



GORDON GIBSON NOMINEES
CIVIL ENGINEERS & PROJECT MANAGERS
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29 June 2023

Mr Euan Diver
Environmental Services Manager
Kosciuszko Thredbo Pty Ltd
P O Box 92
Thredbo NSW 2625

Dear Euan

Re: Thredbo Water Supply and Fire Hydrant Operation

I refer to your email of 12 April, and the attached background report on the proposed Golf Course Subdivision. Based on the information provided in your report, and on our previous hydraulic modelling of the Thredbo Water Supply system, we have now prepared the following report on the capacity of the system, and have provided details on recommended options to upgrade the system, in order to meet the water supply requirements of the proposed development.

BACKGROUND

Kosciuszko Thredbo Pty Ltd (KT) has direct responsibility for the road, car park, water, sewerage and stormwater infrastructure within the Thredbo Alpine Village, and liaises closely with the other utility providers, namely Elgas for the LPG reticulation, Essential Energy for the electricity and Telstra for the communications networks.

Under the terms of the current Head Lease, Thredbo has a bed limit of 4,820 beds and a current un-deployed bed number in the order of 464 beds. In order to realise the deployment of these beds, KT's parent company EVT is in the process of planning the development of several areas in Thredbo, including several new sub-divisions.

One such site is a proposed 19 Lot (186 bed) sub-division located on the current first Fairway of the Thredbo Golf Course (Figure 1). The Crackenback Ridge residential area is currently served by a pump station, a storage tank and a disinfection system, however this proposed Golf Course development will require an upgrading of the existing system.

This report presents details on the water supply infrastructure serving the Golf Course residential area, and details the works required to be constructed in order to satisfactorily service the new development.

EXISTING INFRASTRUCTURE

The Crackenback Ridge and Golf Course area of the Village is supplied with water by the following infrastructure:

- Thredbo River Pump Station - pumps water to the Golf Course tank
- pump capacity 9L/s at 60m head
- Golf Course Tank - Storage Capacity 150kL



- TWL 1436.2 m
- BWL 1434.4 m

- Crackenback Ridge Booster Pump Station - boosts pressures within the Crackenback Ridge area
 - capacity 12 L/s @39 m head
- Supply Main – 200mm diameter

WATER CONSUMPTION

- Approximately 330 beds currently serviced, with the following recorded demands

Year	Average Winter Use (L/bed/day)	Maximum Winter Use (L/bed/day)
2022	96.44	194.12
2021	76.95	142.65
2020	166.24	215.69
2019	114.47	233.33
2018	135.95	260.29

Table 1: Crackenback Ridge water use figures 2018 – 2022.

The above table indicates that the maximum recorded water use is 260L/bed/day, and the average over 5 years is 210L/bed/day.

Our previous modelling of the Thredbo water supply system adopted a Peak Daily Demand (PDD) figure of 330L/bed/day. This makes allowances for system losses and leakage, and commercial and utilities usage.

With these allowances, this PDD figure compares with the maximum recorded use at 260L/bed/day, and we therefore propose that the PDD of 330L/bed/day continue to be adapted for this analysis.

- Peak Hourly Demand factor = 3.5 x average daily demand
- Fire hydrants need to supply at least 10L/s @ 150kPa (feed hydrant) and 10L/s @ 250k (attack hydrant).
- An allowance also needs to be made for irrigation of the Golf Course. Our previous modelling has adopted a figure of 50 equivalent beds.



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PROPOSED DEVELOPMENT – ESTIMATED WATER SUPPLY REQUIREMENTS

The proposed Golf Course subdivision development entails an additional 186 beds to be supplied from the Crackenback Ridge system.

The Peak Day water demand for the developed Crackenback Ridge area is therefore estimated as follows:

Existing system	330 beds
Proposed development	186 beds
Irrigation	<u>50 beds</u>
	566 beds x 330L/bed/day
Plus Fire Hydrant Allowance = 10L/s x 1 hour	

Peak Total Daily Demand = 222,780 L/day (say **225 kL/day**)

Peak Hourly Demand = $3.5 \times 566 \times 330 / 86400 + 10$ (Fire)
=17.6L/s

RECOMMENDED WORKS

Based on the above calculations, we therefore recommend the following works to be undertaken in order to meet the requirements of the proposed Golf Course subdivision.

- Water Storage – minimum recommended storage volume = one Peak Day Demand
= 225kL

Given the existing tank has a capacity of 150kL, we recommend that an additional identical tank be constructed, adjacent to the existing tank (i.e. an additional 150kL tank, with TWL of 1436.2m and BWL of 1434.4m).

- Pump Station - Peak Hourly Demand = 17.6L/s
 - Current capacity approximately 12L/s, provided by 4 pumps in parallel
 - One or two additional pumps may need to be added to this pumpset, or pumps upgraded, in order to provide sufficient Peak Hourly Demand capacity, including fire demand.
- Pipe Network Capacity

The existing 200dia delivery main from the Golf Course Pump Station has sufficient capacity to meet the estimated Peak Hourly Demand. The supply pipeline to the proposed Golf Course subdivision should connect into this existing 200mm main at the proposed access road intersection and be installed in the access road reserve, to the end of the subdivision. An isolation valve should be installed at the connection. This main should be 150mm dia PN 16 pipe (HDPE or mPVC).

Fire hydrants at suitable intervals should be installed on the main and a flushing hydrant at the end of the main, as it will be a dead end. The elevation of the proposed subdivision is such that the existing tank levels will provide satisfactory pressures within the development, including for fire fighting flows.



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I trust that this information is of assistance, however, please do not hesitate to contact me if you have any questions on this matter, or require any additional information.

Yours faithfully,
GORDON GIBSON NOMINEES

Andrew Gibson

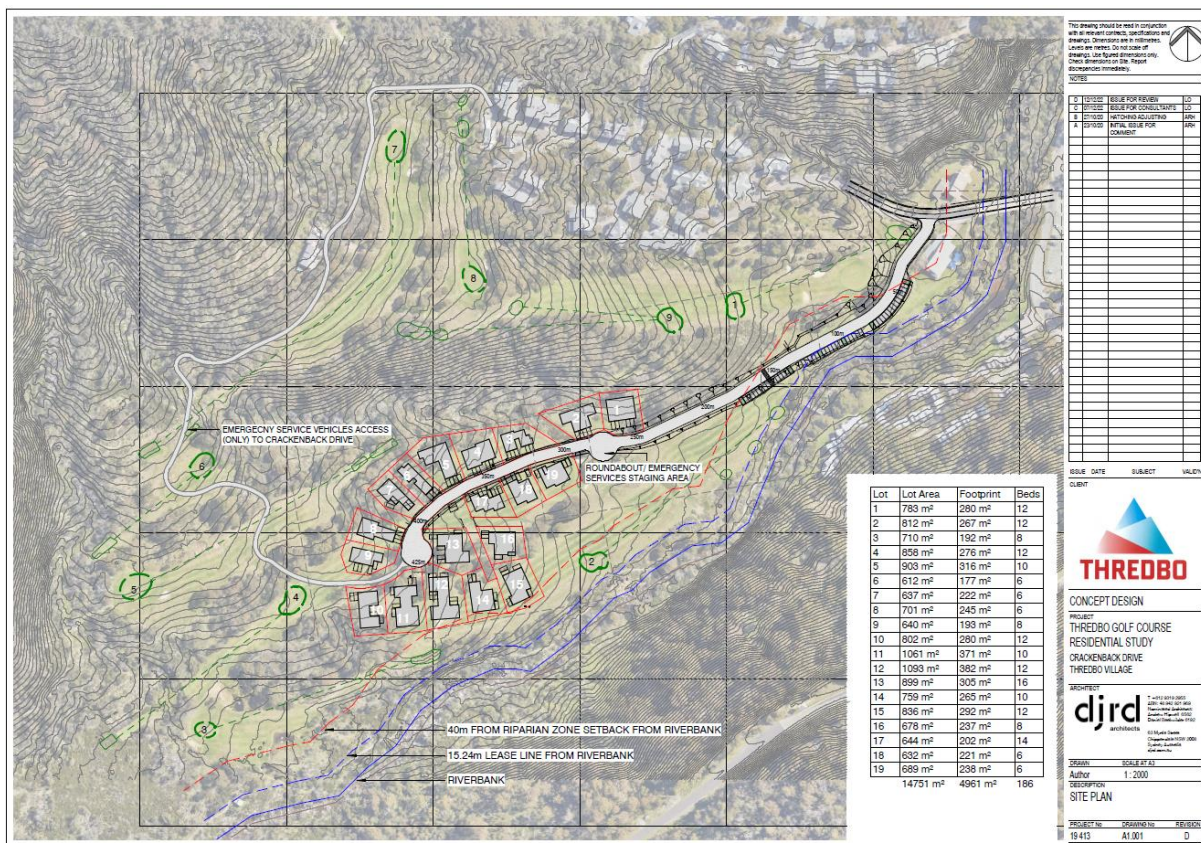


Figure 1: Proposed Development

Water Supply Reticulation to serve proposed development:

Construct 150 diameter PN16 water main in new road reserve, from intersection to south west end of subdivision, with flush point at southern end.