

## Shuswap/Mara Lakes Greywater Discharge Q & A

### **1. What is greywater?**

Waste water that is discharged from showers, tubs and hot tubs, dishwashers, sinks and washing machines.

### **2. What is black water?**

Human body waste from toilets and other receptacles intended to receive or retain human body wastes.

### **3. What are the known contaminants in greywater?**

Greywater can contain nutrients, bacteria, viruses and a variety of chemicals, including endocrine disruptors, associated with detergents and personal care products. Poorly diluted greywater can cause impacts on human health, which may include gastroenteritis (e.g. stomach flu, beaver fever) and other infectious diseases. The cumulative effects of multiple vessels discharging greywater may result in long term disruption of natural nutrient levels and subsequent impacts on the natural ecology of the waterbody.

### **4. What are endocrine disruptors?**

An endocrine disruptor is a synthetic chemical that when absorbed into the body either mimics or blocks hormones and disrupts the body's normal functions. This disruption can happen through the alteration of normal hormone levels, halting or stimulating the production of hormones, or changing the way hormones travel through the body, thus affecting the functions that these hormones control.

Endocrine disruptors and their effect on humans and the environment is a question that is not yet well understood. These compounds are part of the growing awareness of previously undetected contaminants in the environment referred to as “emerging contaminants” or “EC’s”. These chemicals originate from a range of products including prescription and the over-the-counter pharmaceuticals, pesticides, personal care products, fire retardants, and sun screen. The science related to EC’s is in its infancy.

Conduits for these chemicals to enter surface waters include treated and untreated sewage, greywater, and storm runoff. Some studies have been carried out at sewage treatment plants, obvious collection points for ECs, to increase the knowledge base in this area. The 2009 houseboat greywater monitoring program on Shuswap Lake tested for greywater tracers including galaxolide and tonalide, both which have endocrine disruptor properties, and found levels at or below the detection limit in the receiving waters. As the understanding of the potential effects of these contaminants on humans and organisms in the environment improves, we can anticipate future changes in regulatory policy over the coming decades.

**5. Is there a connection between boat greywater discharges and algae blooms?**

Greywater discharges contribute nutrients, such as nitrogen, phosphorus, and organic matter to a waterbody. Algae require nutrients to grow, thus greywater discharge contributes to algae growth. However, in order to cause a typical blue-green or green algae bloom, nutrient concentrations would have to increase measurably. Sampling showed no measurable increase in the limiting nutrient concentrations for these algae (nitrogen and phosphorus) in lake water near beaches highly frequented by boats compared to control sites. Other, larger sources or cumulative effects that cause measurable nutrient increases would be required for these blooms.

The extensive algae blooms in Shuswap Lake in 2008 and Mara Lake in 2010 were not formed by a blue-green or green algae, but by an algae that can multiply even during times of low nitrogen and phosphorus levels in the water. It can consume other, very small algae and bacteria and organic material to meet its energy needs. Since both blooms occurred before the boating season, greywater is not likely responsible for these blooms. Causes of these blooms are still being investigated. The following web link provides additional information on the 2010 Mara Lake algae bloom:

<http://www.env.gov.bc.ca/wat/wq/mara-lake/mara-lake-algae-bloom.pdf>

**6. Is it safe to drink the water in Shuswap Lake?**

Surface water is particularly vulnerable to contamination and if used for drinking water, precautionary measures need to be in place. Interior Health and the Ministry of Environment have stated that residents should not consume water from **any** surface water source unless the water is appropriately treated as per the Provincial Health Officer's recommendation.

**7. Is it safe to swim in Shuswap Lake?**

Yes. Long term water quality monitoring on the Shuswap Lake system shows no signs of significant water quality degradation and indicates the overall water quality of Shuswap Lake is good.

**8. Is it safe to swim in proximity to houseboats and other vessels?**

A comprehensive water quality study was undertaken at Shuswap Lake in 2009 in the vicinity of congested houseboat usage. Upon review of the data, the Interior Health Authority qualified that the water quality in these locations does not pose a high risk of causing acute illness and as tolerable for the interim, but does anticipate future treatment and/or containment. However, from both a safety and human health perspective it would be prudent to avoid excessive contact with water in close proximity to "rafts" or groups of houseboats. The full report of this study can be found at:

<http://a100.gov.bc.ca/pub/eirs/viewDocumentDetail.do?fromStatic=true&repository=EPD&documentId=10060>

Swimming beside or behind parked houseboats or other vessels is not recommended as these vessels may be suddenly started and moved without the operator knowing there are swimmers in close proximity.

**9. Which government agencies are responsible for regulating greywater discharges?**

The regulation of greywater discharges is a shared responsibility. The Ministry of

Environment regulates greywater discharges under the authority of the *Environmental Management Act*.

Transport Canada specifically regulates the discharge of black water from vessels such as houseboats and cabin cruisers in designated waters, including Shuswap Lake, under the authority of the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals*. Although Transport Canada has the authority, the present regulation contains no provisions to regulate greywater discharges.

However, Transport Canada recently advised that they are working on a regulatory approach for greywater discharge from small vessels that would be similar to black water discharge. The Ministry of Environment is working with Transport Canada to meet its goal of developing a draft regulation within the next year and a half. This solution would apply to all inland waters in Canada.

**10. Does the Interior Health Authority have any authority to regulate greywater discharges?**

The Interior Health Authority can issue advisories warning the public concerning the use of and exposure to potentially contaminated waters that could lead to human health issues. The authority works closely with the Ministry of Environment and other applicable agencies to resolve these issues.

**11. In 2007 the Ministry of Environment committed to a three year compliance strategy focused on greywater discharges from boats on Shuswap Lake. What is the status of the strategy?**

The Shuswap Lake commercial houseboat industry has taken notable steps in the past two years to meet the full compliance target in 2010. Based on the 2009 water quality study, the Interior Health Authority believes the health risks are tolerable provided continual improvement in the handling of greywater continues. Messaging about greywater containment has been slow to disseminate down to the private boating public. Efforts to educate the private boating industry have been limited compared to getting the commercial industry on line. As well, MoE recognizes that at the present time there is a significant lack of conveniently located pump out facilities available to the boating sector on Shuswap Lake and, therefore for these reasons, full enforcement has been deferred.

**12. Does this mean MoE will not be doing any enforcement in 2010?**

MoE retains the option of enforcement if quantifiable progress with the boating industry and public does not continue and/or there is a significant public health or environmental impacts issue that arises.

**13. What is MoE's greywater strategy post 2010?**

The Ministry's intent is to evaluate the present strategy in the fall of 2010 taking into consideration steps taken by the boating industry during 2010 to meet full compliance, the results of the Fraser Basin Council study, additional environmental data, and input from both Environment Canada and Transport Canada. In moving ahead with this pilot we are balancing the desires of the community, reasonable targets for industry and adjusting the priority as supported by science. The goal remains the same, protection of

human health and the environment by appropriate management of greywater discharges.

**14. What has the houseboat industry done to reduce or eliminate greywater discharges?**

The commercial houseboat industry has made significant progress in reducing the volume of greywater discharged from their fleet and continue to cooperate with the Ministry of Environment to attain full regulatory compliance. Two of the main companies, Waterway and Twin Anchors, have invested time and money in research and development on greywater containment and treatment methods and have adopted an in-depth customer education campaign with regard to water conservation and greywater management.

Waterway and Twin Anchors have also taken the initiative to plumb all vessels to contain 100% of the greywater from the kitchen sinks prior to the 2010 boating season. A third company, Bluewater, has plumbed the kitchen sinks in a small percentage of their vessels and will be working this season to plumb the sinks in the remainder of their fleet.

In 2011 Waterway will trial the locking out of hot tubs to prevent that water from being discharged while on route. This greywater will be pumped out at the company dock facility along with the contained black and grey water. As well, some of their vessels have been retrofitted with greywater holding tanks sized to contain all generated greywater and all new vessels being built have 100% greywater containment. Older boats, which cannot be retrofitted to capture greywater, are being retired from the fleet over the next couple of years.

Onboard cloths washing machines have been removed from Waterway vessels and there is a commitment to do the same from Twin Anchors. Bluewater boats are not equipped with clothes washers.

The following chart shows the progress to date from the commercial houseboat industry

<b>Modifications for Greywater elimination to date by Company</b>			
	Waterway	Twin Anchors	Blue Water
Educational material on greywater provided and discussed at pre-boarding orientation meetings	✓	✓	✓
Bio-degradable soaps and cleaning products provided for use on board	✓	✓	✓
R&D done regarding greywater treatment before discharge	✓	✓	
All kitchen and bar sinks and some showers are plumbed to blackwater tank	✓	✓	
Clothes washing machines have been removed from vessels	✓		N/A
Commitment to lock out hot tubs in 2011 from being discharged	✓		

Older boats unable to contain greywater will be removed from the fleet over the next 2 years	✓		
New vessels being built are 100% greywater contained	✓		

**15. One of the solutions would be to construct and operate pump out facilities in several locations along Shuswap Lake. Why doesn't MoE install these facilities?**

MoE does not have a mandate to construct and operate facilities such as these although the ministry recognizes that part of the problem on Shuswap and Mara Lakes has been the lack of conveniently located pump out facilities. MoE encourages private enterprise to take on the role of providing this service and several entrepreneurs have expressed their interest in starting up and operating collection facilities on the lakes.

As part of their Liquid Waste Management Planning process, the Columbia Shuswap Regional District has made a commitment to provide access to treatment facilities for the waste collected by the private sector. The regional district and organizations such as the Shuswap Lake Integrated Planning Process (SLIPP) are working with the industry, the public and all levels of government to find solutions to the greywater issue.

**16. Are there any other environmental studies that have occurred recently or that will be occurring?**

In 2009 the Fraser Basin Council was commissioned to review greywater discharge standards in Australia and assess whether or not those standards could also protect the water quality and associated human health in BC waters. They will also be reviewing the effectiveness of greywater treatment systems. Transport Canada is associated with a study on treatment options for houseboats and vessels in general. Both studies are expected to be completed in 2010. In addition, the Ministry of Environment has been doing water quality monitoring on Shuswap Lake since 1971.

Currently the Ministry of Environment leads water quality projects with the following objectives:

- a) Identify changes to primary lake productivity (algae growth) over time;
- b) Assess influence of seepages and runoff on near shore water quality;
- c) Identify nutrient loadings from tributaries into Shuswap Lake to help prioritize nutrient source management;
- d) Measure water clarity trends as an indicator for algae growth changes at numerous sites around the lake since the 1980s;
- e) Monitoring of nutrient availability in critical areas of Shuswap and Mara Lakes through an algae growth study;
- f) Investigation of causes for the 2010 Mara Lake and 2008 Shuswap Lake algae blooms.

The projects are conducted in or funded through various partnerships with one or more of the following partners:

Columbia Shuswap Regional District, City of Salmon Arm, Interior Health, Shuswap Water Action Team Society, Swansea Point Community Association and/or other residents:

**17. What is the Ministry of Environment doing about the increased boat traffic on Shuswap Lake?**

Transport Canada has legal authority to regulate this activity. However the provincial government introduced a carbon tax in 2008 to discourage excessive fuel-consuming activities and related emissions and encourage the public to make more environmentally responsible choices. These choices include reducing the use of fossil fuels, increasing efficiency of engines, changing fuels, adopting new technology or any combination of these approaches. A higher price for higher-carbon choices also makes greener options more commercially viable, thereby encouraging innovation that offers lower or no-carbon emission alternatives.

While the total number of boats, including cruisers and ski boats, on Shuswap Lake has increased, the actual number of commercial houseboats has declined from a high of approximately 350, down to less than 200 in total in the last decade.

**18. What should private boaters be doing to minimize and eventually eliminate the discharge of greywater?**

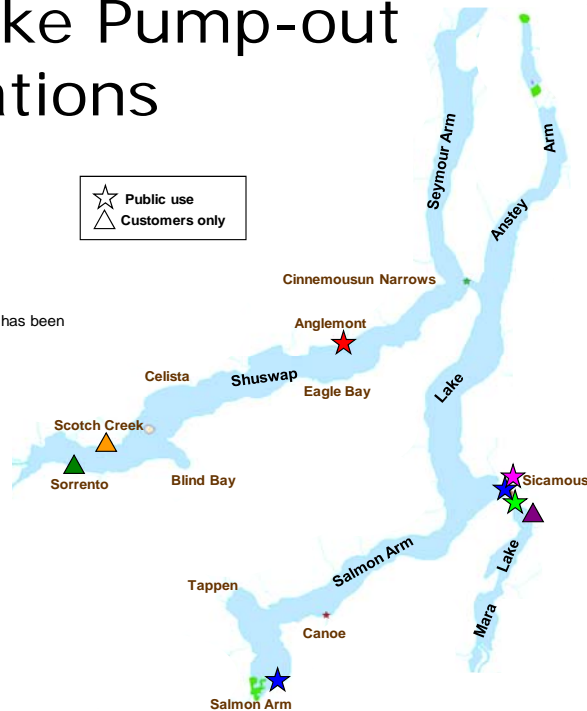
Private boat owners, who have vessels equipped with toilets, showers, kitchen facilities, laundry facilities, hot tubs, etc are expected to comply with both greywater and black water discharge regulatory requirements. Best management practices (BMP's) to minimize the generation of greywater are expected to be employed prior to the implementation of full compliance to reduce the potential impact on human health and the environment and lower the costs of retrofitting. For information on greywater requirements and BMP's contact the organisations listed at the end of this document.

It should be noted that complete greywater containment will potentially require the retrofitting of vessels. Boat owners should contact the BC Marine Trades Association or a competent marine/boat works for guidance on safe retrofits.

**19. Where are the current pump out facilities on Shuswap Lake located?**

# Shuswap Lake Pump-out Locations

- ★ **Anglemont Marina** – Public use  
Anglemont
- ▲ **Captain's Village Marina** – Customers only  
Scotch Creek
- ★ **Cinnemousun Narrows Provincial Park** – Facility has been closed as of 2009
- ▲ **Little River Boatworld** – Customers only  
Sorrento
- ★ **Three Buoys Marina** – Public use  
Sicamous
- ★ **Twin Anchors** – Public use  
Salmon Arm and Sicamous (call ahead)
- ▲ **Waterway Houseboats** – Customers only  
Sicamous
- ★ **Full Speed Marina** – Public use  
Sicamous channel



**20. If we have concerns/objections or would like additional information who do we contact?**

Ministry of Environment  
Environmental Protection  
Phone: 250-371-6200

Interior Health Authority  
Phone: 250-851-7340

Columbia Shuswap Regional District  
Phone: 888-248-2773

BC Marine Trades Association  
Phone: 604-683-5191

Transport Canada  
Phone: 613-991-3168

The latest updated version of this Q&A can be found on the MoE website at:

<http://www.env.gov.bc.ca/wat/wq/shuswap/greywaterqa.pdf>