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Dear Dan

GREYWATER ASSESSMENT FOR SALMON FARM RELOCATION SITES

Background

The Marlborough District Council and central government are working with the salmon industry on options to implement the Best Management Practice Guidelines for Salmon Farming[1] in the Marlborough Sounds. One of these options is to relocate some existing salmon farms from 'low flow' environments to more environmentally-appropriate locations (see attached map), to ensure the guidelines can be met in the future. Six existing salmon farms are presently positioned at low flow sites not ideally suited to modern salmon farming. Relocating these farms to more suitable sites is expected to result in better environmental, social and economic outcomes. Nine potentially suitable sites have been identified, which now require an Assessment of Environmental Effects (AEE). The Ministry for Primary Industries (under a Heads of Agreement with The New Zealand King Salmon Company Ltd [NZKS]) has contracted the Cawthron Institute to undertake several components of each of the AEEs.

An initial stage in this process was a gap analysis of the existing information regarding the potential farm relocation(s). This gap analysis was undertaken by MWH (NZ) Ltd[2] and presented in a letter dated 14 March 2016. The analysis identified, at a high level, the quality of the existing information and the amount of effort or work required for inclusion in an updated AEE. This was categorised into five different levels ranging from where sufficient information exists for the AEE, to engaging a contractor and commissioning a full report. In terms of greywater discharges, the gap analysis recommended that all that was required was a minor update or addendum letter confirming the previous conclusions and whether or not the information and/or recommendations remain relevant. This letter addresses these aspects.

[1] Keeley et al. 2014. Best Management Practice guidelines for salmon farms in the Marlborough Sounds: Benthic environmental quality standards and monitoring protocol. Available at: http://www.marlborough.govt.nz/Environment/Coastal/Best-Practice-Guidelines-forSalmon-Farming.aspx
[2] Marlborough Initiative - Gap Analysis. Letter to Hamish Wilson (MPI) from Nardia Yozin (MWH NZ Ltd) dated 14 Mar 2016. 7p.

Review of greywaters assessment and conclusions

Discharge of greywater, and its potential adverse environmental effects, from existing and proposed farms were addressed in 2011/12 as part of a proposal at that time by NZKS to develop several new salmon farm sites in the Marlborough Sounds. That proposal was assessed by the Environmental Protection Authority (EPA) via a Board of Inquiry (BOI) Hearing.

The documents produced during that process that are relevant to the relocation assessment are as follows:

- Barter P 2011. The New Zealand King Salmon Company Limited: assessment of environmental effects - greywater. Prepared for New Zealand King Salmon Company Ltd. Cawthron Report No. 2021. 15 p. plus appendices.
- Statement of evidence of Paul James Barter in relation to greywater for the New Zealand King Salmon Company Limited, June 2012. 20p.
- Statement of rebuttal evidence of Paul James Barter in relation to greywater for the New Zealand King Salmon Co. Limited, August 2012. 6p.

The review and conclusions below are based on my understanding that the proposal is simply to move up to six existing farms from low flow areas, to six new locations situated in more dispersive and higher flow environments.

Previous conclusions and updated information

My original assessment of the effects of the discharge of greywater from existing and proposed NZ King Salmon farms, as well as my supplementary evidence, drew on published and popular literature for greywater characterisation, with supplemental information supplied by NZ King Salmon concerning site-specific parameters. In examining the regulatory framework, I identified several key constituents present in the greywater that could give rise to either adverse ecological or aesthetic effects. These were increased temperature, oxygen demanding substances, nutrients, bacteriological indicators/pathogens, and oil and grease/surfactants.

The discharge, and subsequent effects, of each of these parameters was addressed in turn. In all cases, it was determined that either the concentrations or loads (or both) were small enough that none has the potential to cause significant adverse effects. In fact, in almost all instances, predicted concentrations were so low that any effects were unlikely outside a radius of only a few metres from the discharge point.

I have conducted a cursory literature review on effects of greywater discharge since the 2012 BOI hearing and find nothing that changes or alters these conclusions. This is not unsurprising given the specialised nature of greywater produced by the farms which bears little or no resemblance to the types/nature of greywater typically discharged and assessed in the scientific literature. Unlike typical greywater discharge, NZ King Salmon has source control over cleaning and hygiene products that go into greywater production and the ability to manage the loads if problems are identified or an alternative and better solution becomes available.

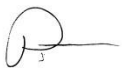
An example of this ability to change products across all farms came up during the 2012 BOI hearing where questions were raised with regard to aquatic toxicity of a certain biodegradable cleaning product being used at the time. While my conclusion was that adverse effects from the product in question were highly unlikely, a more environmentally 'friendly' alternative had just been introduced and NZ King Salmon made the decision to switch over to the alternative product at all farm sites. It is my understanding that the switch to this alternative range of products remains in place today (M. Gillard – NZKS, pers. comm. 16 May 2016).

In terms of the proposed relocation of up to six farms, the potential adverse effects of greywater discharge will be further ameliorated by moving the sites to more dispersive, higher flow environments. That is, my conclusions from the 2012 BOI hearing remain valid and siting the existing farms in a more dispersive area, coupled with the ability to control the source, only reinforces my original viewpoint that the effects from greywater discharges will be less than minor if not negligible.

I trust that the above addendum on greywater discharges is sufficient for MPI's needs. However, please don't hesitate to contact me if you require further information.

Yours sincerely

Scientist



Paul Barter
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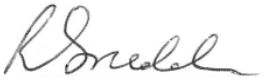
Reviewed by



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