



VMS: Environmental Service Brochure

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VMS: Environmental Service
Brochure

Varuna Marine Services B.V.



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1.0 REVISION HISTORY

Date	Version No	Created By	Approved By	Description
09/03/2026	1.0	Alisha Shaikh	Sanjeev Wewerinke-Singh	Initial Document
06/06/2026	1.1	Alisha Shaikh	Sanjeev Wewerinke-Singh	updated with new legislation

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2.0 VMS AT GLANCE

Varuna Marine Services B.V. founded in May 2020 by a career seafarer and maritime expert (with deep industry experience), and its Managing Director is Sanjeev Wewerinke-Singh. It is a Netherlands, Duivendrecht-based innovative maritime solutions provider, dedicated to delivering timely, cost-effective services offering technical, regulatory, environmental, and digital services to the global shipping industry that meet the dynamic needs of the Global maritime industry. It helps ship owners, operators, and managers; navigate complex maritime environmental compliance and operational challenges with practical, cost-efficient, and reliable support.

Varuna Marine Services offers a broad suite of Environmental Compliance and management maritime services like IMO D2 Ballast water management and advisory, Vessel General Permit USCG compliance, Inventory of Hazardous Materials (IHM) lifecycle maintenance, Asbestos removal and management planning,

VMS Varuna operates globally, serving clients across Europe, Asia, Middle East, Africa, and the Americas with local partners and service networks.

How Varuna Marine Services Makes a Difference

At VMS, we pride ourselves on offering practical, client-focused solutions that make a lasting impact on the maritime industry. Our unique approach combines:

- **Technical Expertise:** Leveraging a team of former seafarers and marine surveyors who bring firsthand maritime experience.
- **Regulatory Mastery:** Helping clients navigate and stay compliant with ever-evolving maritime laws and environmental regulations.
- **Digital Innovation:** Offering cutting-edge cybersecurity and vessel digitalization services to support the modernization of maritime operations.
- **Cost-efficient Solutions:** Tailored to meet the specific needs of ship sizes, fleets, and operational requirements.

This seamless integration of maritime expertise and modern technology not only helps clients reduce compliance risks but also streamlines reporting, optimizes operational performance, and facilitates smooth transitions into industry shifts such as decarbonization and digital transformation. As passionate environmentalists, we are committed to supporting sustainable practices that reduce our environmental impact while helping our clients embrace green initiatives for a more sustainable future.

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3.0 TECHNICAL PROPOSAL : WATER TESTING SERVICES OF VMS

3.1 IMO D2: BALLAST WATER COMMISSION TESTING

Varuna Marine Services offers comprehensive ballast water testing services for both commissioning and due diligence compliance, aligned with BWM.2/Circ.61, BWM.2/Circ.70/Rev.1 and (G2) [MEPC 58/23, Annex 3, 6.2] of the BWM Convention. Our services include:

- ❖ **Sample Collection:** Ballast water samples are collected from Ballast Water Tanks, or discharge lines, utilizing isokinetic sampling methods as outlined in Res. MEPC 173 (58) BW sampling and analysis Guidelines (G2). For new installations, our procedures align with BWM.2/Circ.70 or Circ.70/Rev.1, in accordance with flag state requirements.
- ❖ **Sample Preservation:** Proper preservation techniques are applied to ensure sample integrity.
- ❖ **Analysis:** We conduct
 - a. Indicative analysis specified in IMO BWM.2/Circ.42/Rev.2 and IMO D-2 Discharge Performance Standard ($\geq 50 \mu\text{m}$ and $10\text{-}50 \mu\text{m}$ organisms)
 - b. Detailed analysis using methods specified in IMO BWM.2/Circ.42/Rev.2, employing Compliance Monitoring Devices or microscopy for organism counts. Tests may include (but are not limited to):

Organisms as per the IMO D-2 Discharge Performance Standard ($\geq 50 \mu\text{m}$ and $\geq 10 \mu\text{m}$ organisms, and indicator microbes such as *Vibrio cholerae*, *E. coli*, and *Enterococci*).

Total Residual Oxidants (TRO) and UV Intensity/UV Transmittance measurements.

Our methods ensure that all discharged ballast water meets international compliance standards. Detailed reports, including lab results, sample preservation data, and compliance assessments, are provided for verification of compliance with D-2 standards under the BWM Convention.

3.2 IMO EXHAUST GAS SCRUBBER WASH WATER TESTING

The testing offer is applicable in reference to IMO MEPC 340(77) section 10 and it includes:

- ❖ **Sample collection:** for each engine fitted with a scrubber, permit requires for samples to be collected at the following three locations: Inlet Seawater, Outlet and Overboard Discharge.
- ❖ **Sample preservation:** Shipboard personnel can collect samples with bottles and preservatives provided by Varuna Marine Services.
- ❖ **Contents of VMS sampling Kit:**
 - Glassware/bottles and preservatives
 - Miscellaneous sampling items like filters, beakers and syringe cartridge.
 - Sampling procedures
 - Chain of Custody forms
 - Engine performance recording form
- ❖ **Testing Parameters:**
 - PH: SM 4500-H B (Field Test – within 15 min from sampling)
 - Turbidity: EPA 180.1 / ISO 7027
 - PAHs: EPA Methods 550.1, 610, 625, 8100, 8270c, 8310
 - Nitrate and Nitrite: EPA Method 353.2



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- Total Metals: EPA Methods 200.8 or 200.9
- Dissolved Metals: EPA Methods 200.8 or 200.9
- Total Residual Oxidants and Chlorine (TRO): EPA Method 330.5 7393-2 (monitor to know if preservation is necessary in case of PAHs testing)
- Hydrocarbon oil index (HOI): ISO 9377-2

3.3 USEPA VGP WATER TESTING

EPA states that the 2013 VGP provisions remain in effect as interim requirements until both EPA and USCG VIDA regulations are final, effective, and enforceable.

A. BALLAST WATER TESTING

The testing offer is applicable to the US-EPA Vessel General Permit requirements and concerns all ballast water management systems (BWMS), and it includes:

- ❖ **Sampling:** Collect samples from ballast water discharge points.
- ❖ **Biological testing parameters Mandatory For all types for BWTS:**
Tested once annually.
E. coli and Enterococci levels must comply with VGP standards and Total Heterotrophic Bacteria must be monitored.
- ❖ **Chemical Analysis (VGP Section 2.2.3.5.1.1.5.2 “Residual Biocides and Biocide Derivative**

Monitoring Requirements: pH, Total Residual oxidizers, Total Residual Chlorine, Chlorite, Chlorate, Total trihalomethanes. Haloacetic Acid, Bromate, Bromoform, peracetic acid, Hydrogen Peroxide (Chemical parameters are based on the type of BWTS) and are tested twice annually.
- ❖ **Holding Time:** Biological analyses must be performed within 8 hours of collection and Chemical analysis within 14-28 days depending on the analyte.
- ❖ **Test Methods:** EPA-approved and equivalent methods suggested by VGP/Code of Federal Regulation
 - Total Heterotrophic Bacteria: SM 9215 / ASTM D5465 / ISO 6222
 - E. Coli: EPA 1103.1 and 1603 / SM 9223B / ASTM D5392-93 / ISO 9308-1 / Colilert
 - Enterococci: EPA 1106.1 and 1600 / SM 9230 C / ASTM D5259-92) / ISO 7899-2 / Enterolert).
 - Total Residual Oxidizers as Cl₂ (instantaneous maximum): SM 4500-Cl G / ISO 7393/2 (**Field Test - within 15 min from sampling**)
 - PH: SM 4500 H⁺ or Equivalent (**Field Test - within 15 min from sampling**)
 - Chlorite: EPA 300.1 (**Holding Time: 14 Days**)
 - Chlorate: EPA 300.1 (**Holding Time: 28 Days**)
 - Bromate: EPA 300.1 (**Holding Time: 28 Days**)
 - Total trihalomethanes: EPA 8260 (**Holding Time: 14 Days**)
 - Bromoform: EPA 8260 (**Holding Time: 14 Days**)
 - Haloacetic acids: EPA 552.2 (**Holding Time: 14 Days**)
 - Peracetic acid: Photometric analysis (**test as soon as possible**)
 - Hydrogen Peroxide: ASTM D4991-13 (**test as soon as possible**)

NOTE: The parameters to be tested differ depending on the type of BWMS:

- Electrochlorination/ Chlorine dioxide /Electrolysis based: Biological parameters + TRO as Cl₂, Chlorite, Chlorate, Total trihalomethanes, Haloacetic acids.

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- Ozonation based: Biological parameters + TRO as Cl₂, Bromate, Total trihalomethanes, Bromoform, Haloacetic acids.
- Peratic Acid based system: Biological parameters + pH, Peratic acid, Hydrogen Peroxide

B. BILGE WATER

The testing offer is applicable to the US-EPA Vessel General Permit Section 2.2.2.1 requirements and concerns all new-build vessels built after Dec. 19, 2013, greater than 400 GT, that may discharge bilgewater into waters subject to the permit. and it includes:

Sample collection

- ❖ Sample preservation
- ❖ **Testing Parameters:**
Tested atleast once annually
 - Oil & Grease by EPA-1664A method OR Hydrocarbon Oil Index ISO 9377
 - Record of reading of Oil Content Meter (OCM) from Oily Water Separator (OWS)

C. GRAY WATER

The testing offer is applicable to the US-EPA Vessel General Permit Section 2.2.15.2 requirements and concerns vessels discharge graywater into waters subject to this permit, and it includes:

- ❖ Sample collection
- ❖ Preservation
- ❖ **Testing Parameters:**
2 samples are to be taken, 14 days apart.
 - BOD: SM 5210 B / EN 1899-1
 - Fecal Coliform/ E.Coli: SM 9221 E / Colilert 18, Quanti-Tray **NOTE: 8 hours maximum holding time for microbiological parameters** (USA 40 CFR Part 136)
 - Total Suspended Solids, SM 2540 D / EN 872
 - pH, SM 4500-H+ (**Field Test – within 15 min from sampling**)
 - Total Residual Chlorine, SM 4500-Cl G / EN ISO 7393-2 (**Field Test – within 15min from sampling**)

D. SEWAGE WATER + SEWAGE WATER CO MINGLED WITH GRAY WATER

The testing offer is applicable for due diligence compliance tests for commingled graywater/sewage, which must meet applicable graywater limits and sewage requirements under CWA section 312, 40 CFR Part 140, and 33 CFR Part 159 and it includes:

- ❖ Sample Collection
- ❖ **Testing Parameters:**
 - BOD: SM 5210 B / EN 1899-1
 - Fecal Coliform/ E.Coli: SM 9221 E / Colilert 18, Quanti-Tray **NOTE: 8 hours maximum holding time for microbiological parameters** (USA 40 CFR Part 136)
 - Total Suspended Solids, SM 2540 D / EN 872
 - pH, SM 4500-H+ (**Field Test – within 15 min from sampling**)
 - Total Residual Chlorine, SM 4500-Cl G / EN ISO 7393-2 (**Field Test – within 15min from sampling**)



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E. EXHAUST GAS SCRUBBER WASH WATER

The testing offer is applicable to the US-EPA Vessel General Permit requirements under Section 2.2.26.1 and it includes: ▪

- ❖ **Sample collection:** for each engine fitted with a scrubber, permit requires for samples to be collected at the following three locations: Inlet Seawater, Outlet and Overboard Discharge.
- ❖ **Sample preservation:** Shipboard personnel can collect samples with bottles and preservatives provided by Varuna Marine Services.
- ❖ **Contents of VMS sampling Kit:**
 - Cooling boxes and cooling devices
 - Glassware/bottles and preservatives
 - Sampling procedures
 - Chain of Custody forms
 - Engine performance recording form
- ❖ **Testing Parameters:**
 - PH: SM 4500-H B (**Field Test – within 15 min from sampling**)
 - Turbidity: EPA 180.1 / ISO 7027
 - PAHs: EPA Methods 550.1, 610, 625, 8100, 8270c, 8310
 - Nitrate and Nitrite: EPA Method 353.2
 - Total Metals: EPA Methods 200.8 or 200.9
 - Dissolved Metals: EPA Methods 200.8 or 200.9
 - Total Residual Oxidants and Chlorine (TRO): EPA Method 330.5 7393-2 (monitor to know if preservation is necessary in case of PAHs testing)

3.4 WHO DRINKING WATER TESTING

The testing offer is applicable to the WHO Guidelines for Drinking-water Quality Ed.4th and WHO Ship Sanitation 2011 Rule edition 3rd and it includes:

- ❖ **Sample collection**
- ❖ **Sample preservation.**
- ❖ **Testing Parameters:**

PH (Field test withing 15 minutes)	Conductivity
Free residual Chlorine (as Cl ₂) (Field test withing 15 minutes)	Lead
Temperature (Field test withing 15 minutes)	Copper
Colour	Cadmium
Legionella (only if temperature is above 25°C)	Nickel
Thermotolerant (Fecal) Coliforms/ E. coli	Iron
Heterotrophic Plate count @ 22°C @ 37°C	Zinc
Total Hardness as CaCO ₃	Chlorine Di Oxide
Turbidity	

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4.0 TECHNICAL PROPOSAL :FIREFIGHTING FOAM TESTING SERVICES OF VMS

4.1 IMO FIREFIGHTING FOAM TESTING

A. PFOS ANALYSIS

The testing offer is applicable to the IMO's requirements under MSC.532(107) requiring the PFOS to be less than 10mg/kg and it includes:

- ❖ **Testing applicability:** foams of fixed firefighting system and portable extinguishers/cans.
- ❖ **Sample Collection:** The Samples are collected in specialized PFAS free certified sampling bottles to avoid cross contamination and provide accurate results
- ❖ **Testing Parameters:** PFOS: Preferred method LC-MS/MS or equivalent method considering sensitivity.

Note: If the PFOS content in the Foam sample is found above the threshold; Check section 4.3 of this document

VMS can assist with

1. Fixed tank Cleaning and removal of foam , Disposing the positive foam at hazardous waste management facility, refilling the tank with Certified PFAS free firefighting foam.
2. Portable fire extinguishers/cans can be replaced with Certified PFAS free foams

B. FIREFIGHTING FOAM PERFORMANCE ANALYSIS

The testing offer is applicable to the IMO's requirements under MSC.1/CIRC.1312. It is a test that check for the foam's ability to perform in case of fire emergencies.

- ❖ **Applicability:**
 - **Foam Concentrate of fixed firefighting systems** including Low & High expansion systems, including Alcohol resistant foams.
 - **Tankers:** by SOLAS regulations II-2/10.8 and chapter 14 of the International Code for Fire Safety Systems (FSS Code)
 - **Chemical tankers:** as specified by SOLAS regulation II-2/1.6.2.1.2 and the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code)
 - **Foam concentrates for fixed foam fire-extinguishing systems in machinery spaces** according to chapter 6 of the FSS Code and to portable foam applicators according to chapter 4 of the FSS Code.
- ❖ **Sample Collection**
- ❖ **Testing Parameters:** Sediment content, pH, Expansion ratio, Drainage time, Volumic mass, Small scale fire test and chemical stability.

Note: If the Foam sample is found to be failing the performance test, it will be considered inefficient to control real case fire; Check section 4.3 of this document

VMS can assist with

1. Fixed tank Cleaning and removal of foam , Disposing the positive foam at hazardous waste management facility, refilling the tank with Certified PFAS free firefighting foam.
2. Portable fire extinguishers/cans can be replaced with Certified PFAS free foams



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4.2 EU FIREFIGHTING FOAM TESTING

The testing offer is applicable to the EU's requirements under EU Regulation 2025/1988. REACH Annex XVII, Entry 82.

- ❖ **KEY LEGAL REQUIREMENT OF REGULATION 2025/1988**
 - Maximum allowed PFAS concentration: ≤ 1 mg/L (sum of all PFAS) in firefighting foams (Applicable to Fixed and portable firefighting foam systems)
 - ≤ 50 mg/L for cleaned Fixed firefighting foams systems.
 - Foams exceeding this limit are restricted and subject to phase-out deadlines.
- ❖ **Applicability:**
 - The regulation applies to: All vessels (EU and non-EU flagged) calling at or operating in EU ports or waters.
 - All vessel types and sizes, including commercial, offshore, and military vessels
- ❖ **Deadline for shipping Sector**

Application	Last Legal Use
Fixed foam systems installed before 23-10-2025	23 Oct 2035
Portable foam extinguishers	31 Dec 2030
Training & testing foam use	23 Apr 2027 (use prohibited)
New PFAS foam installations after 23-10-2025	✗Immediately prohibited

Important: Civil ships receive the longest derogation (2035) for fixed systems only.

Note: If the All PFAS content in the Foam sample is found above the threshold; Check section 4.3 of this document.
Isolate e and Label foam: “WARNING: Contains PFAS ≥ 1 mg/L”

VMS can assist with

1. Fixed tank Cleaning and removal of foam, Disposing the positive foam at hazardous waste management facility, refilling the tank with Certified PFAS free firefighting foam.
2. Portable fire extinguishers/cans can be replaced with Certified PFAS free foams

4.3 PFAS FOAM REMOVAL AND REPLACEMENT PACKAGE

When the PFAS Containing foam is from Portable extinguishers, VMS can assist in replacing the foam with PFAS free or fluorine free extinguishers/ cans/ drums etc.

When the PFAS containing foam is from a fixed firefighting system of the vessel, below mentioned services are offered by VMS:

A. REMOVING AND DISPOSING THE PFAS CONTAINING FOAM FROM FIXED FIREFIGHTING SYSTEM

Involves the careful removal of firefighting foam that contains PFAS (Per- and Polyfluoroalkyl Substances) from the firefighting foam system. Once removed, the foam is transported and disposed of in accordance with hazardous waste management regulations. The disposal process ensures that the foam is handled and processed at certified hazardous waste facilities, mitigating any potential contamination and ensuring compliance with environmental standards.

B. CLEANING THE FIXED TANK THAT CONTAINED PFAS CONTAINING FOAM

After the PFAS-containing foam is removed, the next service is the cleaning of the fixed firefighting foam tanks that previously contained the hazardous foam. This involves thorough washing and decontamination of the tanks to ensure no residual foam or PFAS substances remain. Specialized equipment and cleaning agents are used to remove any contaminants, ensuring that the tanks are free from chemical residues. This cleaning process ensures that the tanks are

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properly prepared for the next step, preventing cross-contamination when refilled with PFAS-free foam.

C. REFILLING THE FIXED FIREFIGHTING SYSTEM WITH PFAS FREE FIREFIGHTING FOAM

The final service is the refilling of the fixed firefighting foam system with PFAS-free firefighting foam. This foam is designed to meet all the regulatory and safety standards while eliminating the harmful PFAS chemicals. The use of PFAS-free foam not only ensures compliance with environmental regulations, but it also promotes safety and environmental responsibility, contributing to a safer, cleaner system for firefighting operations.

5.0 TECHNICAL PROPOSAL : MISCELLANEOUS SERVICES OF VMS

5.1 INVENTORY OF HAZARDOUS MATERIALS (IHM)

The Inventory of Hazardous Materials (IHM) is a document that identifies and records all hazardous materials present onboard a vessel, including their location, quantity, and condition.

It is a mandatory requirement under the It is mandatory under Hong Kong Convention (HKC) SR/CONF/45, Guidelines for IHM under MEPC.379(80) as amended by **MEPC.405(83)** and EU Ship Recycling Regulation EC No. 1257/2013 to ensure safe ship operation, environmentally sound recycling, to protect crew.

❖ Applicability:

- Mandatory for all ships and rigs ≥ 500 GT
- Required for: EU-flagged ships and Non-EU ships calling EU ports

❖ Parts of IHM covered by VMS:

Part 1: Recording Materials onboard (During Construction or Operational Phase):

Covers materials in ship structure, ship equipment, and systems, and the systems that are required during ship operation.

These materials include, but are not limited to, asbestos, polychlorinated biphenyls (PCBs), ozone-depleting substances (ODS), antifouling compounds (TBT), heavy metals (lead, mercury, cadmium), PFOS from the firefighting foam.

Note: (Most operating vessels require Part I only.)

Part 2: Documenting Operationally Generated Waste (Before Scrapping the vessel)

Required before recycling. Lists Waste accumulated during ship's operation

Part 3: Listing materials in stores (Before Scrapping the vessel)

This is to make list of remaining consumables and stores before recycling

❖ IHM Deadlines

- **HKC (IMO Hong Kong Convention) effective:** 26 June 2025
- **Existing ships ≥ 500 GT:** IHM Part I approved & certified **by 26 June 2030 or before recycling**, whichever is earlier
- **EU SRR (EU Ship Recycling Regulation):** Applicable to ships trading to EU ports **since 31 Dec 2020**
- **New ships contracted ≥ 26 June 2025:** IHM Part I required **upon delivery**
-

❖ Part 1 Parameters:

- **According to Annex I EU SSR, Appendix 1 HKC and Table A Res.MEPC 379(80)** as amended by



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MEPC.405(83), prohibited hazardous substances: asbestos, ozone-depleting substances, polychlorinated biphenyls, anti-fouling systems containing organotin, anti-fouling systems containing cybutryne, polyfluoroalkyl sulfonic acids

- **According to Annex 2 EU SSR, Appendix 2 to the HHKC and Table B, MEPC 379(80)** as amended by **MEPC.405(83)**: cadmium and cadmium compounds, hexavalent chromium and hexavalent chromium compounds, lead and lead compounds, mercury and mercury compounds, polybrominated biphenyls, polybrominated diphenyl ethers, polychlorinated naphthalene, radioactive substances, certain short-chain chlorinated paraffins, alkanes C10-C13-chloro, brominated flame retardant HBCD.

❖ Complete service overview:

VMS provide end-to-end IHM solutions, including:

- IHM documentation preparation
- Onboard visual inspection
- Sampling & laboratory analysis (ISO/IEC 17025)
- Hazardous material mapping & location plans
- IHM Part I report issuance
- IHM maintenance & updates
- IHM for: New buildings, Existing vessels and Ships ready for recycling

❖ Our IHM Process flow:

- Document Collection & Review
- Onboard Survey & Visual Inspection
- Sampling by Authorized Technicians
- Laboratory Testing
- Risk Assessment & Material Declaration
- IHM Report Preparation
- Client Review & Final Submission to make the vessel *Clear, transparent, and audit-ready*.

Note: (If during Part 1 of the IHM, Asbestos is found to be present, VMS can provide Asbestos removal service. Refer to section 5.2)

5.2 ASBESTOS REMOVAL

Asbestos is a hazardous material commonly found on older vessels in insulation, gaskets, flooring, fire doors, and machinery components. When disturbed, asbestos fibers become airborne and pose **serious health risks**. It is important to remove asbestos as it is strictly regulated under International Maritime Regulations, Hong Kong Convention (HKC) SR/CONF/45, Guidelines for IHM under MEPC 269(68) and EU Ship Recycling Regulation EC No. 1257/2013.

VMS Carries our Asbestos Removal post testing and also for independent fleets.

❖ Complete service overview:

We provide complete asbestos management solutions, including:

- Asbestos identification/pre-removal Survey & risk assessment (based on IHM)
- Removal planning and Permits
- Area Isolation & Containment
- Certified asbestos removal technicians
- Air monitoring & clearance testing
- Decontamination and Cleaning
- Safe packaging, labeling & containment
- Approved disposal at licensed facilities

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- Post-removal clearance certification
- Final Clearance & Certification

(All steps carried out under strict safety protocols.)

6.0 TRACEABILITY OF REPORTS

All onboard testing is meticulously documented using chain-of-custody forms, signed and stamped by the crew, ensuring full traceability. Our analyses are conducted with calibrated equipment, brought onboard by our certified VMS Inspectors. Each report includes a PDF that details:

- Our Chain of custody and field test form
- IMO number of the vessel
- Name of the vessel
- Service being carried out
- Date and time of the sampling
- Exact location of the sampling
- Sample collector information (Name, email and phone number)
- Sample shipment details.
- Sample receiver's information (Name, date of receipt, time of reception, email, phone number)
- Sample detailed description (sample number, sampling date and time, vessel or ambient source information, discharge types, field test pH and field test TRC/TRO, preservation used and detailed testing parameter based on the type of effluent that is being tested.)
- Sample collector's signature, receiver's signature, and the vessel's stamp or vessel master's signature.)
- In case of the ballast water testing : (BWTS maker and model, technology used, commencement of sampling and completion of sampling with exact sampling port or location on board)
- Ship name and IMO number
- Sampling date, port, and time
- Test methods used
- Analysis results
- Statement of compliance with applicable regulatory limits.

This process ensures the highest standards of accuracy, reliability, and compliance for all services provided.



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7.0 OVERVIEW OF VMS PORT NETWORK CAPABILITIES

This section provides a global overview of marine environmental compliance services available across approximately 317 ports worldwide from Varuna Marine Services. (subject to local partner/laboratory availability and port access conditions). It outlines the availability of various environmental monitoring and laboratory testing services required for maritime regulatory compliance, including sampling activities, ballast water biological and chemical monitoring, bilge water analysis, gray water and sewage (black water) testing, fresh water analysis, scrubber washwater analysis, foam testing, and IMO D2 ballast water performance testing. The data indicates that most services are widely available across 240–260 ports, demonstrating strong operational coverage for environmental monitoring activities, while IMO D2 testing is available at a smaller number of specialized ports due to specific laboratory requirements. Overall, the sheet functions as a service availability matrix, helping organizations quickly identify which environmental compliance services can be performed at specific ports to meet US EPA VGP, IMO, and MEPC environmental regulations.



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8.0 TERMS AND CONDITIONS

The complete Terms and Conditions governing the use of our services/products are available on our official website. Please refer to the link below to review the latest version:

[General Terms & Conditions - Varuna Marine Services](#)

9.0 UPCOMING UPDATES

MEPC 84 Outcomes and Pending Regulatory Updates

This section summarizes the key water-related regulatory developments discussed during MEPC 84, with specific focus on ballast water management, Regulation D-2 compliance, active-substance monitoring, bilge water treatment, and exhaust gas cleaning system washwater.

The updates do not replace the existing IMO requirements already in force, but they indicate the upcoming regulatory direction toward stronger system verification, periodic monitoring, improved recordkeeping, and clearer survey requirements. Where amendments have been approved but not yet formally adopted or entered into force, they are identified as pending updates and shall be monitored until final IMO adoption and implementation dates are confirmed.

Discharge / Area	MEPC 84 Update – What is changing	Status / Effective Date
Ballast Water – IMO D-2 Biological Standard	The D-2 biological limits are not changed by MEPC 84. The existing D-2 limits for viable organisms and indicator microbes continue to apply. The change is mainly in stronger verification, maintenance, survey and documentation requirements for the Ballast Water Management System (BWMS).	Existing D-2 compliance is already mandatory. MEPC 84 amendments are approved but expected to be formally adopted at MEPC 85. Entry-into-force date is not yet stated in the brief.
Ballast Water – D-2 Testing / Analysis Frequency	Annual biological verification now clarified for BWMS; includes commissioning tests, maintenance verification, and annual sampling of residual active substances for active-substance BWMS. The frequency shown is: 1) commissioning testing when BWMS is installed or where required after major change; 2) annual survey verification of BWMS maintenance; 3) annual sampling of residual active substances only for BWMS using active substances; and 4) intermediate/renewal survey verification that BWMS is installed and achieves Regulation D-2.	Commissioning testing is already in force since 1 June 2022. MEPC 84 annual active-substance sampling and strengthened Regulation E-1 survey requirements are approved but pending adoption and entry into force.
Ballast Water – BWMS using Active Substances / MADC	MEPC 84 amends Regulation D-2 to require that BWMS using active substances must not discharge above the Maximum Allowable	MADC already existed under IMO active-substance approval practice, especially G9. MEPC 84 brings the

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	Discharge Concentration (MADC). This is not one universal IMO limit. The relevant active substance and MADC must be checked from the specific BWMS Type Approval Certificate, IMO Final Approval documentation and manufacturer's OMSM.	requirement more directly into Regulation D-2. Approved but pending formal adoption and entry into force.		
Ballast Water – List of Active Substances and Limits	MEPC 84 does not publish a general list of substances and limits for all systems. Examples of active-substance technologies may include electrolysis/TRO-based systems, ozone systems, peracetic acid systems and similar approved technologies. However, the actual limit is system-specific and must be verified against the vessel's installed BWMS documents.	Existing requirement under BWMS approval framework. For manual use, state: "MADC shall be as per BWMS Type Approval Certificate / Final Approval / OMSM."		
Ballast Water Survey – Regulation E-1	Regulation E-1 is being strengthened. Renewal and intermediate surveys must verify that the BWMS is properly installed and achieves Regulation D-2. Annual surveys must confirm required maintenance through the Ballast Water Record Book or equivalent records and include annual sampling of residual active substances where applicable.	Approved at MEPC 84. Expected adoption at MEPC 85. Entry-into-force date not yet provided.		
Ballast Water Management Plan – BWMP / 2026 G4 Guidelines	MEPC 84 adopted the 2026 G4 Guidelines. The BWMP must be more ship-specific and include BWMS approval/operational status, maintenance procedures, OMSM reference, safe ballast exchange procedures, contingency measures, challenging water quality procedures and, where applicable, procedures for temporary storage of treated sewage/grey water in ballast tanks.	2026 G4 Guidelines adopted. Existing G4 revocation and mandatory use of the revised format will align with entry into force of BWM Convention amendments.		
Ballast Water Record Book – BWRB Maintenance Log	The BWRB must include a BWMS maintenance log or refer to an equivalent maintenance recording system. This must record planned/unplanned maintenance and repairs as per OMSM and manufacturer's schedule.	Approved at MEPC 84. Expected adoption at MEPC 85. Entry-into-force date not yet provided.		
Ballast Water – Challenging Water Quality / Contingency Measures	MEPC 84 adds clearer legal basis for dealing with situations where the BWMS cannot operate normally due to challenging water quality. The BWMP must include contingency procedures, and Regulation A-3 is amended to allow certain unmanaged or partially managed ballast water discharge in defined cases, subject to IMO/flag/port State requirements.	Approved at MEPC 84. Expected adoption at MEPC 85. Entry-into-force date not yet provided. Related BWMS Code amendments are still under development.		
Ballast Water – BWMS Code Amendments	The BWMS Code amendments are not finalized yet . Future changes may include stricter type-approval testing under challenging water quality, higher	Not adopted yet. Progress expected at MEPC 85, with further report/work at MEPC 86.		

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	TSS/DOC/POC/organism-load testing, reliability/endurance criteria, TRC limitation based on demonstrated performance, and standardized test-water composition.			
Bilge Water – Integrated Bilge Water Treatment System (IBTS)	MEPC 84 approved draft MARPOL Annex I amendments introducing new Regulation 12B for ships fitted with IBTS. It allows controlled handling/disposal routes including forced evaporation of oily bilge water. IOPP Certificate and Oil Record Book entries will also be updated.	Approved with view to adoption at MEPC 85. No final entry-into-force date yet. Application will depend on ship construction/delivery date and IBTS installation date after entry into force.		
Bilge Water – Forced Evaporation / ORB Entries	The 2026 IBTS Guidelines include definitions for IBTS, forced evaporation and oily bilge water service tanks. They also include forced evaporation requirements, including a maximum oily bilge water temperature of 105°C in the relevant service tank, and new Oil Record Book examples for forced evaporation.	Approved in principle, with final approval expected at MEPC 85 together with MARPOL Annex I amendments.		
Exhaust Gas Scrubber Washwater – EGCS Discharge Water	MEPC 84 did not adopt a new global EGCS washwater ban or a new universal discharge limit. IMO is still working on harmonized EGCS discharge-water regulations and scientific assessment. Member States are invited to report national/local restrictions through GISIS.	Under development. Target completion extended to 2027. Until then, vessels must follow flag, port, coastal-State and local EGCS washwater restrictions.		

ANNEX

ANNEX A. VMS Water testing work flow:

1. Initial Information Gathering

Vessel Sampling Questionnaire:

The process begins by gathering detailed information from the vessel master using the vessel's sampling questionnaire. This includes: Vessel name, Flag of the vessel, Classification society name, Vessel type, Gross tonnage, Port of registry, Manufacturer and model of the installed ballast water management system (BWMS), Type of BWMS technology used (e.g., UV, electrochlorination, etc.), Number of installed BWMS units, Date of BWMS installation Type of testing (biological or residual) to be conducted, Date and time of sampling, Ballast water commissioning status and Additional effluents for testing, as per VGP.

2. Partner Laboratory Selection

Laboratory Location: Once the required information is gathered, we determine the type of analysis requested by the client. Based on this, we locate a partner laboratory nearest to the sampling location to ensure that the sample holding time is not exceeded.

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3. Coordination with Vessel Agent

Agent Details: After receiving the agent details from the vessel master or owner, we initiate communication with the local agent to finalize boarding charges and obtain the necessary documents required for the technician's boarding.

4. BWMS Readiness Confirmation

Instructions to Vessel Crew: Once clearance is granted, we send a set of instructions and markers via email to the vessel to confirm the readiness of the BWMS. This ensures that the system is fully operational and prepared for sample collection.

5. Sample Collection

Technician Mobilization: Upon confirmation, we mobilize trained technicians to board the vessel at the scheduled time for sample collection. The samples are taken in the presence of the ship's master or crew, ensuring proper documentation.

Chain of Custody:

A chain of custody document is completed to indicate that the samples were collected and handled in the presence of authorized personnel.

6. Sample Testing and Analysis

Transport to Laboratory: The collected samples are then transported to the nearest partner laboratory, where testing begins. The laboratory tests typically take 3-4 weeks, depending on the nature of the analysis.

7. Final Report and Compliance Documentation

Compliance Reporting: After the laboratory completes the testing, the final results are reviewed, and a Vessel General Permit (VGP) compliance report is prepared based on the findings. This report is then shared with the client, ensuring compliance with the relevant ballast water regulations.

ANNEX B. Plan for Firefighting Foam testing

1. Initial information gathering

Confirm type of testing required: PFAS content testing (as per IMO Circular 532/107, EU Regulation 2025/1988), or Foam performance testing (as per MSC Circular 1312).

Collect background documents from client: Previous test reports (if available), MSDS / technical data sheet of the foam.

Identify system type: Fixed system or portable system. Confirm number of foam brands to be tested. Review storage conditions and feasibility of sampling. Confirm if vessel master can carry out sampling (for portable systems).

2. Sampling Coordination & Chain of Custody:

Receive local agent details from client.

Dispatch PFAS-free sampling bottles to the agent (for PFAS testing).

Agent hands over sampling bottles to the vessel master.

Issue Chain of Custody (COC) form including:

Vessel name & IMO number, Port and date of sampling, Vessel and laboratory contact details, Sample shipping and receiver information.



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COC includes sample description:

Type of test, Foam type and brand, Number of samples, Date and time of collection, Source of foam, Testing parameters.

Provide vessel master with: Safety sampling instructions, Packaging and labelling guidelines, Contamination prevention instructions.

3. Post Sampling:

Vessel master collects samples and takes photographs. Samples are handed over to the local agent., Sample Shipment to Laboratory. Agent packs samples as per provided instructions. Laboratory address and special shipping instructions are shared. Courier ships samples ensuring proper documentation and clearance.

4. Laboratory Testing

Laboratory receives samples and logs them against the COC.

Samples are analysed as per Regulatory requirements, and Testing scope mentioned in the COC.

5.Reporting & Compliance:

Laboratory issues official test report(s). Compliance report is prepared based on: Applicable regulations (IMO / EU / MSC).

6. Final deliverables are made to client: Laboratory test report(s) and Regulatory compliance statement

ANNEX C. Plan of action for IHM

1. Project Initiation & Planning:

Step 1- Receive client confirmation and vessel particulars (Name, IMO, Flag, Class, Year of Build).

Step 2- Define project scope as per: International Maritime Organization (IMO) guidelines, European Union Ship Recycling Regulation (EU SRR), International Association of Classification Societies (IACS) requirements

Step 3- Nominate Project Manager and Sampling Expert.

Issue document request list to vessel/owner. Document Collection & Desktop Review

Step 4- Obtain and review:

Vessel's specification

- General Arrangement
- Machinery Arrangement
- Equipment list deck and engine stating maker and type / model no.
- List of batteries with locations and number of battery.
- Accommodation Plan
- Fire Control Plan
- Fire Protection Plan
- Insulation Plan (Hull and Machinery) – colour version
- Paint scheme and MSDS for all the paints
- Manuals with material specification for ceilings, panels, deck coverings, doors and insulation – Accommodation and engine room.
- Document showing typical detail of joiner work.
- Arrangement of joiner material with fire protection plan
- Piping insulation specifications – Accommodation, deck and engine room
- MARPOL Annex VI compliance documentation (Ozone depleting substances) – IAPP certificate with Supplement

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- International Anti-Fouling System Certificate with supplement
- Refrigeration system specs (Ozone depleting substances) . Cold rooms insulation specification
- Lube oil chart and MSDS for all Lube and System Oil onboard.
- Anti-fouling Convention compliance documentation or TBT free certificates – AFS certificate
- Information from previous IHMs, green passports and/or asbestos certificates and other analysis from vessel or sister vessels (incl. machinery, equipment, materials, and coatings)

2. Execution

Prepare: Preliminary Hazardous Material Location List (HMLL) and Development of VSCP (Visual/Sampling Check Plan)

Identify: Areas for visual inspection, Areas requiring sampling, Potential ACM / PCB / ODS / TBT locations

Define: Sample numbers, Location references, Responsible surveyor, Submit VSCP to the client.

Onboard Survey Execution: Conduct onboard survey as per approved VSCP, Opening of accessible panels (with Master approval), Collection of representative samples, Photographic documentation, Marking sample locations on GA, Record inaccessible areas (if any)

Maintain: Proper sample labeling, Time Sheet, Safety procedures,

Laboratory Analysis: Dispatch samples to ISO/IEC 17025 accredited laboratory.

Test for: Asbestos, PCBs, ODS (where applicable). Organotin Compounds, Cybutryne, PFOS, Cadmium and compounds, Hexavalent Chromium and Compounds, Lead and Compounds, Mercury and Compounds, PBB, PBDE, PCN, Radioactive Substances, SCCPs, HBCDD

3. Review and verify laboratory results.

4. Preparation of IHM Part I Report

Prepare report in accordance with: IMO Guidelines (MEPC.379(80) – latest amendments), EU SRR (if applicable)

Include:

Table A – Materials contained in ship structure or equipment

Table B – Operationally generated wastes

Table C – Stores, Location diagrams, Sampling summary, Laboratory certificates, Statement of compliance

Internal Quality Review, Technical verification, Cross-check against VSCP, Ensure completeness of documentation

Table D - Regular consumable goods potentially containing hazardous materials (paints, cleaners, batteries, electronic items, etc.).

Tables A and B correspond to Part I; Table C corresponds to Parts II and III; Table D corresponds to Part III.

5. Management approval:

Submission to Client & Class, Submit to client, Address comments (if any)

6. Issue final IHM Part I

Coordinate with Classification Society for review/approval, Post-Approval Support, Assist during Class ,verification survey

Support in issuance of: International Certificate on Inventory of Hazardous Materials (ICIHM)

Maintain records for future updates.

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ANNEX D. Plan of action for Asbestos Removal

1. Pre-Removal Assessment

Review approved IHM Part I – Table A to identify ACM locations. Confirm laboratory test reports.

Identify:

Type of ACM (gasket, insulation, brake lining, packing, etc.), Quantity, Accessibility

Regulatory Compliance: Ensure compliance with: International Maritime Organization (IMO) guidelines, International Labour Organization (ILO) safety standards, Flag State requirements, Port State / local environmental regulations

Prepare: Obtain required permits before starting removal. Prepare Detailed Removal Method Statement, Job Safety Analysis (JSA), Risk Assessment, Emergency response plan, Waste disposal plan

Define: Work area, Isolation boundaries, Ventilation arrangements, Decontamination procedure, Isolation & Containment

Establish restricted work zone:

Shut down nearby ventilation.

Seal openings with plastic sheeting.

Install warning signage: “Danger – Asbestos Work in Progress”.

Provide negative pressure enclosure (if friable ACM).

Personal Protective Equipment (PPE)

All personnel must use: Disposable coveralls (Type 5/6), Nitrile gloves, Safety boots, Full-face respirator with P3 filter (or air-fed respirator if required)

Removal Procedure

Use wet removal method (suppress dust).

Avoid power tools that generate dust.

Carefully dismantle ACM components.

Do not break material unnecessarily.

Immediately place removed ACM into: Double asbestos-approved bags (labeled)

Clean area using: HEPA vacuum, Wet wiping method. Dispose contaminated PPE as asbestos waste.

Conduct air monitoring (if required by regulation).

Waste Handling & Disposal

Label waste as “Hazardous – Asbestos”.

Store temporarily in designated hazardous waste locker.

Dispose only through licensed hazardous waste contractor.

Obtain waste disposal certificate.

Post-Removal Documentation

Issue:

Asbestos Removal Report

Photographic evidence

Waste disposal certificate

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