Case (2017)	Makes the case for government to provide an interest-free loan of up to \$23.8 ⁶ million in 2017/18 and 2018/19 to finance infrastructure headworks that will then allow developers to construct 950 residential units in Kingston.	✓ Provision of the loan will allow developers to install the headworks required to provide services to their residential sections.
QLDC draft Ten Year Plan 2018-2018	The Plan includes new water and wastewater schemes for the existing Kingston township and growth. Stormwater capital works using the housing infrastructure funding is also included.	✓ The proposal for Kingston is included in the draft Ten Year Plan.

⁵ For the purposes of this Strategy, housing is considered to be affordable in the QLDC area if households can access adequate housing by spending a maximum of 30% of their gross income.

The term "adequate housing" includes the suitability of the dwelling to meet the specific needs of the household, in terms of (a) size (not being overcrowded for example), (b) the quality of the design and construction of the dwelling and its facilities and services, including reasonable physical condition, energy efficiency and privacy, and (c) the suitability of the location enabling the household to access employment, shops, school and community facilities without long trips by car.

⁶ Note that \$23.8 million was the growth portion of the estimated total \$28.8 million for the project.

3 Strategic Context

This part of the strategic case confirms the strategic context for the investment proposal and makes a compelling case for change. The strategic context section offers the following:


- Provides a general overview of QLDC and the outcomes that it is seeking to achieve, or contribute to, through its operations.
- Provides evidence of two key challenges facing Queenstown:
 - High growth rates.
 - Infrastructure funding constraints.
- Highlights the impacts of these challenges.
- Discusses how Kingston can be part of the solution.
- Confirms the alignment to existing policies and strategies.

3.1 Organisational Overview

The author of this business case is Queenstown Lakes District Council (QLDC). The QLDC has a central role to play in the development and regulation of the district in a manner that provides high quality services to residents and visitors alike. This includes, amongst other things, providing good quality local infrastructure.

Queenstown Lakes is a unique district in New Zealand. It has significant population and economic growth⁷ coupled with an international reputation as a tourist destination. It has a relatively small number of resident ratepayers (approximately 37,100⁸) but experiences more than 24,000 visitors on an average day and more than 79,300 on a peak day⁹.

With regard to core infrastructure and services, the QLDC Long Term Plan (2015-2025) states:



Our long term Council outcome is:

High performing infrastructure and services that:

- meet current and future user needs and are fit for purpose;
- are cost effective and efficiently managed on a full life-cycle basis; and
- are affordable for the District.

QLDC's mission is:

To enhance the quality of life for all people within the district:

- By further developing services and facilities.
- By carrying out sound social, physical and economic planning.
- By ensuring the provision of cost effective services is responsive to community needs.

⁷ Queenstown Lakes District Annual Economic Profile 2016 (by Infometrics for QLDC) Reports on growth in Queenstown compared with New Zealand up until March 2016. Economic growth in Queenstown-Lakes District averaged 4.2%pa over the last 10 years compared with an average of 1.8%pa in the national economy. Queenstown-Lakes District's population was 34,700 in 2016, up 7.1% from a year earlier. New Zealand's total population grew by 2.1% over the same period. Population growth in Queenstown-Lakes District averaged 4.1%pa over the last 5 years compared with 1.4%pa in New Zealand

⁸ Source: StatsNZ Infoshare: Estimated residential population in June 2017.

⁹ Visitor numbers are for 2018 and taken from Rationales QLDC Growth Projections to 2058 (2017)

Council value statements:

- Commitment to striving for the long-term desires of each community.
- Protection of the environment is essential.
- Recognition of the diversity of communities within the District.
- Communication and consultation with the residents and ratepayers of the district on major policy direction.
- Provision of services in a cost effective and efficient manner.
- A high level of service to residents and ratepayers of the district.
- Management of community assets with a long-term strategic view of community desires.
- A proactive approach to managing the resources of the district.
- A commitment to the strategic planning process.

3.2 The Challenges of Fast Growth

Queenstown and the surrounding areas have been experiencing significant growth for several decades. Figure 1 below compares the population growth rate between Queenstown Lakes District and the rest of New Zealand. It highlights that the district has had a growth rate typically much higher than the national average dating back to at least 2001. Growth projections show that the high rates of growth in Queenstown are predicted to continue. The following sub-sections:

- summarise the latest growth projections
- look at how the growth projections have changed over the past decade
- discuss the National Policy Statement for Urban Development Capacity
- consider current funding constraints
- looks at the impacts of fast growth on housing affordability

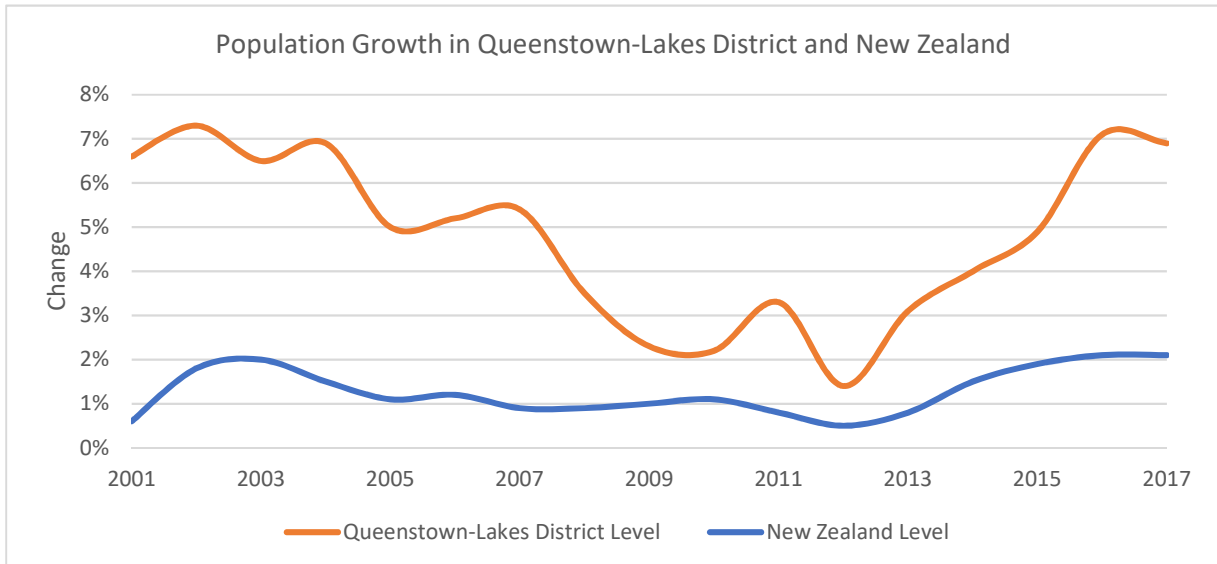


Figure 1: Population Growth in Queenstown Lakes District and New Zealand (Source: Infometrics - Queenstown Lakes District Economic Profile)

3.2.1 Latest Growth Projections

Table 2 below summarises the district's and Queenstown's demand projections for the next 40 years, with continued growth expected throughout this period. This shows district growth of over 28,000 people during the 30-year period between 2018 and 2048, requiring an additional 11,800 houses. The Queenstown growth (shown as Wakatipu Ward) is expected to see an additional 18,300 residents over the same period accommodated within 7,400 new homes. Note that there are additional unoccupied dwellings on top of these figures, making the total number of new dwellings over this period for Queenstown 8,100. The table shows

a steady increase in the proportion of occupied dwellings, indicating a greater utilisation on the dwelling stock by the resident population, and a trend toward visitors staying in commercial accommodation¹⁰.

Table 2: Estimated Population and Dwelling Demand

Wakatipu Ward	2015	2018	2028	2048	2053	2058	Growth# 2015 - 2028	Growth% 2015 - 2028	Growth# 2015 - 2048	Growth% 2015 - 2048
Usually Resident Population	22,070	25,557	32,627	43,846	46,610	49,374	10,557	48%	21,776	99%
Occupied Dwellings	8,529	9,825	12,575	17,250	18,465	19,708	4,046	47%	8,720	102%
Unoccupied Dwellings	2,102	2,303	2,679	3,011	3,061	3,105	577	27%	910	43%
Total Dwellings	10,631	12,128	15,254	20,261	21,526	22,813	4,623	43%	9,630	91%

Wanaka Ward	2015	2018	2028	2048	2053	2058	Growth# 2015 - 2028	Growth% 2015 - 2028	Growth# 2015 - 2048	Growth% 2015 - 2048
Usually Resident Population	10,340	12,491	16,650	22,509	23,933	25,357	6,310	61%	12,169	118%
Occupied Dwellings	4,279	5,181	6,949	9,517	10,154	10,796	2,669	62%	5,237	122%
Unoccupied Dwellings	2,133	2,409	2,471	1,817	1,620	1,421	339	16%	-315	-15%
Total Dwellings	6,412	7,590	9,420	11,334	11,774	12,217	3,008	47%	4,922	77%

Queenstown Lakes District	2015	2018	2028	2048	2053	2058	Growth# 2015 - 2028	Growth% 2015 - 2028	Growth# 2015 - 2048	Growth% 2015 - 2048
Usually Resident Population	32,410	38,048	49,277	66,355	70,543	74,731	16,867	52%	33,945	105%
Occupied Dwellings	12,809	15,006	19,524	26,767	28,619	30,504	6,715	52%	13,958	109%
Unoccupied Dwellings	4,234	4,712	5,150	4,828	4,681	4,526	916	22%	594	14%
Total Dwellings	17,043	19,718	24,674	31,595	33,300	35,030	7,631	45%	14,552	85%

(Source: Rationale February 2017)

3.2.2 Growth Projections – the moving target

Previous growth projections underestimated the growth that is being experienced. This has added to the challenge of keeping up with the provision of infrastructure to service the fast-growing population.

Rationale produced a report in December 2015 entitled 'QLDC Growth Projections 2015-2055' to review and develop growth projections for QLDC. The report considered resident population, visitors, dwellings and rating units.

Figure 2 below shows the population change occurring in the Queenstown Lakes District and the change in projections from 2004. During the Global Financial Crisis (2007-2012) the projections were downgraded (shown purple). However, since that time, there has been a considerable spike in both visitor numbers and residential growth partly driven from larger than expected immigration numbers.

Current projections show that the following changes are expected over the next 10 years:

- A resident population increase of 29%.
- A total visitor increase of 25%.
- A 24% increase in the number of dwellings and rating units.

¹⁰ QLDC Growth Projections to 2058 by Rationale

Population continues to grow (both resident and visitor) at a higher rate than that predicted in 2014 and in earlier years. An increasing population requires an increasing housing stock to accommodate them.

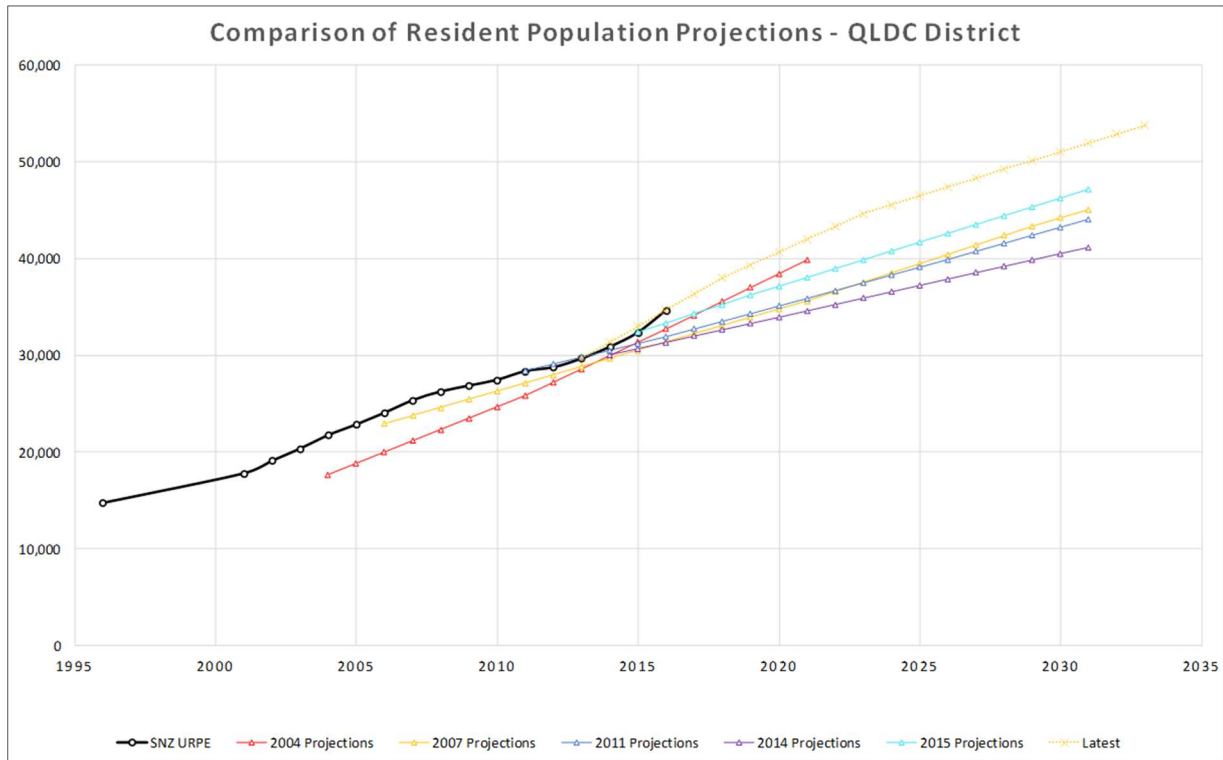


Figure 2: Comparison of Resident Population Projections - QLDC District 2004-2016 (Source Rationale (2015))

3.2.3 Capacity Under National Policy Statement

The National Policy Statement – Urban Development Capacity (NPS-UDC) came into force on 1 December 2016. Under the NPD-UDC local authorities are required to ensure (under PA1) that the development capacity identified in this report is, or can be, serviced by “development infrastructure”. However, the “other infrastructure” necessary to support urban growth is also important for the creation of effective and efficient urban environments, and together supports the achievement of social, economic, and cultural wellbeing.

Policies PA1 and PA2 are directly related to this application to the Housing Infrastructure Fund, as shown in Figure 3 below.

PA1: Local authorities shall ensure that at any one time there is sufficient housing and business land development capacity according to the table below:

Short term	Development capacity must be feasible, zoned and serviced with development infrastructure.
Medium term	Development capacity must be feasible, zoned and either: <ul style="list-style-type: none"> • serviced with development infrastructure, or • the funding for the development infrastructure required to service that development capacity must be identified in a Long Term Plan required under the Local Government Act 2002.
Long-term	Development capacity must be feasible, identified in relevant plans and strategies, and the development infrastructure required to service it must be identified in the relevant Infrastructure Strategy required under the Local Government Act 2002.

PA2: Local authorities shall satisfy themselves that other infrastructure required to support urban development are likely to be available.

Figure 3: Obligations of local authorities in relation to development capacity

The latest QLDC dwelling capacity model (updated in 2017 for Proposed District Plan Hearings) shows a ‘realisable’ zoned capacity of 15,100 across the Queenstown area (Wakatipu ward) and an additional 885 of Special Housing Areas. Throughout the PDP Stage 1 hearings process, it has been confirmed that the network can accommodate the additional growth proposed through the notified PDP and is either planned within the LTP, contained within the Infrastructure Strategy or is being provided by the land developer.

The challenges associated with meeting increasing growth demands particular to Queenstown are many. They include the impact from increasing numbers of visitors and migrant workers, and the high proportion of holiday homes. Also, the natural constraints of the district’s outstanding landscapes, mountainous terrain, lakes and natural hazards, and pressure on roading, all of which make readily developable land more scarce and constrain the outward growth of urban areas as well as influence the cost of development. Other barriers such as land banking, construction industry capacity constraints, the cost of local building materials and labour also adversely impact on the affordability of dwellings in the district.

Policies PB6 and PB7 of the NPS-UDC require local authorities to monitor a range of indicators to ensure they are well informed about demand for housing and business development. This monitoring has highlighted that house prices and rental costs are continuing to increase. Evidence suggests that this is being matched with increases in the issuing of new residential building consents and subdivision consents, which are being issued at record rates. Across all growth scenarios there is a shortage of dwellings being supplied to the market at the lower end of the price range. It is considered that any development in Kingston is likely to be in this lower end price range.

The Housing Infrastructure Fund can therefore assist QLDC in meeting its obligations under the NPS-UDC by assisting with the provision of infrastructure that supports housing development.

Within the Queenstown Lakes district, Queenstown is a high growth urban area, policies PC5-PC14¹¹ and PD3-PD4 also apply to Queenstown. A Future Development Strategy must be prepared to identify the broad location, timing and sequencing of future development capacity in the medium and long term. Any successful proposal approved as part of this Housing Infrastructure Fund application will assist in determining the Future Development Strategy for the Queenstown Lakes district. Table 3 below shows the indicative targets set by QLDC to contribute to the NPS.

Table 3: Contribution to Development Capacity

	2017/18-2019/20 (1-3 years)	2020/21-2027/28 (3-10 years)	2028/29-2047/48 (Up to 30 years)
Territorial development capacity targets required to meet the NPS-UDC	1,800	3,000	6,000

3.2.4 Financial Constraints

The financial constraints facing QLDC are captured well in the consultation materials supporting the new Ten-Year Plan. The summary below has been sourced from the Ten-Year Plan 2018-2028 draft consultation document.

“In order to deliver the substantial capital programme included in this plan, QLDC will need to rely on borrowing. The amount of borrowing required is significantly above the amount anticipated in the 2015-2025 Ten Year Plan. At the end of 2017 the Council applied for a credit rating from Fitch Ratings, an international credit rating agency. This has been granted at AA-

¹¹ NPS-UDC Policy summary:

PC5-11: Local authorities shall set **minimum targets** for sufficient, feasible development capacity for housing.

PC12-14. Local authorities shall produce a **future development strategy** that demonstrates there will be sufficient, feasible development capacity in the medium and long terms and that the minimum targets will be met.

PD3. Local authorities that share jurisdiction over an Urban Area are strongly encouraged to cooperate.

PD4. Local authorities shall work with providers of **development infrastructure** and **other infrastructure** in preparing the future development strategy.

which enables the Council to access a higher debt limit and borrow more. Council has spent a considerable amount of time and effort working through the Capital Programme to ensure that it is affordable, necessary and deliverable.

This has meant that a number of projects have been deferred or omitted due to funding and financing constraints. It is expected that by the end of year five, external debt will have risen to \$443M and by the end of the ten-year period it will have declined to \$339M. In 2015, we forecast our external debt for these years to be far lower, at \$169M and \$134M respectively.

The growth portion of the Capital Programme (\$317M or 32.5% of the total Capital Programme) will be largely funded by development contributions in the long run, but must be funded primarily by debt in the first instance. Some of this debt will be via the Housing Infrastructure Fund to allow QLDC to prepare for anticipated growth and to direct development activities in specific areas. This allows for QLDC to spread the cost of large infrastructural projects over the expected life of the asset.”

BORROWING LIMIT	30 JUNE 2019	30 JUNE 2020	30 JUNE 2021	30 JUNE 2022
Interest expense/rates <30%	10.0%	13.2%	17.6%	13.5%
Interest expense/Total revenue <20%	5.2%	6.0%	7.8%	7.6%
Net debt/Total revenue <250%	100.3%	139.3%	188.0%	154.7%

Figure 4: Forecast debt ratios

3.2.5 Housing is becoming more unaffordable

The main impact of fast population growth is a housing shortage. This has led to a rise in house values and some of the population needing to look further afield to find affordable housing and, therefore, commuting to Queenstown for work. Figure 5 (below) demonstrates the level of housing affordability compared to the index for New Zealand and the upward trend in unaffordability for Queenstown Lakes.



Figure 5: Housing affordability for the district compared to New Zealand

Source: Infometrics economic profile for Queenstown Lakes District.
<https://ecoprofile.infometrics.co.nz/Queenstown-Lakes%20District>

Figure 5 and Figure 6 demonstrate the affordability of housing in the Queenstown-Lakes District and for the country as a whole by comparing average current house values with average annual earnings. Infometrics

present a housing affordability index which is the ratio of the average current house value to average annual earnings. A higher ratio, therefore, suggests that median houses cost a greater multiple of typical incomes, which indicates lower housing affordability.

Housing affordability in Queenstown-Lakes District and New Zealand



Figure 6: Trends in housing affordability for the district as compared to the rest of New Zealand.

Source: Infometrics economic profile for Queenstown Lakes District.
<https://ecoprofile.infometrics.co.nz/Queenstown-Lakes%20District>

There is also a flow on to rental affordability that has a significant impact in the district. As shown below, the rental affordability index is also climbing (becoming more unaffordable), and it sits well above that of New Zealand as a whole. This is a further indication of the impact of inadequate supply of houses in the Queenstown Lakes district.

Rental affordability index



Figure 7: District rental affordability compared to New Zealand.

Source: Infometrics economic profile for Queenstown Lakes District.

<https://ecoprofile.infometrics.co.nz/Queenstown-Lakes%20District>

3.2.6 Defining affordability

For the purposes of this DBC, affordable housing is defined by the QLDC Affordable Housing Strategy, which considers housing as affordable if households can access adequate housing by spending a maximum of 30% of their gross income. This figure reflects the additional costs households face in the Queenstown district, including higher heating costs and other household running costs. It also reflects the make-up of the community and the economy, and the reliance on service and trade workers for the continued economic vitality of the settlements. There is concern about the number of households unable to purchase affordable housing yet who contribute to the diversity of the community, are long-term residents of the community, and/or are essential for local economic vitality and quality of life.

The term “adequate housing” includes the suitability of the dwelling to meet the specific needs of the household in terms of size (not being overcrowded for example), the quality of the design and construction of the dwelling and its facilities and services, including reasonable physical condition, energy efficiency and privacy. It also considers the suitability of the location enabling the household to access employment, shops, school, medical doctors and community facilities without long trips by car. Shortage of land for development and continually high demand is evident by the high price of properties in Queenstown and the surrounding district. The flow-on effect being a shortage of affordable housing in Queenstown.

Figure 8 shows the change in Queenstown average house value compared to New Zealand’s main urban areas. For the past two years the percentage increase of house values in the Queenstown has been considerably higher than the national average and increasing each year.

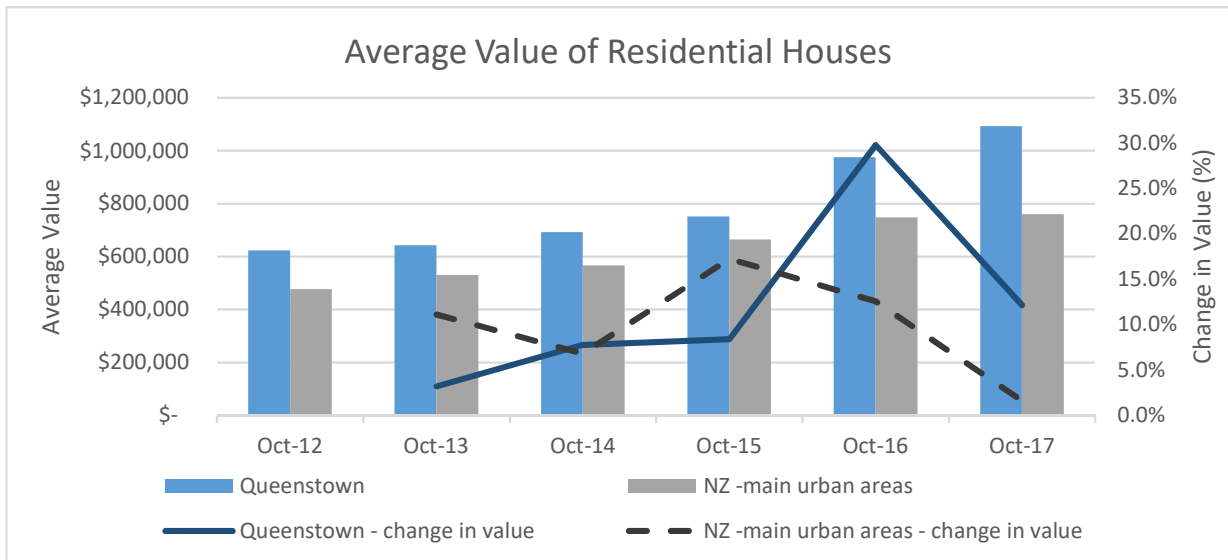


Figure 8: Average Value of Residential Houses (Source: QV website)

The cost of housing in Queenstown is becoming less and less affordable for much of the population and this is further confirmed in the sales data available from QV.com. The table in Appendix 1 shows that in the three-month period from mid-August 2017 to mid-November 2017, house sales in the Queenstown district were mostly over half a million dollars. The most affordable suburb to buy a residence within 20 minutes’ drive of Queenstown was Fernhill where six flats were sold at median price of \$629,000. All other suburbs within 20 minutes of Queenstown had sales medians over \$750,000. This is well above the national median sales price of \$530,000¹² (October 2017). The only suburbs in the district with sales medians under \$500,000 were Glenorchy and Kingston (both are 46 minutes’ commute to downtown Queenstown), with one house sold in Makarora (150 minutes from Queenstown).

The average household income for the Queenstown Lakes District was \$73,300 in the 2013 Census. Assuming \$22,000 of this income is allocated to servicing a 30-year mortgage payment at 7% (with 20% deposit), an affordable house would be priced at approximately \$340,000. Houses in the district are not affordable for households on an average income and based on Figure 8 they haven’t been for at least the past five years.

It is not uncommon for people to commute long distances to work in Queenstown/Frankton. Statistics New Zealand 2013 census data shows that approximately 60 people were commuting each day from the Wanaka/Hawea area (60-90 minutes’ drive) and approximately 200 people from Cromwell/Alexandra (55-80 minutes’ drive). Housing affordability would be one of the primary reasons for commuting¹³. The private vehicle commute from Kingston is 46 minutes to downtown Queenstown and just 35 minutes to Frankton¹⁴.

For further comparison, during the same period as the table in Appendix 1, Cromwell (56 minutes commute) had 30 house sales with a median price of only \$540,500. Commutes from surrounding townships and districts rely on the level of service provided by State Highways and on the district plan zoning of neighbouring TLAs. Both of which are beyond the immediate control of QLDC.

¹² REINZ Residential Statistics report for October 2017

¹³ Sources: <https://www.stuff.co.nz/business/property/85317493/people-turn-to-commuting-as-queenstown-house-prices-soar> and <https://www.radionz.co.nz/news/political/335509/labour-pledges-to-boost-queenstown-housing>

¹⁴ Note that most major services are now located in Frankton as opposed to central Queenstown. This includes supermarkets, large retail outlets, various industrial businesses, hospital and international airport.

3.3 Kingston – Part of the Solution for More Houses Faster

Expanding Kingston is part of the solution to provide more houses faster. This section provides an overview of Kingston, provides the case for including Kingston as part of the solution and outlines the proposed project. After all, Kingston is more affordable, commutable, already zoned and developer ready; it just needs funds for infrastructure to get it off the ground.

3.3.1 Kingston overview

The current Kingston township contains approximately 225 residential dwellings that are a mix of permanent residences and holiday houses/baches along with many vacant sections and larger undeveloped blocks. Many residents commute to Queenstown for work, and this practice is expected to grow in proportion with the size of Kingston, and the much greater affordability of housing within this community¹⁵. As such, Kingston is a key location for providing affordable housing to service the Queenstown urban area, as discussed below.

The Kingston Village Special Zone¹⁶ (KVSZ) encompasses most of the undeveloped flat land to the south of the current township. It has approval for approximately 750 residential dwellings across a range of densities and is currently undeveloped with no infrastructure. Investigations into 3 Waters infrastructure options have been carried out and they are referred to in the following section.

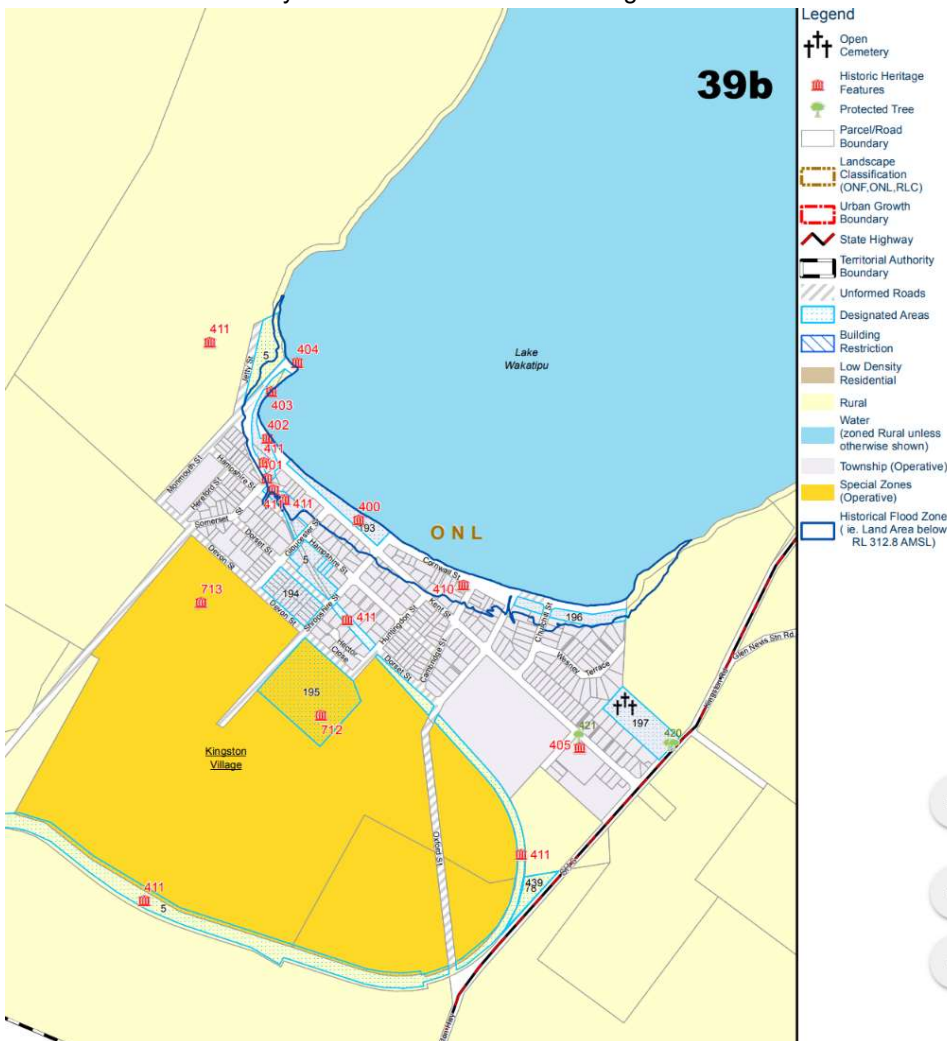


Figure 9: Kingston Village (shown grey) and Kingston Village Special Zone (shown yellow) (as shown in the QLDC Proposed District Plan)

¹⁵ Source: QLDC Kingston Township Population Projections, Rationale (2008)

¹⁶ KVSZ was approved under Plan Change 25 by the Queenstown Lakes District Council in October 2008

The QLDC District Plan states: “*The purpose of the Kingston Village Special Zone is to achieve a comprehensively designed settlement that provides a range of residential densities, extensive open space and recreational opportunities and employment land.*”¹⁷ Zone standards include: “*All subdivision, use and development shall be undertaken in general accordance with the Kingston Village Special Zone Structure Plan.*”¹⁸

At the same time as the Plan Change was enacted in 2008, water and wastewater budgets for Kingston schemes were added to the LTP for construction in 2014-2016. Due to affordability issues highlighted in the qualified audit of the 2009 LTP¹⁹, the budget for wastewater was pushed out to 2021/22 and water was similarly pushed out a few years to match wastewater timing²⁰. In 2016/17 the wastewater budget was pushed right out to 2026/27 but the water budget remains. Pushing the budgets back was effectively putting the onus back on the developer of KVSZ, Kingston Village Limited (KVL). Despite the right intentions, affordability has always been an issue and there has been a ‘chicken and egg’ scenario due to the population not being at a critical mass for affordability of servicing. An interest free loan from the Housing Infrastructure Fund (HIF) would effectively enable the developments to be brought forward, thus providing more houses sooner.

A large amount of undeveloped and under-developed land is located within the existing Kingston township itself. There are several large landholdings that have not previously been subdivided due to the constraint caused by the lack of a reticulated wastewater and water schemes. As any new section would currently need to be serviced by a septic tank, the District Plan restricts section sizes to a minimum of 800 m², which does not make the land affordable to many residents. If a reticulated system were installed, the minimum section size could be reduced in size²¹ and made more affordable. With the provision of 3 waters infrastructure, it is believed that there is the potential for an additional 200²² residential dwellings within the existing township.

3.3.2 Why include Kingston when it is not contiguous with the Queenstown Urban Area?

Kingston is affordable and commutable

Kingston is located at the southern end of Lake Wakatipu and forms a natural extension of the housing market for Queenstown. This is evident by the current number of commuters from Kingston to Queenstown. Census data from 2013 shows a usually resident population of 250 with 63 people commuting to the Queenstown area for work (25% of residents), with 72 people working within the Kingston South area. Furthermore, there is a shortage of affordable²³ housing in Queenstown, and Kingston is one of the most affordable places to live close to Queenstown (refer to table in Appendix 1, which shows recent residential sales in the Queenstown Lakes District). The private vehicle commute from Kingston is 45 minutes to downtown Queenstown and 35 minutes to Frankton. Most major services are located in Frankton (not downtown Queenstown), including supermarkets, retail outlets, international airport, hospital and various industrial businesses.

Kingston is the next developable area when heading south

While the previous section discussed commutability and housing affordability, this section will discuss the geography of the land and its impact on development. Queenstown is a unique high-growth urban area when

¹⁷ QLDC District Plan (May 2011) Section 12.28.1 - Zone Purpose

¹⁸ QLDC District Plan (May 2011) Section 12.28.5.2i - Kingston Village Special Zone Structure Plan

¹⁹ The audit is discussed further in section 3.2.4 Financial Constraints

²⁰ NB: Following the 2009 LTP audit, many projects were removed from Council planning and their responsibility transferred back on to the development community.

²¹ If the township was rezoned to Low Density residential the minimum site size would reduce to 450m² and minimum density of 1 dwelling per 300m². (Compared to current minimum site size of 800m²)

²² If reticulated infrastructure is installed in Kingston and the area was rezoned to low density residential it is estimated that there is capacity for approximately 200 infill houses (this takes into account locations of existing houses etc) (taken from email from QLDC Planning Practice Manager).

²³ Housing is considered to be affordable in the QLDC area if households can access adequate housing by spending a maximum of 30% of their gross annual income.

compared to the four other recognised high growth areas (Auckland, Tauranga, Hamilton and Christchurch) due to its significantly smaller number of residents (base of ratepayers), high proportion of visitor numbers and its geographical constraints.

Figure 10 below highlights the locality of Kingston relative to Queenstown and Frankton. Most of the area around Queenstown is either mountainous or lake, both of which lead to a shortage of developable land. Just 12 minutes’ drive south of Frankton, on the road to Kingston, there is developable land, but this is already in the process of being developed (Jacks Point and Hanley’s Farm) and hence does not meet the HIF criteria for bringing forward future developments. To the south of this area, the land remains undevelopable due to mountains until SH6 reaches Kingston (refer to Figure 10 and Figure 11). Kingston is geographically the next available area for development going south along SH6.

The 2008 report for QLDC on Kingston Township Population Projections notes:

“There is evidence that the lower housing costs in Kingston are attracting commuters working in the Queenstown area to live in Kingston. As long as the relative disparity in housing costs remains significant, and Queenstown housing remains out of reach for lower income households, it is likely that demand from Queenstown workers will continue to fuel Kingston population growth”.

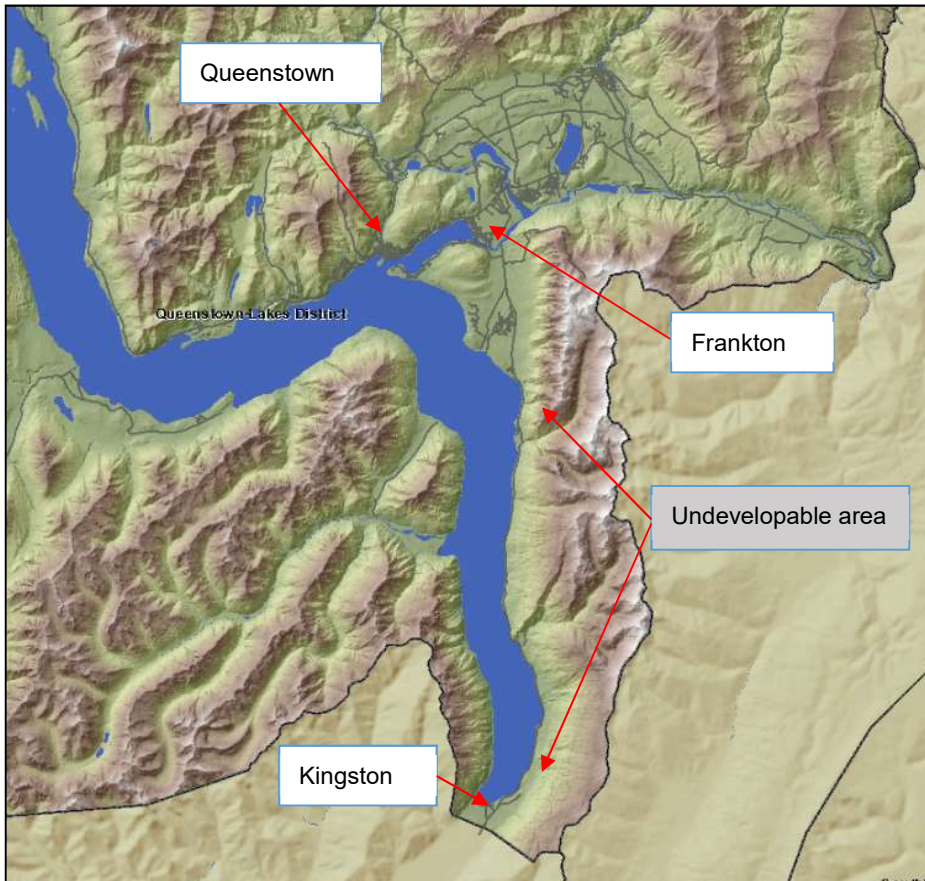


Figure 10: Locality Map



Figure 11: Kingston Road (SH6), undevelopable land - typical landscape (image: Google Maps)

3.3.3 KVSZ and Proposed Community Schemes

The KVSZ land is owned by one developer Kingston Village Limited (KVL) and was previously rezoned to permit the proposed development. QLDC’s standard procedure for the installation of 3 Waters infrastructure is for the development to be at the developer’s cost. Engineering assessments have been made for 3 Waters servicing options, which have included preliminary testing of soils for wastewater disposal and a new bore for water supply purposes. A nearby land owner with suitable agriculture land has indicated strong interest in receiving effluent disposal on his land for irrigation.

The District Plan rules for KVSZ include a Structure Plan for development. More recently, KVL has developed preliminary layout plans for Stage 1 in consultation with QLDC (included in Appendix 5). The next step for KVL is to apply for a resource consent for subdivision which is being prepared in parallel with the infrastructure design.

The infrastructure concept designs for the KVL development have been further developed as part of this business case to provide a preliminary design for the whole of Kingston. This is outlined further in Section 3.3.4 below.

3.3.4 The HIF Proposal for Kingston

It is proposed to provide 3 waters systems for both the Kingston township and the KVL development. The plans below show the proposed infrastructure for the preferred programme²⁴. Enlarged versions are included in Appendix 5. It is proposed to commence construction in 2019 in time for the first sections to be released in 2020.

²⁴ Later in this report this proposal is referred to as Programme 2 and/or the preferred programme.

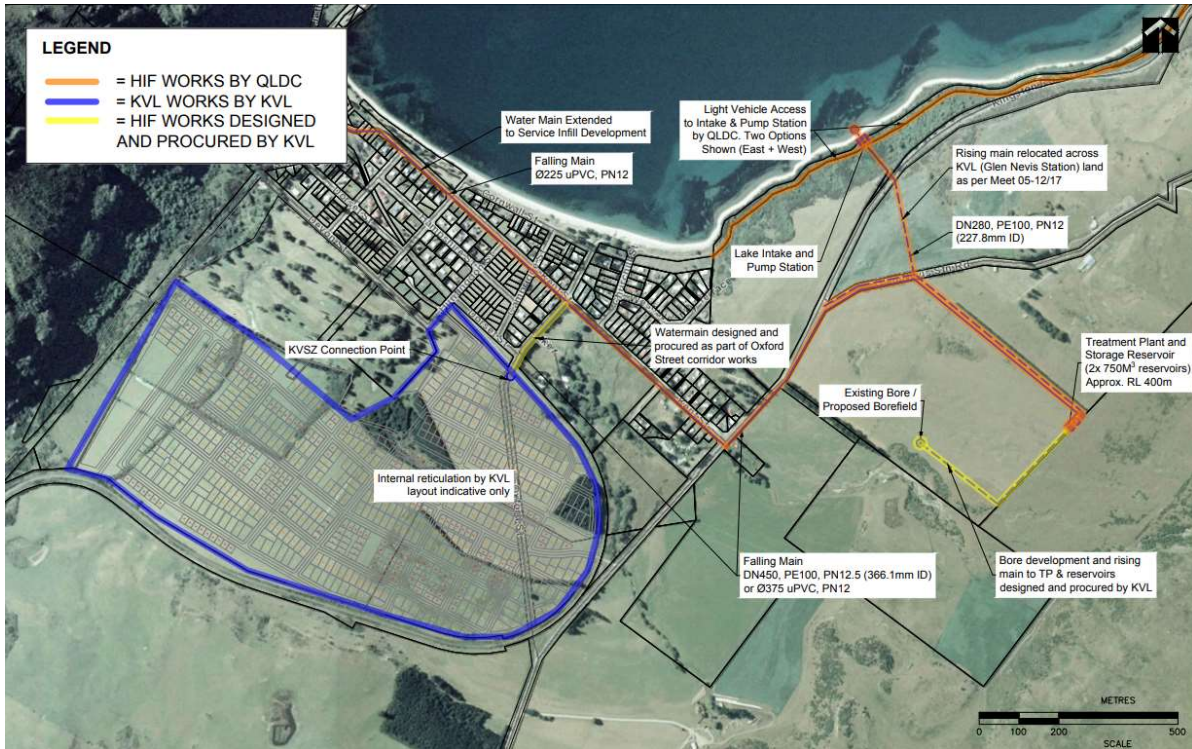


Figure 12: Proposed water supply infrastructure for Kingston

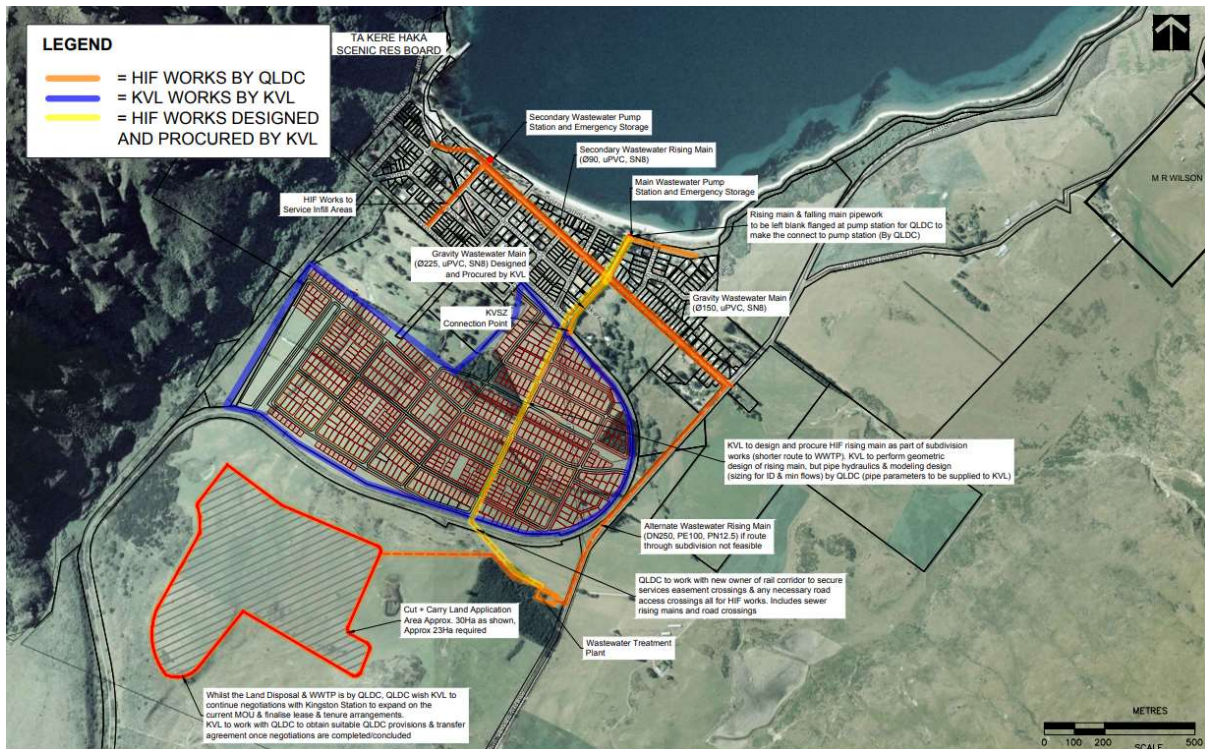


Figure 13: Proposed wastewater infrastructure for Kingston



Figure 14: Proposed stormwater infrastructure for Kingston

3.4 Development Challenges at Kingston

3.4.1 Current 3 Waters Servicing at Kingston

There is no public water supply or wastewater service at Kingston. Water supply within the existing Kingston township consists primarily of individual roof rainwater collection and storage tanks. Anecdotally, several dwellings also have shallow groundwater bores or wells since rainfall can be unreliable over the summer months. Shallow groundwater is susceptible to contamination from faecal bacteria²⁵ given the shallowness (2-4 m) of the groundwater combined with the old septic tank systems. This is a very high public health risk for the township.

Wastewater treatment and disposal within the existing township is generally by way of individual on-site treatment and disposal systems. There are an estimated 225 dwellings in Kingston with simple individual septic tank systems. Some properties located near the lakeshore are floodable when the lake level is high, hence septic tanks may not be usable and may contaminate water in the event of flooding. There is a very high risk of environmental and/or public health issues if this wastewater disposal practice continues for an expanding population.

Stormwater within the existing Kingston Township is currently managed on a relatively informal basis with water conveyed to Lake Wakatipu via several natural watercourses and a series of manmade drainage channels or culverts. Several localised areas within the existing township currently experience surface flooding, overland flow, ponding and other stormwater related issues because of the relatively ad-hoc stormwater infrastructure²⁶. To enable further development in Kingston stormwater management is required.

This lack of public water, wastewater and stormwater infrastructure provides a challenge for Kingston because further residential development is restricted by the associated environmental and public health risks. The expansion of the township under a septic tank system is not a sustainable solution as it would increase degradation of the environment and limit the total number of residential dwellings. Expansion of the individually-owned shallow water supply bores is also not sustainable from both the groundwater management and public health risk perspectives, particularly when combined with the use of nearby septic tanks. And the existing stormwater facilities would rapidly be overwhelmed if additional growth were to occur without considerable upgrade in system capacity and performance.

3.4.2 Pristine Receiving Environment

Kingston sits at the southern end of Lake Wakatipu. The lake flows into the Kawarau River which ultimately flows into the Clutha River, via Lake Dunstan at Cromwell. Water quality of the lake and river is excellent given the alpine catchment. Selvarajah (2015)²⁷ describes how Lake Wakatipu meets the National Policy Statement (NPS) for Freshwater Quality 2014 highest limits for Attribute State A for lakes²⁸, falling well within the required thresholds. Selvarajah also confirms that Lake Wakatipu meets all the water quality limits outlined in the Otago Regional Council (ORC) Plan Change 6A Schedule 15.

²⁵ In 2014, ORC's Resource Science Unit undertook a review of available groundwater quality data for Kingston. The review concluded that groundwater in the Kingston area continues to be susceptible to periodic contamination events, most likely derived from septic tank discharges. At times faecal coliform concentrations have exceeded New Zealand Drinking Water Standards.

²⁶ Hadley Consultants Ltd, Kingston Township Infrastructure Servicing-Housing Infrastructure Fund Briefing Report for QLDC (Nov 2016)

²⁷ Selvarajah, S. 2015. Effective human wastewater management in rapidly growing towns in sensitive receiving environment- A perspective on Queenstown-Lakes District area. KEYNOTE PAPER. New Zealand Land Treatment Collective Conference, Wanaka, New Zealand (March 25-27, 2015).

²⁸ This rating indicates the lakes ecological communities are healthy and resilient, similar to natural reference conditions.

3.4.3 The Effects of a Septic Tank Township

Septic tanks can cause contamination to groundwater and/or surface water. The reason can be due to poorly maintained systems that are failing and/or the cumulative effects of too high a density of septic tanks²⁹.

The two main forms of contamination by septic tanks are³⁰:

- nitrates – which can lead to illness or nuisance growths of algae and pest plants
- microbiological – which can lead to outbreaks of diseases such as rotavirus, norovirus and hepatitis.

According to the ORC Water Plan Change 6A, the Wakatipu Basin falls within the nitrogen sensitive zone. Rule 12.C.1.3 allows as a permitted activity the discharge of nitrogen to land from farming activities that may then enter a water course, provided the discharge does not exceed a set annual loading rate. The Plan Change rule restricts nitrogen leaching rates to less than 15 kg N/ha/year within the nitrogen sensitive zone. The technical report by ORC (Leslie, 2014) indicated that the large number of properties within Kingston will collectively exceed the nitrogen sensitive zone leaching restriction by a substantial amount, with a majority of the septic tank clusters exceeding 30 kg N/ha/year. While the nitrogen leaching rules are not currently applicable to septic tank discharges, when new septic tank rules are set by ORC it is likely that the same nitrogen leaching restrictions will apply to septic tanks to achieve the same desired environmental outcomes set within the current Plan Change 6A (Selvarajah, 2015).

The local groundwater has not been investigated regularly or extensively by ORC, hence it is difficult to ascertain whether a nitrogen plume significantly affects Lake Wakatipu. There is, however, a high potential for nuisance algal growth events around the currently pristine Lake Wakatipu shore close to the residential blocks³¹.

Selvarajah (2015) reported how a specific groundwater quality study conducted by ORC in Kingston in 2002-2003 indicated 4 water bores out of 19 sampled had faecal bacteria contamination (ORC, 2006). These bores were centrally located within the township. Compared to many Queenstown Lakes district aquifers, Kingston groundwater has slightly elevated nitrate-N levels (the highest being 2.4 mg/L). This is despite the reducing conditions characterised by high iron levels prevailing in many of the bore sites, which are generally conducive to reducing nitrate in groundwater (Selvarajah et al., 1994). The ORC technical report attributed the elevated levels of ammoniacal-N (average of 0.213 mg/L) found in one bore to contamination by septic tank effluent and the generally elevated nitrate-N level to garden fertiliser or septic tanks.

²⁹ ORC (August 2015), Groundwater Contamination Risk, Septic Tank Density and Distribution within Otago.

³⁰ Leslie, S. 2015, Septic tanks in Kingston: A summary

³¹ Selvarajah, S. 2015. Effective human wastewater management in rapidly growing towns in sensitive receiving environment- A perspective on Queenstown-Lakes District area. KEYNOTE PAPER. New Zealand Land Treatment Collective Conference, Wanaka, New Zealand (March 25-27, 2015).

Beardmore³² (2014) noted that an assessment of probable septic tank locations by the ORC in 2012-2013 identified Kingston as an area of extremely high septic tank density. The United States Environmental Protection Agency (USEPA) defines 'high-density' as more than 15 septic tanks per km² and considers these areas to be at high risk of groundwater contamination. In Kingston, it is estimated that there are densities of over 200 septic tanks per km² (refer to Figure 15 below). Based on the density of septic tanks and site specific hydrogeologic factors such as soil type and depth to groundwater, there is a high risk of groundwater contamination at Kingston (Beardmore, 2014).

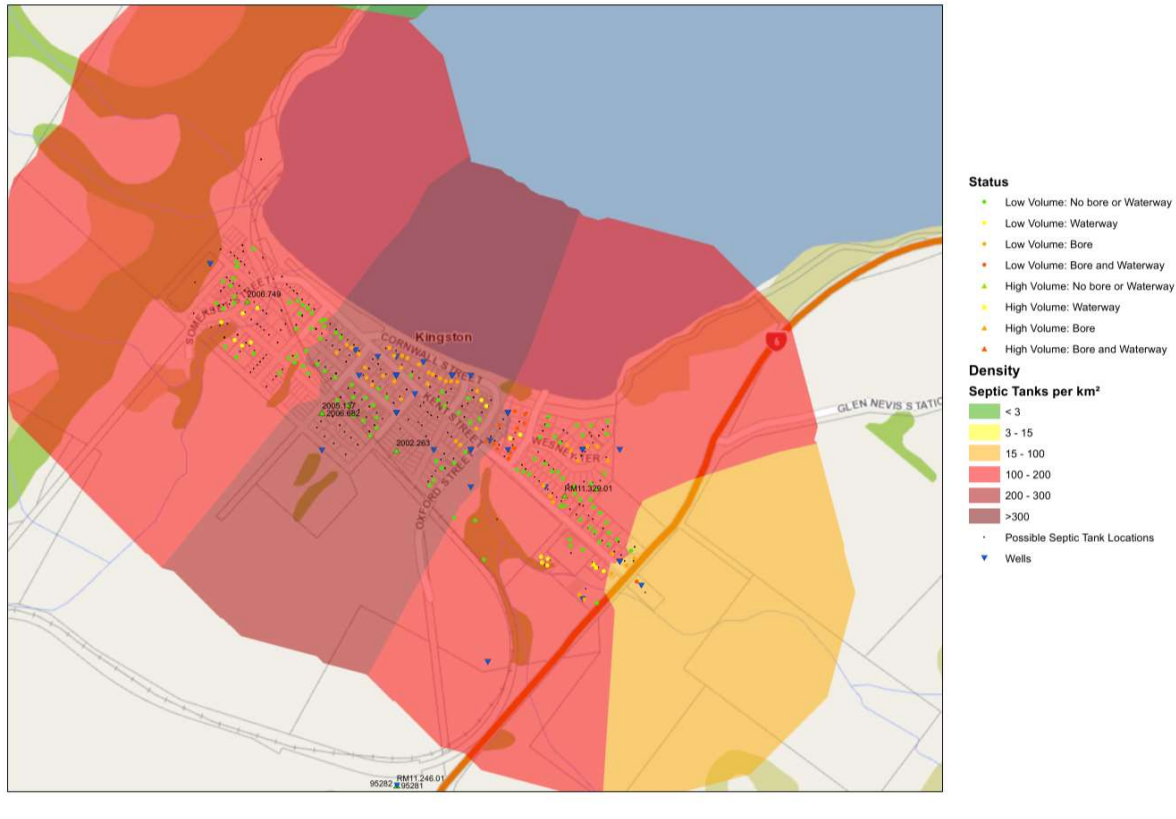


Figure 15: Septic Tank Densities in Kingston (source: Beardmore, 2014)

Beardmore also noted that Otago Regional Council’s Resource Science Unit recently undertook a review of available groundwater quality data for Kingston. The review concluded that groundwater in the Kingston area continues to be susceptible to periodic contamination events, most likely derived from septic tank discharges. At times, faecal coliform concentrations have exceeded New Zealand Drinking Water Standards.

3.4.4 Kingston’s infrastructure needs

To enable and accelerate growth Kingston needs public 3 Waters infrastructure. This will enable good urban outcomes such as:

- protecting public health
- minimising adverse effects on the environment
- maximising land use capacity.

The benefits of providing this infrastructure are discussed in section 4.5.

³² Beardmore, S. 2014, Septic Tank Densities and Groundwater Quality in Kingston (16 May 2014)

3.5 Alignment to Existing Policies and Strategies

The provision of 3 Waters infrastructure in Kingston will enable pre-planned growth, as well as improve public health and environmental outcomes. This aligns with several local, regional and national strategies and plans, which are discussed further below.

3.5.1 Queenstown Lakes District Council (QLDC) Policies and Strategies

Kingston 2020 – The Community Plan

In 2003, the vision of the Kingston community was captured in the Kingston 2020 Community Plan. One of the key community outcomes this project will contribute to is to “provide the cost-effective reticulation of sewerage and water for the Township of Kingston”.

QLDC Growth Management Strategy 2007

The QLDC Growth Management Strategy 2007 outlines core growth management strategies for the district. Principle No. 1 is to locate growth in the right places, and the following strategy to implement this principle aligns with this project:

“Growth of the smaller outer lying towns (including Kingston) is to be encouraged to a point where critical mass (around 800 to 1,000 dwellings) for affordable servicing is reached.”

QLDC District Plan

Kingston currently has two types of zoning in the District Plan (refer to Figure 9 in section 3.3.1). A township zoning which restricts section sizes to a minimum of 800m² and the Kingston Village Special Zone (KVSZ) which has a structure plan but is currently undeveloped. The District Plan zonings are discussed further in section 3.3.1.

In summary, when the KVSZ was adopted in the District Plan (Plan Change 25 in 2008) the provision of 3 waters infrastructure in Kingston was added to the Long-Term Plan, with construction expected around 2015. Due to affordability issues, construction was pushed out to 2021 and 2026 for water and wastewater respectively. The HIF loan will enable the provision of 3 waters infrastructure to be brought forward, enabling the development of more houses in Kingston sooner.

QLDC 2015-2045 Infrastructure Strategy

The QLDC 2015-2045 Infrastructure Strategy identified several significant infrastructure issues for 3 Waters in the district, including the Kingston water supply. The Strategy recognises “the need to provide new community water supply schemes, due to growth or other drivers/events e.g. community expectation, public health concerns. ... QLDC is seeking to better understand Kingston’s future infrastructure requirements. Future responses may need to consider alternative funding models to make these schemes affordable. The following scheme and estimated expenditure have been identified: - Kingston New Water Scheme 2021-22 \$3.5M”. This Kingston HIF project aims to make the scheme more affordable and achievable, aligning well with this strategy.

QLDC draft Ten Year Plan 2018-2018

The draft Ten Year Plan is currently out for consultation. The Plan includes new water and wastewater schemes for the existing Kingston township and growth. Stormwater capital works using the housing infrastructure funding is also included. The proposal for Kingston is included in the draft Ten Year Plan.

3.5.2 Otago Regional Council (ORC) Policies and Strategies

ORC Urban Water Quality Strategy

The ORC Urban Water Quality Strategy – Loving Water, Loving Life! (adopted September 2017) sets out what the Otago community wants from the waterbodies they love and how they can work together to achieve that. The urban strategy is consistent with the approach used in Otago’s rural areas and acknowledges that the management of stormwater and wastewater play a significant role in having good or excellent water quality in Otago.

“The Vision: Otago will enjoy safe and healthy water resources which everyone can use and appreciate.”



Three key goals to help achieve the urban water quality vision are:

1. Pride in water quality
2. Looking after water
3. Water quality for community wellbeing

The strategy identifies nine key issues and their consequences, in three categories: Cumulative Effects, Complex Environment, and Infrastructure & Funding. Most of the issues identified are relevant to the existing 3 Waters situation in Kingston. The Kingston HIF project will tackle the issues that QLDC are able to address and is consistent with the strategy.

Regional Plan: Water for Otago

The *Regional Plan: Water for Otago* rules (updated May 2014) generally allow septic tanks as a permitted activity if installed pre-1998, and new septic tank discharges are permitted only if they are less than 2000 L/day and meet criteria such as setbacks from bores and surface water bodies.

Plan Change 6A (Water Quality)

Plan Change 6A (Water Quality) (operative in 2014) makes provision for controlling contaminants and sediment coming off rural properties into waterways from runoff, leaching and drains (non-point sources). In light of these changed requirements, ORC is reconsidering septic tank management to highlight the threat posed by high priority septic tank areas. These ORC reports highlight Kingston’s high risk of groundwater contamination due to the topography and density of septic tanks. Providing a reticulated wastewater system would improve the situation as the discharge would be subject to consented standards that would be monitored and enforced.

3.5.3 National Policy Statements (NPS), Funds and Plans

NPS – Freshwater Management (updated 2017)

Water Quality Objective A1 of the NPS – Freshwater Management is:

“To safeguard:

a) the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water; and

b) the health of people and communities, as affected by contact with fresh water;

in sustainably managing the use and development of land, and of discharges of contaminants.”

Integrated Management Objective C1 is:

“To improve integrated management of fresh water and the use and development of land in the whole catchments, including the interactions between fresh water, land, associated ecosystems and the coastal environment.”

The provision of 3 Waters infrastructure in Kingston has a strong strategic alignment with these objectives. 3 Waters infrastructure will minimise the adverse cumulative effects of development; safeguarding the fresh water environment and the health of the community.

NPS – Urban Development Capacity

A key objective of the NPS – Urban Development Capacity is that the short-term development capacity must be feasible, zoned and serviced with development infrastructure. This current project will assist QLDC in meeting its obligations by providing infrastructure to enable development of 950 houses in Kingston within the next 30 years, which is 16% of the 30-year target for QLDC. Most of the development is anticipated in the next 10 years (refer to section 4.5, the benefits section).

Thirty Year New Zealand Infrastructure Plan 2015

The purpose of the *Thirty Year New Zealand Infrastructure Plan 2015* is to help navigate through the infrastructure challenges and grasp the opportunities they present. The 2015 Plan includes an Action Plan that outlines the first steps to achieving the 2045 vision. For 3 Waters, this will require infrastructure providers to collaborate more effectively within and across regions, taking a long-term view and ensuring adequate investment in high-growth communities. The provision of 3 waters infrastructure to Kingston is an effective collaboration that embodies the vision of the 2015 Plan:

“Vision: By 2045 New Zealand’s infrastructure will be resilient and coordinated and contribute to a strong economy and high living standards.”

Housing Infrastructure Fund (HIF)

“One-off contestable fund which councils in high-growth areas can apply to for funding to bring forward the transport and water infrastructure required for new housing.”

The Housing Infrastructure Fund (HIF) aims to accelerate the short and medium-term supply of new housing where it’s most needed. QLDC is eligible for funding assistance due to being in a high growth area. QLDC is facing funding constraints and will need to rely on borrowing in order to deliver the substantial capital programme included in their Ten-Year Plan³³. The growth portion of the Capital Programme will be largely funded by development contributions in the long run, but must be funded primarily by debt in the first instance. For Kingston, the infrastructure is required to support dwellings in a greenfield situation (KVL) and within available vacant land within the existing Kingston township. The funds will cover the percentage of the project associated with growth (although provision will be provided for existing dwellings to connect in future). The fund will bring forward the provision of infrastructure by 2 years for water and 7 years for wastewater.

³³ Taken from QLDC Ten-Year Plan 2018-2028 draft consultation document

4 The Need for Investment

4.1 Problems and Opportunities

As outlined in the strategic context, Queenstown is facing challenges caused by high growth. The rate of growth has exceeded historical forecasts and Queenstown is struggling to keep up with housing demand. The logic of the problem is summarised below:

Problem: High growth (higher than historical forecasts).

Consequence: Housing shortage (consequence/evident by affordability/high house prices).

Solution: Prepare more land for development – aiming for more houses faster.

Existing constraint: Funding for infrastructure.

Opportunities: QLDC has identified Kingston as an area where housing development could be accelerated with the help of HIF funding (as well as Quail Rise South and Ladies Mile). The opportunity at Kingston includes capacity for development of 950 more houses in total located within the existing township and in the adjoining area of KVSZ. Infrastructure is needed to provide safe and reliable water supply, wastewater and stormwater facilities. HIF funding will alleviate existing financial constraints.

4.2 Investment Logic Map (ILM)

QLDC have prepared an ILM for meeting district-wide housing demand with an appropriate housing supply. This ILM demonstrates the agreed problems, benefits, strategic responses and solutions for the three HIF projects in Queenstown Lakes district. This integrated approach ensures that these projects can each focus on the key benefits for the district, which are as follows:

- Improved housing affordability.
- Efficient and effective housing supply.

The response to this situation is to enable more houses sooner through the following actions:

- Funding support to remove infrastructure constraints, which enables the delivery of the required infrastructure where there is currently none (Kingston, Quail Rise and Ladies Mile).
- Committing to a common approach between QLDC and developers.
- Putting enabling policy/plans in place including:
 - SHA Lead Policy
 - Proposed District Plan.

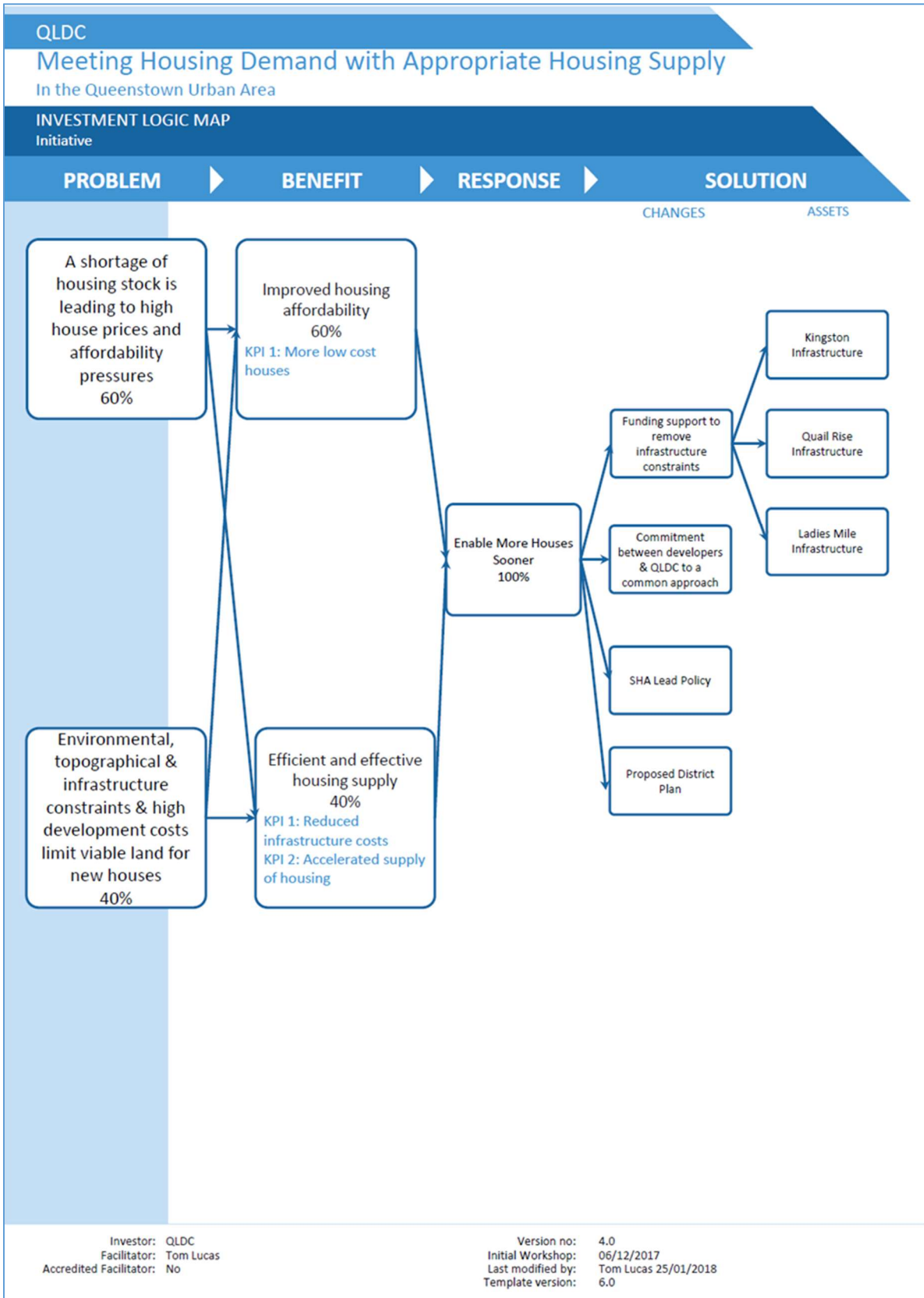


Figure 16: Investment Logic Map for the Queenstown Lakes HIF projects

4.3 Benefits Map

QLDC have prepared a Benefits Map for meeting housing demand with appropriate housing supply. Similar to the ILM, QLDC is using an integrated approach to identify and manage benefits across its three HIF projects. Benefits management will be discussed further in the Management Case and QLDC will continue monitoring and managing the project benefits as part of a wider Benefits Management Framework.

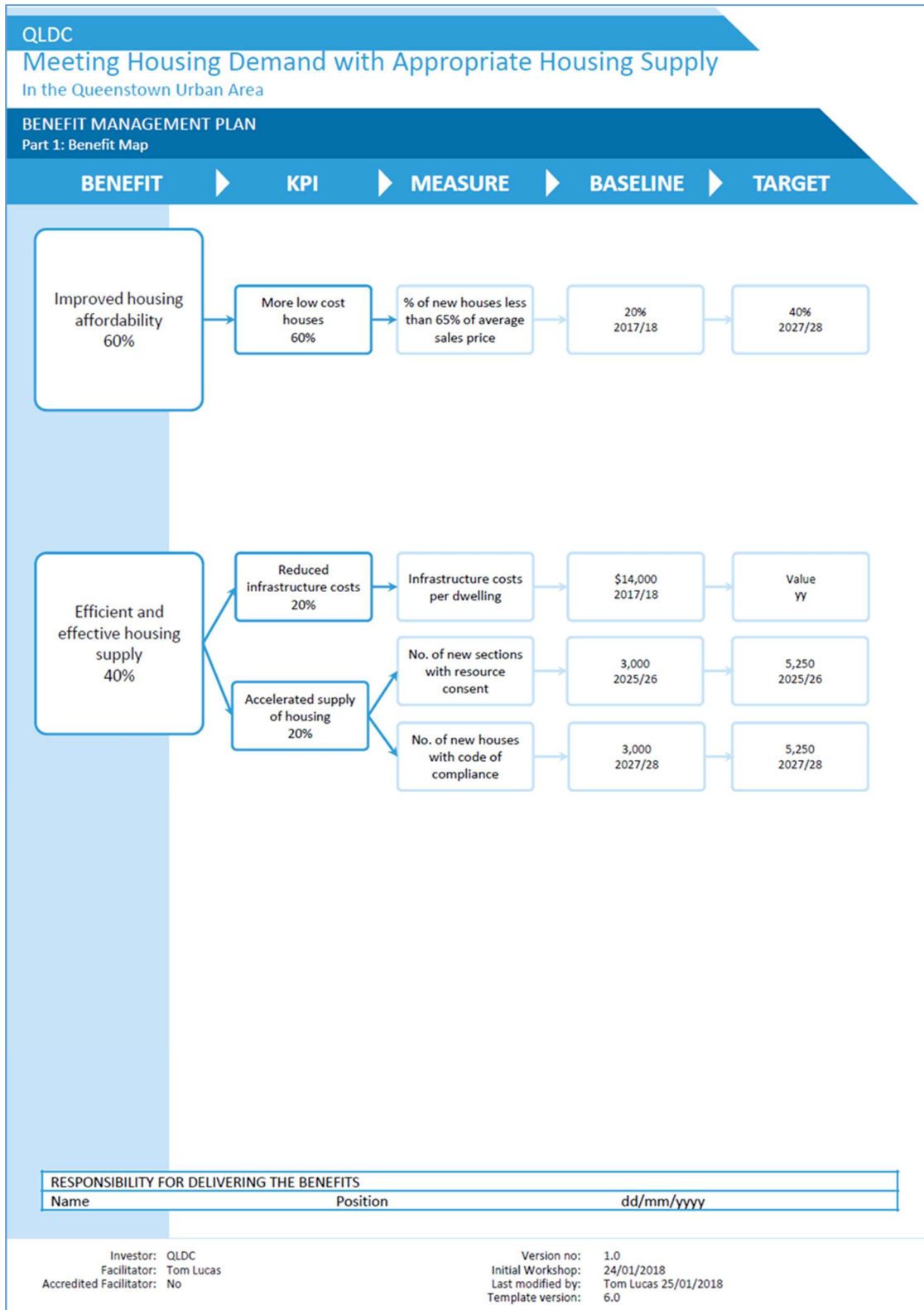


Figure 17: Benefits Map for QLDC HIF projects

4.4 Investment Objectives

The investment objectives for Kingston have been developed based on the ILM benefits³⁴, with the addition of a further objective summarising the needs of the Kingston community³⁵. These objectives are outlined in Table 4, with each objective targeted against an expected performance outcome that is measured by a Key Performance Indicator and tied to an expected level of benefit.

Table 4: Investment Objectives

Investment Objective	1. Improved housing affordability	2. Efficient and effective housing supply	3. Improved public health and environmental outcomes
Investment Objective Summary	Developments with lower cost housing are encouraged and enabled.	The cost of land development infrastructure by dwelling equivalent is reduced. Increase the supply of housing at a faster rate.	Infrastructure is provided to protect the public health of residents and visitors to this community. Adverse effects on the environment from 3 Waters infrastructure are managed/mitigated.
Existing Arrangement at Kingston	Kingston is currently one of the most affordable housing areas in the district. The lack of public infrastructure has delayed the development of Kingston.	Water and wastewater is managed privately on each property. The lack of public infrastructure has delayed the development of Kingston and limited the minimum lot size. Lack of funding has delayed the provision of infrastructure to Kingston.	Water and wastewater is managed privately on each property. This includes septic tanks and predominantly roof water, but some shallow bores. Risk of contamination from high density of septic tanks effecting groundwater, failing septic tanks and/or stormwater flooding. ORC has identified Kingston as having a high density of septic tanks. Which is slowly having an adverse effect on the environment. Currently most septic tanks do not require resource consent.
Benefits	With the use of the HIF funding to build 3 Waters infrastructure, the residential development of Kingston will enable more low-cost housing.	With the use of the HIF funding to build 3 Waters infrastructure, the residential development of Kingston could be brought forward from the planned delivery in the LTP.	Provision of 3 Waters infrastructure managed by QLDC, provides more control of public health outcomes. Providing wastewater infrastructure will allow QLDC to manage the environmental effects and will include obligation to comply with resource consents. Protection of water quality.

³⁴ The objectives from the ILM benefits are HIF focussed.

³⁵ The third objective is taken from QLDC Business Case Outcomes Framework (Nov 2016). It is driven by the QLDC 2015-2045 Infrastructure Strategy and ORCs Plan Change 6A (both strategies are discussed earlier in this document).

Investment Objective	1. Improved housing affordability	2. Efficient and effective housing supply	3. Improved public health and environmental outcomes
KPI	More low-cost houses.	Reduced infrastructure costs. Accelerated supply of housing.	Compliance with NZ Drinking Water Standards (Bacteria and Protozoa) by 2018. 100% compliance with resource consents
Expected Evidence (note these are district wide measures that Kingston is contributing to)	40% of new houses in Kingston that are less than 65% of average sales price by 2027/28.	Infrastructure costs per dwelling (improved from 2017/18 baseline of \$14,000 ³⁶) Number of new sections with resource consent (baseline of 3000 by 2025/26 to target 5250 by 2025/26) Number of new houses with code of compliance (baseline of 3000 by 2027/28 to target 5250 by 2027/28) Construction of Stage 1 infrastructure by 2020 at Kingston.	Monitoring data or verified reports showing/predicting non-compliance with DWSNZ. Verified reports showing/predicting non-compliance with consents. ORC monitoring data showing an improvement of groundwater quality.

4.5 Benefits of this proposal to encourage more houses faster

The overall benefits of encouraging more houses faster in Kingston include:

- helping provide affordable housing options at a commuting distance to Queenstown
- assisting in providing housing capacity as required under the National Policy Statement on Urban Development Capacity
- protecting water quality (discussed further below)
- encouraging more economic activity in the Kingston Village.

The expected housing outcome is presented below.

Table 5: Contribution to Development Capacity

	2017/18 - 2019/20 (1-3 years)	2020/21 - 2027/28 (3-10 years)	2028/29-2047/48 (Up to 30yrs)
Territorial development capacity targets required to meet the NPS-UDC	1,800	3,000	6,000
Kingston's contribution to NPS-UDC targets	250 14% of requirement	700 23% of requirement	950 16% of requirement

³⁶ \$14,000 is Queenstown's average Development Contribution for transportation and 3 waters (taken from the QLDC Policy on Development Contributions and Financial Contributions)

4.5.1 Benefits of Providing 3 Waters Infrastructure to Kingston

Houses in Kingston currently manage water and wastewater privately onsite. To enable and accelerate growth that will protect public health, maximise land use capacity and in a manner that isn't detrimental to the environment, Kingston needs public 3 Waters infrastructure.

Benefits of a community water supply include:

- Enables QLDC to manage the supply ensuring:
 - drinking water quality is meeting national standards (public health)
 - security of supply.
- Removes barriers to building new houses in Kingston
 - no longer need to manage individual collection systems (by providing large water storage tanks, pumps and pipework).
 - better security of supply (especially in summer).

Benefits of a community wastewater scheme include:

- Enables QLDC to manage the outcomes by:
 - providing ongoing monitoring of ORC resource consent conditions
 - being better positioned to protect the environment.
- Unlocks more land for houses
 - no longer need to build (pay for) and manage individual treatment and disposal systems
 - removes need for large lot sizes for disposal fields (and hence allows greater housing density).
- Groundwater quality improvements from the removal of a high density septic tank cluster.

Benefits of installing stormwater infrastructure include:

- The safe conveyance of stormwater through the existing Kingston township from the upstream KVL development.
- Alleviation of existing flooding issues in Kingston.

5 Risks and Issues

Every development project includes uncertainty over what will happen. The uncertainty – each assumption or best guess – reduces our chances of project success. We can endeavour to deliver success by managing *risk*.

When something goes wrong, or deviates from the plan, it stops being a risk and becomes an *issue* that must be addressed to ensure success. Issues are those conditions that are having a negative impact on one's ability to execute the project plan. They can be easily identified because they directly cause slippage and extra work.

There are two simple tools that can be used to manage risks and issues to prevent project failure. One is the *Risk Register*; the other is the *Uncertainty Log*. These are distinct documents that should contain different information and drive different actions and are explained in the following sections.

5.1 Constraints and Assumptions

Constraints are externally imposed boundaries that determine key requirements or limits of the project, and which must be identified and managed from the outset. The stakeholder workshops have identified the key constraints shown in Table 6 below. These parameters have been captured in the Risk Register and will be further evaluated and monitored throughout the life of the project.

Table 6: Key Constraints

Factor	Constraint
Timing	<ul style="list-style-type: none"> To be eligible for HIF Funding there are timing constraints for both the drawdown (quarterly, for up to approximately 7 years) and repayment (10 years from each drawdown).
Costs	<ul style="list-style-type: none"> The development needs to be commercially viable within HIF funding limits, QLDC debt limits, and the affordability of Development Contributions and rate increases during repayment.
Land for infrastructure	<ul style="list-style-type: none"> To assist fast project delivery, key pipeline infrastructure will be built only on land already owned by the developer, and within QLDC and state highway road reserve. The water supply borefield, treatment plant and reservoir are on freehold land owned by the principal of KVL. Easements will be obtained for this infrastructure. The wastewater treatment plant and disposal field are on a neighbouring Crown (LINZ) leasehold farm, Kingston Station. Easements will be agreed with the owner, which is already under negotiation through an existing MoU, and LINZ approval will be required. Kingston Flyer Limited owns a rail corridor surrounding the KVL development. KVL has caveats on this title which allow road and buried pipeline crossings, and easements will be established once the locations are finalised.
ORC requirements	<ul style="list-style-type: none"> Consents will be required for the water abstraction and the wastewater disposal. These will have constraints on intake capacity and disposal quality. Designers are liaising with ORC to confirm these and incorporate them into the design.
QLDC design requirements/standards	<ul style="list-style-type: none"> The design will need to meet QLDC standards (unless agreed otherwise) as outlined in the following: <ul style="list-style-type: none"> QLDC Land Development and Subdivision Code of Practice (2015)

Factor	Constraint
	<ul style="list-style-type: none"> ○ QLDC 3 Waters Technical Level of Service Specifications (currently draft but to be used if it is adopted in time)
Water and wastewater treatment process units available in New Zealand	<ul style="list-style-type: none"> ● Due to the staged nature of the development, process units will need to be expandable in stages to ensure operational efficiencies are maintained as the development expands. They will also need to have low operating costs to ensure affordability for the small community, and their operation will need to be reliable with few on-site staff and remote monitoring/control.

There are also key assumptions upon which the project is based, and which could impact upon the successful delivery of housing in Kingston were they to change materially. These are identified in Table 7 below and are captured in the Risk Register for monitoring throughout the project life.

Table 7: Key Assumptions

Factor	Assumption
Funding	<ul style="list-style-type: none"> ● The lending conditions do not change through the life of the funding arrangement.
Engineering Design and Consenting	<ul style="list-style-type: none"> ● The basis of design for water and wastewater treatment and disposal processes does not change significantly through the design period. ● The rate of groundwater abstraction is achievable and sustainable. ● The rate and quality of wastewater disposal is achievable and sustainable. ● Resource consent is granted for the extraction of water and disposal of wastewater in accordance with the preliminary design specification.
Developer's Commitment	<ul style="list-style-type: none"> ● KVL will proceed with the development of residential sections in alignment with the intent of Plan Change 25, as per the Developer Agreement (once finalised) ● Developed sections will be immediately on-sold to a purchaser who intends to build a dwelling (and not hold the land vacant on speculation).
Land for wastewater disposal	<ul style="list-style-type: none"> ● QLDC enters a long-term enduring relationship with the neighbouring landowner to allow disposal of treated wastewater effluent for irrigation.
Construction Industry Capacity	<ul style="list-style-type: none"> ● Builders and their suppliers have the capacity to commence and complete the construction of residential dwellings in a timely manner.
Residential Appeal	<ul style="list-style-type: none"> ● The new bridge over the Kawarau River is completed to schedule and functions as expected to ease traffic flows, thereby making the commuting time between Kingston and Frankton acceptable to future residents. ● That completed residential dwellings are priced at a value that enables the normally-resident population of the district to purchase or rent. ● That completed residential dwellings are occupied predominantly by a normally-resident population, rather than left unoccupied as holiday homes or utilised as short-term holiday accommodation.

5.2 Interfaces and Interdependencies

The development of headworks infrastructure in Kingston will link and interface with other issues and proposals in the district upon which the success of this project may be dependent. Additional risk could be introduced should some uncertain future action or development under the control of other parties not play out as forecast, so these interfaces and interdependencies are also captured in the Risk Register.

Interfaces include:

- Crossing agreements with the operator of Kingston railway.
- Agreement with the local community about construction traffic movements.
- Contractor and QLDC staff and resource commitments to other community developments such as Glenorchy wastewater, which offer both an opportunity to share resources and a challenge to ensure sufficient resources are available.

Interdependencies include:

- Development of Kingston Village Special Zone by KVL starting in parallel with the headworks infrastructure to ensure benefits are realised.
- Additional power capacity provided to Kingston by PowerNet.
- Provision of water and wastewater reticulation to existing Kingston township by QLDC.
- Kingston residents willing to connect to water and wastewater reticulation.
- Agreement with NZTA for a new access intersection off SH6.
- House builders have capacity and willingness to commit to Kingston.
- Staging of wastewater treatment plant capacity and disposal field size expansion aligned with development growth.

5.2.1 State Highway 6 and access needs for development

Part of the evidence for Plan Change 25 in 2008 included a transportation assessment by Traffic Design Group³⁷. Particular attention was paid to the expected changes in travel patterns on State Highway 6 between Kingston and Queenstown. The report concluded that *“any wider area transportation related effects are minor, and localised transportation effects can be addressed during subdivision with the development of the transport network, suitably detailed intersection designs and a management plan for the rail corridor. Therefore, the proposal can be supported from a transportation perspective.”*

This report was revisited by the Traffic Design Group as part of the preliminary engineering for this Business Case and confirms the position that localised transportation effects can be addressed during subdivision, and not as part of the headworks infrastructure development (refer Appendix 5). NZTA has supported the content of this report.

The report proposed a second intersection off SH6 located 420 m south of Kent Street. This would lead directly to the KVSZ land and is considered to be part of the subdivision. The provision of a new intersection will be addressed by the developer and does not form part of this business case for 3 waters headworks as the primary benefit is to the new development rather than the wider Kingston community, and it does not directly influence the objective of more houses sooner.

5.2.2 Proposed power upgrades for Kingston

The electricity network provider for Kingston is PowerNet Limited. They have indicated that there is adequate capacity in their existing power distribution network for the next 80 homes built in the Kingston area. To achieve the ultimate development level of 1175 homes there is a clear requirement to upgrade the network capacity from the Athol substation to Kingston, a distance of approximately 45 km. PowerNet have commenced an initial 8 km upgrade project as part of their planned 2018/19 network expansion, which will assist capacity to Kingston in the short term, but ultimately a transmission line upgrade is required to accommodate the full growth, which will take up to two years to implement. The trigger for completing the

³⁷ Transportation Assessment for Plan Change 25 for QLDC (Traffic Design Group, Oct 2008)

remaining upgrade works is a formal application from a developer for a large development (>80 homes or similar) in Kingston, which will be lodged upon confirmation of the HIF funding. KVL and QLDC will continue to work together with PowerNet to ensure risk is spread fairly between the three parties, and contributions to network power upgrades by KVL do not become financially penal to the point they prevent and inhibit land development in Kingston.

5.3 Risk Management

The risk register is a means of capturing risks that we want to monitor over the life of the project so that action can be taken before the risk has a negative impact on the project. These are conditions that will not be explicitly worked into the execution plan because they are not in themselves a project deliverable, but they cannot be allowed to ‘slip under the radar’ so they will be regularly evaluated and tracked to ensure they do not create more significant issues later.

A Risk Workshop was held on 12 September 2017 with key stakeholders including QLDC and KVL in attendance. The highest-level risks identified in that workshop are presented in Table 9 below, showing the controls to be implemented to treat and reduce the risks. The full Risk Register is presented in Appendix 10. The risk register will be a ‘live’ document throughout the project life and shall be updated and reviewed regularly by the project team. Its purpose shall be to:

- identify the main risks
- quantify and appraise the main risks
- apportion and transfer risks
- mitigate and manage risks over the entire project life cycle.

The cost of risk has been estimated in the preliminary engineering phase through a multi-point probability analysis to establish a ‘risk contingency’, which has been added to the costs of the development to provide the full expected value of the preferred option, based on the likelihood of a risk occurring and the size of the financial impact. The key areas where risk may have the greatest cost impact are (a) yield and quality of the bore water (impact on treatment plant type, requirement for alternative source), (b) performance of the wastewater disposal field (impact on treatment process, size and location of disposal area, disposal method), and (c) stormwater design (size and type of channels, pipes and controls). These design risks will be managed by front-end engineering investigations that will commence shortly. For example, LEI has recently been engaged to assess the environmental effects of the wastewater disposal.

As the design proceeds, more specific risks related to the design and build phases will be identified and managed to reduce the more general risk placeholders. The ongoing management and transfer of risk is further discussed in Section 10.8.

5.3.1 Uncertainty Log

Uncertainty is a lack of complete certainty. In uncertainty, the outcome of any event is completely unknown, and it cannot be measured or guessed because there is no background information on the event. Table 8 presents the key uncertainties that the project team has identified that they may not be in a position to resolve but must work within the context of. The project team will attempt to neutralise these uncertainties by liaising with the key stakeholders and monitoring the drivers.

Uncertainties are classified as:

- Near certain: The outcome will happen or there is high probability that it will happen.
- More than likely: The outcome is likely to happen but there is some uncertainty.
- Reasonably foreseeable: The outcome may happen, but there is significant uncertainty.
- Hypothetical: There is considerable uncertainty whether the outcome will happen.

Table 8: Uncertainty Log

Factor	Uncertainty	Impact on Programme
Factors affecting demand for housing		
Slow-down in regional, national or international growth	Hypothetical in short term (1-3 years), reasonably foreseeable in long-term (10 years).	Medium
Growth in traffic volume on SH6 exceeds forecasts due to other drivers (tourism, other residential)	Reasonably foreseeable	Low
Developer or Builder mis-reads market expectation and/or supplies unappealing product	Hypothetical	High
Commuters preference remains with competing townships	Reasonably foreseeable	Low
Competing developer/s get to market first in Kingston or elsewhere in District	Hypothetical	Medium
Factors affecting supply of housing		
Building contractors committed to other projects elsewhere	Reasonably foreseeable	High
Materials supply chain cannot deliver volume	Hypothetical	Medium
Factors affecting cost		
Contractors charge premium pricing.	Reasonably foreseeable	Low
Global commodity price increases.	Hypothetical	Low

Table 9: Highest project risks before treatment

Risk Register - Kingston Housing Infrastructure Fund

STAGE 1 - RISK IDENTIFICATION			STAGE 2 - ANALYSIS OF UNCONTROLLED RISK				STAGE 3 - RISK CONTROLS AND ANALYSIS OF CONTROLLED RISK			STAGE 4 - RISK CLA		
RISK DETAILS			Uncontrolled Risk Score				Risk Controls			Controlled Risk		
Risk ID	Date	Risk Title <i>There is a chance that...</i>	Risk Causes <i>Because...</i>	Consequences <i>Resulting in...</i>	Consequence Score (1 - 5)	Likelihood (1 - 5)	Risk Class (Very Low to Very High)	Risk Control Options	Selected Control <i>From one of the options identified</i>	Consequence Score (1 - 5)	Likelihood (1 - 5)	Risk Class (Very Low to Very High)
R1	12-Sep-17	We cannot deliver the project infrastructure.	There are not enough internal or external resources to undertake design and construction of infrastructure (for ALL upcoming work in the District within Council and private sector).	Failure to deliver sections and houses on schedule.	5	3	Very High	Treat	Undertake early contractor engagement and develop Contracting Plan to enable broad supply base.	5	2	High
R2	12-Sep-17	There may be dispute about responsibility to produce houses.	MBIE's expectation for house production may differ from the developer's business model to deliver sections.	MBIE or Developer may withdraw, or project experiences significant delay while dispute is resolved.	5	3	Very High	Treat	Arrange Developer agreement	5	2	High
R3	12-Sep-17	We cannot deliver house construction.	There are not enough internal or external resources to build houses (for ALL upcoming work in the District)	Failure to deliver houses on schedule.	5	4	Very High	Treat	Undertake early contractor engagement and develop Contracting Plan to enable broad supply base.	5	2	High
R8	12-Sep-17	Funding is not secured.	Central government (MBIE) and QLDC do not reach funding agreement.	Developer may withdraw.	5	4	Very High	Treat	Arrange MBIE/QLDC agreement.	5	2	High
R10	12-Sep-17	Developer withdraws.	Council and Developer cannot agree terms.	Development does not proceed.	5	4	Very High	Treat	Arrange Developer agreement.	5	2	High
R11	12-Sep-17	We cannot obtain wastewater discharge consents in time (possibly both ORC and SRC)	The procedure for design, assessment and approval may take too long.	Additional time and cost.	5	3	Very High	Treat	Early engagement with ORC and SDC.	5	2	High
R12	12-Sep-17	Wastewater disposal consent conditions may be too onerous, and affect commercial viability.	Design is not mature.	Development does not proceed.	5	3	Very High	Treat	Undertake additional engineering design as priority.	5	2	High
R13	12-Sep-17	We do not complete the wastewater scheme on time.	We may not obtain easement/ownership of required land.	Additional time and cost.	5	3	Very High	Treat	Early engagement with landowner/s.	5	2	High
R14	12-Sep-17	We do not complete the wastewater scheme on time.	We may not obtain land-use (planning) designation in time.	Additional time and cost.	5	3	Very High	Treat	Need collective work between developer and Council as leader.	5	2	High
R17	12-Sep-17	The water supply borefield may not provide sufficient yield.	Groundwater capacity may be insufficient.	Requirement to take water from other (non-preferred) source.	5	3	Very High	Treat	Undertake bore capacity tests as priority.	5	2	High
R23	12-Sep-17	Existing rail corridor could restrict subdivision access or layout.	Ownership and long-term use of rail corridor is not clear (currently under conditional sale).	Development has limited access options.	5	3	Very High	Treat	Engage with rail owner.	5	2	High
R24	12-Sep-17	Existing rail corridor could restrict wastewater pipeline layout.	Approval may not be given by corridor owner for easement/crossing.	Development does not proceed.	5	3	Very High	Treat	Engage with rail owner.	5	2	High
R26	12-Sep-17	Plan Change 25 may no longer be suitable.	Developer may change their design intent.	Another Plan Change (and the time required to achieve that).	5	3	Very High	Treat	Arrange Developer agreement.	5	2	High
R29	12-Sep-17	Stormwater design requirements may change and take up development land.	Design is not mature.	Reduction in lot yield for developer, and/or additional cost.	5	3	Very High	Treat	Commence detailed design as priority.	5	2	High
R34	14-Nov-17	Headworks infrastructure designed by QLDC is beyond cost capacity of Developer.	Developer's current design is immature and additional components or higher treatment specification is identified during detailed design.	Development does not proceed.	5	3	Very High	Treat	Maintain Developer buy-in during design development.	5	2	High
R38	4-Jan-18	We cannot obtain water supply consents in time: - construction of bore - water take - intake in lake - water discharge from treatment plant	The procedure for design, assessment and approval may take too long.	Additional time and cost.	5	3	Very High	Treat	Commence detailed design and engagement with ORC as a priority.	5	2	High
R39	4-Jan-18	We cannot obtain wastewater treatment plant air discharge consent in time.	The procedure for design, assessment and approval may take too long.	Additional time and cost.	5	3	Very High	Treat	Commence detailed design and engagement with ORC as a priority.	5	2	High
R40	4-Jan-18	We cannot obtain consent for water course channel works in time.	The procedure for design, assessment and approval may take too long.	Additional time and cost.	5	3	Very High	Treat	Commence detailed design and engagement with ORC as a priority.	5	2	High
R41	4-Jan-18	We cannot obtain QLDC designations in time: - wastewater treatment plant - wastewater disposal field - wastewater pump station, emergency storage, standby generation at lake front - water supply lake intake and pump station - water supply treatment plant - water supply reservoir - stormwater attenuation reserves	The procedure for design, assessment and approval may take too long.	Additional time and cost.	5	3	Very High	Treat	Commence detailed design and engagement with QLDC as a priority.	5	2	High
R42	4-Jan-18	We cannot obtain Concessions/Licenses in time: - DOC/LINZ for crossing marginal strip with water infrastructure - DOC/LINZ for lakeside wastewater pump station - QLDC licence to occupy road reserves with services - NZTA license to occupy State Highway with services - NZTA licenses to cross State Highway with services	The procedure for design, assessment and approval may take too long.	Additional time and cost.	5	3	Very High	Treat	Commence detailed design and engagement with QLDC as a priority.	5	2	High

6 Stakeholders

6.1 Consultation and Communication Approach

6.1.1 Key responsibilities

QLDC is responsible for the planning, development, operation and maintenance of 3 Waters infrastructure throughout Queenstown Lakes district, in consultation with the Otago Regional Council as the authority responsible for issuing water abstraction and disposal consents for public and private systems under the Resource Management Act.

The primary public agency and private sector partners involved in the planning and implementation of the provision of the HIF-funded infrastructure in Kingston are QLDC, MBIE, and the developer KVL.

- **QLDC** is the author of this business case and the applicant for HIF funding. As the entire township falls within the QLDC territorial boundary, the way QLDC manages and invests in 3-waters infrastructure is critical.
- **MBIE** as the central government provider of interest-free loans (the Housing Infrastructure Fund) to local government to enable the construction of infrastructure to achieve the production of more houses sooner. With a national focus, MBIE sees a well-functioning housing market is important for both economic performance and social wellbeing. MBIE is working in a number of areas to enhance affordability, social housing and the quality of the built environment.
- **Kingston Village Limited (KVL)** as the private developer of existing farmland into residential sections. The construction and sale of residential sections, and the subsequent construction of dwellings by private purchasers, is critical to the provision of more houses sooner. KVL is represented by their engineer **Hadley Consultants Limited** who is managing the master planning and preliminary engineering of the new subdivision.

6.1.2 Stakeholder engagement

Other key stakeholders have been consulted through this Kingston Detailed Business Case including:

- **Residents of Kingston** who currently operate private individual water, wastewater and stormwater facilities and will be required to connect to public facilities upon completion.
- **Otago Regional Council** who issues and administers the water extraction and wastewater disposal consents that will be required (*note*: stormwater discharge is currently a permitted activity under the Regional Plan).
- **NZTA** for discussions regarding impact of traffic on the state highway network.
- **The neighbouring landowners** on whose farming properties the borefield, water treatment plant, reservoir, wastewater treatment plant and disposal field will be located.
- **Owner of the rail corridor** through whose land the buried pipes will need to be installed.

Other parties engaged by QLDC to administer the business case process in a consulting role include:

- **Harrison Grierson Limited** is engaged by QLDC as project manager to secure the MBIE funding by controlling the business case process.
- **Rationale Limited** is engaged by QLDC to prepare the business case.
- **WT Partnership** for third-party peer review of cost estimates.

6.1.3 Engagement methods

Consultation with stakeholders involved a series of individual and collective meetings and attendance at workshops to discuss and evaluate risks, engineering, financing, commercial and management issues. A summary of the consultative activities (to date) is provided below:

Table 10: Engagement outline

Stakeholder	Primary method of engagement	Parties involved in the engagement process
Kingston Village Limited	Technical engineering meetings Risk workshop Finance workshop Commercial & management Workshop Developer Agreement	QLDC Harrison Grierson Ltd Rationale Ltd Otago Regional Council NZTA
Residents of Kingston	Public meetings	QLDC
Otago Regional Council	Meetings (seeking clarification of consent requirements)	Kingston Village Limited QLDC
Neighbouring landowner	Meetings (seeking approval for land use)	Kingston Village Limited
Owner of rail corridor	Meetings (seeking approval for pipe crossings)	Kingston Village Limited QLDC (Held recent discussions with conditional new owner during sale and purchase phase)
Future house buyers and land owners	Public meetings	QLDC

6.2 Stakeholder Views

A summary of the key stakeholder views and issues resulting from the consultation process is captured below.

Table 11: Stakeholder views

Stakeholder	View	Key Issues	Issues management steps
Kingston Village Limited	As owner of the land and developer of the subdivision, motivated to have 3-waters infrastructure in place to enable sale of residential sections.	Concerned about the equitable repayment structure of funding.	Detailed business case to drive the value for money solution. Development Agreement to be agreed with QLDC
Residents of Kingston	Motivated to have access to public infrastructure that provides safe and reliable provision of 3-water services.	Concern about cost per property.	Detailed business case to determine and promote the most cost-effective solution.

Stakeholder	View	Key Issues	Issues management steps
	Maintain existing level of roading service.	Concern about increased traffic on local roads.	Subdivision Consent application to address traffic movements and road modifications including possible new state highway intersection.
Otago Regional Council	Manage the impacts of groundwater extraction and dispersion of wastewater and stormwater to the environment.	Maintain sustainable rates of water extraction. Maintain sustainable rates of biological, chemical and odour discharge.	Assessment of Effects to be prepared during Resource Consent process.
Neighbouring landowner	Obtain nutrient-rich water (effluent) for irrigation.	Maintain sustainable flowrate and nutrient load.	Memorandum of Understanding to be prepared between parties
Owner of rail corridor	Ensure continued utility of the rail corridor.	Ensure infrastructure installed through rail corridor (road and pipeline crossings) does not impact operations.	QLDC and KVL to negotiate with new owner to locate road and pipe crossings at finalised locations, as per covenant on title.

7 Alternative options assessment to deliver more houses faster

A wide range of potential options³⁸ was assessed against the investment objectives and critical success factors. Details of the analysis of the first two dimensions (scope and service solution) are included in this section. The last three dimensions (service delivery, service implementation and funding) are covered in later sections of the DBC (commercial, management and financial cases). A detailed analysis is included in the appendices.

This section shows how the longlist was narrowed down to a shortlist of programme options that were further analysed through a multi-criteria assessment (MCA) to confirm the preferred project.

7.1 Critical Success Factors

The following critical success factors have been identified by stakeholders. Stakeholders agreed the generic descriptions as part of the QLDC Business Case Outcomes Framework.

Table 12: Critical success factors

Generic Critical Success Factors	Broad Description	Proposal-Specific Critical Success Factors
Strategic fit and business needs	How well the option meets the agreed investment objectives, related business needs and service requirements, and integrates with other strategies, programmes and projects.	Does it alignment with District Plan, 30-year Infrastructure Strategy & Regional Plans? There is a preference for QLDC to own/operate 3 Waters infrastructure for the benefit of the community to maintain certainty that suitable standards are being met.
Potential value for money	How well the option optimises value for money (i.e., the optimal mix of potential benefits, costs and risks).	Right solution, right time at the right price?
Supplier capacity and capability	How well the option matches the ability of potential suppliers to deliver the required services and is likely to result in a sustainable arrangement that optimises value for money.	Is it a sustainable arrangement? Are there contractors/suppliers that can deliver?
Potential affordability	How well the option can be met from likely available funding and matches other funding constraints.	Is funding available?
Potential achievability	How well the option is likely to be delivered given the organisations ability to respond to the changes required and matches the level of available skills required for successful delivery.	Has QLDC got the skills and capacity to deliver?

³⁸ This is the longlist of options. Based on the Business Case Options Framework this includes the following five dimensions: scope, service solution, service delivery, service implementation and funding.

7.2 Previous Options Analysis (IBC and the preferred way forward)

In the Indicative Business Case (IBC), the longlist considered the scope and how the services can be provided at a broader level than the Detailed Business Case, DBC. This allowed a wider range of alternatives to be considered so they could be then narrowed down to the preferred way forward for the DBC.

Table 13 below highlights key options discounted during the IBC longlist options assessment that are not carried forward for further analysis in this DBC.

Table 13: Discounted IBC key options summary

Dimension	Option	Key reasons for discounting each option
What: What scope is needed?	Including only 1 or 2 of the 3 Waters.	This does not remove the main barriers to development because all three waters are needed to enable development and allow a critical mass of dwellings to be reached sooner. There will also be cost savings in trench sharing if all three are included. Initially it was considered that stormwater could potentially be excluded, however, flooding in the Kingston Village would be exacerbated without the upgrades previously highlighted in development reports.
How: How can services be provided?	Individual Systems	This is the status quo. It limits the development potential of Kingston and does not address the existing public health and environmental issues.
	Centralised System	The distance to connect to the centralised networks in Frankton is too far and the pipe route is too geographically challenging.

At the IBC stage, the preferred way forward was for the provision of community water and wastewater systems for the existing Kingston township and KVSZ, as well as resolving stormwater issues that could be exacerbated by further development.

The project would start in 2018 and be delivered by QLDC and the developer. Planning and designing would account for the full development, but where possible some elements would be staged for growth such as bores, pumps, treatment, storage and disposal.

This DBC builds on the recommendations from the IBC by considering options for the 3 waters in more detail as outlined in the following sub-sections.

7.3 Longlist Options for the 3 Waters

Stakeholders have identified and evaluated a comprehensive longlist of scope options for the 3 Waters; they are summarised as follows.

WATER SUPPLY

Dimension	Description	Options within each Dimension
Supply Area	In relation to the proposal, what area can best be supplied?	Status quo Kingston township only KVL only Kingstown township and KVL Kingston township, KVL, and the surrounding area

Dimension	Description	Options within each Dimension
Level of Service (Demand)	What level of service (demand) can be achieved?	Rural restricted On demand (1000 l/dwelling/day) with metering (and capability to charge by volume if required) On demand (QLDC design standard of 2100 l/dwelling/day)
Level of Service (Storage)	What level of service (storage) can be achieved?	Storage for minimum flow only (no extra storage for fire capacity or resilience) Storage for minimum flow <i>plus</i> fire capacity FW2 (45 m ³) Storage for minimum flow <i>plus</i> fire capacity FW3 (180 m ³) Storage for minimum flow <i>plus</i> fire capacity FW3 (180 m ³) <i>plus</i> reserve (24 hours) Storage for minimum flow <i>plus</i> fire capacity FW3 (180 m ³) <i>plus</i> some reserve <i>plus</i> generator backup for pumps
Source	What water source can be utilised?	Existing bore Existing bore <i>plus</i> additional bores in same location Relocate borefield Streams Surface water (lake) Combination borefield then supplemented by lake (staged, for resilience)
Treatment	What treatment technology can be utilised?	Chlorination only Filters for bores <i>plus</i> UV Filters for bores <i>plus</i> UV <i>plus</i> residual chlorination Filters for bores (with additional coagulation for lake water) <i>plus</i> UV <i>plus</i> residual chlorination
Storage Location	Where can storage best be located?	Low-level reservoir with marginal level of service Mid-level reservoir on own land with gravity distribution Mid-level reservoir on own land with boosting High-level reservoir on neighbouring land with gravity distribution

WASTEWATER

Dimension	Description	Options within each Dimension
Geographic Coverage	In relation to the proposal, what area can best be serviced?	Status quo Kingston township only KVL only Kingstown township and the KVL Kingston township, the KVL and the surrounding area
Level of Service (Collection System)	What level of service (collection system) can be utilised?	Septic tanks Gravity reticulation Pressure system Vacuum system Hybrid (gravity mostly, pressure where necessary)
Level of Service (Treatment)	What level of service (treatment) can be achieved?	Status quo Primary treatment only Secondary treatment Secondary plus tertiary treatment including nutrient removal and disinfection
Treatment Plant Composition	What type of treatment plant can best be utilised?	Package plant Bespoke MBR (Membrane Bio-Reactor) Bespoke SBR (Sequencing Batch Reactor)
Discharge (Location)	What is the most effective location for discharge of treated effluent?	To the lake To soakage on KVL land Re-use for irrigation on golf course Re-use for irrigation on neighbouring farm Hybrid: re-use plus wet weather (saturation) discharge to lake Consent in only one Regional Council Consents for both Otago Regional Council and Southland Regional Council
Discharge (Method)	What method of effluent discharge can best be utilised?	To sub-surface irrigation on neighbouring farm for winter feed cut-and-carry To sub-surface irrigation on neighbouring farm for cash cropping To surface irrigation on neighbouring farm for winter feed cut-and-carry To surface irrigation on neighbouring farm for cash cropping Combination cash cropping (surface irrigation) and winter feed cut-and-carry (sub-surface)

STORMWATER

Dimension	Description	Options within each Dimension
Catchment Area	What catchment area would be contained?	Kingston township only KVL only Kingston township and KVL Kingston township, KVL and surrounding area
Conveyance	What method could be used to convey stormwater to the point of discharge?	Discharge to soakage Capture, store and pump Open channel flow only Piped gravity flow only Combination open channel and piped gravity flow
Capacity	What level of capacity can be provided?	All areas served by primary system capacity 1 in 20 yr (5% AEP) with secondary flow paths to lake All areas served by primary system capacity 1 in 100 yr (1% AEP) without secondary flow paths to lake. Combination: 1 in 20 yr (5% AEP) in KVL with secondary flow paths, and 1 in 100 yr (1% AEP) in Kingston township without secondary flow paths.
Level of Treatment	What method of water treatment could be utilised?	Low Impact Design – treatment at source Centralised oil and litter trap Decentralised oil and litter trap at outlet

7.4 Longlist Options Assessment for Water

7.4.1 Scope and Service Solution Options (What and How)

What - Supply Area

The preferred supply area is Kingston Township and KVL because a critical mass is needed for affordable servicing of Kingston. It will also mitigate existing potential health risks in Kingston and assist the developability of KVL. The inclusion of surrounding houses is not included in the preferred option due to the sparsity of houses, no known areas with potential housing development aspirations and hence the lack of benefit. It would be possible to supply KVL only, although this would compromise the quality of outcomes; this is part of the less ambitious option and is discussed further in the analysis of the shortlisted options.

What - Level of Service (Demand)

The preferred water demand level of service is 1000 litres/dwelling/day with metering (and the capability to charge on a volume basis if required). This is less than the usual QLDC standard of 2100 litres/dwelling/day which includes a large irrigation component. Recent water metering trials (uncharged) showed that water demand in the district is much lower than the QLDC design standard. QLDC are comfortable with moving to 1000 litres/dwelling/day for Kingston and it will be easier to obtain consents from ORC for the lower demand.

What - Level of Service (Storage)

The preferred level of service for storage is for minimum flow + FW3 fire capacity (180 m³) + reserve (24 hrs). Firefighting capacity of FW3 will ensure firefighting capacity for Kingston's commercial developments both existing and proposed. 24 hours reserve meets QLDC's minimum level of service and provides reliability and resilience by minimising pressure and flow disruptions. It would be possible to have less storage reserves by providing a back-up generator for the bore pumps, however, there is preference to have the adequate storage instead for resilience.

How - Source

The existing bore was established by KVL as part of investigations into water supply options for the KVSZ land. Various alternative sources were considered and ruled out due to them having no benefit over the existing bore location with a risk of lower water quality (streams, lake and relocated bore field). Whilst the existing bore is too small for the whole community, it is proposed the bore field be expanded in the same location. It is possible to use the existing bore if only KVL is being serviced. Alternative bore field locations risk contamination from septic tanks and/or high arsenic levels (test drilling below Kingston township revealed unacceptable high levels of arsenic, thought to be naturally occurring). Further details of water source options investigated are in the technical memos and reports by Hadley Consultants⁴⁰ included in the Appendix 5.

How – Treatment

The preferred option is the minimum requirement to meet Drinking Water Standards, this includes filters, UV and residual chlorination. If a supplementary lake take is added to the supply, then the addition of coagulation for the lake water will be required. The minimum requirement has recently become a council standard; the Havelock North Water Inquiry⁴¹ has created an expectation that this will be mandated in the future so it is prudent to move to this standard now. Further details of the proposed water treatment process is included in Appendix 5.

How - Storage Location

A suitable storage tank location has been identified on Glen Nevis Station, which is Crown pastoral land currently leased by the principal behind KVL. This would provide a mid-level reservoir that can feed gravity reticulation to the community and is the preferred option. A reservoir site close to the water bores was initially proposed but it would most likely have required booster pumps and hence it was discounted. It is possible to install a higher-level reservoir on neighbouring land that would ensure good network pressures would be achievable, however, the cost of this option may not be good value for money or affordable. There is some uncertainty as to the level of the proposed mid-level reservoir as it has not been physically surveyed but the risk is low enough for it still to be the preferred option.

⁴⁰ Hadley Consultants Reports (available in the Appendices) include:
Kingston Village PC25 – Stage 1 - Summary Memorandum to KVL (June 2017),
Kingston Township Infrastructure Servicing – HIF Briefing Report (Nov 2016),
KVL Kingston Stage 1A Water supply options discussion paper (May 2014)

⁴¹ The Havelock North Water Inquiry has recommended the Ministry of Health take immediate steps to address the water supply quality in some areas of the country. The inquiry was ordered after the Havelock North drinking water supply was in 2016 contaminated with a bacteria called campylobacter and caused wide-spread illness.

7.4.2 Summary of water options assessment

Table 14: Summary of longlist options assessment for water

Dimension	Do Minimum		Intermediate		More Ambitious	
What:						
Supply Area?	Status Quo - Do Nothing	Kingston Township only	KVL only	Kingston Township and KVL	Kingston Township, KVL and surrounding area	
	Continued for VFM	Discount	Possible	Preferred	Discount	
What:						
Level of Service (Demand)?	Rural Restricted	On demand (1000 l/dwelling/day) with metering (and capability to charge if required)		On demand (QLDC design standard 2100 l/dwell/day)		
	Discount	Preferred		Discount		
What:						
Level of Service (Storage)?	Minimum flow only	Minimum flow + fire capacity FW2 (45m ³)	Minimum flow + fire capacity FW3 (180m ³)	Minimum flow + fire capacity FW3 (180m ³) + reserve (24 hours)	Minimum flow + fire capacity FW3 (180m ³) + some reserve + generator back-up for pumps	
	Discount	Discount	Discount	Preferred	Possible	
How:						
Source?	Existing bore	Existing + additional bores; same location	Relocate borefield	Streams	Surface water (lake)	Combination borefield then supplemented by lake (staged, for resilience)
	Possible	Preferred	Discount	Discount	Discount	Possible
How:						
Treatment?	Chlorination only	Filters + UV	Filters (for bores) + UV + residual chlorination		Filters for bores (with additional coagulation for lake water) + UV + residual chlorination	
	Discount	Discount	Preferred		Possible	
How:						
Storage Location?	Low level reservoir with marginal level of service	Mid-level reservoir on own land with gravity distribution	Mid-level reservoir on own land with boosting	High level reservoir on neighbouring land with gravity distribution		
	Discount	Preferred	Discount	Possible		

7.4.3 Discounted Scope and Service Solution Options (water)

During the longlist options assessment, several options within each dimension were discounted. The following table summarises the key justification for the discounting of these options.

Table 15: Discounted scope and solution (what and how) options summary (water)

Dimension	Option	Key reasons for discounting each option
What: Supply Area?	Kingston Township only	KVL needs to be included to reach a critical mass for affordability.
	Kingston Township, KVL and surrounding area	Houses in the surrounding area are sparse, hence not a good value for money option. No known development areas.
What: Level of Service (Demand)?	Rural Restricted	This is not a strategic fit, nor does it meet the business needs. It does not meet QLDC standards.
	On demand (QLDC design standard 2100 l/dwelling/day)	Recent water metering trials indicate that water demand is typically much lower than this. This level of demand is potentially wasteful and would be more difficult to obtain ORC consent for.
What: Level of Service (Storage)?	Minimum flow only	This is not a strategic fit because the supply would not be reliable or resilient and it does not provide for firefighting.
	Minimum flow + fire capacity FW2 (45m ³)	Only provides a slight improvement on the option above. With regards to firefighting, FW2 is suitable for residential only, it does not cater for commercial premises.
	Minimum flow + fire capacity FW3 (180 m ³)	Provides suitable firefighting capacity but not enough storage to be a reliable and resilient supply.
How: Source?	Relocate bore field	There is no benefit over expanding the existing bore field. A new site could have lower water quality (risks of arsenic and septic tank contamination) and the cost involved in finding a more suitable site would not provide value for money. The existing bore field is on land owned by the owners of the KVL development.
	Streams	There is no benefit over expanding the existing bore field. A stream would have a lower water quality and the added risk of low supply availability when maintaining minimum stream flows during dry periods.
	Surface water (lake)	There is no benefit over expanding the existing bore field. A lake take would have a lower water quality (including the risk of nuisances such as algae faced by other lake takes in the district).
How: Treatment?	Chlorination only	On its own this will not meet the public health requirements.
	Filters + UV	This will not meet the recently updated minimum requirements for protecting public health, that requires residual chlorine in the network.
How:	Low level reservoir with marginal level of service	The water supply pressure would be too low, only partially meeting reliability and resilience objectives. Does not meet QLDC business needs.

Dimension	Option	Key reasons for discounting each option
Storage Location?	Mid-level reservoir on own land with boosting	This option was for a site adjacent to the proposed bore field. The elevation was marginal and it was considered boosting would be required. An alternative site on the same property with a slightly higher elevation has been found, hence this option was discounted. Pumping does not provide value for money when suitable gravity alternatives are available.

7.5 Longlist Options Assessment for Wastewater

7.5.1 Scope and Service Solution Options (What and How)

What – Geographic Coverage

The preferred geographical coverage area is Kingston Township and KVL because a critical mass is needed for affordable servicing of Kingston. It will also mitigate existing potential health risks in Kingston and assist the developability of KVL. The inclusion of surrounding houses is not included in the preferred option due to the sparsity of houses and hence the lack of benefit. It is possible to cover only KVL, however, by excluding Kingston township most of the objectives are only partially met.

What - Collection

Continuing with the status quo of individual systems for each property is not viable in the long term because it does not address public health and environmental issues, and it is limiting the development potential of Kingston (larger lot sizes and high initial costs for each site).

The preferable collection method is gravity, however, due to high groundwater levels it is not possible to reticulate the whole community this way at a reasonable cost. A full pressure system does not fit strategically and would not provide value for money. QLDC does not have any vacuum sewers currently and is discounted for similar reasons to the pressure system. The preferred option is a hybrid of mostly gravity and pressure only where necessary. A gravity system is possible if only KVL are being serviced.

What - Level of Treatment

The preferred level of treatment is secondary plus tertiary treatment including nutrient removal and disinfection. It is considered that anything less would not be a strategic fit for QLDC and could have detrimental effects on public health and the environment. If KVL provide their own system with a lower strategic requirement than QLDC, then secondary treatment could be possible, however there is a risk that it might not meet ORC requirements.

How – Plant Composition

A treatment plant is needed that can handle flow variations and reliably treat wastewater to tertiary levels of treatment. Package plants would be too small to service the whole community, however, it is possible to use one if only KVL is being serviced. A bespoke MBR or bespoke SBR are both possible for the whole community. The preference is for the SBR treatment as it is better able to cope with anticipated variations in flow and QLDC has existing SBR plants (hence familiarity).

How – Discharge (Location)

Discharging treated effluent to the lake was quickly discounted as it does not line up with council strategies and it would be unacceptable to Māori. The treated effluent will need to be discharged to land. It is not suitable to discharge to KVL land because it would restrict the amount of house sites available and is too close to the existing water bores in Kingston. Irrigation of the golf course was discounted for environmental and cost reasons. Most of the surrounding land is steep and/or close to the lake.

The owners of the neighbouring farm immediately south of Kingston have shown interest in irrigating treated effluent on their land. The land provides the most suitable disposal area in the vicinity and is the preferred option for the following reasons:

- It is in close proximity to the scheme.
- Good elevation (groundwater clearance).
- Set back from the lake (long contact time with soil before the water eventually reaches the lake).
- Set back from the proposed water supply bore field (will avoid contamination).
- The land owner is onboard.
- The land is flatter than most surrounding land (easier to install and maintain and less likely to have erosion issues).
- The land is within the ORC boundary (the discharge area will stop at the boundary with Environment Southland, obtaining consents from two regional authorities would be more complicated).

How – Discharge (Method)

Treated effluent will be discharged to land on the neighbouring farm south of KVSZ. Various combinations of sub-surface or surface irrigation and winter feed cut-and-carry or cash cropping were considered. Options for cash cropping on its own were discounted because subsurface irrigation would restrict the ability to work the soil for crops and surface irrigation of cash crops could have health and odour issues. Furthermore, during winter, surface irrigation could encounter problems with frozen ground and/or pipes.

The preferred option is to have year-round sub-surface irrigation for winter feed cut-and-carry. It is possible, depending on technology and the risk of odour and/or freezing temperatures, to surface irrigate for winter feed cut-and-carry or have a combination of surface irrigation for cash crops and sub-surface irrigation for winter feed cut-and-carry. The final solution will be determined through detailed design. A combination is the more ambitious option, the advantage it provides is more flexibility in management regimes.

7.5.2 Summary of wastewater options assessment

Table 16: Summary of longlist options assessment for wastewater

Dimension	Do Minimum	Intermediate			More Ambitious
What: Geographic coverage?	Status Quo - Do Nothing	Kingston Township only	KVL only	Kingston Township and KVL	Kingston Township, KVL and surrounding area
	Continued for VFM	Discount	Possible	Preferred	Discount
What: Collection?	Septic Tanks	Gravity Reticulation	Pressure system	Vacuum Sewer	Hybrid (gravity mostly, pressure where necessary)
	Discount	Possible	Discount	Discount	Preferred
How: Level of Treatment?	Status Quo - Do Nothing	Primary Treatment only		Secondary Treatment	Secondary plus tertiary treatment including nutrient removal and disinfection
	Continued for VFM	Discount		Possible	Preferred

How:		Package Plant	Bespoke MBR	Bespoke SBR
Plant composition?		Possible	Possible	Preferred

How:	To lake	To soakage on KVL land	Re-use for irrigation of golf course	Re-use for irrigation on neighbouring farm	Hybrid: re-use plus wet-weather discharge to lake.	Consent in only one Regional Council	Consents for both Otago RC and Southland RC
Discharge Location?	Discount	Discount	Discount	Preferred	Discount	Preferred	Discount

How:	To subsurface irrigation on neighbouring farm for winter feed cut-and-carry	To subsurface irrigation on neighbouring farm for cash crops	To surface irrigation on neighbouring farm for winter feed cut-and-carry	To surface irrigation on neighbouring farm for cash crops	Combination cash crops (surface irrigation) and winter feed cut-and-carry (sub-surface)
Discharge Method?	Preferred	Discount	Possible	Discount	Possible

7.5.3 Discounted Scope and Service Solution Options (wastewater)

During the longlist options assessment, several options within each dimension were discounted, the following table summarises the key justification for the discounting of these options.

Table 17: Discounted scope and solution (what and how) options summary (wastewater)

Dimension	Option	Key reasons for discounting each option
What: Geographic Coverage?	Kingston Township only	KVL needs to be included to reach a critical mass for affordability.
	Kingston Township, KVL and surrounding area	House in the surrounding area are sparse, hence not good value for money.
What: Collection?	Septic tanks	This is not a strategic fit and it does not meet the business needs. Will not enable more houses faster.
	Pressure system	Does not fit strategically and would not provide value for money
	Vacuum sewer	QLDC does not have any vacuum sewers at this point in time and is discounted for similar reasons to the pressure system.
What: Level of Treatment?	Primary treatment only	This is not a strategic fit for QLDC and could have detrimental effects on public health and the environment.
How:	To lake	This is not a strategic fit for QLDC and it would be unacceptable to Māori.

Dimension	Option	Key reasons for discounting each option
Discharge Location?	To soakage on KVL land	This would restrict the amount of house sites available at KVL and is too close to the existing water bores in Kingston.
	Re-use for irrigation of golf course	This option is limited by seasonal factors, the security of the land use (it may not always be a golf course), public health and environmental risks.
	Hybrid: reuse plus wet-weather (saturation) discharge to lake	Discharging to the lake is not a strategic fit for QLDC and it would be unacceptable to Māori.
	Consents for both Otago RC and Southland RC	Dual consents would be more time consuming and costly.
How: Discharge Method?	To subsurface irrigation on neighbouring farm for cash crops	Subsurface irrigation would restrict the ability to work the soil for crops.
	To surface irrigation on neighbouring farm for cash crops	Surface irrigation of cash crops could have health and odour issues.

7.6 Options Assessment for Stormwater

At the IBC stage, it was confirmed that stormwater management needs to be included as part of the HIF project to enable the KVL development. The capture and control of stormwater on KVL land will be arranged by the developer (as with the development's other 3 Waters internal reticulation), but the conveyance through Kingston township is part of this HIF project. The conveyance and disposal system shall be engineered to also include runoff from the existing Kingston township area.

Based on discussions with ORC, we have been advised that the discharge of stormwater to Lake Wakatipu does not currently require resource consent as the process is non-prescriptive, and there are no fixed discharge criteria. The QLDC Subdivision Code of Practice will help guide the subdivision designers towards the best practicable option for collection, conveyance and discharge of stormwater, with a preference for Low Impact Design. The final design of the stormwater system will be determined during detailed design as it forms an integral part of the overall subdivision layout and street-scape, but open channel conveyance will be preferred both within the KVL subdivision and where conditions allow through Kingston village. A piped system will be used where space limitations dictate, through the central and eastern parts of Kingston. It is anticipated that stormwater treatment in the new KVL development will include first flush treatment as a minimum. The cost estimate allows for obtaining easements and access through land for the attenuation and conveyance, and includes contingency for oil and litter collection devices at the point of pipeline discharges into the lake should they be required.

7.6.1 Scope and Service Solution Options (What and How)

What – Catchment Area

The preferred catchment area is Kingston township and KVL because all stormwater from KVL will need to pass through Kingston township, which does not currently have a reticulated stormwater system. A critical mass of dwelling equivalents is also needed for affordable servicing of Kingston township. The inclusion of surrounding houses in the catchment upstream of the KVL development is not included in the preferred option due to the sparsity of houses and because this area is not zoned for residential development. While it would be possible to provide stormwater services only for KVL at the exclusion of Kingston township, this would not achieve QLDC's strategic objectives.

What – Conveyance Method

Both open channel and closed pipe systems will equally achieve the strategic objectives, and the choice between the conveyance method is based on value for money.

There is an existing stream at the western end of Kingston township that flows through the western portion of the golf course before entering the lake east of the railway station. This stream captures and conveys runoff from significant upslope catchments to the west. The size and capacity of this channel and its road culverts can be increased to take the runoff from the west end of KVL, with attenuation ponds or basins provided in or around the golf course to limit increases in peak runoff.

At the central and eastern parts of Kingston, there is insufficient available land to provide open channel flow, so buried gravity pipelines will be installed within QLDC road reserve to convey stormwater to Lake Wakatipu.

These pipelines and channel works will be designed to carry the full runoff volume of the combined KVL and Kingston township areas.

The discharge of all stormwater across the catchment area to soakage is not possible because of the large volume of water and the limited carrying capacity of the groundwater hydrological system. Similarly, pumping of stormwater to a disposal area is also not possible due to the costs of pumping. QLDC's Subdivision Code of Practice (based on NZS4404:2010) states that stormwater pumping should be avoided wherever possible.

How – Capacity

The preferable disposal method is by gravity flow to Lake Wakatipu. As a greenfield subdivision, KVL's primary stormwater system can be designed for a 1 in 20-year event (5% AEP) with secondary overland flow paths. The stormwater system through Kingstown township is compromised by the lack of available space for secondary flow paths, so this part of the system will be designed for a 1 in 100-year event (1% AEP) without secondary overland flow paths.

How – Treatment

QLDC's preferred method of stormwater control is a low impact design solution in accordance with NZS4404:2010. This Standard encourages designers to reduce stormwater generation by reducing impervious areas, minimising site disturbance, and avoiding discharge of contaminants. During detailed design, KVL will endeavour to manage treatment as close to the point of origin as possible. There may be some areas that are not suitable for low impact design, such as the established parts of Kingston township, so treatment structures at the outlet of pipelines will also be considered.

7.6.2 Summary of stormwater options assessment

Table 18: Summary of longlist options assessment for wastewater

Dimension	Do Minimum	Intermediate			More Ambitious	
What: Catchment Area?	Status Quo - Do Nothing	Kingston Township only	KVL only	Kingston Township and KVL	Kingston Township, KVL and surrounding area	
	Continued for VFM	Discount	Possible	Preferred	Discount	
What: Conveyance Method?	Status Quo – Do Nothing	Discharge to soakage	Capture, store and pump	Open channel gravity flow only	Piped gravity flow only	Combination open channel and piped gravity flow
	Continued for VFM	Discount	Discount	Discount	Discount	Preferred

How:			Combination: 1-in-20yr capacity in KVL with secondary flow paths, and 1-in-100yr capacity in Kingston township without secondary flow paths.
Capacity?	All areas served by primary system with 1-in-20yr (5% AEP) capacity and secondary flow paths	All areas served by primary system with 1-in-100 yr (1% AEP) capacity without secondary flow paths	
	Discount	Discount	Preferred

How:		Low Impact Design – attenuation and treatment at source	Centralised oil and filter trap	Decentralised oil and litter trap at outlet
Treatment?	Status Quo - Do Nothing			
	Continued for VFM	Preferred	Discount	Possible

7.6.3 Discounted Scope and Service Solution Options (stormwater)

During the longlist options assessment, several options within each dimension were discounted, the following table summarises the key justification for the discounting of these options.

Table 19: Discounted scope and solution (what and how) options summary (stormwater)

Dimension	Option	Key reasons for discounting each option
What:	Kingston Township only	KVL needs to be included to reach a critical mass for affordability.
Catchment Area?	Kingston Township, KVL and surrounding area	House in the surrounding area are sparse and outside residential zone, hence not good value for money.
What:	Discharge to soakage	Carrying capacity of subsurface geology is insufficient to take entire volume of stormwater.
Conveyance?	Capture, store and pump	Does not fit strategically and would not provide value for money.
	Open channel gravity flow only	Insufficient land availability in all locations.
	Piped gravity flow only	Requires oversize pipes for infrequent large flow, not value for money. Also, would require piping in an existing creek that would not be a strategic fit.
How:	All areas 1 in 20yr (5% AEP) capacity with secondary flow paths	Insufficient secondary flow paths in existing Kingston township
Capacity?	All areas 1 in 100yr (1% AEP) capacity without secondary flow paths	Requires oversize pipes for infrequent large flow, not value for money.
How:	Centralised oil and litter trap	Not a strategic fit, not value for money.
Treatment?		

7.7 Shortlist of programmes

The longlist assessment narrowed down the various options to those preferred and/or possible (discounting unsuitable options). A combination of the preferred options forms the preferred programme (Programme 2). The less ambitious and more ambitious programmes were formed by altering the preferred programme to include possible options. This formed the recommended shortlist of programmes for further assessment in the Multi-Criteria Analysis (MCA). They are summarised in the following list, figure and table:

- **Programme 0: Status quo** option (retained as a baseline comparator).
- **Programme 1: Less ambitious** – KVL only (excludes Kingston township). The smaller project scale has more wastewater treatment alternatives that can provide a greater ability to stage to meet demand.
- **Programme 2: Preferred** – Kingston township and KVL. To meet QLDC requirements.
- **Programme 3: More ambitious** – Kingston township and KVL. Same as preferred but with some extra built in resilience.

Figure 18 below shows which areas are included in each programme. Details about interventions within each programme are included in the Appendices, whilst key differences between the programmes are shown in Table 20 below. A summary of each programme is included in the following section, along with the MCA assessment.

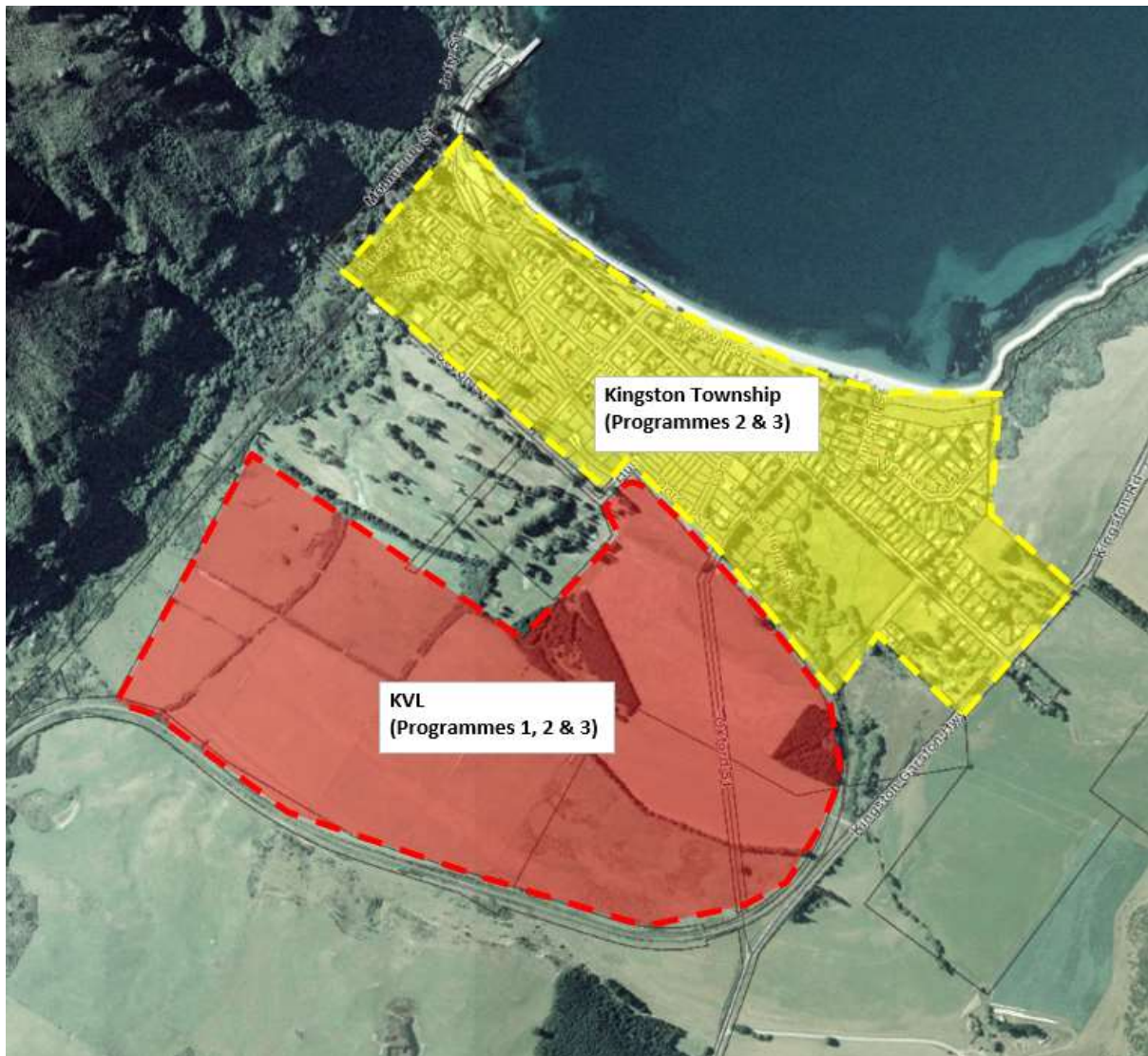


Figure 18 : Plan of programme inclusions

Table 20: Shortlisted Programmes and their key differences

	Intervention options	Programme 1 Less Ambitious – KVL only	Programme 2 Preferred – KVL + Kingston Township	Programme 3 More Ambitious KVL + Kingston Township
Water Supply				
LOS (Storage)	Minimum flow + fire capacity FW3 (180 m ³) + reserve (24 hr) + generator connection	✓	✓	
	Minimum flow + fire capacity FW3 (180 m ³) + some reserve + generator back-up for pumps			✓
Source	Existing bore - increase size	✓		
	Existing + additional bores; same location		✓	
	Combination bore field then supplemented by lake (staged, for resilience)			✓
Treatment	Filters (for bores) + UV + residual chlorination	✓	✓	
	Filters for bores (with additional coagulation for lake water) + UV + residual chlorination			✓
Wastewater				
Collection	Gravity Reticulation	✓		
	Hybrid (gravity mostly, pressure where necessary)		✓	✓
Level of Treatment	Secondary Treatment	✓		
	Secondary + tertiary treatment including nutrient removal and disinfection		✓	✓
Plant Composition	Package Plant	✓		
	Bespoke SBR		✓	
	Bespoke MBR			✓
Discharge (Method)	To subsurface irrigation on neighbouring farm for winter feed cut-and-carry	✓	✓	
	Combination surface and sub-surface irrigation			✓
Stormwater				
Treatment	Low Impact Design – attenuation and treatment at source	✓	✓	
	Decentralised oil and filter trap at outlet			✓

7.8 Analysis of Shortlisted Programmes

This sub-section includes summaries of the cost and benefits, multi criteria analysis and an outline of each shortlisted programme with advantages and disadvantages of each. The preferred programme is outlined in more detail the following section.

7.8.1 Estimated costs and benefits summary

Table 21, below, compares estimated costs in 2018 dollars and benefits of each shortlisted option. In summary, the status quo does not enable housing development, however, all three other options enable a 950 dwelling yield. The cost of the less ambitious option at \$49m is higher than the preferred option because in this case Kingston township would need to develop its own 3 water headworks, as the HIF-funded headworks in this option would only supply the KVL development. If QLDC did not develop these stand-alone headworks at an estimated \$9m of the \$49m total cost, this option would not achieve sufficient benefit because Kingston township could not be serviced.

The preferred option provides a \$1,800 lower cost per residential unit than the second (less ambitious) option.

Table 21: Estimated costs and benefits, by shortlisted programme.

\$millions	Shortlisted Programme			
	0 Status Quo	1 Less Ambitious	2 Preferred	3 More Ambitious
Total capital costs	\$0 M	\$46 M	\$42 M	\$52 M
Number of new dwellings served	0	950	950	950
Total number of dwellings served	0	1175	1175	1175
Cost/dwelling*	\$0	\$38,900	\$35,500	\$44,000
Yield as a % of demand 30 years	0%	16%	16%	16%

* Based on the full cost not the growth portion targeted towards the Housing Infrastructure Fund.

7.8.2 Multi-criteria assessment - Option analysis and initial RMA screen

The multi criteria assessment demonstrates the balance of factors that are considered to demonstrate that the selected shortlisted programmes deliver against the investment objectives and critical success factors, provides a value for money solution and is affordable. This assessment highlighted that all the programmes performed well in some areas but had different strengths and weaknesses. The full assessment can be found in Appendix 3, showing all criteria included in the MCA screen including preliminary assessment of environmental effects.

Table 22: Summary of multi criteria assessment rankings (refer to the appendices for the full MCA)

	Programme 0 Status Quo	Programme 1 Less Ambitious	Programme 2 Preferred	Programme 3 More Ambitious
Cost Estimate	1	3	2	4
Delivery on Investment Objectives	4	3	1	2
Benefits	4	3	1=	1=
Risks	1	2	3	4
Overall Ranking	2	4	1	3

7.8.3 Programme 0 - The status quo option

Description

Under the status quo, Kingston community water supply will be installed in 2021/22 and wastewater investigations start 2026/27 as per QLDC LTP funding. KVL will develop their land when they are ready.

Advantages

The main advantages are:

- Aligns with existing budget forecasts
- Low technical and financial risks

Disadvantages

The main disadvantages are:

- it does not unlock development of the KVL land in the short term, delaying:
 - reaching of a critical mass for affordable servicing and
 - the availability of more houses sooner.
- None of the investment objectives are met.
- None of the business needs are met.
- High stakeholder and environmental risks.
- Missed savings due to not trench sharing (plans are to install water and wastewater years apart).
- LTP funding for wastewater only covers the investigations, not the actual construction.
- Stormwater issues are not addressed.

Conclusion

Whilst this option is in some ways low risk, it does not address the need of unlocking the KVL land for development sooner. The land needs unlocking to provide the critical mass needed for affordable servicing of Kingston and the land will provide affordable housing within reach of Queenstown.

7.8.4 Programme 1 – Less Ambitious Option

Description

This option includes servicing only the KVL land, which will ultimately include 750 dwellings. The smaller scale of the project means that the existing water bore should be a suitable source if it is enlarged. For wastewater, the whole development can be serviced by a gravity sewer and the volume will be small enough to use a package plant. Stormwater from KVL would pass through Kingston in existing streams or new gravity pipelines, without capacity to take stormwater from Kingston township itself.

Advantages

The main advantages are:

- Enables the new development (more houses sooner).
- Most economical option
- Less disruption to Kingston township
- Able to stage infrastructure

Disadvantages

The main disadvantages are:

- Does not deliver a better urban outcome for the whole Kingston community.
- A critical mass is not achieved, the cost /dwelling ratio is higher than the preferred option.
- No improvement for the existing Kingston township (key stakeholder).

- Social exclusion of Kingston township.
- May not qualify for HIF funding due to lack of benefit.
- Existing public health and environmental issues are not addressed (this is one of the three investment objectives).
- Private ownership would mean QLDC are unable to maintain certainty that suitable standards are being met for the benefit of the community.
- The water supply will be from a single bore making it vulnerable to resilience and reliability issues.

Conclusion

Whilst this option provides value for money in terms of enabling more houses faster, it does not benefit the community as a whole. QLDC would still need to address the public health and environmental issues in Kingston, which would entail additional cost of \$9m for provision of stand-alone headworks. The development of two separate headworks facilities (one for KVL, one for Kingston) does not provide cost efficiency either in construction or operation.

The infrastructure can be provided at a better cost/dwelling if Kingston township is served by the same headworks as KVL (the Preferred Option below).

7.8.5 Programme 2 – Preferred Option

Description

The preferred option includes both Kingston township and KVL. It includes 3 Waters solutions that meet QLDC standards and are capable of servicing 1175 dwellings. This includes the 225 existing houses within Kingston township that currently have individual water and wastewater systems. For the water supply, additional bores will be required in the same location as an existing test bore. Water treatment and storage will be similar to the less ambitious programme, and a preliminary design report is included in Appendix 5. For wastewater, the reticulation network would be mostly gravity but some areas of Kingston township may require a pressure system due to ground constraints. Wastewater treatment will be through a bespoke SBR to provide tertiary treatment including nutrient removal and disinfection. Wastewater disposal will be to subsurface irrigation on the neighbouring farm for winter feed cut-and-carry. The stormwater alignment is similar to the less ambitious option, with piped infrastructure in KVL capable of carrying a 1 in 20-year design event with secondary flow paths, but would also include pipelines in Kingston able to carry a 1 in 100-year event without secondary flow paths. The capacity of the stream to the west of town will be improved to carry the additional capacity in that area.

Advantages

The main advantages are:

- Enables the maximum number of new houses sooner.
- Existing public health and environmental issues are addressed.
- QLDC ownership of the 3 Waters infrastructure benefits the community by maintaining certainty that suitable standards are being met consistently.
- Eligible for HIF funding.
- Provides the best cost/dwelling ratio for the new infrastructure.
- Delivery shared between QLDC and the developer.
- Better level of treatment for wastewater than the less ambitious option.

Disadvantages

There are no main disadvantages with this option.

Conclusion

This programme delivers consistently well across all three investment objectives. There are economies of scale from servicing the whole community. The benefits stretch to more of the community. QLDC standards

will influence the quality of the outcome, ensuring better resilience and levels of treatment. This is still the preferred option.

7.8.6 Programme 3 – More Ambitious Option

Description

This option is similar to the preferred option but it has improvements to resilience. For the water supply, it includes a supplementary lake take (and treatment) as well as generator back up for the pumps. For wastewater, it provides MBR treatment and two methods for disposal of treated wastewater effluent. For stormwater, it includes treatment at the piped outlets into the lake, such as cyclone oil and litter traps.

Advantages

The main advantages are:

- Provides a more resilient infrastructure service.
- Enables the maximum number of new houses sooner.
- Existing public health and environmental issues are addressed.
- QLDC ownership of the 3 Waters infrastructure benefits the community by maintaining certainty that suitable standards are being met consistently.
- Eligible for HIF funding.

Disadvantages

The main disadvantages are:

- Much more expensive than other options.

Conclusion

The costs associated with providing further resilience for the infrastructure do not provide value for money at this point in time. However, aspects of this programme could be added in the future as required.

8 The Preferred Programme

This section describes the preferred programme and assesses its:

- outcomes
- implementability
- wider project impacts
- sensitivity of the MCA analysis.

8.1 Programme Description

It is proposed to provide 3 Waters systems for both the Kingston township and the KVL development (Programme 2). The 3 Waters infrastructure will include the following features (note that plans showing the proposed 3 Waters infrastructure are included in Appendix 5):

Water Supply

- Extended bore field from the single test bore that currently exists to the east of Kingston.
- New water take consent.
- New water treatment plant on a site to the northeast of the bore field.
- New water storage reservoir adjacent to the new water treatment plant (storage will meet minimum flow, fire capacity FW3 (180 m³), reserve (24 hr))
- Trunk water main from the storage reservoir to the western end of the township, with a connection to the KVL development.
- Reticulation within Kingston township (partially HIF funded for growth portion).

Wastewater

- New wastewater treatment plant to the south of the KVL development, near the state highway (bespoke SBR to provide tertiary treatment including nutrient removal and disinfection).
- New land disposal area south of the proposed township extension.
- A new wastewater discharge consent will be required and land disposal with a cut-and-carry management regime has been assumed.
- New pump stations in the existing township and associated rising main and falling mains.
- Gravity reticulation within Kingston township, some areas may require a pressure system due to ground constraints (partially HIF funded for growth portion).

Stormwater

- 2 trunk mains (with capacity for the 100 Year ARI event) from the KVL development to Lake Wakatipu
- Enlarged surface channel from the KVL development to Lake Wakatipu at the western end of the existing township
- 3 new outlets to Lake Wakatipu.

8.2 Assessment

8.2.1 Outcomes

The preferred project will deliver consistently well across all three investment objectives. Expected outcomes are summarised on the following table.

Table 23: Outcomes of the preferred project

Investment Objective	Outcome
1. Improved housing affordability	The new infrastructure will enable 950 new houses in one of the most affordable parts of the district (750 in KVL and 200 infill in Kingston). It will achieve the KPI target of 40% of new houses less than 65% of average sales price within the district by 2027/28.
2. Efficient and effective housing supply	<p>The preferred option provides the lowest infrastructure cost per dwelling. It is worth noting that this cost per dwelling is just over twice the baseline cost of providing reticulation to Kingston only, because currently Kingston has no headworks infrastructure whatsoever, and the preferred options will be establishing all new facilities.</p> <p>The preferred option accelerates housing supply for the 950 new houses by removing the existing barriers to development. This will provide a significant contribution to the target of 5,250 by 2027/28.</p>
3. Improved public health and environmental outcomes.	The preferred option will provide the best outcomes for public health and environmental improvements. To address this objective, Kingston township must be included in the solution.

8.2.2 Implementability

The preferred project is highly implementable because:

- Design and construction involves conventional technology and methods and will therefore be straightforward.
- QLDC will have a private Developer Agreement in place (currently under negotiation).
- All the works are on either public land, land owned by the developer or on land with agreements that will be in place.
- Water quality test results in the proposed bore field location have been positive.
- It aligns with ORCs water quality objectives.
- The Kingston community supports the project provided that access from SH6 is secured.

8.2.3 Wider project impacts

Wider project impacts include:

- Environmental and public health benefits of the future removal of septic tanks.
- Increased traffic on SH6 and possibly local through-roads, to be addressed by the developer.
- The entire community will have a reliable water supply.
- Provides an affordable housing option for the district.
- Kingston will be able to reach a critical mass of residents to encourage and enable:
 - a possible new school
 - potential future public transport
 - better access from the state highway

- other infrastructure improvements such as streetscape upgrades
- new community services
- new business and employment opportunities (shops, groceries).

8.3 Economic analysis including sensitivity analysis

A sensitivity analysis of the MCA was carried out with the weightings on the following criteria:

- Achievement of objectives
- Capital Cost
- Business Needs/ Considerations
- Risks

For the MCA analysis, each criterion was equally weighted at 25% each. For the sensitivity analysis, each criterion was doubled whilst the others were equally weighted to observe the effect of the rankings of the options. The results are summarised in Table 24 below.

Table 24: Sensitivity Analysis Rankings

Sensitivity analysis	Programme 0 Status Quo	Programme 1 Less Ambitious	Programme 2 Preferred	Programme 3 More Ambitious
Equal Weightings	2	4	1	3
50% Cost	1	3	2	4
50% Objectives	4	3	1	2
50% Needs	4	3	1	2
50% Risks	1	3	2	4

This analysis shows the rankings of the programmes are sensitive to costs and risks. When doubling the weightings on risks and cost, the preferred programme switched from Programme 2 to Programme 0. There was no change in the preferred programme when the weightings of objectives and needs were doubled.

9 Financial case to deliver infrastructure projects

9.1 General

The Financial Case develops the financial model to be used for the Kingston HIF infrastructure project. It will assess the affordability of the proposal, its funding arrangements and technical accounting issues.

9.2 Project delivery costs

Project construction cost estimates are attached in Appendix 4. These are the expected costs in 2018 dollars. QLDC proposes to manage the contingency across all 3 Waters projects to reduce the funding risk since the HIF funding amount is capped.

Table 25 below presents the key infrastructure elements for the overall project. The expected 2018 costs are used for comparisons to the IBC but further analysis on real expected costs for drawdown and repayments have been analysed in real, inflated dollars. Total costs include project property, project development, pre-implementation costs and implementations costs. Details of what is included in each category and activity of the project delivery costs are shown in Table 26 and Table 27 below. The P50 is the base estimate with some added contingency to produce the expected project cost. The P95 includes further contingency above and beyond the P50 estimate of which there is a 95% certainty the project costs will be below. The total project costs increases from \$41.7m in 2018 dollars to \$44.8.

Table 25: Expected Project Delivery Costs

Item	Description	Base	Contingency (P ₅₀)	Funding Risk Contingency (P ₉₅)
A	Project Property			
	Stormwater	\$ 600,000	\$ 33,396	\$ 94,735
	Potable Water	\$ 101,200	-\$ 2,733	\$ 11,081
	Waste Water	\$ -	\$ -	\$ -
	Nett Project Property Cost	\$ 701,200	\$ 30,663	\$ 105,816
B	Project Development Phase			
	Stormwater	\$ 400,267	\$ 143,694	\$ 163,515
	Potable Water	\$ 548,953	\$ 195,781	\$ 243,004
	Waste Water	\$ 1,764,007	\$ 395,469	\$ 689,852
	Total Project Development	\$ 2,713,227	\$ 734,944	\$ 1,096,371
C	Pre-implementation Phase			
	Stormwater	\$ 288,040	\$ 76,330	\$ 126,788
	Potable Water	\$ 351,577	\$ 153,627	\$ 147,554
	Waste Water	\$ 1,469,994	\$ 322,915	\$ 640,223
	Total Pre-implementation	\$ 2,109,611	\$ 552,871	\$ 914,565
D	Implementation Phase			
	Implementation Fees			
	Stormwater	\$ 164,595	\$ 112,582	\$ 140,027
	Potable Water	\$ 273,800	\$ 158,519	\$ 166,735
	Waste Water	\$ 1,189,333	\$ 353,013	\$ 607,945
	Sub Total Base Implementation Fees	\$ 1,627,727	\$ 624,113	\$ 914,707
	Physical Works			
	Stormwater	\$ 4,114,863	\$ 719,941	\$ 1,289,337
	Potable Water	\$ 5,404,615	\$ 1,572,409	\$ 2,238,258
	Waste Water	\$ 17,586,786	\$ 3,212,845	\$ 4,796,776
	Sub Total Base Physical works	\$ 27,106,263	\$ 5,505,195	\$ 8,324,371
	Total for Implementation Phase	\$ 28,733,990	\$ 6,129,308	\$ 9,239,078
E	Project Base Estimate (A+C+D)	\$ 34,258,028	\$ 7,447,786	
F	Contingency (Assessed/Analysed)		\$ 7,447,786	

G	Project Expected Estimate (P ₅₀)	\$	41,705,815
	Nett Project Property Cost Expected Estimate	\$	731,863
	Project Development Phase Expected Estimate	\$	3,448,171
	Pre-implementation Phase Expected Estimate	\$	2,662,483
	Implementation Phase Expected Estimate	\$	34,863,299
H	Funding Risk Contingency (Assessed/Analysed)	(A+C+D)	\$ 11,355,830
I	95th percentile Project Estimate	(G+H)	\$ 53,061,645
	Nett Project Property Cost 95th percentile Estimate	\$	837,679
	Project Development Phase 95th percentile Estimate	\$	4,544,542
	Pre-implementation Phase 95th percentile Estimate	\$	3,577,048
	Implementation Phase 95th percentile Estimate	\$	9,239,078

Table 26: Constituents of Project Delivery Costs

Category	Constituents
Project Property	Internal and legal costs to obtain lease agreements and easements
Project Development Phase	Consultancy fees and QLDC costs for development of concept and preliminary engineering, indicative and detailed business cases, and stakeholder engagement, as a percentage of physical works costs
Pre-implementation Phase	Consultancy fees and QLDC costs for detailed design, stakeholder engagement, project management and tendering of physical works contract, as a percentage of physical works costs
Implementation Fees	Consultancy fees and QLDC costs for administration, project management and MSQS of physical works contracts during construction, as a percentage of physical works costs
Physical Works	Any and all construction related works such as siteworks, earthworks, buildings, process and mechanical equipment. Includes preliminary and general, offsite construction costs and contractors overhead and profit as a percentage of direct works, as well as commissioning costs.

Table 27: Constituents of each activity included in the project delivery costs

Activity	P50 Project constituents
Water Supply	Headworks to existing township and connection point to KVLSZ Treatment plant and Reservoir Bore field Falling Main Reticulation to existing township Schedule Risk
Wastewater	Headworks to existing township and connection point to KVLSZ Treatment plant Land disposal Primary pump station Primary rising main

	Secondary pump station Secondary rising main Gravity Reticulation Reticulation to existing township Schedule Risk
Stormwater	Eastern trunk main Central trunk main Western trunk main Schedule Risk

9.2.1 HIF cost breakdown

Table 29 and Table 30 below show the comparison between the cost estimates from the IBC and the DBC stages. The estimated costs have increased since the IBC to better reflect the expected level of detailed design, planning, stakeholder engagement and land approvals, as well as the cost of risks and the addition of the Kingston reticulation. The figures in Table 29 to Table 32 are expressed in 2018\$ to allow for a like for like comparison between the IBC and the DBC. Analysis from Table 33 onwards are in real, inflated \$ to reflect the true likely costs, unless otherwise stated.

Table 33 and Table 34 highlight the proposed district wide rate to fund 20% of the costs of water supply and wastewater to the existing community to provide a more affordable option. This results in a \$1.7m subsidy from the district.

For the DBC the costs are apportioned between HIF (growth portion) and the existing township based on the number of dwellings benefiting from each. For stormwater, KVL has been apportioned a higher percentage of the costs as the Eastern trunk main is the only channel which provides benefit to the existing community.

Table 28: Headworks benefit apportionment

Headworks	HIF (950 dwellings)	Existing Township (225 dwellings)	Total
Water Supply	81%	19%	100%
Wastewater	81%	19%	100%
Stormwater	93%	7%	100%

A summary of how the costs are broken down to HIF and Non-HIF funded are located in Table 29 to Table 32.

Table 29: Indicative Business Case cost breakdown

IBC	HIF (950 dwellings)	Existing Township (225 dwellings)	Total
Headworks	\$23.6m	\$5.2m	\$28.8m

Table 30: Detailed Business Case - Areas of benefit, overall costs

DBC	HIF	Existing Township (225 dwellings)	Total
Headworks	\$32.1m (950 dwellings)	\$6.6m	\$38.7m
Kingston Reticulation	\$1.4m (200 dwellings)	\$1.6m	\$3.0m
TOTAL	\$33.5m	\$9.0m	\$41.7m

Table 31: Detailed business case - Areas of benefit, cost per dwelling

Dwellings	HIF (950 dwellings)	Existing Township (225 dwellings)	Total
Headworks	950 new	225 existing	1175
Kingston Reticulation	200 infill	225 existing	425
Cost/Dwelling Headworks	\$32,942	\$32,942	\$32,942
Cost/Dwelling Reticulation	\$1,486	\$7,057	\$2,553
Cost/Dwelling Total	\$34,427	\$ 39,999 (\$29,926 subsidised⁴²)	\$35,494

Table 32: Cost Breakdown by Activity

Activity	New Dwellings	Existing	Total
Water Supply	\$6.8m	\$2.0m	\$8.8m
Wastewater	\$20.6m	\$5.7m	\$26.3m
Stormwater	\$6.2m	\$0.5m	\$6.7m
TOTAL	\$33.5m	\$8.2m	\$41.7m

Table 33: Cost Breakdown by Activity (Inflated \$)

Activity	New Dwellings	Existing	Total
Water Supply	\$7.0m	\$2.1m	\$9.2m
Wastewater	\$22.3m	\$6.2m	\$28.5m
Stormwater	\$6.7m	\$0.5m	\$7.2m
TOTAL	\$36.0m	\$8.9m	\$44.9m

Table 34: Cost Breakdown by Activity including 20% subsidy to Water Supply and Wastewater (Inflated \$)

Activity	New Dwellings	Existing	Total
Water Supply	\$7.0m	\$1.7m	\$8.7m
Wastewater	\$22.3m	\$5.0m	\$27.3m
Stormwater	\$6.7m	\$0.5m	\$7.2m
TOTAL	\$36.0m	\$7.2m	\$43.2m

9.2.2 Cost breakdown by year

Figure 19 below demonstrates how the total delivery costs that are expected, broken down across an eight-year horizon. The graph highlights the two main stages of construction. Most of the construction spend occurs in 2019 and 2020 including the borefield, water treatment, reservoir and the first stage of the wastewater treatment plant. The first house connections will be enabled at the end of the first stage. The second major expenditures in 2024 are the second stage of the wastewater treatment plant and the connections to the

⁴² For the existing township 20% of the CAPEX in water supply and wastewater is subsidised by district wide rates.

existing community. The timing of the second stage of wastewater treatment will be determined by the rate of housing development.

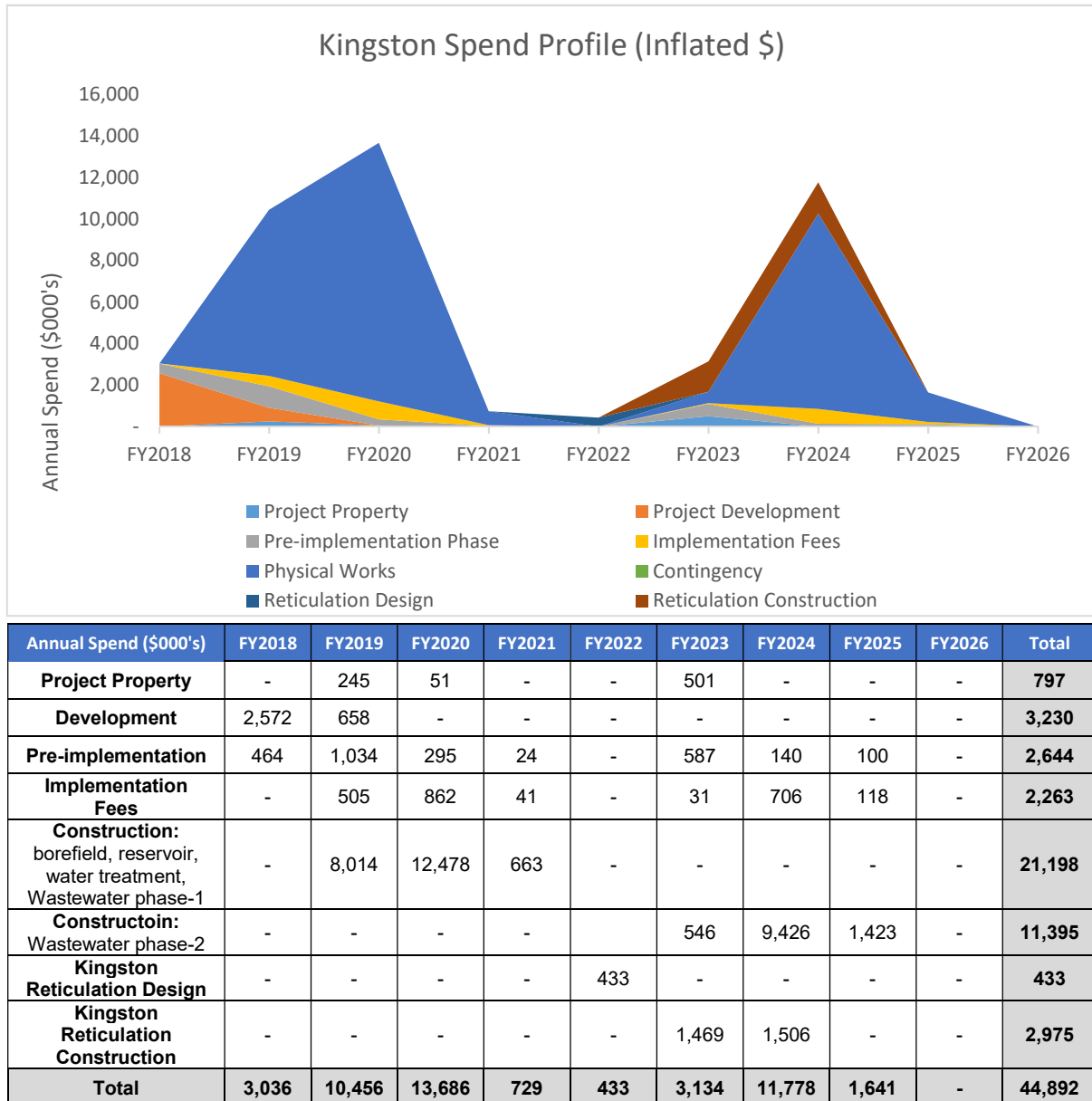


Figure 19: Kingston housing infrastructure spend

9.3 Ongoing maintenance and operations costs

Post-implementation costs allow for ongoing maintenance and operations costs. A detailed estimate of operating and maintenance costs is incomplete at this time. Table 35 and Table 36, below show the estimated operating costs for the new infrastructure, they include operations and maintenance, depreciation and overheads.

Table 35: Annual operating costs breakdown (once fully operational)

Annual Operating Costs	\$1,709,959
Operating Cost/dwelling	\$1,455

Table 36: Estimated operating costs for the first ten years

Estimated Operating Cost	10-year total (Y0-Y10)
Preferred project (includes all 3 waters)	\$ 7.83 million

The annual maintenance and operations costs are expected to increase with each stage of the project. The operating costs do not begin until Year 3, when the headworks are commissioned. The annual wastewater treatment plant cost⁴³ is expected to be \$420,700 in Stage 1 and \$849,000⁴⁴ in Stage 2. For the current modelling purposes, the annual water supply and wastewater operating costs are assumed to be \$50,000 each.

9.4 Overall affordability

QLDC has used the initial costings to test the affordability of the programme as part of the Council's Long-Term Plan budget forecast. Given the significant cost of the full masterplan programme and the other infrastructure investments the Council is required to undertake in the coming decades (such as water treatment plants and arterial road upgrades), QLDC is reaching its debt ceilings. The HIF funding helps to make the LTP more affordable as described in Section 3.2.4 and shown in Appendix 9.

Development contributions were seen as being prohibitively expensive for development as shown in Table 37. Discussions are on the way with the developer to find a more affordable solution. Several options being investigated are detailed in Section 9.5 below.

Table 37: Development contribution per dwelling equivalent

Activity	Development Contribution per Dwelling Equivalent
Water Supply	\$8,169
Wastewater	\$24,949
Stormwater	\$6,539
TOTAL	\$39,657

9.5 Funding/revenue sources and profile

An initial funding model has been prepared and is summarised in Appendix 9. The final version is dependent upon the final cost estimates prepared during detailed design and the funding agreement between QLDC and KVL that will be captured in the Development Agreement. These negotiations are nearing conclusion.

Funding options are summarised in this section. An outline of the methodologies used is included in Section 9.6.

9.5.1 Funding options

The options for funding the growth, operational costs, depreciation, and non-growth costs are shown in Table 38 below.

Table 38: Options for funding the growth

Group	Funding Mechanism
OPEX & Depreciation	Kingston-wide targeted rate

⁴³ Details of the assumptions for the annual operating cost estimate for the wastewater treatment plant are included in Harrison Grierson Technical Memo, Kingston HIF, Conceptual SBR WWTP and Effluent Disposal for QLDC (8 Feb 2018) Appendix 9 of this document.

⁴⁴ Note that these expected costs do not include depreciation.

New Dwellings (Growth CAPEX)	\$1,000 p.a. per dwelling for all 3 Waters targeted rate to dwellings attributed to growth with a lump sum to pick up the remainder
Existing township (LOS)	\$1,000 p.a. per dwelling for all 3 Waters targeted rate to dwellings attributed to growth with a lump sum to pick up the remainder 20% of water supply and wastewater costs to be funded through a district wide rate

9.5.2 Indicative rates and lump sums

A summary of indicative rates and lump sums in 2018 dollars are outlined in Table 39 below. The combination of targeted rate and lump sum provides a level of affordability for both residents and the developer, to optimize both the support of residents and the commercial success of the developer, as well as compliance with Council's long-term debt benchmarks. An outline of the methodology used for the modelling of these are shown in Section 9.6 below. The rates and lump sum will be inflated annually to reflect the true costs.

Table 39: Indicative Rates and Lump Sums

Funding	HIF (950 dwellings)	Existing Township (225 dwellings)
Existing typical Kingston Rate	Nil	\$1,167 p.a.
Expected total Kingston Rate following HIF: <i>which includes:</i> Indicative Targeted Rate: Indicative Operational Rate:	\$3,022 p.a. \$1,000 p.a. (for 25-yrs) \$808 p.a.	\$3,022 p.a. \$1,000 p.a. (for 25-yr) \$808 p.a.
PLUS: Indicative Lump Sum	<u>Plus:</u> \$6,110	<u>Plus:</u> \$12,876

The indicative targeted rate of \$1,000 p.a. excludes depreciation costs as it is proposed that depreciation be funded only after the 25 year targeted rate to recover capital expenditure so as to improve the affordability to ratepayers.

The targeted rates have been set to reflect the percentage of each activity as a portion of the entire CAPEX to each area of benefit (e.g. 20% of the targeted rate to the HIF area of benefit will be used to pay off the HIF loan associated with water supply). The percentages and CAPEX for the existing township reflect the 20% district wide subsidy for water supply and wastewater and are in real, inflated dollars.

Table 40: Rates apportionment by activity, 20% subsidy reflected (Inflated \$)

Activity	HIF \$m	HIF %	Non-HIF \$m	Non-HIF %	Total \$000's
Water Supply	\$7.0m	20%	\$1.7m	24%	\$8.7m
Wastewater	\$22.3m	61%	\$5.0m	69%	\$27.3m
Stormwater	\$6.7m	19%	\$0.5m	7%	\$7.2m
Total	\$36.0m	100%	\$7.2m	100%	\$43.2m

9.5.3 Indicative modelling for new dwellings

An indicative option for using a targeted rate and lump sum has been modelled to recover costs from the new dwellings to be developed.

It is based on a recovery model over 25 years at 5% interest for the remaining 15 years after the initial 10 year interest free period with the targeted rate set at \$1000 p.a. and a lump sum to cover the remainder. The targeted rate/lump sum is modelled to be in place in FY21 when the first houses are expected to reach the market. Further detail on the model assumptions and methodology can be found in section 9.6 below. The lump sums and targeted rates are in 2018\$ and will be inflated annually.

Table 41: Lump sum costs for new dwelling

Activity	Lump sum per dwelling for new dwellings
Water Supply	\$1,315
Wastewater	\$3,691
Stormwater	\$1,104
TOTAL	\$6,110

Table 42: Preliminary targeted rate for new dwellings

Activity	Preliminary Targeted Rate for new dwellings
Water Supply	\$195
Wastewater	\$619
Stormwater	\$186
TOTAL	\$1,000

9.5.4 Indicative modelling for existing dwellings

An indicative option for using a targeted rate and lump sum has been modelled to recover costs from the existing township.

It is based on a recovery model over 25 years at 5% interest with the targeted rate set at \$1000 p.a. and a lump sum to cover the remainder. The targeted rate/lump sum is modelled to be in place in FY23 when the existing community is expected to be connected. Further detail on the model assumptions and methodology can be found in section 9.6 below. The lump sums and targeted rates are in 2018\$ and will be inflated annually.

Table 43: Lump sum costs for existing dwelling

Activity	Lump sum per dwelling in existing township
Water Supply	\$3,250
Wastewater	\$8,684
Stormwater	\$942
TOTAL	\$12,876

Table 44: Preliminary targeted rate for existing dwellings

Activity	Preliminary Targeted Rate for existing township
Water Supply	\$235
Wastewater	\$692
Stormwater	\$73
TOTAL	\$1,000

9.6 Funding option methodology

9.6.1 Cost allocation

Costs for capital expenditure were allocated on the following basis:

1. Costs apportioned to who benefits i.e. between the existing township and new dwellings.
2. Costs apportioned to who benefits on a dwelling basis. i.e. share of total dwellings used in the design.

9.6.2 Capital expenditure for new dwellings

The modelling of funding options for new dwellings was carried out on the following basis:

1. A lump sum and targeted rate regime is preferred.
2. This would be applied on a dwelling equivalent basis. (Land area is an alternative).
3. The targeted rate is to be set around \$1,000 p.a. per dwelling (for all 3-waters), assuming a 25-year period.
4. Interest will be included at 5.0% p.a. following the 10yr interest free period.
5. To achieve the \$1,000 target a lump sum contribution will be required to pick up the remainder.
6. To ease the upfront financial costs for the developer the following options are to be considered:
 - a. Set a differential for developed and undeveloped lots. i.e. 0.5 for undeveloped lots and a full charge for developed lots.
 - b. Ramp up the charge over time so that a full charge is not in place until x years after headworks are complete. This is likely to only apply to undeveloped lots.

With regards to timing:

1. Lump sum contributions to be paid at time of 224c.
2. Targeted rates would be applied once headworks are complete.
3. Lump sum contributions and targeted rates are to be adjusted to reflect historic payments. e.g. if a property has been paying a half charge for a number of years prior to development then the lump sum and/or targeted rate would be adjusted to reflect this.

9.6.3 Existing dwellings

The modelling of funding options for existing dwellings was carried out on the following basis:

1. 20% of the costs for wastewater and water supply will be funded via the district-wide general rate.
2. A lump sum and targeted rate regime is preferred for the remainder.
3. This would be applied on a dwelling equivalent basis. (Land area is an alternative).
4. The targeted rate is to be set around \$1,000 p.a. per dwelling (for all 3-waters), assuming a 25-year period.
5. Interest will be included at 5.0% p.a.
6. To achieve the \$1,000 target a lump sum contribution will be required to pick up the remainder.
7. To encourage existing dwellings to connect the following options are to be considered:
 - a. Set a differential for connected and serviceable lots. i.e. 0.5 for serviceable lots and a full charge for connected lots.
 - b. Ramp up the charge over time so that a property that connects late pays more to cover the interest costs incurred by QLDC.

With regards to timing:

1. Lump sum contributions to be paid once headworks at time of connection.
2. Targeted rates to begin once the headworks are complete.

3. Lump sum contributions and targeted rates are to be adjusted to reflect historic payments. e.g. if a property has been paying a half charge for a number of years prior to connection then the lump sum and/or targeted rate would be adjusted to reflect this.

9.6.4 Operational expenditure

Modelling of the operational expenditure was carried out on the following basis:

Cost Allocation

1. Costs spread over all properties that are connected or serviceable.

Funding Option

1. A fixed charge on each separately used or inhabited part of every rating unit is proposed.
2. With a full charge for those connected to the respective scheme, and a half charge on each separately used or inhabited part of every serviceable rating unit.
3. In this instance bulk lots would only be charged a half charge.

Timing

1. This targeted rate would be applied when the headworks are complete.

9.7 HIF loan drawdown profile

There are two options investigated for HIF loan drawdown and repayments.

1. The preferred is a complete drawdown for all expenditures that have a HIF benefit.
2. The alternative option aims to reduce the drawdown amount by holding the targeted rate and lump sum revenue until 2025 and using this to fund stage 2 expenditure and paying off the HIF loan after this period, thus reducing the drawdown amounts.

The proposed loan drawdown profiles for the two drawdown options are presented in Figure 20 and Figure 21 below. All drawdowns occur in the first 8 years. The complete drawdown from HIF is the preferred option

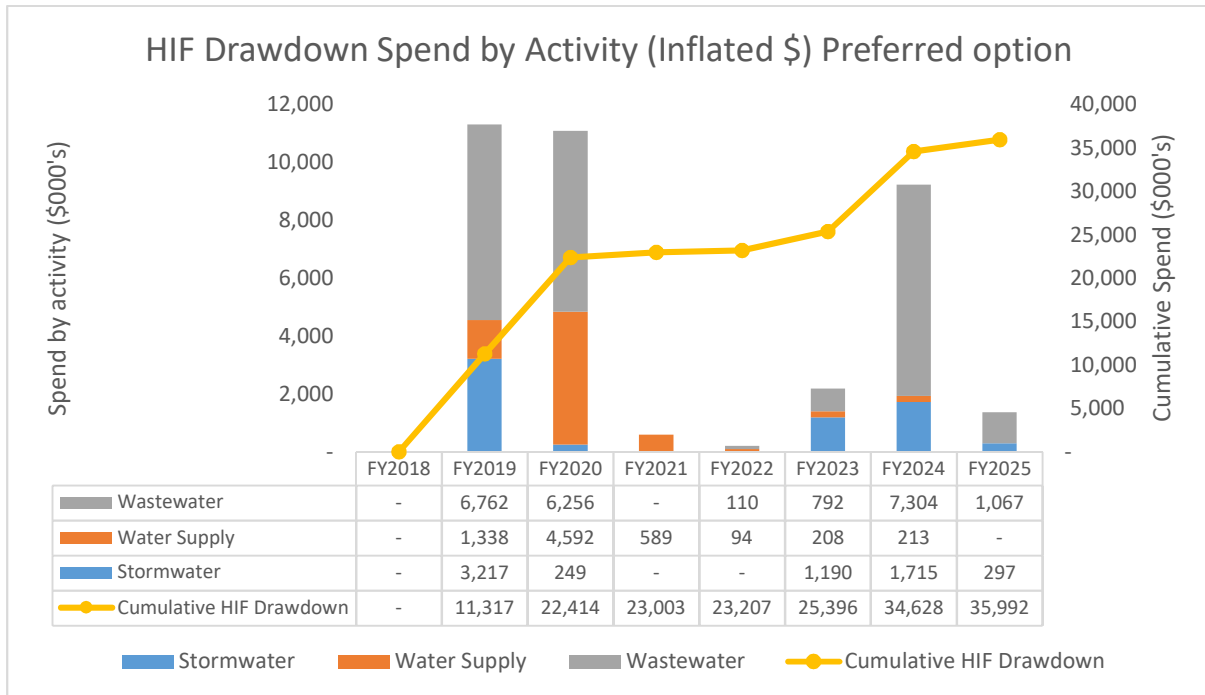


Figure 20: HIF loan drawdown profile, preferred option

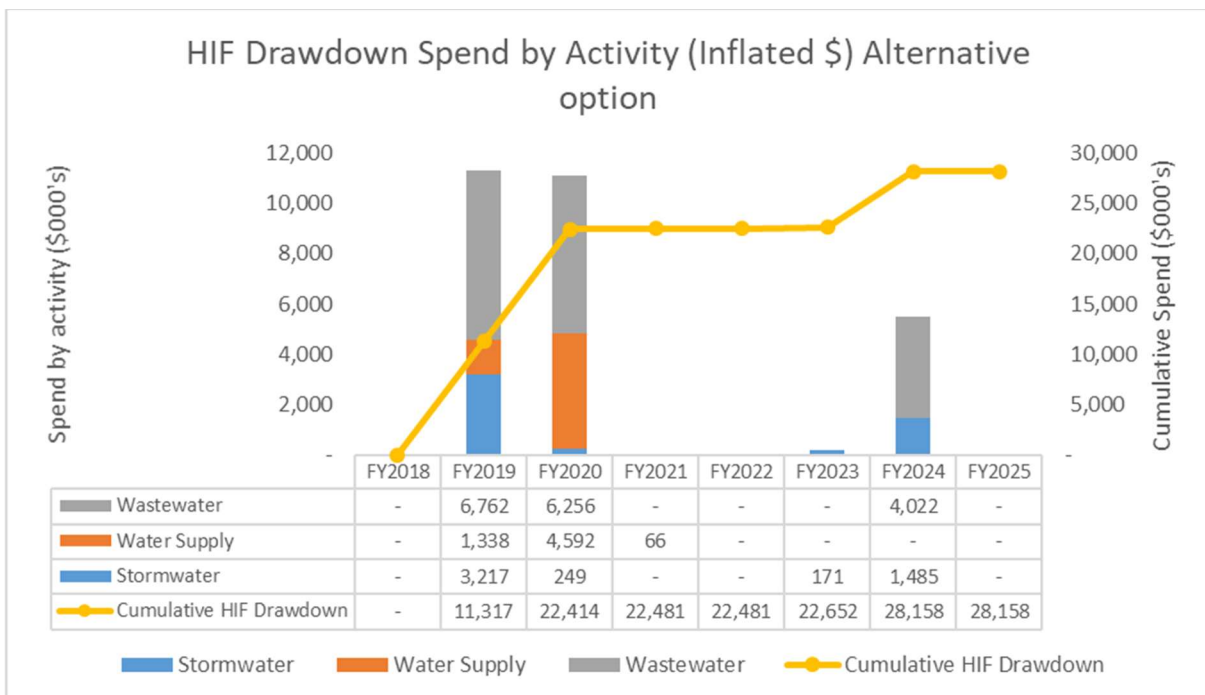


Figure 21: HIF loan drawdown profile, alternative option

as it provides a more affordable lump sum rate component for residents and a reduced interest component for QLDC, as shown in Table 47.

Table 45: Preferred vs alternative drawdowns

Activity	Preferred	Alternative
Water	\$ 7.0m	\$ 6.0m
Wastewater	\$ 22.3m	\$ 17.1m
Stormwater	\$ 6.7m	\$ 5.1m
Total	\$ 36.0m	\$ 28.2m

9.8 HIF loan repayment profile

The loan repayment profile is presented in below.

Repayments are funded through the targeted rate and lump sums recovered for growth capital expenditure with any shortfall being loaned from external sources. Full repayment of each drawn amount is achieved 10 years after drawdown. A detailed breakdown of the repayments for the preferred option is shown in Table 48 below.

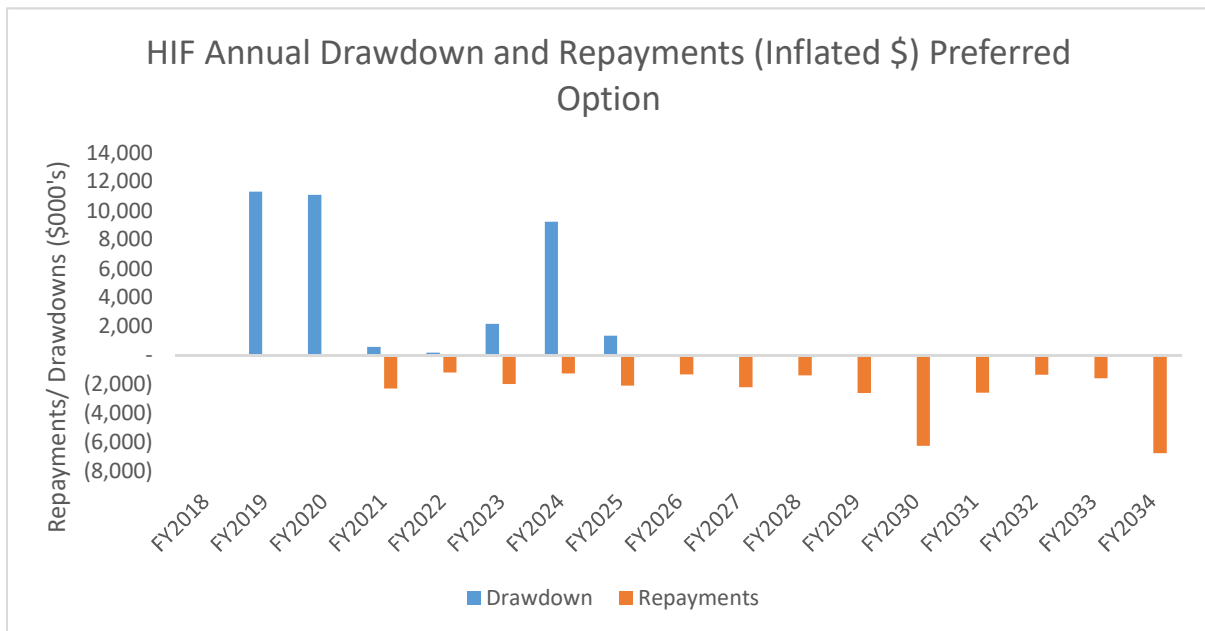


Figure 22: HIF loan repayment profile (Inflated \$), preferred option

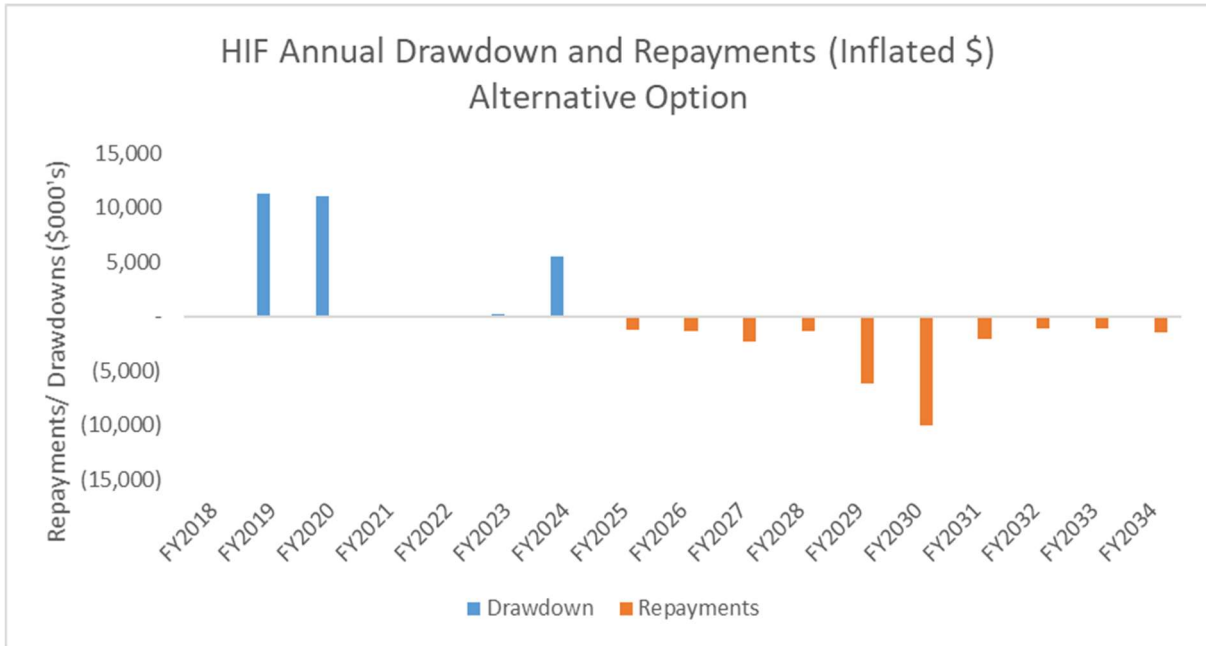


Figure 23: HIF loan repayment profile (Inflated \$), alternative option

Table 46: Repayment funding sources

Funding Source	Preferred	Alternative
Targeted rate/Lump sums	\$24.8m	\$15.4m
External loans	\$11.2m	\$12.8m
Total	\$36.0m	\$28.2m

Table 47: Growth lump sums, preferred vs alternative

Activity	Preferred	Alternative	Difference to preferred
Water	\$ 1,315	\$ 1,584	\$ 269
Wastewater	\$ 3,691	\$ 3,946	\$ 255
Stormwater	\$ 1,104	\$ 1,174	\$ 70
Total	\$ 6,110	\$ 6,704	\$ 594

The alternative drawdown option decreases the drawdowns by \$7.8m and incurs an extra \$594 in the lump sum for new dwellings. This is a result of an increase of \$1.6m in external loans to repay the HIF loans later which has an additional \$685,000 of interest to be funded by these new dwellings. The targeted rates are not affected as they are set at a \$1,000 p.a.

Table 48: HIF Drawdown and repayments for the preferred option

HIF Drawdown and Repayments	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027
Drawdown	-	11,317	11,097	589	204	2,189	9,232	1,364	-	-
Repayments	-	-	-	(2,267)	(1,179)	(1,966)	(1,239)	(2,069)	(1,306)	(2,868)

HIF Drawdown and Repayments	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033	FY2034	FY2035	FY2036	Total
Drawdown	-	-	-	-	-	-	-	-	-	35,992
Repayments	(1,381)	(2,597)	(6,244)	(2,563)	(1,334)	(1,568)	(6,732)	(1,364)	0	(35,992)

Table 49: Repayment funding sources for the preferred option

Repayments	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027
TR/LS	-	-	-	2,267	1,179	1,966	1,239	2,069	1,306	2,184
External Loan	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	2,267	1,179	1,966	1,239	2,069	1,306	2,184

Repayments	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033	FY2034	FY2035	FY2036	Total
TR/LS	1,381	2,297	1,443	2,482	1,334	1,349	1,117	1,140	(0)	24,755
External Loan	-	299	4,800	81	-	218	5,614	225	-	11,238
Total	1,381	2,597	6,244	2,563	1,334	1,568	6,732	1,364	(0)	35,992

9.9 Allocation of financial risks to other parties and their ability to manage risks

Financial risks will be transferred or shared through the project implementation where it makes sense. Risks should always be managed by the organisations that are best placed to manage them.

Table 50: Allocation of financial risks

Organisation	Risk details
MBIE	MBIE holds the risk of loaning money to QLDC in an interest free situation. This risk is focused on the threat of the loan not being repaid and not providing the intended return or benefits.
QLDC	QLDC take on the risk of debt to construct the infrastructure ahead of the returns that will help them repay the loan.
Developer (KVL)	Through the Development Agreement, QLDC transfers some risk to the developer through the responsibility to develop the agreed area to a standard and schedule that is attractive to the market, to provide returns to fund the loan repayment.
Resident Ratepayers	The ratepayer owns financial risk through providing funds to repay debt through rates. They also may be subject to higher rates levels if the operational cost of the new infrastructure is higher than expected.

The transfer of risk may vary based on the approach agreed. QLDC may hold more risk through a Development Contributions-funded arrangement, whereas a lump sum target rate transfers risk to the developer and this incentivises them to develop and pass on their risk.

Refer to the Management Case for mitigation methods to minimise these risks. Wider project risks are captured in the risk register included in Appendix 10.

PART B: READINESS AND ASSURANCE

10 Commercial Case to deliver more houses faster

This Commercial Case focuses on the key strategies to ensure this project is commercially viable and how the market will be engaged to deliver it. Key components are the strategies for procurement, consenting and property acquisition, alongside the approach to risk allocation and delivery responsibilities.

10.1 Commercial viability of housing supply

Within the Queenstown Lakes District, there is a buoyant house construction market with strong capability and demand. This situation bodes well for the commercial viability of housing supply in the area. Figure 24 demonstrates the strong sales growth for properties in the area.

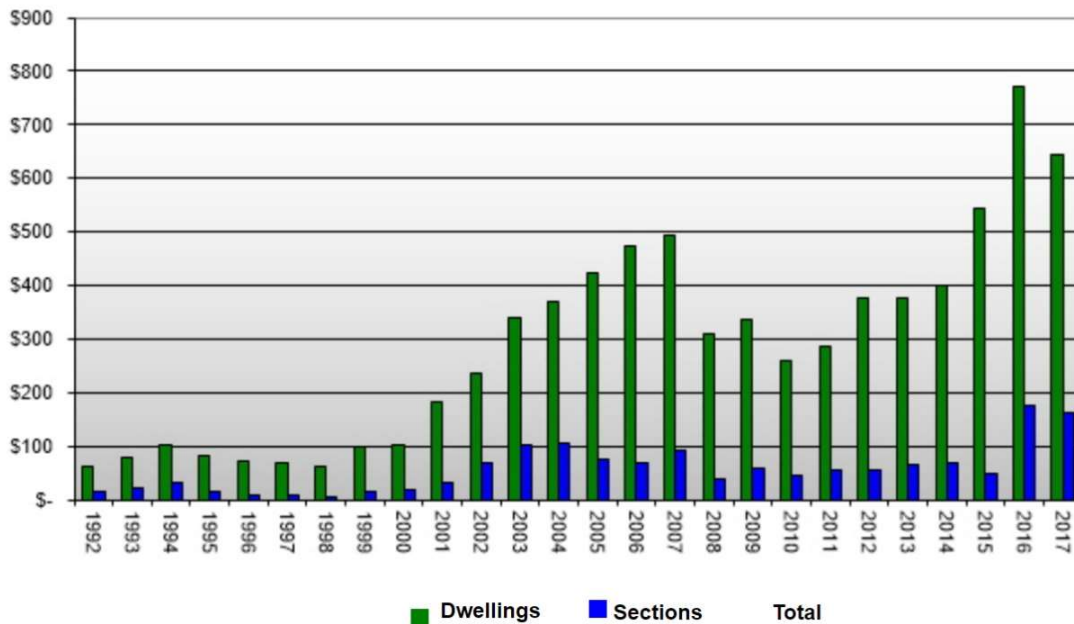


Figure 24: Total sales in millions year on year for properties in Queenstown and Arrowtown

Source: http://www.queenstownproperty.com/queenstown_real_estate_sales.html

There is active developer interest in the Kingston area. Kingston Village Limited (KVL) owns 88 hectares adjacent to the existing township. The land is zoned “Kingston Village Special Zone”. KVL have formally expressed a commitment to this Council application to the HIF based on their current yield projection of 750 residential units over a 10-year period. Council is in the process of entering a Development Agreement with KVL that will formalise their commitment and sales targets in alignment with this DBC.

KVL have stated that the cost of establishing trunk main infrastructure and headworks in Kingston is the largest barrier to establishing sections that will attract buyers of affordable properties. They have stated that with the growth in services now available in Frankton, and the upgrade of the Kawarau Falls bridge, the 35 minutes commute is no longer regarded a barrier.

10.2 Implementation Strategy

The Implementation Strategy considers the strategy to be agreed with the developer, as well as:

- Procurement Strategy
- Consenting Strategy
- Property Acquisitions Strategy
- Implementation Programme.

Each of these will be addressed separately in the following sections. The schedule below provides a snapshot of what needs to be procured, how it will be funded and responsibilities for each phase of work. In summary QLDC lead the headworks and the developer leads the works through the KVL land, with minor exceptions where services are clustered together and one party shall take responsibility for construction.

Table 51: Schedule 2A - outline of commercial and implementation responsibilities

Item	Funded By	Approval/Consent Responsibility (Construction & Operational)	Design Responsibility	Procurement Responsibility	Constructed By	Construction Management Responsibility	Owned By	Operated & Maintained By
Water								
Water Bore & Rising Main	Crown/QLDC	KVL - Bore Permit QLDC - Others as Required incl Water Take	KVL with input from QLDC	KVL	QLDC Contractor	KVL	QLDC	QLDC Contractor
Treatment Plant & Reservoir	Crown/QLDC	QLDC	QLDC with KVL input	QLDC	QLDC Contractor	QLDC	QLDC	QLDC Contractor / Network Provider
Power Supply & Access	Crown/QLDC	QLDC	QLDC with KVL input	QLDC	QLDC Contractor	QLDC	QLDC	QLDC Contractor / Network Provider
Power Supply & Access WTP to Bore only	Crown/QLDC	KVL - QLDC Approval for Access via Engineering Acceptance QLDC - Others as Required incl Power Connection	QLDC - Power KVL - Access Alignment	KVL	QLDC Contractor	KVL	QLDC	QLDC Contractor
Lake Intake & Rising Main (contingency item)	Crown/QLDC	QLDC	QLDC with KVL input	QLDC	QLDC Contractor	QLDC	QLDC	QLDC Contractor
Falling Main	Crown/QLDC	QLDC	QLDC with KVL input	QLDC	QLDC Contractor	QLDC	QLDC	QLDC Contractor
Kingston Reticulation	Crown/QLDC	QLDC	QLDC	QLDC	QLDC Contractor	QLDC	QLDC	QLDC Contractor
Kingston Reticulation Upper Oxford Street Section	Crown/QLDC	KVL - QLDC Approval via Engineering Acceptance	KVL - Alignment & Detailing QLDC - Hydraulic Sizing	KVL	QLDC Contractor	KVL	QLDC	QLDC Contractor
KVL Internal Reticulation	KVL	KVL - RC & Engineering Acceptance	KVL subject to QLDC approval	KVL	KVL Contractor	KVL	QLDC	QLDC Contractor

Item	Funded By	Approval/Consent Responsibility (Construction & Operational)	Design Responsibility	Procurement Responsibility	Constructed By	Construction Management Responsibility	Owned By	Operated & Maintained By
Wastewater								
KVL Internal Reticulation	KVL	KVL - QLDC Approval via RC & Engineering Acceptance	KVL subject to QLDC approval	KVL	KVL Contractor	KVL	QLDC	QLDC Contractor
Kingston Gravity Reticulation outside Oxford Street Corridor	Crown/QLDC	QLDC	QLDC	QLDC	QLDC Contractor	QLDC	QLDC	QLDC Contractor
Kingston Gravity Reticulation Oxford Street Section	Crown/QLDC	KVL - QLDC Approval via Engineering Acceptance	KVL - Alignment & Detailing QLDC - Hydraulic Sizing	KVL	QLDC Contractor	KVL	QLDC	QLDC Contractor
Wastewater Pump Stations	Crown/QLDC	QLDC	QLDC with KVL input re pipe connections	QLDC	QLDC Contractor	QLDC	QLDC	QLDC Contractor
Wastewater Rising Main Oxford Street - KVL - WWTP (Preferred Alignment)	Crown/QLDC	KVL - QLDC Approval via Engineering Acceptance QLDC - Railway Crossing	KVL - Alignment & Detailing QLDC - Hydraulic Sizing	KVL	QLDC Contractor	KVL	QLDC	QLDC Contractor
Wastewater Rising Main Oxford Street - SH6 - WWTP (Alternative Alignment)	Crown/QLDC	QLDC	QLDC	QLDC	QLDC Contractor	QLDC	QLDC	QLDC Contractor
Wastewater Treatment Plant	Crown/QLDC	KVL - Land Owner Approval (with input from QLDC) QLDC - Others as Required	QLDC with KVL input for staging	QLDC	QLDC Contractor	QLDC	QLDC	QLDC Contractor
WWTP Power Supply & Access	Crown/QLDC	QLDC	QLDC with KVL input	QLDC	QLDC Contractor	QLDC	QLDC / Network Provider	QLDC Contractor / Network Provider
Land Application Area	Crown/QLDC	KVL - Land Owner Approval (with input from QLDC) QLDC - Others as Required	QLDC	QLDC	QLDC Contractor	QLDC	QLDC	QLDC Contractor

Item	Funded By	Approval/Consent Responsibility (Construction & Operational)	Design Responsibility	Procurement Responsibility	Constructed By	Construction Management Responsibility	Owned By	Operated & Maintained By
Stormwater								
KVL Internal Stormwater Reticulation & Attenuation	KVL	KVL - QLDC Approval via RC & Engineering Acceptance	KVL subject to QLDC approval	KVL	KVL Contractor	KVL	QLDC	QLDC Contractor
Eastern Oxford Street Stormwater Trunk Main	Crown/QLDC	KVL - QLDC Approval via Engineering Acceptance	KVL with input from QLDC on hydraulic sizing/provisions for existing township	KVL	QLDC Contractor	KVL	QLDC	QLDC Contractor
Central Shropshire Street 450 diameter Stormwater Trunk Main	Crown/QLDC	KVL - QLDC Approval via Engineering Acceptance QLDC - Others as Required incl Third Party Landowner Approvals	KVL with input from QLDC on hydraulic sizing/provisions for existing township	KVL	QLDC Contractor	KVL	QLDC	QLDC Contractor
Western Stormwater Upgrades	Crown/QLDC	KVL - QLDC Approval via Engineering Acceptance QLDC - Others as Required incl Third Party Landowner Approvals	KVL with input from QLDC on hydraulic sizing/provisions for existing township	KVL	QLDC Contractor	KVL	QLDC	QLDC Contractor

10.2.1 The deal – what is required

Schedule 2A (Table 51, page 87), above, outlines what is required in the deal to successfully deliver the project. Some of the services and facilities can be delivered by QLDC internally, while other elements need to be procured from the market. The items required from the market can be broadly broken into two categories:

- Professional services (such as engineering design and legal counsel).
- The construction of 3 Waters bulk infrastructure and headworks.

To enable this, the following needs to be completed:

- Secure funding through an appropriate agreement.
- A procurement process must be in place to ensure that suitable service providers, capable of delivering to the required specification, are in place for both the design and construction phases of the project.
- Property access and affected party approvals must be complete to enable the project to be constructed in the preferred location and to the desired specification.
- Planning approvals and consents must be in place to comply with the Resource Management Act.

10.2.2 Implementing organisations

To ensure commercial viability, to date all key organisations have been involved and advice sought from experts in their field. This includes:

- QLDC (Project Manager, Project Sponsor, Engineer, Planner and owner of the Kingston 3 Waters Scheme).
- MBIE – as investment partners.
- Harrison Grierson consultants (QLDC HIF Programme Management).
- KVL (developer of KVSZ land).
- Hadley Consultants Limited (for concept designs and costings), contracted by KVL.
- ORC – Consenting authority for water take, wastewater treatment/disposal and stormwater disposal.
- NZTA – where advice and activity is required in relation to local roads and state highways.
- Rationale – Business Case Advisors
- Stantec – Non-technical (non-peer) review of engineering documentation.
- WT Partnership – Cost estimate peer review and risk contingency evaluation.
- Kingston Station – land owner of proposed wastewater disposal field land.
- Various legal, engineering, planning and commercial advisers as engaged by QLDC or KVL.

The role for each party is outlined in Schedule 2A (Table 51, page 87).

10.2.3 Governance/steering group

It is proposed to retain the governance group (see the Management Case) that will play a role at a strategic level, ensuring the project activities are coordinated with related activities occurring in the district. It is assumed that a governance or steering group will be used to represent the partners and oversee project delivery activities.

Through this steering group, QLDC will work in partnership with NZTA and ORC where appropriate to plan, review and appoint the suppliers for the design and construction.

10.2.4 Assessing the who and the when

A number of alternative implementation strategies were considered in the development of this case, to determine which parties are best placed to manage the delivery of the project, and to identify the most effective pace of implementation. The options and their evaluation discussed in this section and shown in Table 52 below. Schedule 2A (shown as Table 51, page 87) demonstrates the preferred arrangements.

Table 52: Summary of who and when longlist options assessment for project

Dimension	Do Minimum	Intermediate		More Ambitious
Who: Who will deliver the project?	Individuals	KVL (Developer)	QLDC	PPP
	Discount	Possible	Preferred	Possible
When: Implementation options	Defer	Staged with growth: KVL first, Kingston township second		Staged with growth; KVL and Kingston at same time
	Discount	Possible	Preferred	

Service Delivery Options (Who)

The preferred option is for QLDC to deliver the headworks infrastructure because they have a strategic interest in the provision of 3 Waters to Kingston and it aligns with their core purpose. By taking control of delivery, QLDC can ensure the built infrastructure meets their long term strategic objectives and operational requirements. It would be possible for QLDC to deliver the service on their own, which would allow more control, but there is a risk that delivery might not be achievable by QLDC alone due to in-house capacity. Council recognises the significant challenge of delivering not only this HIF infrastructure but also the ambitious Long-Term Plan which requires a significant step-up in expenditure across multiple projects of all infrastructure types. Council recognises that external consultants may be more effective at delivering Project Management services with Council maintaining control through effective Programme Management capabilities and an embedded Project Management Methodology.

Whilst the KVSZ developer option partially met all the objectives it was discounted because QLDC prefer to own and operate 3 Waters infrastructure for the benefit of the community to maintain certainty that suitable standards are being met.

The inclusion of a Public Private Partnership delivery model remains a possibility if it is decided that the wastewater treatment plant is delivered as a design/build contract, particularly if the work is packaged with other similar wastewater treatment plant works upcoming in the district (e.g. Cardrona). This option will undergo further scrutiny as part of QLDC’s ongoing assessment for delivery of their long-term plan projects.

The option of individuals (i.e. the status quo) was discounted because it does not meet any of the objectives.

Implementation Options (When)

The preferred option is to install all 3 Waters headworks infrastructure simultaneously between 2018-2020, while KVL separately develops their internal infrastructure to also complete the first stage in 2020. The headworks infrastructure will be installed with capacity to serve Kingston township so they can be connected as soon as their internal reticulation is provided as part of QLDC’s Long Term Plan commitment.

Construction of the wastewater treatment plant will be divided into two or three stages, because the incoming flowrate will not be sufficient to operate a fully sized plant immediately. The second and third processing trains will be installed in approximately Years 5 to 7, as more sections are released by the developer. The first stage is sized to take the connection of Kingston township, should the release of sections by KVL be delayed for any reason.

The key advantages of performing the works for KVL and Kingston at the same time, but staged for growth, include:

- The public health, environmental and reliability issues for the existing Kingston township are addressed immediately.

- Infrastructure construction can be packaged into a larger contract for economies of scale.
- Staging the size of the wastewater treatment plant provides risk protection against the development being slower than anticipated.
- Removes the main barriers to development, allowing a critical mass of dwellings to be reached sooner.
- Will enable affordable housing to be built in a short timeframe.

The primary disadvantage of performing all the works at the same time, is the risk of slower than expected uptake of residential house construction, and therefore limiting the repayment capability.

The other options were discounted because they do not address the need of unlocking the KVSZ land for development sooner, and they do not immediately provide infrastructure to supply Kingston township. The land needs unlocking to provide the critical mass needed for affordable servicing of Kingston and the land will provide affordable housing within reach of Queenstown.

Deferring the projects was discounted because it is not a strategic fit and does not meet the objectives.

10.3 Developer strategy

The proposed developer and landowner, KVL, is the party that lodged the Plan Change 25 land change application that was approved in 2008. Since that time the developer has been evaluating how to achieve commercially-viable delivery of 3 Waters headworks infrastructure that is necessary to allow the development to proceed. Queenstown Lakes District Council has been in ongoing and productive discussions with KVL, to align their aspirations and program for delivering residential sections and housing in a way that matches the planned investment through the HIF allocation. The potential availability of HIF funds has provided the most recent impetus that is drawing these discussions to a positive conclusion.

The Council is negotiating with KVL to ensure the commitment by the developer to create residential sections as a requirement of the HIF funding. This developer strategy consists of the following elements, which are further explained below:

- Developer Agreement discussions with KVL (in development)
- MoU discussions with other land owners (in development)

10.3.1 Developer Agreement discussions with KVL

QLDC and KVL are currently negotiating a Developer Agreement based on the template facilitated by MBIE and provided by Kensington Swan in 2017. Discussions to date have resulted in agreement over each parties' responsibility for the design, construction and funding of individual 3 Waters scope components. The negotiations are reaching their final stages as the parties finalise the contract wording that sets out the agreed cost sharing, housing density, subdivision structure and timing of stage releases to the market with alignment to the District Plan and urban growth strategy. The Development Agreement is expected to be agreed before the Minister reviews and approves this HIF application in April/May 2018.

KVL's business model centres around subdivision of the KVSZ into residential sections with some areas of mixed-use and commercial development. Sections will be released in staged quantities that optimise the available construction resources and the cost of development with the market price of sections. The Development Agreement with KVL will include a clause requiring the subdivision to have a covenant requiring section purchasers to build a house within 2-years, to address the need to increase housing supply. Subdivision infrastructure constructed by KVL will ultimately be vested in Council.

10.3.2 MoU discussions with other land owners

While the focus of QLDC's discussions has been principally with KVL, Council has also commenced discussions with other land owners:

- Wastewater disposal land owner (key for the WWTP disposal): KVL has a Memorandum of Understanding with the leaseholder of the Crown-owned Kingston Station for the disposal of treated wastewater effluent on this farm as year-round winter feed pasture irrigation. Once the HIF funding is approved, Council will enter a 99-year sublease agreement with this landowner.

- Kingston Flyer rail line: QLDC has been in discussion with the owner of the Kingston Flyer rail facilities to allow the installation of buried pipe crossings at a number of locations beneath the rail line. KVL has an existing covenant on the Kingston Flyer land title that references an agreement for access and crossing points negotiated with the previous owner. This was negotiated at the time of Plan Change 25 with the previous owner and may now be dated in relation to the proposed crossing points as plans have evolved. However, it does provide a signal on the title for the new owner to discuss and agree crossing points with KVL. These discussions are ongoing, and QLDC will request a formal easement through the property once alignments are finalized during the detailed design process.
- The water bore field, treatment plant and reservoir are located on another Crown property leased by the principal of KVL, and it has been agreed that easements and sub-lease arrangements will be put in place for the infrastructure installation.

A location plan of these properties is under preparation and will be finalised once the Development Agreement is confirmed and included in the final issue of this application.

10.4 Procurement strategy

10.4.1 Market capability

QLDC has informally approached sectors of the market to determine whether there is adequate capability to deliver this infrastructure. Given the low level of complexity and the straightforward nature of the construction, current assessments identify several engineering and construction firms based locally and/or regionally who are capable of providing the deliverables.

Kingston also benefits from drawing interest from two markets, Queenstown Lakes and Southland. This effectively broadens the depth of contractor interest and helps to provide a healthy level of competition for the opportunity. The Southland market compares favourably in terms of costs to that of Queenstown Lakes through its access to a cheaper supply of labour, materials and resources.

However, it will be important to ensure that the work is packaged in a way that gives it a reasonable scale and, therefore, a strong market interest. It has been noted that the Queenstown market is such that contractors are able to pick and choose their work and smaller jobs are not receiving a lot of interest. In this situation, a larger, more sustaining contract will take preference over small jobs. For this reason, consideration is being given to wrapping components of the Kingston water infrastructure developments up with other infrastructure required by QLDC to give the market a sizeable contract to pursue, provided that additional risk is not introduced that could divert resources away from Kingston and delay completion of the 3 waters headworks.

Servicing within the KVSZ site is not part of the HIF project but it is essential for achieving the overall benefit of more houses faster. This is discussed further in the following section.

10.4.2 Overall Delivery

Council will adopt a Programme Delivery Model for this HIF project, in conjunction with other infrastructure works identified in the Long-Term Plan. The guiding principles for programme delivery are:

- Programme must be met within:
 - Non-Negotiable Needs dates (NNNs)
 - Budget
 - Scope
 - Identified benefits
 - Appropriate risk tolerances
- Delivery model must achieve programme efficiencies (the approach to delivery must achieve measurable programme and value benefits over and above business-as-usual).
- The approach must be consistent with QLDCs principles for procurement:
 - Quality and Value for Money

- Transparency and Fairness
- Accountability and Integrity
- Sustainability
- The approach to programme delivery must maximise QLDC’s control whilst minimising risk.
- Delivery must pass from one phase to another through a Gateway review and approval process.
- The approach must enable QLDC to be agile, within set principles and boundaries.
- The approach must be attractive to the market.

The Delivery Model for the Kingston HIF Project is likely to be mainly ‘traditional’ (i.e. separate design and construction contracts). An exception may be the wastewater treatment plant (WWTP), which could be contracted under a ‘design and build’ model, or even a ‘design/build/operate’ model, pending the outcome of the QLDC delivery strategy. The primary steps for the delivery involve:

- Appointment of a Design Consultant by QLDC to:
 - prepare designs, including:
 - apply for ORC water take consent on behalf of QLDC
 - prepare funding applications
 - determine a procurement process and programme for the delivery of the physical works
 - tender, evaluate and award physical works contracts on behalf of QLDC
 - administer Construction Contract(s)
 - possibly determine an alternative procurement process and programme for the delivery of the WWTP design and construct contract
 - apply for ORC wastewater disposal consent
 - prepare tender documentation, evaluate and award contract on behalf of QLDC
 - administer Contract(s).
- Appointed Contractors will complete the physical work for each contract to specified completion dates with liquidated damages for late completion.

A Design and Construct option was considered for the whole Kingston HIF Project but was considered to not be an appropriate delivery model due to:

- The lack of resource available to adequately control scope variation and cost variation, given the absence of developed design at the time this was considered.
- The lack of opportunity for value driven innovation in the works due to the type of construction and standardisation of materials.
- The possibility of packaging the Kingston project with other upcoming QLDC work to achieve scale.

10.4.3 Construction

All physical works could be awarded under one or more contracts, depending on further analysis of the market and commercial condition. The WWTP may be procured as a ‘design/build’ or ‘design/build/operate’ contract, depending on the outcome of the QLDC delivery strategy.

A two-stage procurement process will likely be implemented, comprising:

- Expressions of Interest (EOI).
- Tender.

This will enable the market place to be tested for interest prior to full tender.

A price quality method of tender evaluation will ensure quality of works is a key consideration in the evaluation of tenders. The works will likely be undertaken as a ‘measure and value’ contract allowing a transfer of risk

to the contractor. Provided unforeseen circumstances are minimal, with little amendment to the quantities, the price for construction will be relatively certain.

10.5 Consenting strategy

The consenting strategy will aim to gain approvals in a timely manner to prevent delays to construction activities. The KVL land is already zoned for the housing development, and the developer is in the process of preparing a resource consent application for the first subdivision stage of 190 lots. Hence, the consenting strategy will focus on the consents required for the new water and wastewater headworks.

QLDC will obtain legal and planning advice to assess and inform the detailed approach to consenting process management. The scope for this support will be focused on determining the Resource Management Act (RMA) requirements for obtaining the necessary planning approvals to deliver the project as a whole.

A preliminary list of consents and approvals has been prepared and is included in Appendix 6. An outline of the strategy is given below.

10.5.1 Consents

A range of consents from Otago Regional Council, Southland Regional Council and Queenstown Lakes District Council will be required for the establishment and operation of the proposed facilities. The list of consents, as compiled below (Appendix 6), represents the consents anticipated based on investigations to date. A full analysis of consents will be undertaken once details on design, location and methodology are confirmed.

Preliminary designs and site investigations will determine the extent of effects associated with the proposed works, potential mitigation measures and ultimately whether some or all applications are likely to be publicly notified. Until these variables are confirmed public notification of all consent applications has been assumed. Based on similar types of applications it is anticipated that allowing 12 – 18 months for preparation, lodgement and granting of approvals is realistic. Approximately \$400,000 has been allowed in the overall budget for the costs of obtaining consents and land-use approvals. The process will include the following stages:

Preliminary Design and Site Investigations

This will include commissioning the necessary technical reports to identify potential constraints, adverse effects and recommend suitable mitigation measures to support the applications. Once preliminary design is completed the works will be assessed against the rules under the relevant Regional and District Plans to confirm the extent of consents required and activity status. At this stage potential risks to the timeframes will be confirmed and will be managed by the project team early in the process to avoid undue delays.

Pre-application discussions with consenting authorities

Pre-application discussions with the relevant consenting authorities will be undertaken prior to lodgement of the consents. This will ensure that sufficient information is provided with the applications and identify any stakeholder groups that have not already been confirmed as interested / affected parties to the proposals. Pre-application meetings will also allow the applicant to provide background and context to the applications before they are lodged.

Stakeholder and affected party consultation

Stakeholder consultation and engagement has commenced and will continue throughout the duration of the projects. Stakeholders and affected/interested parties identified specifically relating to the resource consent applications include:

- Local residents, Kingston Community and Landowners
- Owners of Kingston Flyer Rail Corridor
- Heritage New Zealand
- Local Iwi (Kai Tahu ki Otago Ltd)
- Fish and Game NZ
- Department of Conservation

- Land Information New Zealand
- Additional stakeholders or affected parties may be identified through either the preliminary investigation or preapplication processes described above. Stakeholder consultation will be tailored to each party in recognition of the different interests and information requirements.

Our engagement with stakeholders to date has been met with support for the improved 3 waters infrastructure in Kingston. The environmental benefit expected from the removal of discharges from septic tanks is particularly welcome from ORC and Iwi, while the community values the reliable groundwater source as a replacement for shallow, privately owned bores.

Further a review of Plan Change 25 (Kingston Expansion) has confirmed that there was not strong community opposition to the proposal to facilitate further growth within Kingston. This shows there is a general acceptance that growth is anticipated, along with the necessary infrastructure to support this.

Finalising applications and lodgement

Finalising the application will bring together stakeholder consultation, matters raised in the preapplication meeting.

Public notification, hearings and decisions

Public notification, processing and the subsequent hearings will follow the statutory timeframes set out under the Resource Management Act, however allowing for further information requests and any other matters through the process a timeframe of 12 months has been allowed for, in consideration of timeframes for similar projects undertaken and work undertaken to date.

Appeal period

Consultation with stakeholders and community engagement at the early stages of the projects and throughout the duration of the consent process will be undertaken to mitigate the risk of appeals. The effect an appeal on timeframes and costs would vary depending on scope and matters of contention and are therefore difficult to anticipate. It is noted however that Plan Change 25 has been operative since March 2010 and is an accepted response to growth within Kingston. It has been recognised that this will require an upgrade of infrastructure and has been well communicated. As detailed above, consultation to date has not identified significant issues that would result in an appeal to the proposed consents.

Notices of Requirement

On review of information collated through investigations and consultation and under advice from RMA/planning specialists it may be determined to utilise the designation process and lodge Notices of Requirement. This would provide certainty with respect to on-going operation, maintenance and upgrading, particularly for those strategic sites located within sensitive receiving environments. Preparing Notices of Requirement would follow a similar process to that followed for resource consent and is expected to be achieved within a comparable timeframe and require the same technical reports.

Archaeological Authorities

Archaeological authorities will be applied for with Heritage New Zealand following an archaeological investigation of works areas. This investigation will inform works methodologies and set out any recommendations to ensure the projects meet the requirements of the Heritage Pouhere Taonga Act. Consultation with interested parties will be undertaken prior to the lodgement of the application and pre-application discussions held with the HNZ Regional Archaeologist to ensure sufficient information is provided to enable the processing of the application. Subject to all necessary information being provided the authority application would be processed within 20 working days with an additional 15 working day stand down (appeal) period. Typically, an authority has a lapse period of 5 years so will be applied for concurrently with resource consent applications. By working under an authority any archaeological material uncovered during

site works will be managed in accordance with the conditions of the authority and will not compromise project timeframes by delaying or halting the projects.

National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS)

Land fill sites and railway yards are included on the Hazardous Activities and Industries List (HAIL) and are known former land uses within the vicinity of the proposed works sites. Further arsenic has been detected during test drilling for bore fields.

Beyond the bore field test soil testing has not been undertaken to confirm the presence of contaminants. Testing will be undertaken as part of site investigations and resource consents under the NESCS sought from QLDC if required. Any effects arising from works on contaminated land can be suitably managed through conditions of consent and the implementation of a site management plan.

Technical Reports Anticipated

The following technical reports are anticipated to be required to support the above applications. This is not an exhaustive list, on completion of detailed design and confirmation of site areas further reports may also be required:

- Ecological
- Acoustic
- Vibration
- Arboricultural
- Contaminated Land / Soil Investigations
- Archaeological / Heritage
- Sediment Control
- Cultural
- Landscape
- Traffic
- Odour
- Groundwater Settlement
- Geotechnical
- Planning (Assessment of Effects)

Infill – Kingston Township

Kingston will require rezoning from the current Township Zone to provide for infill development once the necessary infrastructure has been established. This can be achieved either as part of the District Plan review or a plan change. Stage 3 of the Proposed District Plan review, of which the Townships zone is due to be considered, is scheduled to be notified in first quarter 2019. This would be the most efficient and cost-effective way of enabling rezoning to facilitate infill and increase housing stock within the existing town footprint.

It is anticipated that the review will involve reducing the minimum site size down to the Low Density Residential 1 per 450m², rather than the 1 per 800m² for Townships, which is predicated on the need to provide for onsite disposal.

If undertaken as part of Stage 3 then this process is anticipated to take 12 months to allow for the required process (notification, hearings, decisions) to be followed. While a plan change is possible the timeframe would be comparable to that of the District Plan review. There is a risk that the consenting process for the necessary infrastructure may not be completed by the time the review commences. The inclusion of appropriate rules in the subdivision and development standards with respect to the provision of infrastructure would mitigate risk of subdivisions being undertaken before wastewater treatment facilities are established and operating.

10.6 Property acquisition strategy

It is not intended to purchase or acquire property for the establishment of any of the proposed facilities. Easements or leases are to be obtained to secure the right to establish, occupy, operate and maintain facilities on private and public land.

Crown Land (Administered by Land Information New Zealand)

Kingston Station is Crown owned land administered by Land Information New Zealand (LINZ) and subject to a 33-year Pastoral Lease that commenced in 1991. The wastewater disposal field is proposed to be established over this land and discussions have commenced with the current leaseholder, who supports the proposal. An easement will be obtained from Land Information New Zealand to secure the right to use and access the land as proposed. This process will involve making an application to LINZ that includes:

- Identifying the effect the activity will have on the on-going use of the pastoral land
- A plan showing the location of the activity/ies proposed
- Signed agreement/s with any lessees / licencees
- Draft Deed of Easement (see below for required content)

Any additional parties that may need to be consulted will be identified through discussions with LINZ.

Early discussion with LINZ to establish any conditions associated with the easements will be undertaken. This will further inform whether a designation over the site is also appropriate.

The approval process for gaining the easement is not set out in the LINZ information, however provisionally it is anticipated that this process will take in the order of 6 months from initial discussions through to obtaining formal easement documentation.

Public reserve and road

The wastewater pump stations in Kingston township, as well as all reticulated water, wastewater and stormwater pipelines will be located within existing QLDC road or reserve. Easements over reserve land will follow the process set out under s48B of the Reserves Act 1977. This process includes public notice of the intention to grant an easement with a 1 month submission period, a hearing for consideration of submissions received and Council resolution. Incorporated into this process is consultation with affected parties, including iwi. The timeframe for obtaining easements over public (QLDC) land is anticipated to take no more than 6 months.

The placement of equipment within road reserve is provided for under the Utilities Access Act 2010. Prior to construction activities commencing Corridor Access Requests (CARs) will be lodged with the relevant road controlling authority (QLDC Roading Manager). A CAR must be lodged no later than 15 working days prior to works commencing and approval cannot be unreasonably withheld.

Private Land

The portion of Glen Nevis Station on which plant is proposed to be located is now in private ownership, having been disposed of by the Crown as part of a tenure review in 2003. The current owner is the same principal owner as KVL. Easement and lease discussions have commenced and are not considered to represent a risk to the project. The placement of infrastructure on the site is essential to the facilitation of the development and agreement of the owner of the land is therefore expected to be forthcoming.

10.7 Contract management

The design of all headworks shall be performed by a consulting engineering company, engaged by QLDC under the terms of the *ACENZ/IPENZ Short Form Agreement*.

The procurement of all equipment and materials, and the installation and construction of all works shall be performed by a construction contractor on behalf of QLDC under the terms of *NZS3910:2013 Conditions of Contract for Building and Civil Engineering Construction*.

During construction, the appointed design consultant will act as the Engineer to Contract and perform all MSQA.

Should a design/construct contract be chosen for the wastewater treatment plant, the contract will take the form of *NZS3916:2013 Conditions of Contract for Building and Civil Engineering Construction – Design and construct*, and if any Operations or Maintenance scope is to be performed by contractors it shall be under the terms of *NZS3917:2013 Conditions of Contract for Building and Civil Engineering – Fixed term*.

10.8 Risk allocation and transfer/mitigation

The strategy, framework and plan for managing change, contracts and risk will be founded on QLDC's established quality, risk, contract and cost management policies and procedures, which are based on the Government Rules of Sourcing. QLDC has consistently demonstrated its ability to procure and deliver technically challenging water and wastewater projects in partnership with the private sector, including the Lake Hayes water and wastewater scheme, Project Pure, and the recently completed Shotover wastewater treatment plant.

As part of this current business case process, QLDC has held workshops to identify, evaluate and manage risks. This risk management process will continue through all stages of the planning and implementation of this project, so that all risks are owned by the group most capable of managing it, subject to the relative cost. The primary objective will be to optimise the allocation of risk, rather than simply maximising risk transfer. The Risk Register will be the key to a successful risk transfer process, providing QLDC as the procuring authority with a clear understanding of the risks, their potential impact on their incentives and financing costs, and the degree to which risk transfer offers value for money.

Contractors will be encouraged to take all those risks that they can manage more effectively than QLDC, where clear ownership, responsibility and control can be established. This transfer of risk will generate incentives for Contractors to supply timely, cost effective and more innovative solutions.

A Risk Transfer Matrix shall be implemented as part of the project execution, illustrating the percentage of risk to be borne by each party. The preliminary matrix is currently under preparation as part of the Development Agreement negotiations.

11 Management Case to deliver more houses faster

11.1 Overview

The Management Case addresses how the project will be delivered. It considers:

- Governance structure and project roles
- Peer review and assurance
- Decision gateways
- Change management
- Cost and issue management
- Benefits realisation
- Implementation programme
- KPIs and milestones

All of these elements will be captured in a detailed Project Execution Plan to be developed by QLDC upon approval of the HIF funding.

11.2 Governance Structure and Project Roles

QLDC’s proposed management structure is based on collaboration with NZTA and ORC at a governance and control group level, supported by a Project Delivery Team that will have an implementation focus with mixed representation from QLDC, ORC, KVL and supporting consultants. MBIE’s role during implementation (i.e. post loan drawdown) will be one of receiving progress reports and monitoring status. The HIF Project Governance Group will look across each HIF project in the district and provide a mechanism to share learnings and balance competing priorities across the three HIF projects. Kingston will benefit from a dedicated Kingston Infrastructure Project Control Group and the supporting Project Delivery Team.

The organisational structure and group/individual roles are outlined below.

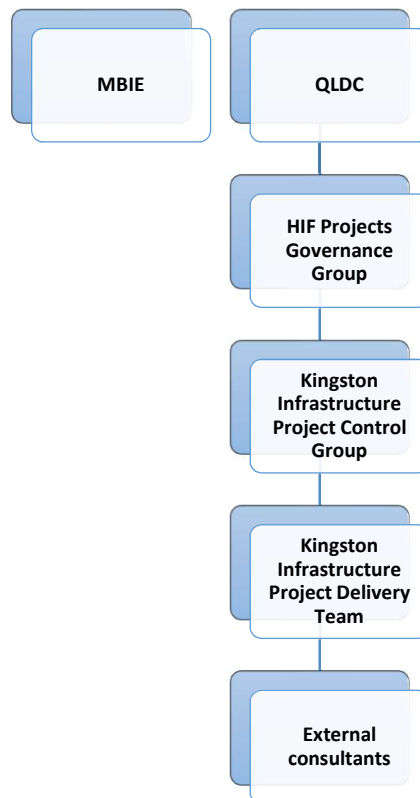


Figure 25: Proposed organisational structure

11.2.1 HIF Projects Governance Group

A Governance Group will be formed to provide leadership for the implementation of Housing Infrastructure Fund projects in the Queenstown Lakes District. The groups role will be to ensure the mutual support of representative organisations and staff, to resolve differences that arise during the development of Kingston, Quail Rise, and Ladies Mile projects.

Terms of Reference: To provide leadership for the implementation of Housing Infrastructure Fund projects in the Queenstown Lakes District; to ensure the mutual support of representative organisations and staff; and agree to resolve differences that arise during the development of these projects.

Meeting frequency: Approximately monthly, but no less than quarterly.

Attendees
Jim Boulton – QLDC Mayor (Chair)
Mike Theelen – QLDC CEO (Alternate Chair)
Stewart Burns – QLDC CFO
Tony Avery – QLDC Planning & Development GM
Peter Hansby – QLDC Property & Infrastructure GM
Leigh Halstead – MBIE Manager of HIF Unit
Ian Duncan – NZTA Chief Advisor
Steve Higgs – NZTA Planning & Investment Manager
Gavin Palmer – ORC Manager Support Services
Ulrich Glasner – QLDC Chief Engineer (PCG Chair)
TBC – QLDC Programme Manager (PCG Alt.)

11.2.2 Kingston Infrastructure Project Control Group

A Project Control Group (PCG) will be established to encourage effective collaboration in the implementation of the Housing Infrastructure Fund projects in the Queenstown Lakes District. The group's role will be to provide efficient resolution of practical matters during the development of the design, procurement, construction, and benefits realisation phases of these projects.

Terms of Reference: A forum to effectively collaborate in the implementation of the Housing Infrastructure Fund projects in the Queenstown Lakes District; to provide efficient resolution of practical matters during the development of the Business Case, Design, Procurement, Construction, and Benefits Realisation phases of these projects.

Meeting frequency: Approximately fortnightly, but no less than monthly.

Attendees
Ulrich Glasner – QLDC Chief Engineer (Chair)
TBC – QLDC Kingston Infrastructure Project Manager (Alt. Chair)
TBC – QLDC Finance Department
Gareth Noble – QLDC Programme Director – Property and Infrastructure
Blair Devlin – QLDC Planning Practice Manager
Steve Kerr – MBIE Senior Advisor

Coral Aldridge – NZTA Outcomes Planner

Dale Farnham – Kingston Village Limited

TBC – ORC

Other – Land/Housing Developers (As Required)

11.2.3 Kingston Infrastructure Project Delivery Meetings

The Project Delivery Meetings will be held to evaluate project status and consider any risks of the Kingston Infrastructure Project under the HIF/CAPEX Programme. The meetings will incorporate design and construction progress with the required consultants.

Meeting frequency: Approximately weekly, but no less than fortnightly.

Attendees
TBC – QLDC Kingston Infrastructure Project Manager
Simon Leary – Technical Project Manager
TBC – ORC Consenting Liaison
TBC – Other QLDC Staff, as required
Designers and Construction Contractors:
Hadley’s – Kingston Designer for KVL
TBC – QLDC appointed Kingston Infrastructure Designer, MSQA
TBC – appointed Kingston Infrastructure Construction Rep

11.2.4 Functional role descriptions

The key functional roles for the project implementation are shown below.

Table 53: Functional role descriptions

Role	Description
Programme Manager	A Programme Manager will be appointed by QLDC to oversee the development and delivery of the HIF Infrastructure across the three projects. The Programme Manager will report to the Governance Group and oversee the work of the Project Managers for each HIF project.
Project Managers	<p>A Project Manager will be appointed for each HIF project. Their roles will include:</p> <ul style="list-style-type: none"> • Day-to-day management of the project against the approved project plan, budget and scope to deliver the specified objectives and benefits. • Ensuring the project is resourced and formally and efficiently planned. • Providing regular progress reports to the PCG. • Delivering project plans, budgets, scoping and resourcing requirements and changes to the PCG for approval. • Ensuring effective delivery of the business process changes, including documentation and training. • Undertaking full risk assessments and developing and implementing risk mitigation strategies as agreed by the PCG. • Ensuring full and proper quality assurance is carried out at regular intervals. Acting on the quality assurance findings and reporting progress on these to the Executive where appropriate. • Managing all third parties contracted during the project life cycle.

Role	Description
Engineer to Contract	An Engineer to Contract will need to be appointed under NZS 3910 or NZS 3916 as part of their professional services contract.
Design, Documentation and MSQA:	QLDC will nominate a people for the design, procurement documentation and MSQA for this project. They will do this in coordination with the Project Manager. In their MSQA role, they will act as the Engineer's Representative (NZS 3910).
Consents:	Consent applications will be managed by QLDC staff in coordination with KVL's development team. Planning consultants may be engaged to address legal and Resource Management Act 1991 (RMA) requirements including supporting applications for resource consent for the HIF Infrastructure and associated land use activities and discharge consents.
Contractor/s:	The Contractor/s will be responsible for ensuring that the works are constructed to specification, time and budget. It is yet to be confirmed exactly how the works will be packaged. The preferred approach is to combine multiple packages of a similar nature to ensure it is attractive to the market. Using this approach, separate contractors will be engaged to construct the infrastructure under direction of both KVL and QLDC. The Contractor's main point of contact during the construction phase will be the Engineer's Representative.
Probity	Independent role to provide a level of assurance to key investors that the project is implemented appropriately through an independent scrutiny of processes.

11.3 Peer review and assurance

Peer review will play an important role in the management of the project and it will form a part of the controls applied by QLDC. QLDC will apply a comprehensive system of controls, management reporting, audit and assurance processes throughout the development and implementation of the Kingston infrastructure projects. This will include:

- QLDC delegation's policy.
- Strategic planning, programme and project development following the business case philosophy.
- QLDC Project Management Office oversight.
- Key project reporting to the infrastructure committee.
- Budget allocations and financial monitoring.
- Management reporting.
- Internal audits.
- Committee and Council reporting of financials.
- External audits (LG Funding Authority, etc).
- Subdivision code of practice.

A key component of the assurance process is the review of engineering designs and cost estimates. QLDC will establish an Engineering Team to review and approve all designs, including HIF elements designed by KVL, which will be performed through the normal Engineering Acceptance submission process used for Subdivision Resource Consents. Independent technical specialists will be engaged to perform peer reviews of key contracted professional services including the engineering design. This may involve review of entire design, or individual components such as geotechnical investigations or treatment plant process design.

The key stages and documents that will require formal review and approval are identified in table below.

Table 54: Review and approval stages

Component	Review and Approval required
Supplier Engagement	<p>Tender Evaluation Teams will be selected from appropriately qualified personnel with no conflict of interest in the process.</p> <p>Contractor/s will be procured in accordance with the QLDC Procurement Manual.</p> <p>Tender Evaluation Recommendations will be submitted for approval in accordance with QLDC procedures.</p>
Preliminary and Final Designs/Documentation	<p>To follow normal internal review procedures of each relevant contracting organisation.</p> <p>Preliminary and final designs and documentation to be submitted to QLDC for approval.</p> <p>Documentation of key identified or high-risk components to be peer reviewed by independent third party.</p>
Budget/Cost Estimates	<p>To follow normal internal review procedures of each relevant contracting organisation.</p> <p>To be submitted to QLDC for approval.</p> <p>Estimates for key identified or high-risk components to be peer reviewed by independent third party.</p> <p>During implementation, budgets to be updated and reported monthly, with deviations passing through the approved Project Control process.</p>
Construction	<p>Quality assurance requirements to be specified in Contract documents.</p> <p>Contractor to submit Quality Assurance Plan prior to commencing physical works, to include QA procedures for construction as well as identification and rectification of faults.</p>

11.4 Decision gateways

A robust Project Execution Plan will be developed that will outline the strategy, framework and plans required for successful delivery of the project. This Plan will guide the project through a controlled, well managed and visible set of activities.

The principles of programme and project management will be adopted by the project team, based on best practice and quality management principles. A project management methodology based on best-practice bodies of knowledge such as PRINCE or PMP will be adopted, covering the life cycle of the project from start-up to closure. The methodology will provide the mechanisms and reporting arrangements to ensure project planning and monitoring are carried out rigorously and will be based on the following key principles:

- A project is a finite process with definite start and end dates.
- A project always needs to be managed in order to be successful.
- All parties must be clear about why the project is needed, what it is designed to deliver, how the outcomes are to be achieved, and a clear definition of roles and responsibilities.

These principles will be used on all occasions throughout the life of the project.

The methodology will establish a rigorous Gateway Review Process to ensure 'health checks' are performed as the project moves from one defined stage to the other, such as from preliminary to detailed design, or from design through to tendering and construction.

11.5 Change Management

During the development and delivery of the preferred engineered solution, it is important to control changes to ensure value for money is still being achieved, and benefits realised. A Change Management Plan will be prepared that will outline how changes in scope, schedule and cost are to be reviewed, agreed, documented and communicated. This will need to be an ongoing process throughout the design and construction stages.

This plan needs to address two key aspects:

1. **Planned changes:** Change that is required to implement the project, that needs to be embraced by individuals and applied to systems. Essentially this Business Case forms the strategy that defines the needs for the change and identifies the benefits to be realised and sets the framework for delivering the change (roles, responsibilities, governance structure). But, there are specific milestones with significant impacts that must be well managed to ensure the project can continue successfully. These are outlined below.
2. **Unplanned changes:** Unforeseen changes are often captured from a risk perspective and strategies must be in place to direct efforts and activities if unforeseen events threaten the implementation of the project or the future operation of the assets. In addition to utilising the governance and management structure outlined above, ongoing management and testing of the risk register and mitigation strategies can help the implementing or operating organisations to manage unforeseen changes.

11.5.1 Planned changes to be managed

Table 55 below identifies the more significant changes that will need to be managed and how this will be done.

Table 55: Planned changes to be managed

Planned change	Estimated timing	Management steps
Formation of the implementing governance arrangements – including new roles and responsibilities	Immediate	Part established for the Business Case process. Implementing organisations to agree roles and commit personnel.
3 Waters infrastructure design and construction commencement	January 2019	Undertake procurement procedure and assign key roles. Proactively manage construction impacts in coordination with the developer. QLDC is in process of recruiting a Senior Project Manager.
3 Waters infrastructure operations	From 30-Dec-19, as soon as construction of the headworks finishes (including Kingston reticulation).	Confirm training needs and arrangements for QLDC staff to travel from Queenstown to monitor infrastructure.
Stormwater changeover (commissioning and start of use by the community)	To be confirmed	Build community awareness to explain the costs associated with connection to the new facilities.

Planned change	Estimated timing	Management steps
Wastewater changeover (commissioning and start of use by the community)	For residents: need early notification of their requirements to fund and engage plumbers to change from septic to reticulated and decommission bores appropriately.	Consultation with community to build awareness of need to connect laterals, and the associated costs. Work with the community association to lead connection approach and timings.
Water changeover (commissioning and start of use by the community)	December 2019	Consultation with community to advise residents of the change and what it means for them. Council to establish water use monitoring.
Housing construction commencement and ongoing impact	Stage 1 subdivision release to market around 29 Apr 2020.	Deployment of building inspectors, implementation of impact management measures.
Maintenance contract extension	Negotiate prior to start of house construction. Needs to start on Day 1 of residents moving in.	Negotiate contract change and educate users where changes apply.
Rubbish collection extension	Negotiate prior to start of house construction. Needs to start on Day 1 of residents moving in.	Negotiate contract change and educate users where changes apply.
Roading network change	Negotiate prior to start of house construction. Needs to start ahead of Day 1 of residents moving in.	Negotiation of timing and delivery.
Benefits Realisation	From start of implementation	Allocate resource to monitor benefits. Identify ongoing benefits owner through each phase, including post implementation. Define procedure for ongoing reporting to MBIE for fund repayments.

11.6 Cost and issues management

Issues will be identified by the Project Manager and raised with the Programme Manager and/or the Project Control Group, with copy to the PCG. The PCG will then monitor the issue and ensure appropriate management actions are prescribed by the relevant Project Manager.

Any departures from scope, performance expectations or disputes not resolved at project delivery or control group level will be escalated to governance level for consideration. Any remaining disputes shall be resolved in accordance with the relevant, signed agreements.

QLDC will also agree the basis for issues management with MBIE and KVL as part of funding approval and the funding agreement, prior to signing the HIF loan. This will include the following elements:

- Confirmation that QLDC is lead organisation that is responsible for the overall project management, recovering costs from other parties.
- The total project cost, the total cost of each phase and the agreed division of these costs between each party, and what level of financial summary reports are required.
- The organisation responsible for reporting on project changes (QLDC).
- The organisation responsible for preparing and updating the economic analysis at key points.
- How the parties' separate interests are protected within the contractual arrangement.
- A risk-sharing and approvals procedure for any variations, contractual disputes, etc. (Escalation to governance group for resolution).
- The basis for accounting for the respective parties' costs associated with the project.

Once the funding arrangement is approved, QLDC's programme relies on no further approvals being necessary for HIF funding drawdown, beyond the following standard requirements.

- Project costs being within expected costs or manageable within HIF contingencies or alternative confirmed third-party funding.
- Independent safety audit, safety in design review, safety in maintenance review.
- Project scope remaining as set out in this case.
- MBIE may audit multi-party projects at any time to confirm that all accounting and reporting requirements are being met.

Council and all contracting parties will be required to submit monthly reports of all project costs and physical progress to the PCG during the design and construction phases. Reporting shall include costs and progress to date plus the anticipated forecast final cost and milestone/completion dates, with the risk being reviewed monthly.

11.6.1 Contingency Management

A contingency has been allocated within the funding application that aims to provide an offset for uncertainty arising through design and development, and risk contingency. If the contingency funding is required, this will be accessed through a request to the PCG, where it can be approved or escalated to the Governance Group.

11.7 Benefits Realisation

The benefits map shown in Section 4.3 demonstrates the way the agreed benefits will be measured.

For Kingston, the targeted benefits and their realisation milestones are outlined in Table 56 below.

Table 56: Benefits realisation schedule for Kingston

Benefit	KPI	Measure	Target and date	Responsibility to track the benefits
Improved housing affordability	More low-cost houses	% of new houses less than 65% of the average sales price	40% by 2027/28	QLDC
Efficient and effective housing supply	Reduced infrastructure costs	Infrastructure costs per dwelling	\$14,000 by 2017/18	QLDC
	Accelerated supply of housing	Number of new sections with resource consent	950 by 2025/26	QLDC
		Number of new houses with code of compliance	950 by 2027/28	QLDC

On a broader scale, QLDC will establish a Benefits Realisation Plan that sits across all HIF projects and monitors their progress in delivering the agreed benefits. This plan will be developed using NZ Treasury guidance and templates. This plan will contain a benefits schedule that will be included in the reporting provided to the project PCG and also shared with the Governance Group as part of a wider district HIF summary.

The Benefits Realisation Plan will include:

- The Benefits Management Map.
- A detailed Benefits Profile, including details on each benefit, supporting KPIs, assumptions and how they will be measured and monitored.
- A benefits realisation schedule or roadmap.
- Roles and responsibilities including benefits owners.
- Significant milestones for post implementation reviews and transfer of benefits management responsibilities as part of a monitoring and reporting schedule.
- Links to outcomes and evaluation frameworks for QLDC and MBIE.
- Processes for determining the extent to which each project or program benefit is achieved prior to formal closure.

Where benefits are not being realised, an assessment will be completed to understand why not and whether the measures or reporting mechanisms need to be updated.

The diagram below (sourced from NZ Treasury Benefits Management Guidance), demonstrates how the Benefits Realisation Plan develops throughout the project lifecycle. For the development and delivery of this project, the emphasis will be on the development of the plan, the register and the reporting steps that track progress through implementation and embedding into BAU.

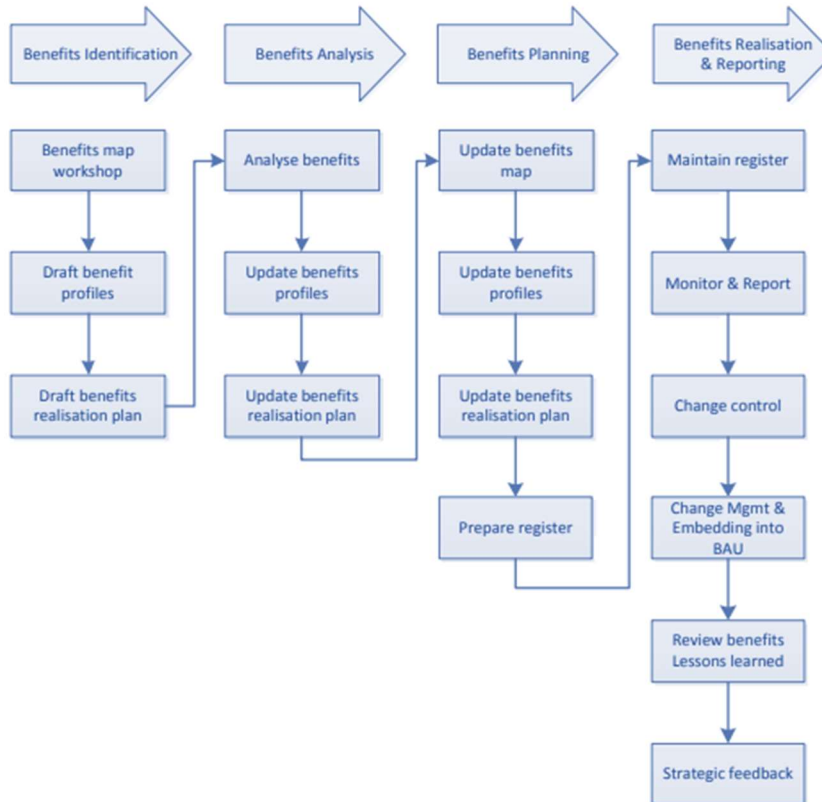


Figure 26: Process flow for benefits activities

11.8 Implementation Programme

A preliminary programme of works, including pre-implementation is included in Appendix 11, and a summary programme is shown in Figure 27 below.

WORK PHASE	2018	2019	2020	2021	2022	6	7	8	9
Detailed Business Case	█								
Development Agreement	█								
MBIE HIF approval	█								
3 Waters Headworks									
Establish Professional Services	█								
Prepare scope of services	█								
Tender for engineering	█								
Resource Consents	█								
Detailed design	█								
Tender for construction		█							
Construction		█							
KVL Subdivision									
Detailed design	█								
Tender		█							
Stage 1 construct (190 lots)		█							
Tender			█						
Stage 2 construct (110 lots)			█						
Tender				█					
Stage 3 construct (110 lots)				█					
Tender					█				
Stage 4 construct (110 lots)						█			
Stage 5 construct (110 lots)							█		
Stage 6 construct (120 lots)								█	

Figure 27: High level implementation programme

11.9 Milestones

Upon approval of the HIF funding and commencement of the project, a Project Execution Plan will be developed that will describe how, when and by whom the specific milestones and targets will be achieved. It will comprise a detailed analysis of how the identified targets, milestones, deliverables and infrastructure will be delivered to timescales, costs and quality. The significant milestones to be captured in this plan are presented in Table 57.

Table 57: Key Milestone Dates

Activity	Target Date	No Later Than
Development Agreement signed	19 March 2018	27 March 2018
Loan & Funding Agreement signed by the Crown	20 May 2018	31 May 2018
Resource Consents lodged by QLDC for water/wastewater	21 May 2018	1 June 2018
Resource Consents granted by ORC (pending no appeals)	15 February 2019	1 June 2019
Construction start of 3 waters headworks	1 March 2019	1 July 2019
Practical completion of 3 waters headworks	24 December 2019	1 July 2020
KVL lodge subdivision consent	24 September 2018	31 November 2018
Award construction contract for Stage 1	27 November 2018	31 December 2018
Release Stage 1 sections to market	29 April 2020	30 June 2020

11.10 Stakeholder Engagement and Communications Plan

A stakeholder engagement and communications plan will be developed to support all QLDC HIF projects. This plan will leverage the strength of the Council's breadth of communications channels used and their active engagement programme. Following on from the Long-Term Plan consultation programme currently underway, this plan will provide agreed content and actions to ensure local audiences that may face impacts are engaged proactively while the wider community are kept up to date on what is happening and what benefit each HIF development will bring to the District. Use of the following channels is recommended:

- Targeted community briefing sessions for high impact areas.
- Distribution of letters or educational materials to targeted high impact areas to explain changes or developments.
- Targeted emails using rates databases.
- Broader social media and traditional media updates/releases.
- Updates in regular QLDC publications, such as Scuttlebutt (Scuttlebutt is QLDC's bi-monthly newsletter which goes out to residents and ratepayers).

12 Post-implementation monitoring

12.1 Monitoring and reporting approach and schedule

12.1.1 Project Implementation Review (PIR)

At the end of the project implementation, a Project Implementation Review will be completed. This will focus on lessons learned through the project and will be captured in a way that can be used meaningfully in the initiation of new projects of a similar nature.

12.1.2 Post Evaluation Review

A post implementation review will be scheduled after the project is completed. The focus for this review will be analysis of benefits realisation.

The Benefits Realisation Plan will provide the platform and schedule for monitoring project outcomes post-implementation. Once the HIF project and programme governance structures for implementation are dissolved, ongoing monitoring and reporting should occur within QLDC's traditional organisational structure until the HIF is repaid in full.

As the benefit and asset owner in a BAU sense, QLDC will be responsible for monitoring the performance of the new assets and the benefits they bring to the district. The results of the monitoring will be provided to MBIE for the period that the loans remain drawn.

Appendix 1: Residential House Sales in the Queenstown region

Table 58: Queenstown Lakes District Residential Sales⁴⁵ in the 3 months prior to 15/11/2017

Suburb (and distance from Queenstown)	House Sales		Flat Sales		Section Sales	
	Number of	Median Sale Price	Number of	Median Sale Price	Number of	Median Sale Price
Makarora (150 mins)	1	\$439,000			1	\$183,300
Glenorchy (46 mins)	1	\$469,000			1	\$250,000
Kingston (46 mins)	4	\$478,500			1	\$200,000
Luggate (75 mins)	3	\$514,000			1	\$249,000
Ben Lomond (7 mins)					1	\$540,000
Queensberry (69 mins)	1	\$603,000				
Fernhill (7 mins)			6	\$629,500		
Lake Hawea (120 mins)	5	\$637,000			2	\$243,500
Gladstone (87 mins)	1	\$735,000				
Sunshine Bay (7mins)			1	\$752,000	1	\$325,000
Lower Shotover (17 mins)	3	\$769,000			5	\$280,000
Arthurs Point (7 mins)	3	\$807,000			1	\$875,000
Lake Hayes Est. (20 mins)	7	\$868,000			2	\$313,750
Lake Hayes (21 mins)	5	\$886,000			3	\$840,000
Albert Town (70 mins)	3	\$939,500			1	\$330,000
Arrowtown (21 mins)	5	\$954,000	2	\$697,500	1	\$800,000
Wanaka (70 mins)	26	\$1,060,500	3	\$752,000	6	\$544,130
Jacks Point (21 mins)	7	\$1,085,000			8	\$409,000
Kelvin Heights (20 mins)	1	\$1,385,000				
Frankton (16mins)	1	\$1,410,000	2	\$730,500		
Queenstown (0 mins)	9	\$1,687,000	8	\$704,500	4	\$822,500

⁴⁵ Information from QV

Appendix 2: Longlist

Appendix 3: Multi Criteria Analysis (MCA)

Appendix 4: Cost estimate

Appendix 5: Engineering Reports and Drawings

- a) Engineering Report
- b) Wastewater Treatment Plant Design Report
- c) Stormwater Design Report
- d) Engineering Risks
- e) Wastewater Disposal Report
- f) Water Options Report
- g) 3 Waters Layout Plans
- h) KVL Subdivision Layout
- i) Land Discharge Effects Engagement
- j) Bore Water Quality
- k) Water Treatment Memo

Appendix 6: List of consents

Appendix 7: Developer Agreement

(Under preparation)

Appendix 8: MOU with neighbouring landowner for disposal

Appendix 9: Supporting financial analysis

Appendix 10: Risk Register

Appendix 11: Preliminary Programme