

# FIFTY SHADES OF GREY (WATER)

Words: Paul Williams

Since the regulations for Grey Water Treatment systems (GWTS) were introduced back in July 2013 for Houseboats at Lake Eildon, much discussion has taken place based around why it's required and how it's going to be implemented.

The regulators say that GWTS are required on all Houseboats to insure water quality in the event of Lake Eildon being used as a backup emergency water supply to Melbourne.

Given Lake Eildon's prime purpose is still irrigation the question is will Eildon ever be used to supply emergency water to Melbourne in the foreseeable future ( we have the Desalination Plant backing up Melbourne's water supply) and do we really need GWTS on all houseboats at Lake Eildon and what is the actual benefit verses the cost?

As responsible lake users we all need to be vigilant about preserving the water quality and protecting the environment in general but the reality is that Houseboat contribution to water pollution is between zero<sup>1</sup> and 0.001% of lake pollution (immeasurable!), for which individual house boat owners are being asked to pay between \$20,000 and \$50,000.

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<sup>1</sup> World Health Organization: Guidelines for the safe use of wastewater, excreta, and greywater.

## Analysis of Jacobs Discussion Paper

In late 2016, Houseboat owners were notified by the Department of Environment, Land Water and Planning (DELWP) that an independent investigation would be made into the grey water regulations by Jacobs Consultants.

In December 2016, Jacobs released their discussion paper, requesting feedback on potential opportunities outlined in this paper to inform their final recommendations to DELWP. This discussion paper contains the draft findings of a review and instructions on how to provide comments.

The following information has been presented to Jacobs for further review

Firstly, Jacobs has not established the need for grey water treatment. They have not investigated Houseboat grey water discharge, or provided any evidence that this discharge contributes to lake pollution. Lake water pollution is caused by run-off into the lake carrying farming fertiliser and faecal waste from farm livestock and native animals. Houseboat contribution to the lake is 2 parts in 100,000,000, an immeasurable contribution, and one the World Health Organisation (WHO) considers as not a health risk.

Secondly, Jacobs makes an assumption (guess) in relation to Houseboat discharge – “the review showed that estimated typical nutrient levels in greywater are up to 100 – 1,000 times higher than background levels at Lake Eildon”, whereas considered estimations show that Houseboat contribution is immeasurable (refer to information attached).

Thirdly, Jacobs draft also states that “greywater also contains pathogens that pose a health risk to other lake users”. Pathogens die when discharged.

The WHO asserts that use of E.coli or enterococci as indicators overestimates the health risk by a factor of 10<sup>3</sup>. They conclude that untreated greywater can be expected to contain far lower densities of pathogens than effluent water from an advanced wastewater treatment plant, and that grey water is safe<sup>2</sup>. This is supported by the European Community standards for grey water<sup>3</sup>. There are no requirements for houseboat grey water treatment in USA, where there are large numbers of Houseboats.

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<sup>1</sup> World Health Organization: Guidelines for the safe use of wastewater, excreta, and greywater.

<sup>2</sup> World Health Organization: Guidelines for the safe use of wastewater, excreta, and greywater

<sup>3</sup> Council of European Communities Directive concerning the quality of bathing water (76/160/EEC). Official Journal, L31/1, 1976.

The Australian Law Reform Commission has stated that every regulation must satisfy the principal of proportionality, that the cost to the few must be balanced against the benefit to the many, which this regulation clearly does not meet.

## **Analysis of the Impact of Houseboat Grey Water on Lake Eildon Water Quality**

### Some basic facts and figures

Number of Boats on lake: 730

Average use per year – 2 weeks over Christmas, 1 week over Easter, 1 weekend in 4, total = 47 days

Typical occupancy – 3 people

Grey water discharge: 100 l/day/person<sup>4</sup>

Waste water/household from bath/shower, kitchen, hand basin: 265 l/day<sup>5</sup>

Total annual grey water discharge is approximately:  $(730 \times 47 \times 3 \times 100) \text{ l} = 10.3 \text{ Ml/year}$

Lake volume  $3.3 \times 10^{12}$  litre

Lake discharge/year = 1200 GI<sup>6</sup>

Houseboat contribution = 0.000003% of volume or 0.00001% of discharge

The evaluation of microbiological risk is commonly done by measuring E. coli.

Grey water typically contains E.colli levels below  $10^5$  bacteria/100ml<sup>7</sup>.

The DELWP regulation requires levels below 100/100ml.

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<sup>4</sup> Vinnerås, B. (2002). Department of Agricultural Engineering, Swedish University of Agricultural Sciences.

<sup>5</sup> NSW Department of Health. Domestic greywater treatment systems accreditation guidelines. April 2000

<sup>6</sup> Extrapolated from Lake Eildon's Inflow and Outflow 2015 records, Lake Eildon Forum

<sup>7</sup> Casanova et al, 2001, Lindgren & Grette, 1998, Rose et al, 1991, Naturvårdsverket, 1995

advanced wastewater treatment plant, and that grey water is safe.<sup>8</sup> This is supported by the European Community standards for grey water<sup>9</sup>.

### **Key issues raised to date with DELWP, GMW, Houseboat owners and Industry regarding the current regulations.**

There are still a number of remaining barriers for compliance for houseboat owners.

- Ability of houseboats to physically accommodate greywater treatment systems
- Reliability, noise, odour and performance of greywater treatment systems
- Cost of installation
- The feasibility of achieving compliance within the time frame.
- Compliance

### **Detailed Outcomes of the review of Greywater Treatment Systems**

- A large number of houseboats lack available space to install a Greywater treatment system either in the buoyancy pontoons or on the decks. To create the required space, these houseboats would potentially require modifications to the existing physical arrangements or extension.
- Most houseboat designs are unique with different internal, tank and plumbing arrangements as well as power sources requiring a unique installation for each houseboat. The bespoke installation process increases the complexity, cost and risk of issues in the future.
- Houseboats are often idle for long periods of time between operations. This can lead to a build-up of stale (anaerobic) Greywater sitting in tanks and an associated odour.
- Houseboats are not connected to mains power and so generate and store their own power. Greywater treatment systems require power to operate, even when the houseboat is not in use to circulate and aerate tanks. This leads to a considerable load on the power system which in some cases exceeds the generation capacity of the houseboat. In these cases the installation of a Greywater treatment system would require an upgrade of the power generation and/or storage system.

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<sup>9</sup> Council of European Communities Directive concerning the quality of bathing water (76/160/EEC). Official Journal, L31/1,1976.

- A small number of house boats could require additional buoyancy before they can install a Greywater treatment system.
  - The base cost for the installation of a GWTS is around \$18,000, excluding slipping. Installation could also require an upgrade of the electrical system and battery storage if the houseboat does not have sufficient electrical power, further increasing the cost by \$5,000 to \$10,000. Once slipping and other costs are considered the installation of a GWTS could range from \$21,000 to \$30,000. In a small number of cases, this cost could increase further if a boat needed additional buoyancy, such as for centreline hulls or similar.
  - Some Houseboats may have a proportionally low value when compared to the cost of installation providing a further disincentive to install a GWTS. For example, category 3 or 4 houseboats may have a market value of \$120,000 to \$200,000. Of this the houseboat licence accounts for \$60,000. In this scenario a \$25,000-\$35,000 upgrade could equate to over half the net value of some of these boats.
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- Approximately 50 houseboats have installed a Greywater treatment system. Many of these systems are not operational due to a range of issues, most notably unreliability and odour.
  - A further 670 houseboats need to install a system by 2020. The existing slipping capacity at Lake Eildon is not considered to be sufficient to allow for the installation of Greywater treatment systems in all houseboats by the required date.
  - Houseboats that are non compliant at point of sale within the current regulations may be adversely affected due to
    - Potential loss of sale
    - Reduced sale price
    - GMW permit/licence not issued
    - Vic roads registration not issued
    - Insurance cover suspended or voided
    - Marina agreement suspended or voided

**The Eildon Boat Owners Group representing the EBC, Eildon Harbour, Jerusalem Creek, and Darlingford Waters have submitted the following to Jacobs based on the December Discussion Paper.**

1. The regulations in relation to GWTS for Houseboats at Lake Eildon must be amended to be applicable only for:
  - Boats built from 2013 onwards
  - Major boat renovations and/or Category changes
  - Exclude the retrospective application for boats built prior to 2013.

2. The application of the regulations requiring grey water treatment to new or renovated/Category change boat must be deferred until an appropriate and proven 'fit for purpose' GWTS system is available.

As this edition of Watermark goes to print, Jacobs are finalising their recommendations of possible amendments/changes to the current legislation for DELWP to consider.

DELWP will then brief the Minister who may or may not accept Jacobs's recommendations.

Hopefully common sense will prevail and the sequel to all of this will be titled 'Zero shades of Grey'

In the meantime, the current regulations remain in place.

**This article is shared with DWBC courtesy of EBC and John Horton**

