The Green Guide to Pump Out Systems

The Green Blue

Making the environment second nature

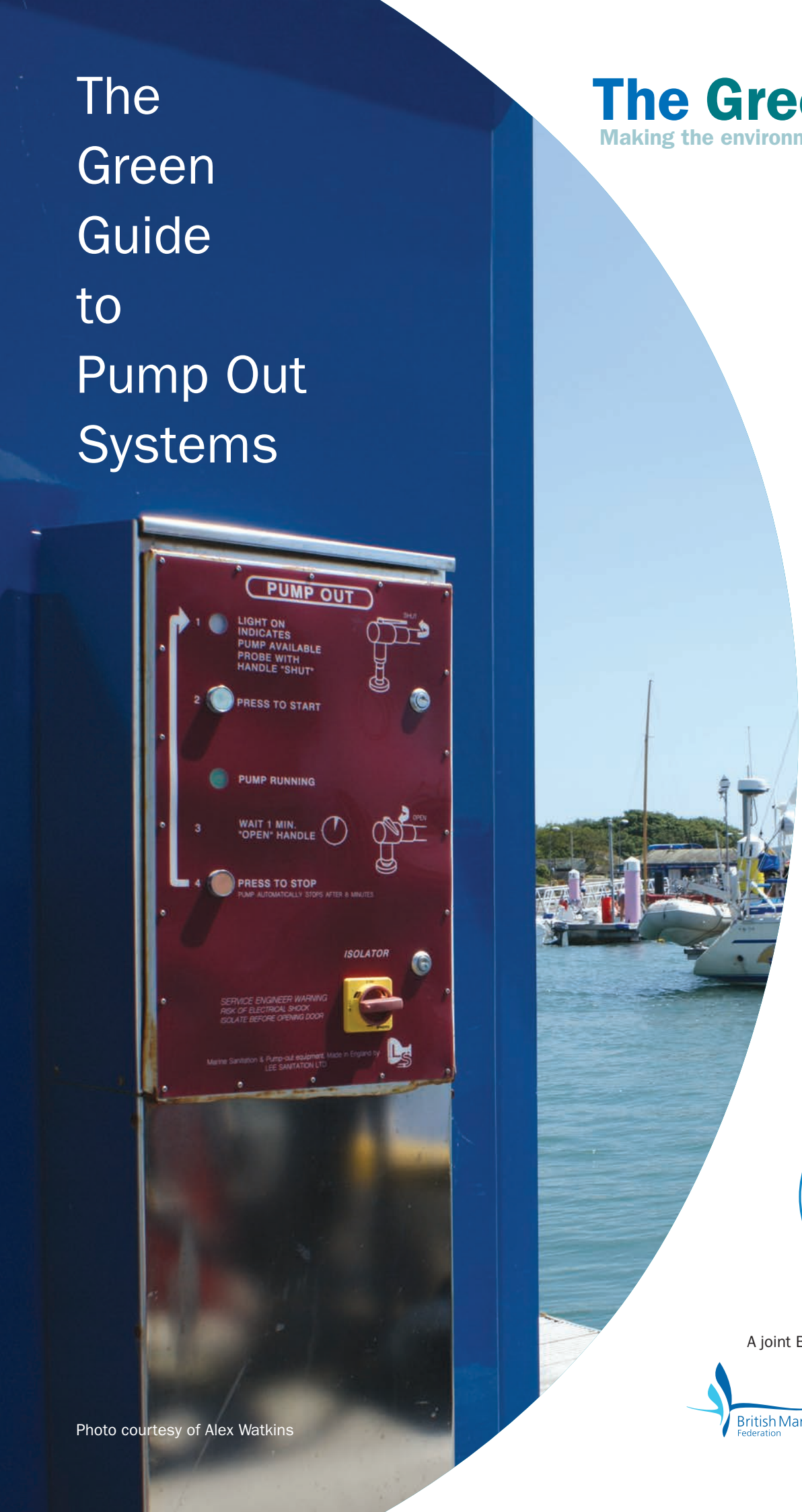

Photo courtesy of Alex Watkins

A joint BMF and RYA Initiative

British Marine Federation

RYA

Green Guide to Pump Out Systems

What's the issue?

There are a wide range of sources of water pollution. Black water – wastewater from the heads of a vessel – is one such source but levels of sewage from recreational craft are relatively small compared to other inputs such as sewage treatment works, and combined sewage overflows in particular. That said, it is still important for the recreational boating sector to demonstrate good stewardship of the environment and where possible put in place the infrastructure and services to enable boaters to discharge their black water responsibly.

In areas where there is low tidal flushing and/or high concentrations of recreational boats however, those levels can be elevated and the impact much greater. The effects of sewage discharge from recreational vessels can then be more serious and potentially affect water quality in the following ways:

- Raw sewage introduces microbial pathogens into the environment, posing a potential health threat for immersion sports (e.g. swimming, diving).
- Microbial pathogens pose a risk to shellfish. Pathogens taken up through filter feeding can lead to diseases such as Paralytic Shellfish Poisoning (PSP) if ingested by humans.
- Sewage reduces the oxygen available to aquatic species by locally reducing the biochemical oxygen demand (BOD).
- Black water may contain suspended solids that, in large quantities, could blanket species or reduce light penetration within the receiving waters.

For boats with holding tanks, boat owners who prefer not to discharge black water at sea look for pump out facilities in the marinas and harbours they visit. Other boats choose to empty their sea toilets at sea either because they do not have a holding tank or because it is easier and more convenient.

With an increasing level of awareness around responsible marine stewardship and sustainable boating, there is a greater interest across the sector in keeping the UK's sailing waters healthy and clean for current and future generations. The Green Blue has therefore pulled together this quick guide to pump out systems. It is aimed at marina operators, harbour authorities, boatyards, local authorities and port authorities on the coast who may be considering installing pump out facilities. It provides a short but informative set of headline issues to take into account:

- The legislative requirements and implications for boaters
- What to consider when installing a pump out system
- Who to contact for system design and installation
- How to promote usage

Green Guide to Pump Out Systems

The legislative requirements and implications for boaters

Discharge of boat sewage to coastal waters is regulated through the International Convention on the Prevention of Pollution by Ships (MARPOL 73/78). This does not apply to small craft carrying less than 15 passengers however so most recreational craft are exempt.

The generally accepted convention around the UK is that holding tanks should be emptied at least three miles offshore where the wave and tide action will be sufficient to swiftly disperse the sewage.

Local byelaws can impose restrictions on the disposal of black water in specific areas. Marina operators can also prohibit the emptying of sea toilets within a marina.

Since 2006, The Recreational Craft Directive (RCD) has applied to newly built vessels and requires provision to be made for a holding tank to be fitted. In practice, this does not mean that a holding tank will always actually be fitted, but space must be left for such a tank to be installed.

In October 2013, the European Parliament approved the adoption of a revised RCD. One of the revisions includes the mandatory installation of holding tanks to watercraft. Application of the revised RCD will start two years after its publication (end of 2015) on a voluntary basis and will become mandatory after another year (by end of 2016). These changes mean that the demand for pump out facilities could potentially increase.

Wider water quality legislation such as the Water Framework Directive, the Marine Strategy Framework Directive and the Bathing Waters Directive focus on the improvement of water quality in inland/estuarine, coastal and bathing water respectively. Large concentrations of recreational craft in an area could cause water quality to drop and the Environment Agencies may focus more attention on to the recreational boating sector if targets in meeting water quality legislation are missed.

Black water discharge from boats is prohibited on most inland waterways so the use of holding tanks is commonplace and there is a reasonably well established network of pump out facilities. Inland boats may also use chemical toilets which are self-contained systems that rely on biocides, in one form or another, to control the production of foul odours. A number of inland marinas provide chemical toilet disposal points as an alternative to pump out stations.

Green Guide to Pump Out Systems

What to consider when installing a pump out system

The following factors should be taken into consideration when deciding what type, size and scale of system might be the most appropriate for your facility:

1. Type of system

The two main types of pump out system available to existing sites are portable and stationary units.

(Multi-station systems are also available and are designed to pump waste from multiple locations into the main sewerage system for central collection and treatment. These systems must be built into the marina design and can therefore be a costly option at established sites.)

Portable Pump Out Units

This unit may be a wheeled device, consisting of a holding tank, hose and mechanical or hand pump that is pushed to the vessel's location to pump out vessel sewage. The primary advantage of this type of system is mobility. The pump out unit is brought to the boat, rather than the boat to the station. When full of sewage, however, they can be very heavy and cumbersome. The total time required for a pump out is typically longer than a fixed unit since the unit has to be brought to the boat, used, and then returned to its storage area, cleaned, and put away.

Stationary Pump Out Units

Stationary units include a connector hose and pump connected directly to a sewage treatment facility or holding tank. Vessels access the pump out station by mooring alongside the pontoon or quayside where the system is located. The advantages are convenience and efficiency. The costs of the units themselves are similar to portable units, but costs for installation of piping will increase the overall cost considerably depending on the distance to the nearest foul sewer connection. The main disadvantage of a fixed unit is that they restrict service to a single area in the marina.

2. Type of pump

Pump out units are based around one of three types of pump technology: vacuum, peristaltic and diaphragm. The choice of pump will be determined by the distance, height and route of the suction and discharge pipe work. You will need to consult with an installer to work out the best type of pump for your location and the major suppliers manufacture systems using all three types of pump.

3. Sewerage connections needed

Ideally, the pump out system will be connected to an existing foul sewer at your facility. If you are already discharging sewage into the foul sewer, no permission is required to connect a pump out system to the foul sewer as doing so is the equivalent of plumbing in a new toilet. In more remote locations where there is no foul sewer, or where it is impractical to connect to one, an alternative would be to install a septic tank or a packaged sewage treatment plant. In both cases this will add significantly to the overall cost of installing a pump out system.

Green Guide to Pump Out Systems

4. Groundworks required

A stationary pump out system will require pipework to connect it to either a foul sewer or to a tank (from where the sewage can be removed by tanker). The pipework can go above or below ground, depending on budget available, proximity of sewer or holding tank connection and whether above ground pipework is aesthetically acceptable. The preferred option is usually to bury the pipework but this involves greater cost and disruption. It is therefore prudent for marina and harbour operators to consider installing pipework for a pump out system if they are doing any significant excavations or renovations in their facility, even if they do not intend to immediately install a pump out system. Stationary pump out systems also require a freshwater connection to allow for rinsing of tanks.

5. Location

A convenient location will mean that the pump out station will get more use. Stationary pumping equipment should generally be located as close to the boat off-loading point as possible and where boats need to manoeuvre the least. Many facilities are located at the fuel berth, so boaters only have to go to one location for both of these activities.
In principle, the pump out should also be located as close to the water as possible so that the hose length is kept short and is therefore most efficient. Pump out systems have a limited vertical pump capacity – 10 metres is about the maximum they can pump but 5 metres is much better. Given tidal ranges, it is therefore often better to locate pump out facilities on a pontoon rather than a quayside.

6. Self-service or staff operated

A portable pump out unit will probably need to be operated by trained staff since it will need to be transported to the boat, used to empty the holding tank and then taken away and emptied. Stationary systems can be self-service (often with the use of tokens or cards) or can be operated by trained staff.

The advantages of operating a self-service system are:

- Customers can use the facility at a time that suits them, which may be outside of usual staffing hours – this may encourage more frequent use of the system
- Staff time is not taken up with operating the pump out
- Potential customers may prefer to deal with this aspect of boating themselves! Although the pump out systems are clean, odourless and no sewage should “escape”, boaters may nonetheless feel that this is a job they would prefer not to outsource.....

The main disadvantage of operating a self-service system is that customers may not use it correctly, potentially resulting in damage.

7. Running and maintenance costs

Running and maintenance costs should not be high since the systems themselves do not use much energy and the main cost involved will be the metered charge from the sewerage company. An annual service is recommended although, from anecdotal evidence, most systems are maintained on an ad-hoc basis. No additives are needed and there are no consumables which need replacing on a regular basis.

A well maintained pump out system should have a lifespan of between 20 and 30 years.

Green Guide to Pump Out Systems

Who to contact for system design and installation

In the UK, the market is dominated by two main suppliers, Lee Sanitation and Rolec.

Lee Sanitation

Lee Sanitation supply, install and maintain a wide variety of systems from mobile pump out carts to multi point systems for superyacht berths. Much of their equipment is manufactured by LeeStrom, a joint venture between Lee Sanitation and Rheinstrom Pumpenfabrik GmbH. Lee Sanitation's range of pump out stations covers:

Mobile stations include units that hold from 80 litres to 2,000 litres of sewage – the largest of which are suitable for marinas at which a fixed pump out station is not viable. The large mobile units come on trailers which can be supplied to a road-legal specification if required.

Permanent stations are available as either single function black water pump out units or dual function black water and bilge water pumps. A variety of different models is available depending on the size of the marina, the anticipated use and the location proposed.

The permanent models can be supplied with simple on/off switches or to run on tokens, keys, coins or magnetic cards.

www.leesan.com

Rolec

Rolec offers a range of free-to-use and pay-to-use pump out systems. A range of communal pump out pedestals is available which can be installed by Rolec or can be supplied with simple installation instructions for the client to install.

They also supply a mobile unit called "The Sani-Caddy" which allows a marina operator to provide an at-berth pump out facility.

www.rolecserv.com

Other suppliers of pump out systems include:

RITAB (available in the UK through Turner Marine) - **http://turnermarine.eu/holding-tank-pump-out-stations/**

Vogelsang - **http://www.vogelsang.info/en/product/wastewater-disposal-boats/**

Prices

For a mobile pump out unit, prices start at around £3,000 for a small unit. The larger mobile units cost around £12,000.

Prices for fixed stations vary from around £7,000 - £10,000 installed price for a black water pump out, depending on the size and capacity of the system.

Combined black water and bilge water systems cost between £10,000 and £16,000 (fully installed) – price is again dependent on the size and capacity.

Green Guide to Pump Out Systems

How to promote usage

Obviously only boats with holding tanks will use the pump out facility so there is an immediate hard limit on how many users you will have though this may increase in time with changes to the RCD as well as a growing focus on water quality improvement. Other factors determining usage are:

Cost

Some facilities make a charge for the use of pump out facilities and the decision to charge will play a large part in how many users you get. If it is expensive to use a pump out and free to pump out your toilet straight into the sea, then the majority of boaters will go for the latter option. Most operators make no charge to berth holders, and sometimes charge nothing to visitors. A nominal charge may help recoup some of the original installation costs. The Green Blue is aware of many marinas charging up to £32.

Standard hose fittings

Unfortunately not all deck fittings for holding tanks are of a standard size and in some cases you will need adapters to hand for visiting boats otherwise they will not be able to use the system. The ISO standard BS EN ISO 8099:2001 'Small Craft Toilet Waste Retention Systems' specifies the deck fittings that should be installed and boat builders should now be complying with these.

Location

The location of the pump out system will play a major role in how often it gets used. If it is difficult to manoeuvre the boat into position, or it is sited in a far corner of the marina or little-used area of a harbour, the incentive to use it is likely to be much reduced.

Promotion

Ask The Green Blue to include the system on The Pump Out Directory so visiting boats know where their nearest pump out is, and promote the QR code or link on your leaflets or in your Marina Guide.

http://www.thegreenblue.org.uk/pump_out_directory.aspx

Signage and information

It is important to publicise the availability of the pump out facility and to give clear guidance and instruction on how to operate it. Put up signs and send out information to berth holders telling them about the facility, when it is available to use, how much it costs (if anything), how long it takes to pump out on average and emphasise the benefits of using the system.

Contact The Green Blue if you would like to use the Love Where You Sail graphic free of charge.

The Green Blue

The Green Blue is a UK wide programme created by the British Marine Federation and the Royal Yachting Association in 2005 to enable the UK recreational boating sector to decrease its impact on the environment by:

- Raising awareness amongst industry and users
- Reducing harmful discharges
- Reducing environmental disturbance
- Encouraging sustainable choices

For more information visit our website
www.thegreenblue.org.uk

A joint BMF and RYA Initiative

The Green Blue
A joint BMF & RYA Initiative
RYA House, Ensign Way
Hamble, Southampton
SO31 4YA

Tel: 023 8060 4100
Fax: 023 8060 4294
info@thegreenblue.org.uk

www.thegreenblue.org.uk

supported by