BEFORE THE HEARINGS PANEL
FOR THE PROPOSED QUEENSTOWN LAKES DISTRICT PLAN

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the Hearing Streams 1A and 1B - Introduction and Strategic chapters

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STATEMENT OF EVIDENCE OF ULRICH WILHELM GLASNER ON BEHALF OF QUEENSTOWN LAKES DISTRICT COUNCIL

INFRASTRUCTURE

19 FEBRUARY 2016

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1. INTRODUCTION

1.1 My full name is Ulrich Wilhelm Glasner. I hold the position of Chief Engineer at Queenstown Lakes District Council (**QLDC**). I have been in this position since July 2013. I was previously employed at Western Bay of Plenty District Council as the Utilities Asset Manager from 2008 and before that in a number of consultant and management roles in New Zealand and Germany.

1.2 I hold an Engineering degree (Diplom Ingenieur) from University of Applied Sciences - Wiesbaden. I have 28 years' experience in Civil Engineering. I am a member of IPENZ, IPWEA and Water NZ. I am a Chartered Professional Engineer (CPEng).

1.3 My experience includes investigations, issues and options studies and the design and construction of several wastewater and stormwater pump stations, reticulation and collection systems. I have managed the design of stormwater and wastewater systems in Germany and New Zealand.

1.4 My current role at QLDC involves asset management (three waters and solid waste), contract management, procurement, strategic planning, and management of road works. The Chief Engineer has responsibility for delivering the Approved Annual Plan of infrastructure work for QLDC, including three waters, transport, solid waste and other capital works. As Engineer to the Contract I also have responsibility for the ongoing operation and maintenance of infrastructure assets. This involves co-ordination of the high level work programme for the infrastructure team, and managing staff and contractors to deliver projects and services within approved timeframe and cost limits.

1.5 As part of my role at the QLDC I have been asked to provide evidence in relation to infrastructure matters for the Strategic Direction and Urban Development Chapters of the Proposed District Plan (**PDP**).

1.6 I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and that I agree to comply with it. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise, except where I state that I am relying on the evidence of another person. The QLDC, as my employer, has agreed to me

giving expert evidence on its behalf in accordance with my duties under the Code of Conduct.

1.7 The key documents I have used, or referred to, in forming my view while preparing this brief of evidence are:

(a) The Council's section 42A Report;
(b) Queenstown Lakes District Council 2015-2045 Infrastructure Strategy;
(c) Three Waters Strategic Direction Working Document 2011 and Beyond;
(d) Wakatipu Transportation Strategy, November 2007;
(e) Wanaka Transportation and Parking Strategy, March 2008;
(f) Queenstown Lakes District Council, Three Waters Asset Management Plan 2015-2030, February 2015;
(g) Queenstown Lakes District Council, Community Transport Asset Management Plan 2015-2030, February 2015;
(h) Queenstown Lakes District Council, Long Term Plan 2015-2025;
(i) Draft Queenstown Town Centre Transport Strategy, December 2015;
(j) Wanaka Transport Strategy Review, Strategic Case, February 2015;
(k) Holmes Consulting Group Report, QLDC MDR Review – Infrastructure Assessment (15 May 2015); and
(l) Queenstown Lakes District Ratepayers and Residents Survey 2015.

1.8 My evidence will cover a general approach to infrastructure and how the various strategies, plans and documents listed above address population growth and infrastructure demand over the next 30 years. I will also address the relationship between QLDC's strategic approach in the PDP and its consistency and integration with the plans and strategies identified above.

2. EXECUTIVE SUMMARY

2.1 The key findings from my evidence are that:

(a) based on work with regard to infrastructure strategies, asset management plans and reports currently and over the past years Council is generally prepared for future growth;
(b) a critical part of QLDC’s ongoing commitment to delivering on its obligations under the LGA is its ability to manage projected growth through integrated planning;

(c) an integrated approach has resulted in a PDP strategy for a more compact urban form through use of Urban Growth Boundaries (**UGBs**), along with the encouragement of intensification of land use in identified areas within the UGBs;

(d) I support the implementation of the proposed UGBs around existing urban areas as being an effective way to support infrastructure provision, which will provide certainty to QLDC and the wider community to plan, fund and implement infrastructure and development;

(e) I consider that the PDP's strategic approach to urban development will have a range of benefits from an infrastructure and broader community perspective, and relatively limited costs;

(f) in comparison, an alternative, less certain approach is likely to lead to greater costs for the community, through less efficient development, use and maintenance of infrastructural assets;

(g) the PDP's strategic approach to urban development is well aligned to QLDC's various non-RMA infrastructure plans and strategies, including in particular the 2015 – 2045 Infrastructure Strategy and the current Long Term Plan;

(h) based on the current provision of and planning for infrastructure, the strategic approach to urban development in the PDP is both appropriate and achievable provided that the general pattern and location of urban growth and development is consistent with that the strategic approach; and

(i) no major infrastructural constraints or issues exist that would prevent a more consolidated form and pattern of urban development from being realised.

3. GROWTH

3.1 The Queenstown Lakes District (**District**) is experiencing a period of significant population growth. The District is a recognised tourism destination that supports economic growth across the southern part of the South Island. As such, the district is attractive to local and international investment in housing, services and visitor related activities. With a current average population of 30,000 and a peak daily population of up to 100,000, this places increased pressures on infrastructure services in terms of capacity and extents. For example, the 2007 Wakatipu Transport Strategy notes that if nothing is done to manage and improve traffic in Queenstown, by 2026 there

will be bumper to bumper traffic traveling at an average speed of 20km/hour on Frankton Road.

3.2 Growth has a significant impact on existing infrastructure. Growth areas need to be managed wisely throughout the District Plan. This gives Council the possibility to plan for the provision of new infrastructure, and maintenance and upgrading of existing infrastructure, early enough and on time. This also gives certainty to developers and the community that levels of service are met and infrastructure is available. QLDC has adopted the medium/high growth population scenario for its long-term strategic planning purposes. This scenario forecasts a population increase across the District from 29,730 in 2013 to 41,730 by 2025 and 60,520 by 2045. The majority of this growth is expected in Wanaka (South) and Queenstown (Frankton, Lake Hayes). The rate of growth is anticipated to be approximately 2.6% for the District over the next ten years.[1]

4. LOCAL GOVERNMENT ACT 2002 / RESOURCE MANAGEMENT ACT 1991

4.1 The LGA provides the framework and requirements for the operation and strategic planning of local governments. This includes the requirement for local governments to operate in democratic and cost effective ways and to provide good quality local infrastructure, both now and in the future (see Part 2 of the LGA).

4.2 Under the LGA, local governments are required to prepare Long Term Plans (**LTP**). The LTP sets the budget for future development of infrastructure, services and assets, and also for the replacement and upgrade of the same. Sections 100 and 101, relating to sustainable and prudent financial management, are particularly relevant. The balance between meeting service demands of the community, while balancing financial requirements are highly relevant factors in the LTP. Specifically, the LTP strategically manages the growth in Queenstown Lakes area, including the location and timing of that growth.

4.3 Therefore, the LGA sets out the framework for QLDC's strategic planning, the result of which is the LTP. The LTP sets out the agreement between QLDC

[1] I have relied on the latest QLDC Growth Projections produced by Rationale Limited in late 2015. I understand other growth projections have been referred to in other evidence on behalf of QLDC. I do not consider any difference between the projections to be material in terms of the conclusions I reach in this evidence.

and the community as to the infrastructure and services to be provided and how they will be funded. Consistency in these decisions and the delivery of the LTP outcomes require a coherent strategic growth management framework and this is the subject of extensive community consultation as is required by the LGA. It would be extremely difficult, if not impossible, to carry out prudent and accurate financial and infrastructural planning in growth areas without relating that to RMA planning, and *vice versa*.

4.4 In my view, a critical part of QLDC's ongoing commitment to delivering on its obligations under the LGA is its ability to manage projected growth through integrated planning in a way that accords with sound financial management principles.

4.5 Commitments to investment through the LTP process in land, consents, buildings and operations rely on the predictable emergence of communities and developments. Sporadic unanticipated development, or development considered on a site by site basis only, risks undermining the delivery of these services, by increasing the likelihood of misplaced assets, and the genuine unaffordability of additional unplanned and inefficient assets to support development in unplanned localities being required.

4.6 The LTP and LGA are therefore both relevant to the RMA District Plan process. The District Plan sets the zoning in the Queenstown lakes area, but this is somewhat limited by infrastructure constraints which are programmed in the LTP under the LGA. I consider that the strategic approach to urban development as proposed in the PDP can be met by the current and planned infrastructure going forward, as I will discuss in further detail later in my evidence.

5. INTEGRATED LAND USE PLANNING

5.1 In a simple sense, integrated land use planning involves ensuring that land use planning is consistent with infrastructure and financial planning in terms of the statutory framework, as I have discussed above. There are obvious benefits, particularly in terms of efficiencies, more predictable outcomes, and cost savings to the wider community from ensuring consistency between these processes.

5.2 In QLDC's case, an integrated approach has resulted in a strategy for a more compact urban form through use of Urban Growth Boundaries (**UGBs**), along with the encouragement of intensification of land use in identified areas within the UGBs. This strategic approach has implications for infrastructural considerations.

5.3 A compact and integrated urban form maximises the efficiency of existing infrastructure and its operation, because the surplus in the network can be utilised and the operation of the network can be managed efficiently which means cost savings for ratepayers and potentially for the developer. Reduced distance to destinations, and more efficient use of embedded infrastructure reduces the cost to the community as a whole.

5.4 By contrast, less certainty about the location and form of future urban growth has the potential to create patterns of development which are less efficient, more expensive, and less likely to result in integrated, comprehensive urban communities.

5.5 Unplanned or sporadic urban development can cause a range of issues and problems. This can include localised impacts of new development at points along the current transport network, and resulting issues of increased congestion, travel time and reduction in levels of service. It also impacts on QLDC's abilities to plan and build effective networks for public transport, as well as pedestrian and cycle linkages. This is particularly so where sporadic development is poorly integrated with adjoining developments or isolated from other urban networks. The latter creates increased car dependency, while population dispersal weakens the case for the introduction of public transport.

5.6 In my opinion, the implementation of the proposed UGBs around existing urban areas is an effective way to support infrastructure provision. Having clear, definitive and long-term provision for urban development provides the certainty to QLDC, other infrastructure providers, and developers. It also provides certainty to plan, fund and implement infrastructure and development.

5.7 Conversely, without the certainty which the proposed UGBs provide, urban development could occur with less control, which makes it very difficult to plan for a pattern of growth that maximises the efficient and effective use of existing

infrastructure, and/or enables the timely and cost effective provision of new infrastructure.

5.8 I consider that the use of UGBs as proposed in the PDP will be an effective tool to assist with integrating QLDC's RMA planning obligations with its LGA responsibilities. An important aspect of the use of UGBs is the encouragement of a more intensive pattern of urban development in identified areas, where this can be serviced and accommodated.

5.9 The need for a more consolidated urban form has been a clear message that has emerged from public consultation undertaken by QLDC in recent years. The strategic approach to urban development proposed in the PDP provides for a balance of continued greenfield growth at the periphery of urban areas, and the more efficient use of the existing urban areas through identified areas for consolidation and intensification. More compact urban areas generally support a greater variety of transport modes (particularly public transport) due to a higher concentration of travellers, while the generally shorter distances reduce travel time and cost, as well as making active transport (such as cycling/walking) attractive alternatives.

5.10 Through planning for growth and actively managing the location of urban growth, the implementation of UGBs around the main settlements of the district, along with reducing constraints on higher density development, will provide the means by which consolidation will be encouraged. In my opinion, this will have a range of benefits from an infrastructure and broader community perspective. It will better enable QLDC to improve and retain a high level of accessibility for people and goods within the district and allow the main urban areas of the district to function and develop in order to provide for projected growth, without imposing unnecessary costs.

5.11 More compact urban areas also result in more efficient use of existing infrastructure (particularly where there is available capacity), and lower overall costs where upgrades or extensions of existing infrastructure are required (compared to the provision of entirely new infrastructure). In addition, having a less sprawling infrastructure network means that the network can generally be more easily and efficiently maintained, which will generally increase asset life and performance, and result in lower overall costs to the community. In addition, more efficient use of existing infrastructure networks is likely to have

environmental benefits, in terms of an overall reduction in the effects of building and maintaining additional infrastructure.

6. INFRASTRUCTURE STRATEGY

6.1 QLDC has various strategies and plans in place to address future infrastructure needs and urban growth boundaries. Because infrastructure assets have long lives (generally greater than 40 years and up to 100 years) and involve significant capital cost, a long term strategic approach to infrastructure provision is essential.

6.2 As outlined earlier, QLDC's obligation under the LGA for prudent long-term financial planning means that QLDC's long-term financial position must be analysed to ensure that rates and debt levels remain affordable for the community and consistent with the financial strategy as consulted on with the community.

6.3 Asset and service planning horizons vary depending on a number of factors. Planning horizons of 50 and 90 years may seem excessive to those outside of local government sector but, for large infrastructure assets, the length of the planning horizons depends on the life of that infrastructure. A 30-year growth management planning horizon provides a foundation of relative certainty upon which to base QLDC's strategic planning.

6.4 A second major factor that obliges QLDC to plan over very long periods is the need to renew existing infrastructure as it reaches the end of its useful life. These asset replacements are not evenly distributed over time, as the periods of peak growth around the district that caused those assets to be constructed were not evenly spread over the past. Peaks of asset renewal are often extremely costly to address and we seek to smooth these.

6.5 If these peaks are not adequately planned for on a long-term basis, they represent a high level of risk to QLDC's financial strategy and the affordability of rates. Failure to manage these assets as they reach the end of their working lives would have a negative impact on the quality of life of the community and the environment.

6.6 Because of the long 'lead-times' planning of this nature necessitates, planning to address peak obsolescence becomes very difficult if there is no certainty as

to where, when, and in what form urban growth will occur. RMA decisions tend to be made on the basis of whether land can be serviced without undue environmental impacts, but QLDC needs time and resources to establish necessary infrastructure. If a plan change is approved, there is usually an expectation that it becomes QLDC's responsibility to provide that plan change site with the necessary infrastructure. Costs to do this can be substantial and can disrupt QLDC's long-term planning, potentially requiring that it make any of a set of unpalatable choices regarding delaying projects elsewhere, raising rates, or reducing a level of service.

6.7 Planning for infrastructure requires QLDC to consider demographic projections, changing community expectations and needs, the existing asset portfolio, asset lives, changing statutory responsibilities, the economic environment, and QLDC's current and projected financial position. All these factors flow into planning for infrastructure.

6.8 Providing funding for new infrastructure has a long lead time, and can require careful financial planning through the LTP process. At the same time in which asset upgrades or renewals are considered, the impact of current and future growth must also be taken into account.

6.9 QLDC's 2015 – 2045 Infrastructure Strategy (**Infrastructure Strategy**) was released in March 2015, as required under the 2014 LGA reforms. The Infrastructure Strategy covers all of the Council's infrastructure, specifically transport and the three waters infrastructure.

6.10 The primary purpose of the Infrastructure Strategy is to identify significant strategic issues or investment requirements and options for managing them in the core infrastructure services over the next 30 years. QLDC identified the following as Key Strategic Priorities for Infrastructure:

(a) we will manage the water needs of the District at acceptable levels that optimise lifecycle costs.
(b) we will manage risk and flexibility for a variety of future scenarios for climate change and population growth.
(c) we will improve the efficiency of our energy use and aim to reduce our use of oil based products.

(d) we will manage the quality of our discharges to minimise the impact on the environment.

(e) we will ensure that, as a minimum, key service levels (affecting public health) are maintained into the future.

(f) we will balance cost increases against affordability.

(g) we will adopt an integrated approach to management of the three waters and other infrastructure.

6.11 A focus of the Key Strategic Priorities for Infrastructure is on efficiency of infrastructure provision and cost effectiveness. In order for infrastructure to be provided for efficiently and in a cost effective manner, an integrated approach to the planning and management of infrastructure is essential, which is recognised by the final Key Strategic Priorities.

6.12 The Infrastructure Strategy is given effect to through Asset Management Plans (**AMPs**) which have a 15 year horizon. QDLC has two AMPs, one for the three waters and one for transport. The AMPs identify issues and necessary works, including anticipated capital and operation expenditure. The AMPs inform the Council's decisions on resource allocation in its LTP and Annual Plans, both of which undergo public consultation before being adopted. For major asset groups such as sewer, roads, water supply and stormwater, AMPs provide the long-term planning tool that considers the management and renewal of this capital infrastructure for growth.

6.13 QLDC also has several other strategic documents which are currently being reviewed. QLDC is reviewing its Three Waters Strategic Direction Working Document this year. The current version was issued in 2011. Amongst other things, it identifies strategic issues for the district, integrates decision making and management of the three waters and other infrastructure, and assists in the integration of asset planning and the long-term financial management of infrastructure assets. The Infrastructure Strategy will be updated once the review of the Three Waters Direction Working Document has been completed.

6.14 In relation to transport, the Council has two key planning documents which are under review. They are the Wakatipu Transport Strategy and Wanaka Transport Strategy, which were released in November 2007 and March 2008 respectively. Both documents have a 20 year planning horizon and were prepared in conjunction with the Otago Regional Council and Transit New

Zealand (now the New Zealand Transport Agency). The strategies aim to deliver a fully integrated transport system which responds to the high level of growth in the district and is in line with the Government's transport strategy. The strategies identify key risks and short, medium and long term measures to mitigate those risks.

6.15 Finally, QLDC's LTP sets out, among other things, a planned capital expenditure of $380 million on physical works over the next 10 years. Roading projects are the biggest cost at $118 million. Upgrading the wastewater treatment facility in Queenstown is another significant project with an estimated cost of $35.9 million. The capital expenditure programs for infrastructure have been derived from revised asset management plans that include the latest growth projections.

6.16 The proposed Urban Growth Boundaries and areas for intensification in the PDP will help to better plan and manage infrastructure requirements in line with QLDC's strategic objectives. Both of these planning approaches will provide certainty about where the high level of growth will be accommodated in the district. This helps QLDC plan for and provide infrastructure in an efficient and cost effective manner and to anticipated levels of service, because as mentioned above infrastructure has a high cost but a long life.

7. CURRENT PROVISION OF INFRASTRUCTURE

7.1 In my opinion, based on the current provision of and planning for infrastructure, the strategic approach to urban development in the PDP is both appropriate and achievable. I set out below a short summary of the current QLDC infrastructure position:

(a) **Water infrastructure:** the three waters infrastructure is currently servicing all of the communities well without any major constraints. Upgrades to the water supply network are planned or currently under construction. The Queenstown Lakes District Ratepayers and Residents Survey 2015 showed a high satisfaction rate for the three waters infrastructure services.

(b) **Wastewater:** there are currently no major known constraints to provide the agreed level of service to our ratepayers in the existing wastewater network. Major upgrades to the wastewater network identified in the

LTP are covering pipeline upgrades and replacements at Kelvin Heights and along Frankton Road, upgrades to Project Shotover, a new wastewater scheme for Glenorchy, a new wastewater scheme for Cardrona, upgrades to the Hawea wastewater treatment plant, upgrades to Project Pure in Wanaka and wastewater pumpstation upgrades in Wanaka.

(c) **Stormwater:** there are no major projects in the LTP apart from a new stormwater network along the planned Eastern Access Road on the Frankton Flats. The existing stormwater infrastructure has proven so far adequate for the rainfall events experienced over the last years. With the review of the Three Waters Strategic Direction Working Document, global warming requirements on modelling and more stringent discharge requirements upgrades are likely to occur and will be addressed during the LTP review process.

(d) **Transport network**: the transport network is subject to constraints, mainly throughout the NZTA network in Queenstown around SH6 and SH6A roundabout in Frankton, as well as SH6A along Frankton Road throughout Stanley Street and Shotover Street. The Queenstown Town Centre Transport Strategy was adopted by Council in December 2015 and addresses the network constraints in the CBD. This provides the basis to build a programme business case for NZTA funding. Approximately 50% of the cost of our roading network is funded by NZTA.

(e) **Open Space and community infrastructure:** the QLDC Property & Infrastructure department manage parks and reserves. Recreation facilities, such as swimming pools are managed by Sport & Recreation as are community halls. Corporate Services manage libraries. The Parks Strategy 2002 outlines the future provision of parks and reserves. This Strategy is currently under review and is intended to be superseded in late 2016.

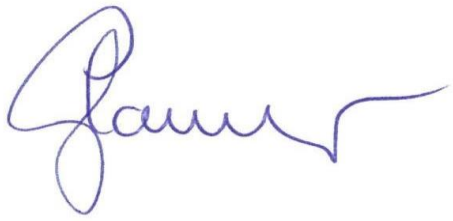
7.2 In my view, the various infrastructure strategies and plans in their current state provide a good basis to identify and address future needs and demands in the District, provided that the general pattern and location of urban growth and development is consistent with the strategic approach in the PDP.

7.3 In that respect, I note that an independent assessment was commissioned by QLDC to gauge whether there were likely to be any particular infrastructural issues or constraints in terms of the proposed identification of medium density residential development areas within existing urban settlements. This was carried out by Holmes Consulting Group and is attached to my evidence as **Appendix 1**.

7.4 Overall, the Holmes Consulting report identified no major infrastructural constraints or issues that would prevent a more consolidated form and pattern of urban development from being realised. Based on my knowledge of the assets and infrastructure that were assessed, I agree with this assessment.

7.5 Overall therefore, I support the proposed strategic approach to urban development that is identified in Chapters 3 and 4 of the PDP. It integrates well with QLDC's LGA planning responsibilities and programmes, and is likely to result in greater benefits and lower costs from an infrastructure point of view, particularly compared a less controlled and more dispersed approach to accommodating projected growth and resulting urban development.

7.6 In that respect, from my perspective as the Chief Engineer, I consider that the PDP's strategic approach (along with the greater certainty that is likely to result from its implementation) is better than that contained in the Operative District Plan.



Ulrich Wilhelm Glasner
19 February 2016

Appendix 1 – Holmes Consulting Group Infrastructure Assessment – 15 May 2015

HolmesConsultingGroup

MEMORANDUM

STRUCTURAL AND CIVIL ENGINEERS

To:	Ulrich Glasner		
Company:	Queenstown Lakes District Council		
From:	Andrea Jarvis		
Date	15 May 2015	Project No:	113676
Subject:	QLDC MDR REVIEW - INFRASTRUCTURE ASSESSMENT		

Holmes Consulting Group (HCG) has been engaged by the Queenstown Lakes District Council (QLDC) to provide a high level assessment of the existing Three Waters infrastructure at 8 sites within the Wanaka and Queenstown areas. It is proposed to change the zoning of these sites from their current, varied uses to Medium Density Residential (MDR). This memo is intended to provide a preliminary evaluation of the capacity of the existing infrastructure in these areas with regard to this proposed zoning change, and to indicate areas where further investigation would be warranted.

Tonkin & Taylor (T&T) have assessed the water supply infrastructure for these sites. The relevant areas of the wastewater network have been assessed by Rationale. HCG has undertaken a preliminary investigation of the stormwater network capacity using a 10 year, 10 minute storm intensity and the Rational Method.

Where existing zoning is High Density Residential (HDR), as requested by QLDC planning staff, the infrastructure has been assumed to provide the required levels of service. Shortfalls in the existing infrastructure have therefore not been identified.

1 WANAKA – AUBREY ROAD

The proposed MDR zone is located on the southern side of Aubrey Road between Kings Drive and Anderson Road. The 11 hectare site is currently zoned Low Density Residential (LDR) but has been designated as a reserve area and is undeveloped.

1.1 Water Supply

The site is located close to the Beacon Point Reservoir. Surrounding areas receive acceptable pressure levels for both domestic service and fire flows. The existing infrastructure should therefore be capable of servicing the potential future level of development set out in the proposed zone change.

1.2 Stormwater

The site is currently undeveloped and is covered in grass and pasture. Runoff generated by the design storm from this undeveloped area is 275 l/s. If the site was developed to the full capacity allowed under the MDR zone change the runoff flows would be 660 l/s. This is a 240% increase in stormwater runoff from the site.

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According to the topography of the site approximately 80% of the runoff (530 l/s) will enter the stormwater network via 600 mm and 250 mm pipes located at Aubrey Road and Bob Lee Place respectively. The combined capacity of these two pipes is around 1700 l/s. The remaining 20% of the stormwater runoff (130 l/s) will flow towards the southern end of the site and enter the network through two 250 mm pipes that have a combined capacity of 260 l/s.

Based upon these numbers it is likely that the northern section of the proposed zone change would be sufficiently serviced by the existing stormwater infrastructure as the runoff generated by the design storm is less than 40% of the pipe capacity. However, the design storm runoff for the southern area is just over 50% of the total capacity of the two 250 mm pipes. As these pipes are already servicing a developed area it is reasonable to anticipate that their size would need to be increased to also accommodate the development of the proposed zone change area.

1.3 Wastewater

The existing wastewater infrastructure within the Aubrey Road area requires significant upgrades to service the current proposed level of development. The MDR zone change would need to be taken into account during the planning and implementation stages of these upgrades although the additional flows associated with this proposed zone change are relatively small (7 l/s).

1.4 Required upgrades

As noted above, upgrades will be required to both the stormwater and wastewater networks to support the proposed re-zoning. The wastewater network in the area is already scheduled for significant upgrades. If the upgrades are taken into account in the planning and implementation stages, the cost implications should not be significant.

The stormwater network will require the upgrade of two lengths of stormwater pipe from 250 mm diameter to at least 300 mm diameter.

The details and costs of these upgrades and confirmation of any downstream effects on the stormwater network will be confirmed after a detailed assessment is carried out.

2 WANAKA MDR

The proposed zone change site is located between Brownston Street and McDougall Street in central Wanaka and covers 43 hectares. The existing zoning is split between High Density Residential (HDR) and Low Density Residential (LDR) – with the HDR area covering approximately 14 hectares along the northern and eastern boundaries of the area.

2.1 Water Supply

The water supply for the area is fed from the Western and Beacon Point Reservoirs. There is sufficient capacity in the network to provide appropriate levels of service and fire flows for the majority of the site. However, the elevated terrace around Chalmers Street is too high to be serviced appropriately by the Western Reservoir. Installation of infrastructure to connect this section to the Beacon Point Reservoir would be an option for resolving this issue.

2.2 Stormwater

As the current zoning for this area is HDR, changing the zoning of this area to MDR (with its lower allowable levels of impermeable coverage) is unlikely to increase the stormwater runoff from this section of the site.

The section of the site that is currently zoned LDR would see an increase in potential impermeable area by changing to MDR and as such, would stormwater flows from the site would potentially increase. However, the increase to stormwater flows would be very small, around 15 l/s for the design storm. The current stormwater infrastructure at this site has sufficient capacity to manage this increase in flows.

2.3 Wastewater

The existing wastewater infrastructure servicing the area has been identified as requiring significant upgrades to the Dungarvon 1 and 2 pumpstations. There are also potential issues with the Albert Town – Hawea Road pumpstation that would require minor upgrades. Changing the zoning for this area to MDR would reduce the allowable development within central Wanaka but is unlikely to affect these required upgrades.

2.4 Required upgrades

As noted above, upgrades will be required to both the water and wastewater networks to support the proposed re-zoning. The wastewater network in the area is already scheduled for significant upgrades. If the upgrades are taken into account in the planning and implementation stages, the cost implications should not be significant.

The water network will require infrastructure to ensure Chalmers Street is fed from Beacon Point reservoir. The GIS implies that interconnecting pipework exists, however it is likely that pressure reducing valves or similar may be required to provide this connection. Detailed modelling of the water network is required to confirm the upgrades needed.

The details and costs of these upgrades and confirmation of any downstream effects on the stormwater network will be confirmed after a detailed assessment is carried out.

3 ARROWTOWN MDR AREA

The proposed Arrowtown MDR area is situated to the south of Kent and Suffolk Streets and covers approximately 30 hectares of land. This area is currently zoned LDR and has largely been developed. The Arrowtown campground occupies a 6 hectare area within this zone that has been designated for recreational purposes. This designation would remain unchanged under the proposed MDR zone.

3.1 Water Supply

Central Arrowtown receives adequate levels of service and FW3 fire flows with the pressure in the area being controlled by a booster pump station. There is sufficient capacity within the network to allow for more intensified development within the proposed MDR zone.

3.2 Stormwater

Should the proposed MDR zone change be implemented the full future potential development of the Arrowtown site (presuming the 6 hectares of campground remains at its current level of development) would see an increase in flows from the LDR zoning of approximately 1%. The existing stormwater infrastructure has sufficient capacity to accommodate this minor increase in flows.

3.3 Wastewater

The current wastewater infrastructure servicing Arrowtown requires upgrade works to be undertaken. Norfolk Street pumpstation currently requires an upgrade to its storage capacity and/or pumps. This upgrade has been included in QLDC's Long Term Plan. Additional works are also required to upgrade the trunk main from the Bendemeer pumpstation to reduce the likelihood of overflows.

The increased development intensification proposed by the MDR zone change would see an increase in wastewater flows from the site of approximately 11 l/s. These flows would require an additional minor increase in these planned upgrades.

3.4 Required upgrades

As noted above, upgrades will be required to the wastewater network to support the proposed re-zoning. This work is already included in the LTP. If the proposed re-zoning is taken into account in the planning and implementation stages, the cost implications should not be significant.

4 FRANKTON ROUNDABOUT AND EXTENSION ALONG STATE HIGHWAY 6

The proposed MDR zone in Frankton is located to the north of State Highway 6 and to the west and south of the Frankton roundabout. These two areas are currently zoned Rural General and LDR respectively. The zone change would encompass approximately 50 hectares of land.

4.1 Water Supply

Within the developed LDR area the current water supply level of service is adequate. However, the Frankton area will be undergoing major development within the near future and with the greater supply demands associated with this, these levels of service will not continue to be achieved by the existing supply network. Significant network upgrades have been proposed and are required to service the growth in this area. The proposed MDR zone change would need to be included in these proposed upgrades to the infrastructure.

The area to the north of State Highway 6 in particular, which is mostly undeveloped in its current state, would require additional water supply infrastructure to achieve appropriate levels of service. A new Frankton Flats reservoir would likely be required to achieve these upgrades. The extent of the area able to be supported without a reservoir is shown on the attached plan.

4.2 Stormwater

Should the proposed MDR zone change be implemented the full future potential development of the western section of the Frankton site would see an increase in flows from the LDR zoning of approximately 1%. The existing stormwater infrastructure has sufficient capacity to accommodate this minor increase in flows.

There is no significant stormwater network adjoining the section of proposed zone change area to the north of State Highway 6. A zone change of this area from Rural General to MDR would see an approximately 140% increase in full development stormwater flows. It would be necessary to implement a full stormwater network investigation and design to enable this area to be developed.

4.3 Wastewater

No comment was requested from Rationale regarding the wastewater infrastructure in this area, due to the recent upgrades of the Frankton Beach pumpstation which considered future development in this area.

4.4 Required upgrades

As noted above, upgrades will be required to both the wastewater and stormwater networks to support the proposed re-zoning.

The western section of the proposed re-zoning does not require significant upgrades to the stormwater or wastewater networks, and planned upgrades to the water supply network to support development in the Frankton Flats area should allow for levels of service to be achieved in this area.

The area to the north of State Highway 6 will require significant upgrades to both the water supply and stormwater networks. As indicated above, portions of this land are too high to achieve the required water supply levels of service without the installation of the previously considered Frankton Flats Reservoir. We understand this reservoir is not currently included in the LTP as other upgrades have been undertaken to support development in the area.

The stormwater network to the north of State Highway 6 is currently limited to a basic swale drain. The new Five Mile development is utilising stormwater soakage due to the lack of suitable piped infrastructure in the area, however soakage to ground may be limited in the area north of the State Highway. It is likely that a new piped infrastructure network connecting to the Shotover River will be required to support the re-zoning of this area.

The details and costs of these upgrades will be confirmed after a detailed assessment is carried out.

5 KELVIN HEIGHTS NEW MDR ZONE

The proposed Kelvin Heights MDR zone is a 16 hectare area of undeveloped grass/pasture above Oregon Drive. The site is currently zoned as LDR but has a reserve designation.

5.1 Water Supply

The existing Kelvin Heights water supply network (including the reservoir) has limited additional capacity. The proposed MDR zone would not receive the required levels of service or fire flows without pressure boosting or the construction of a new reservoir or water intake.

5.2 Stormwater

The stormwater runoff from the proposed zone change area, as calculated for the design storm, is 400 l/s. If the area was developed fully to the level allowable under the MDR zone these flows would have a 240% increase to 950 l/s. The existing stormwater network directly adjacent to the site is a series of 225mm pipes in Oregon Drive and Poplar Drive. Based upon conservative estimates, this pipe network would not have sufficient capacity to accommodate the stormwater flows from a fully developed MDR zone. Upgrades to the stormwater network in the area would therefore be required.

An additional consideration is the stream directly to the north of the proposed zone change area. Increased stormwater flows from development could potentially be directed to this waterway but careful evaluation of the effects of this would need to be undertaken.

5.3 Wastewater

No comment has been provided by Rationale regarding the wastewater infrastructure in this area, however it is noted that wastewater infrastructure is generally not present in the vicinity.

5.4 Required upgrades

As noted above, upgrades will be required to all three waters to support development in this area.

The water supply network is not able to support further development in this area without significant upgrades to both the existing intake and reservoir, or a new intake to be constructed. Preliminary investigations were undertaken a number of years around a water intake adjacent to Jardine Park to replace the existing Kelvin Heights and Two Mile intakes. The anticipated cost of this intake and supporting infrastructure was approximately $70m. Since this work was undertaken, a number of treatment upgrades at both the Kelvin Heights and Two Mile intakes have been undertaken and the separate Jardine intake is no longer considered feasible. Pump and reservoir upgrades may instead be necessary to support future development, and the reservoir upgrades may also require land purchase as the existing reservoir site is tightly constrained.

Any development in the Jardine Park area will either require stormwater soakage to ground or a new piped network to be constructed. There are some known pinch points within the existing Kelvin Heights stormwater network where surface flooding and overflows from outlet manholes occur during heavy rain; it is likely that any development in the Jardine Park area will require very significant upgrades.

The wastewater network in this area is also non-existent and will likely require upgrades to the emergency storage at pump stations in the wider area (eg Cedar Drive pump station).

The details and costs of these upgrades will be confirmed after a detailed assessment is carried out if necessary, but all three waters will require significant upgrades at significant cost to support development in this area.

6 GARDENS/PARK STREET

The site is located to the south of Frankton Road between Park Street to the west and Suburb Street to the east. The existing zoning for this area is High Density Residential subzone C. This subzone has similar levels of allowable development within the District Plan to those proposed for the MDR zone.

6.1 Water Supply

The proposed zone change area is well serviced by the existing water supply network. As the MDR zone change would not measureably change the development levels within this area the current levels of service and fire flow pressures are unlikely to be negatively affected.

6.2 Stormwater

The 12 hectare area is currently zoned HDR subzone C. As such, changing the zoning of this area to MDR (with its comparable levels of impermeable coverage) is unlikely to increase the stormwater runoff from the site.

6.3 Wastewater

No comment has been provided by Rationale regarding the wastewater infrastructure in this area.

7 FERNHILL

The proposed Fernhill MDR zone is situated along Fernhill Road between Greenstone Place and the Heritage Hotel facilities and covers approximately 7 hectares. This area is currently zoned LDR.

7.1 Water Supply

The proposed Fernhill MDR zone is close to the Fernhill Reservoir and is well serviced by the existing water supply infrastructure. However, some network upgrades are required to address current network constraints. The increase in potential development intensification associated with the zone change is unlikely to affect the levels of service to the area.

7.2 Stormwater

Should the proposed MDR zone change be implemented the full future potential development of the Fernhill site would see an increase in flows from the LDR zoning

of approximately 1%. The existing stormwater infrastructure has sufficient capacity to accommodate this minor increase in flows.

7.3 Wastewater

The increased development intensification proposed by the MDR zone change would produce only a smal increase in wastewater flows from the area (1.6 l/s). As such, the current wastewater infrastructure has sufficient capacity to manage this minor increase in flows.

8 QUEENSTOWN HILL

The proposed Queenstown Hill MDR zone covers 14 hectares of land adjacent to Belfast Terrace and Vancouver Drive. This area is currently zoned as HDR but is only partially developed with greater than 50% of its upper elevations being covered by mature bush.

8.1 Water Supply

Because of the high elevation of this site FW2 fire flows are only just achieved under the current water supply infrastructure. It is likely that the upper sections of the area (those less than 30 – 35 metres below the Queenstown Hill #2 reservoir) would require pressure boosting to achieve appropriate levels of service.

8.2 Stormwater

As the current zoning for this area is HDR, changing the zoning of this area to MDR (with its lower allowable levels of impermeable coverage) is unlikely to increase the future full development stormwater runoff from the site. The stormwater infrastructure has therefore not been assessed.

8.3 Wastewater

No comment has been provided by Rationale regarding the wastewater infrastructure in this area.

8.4 Required upgrades

Upgrades to support this area are restricted to a new booster pump station on the water network to provide appropriate levels of service to the upper most part of the site.

The details and costs of these upgrades will be confirmed after a detailed assessment is carried out.

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