



# Lamor MARPOL Port Reception Facilities

Your preferred partner on the journey  
towards a cleaner tomorrow

**LAMOR**

[lamor.com](http://lamor.com)

 **Greenflow**

[greenflow.pt](http://greenflow.pt)

# Port Waste Management Reception Facilities (PRF) - An obligation by IMO Regulation

Lamor and Greenflow have joined forces to enhance together the availability of MARPOL compliant waste systems including Port Reception Facilities. The cooperation paves the way for a globally stronger presence in total solutions for ports to collect and treat the waste generated by the maritime traffic and vessels, thus enhancing their environmental performance as required by the MARPOL convention.



With the adoption of IMO designation, the International Convention for the Prevention of Pollution from Ships, global environmental and societal awareness for ocean protection has expanded and evolved.

The maritime industry must guarantee that waste generated from their activities is safely managed through port waste reception services and facilities. Port Reception Facilities (PRF) customised and environmentally responsible solutions that align with MARPOL standards, enabling efficient and sustainable waste treatment without causing unnecessary delays for ships.

Efficient and sustainable port facilities are a way for us to contribute to limiting maritime pollution, but also to making the maritime industry more competitive and sustainable – a win-win for us all.



## How we operate

- Collaboration with customers to forecast waste volumes
- Supporting Ports in the development of MARPOL Tariff's
- Identification of available land and design of waste treatment solutions
- Delivery of waste recovery, reuse, and recycling targets
- Ongoing operation and maintenance services



# What is a Port Reception Facility?

The International Convention for the Prevention of Pollution from Ships, MARPOL Convention states the Government of each Party to the present Convention undertakes to ensure the provision of facilities for the reception of residues to meet the needs of the ships using them without causing undue delay to ships.



## Requirement to ensure adequate port waste reception facilities:

- The Port Authority shall ensure the availability of waste reception facilities adequate to meet the needs of ships.
- “adequate” means capable of receiving the types and quantities of prescribed wastes from ships normally using the port considering the operational needs of the users of the port, its size and geographical location, and the types of ships berthing.

# IMO Annexes (types of waste)

MOST OFTEN  
REQUIRED



<b>ANNEX I</b>	Regulations for the Prevention of Pollution by Oil	<b>ANNEX I</b>
<b>ANNEX II</b>	Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk	<b>ANNEX II</b>
<b>ANNEX III</b>	Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form	<b>ANNEX III</b>
<b>ANNEX IV</b>	Prevention of Pollution by Sewage from	<b>ANNEX IV</b>
<b>ANNEX V</b>	Prevention of Pollution by Garbage from Ships	<b>ANNEX V</b>
<b>ANNEX VI</b>	Prevention of Air Pollution from Ships	<b>ANNEX VI</b>



# What should be done to fulfil with MARPOL convention

Typical requirements for a PRF include:



## A MARPOL vessel to do the collection

A ship goes alongside the vessels and collects all kind of waste produced on board



## Marpol waste delivered direct to quayside

Oily residues are treated in several steps by equipment designed for emulsion treatment, water & sediment & treatment.



## A Treatment unit for Oily residues

Vessels berth at quayside and wastes are offloaded direct to PRF.



## A Treatment unit for sewage water

A biotreatment with 2 reactors, also used for the final step of oily water, can be used for sewage, in order to deliver quality discharge to local water source



## A Treatment unit for garbage and solids

All the solid wastes, that can not be recycled are incinerated together with the waste produced in the other treatment units of the PRF to minimize impacts and demand on local landfill.



# Collection & Transportation of waste

The methods of waste collection can therefore be either via water (MARPOL vessel, or similar) or by land (primarily Vacuum truck or tanker truck), or a combination of both forms of transportation when waste is presented at the port.





## MARPOL Collection Vessel

Floating vessel that goes alongside anchored vessels to collect MARPOL waste. Consist of tank storage with mechanical pumps & hoses to extract various liquid waste from visiting vessels.

Drum waste storage is available on deck, along with automatic compactor for general waste, which is operated using a crane grab.

The example shown in the image also includes emergency OSR boom deployment.



## Vacuum Tanker

Land based vacuum tankers are often used for the intermediate transfer of liquid wastes from visiting maritime vessels to the tanker, prior to onward transport to the PRF.



## Temporary Tank Storage on quayside

Above Ground Storage Tanks (AST's) are often used for the temporary storage of MARPOL wastes at the quayside, pending their transfer to the Port Reception Facility (PRF).



# Port reception facilities - our solutions

## THE M CONCEPT

### What is the M-concept?



**M**

For modular

**M**

For flexible

**M**

For safety

**M**

For scalable

**M**

For user-friendly

**M**

For reliable

- Has been specially developed for Port Reception Facilities with a medium or small size (less than 40.000 m<sup>3</sup>/year to treat of Annex I).
- Is the best option to reduce initial CAPEX, building the treatment plant step by step, adding Modules only when needed.
- Minimize the footprint and also the construction time. Modules are 90% standard (some changes can be performed depending of the local context or customer requirement) which allows us to build a plant with a minimum time on-site.
- Has several Modules, able to operate alone or together in a full modular plant, in standard containers (20' or 40') or skids with the same dimensions, to facilitate transport, mobility (from site to an another site) and connections.
- Is the best option for a quick response when an increase of treatment capacity is required in a existing plant.

## Which type of waste the M units can handle?

- Water contaminated with hydrocarbons
- Waste oil coming from MARPOL
- Slop-oil coming from refineries
- Oil/water mixtures
- Waste oil/sludges from contaminated pits or spill containment
- Any type of hydrocarbon waste



## Where to use it?

### Port reception facilities

- To build a new PRF to serve a Port
- To add new treatments to an existing PRF
- To increase capacity of a specific treatment line
- To solve specific problems (Hydrogen Sulphide removal from water, odour control, water polishing...)

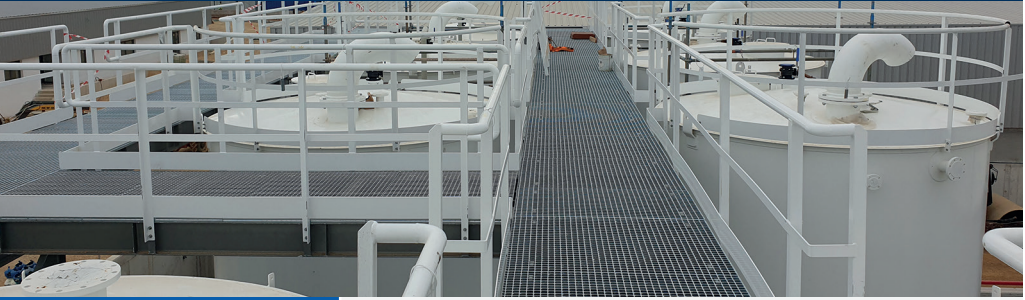
### Waste management plants

- To add new treatments
- To increase capacity
- To solve specific problems (Hydrogen Sulphide removal and odour control, water polishing...)

### In-situ decontamination or waste treatment works:

- To install in the contaminated site and treat the waste without transport

## M-modules



### M-EBS

Modular Emulsion Breaker system: to treat oil in water emulsions

### M-DAF

Modular Separation and Flotation System: which joins a Corrugated Plate Interceptor and a Dissolved Air Flotation unit: to treat oily water

### M-STRIP

Modular stripping unit: design to remove H<sub>2</sub>S and VOC compounds from oily water

### M-CARBON

Activated carbon module, for final filtration of the water after previous treatment

### M-PRESS

Press filter, to remove water from sludge

### M-STU

Decanter centrifuge or screw-press to remove sludge from wastewater

### M-SCRUB

Modular scrubber unit: to control air emissions

### M-BOILER

Modular steam boilers

### M-LAB

Modular laboratory to control process parameters

### M-CONTROL

Control room to supervise all the processes

## How to combine M-modules?

1

### Problem

MARPOL oil emulsion to treat to separate water from oil



### Solution

M-EBS, to separate oil below 2% of water content, and deliver the water to water treatment

2

### Problem

MARPOL oil emulsion to treat to separate water from oil, and to treat the separated water before biotreatment



### Solution

M-EBS + M-DAF

3

### Problem

Water contaminated with sulphides at a high level, and there is a need to remove H<sub>2</sub>S



### Solution

M-STRIP + M-SCRUB

4

### Problem

Treated water needs a polishing treatment as final step after M-DAF



### Solution

M-CARBON

5

### Problem

I need a full standard PRF...

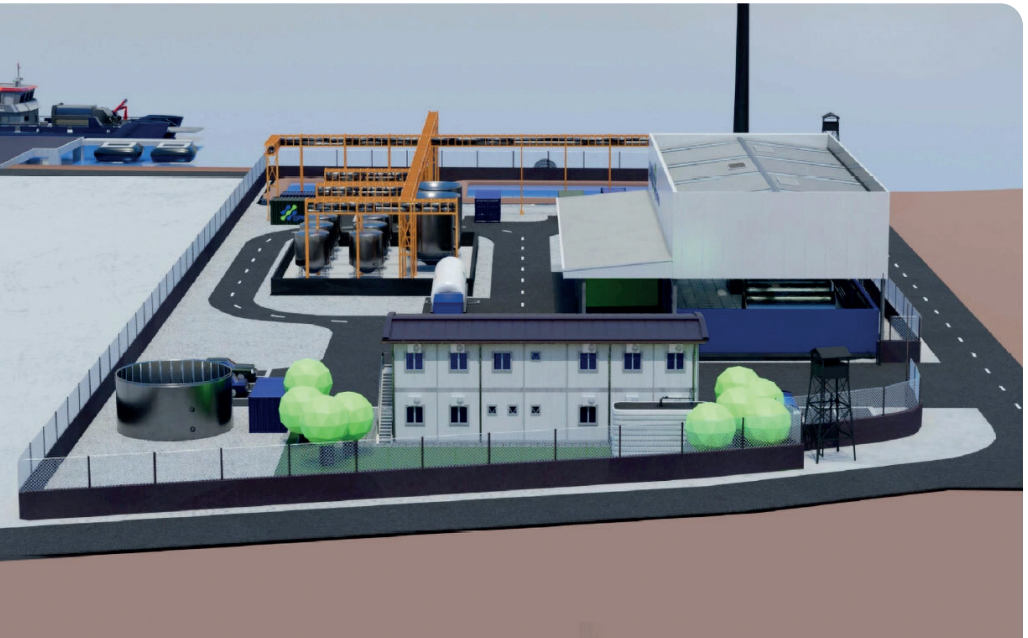


### Solution

M-EBS + M-DAF + M-STU + M-BOILER + M-SCRUB + M-CARBON + M-LAB + M-CONTROL + TANKS (stainless steel or fiberglass)

# Bangladesh: Mongla Port a Lamor MARPOL reference project for port waste management and oil spill response

Lamor is one of the world's leading providers of environmental solutions. For four decades, we have worked to clean up and prevent environmental incidents on land and at sea.



## Lamor and Greenflow deliver the technology needed to succeed in this mission, including:

- Port reception facility for handling the waste, with specialized technologies for both processing emulsion, water and sediment separation, and a 2-reactor biotreatment system for sewage
- Oil spill response technology
- Vessel fleet to collect the waste from ships and to respond to oil spills

## Plant with a modular concept scalable for future expansion



A MARPOL vessel to  
collect waste offshore

60 cum of oily waste  
20 cum of solid waste with  
segregations and compactor/crane



PRF Treatment unit for  
oily residues

20.000 MT/year



PRF Treatment unit for  
sewage water

5.000 MT/year



PRF Treatment unit for  
garbage and solids

500 MT/year



# Mongla Port PRF residuals



Treated water - 85%

- Water fulfilling the European standards to be delivered in river waters



Recovered fuel - 12%

- To be used as energy source inside the PRF
- To be sold to industries



Ashes from the incineration unit - 3%

- As a result of the incineration process, a small amount of ashes is produced



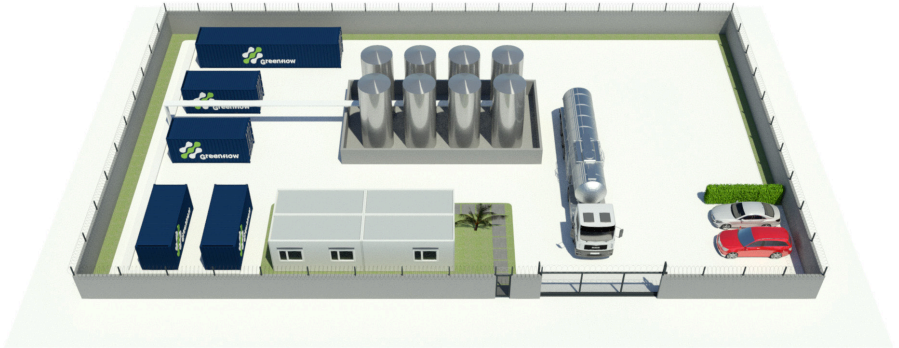
Exhaust gases

- To avoid any further pollution, all produced wastes and all solid waste coming from ships are incinerated with a specific treatment of the exhaust gases within EU standards for special areas





## Example of PRF layout





**“By combining Lamor and Greenflow’s business coverage, technologies, and expertise, we can reach more ports and authorities to address their needs and collaboratively solve their challenges, helping them achieve MARPOL compliance.**

**There are still hundreds of ports worldwide inadequately equipped to combat pollution. Lamor and Greenflow share the goal of equipping these ports with MARPOL-level waste management, securing the well-being of marine life and natural habitats.”**



Watch video about Lamor and Greenflow establishment plans of Port Reception Facility at Mongla port, Bangladesh



Watch and overview of Lamor's Marpol Port Reception Facility



# LAMOR

Let's clean the world

## Lamor in brief

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Lamor is one of the world's leading providers of environmental solutions. For four decades, we have worked to clean up and prevent environmental incidents on land and at sea.

Environmental protection, soil remediation and material recycling: Our innovative technologies, services and tailored solutions, ranging from oil spill response, waste management and water treatment to soil remediation and plastic recycling, benefit customers and environments all over the world. We are capable of vast and fast operations thanks to our connected ecosystem of local partners, steered by our experts. Lamor's share is listed on the Nasdaq Helsinki (ticker: LAMOR). Further information: [www.lamor.com](http://www.lamor.com)

## Greenflow in brief

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Greenflow is a Group of companies with a highly experienced team in waste management, maritime activities, recycled products and the supply of chemicals at an international level.

We are an Engineering, Marine and Chemical company, specialized in providing a tailor made solution for waste management, waste treatment, and supplying chemicals to ensure the success of our treatments. Further information: [www.greenflow.pt](http://www.greenflow.pt)

