

Before Queenstown Lakes District Council

In the matter of The Resource Management Act 1991

And The Queenstown Lakes District proposed District Plan Topic 09
Resort Zones

STATEMENT OF EVIDENCE OF KEN GOUSMETT FOR

Jack's Point Residential No.2 Ltd, Jack's Point Village Holdings Ltd, Jack's Point Developments Limited, Jack's Point Land Limited, Jack's Point Land No. 2 Limited, Jack's Point Management Limited, Henley Downs Land Holdings Limited, Henley Downs Farm Holdings Limited, Coneburn Preserve Holdings Limited, Willow Pond Farm Limited (#762, #856 and #1275)

Jack's Point Residents and Owners Association (#765, and #1277)

Dated 3 February 2017

Solicitors

Anderson Lloyd
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**anderson
lloyd.**

QUALIFICATIONS AND EXPERIENCE

- 1 My name is Kenneth Frank Gousmett.
- 2 Director Cavell Heights Ltd, trading as Construction Management Services.
- 3 Qualifications and Professional membership:
 - (a) NZ Certificate of Engineering, Civil;
 - (b) Registered Engineering Associate – REA; and
 - (c) Member of Water New Zealand (NZ Water and Waste)

RELEVANT EXPERIENCE

- 4 I have been involved in wastewater, water supply and stormwater design and construction in the Queenstown Lakes District since the early 1970's, including:
 - (a) Wanaka Water and Wastewater, Hawea Wastewater, Albertown Water and Wastewater, Kelvin Heights Wastewater, Arrowtown Water and Wastewater, Queenstown and Wanaka Stormwater.
 - (b) Development and Construction Manager for Millbrook Resort for 5 years from commencement, responsible for construction of all infrastructure and buildings, landscape features and the golf course.
 - (c) Infrastructure Manager Jack's Point Development from inception in 2001 to 2009. I managed the consenting and construction of the water supply, wastewater, stormwater, power supply, telecommunications and main road design for Jack's Point Ltd. Advisor on existing infrastructure at Jack's Point from 2012 to present.
 - (d) Director of Cavell Heights Ltd T/A Construction Management Services 2000 to 2009 and 2013 to present. Infrastructure for various subdivision and development projects Queenstown and Wanaka, project management of Lake Wanaka Centre (2001), Wanaka Library (2003), Queenstown Lakeview Holiday Park (2003 \$6.1m), Queenstown Aquatic Centre (2008 \$18.1m), Gibbston Valley Winery wastewater treatment plant, New Winery, Administration Building and Barrel Room (2015-16).
 - (e) Capital Works Manager (Infrastructure) Queenstown Lakes District Council October 2009 to June 2013, including one year acting GM Infrastructure Services. Annual expenditure of around \$40m.

MATERIAL REVIEWED IN PREPARATION OF EVIDENCE

- 5 The reports and statements of evidence of other experts and witnesses giving evidence relevant to my area of expertise, including:

- (a) Those experts giving evidence on behalf of Queenstown Lakes District Council;
- (b) Evidence prepared by those representing Jack's Point entities;
- (c) The evidence of Mike Coburn for Jack's Point Residents and Owners Association; and
- (d) I am familiar with the Jack's Point Zone, the existing infrastructure at Jack's Point, the relevant Queenstown Lakes District Council land use consents and the Otago Regional Council water, wastewater and stormwater consents.

6 I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note. This evidence has been prepared in accordance with it and I agree to comply with it. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

SCOPE OF EVIDENCE

7 I have been asked by Maree Baker-Galloway of Anderson Lloyd to prepare evidence in relation to the Jack's Point Zone infrastructure capacity and future demand. This includes:

- (a) Water Supply;
- (b) Wastewater Treatment and Disposal; and
- (c) Stormwater Management

EXECUTIVE SUMMARY

8 From my research and personal knowledge gained from direct involvement with the design and construction of infrastructure at Jack's Point I have established that forward planning of infrastructure to support future development at Jack's Point is well advanced in terms of consents and facilities. Further consents or variations to existing consents and additional infrastructure will be required to support future development. There are available options for the provision of additional infrastructure for water supply, wastewater and stormwater. I do not consider there are infrastructure constraints or unresolvable constraints for servicing the development of Jack's Point land.

9 For clarification this does not include water supply or wastewater infrastructure for Hanley Downs RCL Land (principally activity areas R (HD) A – E) as I have no involvement with the RCL Land in the Jack's Point Resort Zone.

WATER SUPPLY

10 A new water supply was constructed in 2006 to serve all of the Coneburn area (Hanley Downs, Jack's Point and Homestead Bay) and has been in continuous use since. The design capacity for Stage 1 (which exists now) was for some 1500 dwelling equivalents. All

of the existing water supply components were designed for an ultimate capacity at build out of 3090 dwelling equivalents with provision for capacity upgrades where necessary.

- 11 The following table shows the planned future capacity upgrades. These planned upgrades will increase the capacity from some 1500 dwelling equivalents at present to 3090DE on the land serviced by Jack's Point, and will still be within the existing Otago Regional Council consent to take water.

Coneburn Water Supply	Planned Upgrade	Total Capacity
Reservoir Tank #1	Existing	1300m3
Reservoir Tank #2	1300m3	2600m3
Reservoir Tank #3	1300m3	3900m3
Additional Pump and Controls	82 l/sec	164 l/sec
Additional UV unit	82 l/sec	164 l/sec

- 12 The actual timing of each planned upgrade will be determined through analysis of recorded flows and the number of dwellings and dwelling equivalents as the planned upgrade thresholds approach.
- 13 To increase the water supply capacity from 3090DE to 4166DE as identified in the Density and Yield analysis undertaken by Jack's Point, the consented water maximum take will have to be increased and a number of the key components of the water supply will have to be increased in capacity beyond that currently planned. Given the very large volume of water contained in Lake Wakatipu and the equally high rate of flow into the lake I consider that increasing the consented maximum water take is reasonable and feasible. Upgrading the capacity of the existing water supply system is practical. The potential to increase the water supply means there is no limitation in respect of this on the ongoing development of the zone in my opinion.
- 14 The current Otago Regional Council (ORC) consent to take water 2004.724 will provide for some 3100 to 3500 dwelling equivalents. A more recent ORC water take consent RM13.418.01 permits an increased water take, however this consent has not yet been given effect to.
- 15 The water reservoir serves several purposes:
- (a) Fire storage – NZS4509:2008 Fire Service Code of Practice requires dedicated emergency storage based on fire risk categories.

(b) Operational storage – to cover for breakdown or power outage and to even out peaks during each day. This covers the longest foreseeable power outage and gives time to respond to a breakdown. This is in addition to the fire storage. In the event of a breakdown during a high demand period it is normal to impose water conservation measures.

16 Reservoir contact time for chlorination, one hour minimum is required. This does not need to be additional to either fire storage or operational Storage. See f) the appended Jack's Point Resort Zone Water Supply Demand Summary

WASTEWATER TREATMENT AND DISPOSAL

17 The existing wastewater system that serves the Jack's Point development comprises three separate treatment and dispersal systems each of which includes a septic tank effluent pumped (STEP) reticulation system with treatment by recirculating textile packed bed reactors. Treated effluent is discharged to land via sub-surface pressure compensating dripper irrigation. The three wastewater treatment plants serve R(JP)-1 and R(JP-SH)-1, R(JP)-2 and R(JP)-3, R(JP-SH)-2, R(JP-SH)-3 and R(JP-SH)-4. There is no excess capacity in the existing wastewater treatment plants and a new plant or an extension to the existing plants will be necessary to provide capacity for growth.

18 The Innoflow wastewater treatment system that is in use is modular and reasonably easily expanded in capacity provided such expansion is planned for. This is the case at Jack's Point. The treatment system produces a high quality clear effluent well suited to sub surface dispersal. The low rate of dispersal ensures that no effluent comes to the surface and the time of travel through the soils results in a die off of pathogens and faecal coliform before contact with the relatively deep ground water (17m depth plus).

19 The original design/build/operate contractor Innoflow Technologies, continues to operate and maintain the wastewater system under contract to the Jack's Point Residents and Owners Association. The Otago Regional Council (ORC) consent 2009.312 to discharge treated wastewater for all of Jack's Point expires in 2045. The consent, which is held by the Jack's Point Residents and Owners Association (JPROA) includes projected wastewater flows from the following existing development areas within Jack's Point:

Neighbourhood/ Activity Area	Existing Demand DE	Proposed Demand DE	Existing Treatment Capacity DE	Proposed Treatment Capacity DE
N1/N4/R(JP)-1, R(JP-SH)-1			413	422
N2/N3/R(JP)-2,3			162	244
N5,6,7/R(JP-SH) 1, 2, 3			182	216

Total Residential	697	882	757	882 High Yield
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- 20 Wastewater from the Jack's Point Village (V-JP) will be treated at the site of the existing N1/N4 R(JP)-1, R(JP-SH)-1 plant. It is reasonably straight forward to increase the capacity of the existing treatment plant by some 800 Dwelling Equivalents (DE) of the 2472 DE planned at the Jack's Point Village under the High Yield scenario. There is sufficient land available for an increase of some 800 DE within the existing wastewater easement. Also, the existing reticulation from the Village area was designed for this additional flow.
- 21 Jack's Point Lodge (L) is included in the Otago Regional Council consent 2009.312 to discharge treated wastewater, although the peak volume is not separately defined. The soils at the Lodge site have been tested and found to be suitable for dispersal of treated wastewater. A separate wastewater treatment plant is planned adjacent to the Lodge.
- 22 R(HD)-E part only, R(HD)-F, R(HD)-G, R(HD-SH)-1 and R(HD-SH)-2 have no currently consented land for dispersal of treated wastewater. The maximum yield of these areas is 359DE.
- 23 The R (HD SH)3 land is not yet consented for dispersal of treated wastewater. Nevertheless, in a previous investigation by others the R(HD SH)3 land and surrounding land was found to be suitable for subsurface dispersal of treated wastewater effluent. The maximum yield of the R(HD SH)3 land is 187 DE.
- 24 Other land exists within the Jack's Point Resort Zone that has been investigated and identified as being suitable for subsurface dispersal of treated wastewater effluent, but is not being used for this purpose. Some of this land is owned by JPROA, the owner of the existing WWTP plants at Jack's Point. It will be necessary to obtain the consent of the Otago Regional Council for these additional land treatment areas for volumes beyond that currently consented.

Otago Regional Council (ORC) Consent 2009.312 to Discharge Treated Wastewater

- 25 The recent flow records indicate that the design peak day discharge the current consent is for is somewhat conservative i.e. the recorded flows at peak times are less than 960 litres per dwelling. Therefore there is still significant capacity under the current consent over and above the 358 houses currently built or being built, and the further 121 that I understand have received approval from the Design Review Board. The current consent is to service at least 1430 dwelling equivalents (DE) but due to the conservatism there is likely to be even more capacity than that. As Jack's Point grows the flow records and effluent quality monitoring will allow a more refined assessment of dwelling equivalent capacity, effluent quality, Nitrogen reduction and operational enhancements. This data can be factored into future upgrades and associated consenting before consent limits are reached.

- 26 If additional discharge to land is required to meet future demand additional areas will be investigated or in the alternative the feasibility of connecting to the council network assessed.
- 27 I have been asked to provide some facts relevant to the submission by RCL to reclassify Open Space Community and Recreation Activity Area (OSCR) the land occupied by the existing N1/N4 R(JP)-1, R(JP-SH)-1 wastewater treatment plant and disposal area plant. The Otago Regional Council consent 2009.312 to discharge treated wastewater, condition 8 restricts the use of the land application (disposal) areas. These are not to be used for:
- (i) for roading whether sealed or unsealed;
 - (ii) as a hard standing area;
 - (iii) for erecting buildings or any non-effluent systems structures;
 - (iv) for activities that require intensively managed grass surfaces (e.g. grass tennis courts or bowling greens or golf tees and greens); and
 - (v) for the grazing of stock, excluding sheep.
- 28 See Appendix for a plan of the easement over the area occupied by the existing N1/N4 R(JP)-1, R(JP-SH)-1 wastewater plant.

STORMWATER

- 29 The QLDC as built plans show that Jack's Point Village (JP-V) is served by existing 225mm/300mm/375mm/450mm gravity stormwater pipelines laid along the main streets in the Village and a 450mm/525mm stormwater trunkmain leading to a 750mm pipeline that discharges into the outfall channel from Lake Tewa at the rear of the Clubhouse. There is also an existing 900mm diameter stormwater pipeline through the south side of Lot 2. These pipelines service Jacks Point Village activity area and they discharge into the overflow channel below Lake Tewa. All stormwater from Jacks Point Village will be directed to these pipelines.
- 30 It will be necessary to ensure that a safe secondary flow path of sufficient capacity is constructed across or around the Village to enter Lake Tewa at the north end, with capacity for a 1 in 100 year return period flood flow. This is for the ephemeral stream that comes off the Remarkables range and descends alongside the main entry road. At present a significant flood flow coming off the Remarkables and descending the stream alongside the main entry road could flow out over the Village land unless contained in a channel. I understand that this secondary flow path channel is being incorporated into design considerations to avoid any pollution of Lake Tewa.
- 31 Lake Tewa has been designed as a key detention pond to reduce post development peak flood flows from the stream leaving Jack's Point. The outlet weir will store flood flows in

Lake Tewa and release the detained water over the following hours and days. R (HD SH)3 – two existing main stormwater channels flow along the south and west boundaries of the E/R land and head in a northerly direction. Capacity upgrades of the existing surface channels and a detention pond are part of the infrastructure planning for the adjoining Hanley Downs RCL land.

- 32 Stormwater from land within Hanley Downs i.e. the R(HD) activity areas will have to be included in the overall stormwater management planning for Hanley Downs to ensure there are no direct discharges into Lake Tewa and no adverse water quality effects on the Lake Tewa.
- 33 Lake Tewa is an important part of the Jack's Point village, used for recreational activities including swimming and therefore needs to be maintained at a high quality.

ACCESS AND ROADING

- 34 I have been involved in the establishment of the access and roading for Jack's Point and confirm that the current Jack's Point roading network and proposed accesses and roading shown on the updated structure plan are capable of implementation and operation.

CONCLUSION

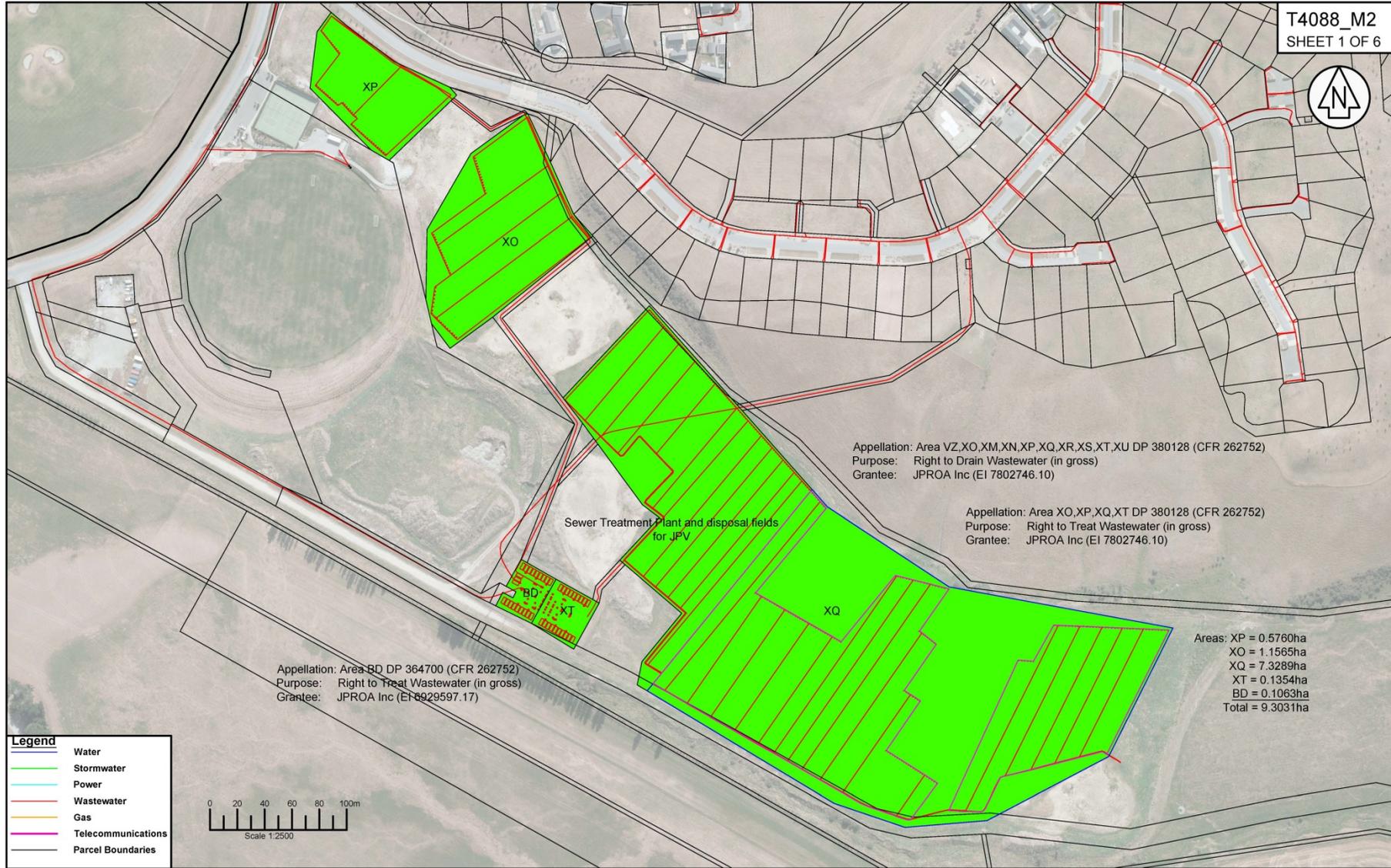
- 35 The Coneburn Water Supply was designed and constructed with considerable inbuilt capacity. The planned and some additional upgrades will increase capacity as needed for the proposed development of the Jack's Point land. It will be necessary to vary the existing Otago Regional Council consent to provide for additional flows before full build out.
- 36 For wastewater treatment additional capacity will eventually be required and this can be met by a combination of on-site and off-site treatment and dispersal and possibly also by conveyance to the Council wastewater treatment plant. The existing stormwater network, with planned upgrades, is well placed to handle increased stormwater flows resulting from proposed development, and designed so that it does not discharge into or have an adverse effect on Lake Tewa.
- 37 I have not identified any infrastructure constraints or unresolvable constraints for servicing the development of Jack's Point land.

DATED this 3rd day of February 2017

Ken Gousmett

APPENDIX A - Southern Land Ltd Surveyors, Wastewater Easement Plan, Jack's Point

T4088_M2
SHEET 1 OF 6



Appellation: Area VZ,XO,XM,XN,XP,XQ,XR,XS,XT,XU DP 380128 (CFR 262752)
Purpose: Right to Drain Wastewater (in gross)
Grantee: JPROA Inc (EI 7802746.10)

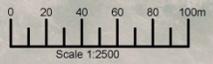
Appellation: Area XO,XP,XQ,XT DP 380128 (CFR 262752)
Purpose: Right to Treat Wastewater (in gross)
Grantee: JPROA Inc (EI 7802746.10)

Appellation: Area BD DP 364700 (CFR 262752)
Purpose: Right to Treat Wastewater (in gross)
Grantee: JPROA Inc (EI 6929597.17)

Areas: XP = 0.5760ha
XO = 1.1565ha
XQ = 7.3289ha
XT = 0.1354ha
BD = 0.1063ha
Total = 9.3031ha

Legend

- Water
- Stormwater
- Power
- Wastewater
- Gas
- Telecommunications
- Parcel Boundaries



REVISION	DESCRIPTION	DATE
A	ORIGINAL ISSUE	18/06/16
B	LOTS 86/201 AMENDED	17/09/16
C	XPXXOQXT DP 364700 AREAS	02/02/17

Jacks Point Infrastructure Review
(Wastewater)

PREPARED FOR: Darby Partners
SCALE: 1:2500 @ A3

DRAWN	DATE	CHECKED	DATE	DRAWING REFERENCE	REVISION
ST	02/02/17	VW	02/02/17	T4088_M2	C

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APPENDIX B - Water Supply Technical Support Information:

- a) Water is drawn from Lake Wakatipu at Woolshed Bay and then pumped to a buried storage reservoir located below the top of Jack's Point. Water treatment is in accordance with the 2005 NZ Drinking Water Standard. This comprises UV sterilisation and chlorine disinfection, with continuous turbidity monitoring which is alarmed to signal any transgression. For the UV treatment system to be compliant with the 2005 NZ Drinking Water Standard water leaving the treatment plant must have a turbidity of less than 1 NTU (.Nephelometric Turbidity Units). There were no turbidity transgressions in 2015 or 2016. Also there is an automatic backflush at the lake intake screen using compressed air released at least daily from inside the intake screen (frequency is adjustable). This explosive release of high pressure air keeps the intake screen free of algae (such as Lake Snow) and fine silts.
- b) The treated water is reticulated by gravity throughout Jack's Point. The water supply has been designed and constructed to the same standards as a municipal system serving a similar population. This includes back up and fail safe components, remote monitoring and pager alarms. The system complies with the requirements of NZS4509 with respect to fire flows and fire hydrants.
- c) The water supply system that serves Jack's Point currently has the following design capacities:
 - a. Pumps each 82 litres/sec, two installed, one to operate at a time, one duty pump, one standby i.e. 100% mechanical backup. Capacity verified in October 2016 from meter recordings and the manufacturers pump curves.
 - b. Treatment capacity 82 litres/sec
 - c. Rising main 375mm concrete lined steel, capacity 164 litres/sec
 - d. Storage 1300 cubic metres. Capacity verified from the QLDC building consent reservoir construction plans.
 - e. Gravity supply main 450mm HDPE, capacity 328 litres/sec
- d) Peak day demand for the current number of lots, some 700, is 34 litres/sec. In September 2016 the duty pump was operating for just 40 to 50 minutes per day. September would be average occupancy with no irrigation and there are around 250 occupied dwellings. This is 1000 litres/day/dwelling, as would be expected. The water supply system at Jack's Point has been designed and constructed for considerable capacity expansion.
- e) All necessary consents have been obtained and easements registered. Otago Regional Council water take consent 2004.724 expires May 2035, Queenstown Lakes District Council land use consent RM040843.

- f) The Otago Regional Council consent 2004.724 permits a maximum rate of abstraction of 225 litres/sec, which is greater than the maximum planned pump capacity of 164l/sec for potable water plus 45 litres/sec for golf course irrigation.

Current Capacity

- g) 82 litres/sec for 22 hours per day will meet the peak day demand of 1545 dwelling equivalents (DE) at 2100 litres per dwelling per day assuming an average of 3 persons per dwelling and a peaking factor of 2.0. Peak Day Demand (over a 12-month period) = Average Day Demand x PF. The second duty pump will double the capacity to 3090 DE's.
- h) This is the basis for design adopted for Jack's Point Water Supply and is the same as the 2015 QLDC Land Development and Subdivision Code of Practice 6.3.5.3 and 6.3.5.5.
- i) The additional pump will double the capacity of the water supply system by changing the configuration from one duty pump and one standby pump to two duty pumps and one standby pump. This is a standard water supply multi pump scenario and was part of the original water supply design. The intake, wet well, pipework, power supply and the pumping main (375mm diameter steel) were all designed for an additional pump and a total pump flow of 164 litres/sec. The 450mm diameter HDPE gravity trunk main was designed to deliver 328 l/sec, twice the pumping capacity, to cope with peak day demand.

Water Reticulation

- j) The existing 450mm diameter HDPE trunk main descends from the reservoir near the top of Jack's Point to the south end of Maori Jack Road, then along the road through the future Village and then breaks into 225mm and 150mm diameter PVC distribution pipelines. The existing reticulation network was designed for the full development of Jack's Point. The reticulation was modelled hydraulically in June 2015 which found virtually no limitations, and complying fire flows throughout Jack's Point, when fully developed.