MEDITERRANEAN ACTION PLAN (MAP)
REGIONAL MARINE POLLUTION EMERGENCY RESPONSE CENTRE FOR THE MEDITERRANEAN SEA (REMPEC)

Twelfth Meeting of the Focal Points of the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC)

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CONSULTANCY REPORT FOR THE DEVELOPMENT OF A QUALITY ASSURANCE PROGRAMME FOR DATA REPORTING AND COLLECTION, IN ACCORDANCE WITH ARTICLE 5 OF THE 2002 PREVENTION AND EMERGENCY PROTOCOL, AS WELL AS FOR THE DEVELOPMENT OF THE 2017 QUALITY STATUS REPORT (QSR2017) FOR THE MEDITERRANEAN

Note by the Secretariat

SUMMARY

Executive Summary: This document presents the Consultancy Report for the development of a quality assurance programme for data reporting and collection, in accordance with Article 5 of the 2002 Prevention and Emergency Protocol, as well as for the development of the 2017 Quality Status Report (QSR2017) for the Mediterranean.

Action to be taken: Paragraph 3

Related documents: REMPEC/WG.41/9

Background

1 As explained in document REMPEC/WG.41/9, with a view to complementing the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (IMAP) with elements corresponding to the shipping-related monitoring at regional level, consultancy services were provided to the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC) for the development of a quality assurance programme for data reporting and collection, in accordance with Article 5 of the Protocol concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea ("the 2002 Prevention and Emergency Protocol") as well as for the development of the 2017 Quality Status Report (QSR2017) for the Mediterranean, pursuant to the Programme of Work and Budget 2016-2017 of the Mediterranean Action Plan (MAP) of the United Nations Environment Programme (UN Environment), also referred to as UN Environment/MAP, adopted by the Nineteenth Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean ("the Barcelona Convention") and its Protocols (COP 19).

2 The Consultancy Report is presented in the Annex to the present document.

Action requested by the Meeting

3 **The Meeting is invited to take note** of the information provided in the present document.

ANNEX

Consultancy Report

for the development of a quality assurance programme for data reporting and collection, in accordance with Article 5 of the 2002 Prevention and Emergency Protocol

as well as

for the development of the 2017 Quality Status Report (QSR2017) for the Mediterranean

Development of a Quality Assurance Programme for Data Reporting and Collection, in accordance with Article 5 of the 2002 Prevention and Emergency Protocol

Development of the 2017 Quality Status Report for the Mediterranean

Consultancy Report

April 2017

Produced by Dr Lilia Khodjet El Khil, Consultant, for the UN Environment/MAP-Barcelona Convention Secretariat – MED POL in collaboration with REMPEC

Note:

This activity was undertaken to deliver one of the outputs (Output 2.4.1 "*National pollution and litter monitoring programmes updated to include the relevant pollution and litter MAP indicators, implemented and supported by data quality assurance and control*") of the UN Environment/MAP Programme of Work and Budget 2016-2017. This activity was financed by the European Union under the EcAp-MED II project (Output 1.2.4), which supports Southern Mediterranean Contracting Parties to the Barcelona Convention[1] in the establishment of new monitoring programmes.

[1] Algeria, Egypt, Israel, Libya, Lebanon, Morocco and Tunisia.

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Acronyms and Abbreviations

2002 Prevention and Emergency Protocol	Protocol concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combatting Pollution of the Mediterranean Sea
BAOAC	Bonn Agreement Oil Appearance Code
Barcelona Convention	Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean
BCRS	Barcelona Convention Reporting System
CBD	Convention on Biological Diversity
CI	Common Indicator
COR GEST	Correspondence Group on Good Environmental Status and Targets
COR MON	Correspondence Group on Monitoring
EcAp	Ecosystem Approach
EMSA	European Maritime Safety Agency
EO	Ecological Objective
GES	Good Environmental Status
GIS	Geographical Information System
GISIS	Global Integrated Shipping Information System
HNS	Hazardous and Noxious Substances
IBC Code	International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk Code
IGC Code	International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk Code
ILO	International Labour Organisation
IMAP	Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria
IMDG Code	International Maritime Dangerous Goods Code
IMO	International Maritime Organization
IMSBC Code	International Maritime Solid Bulk Cargoes Code

ITOPF	International Tanker Owners Pollution Federation Limited
MAP	Mediterranean Action Plan
MARPOL	International Convention for the Prevention of Pollution from Ships
MEDGIS-MAR	Mediterranean Integrated Geographical Information System on Marine Pollution Risk Assessment and Response
MED POL	Mediterranean Pollution Assessment and Control Programme
MLC	Maritime Labour Convention, 2006
NIS	Non-Indigenous Species
OPRC Convention	International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990
OPRC-HNS Protocol	Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000
PAP/RAC	Priority Actions Programme Regional Activity Centre
QSR2017	2017 Quality Status Report for the Mediterranean
R&D	Research and Development
Regional Activity Centre	RAC
Regional Strategy (2016-2021)	Regional Strategy for Prevention of and Response to Marine Pollution from Ships (2016-2021)
REMPEC	Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea
SPA/RAC	Regional Activity Centre for Specially Protected Areas
UN Environment	United Nations Environment Programme

1. Terms of Reference and Expected Outputs

The objective of the consultancy work is to support the UN Environment/MAP-Barcelona Convention Secretariat with the development of a quality assurance programme for data reporting and collection, in accordance with Article 5 of the 2002 Prevention and Emergency Protocol, with a view to complementing the IMAP with relevant elements corresponding to the shipping-related monitoring at regional level to implement the 2002 Prevention and Emergency Protocol and the Regional Strategy (2016-2021).

The original contract was amended in February 2017 to add additional consultancy work to support the UN Environment/MAP-Barcelona Convention Secretariat with the development of the QSR2017.

1.1 Tasks related to the Development of a Quality Assurance Programme for Data Reporting and Collection, in accordance with Article 5 of the 2002 Prevention and Emergency

The Terms of Reference for the consultancy identified the following outputs to be delivered by the Consultant:

1. *Detailed work plan and inception report,*
2. *List of monitoring obligations under the international regulations referred in paragraph 8 and 9 of the present ToR,*
3. *List of pollutants monitored in the context of the monitoring obligations referred in the expected output 2,*
4. *List of parameters monitored in the context of the monitoring obligations referred in the expected output 2,*
5. *List of the existing reporting procedures at international and regional level related to pollutants and parameters referred in the expected output 3 and 4, and*
6. *Matrix linking the above outputs to the relevant IMAP qualitative indicators and draft, where required the related fact sheets based on the agreed template between MED POL and REMPEC.*

1.2 Complementary Mandate: Development of the QSR2017

The Terms of Reference as amended reads:
In the context of the MAP Programme of Work (2016-2017), a Quality Status Report (QSR) for the Mediterranean is expected to be submitted to the 20th Meeting of the Contracting Parties to the Barcelona Convention to be held in Albania, mid-December 2017. MED POL with the support of REMPEC is tasked with developing some sections of the Report related to pollution from ships under the 2002 Prevention and Emergency Protocol, specifically with respect to Common Indicator 19 (Occurrence, origin (where possible), and extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances), and their impact on biota affected by this pollution (EO9)). Inputs are also expected for the Ecological Objective 2 (EO2) (Non-indigenous Species) coordinated by the Regional Activity Centre for Specially Protected Areas (SPA/RAC); and the EO10 (Marine Litter) and EO11 (Underwater energy; noise) which will be drafted by MED POL with the support of REMPEC.

The Expected outputs as amended reads:
Analytical summary information relevant to pollution from ships for the development of the Quality Status Report for 2017; completion of the QSR2017 Assessment template and inputs to the draft Indicator Guidance factsheets.

The Specific tasks as amended reads:
For the analytical summary information relevant to pollution from ships for the development of the Quality Status Report for 2017, the Consultant will:
Complete the Assessment template for QSR Report addressing Common Indicator 19 (Occurrence, origin (where possible), and extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances), and their impact on biota affected by this pollution (EO9) using information provided by REMPEC and other sources as appropriate
Identify case studies and pilots to be included, through partners, projects or countries testing assessment templates
Provide inputs (shipping perspective) for the development of the following sections of the QSR Reports:

Marine Litter (EO10) (shipping part)
Underwater energy; noise (EO11)
Non-indigenous species (EO2)

REMPEC will provide the Consultant with relevant data and information sources available at the Centre to assist the Consultant in fulfilling its tasks and will introduce the consultant to relevant partners which may possibly contribute to the provision of data relevant to the production of these parts of the QSR2017.

2. Methodology followed for the Production of Deliverables

2.1 Output 1: Work plan and Inception Report

An Inception Meeting that was held at the offices of the UN Environment/MAP-Barcelona Convention Secretariat in Athens, Greece, from 19 to 20 September 2016 during which the method of work, communication and next steps were discussed and agreed upon between the Consultant, REMPEC and MED POL. A revised work plan was produced to take into account already scheduled COR MON meetings, which was an opportunity to get comments and guidance before finalisation of outputs. The Inception Report (Output 1) including Revised Work Plan was submitted by the Consultant in September 2016.

2.2 Outputs 2 to 6: Tasks related to the Development of a Quality Assurance Programme for Data Reporting and Collection, in accordance with Article 5 of the 2002 Prevention and Emergency

The methodology followed to carry out the regulatory review included 4 main steps:

- **Listing and grouping** international conventions and instruments by subject;
- **Selecting** international conventions and instruments relevant for the purpose of the Matrix;
- **Screening and identifying** required parameters for expected outputs 2 to 5, i.e. monitoring obligations; monitored pollutants; monitored parameters and existing reporting procedures; and
- **Cross-checking** and determination of relevant IMAP qualitative indicators.

2.2.1 Listing and grouping international conventions and instruments

- **International conventions and instruments.** The Matrix produced by the Consultant is based on the results of the review of a total of 27 international conventions and instruments, composed of:
- international conventions and instruments provided to the Consultant by REMPEC; and

- 2 additional instruments added by the Consultant, namely:
    - the MLC which was adopted by the ILO in 2006 and came into force on 20 August 2013. The MLC aims at consolidating and replacing 37 ILO maritime conventions related to minimum working and living standards for seafarers, including the ILO 147 Convention; and
    - the Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life. Although not mandatory, the instrument is directly relevant to the IMAP CI on Noise.

- **Guidelines.** In addition, as it is a common practice for IMO to include general mandatory obligations in the text of its conventions, and address technical, operational and scientific aspects of implementation in separate guidelines and other non-binding instruments, the Consultant also included in this exercise the guidelines related or complementing the conventions relevant for the Matrix. Even though the review of guidelines was not within the scope of the consultancy terms of reference, the Consultant felt that including technical, operational and scientific aspects of international regulations was necessary to get an exact picture of what is/should be the practice of States when implementing international conventions and instruments related to pollution monitoring and reporting. Therefore, findings related to outputs 2 to 5 also refer to IMO guidelines provisions.

To facilitate the review work, the conventions and instruments were grouped under 5 categories: prevention of marine pollution; maritime safety; preparedness and response; liability and compensation and labour standard in merchant shipping. The Table summarising the findings for outputs 2 to 5 was consequently divided in 5 sub-tables by subject matter.

2.2.2 Selection of relevant international conventions for the Matrix

Some conventions and instruments provided to the Consultant were outside of the scope of IMAP. These were essentially conventions dealing with issues related to maritime safety (such as navigation; design and construction of ships), standards for seafarers and liability and compensation issues. In some cases, the regulations were related to pollution but out of the scope of IMAP EOs and CIs (for example, MARPOL Annex VI addressing air pollution was not retained as none of the IMAP indicators deals with this issue). All conventions and regulations presenting no relevance to IMAP indicators were excluded from the cross-checking exercise and are shadowed in orange in the findings Table. Conventions and instruments (including guidelines) retained for the exercise are highlighted in green in the findings Table.

2.2.3 Screening and identification of parameters for outputs 2 to 5

The Consultant reviewed in detail all selected international conventions and instruments to identify obligations or regulations related to output 2 (monitoring obligations), output 3 (list of pollutants), output 4 (monitored pollutants) and output 5 (existing reporting procedures).

The result of this work is embedded in the Table of Appendix II to the present report, which presents for each instrument/relevant provision, the findings related to outputs 2 to 5. Each output's finding appears in a separate column. The last column contains corresponding relevant CIs.

2.2.4 Cross-checking and determination of relevant IMAP qualitative indicators

The findings resulting from the identification of outputs 2 to 5 were compared and analysed against IMAP EOs/CIs to determine which of these presented some relations and links with obligations and regulations reviewed. All IMAP EOs were considered as well as their respective twenty-seven (27) qualitative indicators (including both common indicators and candidate indictors).

Relationships between indicators developed to measure the state of the environment of the Mediterranean Sea and the relevant IMO conventions, are shown in the Matrix produced by the Consultant and appearing as the Table of Appendix III to the present report.

2.3 Complementary Mandate: Development of the QSR2017

2.3.1 Draft QSR2017 Assessment Factsheet for EO9 CI19

The Draft QSR2017 Assessment Factsheet for EO9 CI19 is the result of thorough research and literature review undertaken by the Consultant on the various aspects listed in the QSR2017 Assessment Factsheet template provided by MED POL. Some statistical documents provided by REMPEC were also used, as well as direct contacts with representatives from IMO, ITOPF and EMSA to get the latest status of technical and scientific knowledge related to monitoring and impact issues.

2.3.2 Case Studies and Pilot Projects

There was no study or pilot project to be included at this stage. REMPEC, after consulting with MED POL, indicated to the Consultant via e-mail om 16 February 2017 that, considering the overall state of play on case studies and pilot projects (with no Contracting Party to the Barcelona Convention having proposed any of these despite the formal request sent by the UN Environment/MAP-Barcelona Convention Secretariat to the Focal Points of the UN Environment/MAP towards the end of 2016), it was agreed that we should continue to advance on the QSR2017 Assessment Factsheets whilst the case studies and pilot projects would be the next work to do.

2.3.3 Inputs (shipping perspective) to other Draft QSR2017 Assessment Factsheets

- EO10 (Marine Litter): there was no input/comment to make.
- EO2 (Non-indigenous Species): there was no specific input/comment to make.
- EO11 (Underwater Energy/Noise): MED POL advised the Consultant that there was no need at this stage to review EO11.

3. Outputs and Deliverables - Summary Table

Outputs	Deliverables
Outputs 1 to 6	
1 *Detailed work plan and inception report.*	Revised Work Plan and Activity Inception Report, September 2016. **Appendix I to the present report**
2 *List of monitoring obligations under the international regulations.*	Review and Analysis of Monitoring and Reporting Obligations - Findings (Output 2). **Appendix II to the present report**
3 *List of pollutants monitored in the context of the monitoring obligations referred in the expected output 2.*	Review and Analysis of Monitoring and Reporting Obligations - Findings (Output 3). **Appendix II to the present report**
4 *List of parameters monitored in the context of the monitoring obligations referred in the expected output 2.*	Review and Analysis of Monitoring and Reporting Obligations - Findings (Output 4). **Appendix II to the present report**
5 *List of the existing reporting procedures at international and regional level related to pollutants and parameters referred in the expected output 3 and 4.*	Review and Analysis of Monitoring and Reporting Obligations - Findings (Output 5). **Appendix II to the present report**
6 *Matrix linking the above outputs to the relevant IMAP qualitative indicators and draft, where required the related fact sheets based on the agreed template between MED POL and REMPEC.*	Table - Matrix Linking Outputs 2 to 5 to Relevant IMAP indicators. **Appendix III to the present report**
	Revised Draft IMAP Indicator Guidance Factsheet for EO9 CI19. **Appendix IV to the present report**
	Review of Draft IMAP Indicator Guidance Factsheets EO10 CI22/CI23/CI24; Draft IMAP Indicator Guidance Factsheet for EO2 C6; and Draft IMAP Indicator Guidance Factsheet EO11. **Appendix V to the present report**

Additional Outputs (Addendum to Contract)	
Complete the Assessment template for QSR Report addressing Common Indicator 19 (Occurrence, origin (where possible), and extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances), and their impact on biota affected by this pollution (EO9) using information provided by REMPEC and other sources as appropriate	Draft QSR2017 Assessment Factsheet for EO9 CI19. **Appendix VI to the present report**
Identify case studies and pilots to be included, through partners, projects or countries testing assessment templates	**Postponed. No Deliverable.**
Provide inputs (shipping perspective) for the development of the following sections of the QSR Reports: *Marine Litter (EO10) (shipping part)* *Underwater energy; noise (EO11)* *Non-indigenous species (EO2)*	**Appendix VII to the present report**

4. Remarks on Environmental Data Gap

4.1 Environmental monitoring vs. compliance monitoring

One important issue that emerged from the regulatory review (Outputs 2 to 5) is that international conventions and instruments adopted by the IMO rarely deal with pollution monitoring issues from the perspective of the IMAP monitoring and reporting exercise. In IMO conventions, obligations referring to environmental monitoring are most of the time addressed in general terms, usually in regulations relating to R&D. The focus of maritime conventions, instruments and guidelines is on compliance monitoring (usually in the context of port State controls) rather than on monitoring or measuring pollution or the state of the environment.

Regarding reporting obligations, the observation is quite the same as for pollution monitoring: reporting procedures and exchange of information between Parties are mentioned in general terms under articles related to R&D or technical cooperation. Reporting obligations under IMO conventions related to pollution from ships do not relate to environmental monitoring or assessment data on state of the environment or pressures on the environment. Most of the time, reporting is required in case of an accident causing a pollution or in case an illegal pollution is discovered (operational discharges; dumping). Therefore, reporting obligations, as is the case for monitoring obligations, have to be considered from a compliance (or non-compliance) perspective and/or from a prosecution perspective.

4.2 IMO international reporting system: GISIS

Information related to the Global Integrated Shipping Information System (GISIS) was developed by the IMO Secretariat in compliance with the decisions of the IMO Member States requesting public access to sets of data collected by the IMO Secretariat and stored in off-line databases. Its aim is to allow on-line access to information supplied to the IMO Secretariat by maritime Administrations, in compliance with IMO's instruments. The databases are maintained updated by the national maritime Administrations, directly or by means of submission to the IMO Secretariat.

With the exception of dumping, GISIS contains no information related to environmental monitoring and reporting. However, GISIS has a module on Maritime Casualties and Incidents where ship casualties are reported according to the following classification: "very serious casualties", "serious casualties", "less serious casualties" and "marine incidents". "Very serious casualties" involve total loss of the ship, loss of life, or severe pollution, and "serious casualties" are casualties which, amongst other criteria, result in "pollution (regardless of quantity)". For details on the type of data and information displayed by GISIS, see https://gisis.imo.org/Members/Default.aspx.

4.3 R&D Programmes and technical cooperation

In IMO conventions and instruments, as mentioned above, environmental monitoring and exchange of information on scientific and technical issues are addressed from an R&D point of view. Parties are encouraged to undertake R&D activities on scientific, operational and technical issues, which often include surveillance/monitoring activities, and share information with other Parties. In several instruments, technical cooperation is called for to support Parties in implementing R&D activities. Therefore, environmental monitoring activities carried out under R&D programmes fall within the responsibility of individual States, even though international and regional technical cooperation has an important role to play.

5. Recommendations on Environmental Monitoring and Reporting from Shipping Activities

IMO international conventions and instruments do not address monitoring and reporting activities aimed at assessing the state of the marine environment, but rather look at monitoring and reporting issues from a compliance perspective. Ships being a pollution source point (and not a pollutant *per se*), it is somehow difficult to conceive an environmental monitoring and reporting system that would target specifically pollution from ships. Indeed, the Matrix clearly shows that ship-generated pollutants are relevant to several CIs (10 in total). In addition, the fact that ships can cause massive instantaneous pollution (especially oil and other liquid chemical transported in bulk) makes it difficult in principle to include accidental pollution from ships in a routine environmental surveillance and monitoring programme.

The way pollution from shipping is approached by the international regulatory framework presents a challenge for UN Environment/MAP and IMAP's objectives to develop an integrated comprehensive monitoring and reporting system, since environmental monitoring and reporting systems aimed at assessing the state of the environment focus on pollutants (chemicals, invasive species, litter, etc.) rather than on activity/source of pollution. One way to address this tricky issue was to adopt an indicator for oil and HNS specifically, i.e. EO9 CI19. It is however important to keep in mind the limits of such an approach, especially when using this indicator to assess marine ecosystems health and changes (deterioration/improvement).

Monitoring activities: as environmental monitoring activities are primarily undertaken at national level, there could be an added-value in undertaking an assessment of monitoring initiatives undertaken by Mediterranean coastal States (especially under their R&D projects and programmes), to get a picture of the state of play in the region with respect to marine pollution from ships. This should not be necessarily limited to EO9 CI19 (oil and HNS) and should include monitoring of NIS invasion and underwater noise from commercial shipping. In these last two instances, where direct links can be established between ships and impacts, it is certainly sensible to undertake ship-specific environmental monitoring activities. If such an assessment is viewed positively, then REMPEC should be the MAP repository to collect this data using its network of Prevention and OPRC Focal Points (a questionnaire to be filled in could be developed for that purpose).

Measuring trends: data reporting and collection for IMAP can rely on the Mediterranean Alerts and Accidents Database maintained by REMPEC to measure trends from a risk assessment perspective. However, since the Contracting Parties to the Barcelona Convention are also reporting on ship-generated pollution incidents at international level (IMO/GISIS) and at European level (EMSA has an obligation to provide a yearly overview of maritime casualties and incidents and produces a casualty report every year), it is recommended, when working towards a standardised monitoring and reporting format for pollution from ships, to carry out a comparative exercise between already existing reporting procedures and formats in order to, as far as possible, avoid duplication and ensure the format retained is in line with the ones already developed.

6. Recommendation on the Development of the QSR2017

Only shipping activities were addressed under the Terms of Reference, therefore offshore activities were not included in this work. It is recommended that some assessment work be also undertaken for offshore activities as these are relevant under EO9 CI19.

Appendix I

Detailed work plan and inception report (Output 1)

1. Implementing the Ecosystem Approach in the Mediterranean region

1.1. The Ecosystem Approach and the MAP Process

The CBD defines the EcAp as "a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way". This approach has been the guiding principle to all policy development undertaken under the auspices of the Barcelona Convention since 2008[1], when the Contracting Parties to the Barcelona Convention agreed to progressively implement the EcAp to the management of human activities, with the ultimate objective of achieving the GES of the Mediterranean Sea.

In 2012, the Contracting Parties to the Barcelona Convention have adopted 11 Ecological Objectives (and their respective common indicators) that relate to the following topics:

- Biodiversity (EO1);
- Non-indigenous species (EO2);
- Fisheries (EO3);
- Marine food webs (EO4);
- Eutrophication (EO5);
- Sea-floor integrity (EO6);
- Hydrography (EO7);
- Coast (EO8);
- Contaminants (EO9);
- Marine litter (EO10); and
- Noise (EO11)[2].

The identification of key indicators was a crucial step towards achieving accurate reporting and monitoring activities throughout the basin. Based on relevant data reported by the Contracting Parties, the Secretariat will be able to undertake assessments of the GES of the Mediterranean Sea and Coast and ensure policy makers have informed science available on the status of Mediterranean ecosystems to base their policy and management decisions.

Additionally, in 2013 (COP 18), the Contracting Parties to the Barcelona Convention have adopted an integrated list of Mediterranean GES and related targets associated[3].

The substantive work is mainly carried out by experts working groups, the COR-GEST and COR MON groups and under the overall guidance of the EcAp Coordination Group.

[1] Decision IG 17/6 on "Implementation of the ecosystem approach to the management of human activities that may affect the Mediterranean marine and coastal environment" (UNEP(DEPI)/MED IG.17/10). The Contracting Parties to the Barcelona Convention committed to progressively apply EcAp to the management of human activities with the goal of effecting real change in the Mediterranean marine and coastal environment. Decision IG 17/6 also outlines a roadmap for the implementation of EcAp, consisting of several subsequent steps, such as the development of Ecological Objectives (EO), operational objectives and respective indicators, the development of GES descriptors and targets, monitoring programmes, and finally the necessary management measures and programmes to achieve GES.

[2] Noise has been adopted as a *candidate common indicator*, to be further developed, based on pilot monitoring activities, additional expert knowledge, and scientific developments.

[3] Decision IG.21/3 on "Ecosystems Approach including adopting definitions of Good Environmental Status (GES) and Targets" (COP 18).

Three (3) topic specific, monitoring experts correspondence groups were established to work on assessment and monitoring needs related to EOs:

- Biodiversity and Fisheries Correspondence Group on Monitoring (CORMON Biodiversity and Fisheries);
- Correspondence Group on Monitoring, Pollution and Litter (CORMON Pollution and Litter; and
- Correspondence Group on Monitoring, Coast and Hydrography (CORMON Coast and Hydrography).

In 2015, the Barcelona Convention efforts focused on the development of a new framework, the IMAP that was adopted in 2016, in a timely manner as the Barcelona Convention has now entered in a second cycle (2016-2021) of the EcAp Process, with focus on monitoring and assessing the status of the Mediterranean Sea and coast. Based on common indicators and monitoring data provided by Contracting Parties, a Quality Status Report will be developed for the region in 2017, and a State of Environment and Development and a State of environment Report will be respectively issued in 2019 and in 2023.

1.2. Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (IMAP)

As noted above, in February 2016, the Contracting Parties to the Barcelona Convention (COP19) adopted the IMAP[4]. The objective of the IMAP programme is to support the assessment of the ecological status of the Mediterranean Sea, so that management of human activities is based on sustainable use of the Mediterranean Sea ecosystems.

1.2.1 Monitoring Activities under IMAP

To achieve its objective, IMAP will set the basis for how the Contracting Parties should design and carry out their national integrated monitoring programmes and work together in the framework of the UN Environment/MAP-Barcelona Convention to produce and update common indicators. Under IMAP, guidance and tools will be developed to enable monitoring, reporting and assessment of the ecological status of the Mediterranean Sea in a reliable and accurate manner.

IMAP will be implemented between 2016 and 2021. This 6-year period is divided into two implementation phases, the first one being implemented between 2016 and 2019. During this initial phase, existing national monitoring and assessment programmes will be reviewed and revised as appropriate to ensure harmonization of IMAP implementation at the national level. Monitoring and reporting should be carried out based on selected ecological objectives and indicators.

1.2.2 Ecological Objectives and Related Indicators for Monitoring and Reporting

Currently IMAP covers ecological objectives related to biodiversity (EO1), non-indigenous species (EO2), eutrophication (EO5), hydrography (EO7), coast (EO8), contaminants (EO9), and marine litter (EO10). Their respective twenty-seven (27) indicators (including both common indicators[5] and candidate indictors[6]) include:

[4] See Decision IG.22/7.
[5] A common indicator is an indicator that summarizes data into a simple, standardized, and communicable figure and is ideally applicable in the whole Mediterranean basin, or at least on the level of sub-regions, and is monitored by all Contracting Parties. A common indicator is able to give an indication of the degree of threat or change in the marine ecosystem and can deliver valuable information to decision makers. See UNEP(DEPI)/MEDIG.22/28, Annex p.4 and 5.

1 Habitat distributional range (EO1) to also consider habitat extent as a relevant attribute;
2 Condition of the habitat's typical species and communities (EO1);
3 Species distributional range (EO1 related to marine mammals, seabirds, marine reptiles);
4 Population abundance of selected species (EO1, related to marine mammals, seabirds, marine reptiles);
5 Population demographic characteristics (EO1, e.g. body size or age class structure, sex ratio, fecundity rates, survival/mortality rates related to marine mammals, seabirds, marine reptiles);
6 Trends in abundance, temporal occurrence, and spatial distribution of non-indigenous species, particularly invasive, non-indigenous species, notably in risk areas (EO2, in relation to the main vectors and pathways of spreading of such species);
7 Spawning stock Biomass (EO3);
8 Total landings (EO3);
9 Fishing Mortality (EO3);
10 Fishing effort (EO3);
11 Catch per unit of effort (CPUE) or Landing per unit of effort (LPUE) as a proxy (EO3);
12 By catch of vulnerable and non-target species (EO1 and EO3);
13 Concentration of key nutrients in water column (EO5);
14 Chlorophyll-a concentration in water column (EO5);
15 Location and extent of the habitats impacted directly by hydrographic alterations (EO7) to also feed the assessment of EO1 on habitat extent;
16 Length of coastline subject to physical disturbance due to the influence of man-made structures (EO8) to also feed the assessment of EO1 on habitat extent;
17 Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater);
18 Level of pollution effects of key contaminants where a cause and effect relationship has been established (EO9);
19 Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution (EO9);
20 Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood (EO9);
21 Percentage of intestinal enterococci concentration measurements within established standards (EO9);
22 Trends in the amount of litter washed ashore and/or deposited on coastlines (including analysis of its composition, spatial distribution and, where possible, source) (EO10);
23 Trends in the amount of litter in the water column including microplastics and on the seafloor (EO10);
24 ***Candidate Indicator:*** Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds and marine turtles (EO10);
25 ***Candidate Indicator:*** Land use change (EO8);
26 ***Candidate indicator:*** Proportion of days and geographical distribution where loud, low, and mid-frequency impulsive sounds exceed levels that are likely to entail significant impact on marine animals (EO11); and
27 ***Candidate Indicator:*** Levels of continuous low frequency sounds with the use of models as appropriate (EO11).

[6] Candidate indicators are indicators which still have many outstanding issues regarding their monitoring and assessment and therefore are recommended to be monitored in the initial phase of IMAP on a pilot and voluntary basis. See UNEP(DEPI)/MEDIG.22/28, Annex p.4 and 5.

1.2.3 Application of EcAp and IMAP to Pollution from Ships

REMPEC is a RAC established within the framework of the UN Environment/MAP, with a view to coordinating the activities of the Mediterranean coastal States related to the implementation of the 2002 Prevention and Emergency Protocol to the Barcelona Convention. The Centre is based in Malta, hosted by the Maltese Government and is administered by the IMO in cooperation with UN Environment/MAP.

Monitoring and reporting obligations are already mandatory for the Contracting Parties under Article 5 of 2002 Prevention and Emergency Protocol. The said Article states that the Parties "*shall develop and apply, either individually or through bilateral or multilateral cooperation, monitoring activities covering the Mediterranean Sea Area in order to prevent, detect and combat pollution, and to ensure compliance with the applicable international regulations"*.

In addition, the newly adopted Regional Strategy (2016-2021) makes specific reference to monitoring obligations originating from the EcAp process including monitoring programmes. It's Specific Objective 19 untitled *To improve the quality, speed and effectiveness of decision-making process in case of marine pollution incidents through the development and introduction of technical and decision support tools*, that requests the Contracting Parties to contribute to the development of a quality assurance programme for data reporting and collection in line with the EcAp Monitoring Programme, whilst the Secretariat is expected to provide support for the development of a quality assurance programme for data reporting and collection in line with the EcAp Monitoring Programme.

Pollution from ships is specifically addressed by IMAP under EO9 (Contaminants): "*Regarding acute pollution events, while Contracting Parties already have an existing monitoring obligation under Article 9 of the Prevention and Emergency Protocol, the efforts of which need to be strengthened, it is also foreseen that further analysis of the links in between acute pollution events and their effects on biota and the development of specific assessment criteria for this latter should occur*"[7].

However, in addition to EO9 and out of the twenty-seven indicators covered by IMAP (listed above in 3.2.2), three more EOs have been identified by REMPEC Focal Points[8] as potentially relevant with respect to pollution from ships under the 2002 Prevention and Emergency Protocol. As a result, a list of 4 EOs will be considered under Contracting Parties monitoring and reporting obligations related to pollution from ships. The four EOs identified are the following:

- EO2: non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystem;
- EO9: contaminants cause no significant impact on coastal and marine ecosystems and human health;
- EO10: marine and coastal litter does not adversely affect coastal and marine environment; and
- EO11: noise from human activities causes no significant impact on marine and coastal ecosystems.

[7] See UNEP(DEPI)/MEDIG.22/28, Annex p.12.
[8] See REMPEC/WG.37/10, p.9 para. 47.

2. Technical Expertise to Support Output

Following the selection of the consultant (Dr Lilia Khodjet El Khil), an Inception Meeting was held at the MAP Secretariat in Athens, Greece on 19 and 20 September 2016 to discuss and agree on the method of work and communication channel for the activity and way forward. The provisional agenda of the meeting is provided in Annex I of the present report.

It was not possible to meet as originally planned Mrs Tatiana Hema, MEDPOL Coordinator, who had an unexpected priority meeting to attend, but I was well briefed and guided by the officers responsible for MEDPOL and the EcAp programs. The list of persons met is provided in Annex II to the present report.

2.1. Terms of Reference (ToR)

The ToR requires the consultant to produce the following:

1. Detailed work plan and inception report,
2. List of monitoring obligations under the international regulations referred in paragraph 8 and 9 of the present ToR,
3. List of pollutants monitored in the context of the monitoring obligations referred in the expected output 2,
4. List of parameters monitored in the context of the monitoring obligations referred in the expected output 2,
5. List of the existing reporting procedures at international and regional level related to pollutants and parameters referred in the expected output 3 and 4, and
6. Matrix linking the above outputs to the relevant IMAP qualitative indicators and draft, where required the related fact sheets based on the agreed template between MEDPOL and REMPEC.

The ToR also request the Consultant to produce a presentation on the methodology and overview of the expected output referred in the ToR to be presented by the Secretariat at the CORMON Meeting, scheduled for October 2016. As to the most effective ways to carry out the above tasks and deliverables, a discussion took place during the Inception meeting and a proposed methodology, which is detailed in the following section, was agreed upon.

2.2. Proposed Methodology

1. **Communication.** List of contacts points (EcAp Task Force participants) and IMAP consultants will be provided to the Consultant by MEDPOL. REMPEC will introduce the Consultant to PAP/RAC and SPA/RAC as needed.
2. **Selection of relevant obligations.** The Consultant will carry out a review of relevant international and regional conventions and identify in each of the instruments, where applicable, the following: (a) monitoring obligations; (b) pollutants / parameters monitored and (c) reporting procedures.
3. Selection of relevant indicators. The Consultant will select from the IMAP indicators/ ecological objectives those that are relevant under the 2002 Prevention and Emergency Protocol.
   - Common Indicator 19 (EO9)[9] has been identified as relevant under the 2002 Prevention and Emergency Protocol.

[9] Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances), and their impact on biota affected by this pollution (EO9).

- In addition, the Consultant will assess whether other indicators / ecological objectives are relevant, and specifically those related to invasive alien species; marine litter and noise.

4. **Draft Matrix and relevant Guidance Fact Sheets.** The Consultant will design a draft matrix (Tabular format) that will correlate the relevant IMAP indicators with monitoring obligations, pollutants / parameters monitored and reporting procedures identified in the relevant international and regional conventions.
   - The matrix document will also provide as an Annex the list of relevant obligations for reference.
   - The relevant Guidance Fact Sheets will also be revised base on the outcome of the review of obligations and already existing reporting procedures.
5. **Gaps and suggestions**. The Consultant will identify gaps if any and make suggestions for follow-up work related to IMAP indicators and monitoring programs.
6. **Final draft Matrix and relevant Fact Sheets.** The Consultant will finalize the Matrix and relevant Guidance Fact Sheets based on comments received following the CORMON meetings, which are tentatively scheduled the first and second week of February 2007. The final Matrix and relevant revised Guidance Fact Sheets will be included in the Final Report that will be submitted by the Consultant the last week of February 2017.

2.3. Other Information and Updates

- The list of International Conventions and other relevant mandatory instruments to be reviewed by the Consultant will be the list provided in the Regional Strategy. This list is reproduced in Annex III of the present report. Official versions of international conventions were provided by REMPEC to the Consultant.

- The Consultant was introduced to the person in charge of the project at SPA/RAC and direct contact was established.

- Mr Christos Ioakeimidis, marine litter expert, has provided the draft versions of the IMAP Fact Sheets for Common Indicators 22, 23 and Candidate Indicator 24. These are in draft versions subject to further amendments after the final review by the MEDPOL Coordinator.

2.4. Revised Work Plan

The ToR's work plan was adjusted (see revised Table below) based on the methodology discussed and agreed upon, as well as taking into consideration the schedule of meetings and specifically the CORMONs meeting that are scheduled first / second week of February 2017. Changes included:

- Work starts working week 3;
- Group Outputs/Tasks 2 to 4;
- Output/Task 5 becomes "Draft Matrix and relevant Guidance Fact Sheets for review by CORMONS"; and
- Output/Task 6 becomes "Final Report including final Matrix and revised Guidance Fact Sheets".

Table: Revised work plan as agreed during the Inception Meeting

			Month 1				Month 2				Month 3				Month 4				Month 5				Month 6			
			September 2016				October 2016				November 2016				December 2016				January 2017				February 2017			
	Outputs / Tasks	Working Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	Final Work plan/Inception Report	0.5 weeks																								
2	List of monitoring obligations	4 weeks																								
3	List of pollutants and parameters monitored																									
4	List of existing reporting procedures																									
5	Draft Matrix and relevant Guidance Fact Sheets for review by CORMONS	1 week																					*CORMONS meetings*			
6	Final Report including final Matrix and revised Guidance Fact Sheets	1,5 weeks																								

Annex I – Provisional Agenda

19th September

9.30 am-13.00:	Introduction to the EcAp project, IMAP and the Indicators Guidance template. Discussion on the relevance and contribution of the consultancy ToR and expected results.
14.00 to 17.30	Introduction and hand-over of all relevant documents (REMPEC, EcAp and IMAP documents and decisions) as a basis to the work and overview of the expected outputs, followed by discussion on all documents.

20th September

9.30 - 15.30	Elaborated work plan, development of Inception report and method of work elaborated.
15.30-17.30	Conclusions and any other substantive or administrative matters.

Annex II – List of Persons Met during the Inception Meeting

Christos Ioakeimidis, PhD
Marine Litter MedProject Expert
Mediterranean Pollution Assessment and Control Programme (MED POL)
United Nations Environment Programme Barcelona Convention Secretariat
Vassileos Konstantinou 48, Athens 11635, Greece
T: +30 210 7273126 F: +30 210 7253196
marine.litter.expert@unepmap.gr
www.unepmap.org

Gabino Gonzalez
Head of Office
Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC)
Maritime House, Lascaris Wharf,
Valletta, VLT 1921, Malta
e: ggonzalez@rempec.org | **w**: www.rempec.org
t: +356 21 337 296/7/8 | **f**: +356 21 339 951 **Skype**: rempec.head

Gyorgyi Gurban
Ecosystem Approach Project Manager
United Nations Environment Programme Barcelona Convention Secretariat Coordinating Unit for the Mediterranean Action Plan
Vassileos Konstantinou 48, Athens 11635, Greece
T: +30 210 7273105 F: +30 210 7253196
Gyorgyi.Gurban@unepmap.gr
www.unepmap.org

Virginie Hart, PhD
Programme Officer, Monitoring and Assessment
Mediterranean Pollution Assessment and Control Programme (MED POL)
United Nations Environment Programme Barcelona Convention Secretariat Coordinating Unit for the Mediterranean Action Plan
Vassileos Konstantinou 48, Athens 11635, Greece
T: +30 210 7273122 F: +30 210 7253196
Virginia.hart@unepmap.gr
www.unepmap.org

Carlos Guitart, PhD
Marine Environment Consultant
Currently Consultant (Contaminants) for MEDPOL, UNEP/MAP
Email: guitart.carlos@gmail.com
Phone: +34639305081

Annex III – List of International Conventions to be reviewed

1. **International Conventions dealing with maritime safety and prevention of pollution from ships:**

- The International Convention on Load Lines, 1966 (LL 1966);
- The Protocol of 1988 relating to the International Convention on Load Lines, 1966;
- The International Convention for the Safety of Life at Sea, 1974 (SOLAS 1974),
- The International Convention for the Prevention of Pollution from Ships, 1973, as amended by the Protocols of 1978 and 1997 relating thereto (MARPOL) and its Annexes;
- The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 as amended in 1995 (STCW 1995);
- The Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREG 1972), as amended;
- The International Convention on Tonnage Measurement of Ships, 1969 (TONNAGE 1969);
- The International Convention on the Control of Harmful Antifouling Systems on Ships, 2001;
- The ILO Merchant Shipping (Minimum Standards) Convention, 1976 (No. 147), and the Protocol of 1996 relating thereto.
- The International Convention for the Control and Management of Ship's Ballast Water and Sediments, 2004;
- The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009;
- The 1996 London Protocol on Prevention of Pollution by Dumping of Wastes and Other Matter; and
- The ILO Merchant Shipping (Minimum Standards) Convention, 1976 (No. 147), and the Protocol of 1996 relating thereto.

2. **International Conventions dealing with combating pollution:**

- The International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC);
- The Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances 2000 (OPRC-HNS Protocol);
- The International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969 (INTERVENTION 1969) and its Protocol relating to Intervention on the High Seas in Cases of Pollution by Substances other than Oil, 1973 (INTERVENTION PROTOCOL 1973);
- The International Convention on Salvage, 1989 (SALVAGE 1989); and
- The Nairobi International Convention on the Removal of Wrecks, 2007.

3. **International Conventions dealing with liability and compensation for pollution damage:**

- The International Convention on Civil Liability for Oil Pollution Damage, 1992 (CLC 1992);
- The International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992 (FUND 1992);
- The Protocol on the Establishment of a Supplementary Fund for Oil Pollution Damage, 2003;

- The Protocol of 1996 to amend the Convention on Limitation of Liability for Maritime Claims, 1976;
- The International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001; and
- The 2010 Protocol to the International Convention on Liability and Compensation for Damage in Connexion with the Carriage of Hazardous and Noxious Substances by sea, 1996.

Appendix II

Review and Analysis of Monitoring and Reporting Obligations (Outputs 2 to 5) - Findings

Review and Analysis of Monitoring and Reporting Obligations (Outputs 2 to 5) - Findings

The Table below and its subsections present the findings resulting from the regulatory review and their correlation with relevant IMAP qualitative indicators. Column 1 describes the instruments reviewed, and the following columns contain the findings related to monitoring and reporting obligations (outputs 2 to 5). The last column indicates the relevant Environmental Objectives (EO) and related qualitative indicators.

Only relevant international conventions and instruments were selected for the Matrix. Instruments retained are highlighted in green while instruments that were not relevant are highlighted in orange. To avoid overloading the Table, detailed information can be found in the annexes to this Table.

Table: Analysis of Monitoring and Reporting Obligations and Relevance to IMAP Indicators

Legend:

Not relevant

Relevant

1 - Prevention of marine pollution:

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
International Convention on the Control of Harmful Anti-Fouling Systems on Ships (AFS 2001) ***In force*** This Convention deals with the use of harmful organotin compounds (TBTs) in anti-fouling	**Article 8 Scientific and Technical Research and Monitoring** **(1)** The Parties shall take appropriate measures to promote and facilitate scientific and technical research on the effects of anti-fouling systems as well as monitoring of such	**Article 4 / Annex 1 Control of Anti-fouling Systems** Organotin compounds used in ships' anti-fouling systems. **Article 5 Control of Annex 1 Waste materials** Wastes material from the application or removal of an anti-	IMO has developed the **2011 Guidelines for Inspection of Anti-Fouling Systems on Ships** aimed at helping exercising port State control inspections. These Guidelines contains information on sampling and analysis methodologies.	**Article 8 Scientific and Technical Research and Monitoring** **(2)** Each Party shall, to further the objectives of this Convention, promote the availability of relevant information to other Parties who request it on: (a) scientific and technical activities	**CONTAMINANT (EO9)** **Common Indicator 17: Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).** **Common Indicator**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
paints used on ships to prevent sea life such as algae and molluscs attaching themselves to the hull. A number of scientific research have provided evidence that TBT is bio-accumulating in food chains, which has led to a total ban of organotin compounds use in ships' anti-fouling systems.	effects. In particular, such research should include observation, measurement, sampling, evaluation and analysis of the effects of anti-fouling systems. Compliance monitoring is achieved through flag State surveys (delivery of the International Anti-fouling System Certificate); port state controls, and violations notifications and procedures.	fouling system		undertaken in accordance with this Convention; (b) marine scientific and technological programmes and their objectives; and (c) the effects observed from any monitoring and assessment programmes relating to anti-fouling systems.	**18:** **Level of pollution effects of key contaminants where a cause and effect relationship has been established.** **Common Indicator 20:** **Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.**
International Convention for the Control and Management of Ship's Ballast Water and Sediments, 2004 (BWM 2004) ***Will be in force on September 18, 2017*** This Convention deals with preventing the introduction in aquatic environment of invasive species such	**Article 6 Scientific and Technical Research and Monitoring** **1** Parties shall endeavour, individually or jointly, to: (a) promote and facilitate scientific and technical research on Ballast Water Management; and (b) monitor the effects of Ballast Water Management in waters under their	**Article 1 Definitions** **8** "Harmful Aquatic Organisms and Pathogens" means aquatic organisms or pathogens which, if introduced into the sea including estuaries, or into fresh water courses, may create hazards to the environment, human health, property or resources, impair biological diversity or interfere	**Regulation D-2 Ballast Water Performance Standard** **1** Ships conducting Ballast Water Management in accordance with this regulation shall discharge less than 10 viable organisms per cubic metre greater than or equal to 50 micrometres in minimum dimension and less than 10 viable organisms per	**Article 6 Scientific and Technical Research and Monitoring** **2** Each Party shall, to further the objectives of this Convention, promote the availability of relevant information to other Parties who request it on: (a) scientific and technology programmes and technical measures undertaken with	**NON-INDIGENOUS SPECIES (EO2)** **Common Indicator 6: Trends in abundance, temporal occurrence, and spatial distribution of non-indigenous species, particularly invasive, non-indigenous species, notably in risk areas (EO2, in relation to the main vectors and pathways of spreading of such**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
as bacteria, microbes, small invertebrates, eggs, cysts and larvae via ships' ballast water and sediments. Alien species can have negative consequences on biodiversity by altering the new habitat where they establish, and cause environmental harm, economic harm, or impact human health. Ships shall be equipped with ballast water management systems when the Convention enters in force. However, IMO's MEPC has not yet decided if additional time may be granted to the ships to comply given some technical and regional challenges. A set of Guidelines was adopted together with the Convention and additional Guidelines have been adopted later. The list of Guidelines is given	jurisdiction. Such research and monitoring should include observation, measurement, sampling, evaluation and analysis of the effectiveness and adverse impacts of any technology or methodology as well as any adverse impacts caused by such organisms and pathogens that have been identified to have been transferred through ships' Ballast Water.	with other legitimate uses of such areas.	millilitre less than 50 micrometres in minimum dimension and greater than or equal to 10 micrometres in minimum dimension; and discharge of the indicator microbes shall not exceed the specified concentrations described in paragraph 2. **2** Indicator microbes, as a human health standard, shall include: .1 Toxicogenic Vibrio cholerae (O1 and O139) with less than 1 colony forming unit (cfu) per 100 millilitres or less than 1 cfu per 1 gram (wet weight) zooplankton samples ; .2 Escherichia coli less than 250 cfu per 100 millilitres; .3 Intestinal Enterococci less than 100 cfu per 100 millilitres.	respect to Ballast Water Management; and (b) the effectiveness of Ballast Water Management deduced from any monitoring and assessment programmes.	**species).** Compliance is achieved through flag State surveys (delivery of the International Ballast Water Certificate); port State controls, and violations notifications and procedures.

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
in Appendix I to this Annex.					
Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 and 1996 Protocol to The Convention On the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (LC PROT 1996) as amended in 2006 ***In force*** This Convention deals with deliberate disposal at sea of wastes or other matter from vessels / aircrafts platform or other man-made structure at sea. The London Protocol prohibits disposal of waste or other matter except for those materials specified in its Annex 1, and outlines waste assessment requirements in its	**Article 14 Scientific and Technical Research** **1** Contracting Parties shall take appropriate measures to promote and facilitate scientific and technical research on the prevention, reduction and where practicable elimination of pollution by dumping and other sources of marine pollution relevant to this Protocol. In particular, such research should include observation, measurement, evaluation and analysis of pollution by scientific methods. **Annex II Assessment of Wastes or Other Matter That May Be Considered for Dumping** **16. Monitoring** Monitoring is used to	**Article 1 Definitions** **4 .1** "Dumping" means: .1 any deliberate disposal into the sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea; .2 any deliberate disposal into the sea of vessels, aircraft, platforms or other man-made structures at sea; .3 any storage of wastes or other matter in the seabed and the subsoil thereof from vessels, aircraft, platforms or other man-made structures at sea; and .4 any abandonment or toppling at site of platforms or other man-made structures at sea, for the sole purpose of deliberate disposal. **8** "Wastes or other	**IMO has developed a set of Guidelines to help national authorities implementing the Protocol:** **-** the **"Waste Assessment Guidelines under the London Convention and Protocol: 2014 edition"** for the specific types of waste listed in Annex 1 of the London Protocol (wastes that may be considered for ocean dumping): - dredged material; - sewage sludge; - fish waste, or material resulting from industrial fish processing operations; - vessels, platforms, or other man-made structures at sea; - inert, inorganic geological material; - organic material of natural origin;	**Reporting requirements for dumping activities** Parties' reporting requirements under Article VI (4) of the Convention and under Article 9.4 of the Protocol include: 1. Annual report on all permits issued; and 2. Annual report on monitoring activities undertaken. A report is also required on emergency permits or in cases of force majeure (as soon as possible). The procedures for force majeure/emergencies cases is found on IMO Website. **Illegal Dumping Incidents** Under Article VII of the London Convention and	**MARINE LITTER (EO10)** **Common Indicator 22:** **Trends in the amount of litter washed ashore and/or deposited on coastlines (including analysis of its composition, spatial distribution and, where possible, source).** **Common Indicator 23:** **Trends in the amount of litter in the water column including microplastics and on the seafloor.** **Common Indicator 24 *(Candidate Indicator)*: Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds and marine**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
Annex 2.	verify that permit conditions are met - compliance monitoring - and that the assumptions made during the permit review and site selection process were correct and sufficient to protect the environment and human health - field monitoring. It is essential that such monitoring programmes have clearly defined objectives.	matter" means material and substance of any kind, form or description. The 1996 Protocol **restricts all dumping** except for a permitted list (which still require permits) and Contracting Parties "shall prohibit the dumping of any wastes or other matter with the exception of those listed in Annex 1." The Annex 1 permitted substances are: 1. Dredged material 2. Sewage sludge 3. Fish waste, or material resulting from industrial fish processing operations 4. Vessels and platforms or other man-made structures at sea 5. Inert, inorganic geological material 6. Organic material of natural origin 7. Bulky items	- bulky items primarily comprising iron, steel, concrete, and similarly harmless materials for which the concern is physical impact, and limited to those circumstances where such wastes are generated at locations such as small islands with isolated communities having no practicable access to disposal options other than dumping; and - carbon dioxide streams from carbon dioxide capture processes for sequestration. These waste-specific guidelines are available on the London Convention/London Protocol website (http://www.imo.org/home.asp?topic_id=1488). **-** the **'Guidelines for the Assessment of Wastes or Other Matter that May be**	Article 10.3 of the Protocol, Contracting Parties agreed to co-operate in the reporting of vessels and aircraft observed dumping in contravention of the Convention. Specifically, if a mariner or other observer ("Incident Observer") witnesses a dumping incident in any ocean waters that appears to be in violation of the Convention or the Protocol, he or she is asked to: 1. Immediately notify the proper authorities to that they can determine an appropriate action. 2. Complete a Dumping Incident Information Form and Supplementary Information Form as completely as possible. **Article 14**	**turtles.**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
		primarily comprising iron, steel, concrete and similar unharmful materials for which the concern is physical impact and limited to those circumstances, where such wastes are generated at locations, such as small islands with isolated communities, having no practicable access to disposal options other than dumping 8. CO2 streams from CO2 capture processes. Other wastes are listed in Annex 2 of the Protocol and are subject to permitting after scientific assessment.	**Considered for Dumping'** or in short **'Waste Assessment Guidance' (WAG) for** Annex II assessment of wastes. It includes: - Waste prevention audit; - Consideration of waste management options; - Characterisation of the chemical, physical, and biological properties of the waste; - Comparison to an action list; - Dump-site selection; Assessment of potential effects of the dumping; - Compliance and field monitoring; and - Permit and permit conditions.	**Scientific and Technical Research** **2** Contracting Parties shall, to achieve the objectives of this Protocol, promote the availability of relevant information to other Contracting Parties who request it on: .1 scientific and technical activities and measures undertaken in accordance with this Protocol; .2 marine scientific and technological programmes and their objectives; and .3 the impacts observed from the monitoring and assessment conducted pursuant to article 9.1.3.	
Nairobi International Convention on the Removal of Wrecks, 2007 (NAIROBI WRC 2007) ***In force*** This Convention provides a set of rules	**Article 7** **Locating wrecks** **1** Upon becoming aware of a wreck, the Affected State shall use all practicable means, including the good offices of States and organizations, to warn mariners and	**Article 1** **Definitions** **5** "Hazard" means any condition or threat that: (a) poses a danger or impediment to navigation; or (b) may reasonably be expected to result	**Article 6** **Determination of hazard** When determining whether a wreck poses a hazard, the following criteria should be taken into account by the Affected State:	**Article 5** **Reporting wrecks** **1** A State Party shall require the master and the operator of a ship flying its flag to report to the Affected State without delay when that ship has been involved in a	**MARINE LITTER (EO10)** **Common Indicator 22:** **Trends in the amount of litter washed ashore and/or deposited on coastlines (including**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
aimed at ensuring effective removal of wrecks located beyond a country's territorial sea, including shipowners' financial liability, reporting of wrecks; determination of hazards posed by wrecks and measures to remove wrecks.	the States concerned of the nature and location of the wreck as a matter of urgency. **2** If the Affected State has reason to believe that a wreck poses a hazard, it shall ensure that all practicable steps are taken to establish the precise location of the wreck.	in major harmful consequences to the marine environment, or damage to the coastline or related interests of one or more States.	(a) the type, size and construction of the wreck; (b) depth of the water in the area; (c) tidal range and currents in the area; (d) particularly sensitive sea areas identified and, as appropriate, designated in accordance with guidelines adopted by the Organization∗, or a clearly defined area of the exclusive economic zone where special mandatory measures have been adopted pursuant to article 211, paragraph 6, of the United Nations Convention on the Law of the Sea, 1982; (e) proximity of shipping routes or established traffic lanes; (f) traffic density and frequency; (g) type of traffic; (h) nature and quantity of the wreck's cargo, the amount and types of	maritime casualty resulting in a wreck. To the extent that the reporting obligation under this article has been fulfilled either by the master or the operator of the ship, the other shall not be obliged to report. **2** Such reports shall provide the name and the principal place of business of the registered owner and all the relevant information necessary for the Affected State to determine whether the wreck poses a hazard in accordance with article 6, including: (a) the precise location of the wreck; (b) the type, size and construction of the wreck; (c) the nature of the damage to, and the condition of, the wreck; (d) the nature and quantity of the cargo, in particular any hazardous and	**analysis of its composition, spatial distribution and, where possible, source).** **Common Indicator 23: Trends in the amount of litter in the water column including microplastics and on the seafloor. CONTAMINANT (EO9)** **Common Indicator 17: Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).** **Common Indicator 18: Level of pollution effects of key contaminants where a cause and effect relationship has been established.** **Common Indicator 19: Occurrence,**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
			oil (such as bunker oil and lubricating oil) on board the wreck and, in particular, the damage likely to result should the cargo or oil be released into the marine environment; (i) vulnerability of port facilities; (j) prevailing meteorological and hydrographical conditions; (k) submarine topography of the area; (l) height of the wreck above or below the surface of the water at lowest astronomical tide; (m) acoustic and magnetic profiles of the wreck; (n) proximity of offshore installations, pipelines, telecommunications cables and similar structures; and (o) any other circumstances that might necessitate the removal of the wreck.	noxious substances; and (e) the amount and types of oil, including bunker oil and lubricating oil, on board. **Article 9** **Measures to facilitate the removal of wrecks** **1** If the Affected State determines that a wreck constitutes a hazard, that State shall immediately: (a) inform the State of the ship's registry and the registered owner; and (b) proceed to consult the State of the ship's registry and other States affected by the wreck regarding measures to be taken in relation to the wreck.	**origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution.** **Common Indicator 20:** **Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.** **POSSIBLY:** ***EO8 (COASTAL ECOSYSTEMS AND LANDSCAPE)*** ***Common Indicator 16:*** ***Length of coastline subject to physical disturbance due to the influence of man-made structure.***

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
					Candidate Indicator 25: ***Land-use change.***
Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (HONG KONG CONVENTION) ***Not in force*** This Convention provides for the safe and environmentally sound recycling of ships. Ships to be sent for recycling must carry an inventory of hazardous materials, and ship recycling yards are required to provide a Ship Recycling Plan specifying the manner in which each ship is recycled.	Compliance monitoring is achieved through flag State surveys (delivery of the International Certificate on Inventory of Hazardous Materials); port state controls, and violations notifications and procedures. IMO has developed the **2012 Guidelines for the Inspection of Ships Under the Hong Kong Convention**.	**Article 2 Definitions** "Hazardous Material" means any material or substance which is liable to create hazards to human health and/or the environment. **This includes:** **1.Hazardous material listed in annexes 1 and 2 of the Convention:** - Asbestos - Ozone-depleting substances - Anti-fouling compounds and systems - Polychlorinated biphenyls (PCB) - Cadmium and Cadmium Compounds - Hexavalent Chromium and Hexavalent Chromium Compounds - Lead and Lead Compounds	IMO has developed the **2015 Guidelines for the Development of the Inventory of Hazardous Materials** that provides detailed information on hazardous items to be listed in the inventory, including threshold values and quantities.	**No pollution reporting procedures except for violations.** **Article 12 Communication of information** .6 information concerning violations of this Convention; and .7 actions taken towards ships and Ship Recycling Facilities under the jurisdiction of that Party.	**NON-INDIGENOUS SPECIES (EO2)** **Common Indicator 6: Trends in abundance, temporal occurrence, and spatial distribution of non-indigenous species, particularly invasive, non-indigenous species, notably in risk areas (EO2, in relation to the main vectors and pathways of spreading of such species).** **CONTAMINANT (EO9)** **Common Indicator 17: Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).** **Common Indicator**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
		- Mercury and Mercury Compounds - Polybrominated Biphenyl (PBBs) - Polybrominated Diphenyl Ethers (PBDEs) - Polychlorinated Naphthalenes (more than 3 chlorine atoms) - Radioactive Substances - Certain Shortchain Chlorinated Paraffins (Alkanes, C10-C13, chloro). **2. Other potentially hazardous items and regular consumable goods potentially containing hazardous material, listed in the 2011 Guidelines for The Development of the Inventory of Hazardous Materials.**			**18:** **Level of pollution effects of key contaminants where a cause and effect relationship has been established.** **Common Indicator 19: Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution.** **Common Indicator 20:** **Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.** **Common indicator 21:** **Percentage of intestinal enterococci**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
					concentration measurements within established standards. **MARINE LITTER (EO10)** **Common Indicator 22:** **Trends in the amount of litter washed ashore and/or deposited on coastlines (including analysis of its composition, spatial distribution and, where possible, source).** **Common Indicator 23:** **Trends in the amount of litter in the water column including microplastics and on the seafloor.**
International Convention for the Prevention of Pollution from Ships, 1973 and Protocol of 1978 relating to the International	In the Convention and its Annexes, compliance monitoring is addressed by flag State surveys and port State controls. **Article 17**	Oil (Annex I) Noxious Liquid Substances in Bulk (Annex II) Harmful Substances Carried by Sea in Packaged Form	In the Convention and its Annexes, parameters for compliance monitoring relate to conditions and procedures for the delivery of Certificates and	**Article 8** **Reports on incidents involving harmful substances** **(1)** A report of an incident shall be made without delay to the fullest extent possible in	Relevance is addressed under each specific annexes of MARPOL described hereunder.

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 1973/1978) ***In force*** This convention deals with prevention of pollution of the marine environment by ships from operational or accidental causes and includes six technical Annexes, each covering a specific source of pollution, namely: oil; noxious liquid substances; packaged harmful cargo; sewage; garbage and air pollution. Protocol I of the Convention deals with pollution reporting obligations.	**Promotion of technical co-operation** The Parties to the Convention shall promote, in consultation with the Organization and other international bodies, with assistance and coordination by the Executive Director of the United Nations Environment Programme, support for those Parties which request technical assistance for: (a) the training of scientific and technical personnel; (b) the supply of necessary equipment and facilities for reception and monitoring; (c) the facilitation of other measures and arrangements to prevent or mitigate pollution of the marine environment by ships; and (d) the encouragement of	(Annex III) Sewage (Annex IV) Garbage (Annex V) Air Pollution (Annex VI) See detailed information provided under each specific annexes of MARPOL described hereunder.	approval of documentation and equipment by the flag State, as well as to procedures for port State control investigations and notification of violations.	accordance with the provisions of Protocol I to the present Convention. **(2)** Each Party to the Convention shall: (a) make all arrangements necessary for an appropriate officer or agency to receive and process all reports on incidents; and (b) notify the Organization with complete details of such arrangements for circulation to other Parties and Member States of the Organization. **(3)** Whenever a Party receives a report under the provisions of the present article, that Party shall relay the report without delay to: (a) the Administration of the ship involved; and (b) any other State which may be affected. **(4)** Each Party to the Convention undertakes to issue	

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
	research; preferably within the countries concerned, so furthering the aims and purposes of the present Convention.			instructions to its maritime inspection vessels and aircraft and to other appropriate services, to report to its authorities any incident referred to in Protocol I to the present Convention. That Party shall, if it considers it appropriate, report accordingly to the Organization and to any other Party concerned. **Protocol I Provisions concerning Reports on Incidents Involving Harmful Substances** (in accordance with article 8 of the Convention) **Protocol I Article I Duty to report** **(1)** The master or other person having charge of any ship involved in an incident referred to in article II of this Protocol shall report	

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
				the particulars of such incident without delay and to the fullest extent possible in accordance with the provisions of this Protocol. **(2)** In the event of the ship referred to in paragraph (1) of this article being abandoned, or in the event of a report from such a ship being incomplete or unobtainable, the owner, charterer, manager or operator of the ship, or their agent shall, to the fullest extent possible, assume the obligations placed upon the master under the provisions of this Protocol. **Protocol I Article II When to make reports** **(1)** The report shall be made when an incident involves: (a) a discharge above the permitted level or probable discharge of	

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
				oil or of noxious liquid substances for whatever reason including those for the purpose of securing the safety of the ship or for saving life at sea; or (b) a discharge or probable discharge of harmful substances in packaged form, including those in freight containers, portable tanks, road and rail vehicles and shipborne barges; or (c) damage, failure or breakdown of a ship of 15 metres in length or above which: (i) affects the safety of the ship; including but not limited to collision, grounding, fire, explosion, structural failure, flooding and cargo shifting; or (ii) results in impairment of the safety of navigation; including but not limited to, failure or breakdown of steering gear, propulsion plant,	

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
				electrical generating system, and essential shipborne navigational aids; or (d) a discharge during the operation of the ship of oil or noxious liquid substances in excess of the quantity or instantaneous rate permitted under the present Convention. **(2)** For the purposes of this Protocol: (a) Oil referred to in subparagraph 1(a) of this article means oil as defined in regulation 1(1) of Annex I of the Convention. (b) Noxious liquid substances referred to in subparagraph 1(a) of this article means noxious liquid substances as defined in regulation 1(6) of Annex II of the Convention. (c) Harmful substances in packaged form referred to in subparagraph 1(b) of this article means	

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
				substances which are identified as marine pollutants in the International Maritime Dangerous Goods Code (IMDG Code). **Protocol I Article III Contents of report** Reports shall in any case include: (a) identity of ships involved; (b) time, type and location of incident; (c) quantity and type of harmful substance involved; (d) assistance and salvage measures. **Protocol I Article IV Supplementary report** Any person who is obliged under the provisions of this Protocol to send a report shall, when possible: (a) supplement the initial report, as necessary, and provide information concerning further developments; and (b) comply as fully as	

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
				possible with requests from affected States for additional information. **Protocol I Article V Reporting procedures** **(1)** Reports shall be made by the fastest telecommunications channels available with the highest possible priority to the nearest coastal State. **(2)** In order to implement the provisions of this Protocol, Parties to the present Convention shall issue, or cause to be issued, regulations or instructions on the procedures to be followed in reporting incidents involving harmful substances, based on guidelines developed by the Organization. IMO has developed **General Principles for Ship Reporting Systems and Ship Reporting**	

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
				Requirements, including **Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants**.	
Annex I of MARPOL 73/78 Regulations for the Prevention of Pollution by Oil ***In force*** This Annex deals with oil pollution from operational measures and from accidental discharges, with more stringent regulations for Special Areas. Reception facilities must be provided at ports and terminals for the discharge of oily mixtures and residues.	Compliance monitoring is addressed by flag State surveys and port State controls. **Regulation 15 - Control of discharge of oil** **D General requirements** **7** Whenever visible traces of oil are observed on or below the surface of the water in the immediate vicinity of a ship or its wake, the Governments of Parties to the present Convention should, to the extent they are reasonably able to do so, promptly investigate the facts bearing on the issue of whether there has been a violation of the provisions of this	Oil See list of substances falling under "oil" in Appendix II. **Discharge of oil at sea in MARPOL Special Areas (applicable to the Mediterranean Sea)** **(1) <u>Oily mixture from machinery space (sludge) (All ship types)</u>** ***Bilges: discharges at sea are prohibited unless these criteria are satisfied:*** -Ship must be *en route;* -Oily mixture must have been processed through oil filtering equipment (OWS) with a 15ppm bilge alarm and an	Parameters for compliance monitoring relate to conditions and procedures for the delivery of Certificates and approval of documentation and equipment by the flag State, as well as to procedures for port State control investigations and notification of violations.	MARPOL Annex I requires that each ship carries a Shipboard Oil Pollution Emergency Plan (SOPEP). IMO has adopted the **Guidelines for the development of Shipboard Marine Pollution Emergency Plans for Oil and/or Noxious Liquid Substances.** These guidelines recommend that information be provided on: - Actual discharge: A report to the nearest coastal State is required whenever there is: .1 a discharge above the permitted level of oil or noxious liquid	**CONTAMINANTS (EO9)** **Common Indicator 17: Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).** **Common Indicator 18: Level of pollution effects of key contaminants where a cause and effect relationship has been established.** **Common Indicator 19: Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
	regulation. The investigation should include, in particular, the wind and sea conditions, the track and speed of the ship, other possible sources of the visible traces in the vicinity, and any relevant oil discharge records.	automatic stopping device. -Oil content of the mixture does not exceed 15 parts per million (ppm); and -in case of an oil tanker, the oily mixture shall not be mixed with oil cargo residues or with oil originating from cargo pump-room bilges. ***Sludges: must be collected in a dedicated tank and disposed of ashore. Discharges at sea are prohibited.*** **(2) <u>Cargo space (slops) / Oil tankers</u>** Any discharge into the sea of oil or oily mixture from the cargo area of an oil tanker are prohibited in a special area. Oil and oily mixture shall be collected on board and delivered at a port reception facility.		substance for whatever reason including those for the purpose of securing the safety of the ship or saving life at sea; or .2 a discharge during the operation of the ship of oil or noxious liquid substance in excess of the quantity or instantaneous rate permitted under the present Convention1. - Probable discharge: The Plan should give the master guidance to evaluate a situation which, though not involving an actual discharge, would qualify as a probable discharge and thus require a report. In judging whether there is such a probability and whether the report should be made, the following factors, as a minimum, should be taken into account: .1 the nature of the damage, failure or breakdown of the	**and hazardous substances) and their impact on biota affected by this pollution.** **Common Indicator 20:** **Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
				ship, machinery or equipment; .2 ship location and proximity to land or other navigational hazards; .3 weather, tide, current and sea state; and .4 traffic density. MARPOL Annex I also require that each ship carries an **Oil Record Book** with entries (time, position of ship, quantity, etc.) made every time an operation involving oil is carried out, such as loading; transfer; unloading; cargo oil washing; ballasting; cleaning of cargo tanks; discharge of slops; disposal of residues and oily mixture; accidental discharges. IMO has developed the **Guidance for Recording of Operations In The Oil Record Book Part I – Machinery Space Operations**	

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
				(All Ships).	
Annex II of MARPOL 73/78 Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk ***In force*** Annex II prohibits the discharge into the sea of noxious liquid substances (NLS) of Categories A, B, C and D or of ballast water, tank washings or other residues or mixtures containing such substances, except in compliance with conditions which are specified in detail for each category. These conditions includes: - the maximum quantity of substances per tank which may be discharged into the sea; - the speed of the ship during the	Compliance monitoring is addressed flag State surveys and port State controls.	**Regulation 3 Categorization and listing of noxious liquid substances** **(1)** For the purpose of the regulations of this Annex, noxious liquid substances shall be divided into four categories as follows: (a) Category A: Noxious liquid substances which if discharged into the sea from tank cleaning or deballasting operations would present a major hazard to either marine resources or human health or cause serious harm to amenities or other legitimate uses of the sea and therefore justify the application of stringent anti-pollution measures. (b) Category B: Noxious liquid	Parameters for compliance monitoring relate to conditions and procedures for the delivery of Certificates and approval of documentation and equipment by the flag State, as well as to procedures for port State control investigations and notification of violations.	MARPOL Annex II requires that ships certified to carry noxious liquid substances in bulk shall carry on board a shipboard marine pollution emergency plan for noxious liquid substances approved by the Administration. IMO has adopted the **Guidelines for the development of Shipboard Marine Pollution Emergency Plans for Oil and/or Noxious Liquid Substances.** These guidelines contain recommendations on reporting discharges: - Actual discharge: A report to the nearest coastal State is required whenever there is: .1 a discharge above the permitted level of oil or noxious liquid substance for	**CONTAMINANTS (EO9)** **Common Indicator 17: Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).** **Common Indicator 18: Level of pollution effects of key contaminants where a cause and effect relationship has been established.** **Common Indicator 19: Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
discharge; - the minimum distance from the nearest land during discharge; - the minimum depth of water at sea during discharge; - the maximum concentration of substances in the ship's wake or the dilution of substances prior to discharge; and - the need to effect the discharge below the waterline. Reception facilities for NLS residues must be provided at ports and terminals.		substances which if discharged into the sea from tank cleaning or deballasting operations would present a hazard to either marine resources or human health or cause harm to amenities or other legitimate uses of the sea and therefore justify the application of special anti-pollution measures. (c) Category C: Noxious liquid substances which if discharged into the sea from tank cleaning or deballasting operations would present a minor hazard to either marine resources or human health or cause minor harm to amenities or other legitimate uses of the sea and therefore require special operational conditions.		whatever reason including those for the purpose of securing the safety of the ship or saving life at sea; or .2 a discharge during the operation of the ship of oil or noxious liquid substance in excess of the quantity or instantaneous rate permitted under the present Convention1. - Probable discharge: The Plan should give the master guidance to evaluate a situation which, though not involving an actual discharge, would qualify as a probable discharge and thus require a report. In judging whether there is such a probability and whether the report should be made, the following factors, as a minimum, should be taken into account: .1 the nature of the damage, failure or breakdown of the ship, machinery or	**affected by this pollution.** **Common Indicator 20:** **Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
		(d) Category D: Noxious liquid substances which if discharged into the sea from tank cleaning or deballasting operations would present a recognizable hazard to either marine resources or human health or cause minimal harm to amenities or other legitimate uses of the sea and therefore require some attention in operational conditions. Appendix I of MARPOL Annex II provides **Guidelines for the categorization of noxious liquid substances** according to their toxicity. See Appendix III for more details.		equipment; .2 ship location and proximity to land or other navigational hazards; .3 weather, tide, current and sea state; and .4 traffic density. MARPOL Annex II also requires that each ship carries a **Cargo Record Book** with entries (time, position of ship, quantity, etc.) made every time an operation involving LNS is carried out, such as loading; transfer; unloading; prewashing of tanks; cleaning of cargo tanks; ballasting; discharge of tank washing; discharge of ballast water from cargo tanks; accidental discharges.	

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
Annex III of MARPOL 73/78 Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form (MARPOL ANNEX III) ***In force*** Annex III contains regulations which include requirements on packaging, marking, labelling, documentation, stowage and quantity limitations for substances identified as pollutants by the International Maritime Dangerous Code (IMDG Code).	Compliance monitoring is addressed through port State controls. Flag ships shall issue, or cause to be issued, detailed requirements on packing, marking, labelling, documentation, stowage, quantity limitations and exceptions for preventing or minimizing pollution of the marine environment by harmful substances.	**Regulation 1 Application** Substances which are identified as marine pollutants in the International Maritime Dangerous Goods Code (IMDG Code) See Appendix IV for more details. Guidelines for the identification of harmful substances in packaged form are given in the Appendix to Annex III **Guidelines for the identification of harmful substances in packaged form**.	Parameters for compliance monitoring relate to conditions and procedures for the delivery of Certificates and approval of documentation and equipment by the flag State, as well as to procedures for port State control investigations and notification of violations.	Each ship carrying harmful substances shall have a special list or manifest setting forth the harmful substances on board and the location thereof. A detailed stowage plan which sets out the location of the harmful substances on board may be used in place of such special list or manifest. Copies of such documents shall also be retained on shore by the owner of the ship or his representative until the harmful substances are unloaded. A copy of one of these documents shall be made available before departure to the person or organization designated by the port State authority.	**CONTAMINANTS (EO9)** **Common Indicator 17: Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).** **Common Indicator 18: Level of pollution effects of key contaminants where a cause and effect relationship has been established.** **Common Indicator 19: Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution.** **Common Indicator**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
					20: **Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.**
Annex IV of MARPOL 73/78 Regulations for the Prevention of Pollution by Sewage from Ships (MARPOL ANNEX IV) ***In force*** The Annex requires ships to be equipped with either an approved sewage treatment plant or an approved sewage comminuting and disinfecting system or a sewage holding tank. The discharge of sewage into the sea is prohibited, except when the ship is equipped with such a sewage treatment	Compliance monitoring is achieved through flag State surveys, port State controls, and violations notifications.	**Regulation 1 Definitions** (3) Sewage means: (a) drainage and other wastes from any form of toilets, urinals, and WC scuppers; (b) drainage from medical premises (dispensary, sick bay, etc.) via wash basins, wash tubs and scuppers located in such premises; (c) drainage from spaces containing living animals; or (d) other waste waters when mixed with the drainages defined above.	MARPOL Annex IV requires that ships must be equipped with a sewage treatment plant/comminuter/holding tank and a discharge pipeline in compliance with certain specifications. IMO has adopted the **2012 Guidelines on Implementation of Effluent Standards and Performance Tests for Sewage Treatment Plants** which set a number of parameters to test and approve sewage treatment plants, including Thermotolerant coliforms – the group of coliform bacteria which produce gas	**No reporting obligation.**	**CONTAMINANTS (EO9)** **Common indicator 21:** **Percentage of intestinal enterococci concentration measurements within established standards.**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
plant or disinfecting system, at a distance of more than three nautical miles from the nearest land. Sewage not comminuted or disinfected may be discharged at a distance of more than 12 nautical miles from the nearest land. Sewage reception facilities must be provided at ports and terminals.			from lactose in 48 hours at 44.5°C. These organisms are sometimes referred to as "faecal coliforms".		
Annex V of MARPOL 73/78 Regulations for the Prevention of Pollution by Garbage from Ships (MARPOL ANNEX V) ***In force*** **As amended by RESOLUTION MEPC.201(62) adopted on 15 July 2011 (<u>Revised MARPOL Annex V</u>)** Annex V regulates discharges of garbage into the sea	Compliance monitoring is achieved through flag State surveys, port State controls, and violations notifications.	**Regulation 1 Definitions** **9** Garbage means all kinds of food wastes, domestic wastes and operational wastes, all plastics, cargo residues, incinerator ashes, cooking oil, fishing gear, and animal carcasses generated during the normal operation of the ship and liable to be disposed of continuously or periodically except those substances which are defined or listed in other Annexes to the	IMO has developed the **2012 Guidelines for The Implementation of MARPOL Annex V** that provides details on garbage management including cargo residues toxicity protocol for solid bulk cargoes.	Parties shall ensure that each ship carries a **Garbage Record Book** with entries made every time when garbage is discharged at sea, or discharged in port reception facilities, or incinerated, or accidentally discharged. The master should obtain from the operator of port reception facilities, or from the master of the ship receiving the garbage, a receipt or certificate specifying the estimated amount	**MARINE LITTER (EO10)** **Common Indicator 22:** **Trends in the amount of litter washed ashore and/or deposited on coastlines (including analysis of its composition, spatial distribution and, where possible, source).** **Common Indicator 23:** **Trends in the amount of litter in the water column including**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
and management of garbage on board the ship. Discharges of garbage in Special Areas (applicable to the Mediterranean Sea) is completely prohibited except for food wastes, and washing water containing cargo residues, cleaning agents or additive which can be discharged at sea under certain limited conditions. Reception facilities for ports and terminals must be provided at ports and terminals.		present Convention. Garbage does not include fresh fish and parts thereof generated as a result of fishing activities undertaken during the voyage, or as a result of aquaculture activities which involve the transport of fish including shellfish for placement in the aquaculture facility and the transport of harvested fish including shellfish from such facilities to shore for processing.		of garbage transferred. The amount of garbage on board should be estimated in cubic metres and broken down by garbage category, as follows: - Plastics - Food wastes - Domestic wastes (e.g., paper products, rags, glass, metal, bottles, crockery, etc.) - Cooking oil - Incinerator Ashes - Operational wastes - Cargo residues - Animal Carcass(es) Fishing gear.	**microplastics and on the seafloor.** **Common Indicator 24 *(Candidate Indicator):* Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds and marine turtles.**
Annex VI of MARPOL 73/78 Regulations for the Prevention of Air Pollution from Ships (MARPOL ANNEX VI) ***In force***	**n/a**	**n/a**	**n/a**	**n/a**	**NONE (No IMAP Indicator related to air pollution)**
Guidelines for the reduction of underwater noise from commercial shipping to address	**No monitoring obligation** **5 Predicting underwater noise**	**4 Definition** **4.3** Underwater noise, or the underwater-radiated noise level, for the purposes of	**6 Standards and references** **6.1** Underwater noise should be measured to an objective	**No reporting obligation**	**EO11 ENERGY INCLUDING UNDERWATER NOISE (*Candidate Indicator*)**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
adverse impacts on marine life. **(NOT mandatory)** These non-mandatory Guidelines are intended to provide general advice about reduction of underwater noise to designers, shipbuilders and ship operators.	**levels** 5.1 Underwater noise computational models may be useful for both new and existing ships in understanding what reductions might be achievable for certain changes in design or operational behaviour. Such models may be used to analyse the noise sources on the ship, the noise transmission paths through the ship and estimate the total predicted noise levels. This analysis can help shipowners, shipbuilders and designers, to identify noise control measures that could be considered for the specific application, taking into account expected operational conditions. Such measures may include amongst others: vibration isolation mounts (i.e. resilient mounts) for machinery and other	these Guidelines refers to noise from commercial ships. *Underwater-radiated noise level is reported in sound pressure levels in decibels and expressed as 10 times the logarithm of the square of the ratio of the rms sound pressure to a reference pressure of 1 micro Pascal. When it is a ship source level, the sound pressure level is adjusted to a level at 1 m from the source.	standard for any meaningful improvements. .1 The International Organization for Standardization (ISO) has developed the (ISO/PAS) 17208-1 – Acoustics – Quantities and procedures for description and measurement of underwater sound from ships – Part 1: General requirements for measurements in deep water. This measurement standard is for deep water which implies that the water depth should be larger than 150 m or 1.5 times overall ship length (engineering method), whichever is greater. This is a temporary publicly available standard. This standard is based on the American National Standards Institute and the Acoustical Society of America (ANSI/ASA) S12.64-2009		**Candidate Indicator 26** **Proportion of days and geographical distribution where loud, low, and mid-frequency impulsive sounds exceed levels that are likely to entail significant impact on marine animals** **Candidate Indicator 27** **Level of continuous low frequency sounds with the use of models as appropriate.**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
	equipment, dynamic balancing, structural damping, acoustical absorption and insulation, hull appendages and propeller design for noise reduction. 5.2 Types of computational models that may assist in reducing underwater noise include: 1.1 Computational Fluid Dynamics (CFD) can be used to predict and visualize flow characteristics around the hull and appendages, generating the wake field in which the propeller operates; 1.2 Propeller analysis methods such as lifting surface methods or CFD can be used for predicting cavitation; 1.3 Statistical Energy Analysis (SEA) can be used to estimate high-frequency transmitted noise and vibration levels from machinery; and 1.4 Finite Element		"Quantities and Procedures for Description and Measurement of Underwater Sound from Ships, Part 1: General Requirements". .2 ISO is also developing ISO/DIS 16554 – Ship and marine technology – Measurement and reporting of underwater sound radiated from merchant ships – deep-water measurement, which is expected to be published in 2013. The standard would provide shipyards, shipowners and ship surveyors with a well-established measurement method for underwater sound radiated from merchant ships for use at the final delivery stage of ships. **6.2** Several research ships have been designed using the		

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
	Analysis (FEA) and Boundary Element Method (BEM) may contribute to estimate low-frequency noise and vibration levels from the structure of the ship excited by the fluctuating pressure of propeller and machinery excitation. 5.3 The value of a modelling exercise is enhanced if its predictive capabilities are assessed in case studies under various operational conditions.		noise specification proposed by the International Council for the Exploration of the Sea (ICES) Cooperative Research Report No.209 (CRR 209). It should be noted that the ICES CRR 209 noise specification was designed for fishery research ships so that marine life would not be startled during biomass surveys; it was not intended to be used as a commercial ship design standard to prevent potential harm of marine life. However, certain design arrangements used to meet ICES CRR 209 may still be useful for new commercial ships to reduce underwater noise. **6.3** Other underwater noise rating criteria are available and may prove useful as guidance.		

2- Maritime safety:

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
Convention on International Regulations for Preventing Collisions at Sea, 1972 (COLREGs 1972) ***In force*** This Convention sets rules of navigation related to traffic separation schemes, sailing and steering, lights and shapes and other safe navigation rules.	**n/a**	**n/a**	**n/a**	**n/a**	**NONE (Instrument not related to pollution)**
International Convention on Tonnage Measurement of Ships, 1969 (TONNAGE 1969) ***In force*** This Convention introduces a universal tonnage	**n/a**	**n/a**	**n/a**	**n/a**	**NONE**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
measurement system.					
International Convention on Salvage, 1989 (SALVAGE 1989) ***In force*** This Convention makes provision for an enhanced salvage award taking into account the skill and efforts of the salvors in preventing or minimizing damage to the environment.	**n/a**	**Article 1 Definitions** (d) Damage to the environment means substantial physical damage to human health or to marine life or resources in coastal or inland waters or areas adjacent thereto, caused by pollution, contamination, fire, explosion or similar major incidents.	**n/a**	**n/a**	**NONE**
International Convention on Load Lines, 1966 (LL 1966) **Protocol of 1988 relating to the International Convention on Load Lines, 1966 (LL PROT 1988)** ***In force*** This Convention deals	**n/a**	**n/a**	**n/a**	**n/a**	**NONE**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
with safety limitations on the draught to which a ship may be loaded.					
International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended in 1995 (STCW-F 1995) and Code, including the Manila amendments to the STCW Convention and Code adopted on 25 June 2010. ***In force*** This Convention establishes common international standards of training, certification and watchkeeping for seafarers.	**n/a**	**n/a**	**n/a**	**n/a**	**NONE**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
International Convention for the Safety of Life at Sea, 1974 (SOLAS 1974) ***In force*** **Protocol of 1978 relating to the International Convention for the Safety of Life at Sea, 1974 (SOLAS PROT 1978)** ***In force*** **Protocol of 1988 relating to the International Convention for the Safety of Life at Sea, 1974 (SOLAS PROT 1988)** ***In force*** This Convention deals with the safety of merchant ships (design ; construction ; equipment and appliances ; carriage of cargo ; radio	**n/a**	**n/a**	**n/a**	**n/a**	**NONE**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
telecommunications ; navigation services etc.)					

3 - Preparedness and response:

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (Intervention 1969) ***In force*** This Convention deals with the right of a coastal State to take measures on the high seas to prevent mitigate or eliminate oil pollution.	**n/a**	**Article II.3** "Oil" defined as crude oil, fuel oil, diesel oil and lubricating oil.	**n/a**	**n/a**	**NONE** **(Instrument related to coastal States intervention rights)**
Protocol Relating to Intervention on the High Seas in Cases of Pollution by	**n/a**	**Annex** 1. Oil (when carried in bulk) 2. Noxious	**n/a**	**n/a**	**NONE** **(Instrument related to coastal States intervention rights)**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
Substances other than Oil, 1973 (Intervention Protocol 1973) ***In force*** This Protocol deals with the right of a coastal State to take measures on the high seas to prevent mitigate or eliminate pollution from substances other than oil.		Substances 3. Liquefied Gases (when carried in bulk) 4. Radioactive Substances			
International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC Convention) ***In force*** This Convention deals with measures for dealing with oil pollution incidents (national contingency systems; shipboard oil pollution emergency plans; adequate response capacities; mutual assistance, reporting etc.), either	**Article 8** **Research and development** **(1)** Parties agree to co-operate directly or, as appropriate, through the Organization or relevant regional organizations or arrangements in the promotion and exchange of results of research and development programmes relating to the enhancement of the state-of-the-art of oil pollution preparedness and response, including	**Article 2** **Definitions** "Oil" defined as "petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined products".	**Article 5** **Action on receiving an oil pollution report** **(1)** Whenever a Party receives a report referred to in article 4 or pollution information provided by other sources, it shall: (a) assess the event to determine whether it is an oil pollution incident; (b) assess the nature, extent and possible consequences of the oil pollution incident; and **(c)** then, without	**Article 4** **Oil pollution reporting procedures** **(1)** Each Party shall: (a) require masters or other persons having charge of ships flying its flag and persons having charge of offshore units under its jurisdiction to report without delay any event on their ship or offshore unit involving a discharge or probable discharge of oil: (i) in the case of a ship, to the nearest coastal State;	**CONTAMINANTS (EO9)** **Common Indicator 17:** **Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).** **Common Indicator 18:** **Level of pollution effects of key contaminants where a cause and effect relationship has been established.**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
nationally or in co-operation with other countries.	technologies and techniques for surveillance, containment, recovery, dispersion, clean-up and otherwise minimizing or mitigating the effects of oil pollution, and for restoration. **(2)** To this end, Parties undertake to establish directly or, as appropriate, through the Organization or relevant regional organizations or arrangements, the necessary links between Parties' research institutions. **(3)** Parties agree to co-operate directly or through the Organization or relevant regional organizations or arrangements to promote, as appropriate, the holding on a regular basis of international symposia on relevant subjects, including technological advances in oil		delay, inform all States whose interests are affected or likely to be affected by such oil pollution incident, together with (i) details of its assessments and any action it has taken, or intends to take, to deal with the incident, and (ii) further information as appropriate, until the action taken to respond to the incident has been concluded or until joint action has been decided by such States.	(ii) in the case of an offshore unit, to the coastal State to whose jurisdiction the unit is subject; (b) require masters or other persons having charge of ships flying its flag and persons having charge of offshore units under its jurisdiction to report without delay any observed event at sea involving a discharge of oil or the presence of oil: (i) in the case of a ship, to the nearest coastal State; (ii) in the case of an offshore unit, to the coastal State to whose jurisdiction the unit is subject (c) require persons having charge of sea ports and oil handling facilities under its jurisdiction to report without delay any event involving a discharge or probable discharge of oil or the presence of oil to the competent national authority;	**Common Indicator 19: Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution.** **Common Indicator 20:** **Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
	pollution combating techniques and equipment. **(4)** Parties agree to encourage, through the Organization or other competent international organizations, the development of standards for compatible oil pollution combating techniques and equipment.			(d) instruct its maritime inspection vessels or aircraft and other appropriate services or officials to report without delay any observed event at sea or at a sea port or oil handling facility involving a discharge of oil or the presence of oil to the competent national authority or, as the case may be, to the nearest coastal State; (e) request the pilots of civil aircraft to report without delay any observed event at sea involving a discharge of oil or the presence of oil to the nearest coastal State. **(2)** Reports under paragraph (l)(a)(i) shall be made in accordance with the requirements developed by the Organization and based on the guidelines and general principles adopted by the Organization. Reports under paragraph	

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
				(l)(a)(ii), (b), (c) and (d) shall be made in accordance with the guidelines and general principles adopted by the Organization to the extent applicable. **Article 5** **Action on receiving an oil pollution report** **(2)** When the severity of such oil pollution incident so justifies, the Party should provide the Organization directly or, as appropriate, through the relevant regional organization or arrangements with the information referred to in paragraph (l)(b) and (c). **(3)** When the severity of such oil pollution incident so justifies, other States affected by it are urged to inform the Organization directly or, as appropriate, through the relevant regional organizations	

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
				or arrangements of their assessment of the extent of the threat to their interests and any action taken or intended. **(4)** Parties should use, in so far as practicable, the oil pollution reporting system developed by the Organization when exchanging information and communicating with other States and with the Organization.	
Protocol on Preparedness, Response and Cooperation to Pollution Incidents by Hazardous and Noxious Substances, 2000 (OPRC-HNS Protocol) ***In force*** This Protocol deals with measures for dealing with pollution incidents involving hazardous and Noxious Substances.	**Article 6 Research and development** **(1)** Parties agree to co-operate directly or, as appropriate, through the Organization or relevant regional organizations or arrangements in the promotion and exchange of results of research and development programmes relating to the enhancement of the state-of-the-art of preparedness for	**"Hazardous and noxious substances"** defined as "any substance other than oil which, if introduced into the marine environment is likely to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea".	**No parameters for monitoring.**	**Article 3 Emergency plans and reporting** **(1)** Each Party shall require that ships entitled to fly its flag have on-board a pollution incident emergency plan and shall require masters or other persons having charge of such ships to follow reporting procedures to the extent required. Both planning requirements and reporting procedures shall be in	**CONTAMINANTS (EO9)** **Common Indicator 17: Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).** **Common Indicator 18: Level of pollution effects of key contaminants where a cause and effect**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
	and response to pollution incidents, including technologies and techniques for surveillance, containment, recovery, dispersion, clean-up and otherwise minimizing or mitigating the effects of pollution incidents, and for restoration. **(2)** To this end, Parties undertake to establish directly or, as appropriate, through the Organization or relevant regional organizations or arrangements, the necessary links between Parties' research institutions. **(3)** Parties agree to co-operate directly or through the Organization or relevant regional organizations or arrangements to promote, as appropriate, the holding on a regular basis of international symposia on relevant			accordance with applicable provisions of the conventions developed within the Organization which have entered into force for that Party. (…) **(2)** Each Party shall require that authorities or operators in charge of sea ports and hazardous and noxious substances handling facilities under its jurisdiction as it deems appropriate have pollution incident emergency plans or similar arrangements for hazardous and noxious substances that it deems appropriate which are co-ordinated with the national system established in accordance with article 4 and approved in accordance with procedures established by the competent national authority. **(3)** When the	**relationship has been established.** **Common Indicator 19: Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution.** **Common Indicator 20:** **Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
	subjects, including technological advances in techniques and equipment for responding to pollution incidents. **(4)** Parties agree to encourage, through the Organization or other competent international organizations, the development of standards for compatible hazardous and noxious substances pollution combating techniques and equipment.			appropriate authorities of a Party learn of a pollution incident, they shall notify other States whose interests are likely to be affected by such incident.	

4 - Liability and compensation:

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001 (BUNKER, 2001) ***In force***	**No monitoring obligation**	"Bunker oil" defined as any hydrocarbon mineral oil, including lubricating oil, used or intended to be used for the operation or propulsion of the ship, and any residues of such oil.	**n/a**	**n/a**	**NONE**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
This Convention deals with liability and insurance related to damage caused by spills of oil, when carried as fuel in ships' bunkers.					
International Convention on Civil Liability for Oil Pollution Damage, 1992 (CLC PROT 1992) ***In force*** This Convention deals with the shipowners liability for oil pollution damage resulting from maritime casualties.	**n/a**	**Article 1** **5.** "Oil" means any persistent hydrocarbon mineral oil such as crude oil, fuel oil, heavy diesel oil and lubricating oil, whether carried on board a ship as cargo or in the bunkers of such a ship.	**n/a**	**n/a**	**NONE**
International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992 (FUND PROT 1992) ***In force*** This Convention establishes a Fund to pay compensation to States and persons	**n/a**	**Article 1** **3.** "Contributing Oil" means crude oil and fuel oil as defined in sub-paragraphs (a) and (b) below: (a) "Crude Oil" means any liquid hydrocarbon mixture occurring naturally in the earth whether or not treated to render it suitable for transportation. It also includes crude oils	**n/a**	**n/a**	**NONE**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
who suffer pollution damage, if they are unable to obtain compensation from the owner of the ship or if the compensation is not sufficient to cover the damage suffered.		from which certain distillate fractions have been removed (sometimes referred to as “topped crudes”) or to which certain distillate fractions have been added (sometimes referred to as “spiked” or “reconstituted” crudes). (b) “Fuel Oil” means heavy distillates or residues from crude oil or blends of such materials intended for use as a fuel for the production of heat or power of a quality equivalent to the “American Society for Testing and Materials’ Specification for Number Four Fuel Oil (Designation D 396-69)”, or heavier.			
Protocol of 2003 to the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992 (FUND PROT 2003)	**n/a**	Same as for the definition of Article 1.3 of the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992 (FUND PROT 1992)	**n/a**	**n/a**	**NONE**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
In force The 2003 Protocol establishes an International Oil Pollution Compensation Supplementary Fund to supplement the compensation available under the 1992 Civil Liability and Fund Conventions with an additional, third tier of compensation.					
International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, 1996 (HNS 1996) **Superseded by the Protocol of 2010 to the Convention (HNS PROT 2010)** **NOT *in force*** The Protocol establishes a two-tier	**n/a**	**Article 1** **5 "Hazardous and noxious substances (HNS)"** means: (a) any substances, materials and articles carried on board a ship as cargo, referred to in (i) to (vii) below: (i) oils, carried in bulk, as defined in regulation 1 of Annex I to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended;	**n/a**	**n/a**	**NONE**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
system for compensation, to be paid by the shipowners and by a Funds respectively, in the event of accidents at sea involving hazardous and noxious substances. Compensation covers not only pollution damage but also the risks of fire and explosion, including loss of life or personal injury as well as loss of or damage to property.		(ii) noxious liquid substances, carried in bulk, as defined in regulation 1.10 of Annex II to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended, and those substances and mixtures provisionally categorized as falling in pollution category X, Y or Z in accordance with regulation 6.3 of the said Annex II; (iii) dangerous liquid substances carried in bulk listed in chapter 17 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, as amended, and the dangerous products for which the preliminary suitable conditions for the carriage have been prescribed by the			

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
		Administration and port administrations involved in accordance with paragraph 1.1.6 of the Code; (iv) dangerous, hazardous and harmful substances, materials and articles in packaged form covered by the International Maritime Dangerous Goods Code, as amended; (v) liquefied gases as listed in chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk, as amended, and the products for which preliminary suitable conditions for the carriage have been prescribed by the Administration and port administrations involved in accordance with paragraph 1.1.6 of the Code; (vi) liquid substances carried in bulk with a			

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
		flashpoint not exceeding 60ºC (measured by a closed-cup test); (vii) solid bulk materials possessing chemical hazards covered by the International Maritime Solid Bulk Cargoes Code, as amended, to the extent that these substances are also subject to the provisions of the International Maritime Dangerous Goods Code in effect in 1996, when carried in packaged form; and (b) residues from the previous carriage in bulk of substances referred to in (a)(i) to (iii) and (v) to (vii) above. **5bis "Bulk HNS"** means any hazardous and noxious substances referred to in article 1, paragraph 5(a)(i) to (iii) and (v) to (vii) and paragraph 5(b). **5ter "Packaged HNS"** means any			

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
		hazardous and noxious substances referred to in article 1, paragraph 5(a)(iv).			
Convention on Limitation of Liability for Maritime Claims (LLMC 1976) ***In force*** **as amended by Protocol of 1996 (Protocol amended in 2012) (LLMC PROT 1996)** ***In force*** This Convention established compensation limits in case of maritime casualty for two types of claims - claims for loss of life or personal injury, and property claims (such as damage to other ships, property or harbour works).	**n/a**	**n/a**	**n/a**	**n/a**	**NONE**

5 - Labour standards in merchant shipping:

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
Merchant Shipping (Minimum Standards) Convention, 1976 (ILO C147) ***In force*** **Protocol of 1996 to the Merchant Shipping (Minimum Standards) Convention, 1976 (P147)** ***In force*** **Maritime Labour Convention, 2006 (MLC, 2006)** ***In force*** The MLC Convention updates and unify previous instruments related to maritime labour and covers conditions of employment, hours of work and rest, accommodation, recreational facilities, food and catering, health protection,	**No monitoring obligation**	**n/a**	**n/a**	**n/a**	**NO**

Title, status and description of instrument	Monitoring obligations (Output 2)	Type of pollutant monitored (Output 3)	Parameters for monitoring (Output 4)	Reporting procedures (Output 5)	Relevance to IMAP qualitative indicators (Cross-checking)
medical care, welfare and social security protection.					

Annex I - Guidelines for the implementation of the BWM Convention

Adopted with the Convention (some Guidelines were revised after the adoption of the Convention)

Guidelines for sediment reception facilities (G1)
Guidelines for ballast water sampling (G2)
Guidelines for ballast water management equivalent compliance (G3)
Guidelines for ballast water management and development of ballast water management plans (G4)
Guidelines for ballast water reception facilities (G5)
Guidelines for ballast water exchange (G6)
Guidelines for risk assessment under regulation A-4 of the BWM convention (G7)
Guidelines for approval of ballast water management systems (G8)
Procedure for approval of ballast water management systems that make use of active substances (G9)
Guidelines for approval and oversight of prototype ballast water treatment technology programmes (G10)
Guidelines for ballast water exchange design and construction standards (G11)
2012 Guidelines on design and construction to facilitate sediment control on ships (G12)
Guidelines for additional measures regarding ballast water management including emergency situations (G13)
Guidelines on designation of areas for ballast water exchange (G14)

Adopted after the adoption of the Convention

Guidelines for port State control under the BWM Convention
Measures to be taken to facilitate entry into force of the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2014
Information reporting on type approved ballast water management systems
Procedure for approving other methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention
Installation of ballast water management systems on new ships in accordance with the application dates contained in the ballast water management convention (BWM Convention)

Annex II - Oil (MARPOL Annex I)

Regulation 1
Definitions

For the purposes of this Annex:
(1) Oil means petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined products (other than petrochemicals which are subject to the provisions of Annex II of the present Convention) and, without limiting the generality of the foregoing, includes the substances listed in appendix I to this Annex.

Appendix I
List of oils*
Asphalt solutions
Blending stocks
Roofers flux
Straight run residue
Oils
Clarified
Crude oil
Mixtures containing crude oil
Diesel oil
Fuel oil no. 4
Fuel oil no. 5
Fuel oil no. 6
Residual fuel oil
Road oil
Transformer oil
Aromatic oil (excluding vegetable oil)
Lubricating oils and blending stocks
Mineral oil
Motor oil
Penetrating oil
Spindle oil
Turbine oil
Distillates
Straight run
Flashed feed stocks
Gas oil
Cracked
Gasoline blending stocks
Alkylates ± fuel
Reformates
Polymer ± fuel
Gasolines
Casinghead (natural)
Automotive
Aviation
Straight run
Fuel oil no. 1 (kerosene)
Fuel oil no. 1-D
Fuel oil no. 2
Fuel oil no. 2-D
Jet fuels
JP-1 (kerosene)

JP-3
JP-4
JP-5 (kerosene, heavy)
Turbo fuel
Kerosene
Mineral spirit
Naphtha
Solvent
Petroleum
Heartcut distillate oil

Annex III - Guidelines for the categorization of noxious liquid substances (Appendix I of MARPOL Annex II)

Category A Substances which are bioaccumulated and liable to produce a hazard to aquatic life or human health, or which are highly toxic to aquatic life (as expressed by a Hazard Rating 4, defined by a TLm less than 1 ppm); and additionally certain substances which are moderately toxic to aquatic life (as expressed by a Hazard Rating 3, defined by a TLm of 1 ppm or more, but less than 10 ppm) when particular weight is given to additional factors in the hazard profile or to special characteristics of the substance.

Category B Substances which are bioaccumulated with a short retention of the order of one week or less, or which are liable to produce tainting of the sea food, or which are moderately toxic to aquatic life (as expressed by a Hazard Rating 3, defined by a TLm of 1 ppm or more, but less than 10 ppm); and additionally certain substances which are slightly toxic to aquatic life (as expressed by a Hazard Rating 2, defined by a TLm of 10 ppm or more, but less than 100 ppm) when particular weight is given to additional factors in the hazard profile or to special characteristics of the substance.

Category C Substances which are slightly toxic to aquatic life (as expressed by a Hazard Rating 2, defined by a TLm of 10 ppm or more, but less than 100 ppm); and additionally certain substances which are practically non-toxic to aquatic life (as expressed by a Hazard Rating 1, defined by a TLm of 100 ppm or more, but less than 1,000 ppm) when particular weight is given to additional factors in the hazard profile or to special characteristics of the substance.

Category D Substances which are practically non-toxic to aquatic life (as expressed by a Hazard Rating 1, defined by a TLm of 100 ppm or more, but less than 1,000 ppm); or causing deposits blanketing the sea floor with a high biochemical oxygen demand (BOD); or which are highly hazardous to human health, with an LD50 of less than 5 mg/kg; or which produce moderate reduction of amenities because of persistency, smell or poisonous or irritant characteristics, possibly interfering with use of beaches; or which are moderately hazardous to human health, with an LD50 of 5 mg/kg or more, but less than 50 mg/kg, and produce slight reduction of amenities.

Other Liquid Substances (for the purposes of regulation 4 of Annex II i.e. other Liquid Substances that present no harm to the environment) Substances other than those categorized in Categories A, B, C, and D above.

Annex IV - Marine Pollutant According to IMDG Code

IMDG Code Criteria:
• A substance that is identified as a MP in Column 4 of the Dangerous Goods List, or the IMDG Code Index, or that meets the criteria for classification as an “Environmentally Hazardous Substance (aquatic environment)” in 2.9.3.3.
• **Section 2.9.3.3:** A substance is classified as a Marine Pollutant, if they satisfy the criteria for Acute 1, Chronic 1, or Chronic 2 within the following tables:

Acute toxicity Category: Acute 1

96 hr LC50 (for fish)	≤1mg/l and/or
48 hr EC50 (for crustacean)	≤1mg/l and/or
72 or 96 hr ErC50 (for algae or other aquatic plants)	≤1mg/l

Chronic toxicity Category: Chronic 1

96 hr LC50 (for fish)	≤1mg/land/or
48 hr EC50 (for crustacean)	≤1mg/land/or
72 or 96 hr ErC50 (for algae or other aquatic plants)	≤1mg/l

and the substance is not rapidly degradable and/or the log Kow ≥ 4 (unless the experimentally determined BCF < 500)

Category: Chronic 2

96 hr LC50 (for fish)	>1 to ≤10mg/land/or
48 hr EC50 (for crustacean)	>1 to ≤10mg/land/or
72 or 96 hr ErC50 (for algae or other aquatic plants)	>1 to ≤10mg/l

and the substance is not rapidly degradable and/or the log Kow ≥ 4 (unless the experimentally determined BCF < 500), unless the chronic toxicity NOECs are >1 mg/l

Appendix III

Matrix Linking Outputs 2 to 5 to Relevant IMAP Indicators (Output 6)

Matrix Linking Outputs 2 to 5 to Relevant IMAP Indicators

The Matrix below links monitoring and reporting obligations identified in relevant international conventions applicable to ship-generated pollution with IMAP Common Indicators developed for the assessment of the state of marine and coastal environment in the Mediterranean Sea.

Table: Matrix Correlating International Obligations Related to Monitoring and Reporting with IMAP Indicators:

Legend:
- EO9 (Contaminants)
- EO10 (Marine Litter)
- EO11 (Energy / underwater noise)
- EO2 (Non-Indigenous Species)
- EO8 (Coastal Ecosystems and Landscape)

Relevant IMO Instruments	Pollutant Addressed	Corresponding IMAP Ecological Objective (EO)	Corresponding IMAP Common Indicator (CI)	Monitoring and Reporting Obligations
OPRC (Preparedness and Response – Oil)	Oil	EO9 (Contaminants)	CI 17 Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).	Marine pollution monitoring and reporting are required only in case of a pollution incident. Reporting should be made by the master of the ships to the nearest coastal State. The Party receiving the report shall inform the affected State, and, in case of severity, IMO. Cooperation for research and development on oil pollution preparedness and response
		EO9 (Contaminants)	CI 18 Level of pollution effects of key contaminants where a cause and effect relationship has been established.	
		EO9 (Contaminants)	CI 19 Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution.	
		EO9 (Contaminants)	CI 20 Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.	

Relevant IMO Instruments	Pollutant Addressed	Corresponding IMAP Ecological Objective (EO)	Corresponding IMAP Common Indicator (CI)	Monitoring and Reporting Obligations
OPRC-HNS (Preparedness and Response – HNS)	Hazardous and noxious substances other than oil (liquid and solids HNS transported in bulk and in packaged form)	EO9 (Contaminants)	CI 17 Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).	Marine pollution monitoring and reporting are required only in case of a pollution incident. Reporting should be made by the master of the ship and by a Party to other States whose interests are likely to be affected by the incident. Cooperation for research and development.
		EO9 (Contaminants)	CI 18 Level of pollution effects of key contaminants where a cause and effect relationship has been established.	
		EO9 (Contaminants)	CI 19 Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution.	
		EO9 (Contaminants)	CI 20 Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.	
Hong Kong Convention (Ship Recycling) **NOT IN FORCE**	Hazardous material (Polychlorinated naphtalenes; polychlorinated biphenils; mercury; cadmium; lead; radioactive substances and other solid and liquid chemicals and contaminants)	EO9 (Contaminants)	CI 17 Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).	No marine pollution monitoring and reporting obligations.
		EO9 (Contaminants)	CI 18 Level of pollution effects of key contaminants where a cause and effect relationship has been established.	
		EO9 (Contaminants)	CI 20 Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.	
AFS Convention (Antifouling)	Organotin compounds used in ships' anti-fouling systems.	EO9 (Contaminants)	CI 17 Concentration of key harmful contaminants measured in the relevant matrix (EO9,	No marine pollution monitoring and reporting obligations. Monitoring obligation

Relevant IMO Instruments	Pollutant Addressed	Corresponding IMAP Ecological Objective (EO)	Corresponding IMAP Common Indicator (CI)	Monitoring and Reporting Obligations
			related to biota, sediment, seawater).	under technical and scientific cooperation on anti-fouling systems effects.
		EO9 (Contaminants)	CI 18 Level of pollution effects of key contaminants where a cause and effect relationship has been established.	
		EO9 (Contaminants)	CI 20 Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.	
MARPOL Annex I (Oil)	Oil, oily mixtures and cargo slops	EO9 (Contaminants)	CI 17 Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).	Marine pollution monitoring and reporting are only required in case of an oil pollution incident.
		EO9 (Contaminants)	CI 18 Level of pollution effects of key contaminants where a cause and effect relationship has been established.	
		EO9 (Contaminants)	CI 19 Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution.	
		EO9 (Contaminants)	CI 20 Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.	
MARPOL Annex II (NLS)	Noxious liquid substances (bioaccumulated and liable to produce a hazard to aquatic life or human health, or	EO9 (Contaminants)	CI 17 Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).	Marine pollution monitoring and reporting are only required in case of a NLS pollution incident.

Relevant IMO Instruments	Pollutant Addressed	Corresponding IMAP Ecological Objective (EO)	Corresponding IMAP Common Indicator (CI)	Monitoring and Reporting Obligations
	which are toxic to aquatic life)	EO9 (Contaminants)	CI 18 Level of pollution effects of key contaminants where a cause and effect relationship has been established.	
		EO9 (Contaminants)	CI 19 Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution.	
		EO9 (Contaminants)	CI 20 Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.	
MARPOL Annex III (Packaged Form)	Harmful substances in packaged forms (identified as marine pollutant in the IMDG Code (International Maritime Dangerous Code)	EO9 (Contaminants)	CI 17 Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).	Marine pollution monitoring and reporting are only required in case of a pollution incident involving packaged goods.
		EO9 (Contaminants)	CI 18 Level of pollution effects of key contaminants where a cause and effect relationship has been established.	
		EO9 (Contaminants)	CI 19 Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution.	
		EO9 (Contaminants)	CI 20 Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood.	

Relevant IMO Instruments	Pollutant Addressed	Corresponding IMAP Ecological Objective (EO)	Corresponding IMAP Common Indicator (CI)	Monitoring and Reporting Obligations
MARPOL Annex IV (Sewage)	Sewage (waste waters containing faecal coliforms)	EO9 (Contaminants)	CI 21 Percentage of intestinal enterococci concentration measurements within established standards.	No marine pollution monitoring and reporting obligations.
MARPOL Annex V (Garbage)	Garbage	EO10 (Marine Litter)	CI 22 Trends in the amount of litter washed ashore and/or deposited on coastlines (including analysis of its composition, spatial distribution and, where possible, source).	No marine pollution monitoring and reporting obligations.
		EO10 (Marine Litter)	CI 23 Trends in the amount of litter in the water column including microplastics and on the seafloor.	
		EO10 (Marine Litter)	CI 24 *(Candidate Indicator):* Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds and marine turtles.	
LC (Dumping)	Wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea	EO10 (Marine Litter)	CI 22 Trends in the amount of litter washed ashore and/or deposited on coastlines (including analysis of its composition, spatial distribution and, where possible, source).	Annual reporting on dumping permits issued. Annual reporting on monitoring activities undertaken. Obligation (for the mariner or other incident observer) to report to the Office for the London Convention (hosted at IMO) any observed illegal dumping. Monitoring obligation under technical and scientific cooperation.
	Wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea	EO10 (Marine Litter)	CI 23 Trends in the amount of litter in the water column including microplastics and on the seafloor.	
	Wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea	EO10 (Marine Litter)	CI 24 *(Candidate Indicator):* Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds and marine turtles.	
Nairobi WRC (Removal of Wrecks)	Wreck posing a hazard (damage to the coastline)	EO8 (Coastal Ecosystems and Landscape)	CI 16 Length of coastline subject to physical disturbance due to the influence of man-made	

Relevant IMO Instruments	Pollutant Addressed	Corresponding IMAP Ecological Objective (EO)	Corresponding IMAP Common Indicator (CI)	Monitoring and Reporting Obligations
			structure.	
	Wreck posing a hazard (damage to the coastline)	EO8 (Coastal Ecosystems and Landscape)	Candidate Indicator 25 Land-use change.	
	Wreck posing a hazard (major harmful consequences to the marine environment)	EO10 (Marine Litter)	CI 22 Trends in the amount of litter washed ashore and/or deposited on coastlines (including analysis of its composition, spatial distribution and, where possible, source).	Marine pollution monitoring and reporting are only required in case of a pollution incident.
		EO10 (Marine Litter)	CI 23 Trends in the amount of litter in the water column including microplastics and on the seafloor.	
		EO10 (Marine Litter)	CI 24 *(Candidate Indicator):* Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds and marine turtles.	
	Wreck posing a hazard (Oil and oily mixtures and (hazardous and noxious substances)	EO9 (Contaminants)	CI 17 Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater).	Marine pollution monitoring and reporting are only required in case of a pollution incident.
		EO9 (Contaminants)	CI 18 Level of pollution effects of key contaminants where a cause and effect relationship has been established.	
		EO9 (Contaminants)	CI 19 Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution.	
		EO9 (Contaminants)	CI 20 Actual levels of contaminants that have been detected and number of contaminants	

Relevant IMO Instruments	Pollutant Addressed	Corresponding IMAP Ecological Objective (EO)	Corresponding IMAP Common Indicator (CI)	Monitoring and Reporting Obligations
			which have exceeded maximum regulatory levels in commonly consumed seafood.	
BWM Convention (ballast water and sediments)	Harmful aquatic organisms and pathogens	EO2 (Non-Indigenous Species)	CI 6 Trends in abundance, temporal occurrence, and spatial distribution of non-indigenous species, particularly invasive, non-indigenous species, notably in risk areas (EO2, in relation to the main vectors and pathways of spreading of such species).	No marine pollution monitoring and reporting obligations. General monitoring obligation under technical and scientific cooperation on ballast water management.
Underwater Noise Guidelines **NOT MANDATORY**	Underwater-radiated noise	EO11 (Energy / underwater noise)	*Candidate Indicator* 26 Proportion of days and geographical distribution where loud, low, and mid-frequency impulsive sounds exceed levels that are likely to entail significant impact on marine animals.	No obligation to monitor and report noise from ships.
	Underwater-radiated noise	EO11 (Energy / underwater noise)	*Candidate indicator* 27 Level of continuous low frequency sounds with the use of models as appropriate.	

Appendix IV

Revised Guidance Fact Sheet for EO9 CI19

Revised Guidance Fact Sheet for EO9 CI19

Common Indicator 19 (EO9): Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution

Indicator Title	19. Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution (EO9)	
Relevant GES definition	**Related Operational Objective**	**Proposed Target(s)**
Occurrence of acute pollution events is reduced to the minimum.	Acute pollution events are prevented and their impacts are minimized.	1. Decreasing trend in the occurrences of acute pollution events.

Rational

Justification for indicator selection

Oil and Hazardous and Noxious Substances (HNS) products released at sea may impact an environment as follows:

- physical smothering with an impact on physiological functions;
- chemical toxicity giving rise to lethal or sub-lethal effects or causing impairment of cellular functions;
- ecological changes, primarily the loss of key organisms from a community and the takeover of habitats by opportunistic species; and
- indirect effects, such as the loss of habitat or shelter and the consequent elimination of ecologically important species.

In addition, pollution by oil and HNS has socio-economic impact (recreational activities; fisheries, maricultures as well as other activities such as power plants, shipping, salt production or seawater desalination). Occurrence of acute pollution events involving oil or HNS needs to be measured and possible impacts monitored.

Scientific References

ITOPF. “Effect of oil pollution on the marine environment”. ITOPF, Technical Information Paper 13.

GESAMP. Report n° 75: “Estimates of Oil Entering the Marine Environment from Sea-Based Activities”, IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (2007).

Zeina G. Kassaify, Rana H. El Hajj, Shady K. Hamadeh, Rami Zurayk and Elie K. Barbour. “Impact of Oil Spill in the Mediterranean Sea on Biodiversified Bacteria in Oysters”, Journal of Coastal Research, Vol. 25, No. 2 (2009), pp. 469-473. Published by: Coastal Education & Research Foundation, Inc.

Indicator Title	19. Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution (EO9)

Peterson CH, Rice SD, Short JW, Esler D, Bodkin JL, Ballachey BE, Irons DB. “Longterm ecosystem response to the Exxon Valdez oil spill”. Science 302:2082–2086(2003).

Policy Context and targets

Policy context description

Acute pollution from oil and other hazardous substances, resulting either from maritime casualties or from ships’ routine operations, is addressed in a number of international conventions under the aegis of the International Maritime Organization (IMO), the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships, some of which provide for stricter regimes in the Mediterranean Sea, including discharges of oil and oily mixtures. At the regional level, the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (“the Barcelona Convention”) and the Protocol concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea (“the 2002 Prevention and Emergency Protocol”) thereto are crucial instruments enabling cooperation and joint action to support all Mediterranean coastal States implementing and enforcing IMO Conventions on pollution prevention and preparedness and response to oil and HNS spills.

The Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC), administered by the IMO in cooperation with the Mediterranean Action Plan (MAP) of the United Nations Environment Programme (UN Environment), also referred to as UN Environment/MAP, is responsible for the implementation of the 2002 Prevention and Emergency Protocol. The Centre has maintained a database on alerts and accidents causing or likely to cause pollution of the sea by oil (since 1977) and by other harmful substances (since 1989) in the Mediterranean Sea. Furthermore, following the adoption by the Contracting Parties to the Barcelona Convention of the Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil (“the Offshore Protocol”), Contracting Parties thereto should endeavour to ratify the said Protocol as well as develop and adopt monitoring procedures and programmes for offshore activities, which is envisaged to take place building on the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (IMAP) of the Ecosystem Approach (EcAp).

Targets

To measure the trend of occurrence of oil and HNS accidental pollution events, the following indicator can be used: number of pollution events (of 50 cubic metres or more) per year in the marine waters of each Contracting Party to the Barcelona Convention. A target could be a maximum of 1 occurrence per year per Contracting Party to the Barcelona Convention.

Regarding illicit discharges of oil and oily waters (Annex I to the International Convention for the Prevention of Pollution from Ships (MARPOL)), minimum tolerance (near to 0 events) could be considered.

Indicator Title	19. Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution (EO9)

Policy documents

General Policy documents

i. 19th COP to the Barcelona Convention, Athens, Greece, 2016. Decision IG.22/7 - Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (UNEP(DEPI)/MED IG.22/28)
ii. 19th COP to the Barcelona Convention, Athens, Greece, 2016. Draft Integrated Monitoring and Assessment Guidance (UNEP(DEPI)/MED IG.22/Inf.7)
iii. 18th COP to the Barcelona Convention, Istanbul, Turkey, 2013. Decision IG.21/3 - Ecosystems Approach including adopting definitions of Good Environmental Status (GES) and Targets (UNEP(DEPI)/MED IG.21/9)

Related Policy documents

iv. 18th COP to the Barcelona Convention, Istanbul, Turkey, 2013. Decision IG.21/9 - Establishment of a Mediterranean Network of Law Enforcement Officials relating to MARPOL within the framework of the Barcelona Convention (UNEP(DEPI)/MED IG.21/9)
v. 2002 Prevention and Emergency Protocol
vi. Offshore Protocol
vii. MARPOL, specifically its Annex I (Regulations for the prevention of pollution by oil), Annex II (Regulations for the control of pollution by noxious liquid substances in bulk) and Annex III (Regulations for the prevention of pollution by harmful substances carried by sea in packaged form)
viii. International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC Convention) and Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 (OPRC-HNS Protocol)

Indicator analysis methods

Indicator Definition

In the case of oil and HNS acute pollution events, the indicator will be obtained from the information of oil and HNS pollution events recorded and submitted in the Mediterranean Sea each year.

Methodology for indicator calculation

Under the 2002 Prevention and Emergency Protocol, Contracting Parties thereto established a reporting procedure (Article 9) whereby the following information (see the format below) should be reported by masters or other persons having charge of ships flying their flags and to the pilots of aircraft registered in their territories:

(1) all incidents which result or may result in a discharge of oil or hazardous and noxious substances; and

(2) the presence, characteristics and extent of spillages of oil or hazardous and noxious substances, including hazardous and noxious substances in packaged form, observed at sea which pose or are likely to pose a threat to the marine environment or to the coast or

Indicator Title	19. Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution (EO9)

related interests of one or more of the Contracting Parties.

Moreover, in accordance with Article 10 (Operational Measures) of the said Protocol, any Contracting Party thereto faced with a pollution incident shall, amongst others:

(1) immediately inform all Contracting Parties thereto likely to be affected by the pollution incident of their assessments and of any action which it has taken or intends to take, and simultaneously provide the same information to REMPEC, which shall communicate it to all other Contracting Parties thereto; and

(2) continue to observe the situation for as long as possible and report thereon in accordance with Article 9.

BCRS (Barcelona Convention Reporting System) format:

(a) accident location (latitude and longitude or closest shore location);
(b) accident type* (*cargo transfer failure, contact, collision, engine breakdown, fire/explosion, grounding, foundering/weather, hull structural failure, machinery breakdown, other);
(c) vessel IMO number or vessel name;
(d) vessel flag;
(e) whether any product has been released or not. If yes, the type of product released (Oil/Hazardous and Noxious Substances) should be specified; and
(f) whether any actions have been taken or not. If yes, the actions taken should be specified.

In addition to monitoring pollution events occurrences against the target (incidents involving oil or hazardous substances that are < or = 1 event per year in the waters of each Contracting Party to the Barcelona Convention), it is recommended to carry out a trend analysis in order to measure performance against the target. Data on actual pollution events from ships would be collected every year and compared to the data for the previous year, to calculate a % increase or a % decrease in occurrences yearly frequency.

Indicator units

The Guidelines for Co-operation in Combating Marine Oil Pollution in the Mediterranean (UNEP/IG.74/5, UNEP/MAP, 1987) recommended Contracting Parties to the Barcelona Convention to report to REMPEC all spillages or discharges of oil in excess of 100 cubic metres. To align with the revised reporting formats for a mandatory reporting system under MARPOL ("one-line" entry format) adopted by IMO in 1996 (see MEPC/Circ.318), the Joint Session of MED POL and REMPEC Focal Points Meetings, which was held in Attard, Malta on 17 June 2015, discussed the appropriate threshold and concluded that spills of 50 cubic metres should be reported, whereas countries could also opt to report on spillages of lower amounts.

Indicator Title	19. Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution (EO9)

List of guidance documents and protocols available

i. ITOPF. "*Aerial Observation of Marine Oil Spills*", Technical Information Paper 1.
ii. ITOPF. "*Recognition of Oil on Shorelines*", Technical Information Paper 6.
iii. ITOPF. "*Fate of Marine Oil Spills*", Technical Information Paper 2.
iv. ITOPF. "*Response to Marine Chemical Incidents*", Technical Information Paper 17.
v. Bonn Agreement. "*Bonn Agreement Oil Appearance Code*".
vi. IPIECA/IMO/IOGP/CEDRE. "*Aerial Observation of Oil Spills at Sea: Good practice guidelines for incident management and emergency response personnel*", February 2015.
vii. CEDRE. "*Surveying Sites Polluted by Oil: An Operational Guide for Conducting an Assessment of Coastal Pollution*" (March 2006).
viii. REMPEC. "*Mediterranean Guidelines on Oiled Shorelines Assessment*" (September 2009).
ix. GESAMP. "*Revised GESAMP Hazard Evaluation Procedure for Chemical Substances Carried by Ships*" (2014).
x. IMO Codes:
- For packaged goods: International Maritime Dangerous Goods (IMDG) Code.
- For Bulk liquids: International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code).
- For Gases: International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code).
- For solids in bulk: International Maritime Solid Bulk Cargoes (IMSBC Code).

Data confidence and uncertainties

Although characterisation of impact of oil and oily products at sea and on shore is well documented and response strategies well defined, there has been much less investment in research for HNS spills. Chemical spills occur at a much lower frequency than spills of oil and involve a very large variety of products with different physical and toxicity properties. Therefore, the characterisation of impacts from HNS pollution due to maritime casualties is more complex and response strategies and indicators will vary according to the specific chemical product involved.

Methodology for monitoring, temporal and spatial scope

Available methodologies for monitoring and monitoring protocols

As oil and HNS accidental spills and discharges from ships take the form of acute pollution events, there are no specific pollution methodologies for systematic oil and HNS pollution surveillance in IMO Conventions and guidance documents, where monitoring is essentially addressed from the perspective of ships' compliance monitoring (flag State surveys; coastal State and port State controls) or in the context of pollution response operations. In this latter case, a monitoring protocol was developed to detect and survey pollution events.

Pollution events are monitored using the following methods/protocols:

Indicator Title	19. Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution (EO9)

- **Oil:**

- Expert human eye observation;
- Aerial observation (human eye observation and/or remote sensing equipment);
- Satellite imagery analysis; and
- Sampling and analysis.

Monitoring at sea will provide the following information:

- Volume of oil: use ITOPF guidance based on oil type and appearance to assess thickness (mm) and volume of oil (m^3/km^2) at sea, or the guidance of the Bonn Agreement Oil Appearance Code (BAOAC) identifying the following relations between oil appearances and oil volume:
    1. sheen, 0.15-0.3 m^3/km^2;
    2. rainbow, 0.3-5 m^3/km^2;
    3. metallic, 5-50 m^3/km^2;
    4. discontinuous true colour, 50-200 m^3/km^2; and
    5. continuous true colour, > 200 m^3/km^2.
- Location and coverage of slick at sea (latitude and longitude - GPS);
- Oil characteristics (persistent vs. non persistent / viscosity); and
- Origin of slick (if visible, ship name and IMO number, offshore installations ID number).

On-shore monitoring will be used to assess the extent of impacted shorelines, type and degree of contamination as well as impact on habitats and wildlife casualties.

- **HNS:**

Detection of HNS pollution events and assessment of impacts are primarily achieved on site by expert human eye observation, complemented with real time monitoring, sampling and analysis, as well as the use of modelling tools. Conclusions of any risk assessment for HNS will be based on a number of information including identification of incident circumstances and location; identification of the involved chemical, its properties/toxicity, and its form (packaged/bulk) as well as identification of sensitive neighbouring areas and environment conditions.

Furthermore, Article 18 (Mutual Assistance in cases of Emergency) of the Offshore Protocol states that in cases of emergency, a Contracting Party thereto, which is also a Contracting Party to the Protocol Concerning Co-operation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency (“the 1976 Emergency Protocol”), shall apply the pertinent provisions of the said Protocol.

Indicator Title	19. Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution (EO9)

Available data sources

Because pollution events originating from ships must lead to response operations and investigations, there are a number of reporting obligations and reporting protocols that are useful for the purpose of determining the frequency of occurrences and assess trends:

(1) Contents and forms of reports that ships must send following maritime casualties involving oil and other hazardous substances are detailed in MARPOL Annex I. In addition, IMO developed the "General Principles for Ship Reporting Systems and Ship Reporting Requirements, including Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants", containing recommendations on reporting requirements (when to report, information required, whom to report to).
(2) At regional level, the standard pollution accidents reporting format (POLREP) and related procedures provided under MARPOL are used between Contracting Parties to the 2002 Prevention and Emergency Protocol and between these Contracting Parties and REMPEC for exchanging information when pollution of the sea has occurred or when a threat of such is present.
(3) With respect to illegal discharges of oil from ships, REMPEC organised pilot projects on surveillance and monitoring of oil discharges at sea in the past. These initiatives led to the establishment of the Mediterranean Network of Law Enforcement Officials relating to MARPOL within the framework of the Barcelona Convention (MENELAS). This network works as a forum where information is exchanged and it is expected that data on pollution incidents (as well as on investigation and prosecution as the case may be) will be collected. REMPEC acts as the MENELAS Secretariat and the possible development of a MENELAS database on illicit ship pollution discharges in the Mediterranean and related reporting format are being looked into.
(4) The BCRS also requests information on spill incidents that occurred during a biennium.

Databases available:

- Mediterranean Alerts and Accidents Database maintained by REMPEC, available in the following versions:

- On-line database (accidents can be sorted by: date; accident location (country); vessel type; release quantity and type);
- Report containing the data and statistical analysis; and
- A Geographical Information System (GIS).

- Mediterranean Integrated Geographical Information System on Marine Pollution Risk Assessment and Response (MEDGIS-MAR) 2012-2015 (http://medgismar.rempec.org/) provides data (private access) on offshore, marine incidents, oil handling facilities, and response equipment.
- Global Integrated Shipping Information System (GISIS) (http://gisis.imo.org) maintained by IMO, with a module on marine casualties and incidents.

Indicator Title	19. Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution (EO9)

Spatial scope guidance and selection of monitoring stations

REMPEC will continue to be the central organisation coordinating and maintaining data on oil and HNS acute events and pollution surveillance in the Mediterranean Sea. REMPEC has implemented pilot projects involving aerial surveillance exercises and satellite imagery analysis jointly with Mediterranean coastal States and this effort should be strengthened.

Temporal Scope guidance

As oil and HNS pollution incidents from ships occurs unexpectedly (as a consequence of maritime casualties) or are not systematic (MARPOL illicit discharges), it is expected that pollution monitoring will continue to essentially take place “in real time” when pollution incidents actually happen or are detected.

Data analysis and assessment outputs

Statistical analysis and basis for aggregation

Frequencies and quantitative statistical analysis. The basis for aggregation would be a “nested approach” over a geographical scale. Trend analysis to calculate the percentage of occurrences for oil and HNS incidents over a period of time (yearly) in the Mediterranean Sea.

Expected assessments outputs

Temporal trends analysis and distribution maps. If possible, this trend should be related to the maritime traffic crossing the Mediterranean Sea.

Known gaps and uncertainties in the Mediterranean

While Contracting Parties to the Barcelona Convention and to the 2002 Prevention and Emergency Protocol have a pollution monitoring and reporting obligation, data submitted to REMPEC are still scarce. Thus the main aim during the initial phase of the IMAP will be to strengthen monitoring efforts towards this already existing obligation.

Contacts and version Date

http://www.rempec.org

Version No	**Date**	**Author**
V.2	28.04.17	MED POL/REMPEC

Appendix V

Review of Guidance Fact Sheets EO10, EO2 and EO11

Review of Guidance Fact Sheets EO10, EO2 and EO11

- **Fact Sheet for EO10 (Marine Litter) CI22; CI 23; CI24.**

After review of the Fact Sheets related to Marine Litter, there was no specific revision to make, but a suggestion to take a look at some recent publications addressing marine litter and debris including from ships source, in order to fill any potential gap:

- a report by GESAMP on microplastics (specifically p.28 section 3.5.4); GESAMP (2015): "Sources, fate and effects of microplastics in the marine environment: a global assessment" (Kershaw, P. J., ed.).(IMO/FAO/UNESCOIOC/UNIDO/WMO/IAEA/UN/UNEP/ UNDP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). Rep. Stud. GESAMP No. 90, 96 p.

- a study developed under the London Protocol which addresses marine litter in wastes dumped at sea (specifically p. 10 on macro litter, p. 22 to 28 on dredged material/harbor sediments): "Review of the Current State of Knowledge Regarding Marine Litter in Wastes Dumped at Sea Under the London Convention and Protocol", published in 2016 by the Office for the London Convention / Protocol and Ocean Affairs.

- a report of the Convention on Biological Diversity on Marine Debris just issued. In this latter publication, it is interesting to read that marine debris have socio-economic impact including on shipping, fisheries and recreational activities. Shipping is identified as a potential source of pollution on p.57): "Marine Debris: Understanding, Preventing and Mitigating the Significant Adverse Impacts on Marine and Coastal Biodiversity". Technical Series No.83. Secretariat of the Convention on Biological Diversity, Montreal, 78 pages.

(Comments submitted by the Consultant by email on December 13, 2016 with reports in attachments.)

- **Fact Sheet for EO2 (Non-Indigenous Species) CI6**

After reviewing the Fact Sheet related to Non Indigenous Species, the following recommendations were made:

- include a reference to the UN Convention on the Law of the Sea (Article 196) which provides the global framework for the NIS issue, by requiring States to work together to prevent, reduce and control pollution of the marine environment including the intentional or accidental introduction of species, alien or new, to a particular part of the marine environment, which may cause significant and harmful changes;

- include a reference to IMO long long-lasting work in the field of NIS moved through ships' ballast water and sediments including a reference to the International Convention for the Control and Management of Ships' ballast Water and Sediment, which hast just entered in force with effect on September 8, 2017. The Convention is only mentioned

under the section of the Fact Sheet entitled List of Guidance documents and protocols available: "There are no established standard protocols for the monitoring of NIS. However, sampling methods are used by monitoring activities implemented in many Mediterranean countries, in particular in relation to the Ballast Water Convention, the EU Water Framework Directive, and the Marine Strategy Framework Directive. These methods may be useful for the estimation of Common Indicator 6". It would be more appropriate to make reference to the Convention's Guidelines for Ballast Water Sampling (G2), and also to the Guidance on ballast water sampling and analysis for trial use in accordance with the BWM Convention and Guidelines (G2), adopted in May 2014. Of note, these sampling and analysis guidance documents have been developed for compliance testing.

- mention the GloBallast project which has addressed regional aspects. As you may know the Mediterranean Sea has been one of the regional seas where GloBallast activities were conducted (RAC-SPA was included in several of these). A number of useful resources published on GloBallast website (globallast.imo.org) are relevant and may be included in the Fact Sheet references, particularly the following: GloBallast Monograph Series No. 22: Guidance on Port Biological Baseline Surveys (PBBS) Awad, A., Haag, F., Anil, A.C., Abdulla, A. 2014. GEF-UNDP-IMO GloBallast Partnerships Programme, IOI, CSIR-NIO and IUCN. Ed. GEF-UNDP-IMO GloBallast Partnerships, London, UK.

(Comments submitted by the Consultant by email on December 20, 2016).

- **Fact Sheet for EO11 (Energy / Underwater Noise) CI27**

After review of the Fact Sheets related to Energy / Underwater Noise, there was no specific revision or comment to make.

(Comments submitted by the Consultant by email on January 20, 2017).

Appendix VI

Assessment Fact Sheet for EO9 CI19

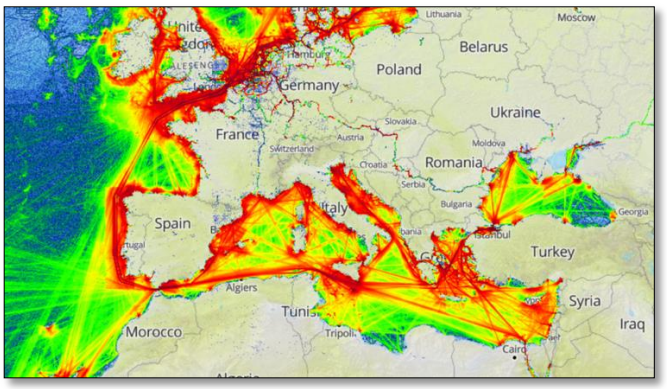
Assessment Fact Sheet for EO9 CI19

Content	Actions	Guidance
General		
Reporter	Underline appropriate	UNEP/MAP/MED POL SPA/RAC **REMPEC** PAP/RAC Plan Bleu (BP)
Geographical scale of the assessment	Select as appropriate	**Regional:** **Mediterranean Sea**
Contributing countries	Text	Mediterranean assessment based on existing regional surveys, research and publications.
Core Theme	Select as appropriate	**Land and Sea Based Pollution**
Ecological Objective	Write the exact text, number	Ecological Objective 9 (EO9) – Pollution: Contaminants cause no significant impact on coastal and marine ecosystems and human health.
IMAP Common Indicator	Write the exact text, number	Common Indicator 19: Occurrence, origin (where possible), and extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution (EO9).
Indicator Assessment Factsheet Code	Text	EO9CI19
Rationale/Methods		
Background (short)	Text (250 words)	Pollution from ships was one of the first issues addressed by the Mediterranean coastal States when they decided to act collaboratively to protect the Mediterranean Sea area in 1975. The 1967 Torrey Canyon oil spill accident, which resulted in massive oil pollution, raised the public awareness on pollution from shipping activities. Concern was expressed regarding possible oil and other harmful substances that may be released in the Mediterranean Sea, a semi-closed marine area. This led to the establishment of the Mediterranean Action Plan (MAP)'s first regional activity centre (ROCC – Regional Oil Combating Centre, now REMPEC – Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea) and to the adoption, under the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean ("the Barcelona Convention"), of the Protocol Concerning Co-operation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency ("the 1976 Emergency Protocol"). This Protocol was revised in 2002 to include prevention of pollution from ships to emergency situations and is today referred to as the Protocol concerning Cooperation in

Content	Actions	Guidance
		Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea ("the 2002 Prevention and Emergency Protocol"). The Protocol addresses pollution incidents, which includes both accidental pollution and illicit discharges. Pollution from oil and other hazardous substances were also addressed internationally in a number of conventions adopted under the aegis of the International Maritime Organization (IMO), some of which provides for stricter regime in the Mediterranean Sea. Although action at regional and international level has resulted in a significant decrease of massive oil pollutions from ships, incidents and illegal discharges are still responsible for the release of oil, oily mixtures and other Hazardous and Noxious Substances (HNS) at sea. It is on these grounds that the Contracting Parties to the Barcelona Convention included a Common Indicator (CI 19) on "*occurrence, origin (where possible), and extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution*" under Ecological Objective 9.
Assessment methods	Text (200-300 words), images, formulae, URLs	**Assessment of accidents:** In the Mediterranean region, under the 2002 Prevention and Emergency Protocol, assessment of occurrences, origins and extents of oil and HNS pollution from ships is carried out on the basis of pollution reports (POLREP) sent by the Contracting Parties to the Barcelona Convention to REMPEC and other affected States to notify a pollution or an event that could result in a pollution. These reports provide details on the incidents, including position, extent of pollution, characteristics of pollution, sources and cause of pollution, trajectory of pollution, forecast and likely impacts, as well as sea state and meteorological information. The reports sent to REMPEC are also used to feed the database on alerts and accidents in Mediterranean Sea (the Mediterranean Alerts and Accidents Database) maintained by the Centre. Records of oil spills and accidents likely to cause spillages of oil in the Mediterranean started in 1977, while accidents involving other HNS are reported since 1988. Another main source of information used to populate the Alert and Accident Database is the Lloyd's Casualty Reporting Services (LCRS). Accidents recorded in this database are accidents that caused or were likely to cause pollution by oil or other HNS in the Mediterranean Sea area. Accidents included are:

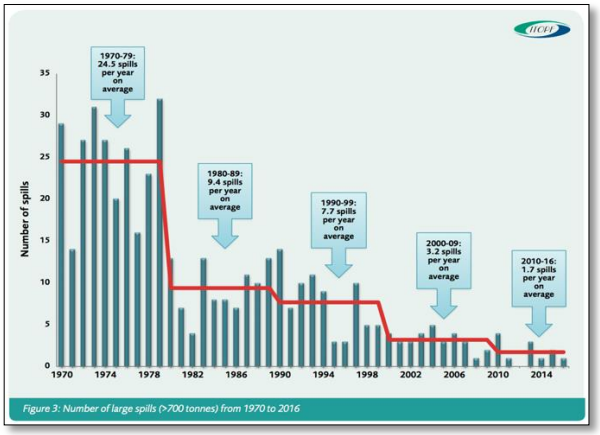
Content	Actions	Guidance
		- accidents happening in the Mediterranean Sea as defined in the Barcelona Convention; - accidents involving any type of ship, which actually resulted in an oil spill, a spill or release of a HNS, or in a loss or damage to a container containing HNS; - accidents on land (terminals, storage tanks, pipelines, industries, power plants, etc.) that resulted in entry into the sea of oil or HNS; - accident involving one or more oil tankers or chemical tankers (either laden or not); - collisions, groundings or other accidents causing serious damage to the ships involved, in particular if these carried or could carry significant quantities of fuel oil as bunkers; - accidents involving sinking of vessels that had on board any quantity of oil as bunkers; and - accidents involving sinking of vessels that carried HNS as cargo (either in bulk or in packaged form). **Assessment of illicit discharges:** Monitoring of illicit discharges is conducted to detect violations of requirements of the International Convention for the Prevention of Pollution from Ships (MARPOL) and collect evidence for prosecuting ships offenders. The POLREP can also be used by a Contracting Party to the Barcelona Convention to report a deliberate discharge to REMPEC. Methods: The following methods are used to detect a pollution and assess its origin and extent: • **Oil:** - expert human eye observation; - aerial observation (human eye observation and/or remote sensing equipment); - satellite imagery analysis to assess the extent and fate of an oil slick; and - sampling and analysis to determine the nature of the substance at sea, on shore and on board vessels. The Agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances, 1983 (“the Bonn Agreement”) developed an internationally recognised procedure for sampling at sea, analysis and interpretation of results. The following can be identified: - volume of oil: internationally recognised guidance is used based on oil type and appearance to assess thickness (mm) and volume of oil (m^3/km^2) at sea (Bonn Agreement Oil Appearance Code – BAOAC);

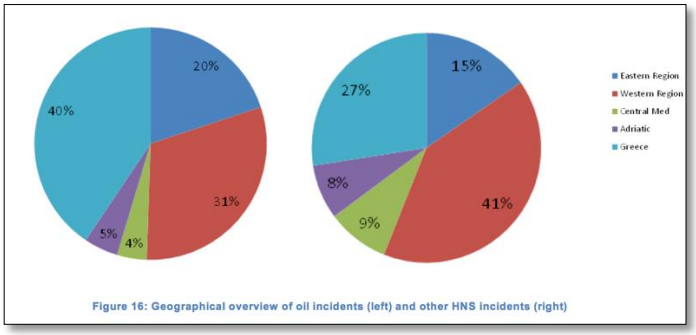
Content	Actions	Guidance
		- location and coverage of slick at sea (latitude and longitude – GPS); - characteristics of oil (persistent vs. non persistent / viscosity); and - origin of slick (if visible ship name and IMO number, offshore installations identification number). Backtracking oil using trajectory modelling methods help to identify ship source. On-shore monitoring will be used to assess the extent of impacted shorelines, type and degree of contamination as well as impact on habitats and wildlife casualties. • **HNS:** Detection of HNS pollution events and assessment of impacts are primarily achieved on site by expert human eye observation, complemented with real time monitoring, sampling and analysis, as well as the use of modelling tools. Conclusions of any risk assessment for HNS will be based on a number of information including identification of incident circumstances and location, identification of the involved chemical, its properties / toxicity, and its form (packaged / bulk) as well as identification of sensitive neighbouring areas and environment conditions.
Background (*extended)*	Text (no limit), images, tables, references	Increasing shipping and maritime activities are important drivers for anthropogenic pressure on the marine environment in the Mediterranean Sea. Pressure from maritime transport includes potential chemical pollution from oil and HNS, dumping of garbage at sea, release of sewage, biofouling and non-indigenous species introduction. As documented in a great number of scientific researches, chemical pollution by oil and other harmful substances has impacts on water, seabed, fauna and flora. The level of risk of an accident occurring in the Mediterranean Sea is driven by two factors: traffic density as well as routes for oil and chemical tankers. In addition, illicit discharges of oil from ships remain a concern. • **Risk of accidents:** The Mediterranean is a major shipping lane. It is estimated that around 80% of global trade by volume and over 70% of global trade by value are carried by sea (UNCTAD, 2015), with approximately 15% of global shipping activity by number of calls and 10% by vessel deadweight tonnes (dwt) (REMPEC, 2008) taking place in the Mediterranean. The area is an important transit route for shipping, with two of the narrowest and busiest straits in the world: the Strait of Gibraltar and the Bosphorus Strait. The Mediterranean is a major transit route. In 2006, around 10,000, mainly large, vessels transited the area en-route between non Mediterranean ports. In addition to hosting an important transit lane for

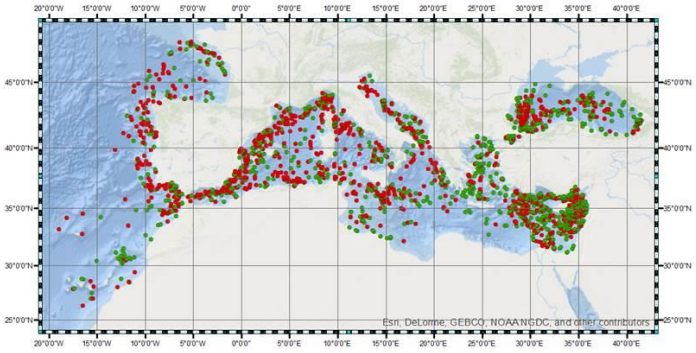
Content	Actions	Guidance
		international shipping, the Mediterranean Sea is also a busy traffic area due to Mediterranean Sea born traffic (movement between a Mediterranean port and a port outside the Mediterranean), and short sea shipping activities. It is estimated that around 18% of the shipping traffic in the Mediterranean Sea takes place between two Mediterranean ports (REMPEC, 2008). Figure 1 is a representation of the maritime traffic in the Mediterranean Sea. Although several factors contribute to maritime casualties, the correlation between traffic density and accidents causing a pollution is confirmed by the fact that "collisions / allisions" represent the first cause of accidents (26%) resulting in an oil spill as recorded by the International Tankers Oil Pollution Federation (ITOPF) between 1970 and 2016. In the Mediterranean, the "collision/contact" category accounts for 17% of accidents reported to REMPEC, after "grounding" (21%). The contribution of other accident types are as follows: "fire/explosion": 14%, "cargo transfer failure": 11%, "sinking": 9%, and "other accidents": 28%. Several studies, based on the daily traffic crossing the Istanbul Strait and the Bosphorus, identified the east Mediterranean / Black Sea area as one of the top areas presenting the greatest probability of a shipping accident occurring. **Figure 1: Density of maritime traffic in the Mediterranean Sea**  **Source: marinetraffic.com.** The Mediterranean is an important route for oil tankers' shipments. The Mediterranean Sea is also a major route for tankers. The REMPEC study mentioned above shows that the Mediterranean is both a major load and discharge centre for crude oil. Approximately 18%, or 421 million tonnes, of global seaborne crude oil shipments which in 2006 amounted to approximately 2.3 billion tonnes, take place within or through the Mediterranean. The following figures (Figure 2, Figure 3 and Figure 4) show the oil export areas and overseas destinations through the Mediterranean Sea.

Content	Actions	Guidance
		Figure 2: Oil export source and destinations (North Africa)  **Source: Tankers International website.** **Figure 3: Oil export source and destinations (Middle East)**  **Source: Tankers International website.** **Figure 4: Oil export source and destinations (Black Sea)**  **Source: Tankers International website.**

Content	Actions	Guidance
		Figures 3 and 4 above emphasise that the East Mediterranean area is at risk: in addition to being an area where traffic is dense, it is also a hot spot because of tanker routes from the Black Sea and the Middle East. • **Deliberate discharges at sea:** It was demonstrated, with the use of satellite imagery and other observation tools, that deliberate oil pollution occurrences are high along busy traffic lanes. In the Mediterranean, there is evidence that the distribution of oil spills is correlated with the major shipping routes, along the major west-east axis connecting the Strait of Gibraltar through the Sicily Channel and the Ionian Sea with the different distribution branches of the Eastern Mediterranean, and along the routes towards the major discharge ports on the northern shore of the Adriatic Sea, east of Corsica, the Ligurian Sea and the Gulf of Lion (UNEP/MAP, 2012).
Results		NOTE: If the assessment has been performed at different geographical scales, include the results and conclusions accordingly.
Results and Status, including trends (brief)	Text (500 words), images	On the one hand, statistical data analyses indicate a significant downward trend in accidental pollution from ships, for both oil and HNS. This decrease can also be seen both in the number of accidents causing these pollutions and in the volumes of pollutants discharged at sea. On the other hand, the same observation cannot be made with regard to illicit discharges from ships. There is no sufficient data to identify an upward or downward trend, but based on 2016 data provided by the European Maritime Safety Agency (EMSA), it can be argued that a significant number of illegal releases are still occurring.
Results and Status, including trends (extended)	Text (no limit), figures, tables	**Key findings for accidents:** **Decrease in the number of major oil spills worldwide** Maritime casualties involving oil have decreased substantially over the years, despite a growth in the volume of oil moved by ships. Today, according to ITOPF statistics, 99.99% of crude oil transported by sea arrives safely at its destination. As shown in Figure 5 below, the average number of large oil spills from tankers, i.e. greater than 700 tonnes, has progressively diminished over the years, to an average of 1.7 spills per year between 2010 and 2016.

Content	Actions	Guidance
		Figure 5: Number of Oil Spills Greater than 700 Tonnes Between 1970 and 2016  **Decrease in the frequency of accidents causing a pollution in the Mediterranean** • **Oil:** The statistical analytical study prepared by REMPEC on the basis of its Mediterranean Alerts and Accidents Database shows that major oil spills occurred frequently between 1977 and 1981 but have become rare events since then, with the last major accident being the MT "HAVEN" accident off Genoa in April 1991, with 144,000 tonnes of crude oil spilled. In terms of volume of oil released at sea, the 2014 REMPEC Study indicates that between 1 January 1994 and 31 December 2013, approximately 32,000 tonnes of oil entered into the Mediterranean Sea as a result of accidents. This includes approximately 15,000 tonnes originating from the 2006 Eastern Mediterranean incident which occurred in the power plant of Jieh, Lebanon, between the 13th and 15th of July 2006. The fuel which did not burn was released in the marine environment. The exact quantity of the burnt fuel remains unknown but, according to the estimate communicated by the Lebanese authorities, between 13,000 and 15,000 tonnes were released as a consequence of the spill. The Lebanese spill is the fifth biggest spill reported since 1977 in the Mediterranean Sea, the largest spill being the spill related to the explosion of the MT HAVEN in 1991, which sunk with its cargo of 144,000 tonnes of crude oil in the Italian waters.

Content	Actions	Guidance
		In terms of accidents causing pollution, the number of accidents resulting in an oil spill dropped from 56% of the total number of accidents for the period 1977 – 1993, to 40% for the period 1994 – 2013. 61% of the incidents resulted in a spillage inferior to 1 tonne. • **HNS:** In the Mediterranean, the quantities of HNS accidentally spilled considerably decreased during the period 1994 – 2013. Since 2003, the release of HNS has become insignificant compared to the period 1994 – 2002. The last two major accidents occurred in 1996 namely: - the sinking of Kaptan Manolis I in Tunisia, with 5,000 tonnes of phosphates on board; and - the sinking of Kira off Greece, releasing 7,600 tonnes of phosphoric acid. The worst HNS spill in the Mediterranean was the sinking of the Continental Lotus in 1991 in the Eastern Mediterranean, with 51,600 tonnes of iron on board. REMPEC's statistical analysis related to geographical location of accidents indicates that the majority of accidents occur in the Eastern Mediterranean area (Cyprus, Egypt, Israel, Lebanon, Syrian Arab Republic, Turkey) if Greece, which is treated separately in REMPEC's findings, is included, showing as Figure 6. **Figure 6: Geographical distribution of accidents**  Figure 16: Geographical overview of oil incidents (left) and other HNS incidents (right) **Source: REMPEC, 2014.** **Key Findings for Illicit Discharges:** REMPEC's Mediterranean Alerts and Accidents Database contains a category for "Illicit Discharges". Only 5 cases were reported (1 in 2012, 1 in 2013 and 3 in 2015). By nature, as they are illegal, illicit discharges of oil are not voluntarily reported by the ship source. The use of satellite imagery can be a useful tool to provide a better picture of the number of oil spills from ships, however, unless evidence is provided that a detected illicit

Content	Actions	Guidance
		discharge originates from a specific ship, no definite conclusion can be made as to whether or not the spill is caused by any ship, and therefore it is difficult to precisely assess the number of illicit discharges actually happening. **Trends: oil pollution occurrences still an issue in the Mediterranean.** In 2016, the CleanSeaNet platform of EMSA recorded a total of 1,073 detections of probable pollution occurrences, and a total of 1,060 detections of possible pollution occurrences in the area covering the Mediterranean Sea and the Atlantic Ocean coasts of Morocco, Portugal, Spain and France (Figure 7 below). Although there is no judicial evidence that all occurrences characterised as probably or possibly oil spills are actually discharges from ships, the map provides a clear indication that oil pollution incidents from ships is still of concern. **Figure 7: Number of spills detected in 2016 by satellite imagery.** **Class A** (red dots on the map) – the detected spill is most probably oil (mineral or vegetable/fish oil) or a chemical product. **Class B** (green dots on the map) – the detected spill is possibly oil (mineral/vegetable/fish oil) or a chemical product.  **Source: CleanSeaNet, EMSA.**

Content	Actions	Guidance
Conclusions		
Conclusions (brief)	Text (200 words)	Accidents rates have gone down globally and regionally despite the increase in shipping transportation and it can be concluded that the impact of the international regulatory framework adopted through the IMO as well as technical cooperation activities undertaken at regional level is very positive, especially as far as prevention of accidental pollution is concerned. However, risks associated with the transport by ships of oil and HNS with possible harmful consequences on biota and ecosystems cannot be completely eliminated, especially in vulnerable areas such as the Mediterranean Sea. In addition, efforts have to be made to strengthen monitoring and reporting of illicit discharges from ships.
Conclusions (extended)	Text (no limit)	**Decrease of pollution occurrences globally:** accidents rates have gone down globally and regionally despite the increase in shipping transportation. Accidental pollution from both oil and HNS has decreased which can be related to the adoption and implementation of environmental maritime conventions addressing oil and HNS pollution prevention, preparedness and response. Indeed, statistical analysis indicates that there is a correlation between the period where the IMO regulatory framework was put in place (in the 70') and the years when this downward trend started to happen (in the 80'). It can therefore be concluded that the impact of the international regulatory framework adopted through the IMO as well as technical cooperation activities undertaken at regional level is very positive, especially as far as prevention of accidental pollution is concerned. However, the issue of illicit discharges from ships remains of concern, especially in semi-enclosed areas where the ability of the marine environment to regenerate is less likely to happen. **Oil pollution long-term effects:** it is also important to keep in mind that recovery of habitats following an oil spill can take place from between a few seasonal cycles (plankton) to several years (within one to three years for sand beaches and exposed rocky shores; between 1 and 5 years for sheltered rocky shores; between 3 and 5 years for saltmarshes; and up to 10 years or greater for mangrove). According to ITOPF, while considerable debate exists over the definition of recovery and the point at which an ecosystem can be said to have recovered, there is broad acceptance that natural variability in ecosystems makes a return to the exact pre-spill conditions unlikely. Most definitions of recovery instead focus on the re-establishment of a community of fora and fauna that is characteristic of the habitat and functions normally in terms of biodiversity and productivity.

Content	Actions	Guidance
		Therefore, despite the progress achieved in mitigating oil spill incidents from ships, it is clear that continuous monitoring of illicit discharges occurrences as well as cumulative effects and impacts, and continuous monitoring of accidental post-spill consequences on biota and ecosystems are needed.
Key messages	Text (2-3 sentences or maximum 50 words)	Chronic sources (illicit discharges) of pollution into the marine environment from ships are the principal target for pollution reduction, as the trends for acute pollution (accidents) are controlled and decreasing.
Knowledge gaps	Text (200-300 words)	• The information collected via pollution reports is related to specific pollution events and not always useful or compatible with the information needed to assess the status of the marine environment. • Maintaining the Mediterranean Alerts and Accidents Database is a prerequisite and the condition for being able to measure Common Indicator CI19. • There is no obligation for countries to carry out environmental surveys of sea and shorelines affected by a spill. Systematic environmental shorelines assessment post spill is today recognised as a “must do” practice and can provide information on biota on a case by case basis. • Very little data is available regarding illegal discharges from ships. **Environmental monitoring and reporting:** the focus of IMO conventions and guidelines relating to prevention of marine pollution is on ships’ compliance monitoring rather than on monitoring or measuring the state of the marine and coastal environment. The same can be noted with respect to reporting obligations. Reporting is required in the case of an accident causing pollution or in case of an illegal pollution is discovered (operational discharges). This perspective is reflected in the 2002 Prevention and Emergency Protocol. Therefore, the information collected is related to specific pollution events and not always useful or compatible with the information needed to assess the status of the marine environment. **Accidents monitoring and reporting:** there is an increase in the number of accidents reported to REMPEC, which is most likely due to a better compliance by the Contracting Parties to the Barcelona Convention to report casualties, as required by Article 9 of the 2002 Prevention and Emergency Protocol. It is of utmost importance that the Contracting Parties to the Barcelona Convention continue to report on accidents as accurately as possible, as it is paramount that REMPEC continues to maintain the Mediterranean Alerts and Accidents Database to keep track of pollution events. This is a prerequisite and the condition for being able to measure Common Indicator

Content	Actions	Guidance
		CI19. **Impact on biota affected by pollution:** for the reason explained above, there is little information on the impact of pollution events caused by shipping on biota. Ship generated pollution impact is usually considered from a response perspective (protection of sensitive areas and facilities). There is no obligation for countries to carry out environmental surveys of sea and shorelines affected by a spill. However, systematic environmental shorelines assessment post spill is today recognised as a "must do" practice in terms of assessing the level of cleanliness of the affected area, as well as from a remediation perspective. **Illicit discharges from ships:** very little data is available regarding discharges from ships. As these are illegal operations by nature (when not within the limits set by MARPOL), it is extremely difficult to get information on occurrences and extent of spills. Marine surveillance requires aerial means and equipment (planes, airborne radars and sampling sets) or special technology such as the use of satellite images. There is no regionally centralised system for surveying the Mediterranean waters as defined in the Barcelona Convention. The CleanSeaNet platform, the European satellite-based oil spill monitoring and vessel detection service, is a good resource, but only available in principle to countries that are Members States of the European Union.
List of references	Text (10 pt, Cambria style)	Allianz Global Corporate & Specialty: Safety and Shipping Review 2016 - An annual review of trends and developments in shipping losses and safety, 2016. EMSA: Addressing Illegal Discharges in the Marine Environment, 2012. IMO/UNEP: Regional Information System; Part C2, Statistical Analysis - Alerts and Accidents Database, REMPEC, December 2014. IMO/UNEP: Regional Information System; Part C2, Statistical Analysis - Alerts and Accidents Database, REMPEC, February 2011. ITOPF: Oil Spill Statistics, February 2017. ITOPF: Effect of Oil Pollution on the Marine Environment, Technical Information Paper 13, 2014. Ömer Faruk Görçün, Selmin Z. Burak: Formal Safety Assessment for Ship Traffic in the Istanbul Straits. Published by Elsevier, 2015. Study of Maritime Traffic Flows in the Mediterranean Sea, Final Report - Unrestricted Version, July 2008. UNCTAD: Review of Maritime Transport 2015. UNEP/MAP: State of the Mediterranean Marine and Coastal Environment, UNEP/MAP – Barcelona

Content	Actions	Guidance
		Convention, Athens, 2012. WWF: Accident at Sea, Summary, 2013.

Annex I. List of IMAP Ecological Objectives (EOs) and Indicators

Ecological Objective	IMAP Indicators
EO 1 Biodiversity	
Biological diversity is maintained or enhanced. The quality and occurrence of coastal and marine habitats and the distribution and abundance of coastal and marine species are in line with prevailing physiographic, hydrographic, geographic and climatic conditions.	Common Indicator 1: Habitat distributional range (EO1) to also consider habitat extent as a relevant attribute
	Common Indicator 2: Condition of the habitat's typical species and communities (EO1)
	Common Indicator 3: Species distributional range (EO1 related to marine mammals, seabirds, marine reptiles)
	Common Indicator 4: Population abundance of selected species (EO1, related to marine mammals, seabirds, marine reptiles)
	Common indicator 5: Population demographic characteristics (EO1, e.g. body size or age class structure, sex ratio, fecundity rates, survival/mortality rates related to marine mammals, seabirds, marine reptiles)
EO 2 Non-indigenous species	
Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystem	Common Indicator 6: Trends in abundance, temporal occurrence, and spatial distribution of non-indigenous species, particularly invasive, non-indigenous species, notably in risk areas (EO2, in relation to the main vectors and pathways of spreading of such species)
EO 3 Harvest of commercially exploited fish and shellfish	
Populations of selected commercially exploited fish and shellfish are within biologically safe limits, exhibiting a population age and size distribution that is indicative of a healthy stock	Common Indicator 7: Spawning stock Biomass (EO3);
	Common Indicator 8: Total landings (EO3);
	Common Indicator 9: Fishing Mortality (EO3);
	Common Indicator 10: Fishing effort (EO3);
	Common Indicator 11: Catch per unit of effort (CPUE) or Landing per unit of effort (LPUE) as a proxy (EO3)
	Common Indicator 12: Bycatch of vulnerable and non-target species (EO1 and EO3)
EO 4 Marine food webs	
Alterations to components of marine food webs caused by resource extraction or human-induced environmental changes do not have long-term adverse effects on food web dynamics and related viability	*To be further developed*

EO 5 Eutrophication	
Human-induced eutrophication is prevented, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algal blooms and oxygen deficiency in bottom waters.	Common Indicator 13: Concentration of key nutrients in water column (EO5);
	Common Indicator 14: Chlorophyll-a concentration in water column (EO5)
EO 6 Sea-floor integrity	
Sea-floor integrity is maintained, especially in priority benthic habitats	*To be further developed*
EO7 Hydrography	
Alteration of hydrographic conditions does not adversely affect coastal and marine ecosystems.	Common Indicator 15: Location and extent of the habitats impacted directly by hydrographic alterations (EO7) to also feed the assessment of EO1 on habitat extent
EO 8 Coastal ecosystems and landscapes	
The natural dynamics of coastal areas are maintained and coastal ecosystems and landscapes are preserved	Common Indicator 16: Length of coastline subject to physical disturbance due to the influence of man-made structures (EO8);
	Candidate Indicator 25: Land use change (EO8)
EO 9 Pollution	
Contaminants cause no significant impact on coastal and marine ecosystems and human health	Common Indicator 17: Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater)
	Common Indicator 18: Level of pollution effects of key contaminants where a cause and effect relationship has been established (EO9)
	Common Indicator 19: Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances), and their impact on biota affected by this pollution (EO9);
	Common Indicator 20: Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood (EO9);
	Common Indicator 21: Percentage of intestinal enterococci concentration measurements within established standards (EO9)
EO 10 Marine litter	
Marine and coastal litter do not adversely affect coastal and marine environment	Common Indicator 22: Trends in the amount of litter washed ashore and/or deposited on coastlines (EO10);
	Common Indicator 23: Trends in the amount of litter in the water column including microplastics and on the seafloor (EO10);
	Candidate Indicator 24: Trends in the amount of litter ingested

	by or entangling marine organisms focusing on selected mammals, marine birds, and marine turtles (EO10)

EO 11 Energy including underwater noise	
Noise from human activities cause no significant impact on marine and coastal ecosystems	Candidate Indicator 26: Proportion of days and geographical distribution where loud, low, and mid-frequency impulsive sounds exceed levels that are likely to entail significant impact on marine animal
	Candidate Indicator 27: Levels of continuous low frequency sounds with the use of models as appropriate

Appendix VII

Inputs (shipping perspective) to other Assessment Templates for the QSR

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EO10 Marine Litter
After review, no input/comment to make.

EO2 (Non-indigenous Species)
After review, no input/comment to make.

EO11 (Underwater Energy / Noise)
MEDPOL advised the Consultant that there was no need at this stage to review EO11.