



MEMO

TO Dave Humm

COPIED TO Mark Kinvig, Keith Woolley, Scott Fryer, Jeremy McKibbin

FROM Nicola Chisnall

DATE 15 December 2016

FOR YOUR CONSIDERATION UNDER URGENCY – TE MARUA BAC FILTER CONVERSION FUNDING

Summary

Macaskill Lakes are being monitored for potential algae and taste and odour issues (Geosmin and MIB). Benthic algae capable of producing toxins are still present on the floor of both lakes. Genetic testing has identified a type of algae in the benthic mats that can produce toxins. Investigations around removal, management and treatment have recommended the following response:

1. Modify treatment through a change in filter media (\$3.32 million) in 2016/17 – this project has been introduced as a new project in the 2017/18 Business Plan.
2. Implement an increased routine monitoring regime for this algae (\$80,000 per annum)
3. Carry out further testing if required at vigilance and alert levels if positive toxin gene testing results are received (approx. \$200,000 per annum is considered probable based on recent positive gene samples, however additional testing may be required)
4. Investigate source mitigation/reduction options (to be confirmed)

Each of the above recommendations requires additional funding. It is recommended that this work is funded immediately under urgency. Additional information is included below.

Background

Over the last few years there have been taste and odour complaints from algae released Geosmin when the Te Marua WTP has been treating lake water. An investigation was started in early 2016 to try and identify the source of this problem and to determine ways of treating or removing it. During these investigations additional algae were found, not previously present. Of particular concern are algae that live on the floor of both lakes and which can under certain circumstances produce toxins.

Investigation

Additional specialist advice was sought including water treatment experts from Connect Water (a member of Wellington Waters' consultancy panel), H₂Ope and Cawthron Institute. Discussions and investigations looked at both mitigation and treatment options to eliminate and/or treat the risk.

Recommended Solutions

A multi-pronged solution is recommended.

1. **Filter Upgrade** - Conversion of the current filters at Te Marua to Biological Activated Carbon which will treat Geosmin, MIB and toxins to a given level, reducing the risk. The expected cost of this solution is \$3.32 million of which it is requested to be funded under urgency in 2016/17. The key need for the new treatment for Te Marua is in the summer period, particularly in February and March. It is advisable that at least half the filters are modified as soon as possible, and preferably all six filters. To achieve this timeframe the filter media will need to be ordered prior to Christmas as there is a six week lead time. If complete funding is available the remaining three filters would be completed by the end of 2016/17 financial year. If half the funding is available the remaining filters would be completed in 2017/18. This upgrade solution will only treat to a given toxin level and represents a first step in treatment process. Hence the investigations on elimination (or control) are important. We are also investigating what the next additional treatment process step is to treat potential higher toxin levels.
2. **Monitoring** – A Risk Management Plan has been developed to specifically test for this toxin and includes protocols to follow if a positive test is found. This monitoring solution has additional monitoring costs associated with it especially if a positive test is found. This plan is currently active and will stay this way indefinitely. There will be additional operational costs spent in 2016/17 and additional operational funding will be required from 2017/18 onwards. An additional \$80,000 is required per annum as a minimum, however based on positive gene tests received to date an additional \$200,000 per annum for additional testing at alert/vigilance levels is likely (however this could increase depending on toxin test results).
3. **Elimination** – Operational projects will be programmed as funding allows to trial ways to eliminating/reducing the algae and associated toxin risk.

Risks

Following are the key risks around not fast tracking this project.

- If the toxins make its way into the treated water there could be health effects.
- If the Geosmin and MIB make its way into the treated water there are likely to be taste and odour complaints.

- The algal concentration in the lakes reaches a level that is too high to treat.
- The lake water source is important for the region during the summer period especially when the river levels are low. If the toxins are present this water source could become unavailable resulting in water shortage.
- If there is a shortage of lake or river water during the late summer and autumn periods it could hold up the investigations on the alternative harbour bore supply investigations. This could have significant cost implications if delays occur. This work needs to be completed as early as possible so winter weather doesn't impact on the project.

If you would like further information please get back to me. We appreciate your urgent consideration of this proposal.

Nicola Chisnall

Team Leader Asset Management

Ph: 021 306 792

nicola.chisnall@wellingtonwater.co.nz