# Houseboat greywater system review – discussion paper

**The *Water (Lake Eildon Recreational Area) (Houseboats) Regulations 2013* aim to protect water quality in Lake Eildon for the community and the environment.**

**Jacobs, on behalf of the Department of Environment, Land, Water and Planning (DELWP) are undertaking an independent review of these regulations. We are seeking your feedback on potential opportunities outlined in this paper to inform final recommendations to DELWP. This discussion paper contains the draft findings of our review and instructions on how you can provide comments.**

## 1. Introduction

Lake Eildon is the only inland waterway in Victoria that allows houseboats. It has been home to a substantial houseboat fleet since the early 1960s, with regulation and licencing introduced in 1971. Houseboat owners on Lake Eildon are required to manage black water using storage tanks and Goulburn-Murray Water (G-MW) provides pump out facilities for its disposal. Most houseboats do not have a Greywater Treatment System (GWTS) and are discharging waste water from kitchens, showers, baths, basins, spas and laundries directly into the lake.

Houseboat operations and greywater discharge releases pollutants to the waterway including nutrients, pathogens and oils. These pollutants can impact on the environment and create a hazard for swimmers, other recreational water users, downstream irrigators, urban drinking water supplies and for houseboats which use lake water on board.

## 2. Scope of the review

Jacobs, on behalf of DELWP are undertaking a review of The Water (Lake Eildon Recreational Area) (Houseboats) Regulations 2013. This review investigated a number of concerns raised by houseboat owners and considered whether the regulations could be updated to deliver the desired water quality outcome with a lower impact on existing boat owners.

The review involved a number of steps:

- A review of existing reports, documentation, regulations and standards
- Consultation with key stakeholders including houseboat owners, industry, greywater treatment system manufacturers and government
- A review of existing water quality at Lake Eildon
- Inspections of greywater systems already installed

# 3. Key terms

The table below explains some of the key terms used in this discussion paper.

| Term | Definition |
|---|---|
| Algal bloom | A rapid increase in algae that can discolour the water or cause ill health |
| Blackwater | Any waste produced by a toilet or urinal |
| Blue-green algae | A type of algae susceptible to blooms when triggered by nutrient levels, low inflows, lower storage volumes and warmer weather conditions |
| Dispensation | An exemption from the regulations |
| Greywater | Wastewater from sinks, laundries and showers |
| Microbe | Single cell organisms that are too small to be seen by the human eye |
| GWTS | Greywater Treatment System |
| Pathogen | A microorganism that can cause disease |

# 4. History of the regulations

Regulations introduced in 2013 require all houseboats on Lake Eildon (approximately 720 in total) to be fitted with an approved on-board GWTS by July 1st 2020. To date approximately 50 houseboats have an approved GWTS installed.

# 5. Water quality at Lake Eildon

A review of Lake Eildon water quality was undertaken in order to understand current water quality conditions and potential impacts from greywater discharge. This aspect of the review relied on three key sources of information:

1) Goulburn Murray Water – Major Storages Operational Monitoring Program
2) Goulburn Valley Water – Drinking water offtake monitoring
3) The Water Measurement Information System – Online data published by DELWP, which monitors and reports on the health and availability of Victoria's water resources through a number of programs and partnerships.

The key water quality issues reviewed were the risk of algal blooms, and the risk of health impacts caused by pathogens in the discharge water.

Water quality data from the major monitoring programs showed that nutrient levels in the lake are close to, or exceeding water quality guidelines in some instances. Greywater represents an additional uncontrolled input that contributes to nutrient levels and risk of algal blooms. Greywater typically contains high concentrations of nutrients; the review showed that estimated typical nutrient levels in greywater are up to 100 – 1,000 times higher than background levels at Lake Eildon.

Greywater also contains pathogens that pose a health risk to other lake users. The risk of impacts to lake water quality and recreational users is greatest in harbours and marinas as the higher concentration of boats in these areas increases the local volume of discharge. In addition to the

higher volume of discharge, these areas contain a smaller volume of water to mix and dilute the greywater discharge. This water volume is further reduced during low water events. A previous risk assessment also concluded that the health risk associated with greywater discharge was highest in the harbour and marina areas.

# 6. Key issues raised to date

DELWP, GMW, houseboat owners and industry have been involved in ongoing discussions regarding the current regulations. The review considered feedback to date as well as the output of discussions with key stakeholders.

To date, all houseboat owners spoken to notes the shared value they place on the recreational opportunities Lake Eildon provides. A number of stakeholders also noted their support for efforts to maintain or improve the environmental health of the waterway.

Despite the shared value placed on Lake Eildon, a number of houseboat owners, industry representatives and other stakeholders identified potential barriers to installing greywater treatment systems, namely

- 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 the timeframe for compliance

# 7. Outcomes of the greywater treatment system review

Four greywater treatment systems have been approved to meet the AS4995 standard; Newtreat, Aquatreat, Wastewater Australia and Aerofloat. However, only Wastewater Australia and Aerofloat are currently manufacturing and installing units.

Early versions of all four units had to be upgraded to deal with reliability, power consumption, odours or noise issues during their development. Both Wastewater Australia and Aerofloat were reported to have addressed these issues with their units now functioning appropriately.

However, there are still a number of remaining barriers to compliance for houseboat owners.

## 7.1 Infrequent and intermittent operation

Houseboats are often idle for long periods of time between operation. This can lead to a build-up of stale (anaerobic) greywater sitting in tanks and an associated odour. This odour can affect people on or adjoining and given houseboat however, with appropriate design, this issue can be avoided.

## 7.2 Non-Constant Power Supply

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 is 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.

## 7.3 Non-uniform installations

Most houseboat designs are unique with different internal, tank and pipework arrangements as well as power sources requiring a unique installation for each houseboat. The bespoke installation process increases the complexity and risk of something having to be rectified later.

## 7.4 Lack of available space

Some 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.

## 7.5 Displacement (or available buoyancy)

A small number of house boats could require additional buoyancy before they can install a greywater treatment system.

## 7.6 Cost

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 $3,000 to $5,000. 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.

## 7.7 Timeline

To date, approximately 50 houseboats have installed a greywater treatment system. However, 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.

# 8. Potential opportunities to adjust the regulations

The current regulations could be adjusted to encourage compliance while meeting the desired water quality outcomes. Key adjustments could include:

- Revising the timeframe for complete implementation across all houseboats to align installation to the 5-7 year slipping of every houseboat.
- Providing a grace period for the installation of GWTS units following a houseboat sale (either a 12 month period or a timeline connected with the next licence renewal date).
- Modifying AS4995 or the regulations to permit use of filtration based treatment systems that work in conjunction with the storage of kitchen waste as part of the black water system – nominally called a “Type B System”.
- Exempting category 1 and 2 houseboats from regulation 5(3)(b) of the Greywater Treatment Regulations.
- Provide a mechanism for category 3, 4 and 5 houseboats (non-commercial) to apply for a dispensation to install a Type B filtration system. Whether a houseboat is eligible for a dispensation should be based on an assessment of the age of houseboat and the relative complexity of installation.

Existing requirements to install a greywater treatment system should remain in for houseboats in the following categories:

- New houseboats
- Houseboats subject to major upgrades
- Category six (6) and above houseboats
- Houseboats upgrading to category six

These adjustments to the existing regulations will better enable houseboat owners to comply while meeting the desired water quality outcomes for Lake Eildon.

# 9. Next steps

## 9.1 Comments sought

DELWP wants to encourage all houseboat owners to participate in this review and we are seeking comments on the draft findings detailed in this discussion paper.

While submissions may be lodged by post, electronic lodgement by email is preferred at houseboat-greywater@jacobs.com. Submissions must be received by 5pm, Friday 20th January 2017.

## 9.2 Next steps

Jacobs will arrange meetings with interested houseboat owners and industry representatives to discuss the draft findings of this review and seek additional feedback. If you are interested in participating in these meetings, please contact us via email at houseboat-greywater@jacobs.com.

Following the receipt of comments on the draft review and potential opportunities will be finalised for DELWP’s consideration. At this time we will hold a final meeting with houseboat owners to explain the draft findings and demonstrate how their feedback was considered.