QUEENSTOWN LAKES DISTRICT COUNCIL

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12 May 2025

[redacted]
Sent via email to [redacted]

LG25-0093 - UV Building at Shotover Wastewater Treatment Plant

Dear [redacted],

REQUEST FOR OFFICIAL INFORMATION – RELEASE OF INFOMATION

Thank you for your request for information held by the Queenstown Lakes District Council (QLDC). On 9 April 2025 you requested the following information under the Local Government Official Information and Meetings Act 1987 (LGOIMA):

- **Can we please get the specifications of the UV building at the Shotover wastewater plant - size, capacity, any upgrades, how much UV light the effluent is exposed to and for how long - and the power/strength of the UV lights.**

  Plus - any and all records showing the effectiveness of the UV building's systems.

QLDC RESPONSE

Release of information

In response to your request, we consulted with the QLDC Property and Infrastructure Team who provided the following information.

The ultraviolet radiation (UV) system is placed prior to discharge to provide disinfection of the secondary treated wastewater flows from the oxidation pond and the MLE/clarifier process.

The installed UV plant is a Wedeco Duron system supplied by Xylem. The equipment consists of 84 lamps housed in an above ground channel. The system has seven banks, each consisting of 12 lamps. The installation includes provision to duplicate the setup in the future if necessary (to 168 lamps total).

The system is designed for a peak instantaneous flow to disinfection of 275 L/s. The design water quality of the effluent entering the system is for Escherichia coli (E. coli) of $1x10^7$ cfu/100ml and a mean UV Transmittance (UVT) of 40%.

UVT is a measure of the amount of UV light (at 254 nm) that is able to pass through the water and directly impacts the efficacy of UV treatment. The higher the UVT, the clearer the water and as such the more effective the UV disinfection process is.

Accordingly, the maximum flow that can pass through the system and achieve optimal treatment is directly related to the UVT. The table below summarises the flowrate at which the target dose of 24mJ/cm^2 can be achieved at various UVT values (based on information from the equipment supplier).

UVT (%)	20	25	30	35	40	45	50
Flow (L/s)	50	90	140	200	279	350	450

Supplied is a spreadsheet with SCADA data for:

- UVT (%)
- UV Receive Flow – Total Clarifier and Oxidation Pond discharge flow (L/s)
- UV reactor status (off)

Please note that the enclosed link will expire on 7 June 2025, 10:53 AM.

To aid with interpretation of the data analysis has been undertaken to illustrate if adequate UV disinfection was achieved at each point in time, using the SCADA data and the table above – results are supplied in the spreadsheet:

- Optimal Disinfection Treatment (True or False)

Note:

1. Interpolation was used for values withing the numbers shown in the table.
2. Assumed 10% UVT is the minimum value at which adequate UV treatment can be provided for flows up to 20L/s.

Discharge Flow - Data Assessment for UV disinfection:

The UV reactor status was shown 'off' at only three times (listed below). The data reflects that the UV plant operates continuously.

- 04 January 2023 at 12:40pm (<10 minutes)
- 10 May 2024 at 1:54pm (<10 minutes)
- 25 March 2025 at 10:09am (<10 minutes)

The UV system runs 24 hours per day. The data assessment for disinfection is indicated below:

Date Range	**Optimal UV Disinfection Achieved (approximate % of time) ***
May 2019 - December 2019	99.7
2020	99.4
2021	98.1
2022	84.6
2023	81.8
2024	89.9
January 2025 - April 2025	94.8

* Maintenance and calibration time spent in the UV system have not been accounted for.

We trust the above information satisfactorily answers your request.

Kind regards,

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