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**Agenda item 12: Harmonization and standardization of IMAP Pollution Cluster Monitoring**

**Monitoring Guideline for Reporting Monitoring Data for IMAP Common Indicators 13, 14, 17, 18 and 20**

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## Note by the Secretariat

In line with the Programme of Work 2020-2021 adopted by COP 21, UNEP/MAP-MED POL Programme has prepared the Monitoring Guidelines /Protocols for: i) Reporting Monitoring Data; ii) Analytical Quality Assurance for IMAP Common Indicators 13, 14, 17, 18 and 20; and iii) IMAP Common Indicator 18 for consideration of the Meeting on CorMon on Pollution Monitoring planned (26-28 April 2021). Along with the Monitoring Guidelines related to IMAP Common Indicators 13, 14, 17 and 20 that have been agreed by the Integrated Meetings of the Ecosystem Approach Correspondence Groups on Monitoring (1-3 December 2020), these monitoring guidelines form a coherent manual to guide technical personnel of IMAP competent laboratories of the Contracting Parties for the implementation of standardized and harmonized monitoring practices related to a specific IMAP Common Indicator (i.e. sampling method, sample preservation and transportation, sample preparation and analysis, along with quality assurance and reporting of monitoring data).

The Monitoring Guideline on Reporting Monitoring Data for IMAP Common Indicators 13, 14, 17, 18 and 20 elaborates the protocols for data reporting to IMAP (Pilot) Info System by building upon IMAP Guidance Fact Sheets for IMAP Common Indicators 13, 14, 17, 18 and 20 (UNEP/MAP, 2019); standardized protocols (UNEP/MAP, 2019a); Data Quality Assurance Schemes (UNEP/MED WG.492/Inf.14); Data Standards (DSs) and Data Dictionaries (DDs) for IMAP Common Indicators 13, 14 and 17 20 (Annex I) and IMAP Pilot Info System: Quality Assurance and Quality Controls (UNEP/MAP, 2019d), in order to allow the comparability of the data for reliable assessment of GES.

Hence, this Monitoring Guideline includes four protocols gathered under the Technical Note for Reporting Monitoring Data for IMAP Common Indicators 13, 14, 17, 18 and 20, as follows: i) Protocol for Reporting Monitoring Data for IMAP Common Indicators 13 and 14; ii) Protocol for Reporting Monitoring Data for IMAP Common Indicators 17; iii) Protocol for Reporting Monitoring Data for IMAP Common Indicators 18 and iv) Protocol for Reporting Monitoring Data for IMAP Common Indicators 20. The procedures for reporting of monitoring data are optimally interrelated with the Data Standards (DSs) and Data Dictionaries (DSs) as built into IMAP (Pilot) Info System for IMAP Common Indicators 13, 14 and 17 (Annex I).

This document also defines the elements of Data Standards (DSs) and Data Dictionaries (DSs) for IMAP Common Indicators 18 (Annexe II) and 20 (Annexe III) in order for the Meeting to provide recommendations of relevance for the ongoing work of INFO/RAC and MEDPOL. Furthermore, UNEP/MED WG.492/Inf.14 is provided with the aim of presenting more details for data reporting, as already agreed by the 7<sup>th</sup> Meeting of the Ecosystem Approach Coordination Group (9 September 2019, Athens, Greece).

The Meeting of CorMon on Pollution Monitoring (26-28 April 2021) reviewed the Meeting documents UNEP/MED WG.492/7 and UNEP/MED WG.492/8 addressing the procedures for Analytical Quality Assurance and Reporting of Monitoring Data elaborated in respective protocols in order to ensure the representativeness and accuracy of the analytical results for generation and reporting of quality-assured monitoring data and agreed on their submission to the Meeting of the MED POL Focal Points upon addressing the technical proposals that have been provided and agreed upon during the Meeting of CorMon on Pollution Monitoring. Further to this conclusion of the Meeting of CorMon on Pollution Monitoring, the Meeting document UNEP/MED WG. 509/33 was prepared for the consideration of the Meeting of MEDPOL Focal Points. It includes the changes introduced to address the technical proposals provided by France and Spain. They are marked in track mode in this meeting document, while their detailed overview along with related responses of the Secretariat is provided in UNEP/MED WG.509/Inf.20. This document also includes new Annex IV containing the Proposal of Data Standards and Data Dictionaries for IMAP Common Indicators 18 and 20 as prepared after the Meeting of CorMon on Pollution Monitoring for sharing with the 8<sup>th</sup> Meeting of Coordination Group Meeting.

## **List of Abbreviations / Acronyms**

<b>CAS</b>	CAS Registry Number, is a unique numerical identifier assigned by the Chemical Abstracts Service (CAS)
<b>CI</b>	Common Indicator
<b>COP</b>	Conference of the Parties
<b>CORMON</b>	Correspondence Group on Monitoring
<b>CP</b>	Contracting Parties
<b>DDs</b>	Data Dictionaries
<b>DSs</b>	Data Standards
<b>EcAp</b>	Ecosystem Approach
<b>EO</b>	Ecological Objective
<b>EU</b>	European Union
<b>GES</b>	Good Environmental Status
<b>IMAP</b>	Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria
<b>LOD</b>	Limit of Detection
<b>LOQ</b>	Limit of Quantification
<b>MAP</b>	Mediterranean Action Plan
<b>MEDPOL</b>	Programme for the Assessment and Control of Marine Pollution in the Mediterranean Sea
<b>MSFD</b>	Marine Strategy Framework Directive
<b>RDBMS</b>	Relational Data Base Management System
<b>SI</b>	International System of Units (SI, abbreviated from the French Système international (d'unités))

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### Annexes:

**Annex I:** Data Standards and Data Dictionaries for IMAP Common Indicators 13, 14, 17, 18 and 20

**Annex II:** Elements proposed for preparation of Data Standards and Data Dictionaries for IMAP Common Indicator 18 as amended by the Meeting of CorMon on Pollution Monitoring

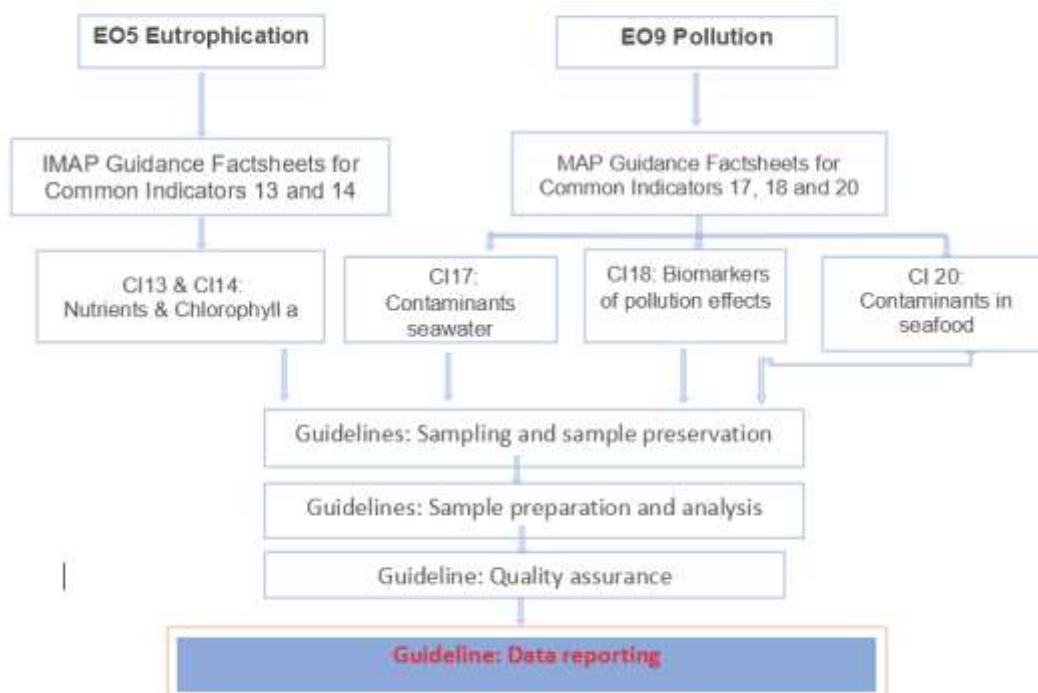
**Annex III:** Elements proposed for preparation of Data Standards and Data Dictionaries for IMAP Common Indicator 20

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**Annex V:** References

## 1. Introduction

1. Reporting is an important step within the monitoring process of the marine environment. Through proper reporting assessment of GES regarding Ecological Objectives 5 and 9, as presented in details in the IMAP Guidance Factsheets (UNEP/MAP, 2019)<sup>1</sup> will be allowed and maintained.
2. Hence this Guideline on Reporting Monitoring Data for IMAP Common Indicators 13, 14, 17, 18 and 20, elaborates the protocols for data reporting to IMAP/Info System, along with detail guidance on applying necessary procedures, addressing weak points and resolving the problems.
3. This Guideline builds upon the UNEP/MAP Integrated Monitoring and Assessment Programme (IMAP) respectively IMAP Guidance Fact Sheets for IMAP Common Indicators 13, 14, 17, 18 and 20 (UNEP/MAP, 2019); standardized protocols (UNEP/MAP, 2019a)<sup>2</sup>; Data Quality Assurance schemes (UNEP/MAP, 2019b)<sup>3</sup>; Data Standards (DSs) and Data Dictionaries (DDs) for Common Indicators related to Pollution and Marine Litter (UNEP/MAP, 2019c)<sup>4</sup> and IMAP Pilot Info System: Quality Assurance and Quality Controls (UNEP/MAP, 2019d)<sup>5</sup> in order to allow the comparability of the data for reliable assessment of GES.
4. The below flow diagram informs on the category of this Monitoring Guidelines related to reporting of monitoring data within the structure of all Monitoring guidelines prepared for IMAP Common Indicators 13, 14, 17, 18 and 20.



**Flow Diagram:** Monitoring Guidelines for IMAP Ecological Objectives 5 and 9.

<sup>1</sup> (UNEP/MAP, 2019), UNEP/MED WG.467/5. IMAP Guidance Factsheets: Update for Common Indicators 13, 14, 17, 18, 20 and 21: New proposal for candidate indicators 26 and 27.

<sup>2</sup> (UNEP/MAP, 2019a), UNEP/MED WG.463/6. Monitoring Protocols for IMAP Common Indicators related to pollution.

<sup>3</sup> (UNEP/MAP, 2019b), UNEP/MED WG.467/13. Schemes for Quality Assurance and Control of Data related to Pollution

<sup>4</sup> UNEP/MAP, 2019c. UNEP/MED WG.467/8. Data Standards and Data Dictionaries for Common Indicators related to Pollution and Marine Litter

<sup>5</sup> (UNEP/MAP, 2019d). UNEP/MAP WG. 467/12. MAP Pilot Info System: Quality Assurance and Quality Controls

### Data quality

5. The 'data quality' management process is without a doubt the most important component of the overall data management system structure to ensure 'quality data'. The data management involves data policy, data warehousing, and data security components, only to mention a few. However, 'quality data' should guide and support any data-related endeavour, such as the gathering of environmental information through scientific-based monitoring strategies to assess the status of the marine environment (e.g. IMAP of UNEP /MAP).
6. The 'data quality' approach is a common approach to ensure, control and optimize the value of data from observations in all fields, including science, medicine, business, and politics. However, the 'data quality' concept has many functional attributes.
7. The building of databases for the collection and use of the monitoring data and pollution load data was seen as a necessity very early within the MED POL Programme. The Monitoring MED POL Database (ca. Microsoft Access SQL database software) was created and included some components and modules, such as plotting and mapping, trend analysis, a remote access module, etc., in an all-in-one approach.
8. At that time, the overall 'data quality' protocol was based on the internal procedures in place. Briefly, once the dataset files were received from the Contracting Parties, the officer in charge sent the files to the database managers to perform the automatic upload of the data into the database. If problems were encountered during the uploading of the data, a report was produced and sent back to the Contracting Parties for review, correct and officially resubmit the data.
9. Although this was the most logical procedure, it faced several technical difficulties such as i) the data sent back to the Contracting Parties could be delayed or new problems were found after resubmission; ii) the flagging function from the database could be used only by experts; iii) the errors detected cannot be sorted out easily (e.g. sometimes a digit or a different 'parameter name' invalidates the automatic loading); iv) the submission of 'out of range' values, which were the main causes of the limited direct database applicability for the regional marine assessments. To this aim, it has been decided to shift to an on-line system since 2007-2008.
10. The adoption of the Integrated Monitoring and Assessment Programme (IMAP) of the Mediterranean Sea and Coast and Related Assessment Criteria (Decision IG. 22/7, COP 19, February 2016) furthermore increased the need for even more and larger datasets. For this reason, and due to the fast developments in information systems and technologies, the Secretariat commissioned the development of a new database to the INFO/RAC.
11. IMAP (Pilot) Info System has been built to strengthen the capacities for data management, along with data reporting, quality assurance and quality controls (UNEP/MAP, 2019d, UNEP/MAP WG. 467/12). The new data management structure allows for an improved data management that is fit-for-purpose for the requirements of the IMAP (i.e. the Barcelona Convention marine monitoring system).
12. The schemes for Quality Assurance and Control of Data for IMAP (Pilot) Info System have been defined on two levels, as elaborated in UNEP/MAP, 2019b, UNEP/MED WG.467/13 (UNEP/MED WG. 492/Inf.14 ). On the first level, there is a monitoring data Quality Assurance and Quality Control (QA/QC) for each IMAP Common Indicator; on the second level, there is a full Database Quality Management and Reporting Schemes considering present functional modules (i.e. MEDPOL Database approach), both for data technical validation and data flagging.
13. Generic QA schemes are defined for IMAP Pollution Cluster Common Indicator to be measured and reported at the primary level (Table 2 of UNEP/MAP, 2019b). It further describes both the QA Schemes and QA Categories for each Common Indicator according to its specificities and overall 'data quality' needs to be reported by the Contracting Parties to IMAP (Pilot) Info System (Tables 4a and 4b, of UNEP/MAP, 2019b). Level 1 of QA/QC provides the scheme for data quality assurance, whilst Level 2 provides the scheme for quality assurance of data assessment.
14. There are basic attributes (i.e. specific requirements of the 'data' within the overall quality framework) to be fulfilled to guarantee both the 'data quality' from an objective point of view and

their fit-for-purpose, under the overall Database Quality Management, including the Reporting Schemes. The completeness, accuracy, consistency, timeliness, accessibility and validity are the main attributes to be fulfilled to obtain 'quality data' reported to the IMAP Info System. This is elaborated in UNEP/MED WG.492/7, providing the Monitoring Guidelines/Protocols for Analytical Quality Assurance for IMAP Common Indicators 13, 14, 17, 18 and 20, as well as in UNEP/MED WG.467/13 (UNEP/MED WG. 492/Inf.14 ).

15. The achievement of these basic attributes guarantees the 'data quality' and should be considered during all the planning process of the data generation, from data collection and reporting, through data storage, up to the data usage by interested parties. The new IMAP (Pilot) Info System platform is designed to facilitate these procedures through data quality algorithms built to support data loading by the Contracting Parties.

16. The first step of the QA process of IMAP (Pilot) Info System (UNEP/MAP, 2019d) has been the definition of Data Standards (DSs) and Data Dictionary (DDs) and associated formal Quality Controls for the monitoring modules associated to the selected 11 IMAP Common Indicators. They aggregate information in different tables (represented by excel spreadsheets) and, for each table, several fields with different formats are defined. When a field has to be filled by selecting a value included in a predefined list of admissible values, such lists constitute the DD associated to DS. Data are compliant to DSs and DDs if all of the following formal quality controls are satisfied: format; unique coding; coherent linking; regular expression and admissible values.

17. The second step of QA process of IMAP (Pilot) Info System (UNEP/MAP, 2019d) requires implementation of formal Quality Controls associated to each DSs and DDs in order to verify compliance of data. In particular, for each DS that corresponds to a monitoring module, the above list of formal quality controls has been defined and implemented in the IMAP (Pilot) Info System. Each row in the list is represented by QC\_Code; IMAP Ecological Objective; Common Indicator; DS/module; spreadsheet; field and description.

18. The process for the collection and quality control of data sets reported into IMAP (Pilot) Info System is implemented for each data standard by the three-way handshaking communication (UNEP/MAP, 2019d):

- Step 1: the user, respectively a Contracting Party, downloads the Data Standard corresponding to the monitoring module for which there is a need to transfer monitoring data;
- Step 2: after filling the Data Standard with monitoring data, the user uploads the file into the system for the data flow which corresponds to the Data Standard used;
- Step 3: The system produces a report of QC formal check validation, with the results of formal quality control applied to the file uploaded and if every quality control is passed, the file is considered as 'formally compliant' (OK!); otherwise as 'formally non - compliant' (Not OK) and the user has to correct the file and upload it again into the system in order pass all the formal quality controls.

19. The report of QC formal check validation is produced as an excel file containing the information for each row that does not pass the quality control check. Formally compliant data sets, i.e. data that pass above presented the formal Quality Controls, are stored in the Relational Data Base Management System (RDBMS) of the IMAP (Pilot) InfoSystem.

20. Further application of higher level Database Quality Controls considers (UNEP/MAP, 2019d), for example, the following issues:

- Check of admissible ranges or maximum or minimum values for parameters based on statistical analysis of monitoring data; scientific literature reviews and/or fixed constraints due to physical or chemical characteristics, as for example, the range 0-14 of pH;
- Geographical location of monitoring stations.

21. Quality Assurance process for data quality also includes application of additional higher level Quality Controls that needs to be applied for the implementation of the standardized and harmonized monitoring practices related to a specific IMAP Common Indicator (i.e. sampling, sample preservation and transportation, sample preparation and analysis). These Quality Controls are directly related to data quality and control procedures of national IMAP competent laboratories, which include the

accreditation process, use of certified reference material or standardized monitoring protocols, participation of laboratory to proficiency testing, etc., and elaborated in the Monitoring Guidelines/Protocols for Analytical Quality Assurance for IMAP Common Indicators 13, 14, 17, 18 and 20 (UNEP/MED 492/7) for consideration during present Meeting.

22. It should be noted, that the IMAP (Pilot) Info System has been designed to further implement higher level Quality Controls, as elaborated above, as well as to collect additional information on laboratory data quality and control procedures and implementation of Monitoring Guidance/ Protocols as discussed and agreed by the Integrated Meetings of the Ecosystem Approach Correspondence Groups on IMAP Implementation (CORMONs) held from 1-3 December 2020 and the present Meeting of the Ecosystem Approach Correspondence Group on Pollution Monitoring. Such information are included in specific DDs and DSs and linked to monitoring data in order to apply a categorization for flagging data sets for EO5 and EO9 (i.e. Category A, Category B, Category C, Category D, Category E), as provided in UNEP/MAP 2019b (UNEP/MED WG. 492/Inf.14).

23. It should be noted that the migration of data from the Monitoring MED POL Database to IMAP Pilot Info System has been completed, therefore providing an access to monitoring data in the format of IMAP (Pilot) Info System Data Dictionaries. Furthermore, reporting of data was continued during the testing phase of IMAP Info System, as well as since being launched in July 2020.

#### Data quality organizational levels

24. In order to guarantee the quality of the IMAP (Pilot) Info System, and well as the previous MED POL Database, the relevant roles and responsibilities in terms of database quality management have been defined (i.e. from the sample collection until the use of the final validated data) to ensure that the quality chain is followed by the Contracting Parties.

25. There are basically three groups of stakeholders within the data management system, as elaborated in UNEP/MAP, 2019b (UNEP/MED WG. 492/Inf.14). Namely, the Contracting Parties' IMAP competent laboratories (i); the ministry or delegated national agency with the responsibility to report monitoring data to IMAP (Pilot) Info System (ii) on behalf of the respective MED POL Focal Points (iii), corresponding to a primary, secondary and tertiary levels in the data quality chain.

26. Each level has a different degree of responsibility to fulfil the 'data quality' attributes to ensure the usefulness of the monitoring data at national and regional scales within the implementation of IMAP. These three organizational levels of responsibility for 'data quality' management and data flows, provide the basis for a common understanding of the 'data quality' requirements and serve to the establishment of the 'data quality' categories.

## **2. Technical Note for reporting Monitoring Data for IMAP Common Indicators 13, 14, 17, 18 and 20**

27. This Technical Note interrelates the procedures for reporting of monitoring data with the Data Standards (DSs) and Data Dictionaries (DSs)<sup>6</sup> as agreed and built into IMAP (Pilot) Info System for IMAP Common Indicators 13, 14 and 17, as well as defines the elements for data reporting for IMAP Common Indicators 18 and 20 in order to guide ongoing preparation of the Data Standards (DSs) and Data Dictionaries (DSs) for IMAP Common Indicators 18 and 20. To that effect, under this Technical Note, this Monitoring Guideline provides the following IMAP Protocols for reporting of monitoring data:

- Protocol for reporting Monitoring Data for IMAP Common Indicators 13 and 14;
- Protocol for reporting Monitoring Data for IMAP Common Indicators 17;
- Protocol for reporting Monitoring Data for IMAP Common Indicators 18; and
- Protocol for reporting Monitoring Data for IMAP Common Indicators 20.

<sup>6</sup> DSs and DDs are a set of information describing the content, format and structure of a database and relationship between the elements. DSs are prepared in a form of Excel spreadsheets in which every row indicates a field to be filled by the data providers, aligned with the current MED POL Database for the common cases. The DSs are accompanied by DDs provided in a form of a column next to each Data Standard or excel spreadsheet to guide the data provider.



## 2.1. Protocol for Reporting Monitoring Data for IMAP Common Indicators 13 and 14

28. Considering the already developed DSs and DDs for CI13 and CI14 (UNEP/MAP 2019c), being built into IMAP Info System, as well as the IMAP Guidance factsheets for CI13 and CI14 (UNEP/MAP (2019b), the following two procedures on reporting monitoring data related to IMAP CI13 and CI14 needs to be applied: a) reporting data related to sampling stations, and b) reporting data related to eutrophication.

29. *The DSs and DDs for stations* for CIs 13 and 14 are structured around data sets that are defined as mandatory in relevant IMAP Guidance Factsheets. Therefore, there is a need to report the following data: i) country code; ii) national station ID; iii) national station name; iv) latitude and longitude of station; v) TCM matrix-water column; vi) station distance from the coast in km; viii) ~~bottom-sea~~ depth in meters, and ix) typology of the monitored area (R = Reference, C = Coastal, HS = Hot spot, O = Other) and x) Remarks (notes). However, there is also a possibility to fill in non-mandatory data (i.e. region - administrative subdivision of first level to which the station belongs and pressure type) as to allow for the CP that already have monitoring systems in place collecting a wider set of data to also report them as additional data sets.

30. *The DDs and DDs for eutrophication* are structured around data sets related to CIs 13 and 14 that are defined as mandatory parameters in relevant IMAP Guidance Factsheets. Specifically, there is a need to report data related to i) country code as ISO two digits; ii) national station ID; iii) year, month, day and time of sampling; vii) sample code; viii) name of the physico-chemical parameter or of the nutrient; ix) unit of measurement of the physico-chemical parameter or nutrient; x) LOD\_LOQ\_flag; xi) concentration measure; xii) sample depth in meters and xiii) analytical method in line with IMAP, as a variety of methods exists (e.g. Chlorophyll a concentration - spectrophotometer, fluorometer, HPLC, in situ) for measurements with different underlying variability, along with a coding list for the used Analytical Methods, corresponding to a combination of analyte and methods.

31. Annex I provides both DDs for reporting on CIs 13 and 14 for stations and eutrophication mandatory parameters as follows: Table 1. Station Information; Table 2. Physicochemical information; Table 3. List of physicochemical parameters, as they have been approved by the 7<sup>th</sup> Meeting of the Ecosystem Approach Coordination Group, held on 9 September 2019 (Athens, Greece), and consequently made operational for data reporting within IMAP Pilot Info System.

## 2.2. Protocol for Reporting Monitoring Data for IMAP Common Indicators 17

32. Considering that the already developed DSs and DDs for CI17 (UNEP/MAP 2019c) are being built into IMAP Pilot Info System, as well as the IMAP Guidance Factsheets for CI17 (UNEP/MAP (2019b), the following two procedures on reporting monitoring data related to IMAP CI17, need to be applied: a) reporting data related to sampling stations and b) reporting data related to contaminants.

33. *The DSs and DDs for stations* for CI 17 are structured around data sets that are defined as mandatory in relevant IMAP Guidance Factsheet. Therefore, there is a need to report the following data: i) country code; ii) national station ID; iii) national station name; iv) latitude and longitude of station; vi) TCM matrix (Biota, Sediment, Seawater or a combination of these matrices); vii) bottom depth in meters; viii) typology of the monitored area (R = Reference, C = Coastal, HS = Hot spot, O = Other) and pressure type (IP = industrial plants, MT = Maritime Traffic). However, there is also a possibility to fill in non-mandatory data i.e. region - administrative subdivision of first level to which the station belongs and closest coast in km as to allow for the CP that already have monitoring systems in place collecting a wider set of data to also report them as additional data sets.

34. *The DDs and DDs for contaminants* are structured around data sets related to CI 17 that are defined as mandatory parameters in related IMAP Guidance Factsheets (UNEP/MAP, 2019b). Specifically, there is a need to report data related to: i) country code as ISO two digits; ii) national station ID; iii) year, month, day and time of sampling; vii) sample ID - code; viii) sample matrix (seawater, sediment, biota); ix) name of the contaminant (Label in list of contaminants); x) ID of the contaminant (ID in list of contaminants); xi) CAS number of the contaminant; xii) unit of measurement of the contaminant; xiii) dry (DW) or wet weight (WW) for sediment and biota; xiv) <LOD\_<LOQ\_flag; xv) concentration value; xvi) sample depth in meters and xvii) salinity (psu) and temperature (°C); xviii) dissolved oxygen concentration; xix) sediment fraction (max size in µm); xx)

sediment depth in m; xx) biota species ID (ID list\_species); xxi) biota species name (Label List\_species); xxii) specimen length in cm and specimen length standard deviation (specimens in pool in cm); xxiii) specimen weight in g and specimen weight standard deviation (specimens in pool in g); xxiv) pooling (content of pooling and number of specimens); xxv) extractable organic matter in mg g<sup>-1</sup>; xxvi) tissue (for biota – fluids, eggs, tissues, kidney, liver, muscle, other, soft tissues); xxvii) fat content (percentage of total wet matter); xxviii) analytical method in line with IMAP, as a variety of methods exists (e.g. metal concentration – AAS, GC-AAS, ICP-MS; organic contaminant concentration – GC-ECD, GC-MS, HPLC) for measurements with different underlying variability, along with a coding list for the used Analytical Methods, corresponding to a combination of analyte and methods; xxix) LOQ; xxx) Emodnet codeP01 (code of the parameter/EMODNet method according to List\_dictionary\_P01); xxxi) Remarks (notes). There is also a possibility to fill in non-mandatory data (i.e. for sediment matrix: grain type, Total Carbon %, Total Organic Carbon %, Total Inorganic Carbon %, Total Nitrogen %) as to allow for the CP that already have monitoring systems in place collecting a wider set of data to also report them as additional data sets.

35. The list of reference for the CI 17 on chemicals, which is also in use by the European Environmental Agency (EEA, WISE-Marine) includes either the CAS numbers (Chemical Abstract Service reference number) or the EEA reference number (for particular EEA requirements). The mandatory reporting is foreseen only for the biota and sediment matrices as agreed under IMAP Guidance Factsheets (UNEP/MAP, 2019b) and for specific compounds under each Common Indicator, despite any other substance and matrix can be reported by applying then harmonized CAS number. For Biota matrices, a list with the codes of reference species is provided in Annex I.

36. Annex I provides both DDs for Reporting on CI17 for stations and contaminants mandatory parameters as follows: Table 4. Station Information; Table 5. Contaminants information; Table 6. List of mandatory contaminants; Table 7. List of reference species, as they have been approved by the 7<sup>th</sup> Meeting of the Ecosystem Approach Coordination Group, held on 9 September 2019 (Athens, Greece), and consequently made operational for data reporting within IMAP Info System.

### **2.3. Protocol for Reporting Monitoring Data for IMAP Common Indicators 18**

37. The DSs and DDs specific for CI18 Stations and Contaminants are under preparation by UNEP/MAP (MEDPOL and INFO/RAC). In line with the structure and content of DDs for CI17, the present document provides elements for building DSs and DDs for CI18, as provided in Annex II. Similarly to procedure established for CIs 13, 14 and 17, the following two procedures on reporting monitoring data related to IMAP CI18 are proposed: a) reporting data related to sampling stations and b) reporting data related to biomarkers.

38. *The proposed DSs and DDs for stations and parameters* related to CI18 are structured around data sets that are defined as mandatory in relevant IMAP Guidance Factsheet. Annex II provides both proposals of DDs for Reporting on CI18 for stations and biomarkers mandatory parameters as follows: Table 1. Station Information, Table 2. List of mandatory biomarkers, Table 3. Biomarker information and Table 4. List of reference species. The organisms that should be analysed are for molluscs the *Mytilus* sp. and for fish *Mullus barbatus*.

39. In line with above protocol for reporting monitoring data for IMAP CI 18, the elements of Data Standards (DS) and Data Dictionaries (DDs) specific for CI 18 are prepared, as presented in Annex II, for receiving the suggestions of present Meeting and guiding further work of INFO/RAC and MEDPOL.

### **2.4. Protocol for Reporting Monitoring Data for IMAP Common Indicators 20**

40. Taking into consideration already developed DSs and DDs for CI17 (UNEP/MAP 2019c), as well as the IMAP Guidance factsheets for CI20 prepared by UNEP/MAP (2019b), the following two procedures on reporting monitoring data related to IMAP CI20 are proposed: a) reporting data related to sampling stations and b) reporting data related to contaminants.

41. *The DSs and DDs for stations* related to CI20 are structured around data sets that are defined as mandatory in relevant IMAP Guidance Factsheet. Sampling stations may be at sea (on board of a fishing boat) or on land (fishing port or fish market). Therefore, each seafood sampling lot must be traced back unambiguously to the sub-region where the organisms were initially captured. Therefore,

DDs for stations should include information as for CI17, in order to be able to relate environmental quality data (CI17) with seafood safety data (CI20): i) Country code; ii) Station code (sampling); iii) Station name (sampling); iv) Station geographical coordinates (sampling); v) Seafood species; vi) Station code (where seafood samples were initially captured); vii) Station name (where seafood samples were initially captured); viii) Station geographical coordinates (where seafood samples were initially captured) and ix) Additional information on the area of organism's capture (such as fishing area code, area name, coordinates, date of fishing, etc.)

42. *The DDs and DDs for contaminants* related to CI 20 for characteristic parameters including contaminants information and the List of reference on chemicals are not yet developed for CI20, but they can be based on the DDs (contaminants information), which have been developed by INFO/RAC and MED POL for CI17 (UNEP/MAP 2019c).

43. The list of reference for the CI 17 on chemicals is also in use by the European Environmental Agency (EEA, WISE-Marine) and includes either the CAS numbers (Chemical Abstract Service reference number) or the EEA reference number (for particular EEA requirements). The IMAP Guidance Factsheet related to CI 17 contains the agreed chemical compounds and those can be found in the EEA list with its CAS number. The mandatory reporting is foreseen only for the biota and sediment matrices as agreed under relevant IMAP Guidance Factsheets and for specific compounds under each Common Indicator, despite any other substance and matrix can be reported by applying then harmonized CAS number. For Biota matrices, a list with the codes of reference species is provided.

44. For the CI20, contaminants' levels should also be expressed in absolute figures and not only in relation to the regulatory level (i.e. above or below the regulatory level). Regulatory levels for the protection of human health as presented in EU Regulations (EC) No 1881/2006, (EC) No 835/2011 and EC No 1259/2011 (Annex III) are usually high in relation to the normal ambient concentrations of contaminants in marine organisms. However, recording the absolute concentration (and not the relative above/below the regulatory level information) triggers a warning signal in the event of an ascending trend of contaminants concentrations, even if these concentrations are still below the regulatory limit. It has to be underlined that concentrations below regulatory levels are not necessarily indicators of good environmental status, since environmental effects might be present at lower concentrations (JRC, 2010). Furthermore, recording the absolute concentration of pollutants generate data for contaminants, which may not be regulated yet but which might be regulated in the future.

45. The concentration limits for the regulated contaminants in the EU are presented in a concise format in Annex III. The list of contaminants includes Cd, Hg, Pb, four PAHs (benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene and chrysene), dioxins, dioxin-like and non dioxin-like PCBs and radionuclides. Non-regulated contaminants could be included in the CI20 monitoring programme, but for the time being no concentration limits are set in the EU legislation.

46. Integration of monitoring data for CI20 should be made with care. JRC (2010) suggests to take into account "the frequency that levels exceed the regulatory levels, the actual levels that have been detected, the number of contaminants for which exceeding levels have been detected and in parallel the origin of the contamination (geological versus anthropogenic, local versus or long distance)". Also "further an intake assessment taking into account the importance in the human diet of the species showing the exceeding levels could be taken into account" (JRC, 2010). If regulatory levels are exceeded in one species, that doesn't mean that all seafood consumption from this sub-region is dangerous.

47. In line with above protocol for reporting monitoring data for IMAP CI 20, elements of Data Standards (DS) and Data Dictionaries (DDs) specific for CI 20 are proposed, as presented in Annex III, for receiving the suggestions of present Meeting and guiding further work of INFO/RAC and MEDPOL.

**Annex I:**  
**Data Standards and Data Dictionaries for IMAP Common Indicators 13, 14 and 17**

**ECOLOGICAL OBJECTIVE 5: Common Indicators 13 and 14****Table 1:** Data Dictionaries (stations information) for CI13 and CI14.

Field	Description	List of values
Country Code	Enter member country code as ISO two digits, for example "IT" for Italy.	
National Station ID	Station code	
National Station Name	Station name	
Region	Administrative first level subdivision to which the station belongs to	
Latitude	Latitude of the station in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx).	
Longitude	Longitude of the station in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx). Use positive values without '+' before numbers (for ex. 13.98078) for coordinates east of the of the Greenwich Meridian (0°) and negative values with '-' for coordinates west of the Greenwich Meridian (0°) (for ex. -2.6893).	
Closest Coast	Station distance from the coast in km	
TCM Matrix	Measure of seawater at the station	W = Sea water column
Sea Depth	Sea depth in meters	
Area Typology	Typology of the monitored area enter one of the values in the list	R = Reference C = Coastal HS = Hot spot O = Other
Pressure Type	If the monitoring station id dedicated to monitor pressure, indicate the typology of pressure monitored, enter one of the values in the list	AP = Aquaculture plant RP = River Plume UWWTP = Urban Waste Water Treatment Plant IP = Industrial Plant O = Others
Remarks		

\*non-mandatory under IMAP Guidance Factsheets

**Table 2:** Data Dictionaries (physicochemical information) for EO5 Common Indicator 13 and 14.

Field	Description	List of values
Country Code	Enter member country code as ISO two digits, for example "IT" for Italy.	
National Station ID	Station code	
Year	Year of sampling in AAAA format	
Month	Month of sampling in 1-12 format	
Day	Day of sampling in 1-31 format	
Time	Hour-minutes-seconds of sampling in HH:MM:SS format	
Sample ID	Sample Code if multiple replies are made with the same value as Year, Month, Day and Time	
Determin_Nutrients	Name of the physico-chemical parameter or of the nutrient, enter one of the values in the list in the "List_PhysicoChemical"	

Field	Description	List of values
Nutrients Seawater_unit	Unit of measurement of the physiochemical parameter or nutrient, enter one of the values in the list	% = Oxygen saturation m = Secchi disks depth pH = pH °C = Temperature µg/L = Chlorophyll <i>a</i> µmol/L = Ammonium, Nitrate, Nitrite, Total Nitrogen µmol/L = Dissolved Oxygen µmol/L = Orthophosphate, Total Phosphorus µmol/L = Orthosilicate µS/cm = Conductivity
LOD_LOQ_Flag	Enter the value LOQ in case the concentration value is less than the quantification limit or the value LOD in case the concentration value is less than the detection limit. In the other cases, leave the field empty.	"LOQ = Concentration value below the quantification limit LOD = Concentration value below detection limit
Concentration	Concentration measure	
Sample Depth	Sampling depth in meters	
Analytical Method	Analytical method List of analytical methods, in line with IMAP, will be completed. Suggestion to use code from List_P01 provided in an Excel file	
Remarks		

**Table 3:** List of physicochemical parameters under IMAP Guidance Factsheets EO5 and provided as mandatory in Data Dictionaries for Common Indicators 13 and 14.

Field	Description	Remarks
Temperature (water)	Water Temperature (°C)	
Salinity	Salinity (psu)	
Conductivity	Conductivity (µS/cm)	
Dissolved oxygen	Dissolved Oxygen (µmol/L)	
Oxygen saturation	Dissolved Oxygen - saturation percentage (%)	
pH	pH	
Chlorophyll <i>a</i>	Chlorophyll- <i>a</i> (µg/L)	
Secchi disk depth	Secchi disk (m)	
Nitrate	Nitrate (µmol/L)	
Nitrite	Nitrite (µmol/L)	
Ammonium	Ammonium (µmol/L)	
Total phosphorus	Total Phosphorus (µmol/l)	
Orthophosphate	Orthophosphate (µmol/L)	
Total nitrogen	Total Nitrogen (µmol/L)	
Orthosilicate	Reactive silicate (µmol/L)	

**ECOLOGICAL OBJECTIVE 9: Common Indicator 17****Table 4:** Data Dictionaries (Stations Information) for Common Indicator 17 within EO9.

Field	Description	List of values
Country Code	Enter member country code as ISO two digits, for example "IT" for Italy.	
National Station ID	Station code	
National Station Name	Station name	
*Region	Administrative subdivision after country which the station belongs to (according to the country subdivision)	
Latitude	Latitude of the station in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx).	
Longitude	Longitude of the station in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx). Use positive values without '+' before numbers (for ex. 13.98078) for coordinates east of the of the Greenwich Meridian (0°) and negative values with '-' for coordinates west of the Greenwich Meridian (0°) (for ex. -2.6893).	
*Closest Coast	Station distance from the coast in km	
TCM Matrix	Environmental matrix measured in the station, enter one value of the list	B = Biota BS = Biota and sediment BSW = Biota, sediment and sea water column BW = Biota and sea water column S = Sediment SW = Sediment and sea water column W = Sea water column
Sea Depth	Sea depth in meters	
Area Typology	Indicate the typology of the monitored area, enter one of the values in the list	R = Reference C = Coastal HS = Hot spot O = Others

PressureType	If the monitoring station id dedicated to monitor pressure, indicate the typology of pressure monitored, enter one of the values in the list	IP = Industrial Plants MT = Maritime Traffic
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\*non-mandatory under IMAP Guidance Factsheets

**Table 5:** Data Dictionaries (contaminants information)

Field	Description	List of values
Country Code	Enter member country code as ISO two digits, for example "IT" for Italy.	
National Station ID	Station code	
Year	Year of sampling in YYYY format	
Month	Month of sampling in 1-12 format	
Day	Day of sampling in 1-31 format	
Time	Hours-minutes-seconds of sampling in HH:MM:SS format	
Sample ID	Sample Code if multiple replies are made with the same value as Year, Month, Day and Time	
Matrix	Sample matrix, enter one value of the list	W = Water S = Sediments B = Biota
Determin Haz Subs Name	Name of the contaminant, enter one value of the column 'Label' of the list 'List contaminants'	
Determin Haz Subs ID	ID of the contaminant, enter one value of the column 'ID_Contaminant' of the list 'List_contaminants'	
CAS Number	CAS number of contaminant, enter one value of the column CAS Number of list 'List_contaminants'	
Haz Subs_unit	Unit of measurement for the contaminant, enter one value of the list	µg/l = water matrix µg/kg = sediments and biota matrices
Haz Subs_WD	For sediment or biota, specify dry or wet weight, enter one value of the list	WW = Wet weight DW = Dry weight
LOD_LOQ_Flag	Enter the value '<' in case the concentration value is less than the quantification limit or the value '[' in case the concentration value is less than the detection limit. In the other cases, leave the field empty.	<= Concentration value below the quantification limit [= Concentration value below detection limit



Concentration	Concentration value. In the case of analytes sums in which at least one is not less than the LOQ, use the Concentration field with the sum of solely quantifiable analytes (i.e. not lower than the LOQ). In case the concentration value of the single analyte or all the analytes constituent the sum is less than the LOQ, the LOD_LOQ_Flag field and the Concentration field should be used as follows: in the case of a single analyte enter the value of LOQ/2; in the case of analytical additions, enter the zero value taking into account that the individual substances below the quantification limit do not contribute to the value of the sum.	
Sample Depth	Sampling depth in meters	
Salinity	For water matrix: Salinity (psu)	
Temperature	For water matrix: Temperature (°C)	
Dissolved oxygen	For water matrix: dissolved oxygen (µmol O <sub>2</sub> /l)	
*Grain Type	For sediment matrix: tipology of sediment, enter one value of the list	CS = Coarse Sand FS = Fine Sand G = Gravel M = Mud MS = Middle Sand
Fraction	Per sediment matrix: maximum size of sediment particles in µm	
Sediment Depth	For the sediment matrix: Depth of the collected sample of sediment, measured as a range, in centimeters, starting at the seafloor surface. The range would start by zero if the top of the sediment sample is the seafloor surface. For ex. insert '0-10' if 10 cm of sediments have been sampled starting from seafloor surface or insert '5-15' if 10 cm of sediments have been sampled starting from 5 cm from the seafloor surface.	
*TC	For sediment matrix: Total carbon content in % unit	
*TOC	For sediment matrix: Total organic carbon in % unit	
*TIC	For sediment matrix: Total inorganic carbon in % unit	
*TN	For sediment matrix: Total nitrogen content in % unit	
Species ID	For the biota matrix: monitored species. Enter one value of the column 'ID_Species' of the list 'List_species'	
Species Name	For the biota matrix: monitored species. Enter one value of the	

	column 'Label' of the list 'List_species'	
Specimen_lenght	For the biota matrix: length of specimen in cm. In case of pooling, indicate mean length	
Specimen_length_sd	For the biota matrix: Standard deviation of average length of specimens in a pool in cm.	
Specimen_weight	For the biota matrix: weight of specimen in g. In case of pooling, indicate mean weight.	
Specimen_weight_sd	For the biota matrix: Standard deviation of average weight of specimens in a pool in g.	
Pooling	In case of pooling, describe the content of pooling as number of specimens and other methodological issues	
Extractable Organic Matter	Extractable Organic Matter in mg/g	
Tissue	For biota matrix: tissue element of the monitored species, enter one of the list values	<p><b>BL</b> = Fluids - Blood. Includes haemolymph, erythrocytes, haemocytes, serum (blood component without cells and clotting factors) and plasma (serum including clotting factors)</p> <p><b>EG</b> = Eggs. Includes bird eggs and fish eggs (roe). Use the remarks field to provide additional information, if necessary.</p> <p><b>FA</b> = Tissues - Fat. Any type of adipose tissue or organ. Includes the form code BB for "Blubber".</p> <p><b>GO</b> = Organs - Gonads. Includes female gonads (ovaries) and male gonads (testes). Use the remarks field to provide additional information, if necessary.</p> <p><b>KI</b> = Organs - Kidney. Use the remarks field to provide additional information, if necessary.</p> <p><b>LI</b> = Organs - Liver. Includes hepatopancreas. Use the remarks field to provide additional information, if necessary.</p> <p><b>MU</b> = Tissues - Muscle. Any type of muscle tissue or organ. Includes the former code TM for "Tail muscle".</p> <p><b>OT</b> = Other. Use the remarks field to provide additional information, if necessary.</p> <p><b>ST</b> = Tissues - Soft tissue. Includes any body tissue except mineralized tissue (hard tissue)</p>
Fat Content	Fat content as percentage of total wet matter	
Analytical Method	Analytical method	
LOQ	Limit of quantification	

EmodnetCodeP01	Code of the parameter/ EMODNet method according to the dictionary P01,enter one value of the list "List_dictionary_P01"	
Remarks	Notes	

\*non-mandatory under IMAP Guidance Factsheets

**Table 6:** Example of the List of physicochemical parameters under IMAP Guidance Factsheets EO9, that are also available in the EEA reference list of contaminants (Code list), showing compounds provided as mandatory in the Data Dictionaries for Common Indicator 17 (PAHs not shown). The full list is provided with related Excel files presented at the IMAP Best Practices Meeting.

ID_Contaminant	Label	CAS Number	Matrix	Mandatory	Additional
CAS_309-00-2	Aldrin	309-00-2	Sediments	Y	
CAS_7429-90-5	Aluminium and its compounds	7429-90-5	Sediments	Y	
CAS_7440-43-9	Cadmium and its compounds	7440-43-9	Biota, Sediments	Y	
CAS_60-57-1	Dieldrin	60-57-1	Sediments	Y	
CAS_58-89-9	Gamma-HCH (Lindane)	58-89-9	Biota, Sediments	Y	
CAS_118-74-1	Hexachlorobenzene	118-74-1	Biota, Sediments	Y	
CAS_7439-92-1	Lead and its compounds	7439-92-1	Biota, Sediments	Y	
CAS_7439-97-6	Mercury and its compounds	7439-97-6	Biota, Sediments	Y	
CAS_3768-0-73-2	PCB 101 (2,2',4,5,5'-pentachlorobiphenyl)	37680-73-2	Biota, Sediments	Y	
CAS_3259-8-14-4	PCB 105 (2,3,3',4,4'-pentachlorobiphenyl)	32598-14-4	Biota, Sediments	Y	
CAS_3150-8-00-6	PCB 118 (2,3',4,4',5-pentachlorobiphenyl)	31508-00-6	Biota, Sediments	Y	
CAS_3506-5-28-2	PCB 138 (2,2',3,4,4',5'-hexachlorobiphenyl)	35065-28-2	Biota, Sediments	Y	
CAS_3506-5-27-1	PCB 153 (2,2',4,4',5,5'-hexachlorobiphenyl)	35065-27-1	Biota, Sediments	Y	
CAS_3838-0-08-4	PCB 156 (2,3,3',4,4',5-hexachlorobiphenyl)	38380-08-4	Biota, Sediments	Y	
CAS_3506-5-29-3	PCB 180 (2,2',3,4,4',5,5'-heptachlorobiphenyl)	35065-29-3	Biota, Sediments	Y	
CAS_7012-37-5	PCB 28 (2,4,4'-trichlorobiphenyl)	7012-37-5	Biota, Sediments	Y	
CAS_3569-3-99-3	PCB 52 (2,2',5,5'-tetrachlorobiphenyl)	35693-99-3	Biota, Sediments	Y	
EEA_33-38-5	Polychlorinated biphenyls(7 PCB: 28,52,101,118,138,153,180)		Biota, Sediments	Y	
EEA_32-03-1	Total DDT (DDT, p,p' + DDT, o,p' + DDE, p,p' + DDD, p,p')		Biota, Sediments	Y	
CAS_7440-66-6	Zinc and its compounds	7440-66-6	Biota, Sediments		Y

**Table 7:** Example of the List of available reference species (Code list) for Data Dictionaries and Data Standards of the IMAP (Pilot) Info System for EO9 (CI17 and CI20).

Species code	Species
2279156	Holothuria tubulosa
2357093	Hoplostethus atlanticus
2481126	Larus
2481156	Larus glaucoides
2481127	Larus hyperboreus
2409391	Lepidorhombus whiffiagonis
2419875	Leucoraja naevus
5213960	Limanda limanda
2301117	Littorina littorea
2415070	Lophius budegassa
2415075	Lophius piscatorius
2291262	Lymnaea palustris
2286995	Macoma balthica
5214420	Mallotus villosus
2415822	Melanogrammus aeglefinus
2415788	Merlangius merlangus
2415643	Merluccius merluccius
2415777	Micromesistius poutassou
5214022	Microstomus kitt
5214883	Molva dypterygia
5214880	Molva molva
5220008	Monodon monoceros
4284897	Mullus barbatus
7791733	Mya arenaria
7865139	Mya truncata
2333785	Myoxocephalus scorpius
8288896	Mytilus edulis
2285683	Mytilus galloprovincialis
2303019	Nassarius reticulatus
2226962	Nephrops norvegicus
5193449	Nucella lapillus
2286060	Ostrea edulis

**Annex II:**  
**Elements proposed for preparation of Data Standards and Data Dictionaries for**  
**IMAP Common Indicator 18**  
**as amended by the Meeting of CorMon on Pollution Monitoring**



## Common Indicator 18

**Table 1:** Data Dictionaries (Stations Information) for Common Indicator 18 within EO9.

Field	Description	List of values
Country Code	Enter member country code as ISO two digits, for example "IT" for Italy.	
National Station ID	Station code	
National Station Name	Station name	
*Region	Administrative subdivision after country which the station belongs to (according to the country subdivision)	
Latitude	Latitude of the station in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx).	
Longitude	Longitude of the station in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx). Use positive values without '+' before numbers (for ex. 13.98078) for coordinates east of the of the Greenwich Meridian (0°) and negative values with '-' for coordinates west of the Greenwich Meridian (0°) (for ex. -2.6893).	
*Closest Coast	Station distance from the coast in km	
Sea Depth	Sea depth in meters	
Area Typology	Indicate the typology of the monitored area, enter one of the values in the list	R = Reference C = Coastal HS = Hot spot O = Others
Pressure Type	If the monitoring station id dedicated to monitor pressure, indicate the typology of pressure monitored, enter one of the values in the list	<u>AG = Agriculture and livestock</u> IP = Industrial Plants <u>-MN = Mining</u> MT = Maritime Traffic

\*non-mandatory under IMAP Guidance Factsheets

**Table 2.** Biomarkers for which reporting of parameters is mandatory in line with related IMAP Guidance Factsheet

Biomarker	Organism	Tissue	Mandatory	Additional ( <u>Not-mandatory</u> )
Lysosomal membrane stability on cryostat sections - enzymatic determination	Fish/Mussel	Liver/Digestive gland	Y	
Lysosomal membrane stability in mussel haemocytes - in vivo	Mussel	Haemocytes ( <i>in vivo</i> )	Y	

determination (neutral red retention time (NRRT) assay)				
Micronuclei frequency <u>in fish blood cells</u>	Fish	Erythrocytes	Y	
<u>Micronuclei (MNi) frequency in mussel gill cells and haemocytes</u>	<u>Mussel</u>	<u>Gill cells, Haemocytes</u>	<u>Y</u>	
Acetylcholinesterase activity - <u>enzymatic determination</u>	Mussel / Fish	Gills / Muscle	Y	
<u>% LMS</u>	<u>Mussel</u>	<u>Haemocytes</u>		<u>Y</u>
<u>Metallothioneins</u>	Fish	Digestive gland		Y
Stress on stress	Mussel			Y
<u>Other: Specify</u>	<u>Specify</u>	<u>Specify</u>	=	<u>Y</u>

**Table 3.** Data Dictionaries for providing mandatory information/parameters for biomarkers defined for Common Indicator 18, as listed in Table 2

Field	Description	List of values
Country Code	Enter member country code as ISO two digits, for example "IT" for Italy.	
National Station ID	Station code	
Year	Year of sampling in YYYY format	
Month	Month of sampling in 1-12 format	
Day	Day of sampling in 1-31 format	
Time	Hours-minutes-seconds of sampling in HH:MM:SS format	
Sample ID	Sample Code if multiple replies are made with the same value as Year, Month, Day and Time	
Sample Type	Wild / Caged (add information about the collection site)	
Sample Depth	Sampling depth in meters	
Salinity	Water Salinity (psu)	
Temperature	Water Temperature (°C)	
Dissolved oxygen	Water dissolved oxygen (µmol O <sub>2</sub> /L)	
Species ID	Monitored species. Enter one value of the column 'ID_Species' of the list 'List_species', if present.	
Species Name	Monitored species. Enter one value of the column 'Label' of the list 'List_species'; if the species is not present in the List, enter the name of the species.	
<u>Gender</u>	<u>Specify gender</u>	<u>F= female</u> <u>M=male</u> <u>I= Undefined Stage Maturation degree of the gonads</u>
<u>Maturity Key</u>	<u>Maturation degree of the gonads for demersal species as referred according Workshop on Sexual Maturity Sampling (ICES WKMAT 2007).</u>	<u>I= Inactive</u> <u>II = Maturing</u> <u>III= Spawning</u> <u>IV= Post-spawning</u>
Specimen_lenght	Length of specimen in cm. In case of pooling, indicate mean length	



Specimen_length_SD <sup>sd</sup> /SE	Standard deviation/ <u>standard error</u> of <sup>7</sup> average length of specimens in a pool in cm.	
Specimen_weight	Weight of specimen in g. In case of pooling, indicate mean weight.	
Specimen_weight_SD <sup>sd</sup> /SE	Standard deviation/ <u>standard error</u> of average weight of specimens in a pool in g.	
Pooling	In case of pooling, describe the content of pooling <del>as number of specimens</del> and other methodological issues	
Pooling_N	<u>Number of specimens pooled</u>	
Pooling_SD/SE	<u>Which statistical measure is provided</u>	<b>SD = Standard Deviation</b> <b>SE = Standard Error</b>
Tissue	Tissue used for biomarker analysis of the monitored species, enter one of the list values	<b>BL</b> = Fluids - Blood. Includes haemolymph, erythrocytes, haemocytes <b>GO</b> = Organs - Gonads. Includes female gonads (ovaries) and male gonads (testes). Use the remarks field to provide additional information, if necessary. <b>LI</b> = Organs - Liver. Includes digestive gland. Use the remarks field to provide additional information, if necessary. <b>GI</b> = Organs - Gills. <b>MU</b> = Tissues – Muscle. Any type of muscle tissue or organ. Includes the former code TM for “Tail muscle”. <b>OT</b> = Other. Use the remarks field to provide additional information, if necessary. <b>ST</b> = Tissues – Soft tissue. Includes any body tissue except mineralized tissue (hard tissue)
Tissue_weight	<u>Weight of tissue in g. In case of pooling, indicate mean weight.</u>	
Tissue_weight SD/SE	<u>Standard deviation/standard error of average weight of specimens in a pool in g.</u>	
Remarks	<u>Notes</u>	

<sup>7</sup> The terms “standard error” and “standard deviation” are often confused. The contrast between these two terms reflects the important distinction between data description and inference, one that all researchers should appreciate. The standard deviation (often SD) is a measure of variability. The standard error of the sample depends on both the standard deviation and the sample size; this interrelation is provided by the simple equation  $SE = SD/\sqrt{\text{sample size}}$ . The standard error falls as the sample size increases, as the extent of chance variation is reduced; - this underlies the sample size calculation for a controlled trial, for example. By contrast the standard deviation will not tend to change if the size of sample is increased.

		<p><b>MU = Tissues – Muscle.</b> Any type of muscle tissue or organ. Includes the former code TM for "Tail muscle".</p> <p><b>OT = Other.</b> Use the remarks field to provide additional information, if necessary.</p> <p><b>ST = Tissues – Soft tissue.</b> Includes any body tissue except mineralized tissue (hard tissue)</p>
Remarks	Notes	

**Table 4:** The List of available reference species (Code list) for Data Dictionaries and Data Standards of the IMAP (Pilot) Info System for EO9 (CI17, CI18 and CI20)

Species code	Species
2279156	Holothuria tubulosa
2357093	Hoplostethus atlanticus
2481126	Larus
2481156	Larus glaucooides
2481127	Larus hyperboreus
2409391	Lepidorhombus whiffiagonis
2419875	Leucoraja naevus
5213960	Limanda limanda
2301117	Littorina littorea
2415070	Lophius budegassa
2415075	Lophius piscatorius
2291262	Lymnaea palustris
2286995	Macoma balthica
5214420	Mallotus villosus
2415822	Melanogrammus aeglefinus
2415788	Merlangius merlangus
2415643	Merluccius merluccius
2415777	Micromesistius poutassou
5214022	Microstomus kitt
5214883	Molva dypterygia
5214880	Molva molva
5220008	Monodon monoceros
4284897	Mullus barbatus
7791733	Mya arenaria
7865139	Mya truncate
2333785	Myoxocephalus Scorpius
8288896	Mytilus edulis
2285683	Mytilus galloprovincialis
2303019	Nassarius reticulatus
2226962	Nephrops norvegicus
5193449	Nucella lapillus
2286060	Ostrea edulis

**Annex III:**  
**Elements proposed for preparation of Data Standards and Data Dictionaries for**  
**IMAP Common Indicator 20**



The elements of Data Standards (DS) and Data Dictionaries (DDs) specific for CI 20 are provided in the tabular format as presented here-below for receiving the suggestions of present Meeting and guiding further work of INFO/RAC and MEDPOL. They are based on the concentration limits for the contaminants regulated in the EU, as defined in EU Commission Regulations (EC) No 1881/2006<sup>8</sup>, (EC) No 835/2011<sup>9</sup> and EC No 1259/2011<sup>10</sup>.

**Maximum Levels of Heavy Metals – (EC) Regulation 1881/2006**

	Foodstuffs	Maximum levels µg kg <sup>-1</sup> wet weight		
		Cadmium	Lead	Mercury
1	Muscle meat of fish <sup>(1)</sup>	0.050 Excluding species listed in 2 and 3	0.30	0.50 Excluding species listed in 4
2	Muscle meat of the following fish <sup>(1)</sup> anchovy ( <i>Engraulis species</i> ) bonito ( <i>Sarda sarda</i> ) common two-banded seabream ( <i>Diplodus vulgaris</i> ) eel ( <i>Anguilla anguilla</i> ) grey mullet ( <i>Mugil labrosus labrosus</i> ) horse mackerel or scad ( <i>Trachurus species</i> ) louvar or luvar ( <i>Luvarus imperialis</i> ) sardine ( <i>Sardina pilchardus</i> ) sardinops ( <i>Sardinops species</i> ) tuna ( <i>Thunnus species</i> , <i>Euthynnus species</i> , <i>Katsuwonus pelamis</i> ) wedge sole ( <i>Dicologlossa cuneata</i> )	0.10		
3	Muscle meat of swordfish ( <i>Xiphias gladius</i> ) <sup>(1)</sup>	0.30		
4	Muscle meat of the following fish: anglerfish ( <i>Lophius species</i> ) atlantic catfish ( <i>Anarhichas lupus</i> ) bonito ( <i>Sarda sarda</i> ) eel ( <i>Anguilla species</i> ) emperor, orange roughy, rosy soldierfish ( <i>Hoplostethus species</i> ) grenadier ( <i>Coryphaenoides rupestris</i> ) halibut ( <i>Hippoglossus</i> )			1.0

<sup>8</sup> Commission Regulation (EC) No 1881/2006, setting maximum levels for certain contaminants in seafood

<sup>9</sup> Commission Regulation (EC) No 835/2011 amending Regulation (EC) No 1881/2006 as regards maximum levels for polycyclic aromatic hydrocarbons in foodstuffs;

<sup>10</sup> Commission Regulation (EC) No 1259/2011, amending Regulation (EC) No 1881/2006 as regards maximum levels for dioxins, dioxin-like PCBs and non-dioxin-like PCBs in foodstuffs

	<i>hippoglossus</i> marlin ( <i>Makaira species</i> ) megrim ( <i>Lepidorhombus species</i> ) mullet ( <i>Mullus species</i> ) pike ( <i>Esox lucius</i> ) plain bonito ( <i>Orcynopsis unicolor</i> ) poor cod ( <i>Tricopterus minutes</i> ) portuguese dogfish ( <i>Centroscymnus coelolepis</i> ) rays ( <i>Raja species</i> ) redfish ( <i>Sebastes marinus</i> , <i>S. mentella</i> , <i>S. viviparus</i> ) sail fish ( <i>Istiophorus platypterus</i> ) scabbard fish ( <i>Lepidopus caudatus</i> , <i>Aphanopus carbo</i> ) seabream, pandora ( <i>Pagellus species</i> ) shark (all species) snake mackerel or butterfish ( <i>Lepidocybium flavobrunneum</i> , <i>Ruvettus pretiosus</i> , <i>Gempylus serpens</i> ) sturgeon ( <i>Acipenser species</i> ) swordfish ( <i>Xiphias gladius</i> ) tuna ( <i>Thunnus species</i> , <i>Euthynnus species</i> , <i>Katsuwonus pelamis</i> )			
5	Crustaceans, excluding brown meat of crab and excluding head and thorax meat of lobster and similar large crustaceans	0.50	0.50	0.50
6	Bivalve molluscs	1.0	1.5	
7	Cephalopods (without viscera)	1.0	1.0	

(1) Exclusion of liver. Where fish are intended to be eaten whole, the maximum level shall apply to the whole fish

**Maximum Levels of Benzo(a)pyrene and sum of four PAHs (benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene and chrysene) Regulation No 835/2011 amending Regulation (EC) 1881/2006**

Foodstuffs	Maximum levels ( $\mu\text{g kg}^{-1}$ )	
	Benzo(a)pyrene	Sum of benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene and chrysene *
Bivalve molluscs (fresh, chilled or frozen)	5.0	30.0

\* Lower bound concentrations are calculated on the assumption that all the values of the four substances below the limit of quantification are zero

**Maximum Levels of Dioxins and PCBs - Regulation (EC) 1259/2011 amending Regulation (EC) 1881/2006**

Foodstuffs	Maximum levels		
	Sum of dioxins (WHO-PCDD/F-TEQ) <sup>(1)</sup>	Sum of dioxins and dioxin-like PCBs (WHO-PCDD/F-PCB-TEQ) <sup>(1)</sup>	Sum of PCB28, PCB52, PCB101, PCB138, PCB153 and PCB180 (ICES 6)
Muscle meat of fish and fishery products and products thereof <sup>(2)</sup> with the exemption of: <ul style="list-style-type: none"> <li>• wild caught eel</li> <li>• wild caught fresh water fish, with the exception of diadromous fish species caught in fresh water</li> <li>• fish liver and derived products</li> <li>• marine oils</li> </ul> The maximum level for crustaceans applies to muscle meat from appendages and abdomen. In case of crabs and crab-like crustaceans ( <i>Brachyura</i> and <i>Anomura</i> ) it applies to muscle meat from appendages.	3.5 $\text{pg g}^{-1}$ wet weight	6.5 $\text{pg g}^{-1}$ wet weight	75 $\text{ng g}^{-1}$ wet weight

(1) Dioxins (sum of polychlorinated dibenzo-para-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs), expressed as World Health Organisation (WHO) toxic equivalent using the WHO-toxic equivalency factors (WHO-TEFs)) and sum of dioxins and dioxin-like PCBs (sum of PCDDs, PCDFs and polychlorinated biphenyls (PCBs), expressed as WHO toxic equivalent using the WHO-TEFs). WHO-TEFs for human risk assessment based on the conclusions of the World Health Organization (WHO) (For TEF values see note 31, (EC) Regulation 1259/2011 – Annex 1.1.9.).

(2) Where fish are intended to be eaten whole, the maximum level shall apply to the whole fish.





**Annex IV**  
**Proposal of Data Standards and Data Dictionaries for**  
**IMAP Common Indicators 18 and 20**  
**as prepared after the Meeting of CorMon on Pollution Monitoring for consideration of the**  
**8<sup>th</sup> Meeting of Coordination Group Meeting**



## Data Standards and Data Dictionaries for IMAP Contaminants (EO9): Common Indicators 18

1. The present proposal builds on the initial proposal of DSs and DDs for IMAP CI 18, as provided in the document UNEP/MED WG. 492/8 that was discussed at the Meeting of CorMon on Pollution Monitoring (26-28) and further revised in line with the comments of CPs received during the Meeting (as provided in Annex II). It also includes the changes introduced to address the comments provided from the participants of the Meeting of CorMon Pollution Monitoring, as well additional fields added to allow the correct functioning of the data flow and analogy with DDs and DSs for other CIs.
2. The list of reference species provided in Table 3 represents the list of species approved for the IMAP CI 17 by the 7<sup>th</sup> Meeting of the Ecosystem Approach Coordination Group and consequently made operational for data reporting for DSs and DDs for EO9 within IMAP Info System.
3. This proposal of DSs and DDs for IMAP CI 18 provides broader data sets and associated dictionaries than requested as mandatory by related IMAP Guidance Factsheets and Metadata Templates. In the Data Standards the **mandatory** data are represented in **black** and the **non-mandatory** ones in **red colour**. The possibility to fill in also non-mandatory fields is given to allow the Contracting Parties that already have monitoring systems collecting a wider set of data to also report them as the additional data. Although it is at the discretion of the Contracting Parties to decide, reporting on non-mandatory data sets is **strongly encouraged** to avoid knowledge gaps between IMAP and other national data flows.

**Table 1: DSs & DDs Module PMO1 (Level of pollution effects) for IMAP CI 18: Stations**

Field	Description	List of value
CountryCode	Enter member country code as ISO two digits, for example "IT" for Italy.	
NationalStationID	Station code	
NationalStationName	Station name	
*Region	Administrative subdivision of the first level where the station belongs to (according to the country subdivision)	
Latitude	Latitude of the station in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx).	
Longitude	Longitude of the station in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx). Use positive values without '+' before numbers (for ex. 13.98078) for coordinates east of the of the Greenwich Meridian (0°) and negative values with '-' for coordinates west of the Greenwich Meridian (0°) (for ex. -2.6893).	
*ClosestCoast	Station distance from the coast in km	
TCMMatrix	Environmental matrix measured in the station, enter one of the values in the list.	B = Biota

SeaDepth	Sea depth in meters	
AreaTypology	Indicate the typology of the monitored area, enter one of the values in the list	R = Reference sites C = Coastal HS = Hot spot O = Others
Pressure Type	If the monitoring station is dedicated to monitoring of pressure, indicate the typology of pressure monitored, enter one of the values in the list	AG = Agriculture and livestock IP = Industrial Plants MN = Mining MT = Maritime Traffic
Remarks	Notes	

\* non-mandatory under IMAP Guidance Factsheets

**Table 2: DSs & DDs Module PMO1 (Level of pollution effects) for IMAP CI 18 –Biomarkers**

Field	Description	List of value
CountryCode	Member country code as ISO two digits, for example "IT" for Italy.	
NationalStationID	Station code.	
Year	Year of sampling in YYYY format	
Month	Month of sampling in 1-12 format	
Day	Day of sampling in 1-31 format	
Time	Hours-minutes-seconds of sampling in HH:MM:SS format	
SampleID	Sample Code if multiple replies are made with the same value as Year, Month, Day and Time"	
SampleType	Wild/Caged (add information about the collection site)	
Matrix	Sample matrix, enter one value of the list	B = Biota
SampleDepth	Sampling depth in meters	
* Salinity	Salinity (psu)	
* Temperature	Temperature (°C)	

* DissolveOxygen	Dissolved oxygen ( $\mu\text{mol O}_2/\text{l}$ )	
SpeciesID	Monitored species. Enter one value of the column 'ID_Species' of the list 'List_species'	
SpeciesName	Monitored species. Enter one value of the column 'Label' of the list 'List_species'	
SpeciesNameOther	Name of the species, if not included in the list 'List_species'	
*SpeciesGender	Gender of the species. Enter one value of the List of values.	M = male F = female U = undefined
MaturationKey	Maturation degree of the gonads for demersal species according to the Workshop on Sexual Maturity Sampling (ICES WKMAT 2007). Enter one value of the List of values.	I= Inactive II = Maturing III= Spawning IV= Post-spawning
Specimen_lenght	Lenght of specimen in cm. In case of pooling, indicate mean lenght. (precision at 0,1 cm). In the case of fish, this value refers to the total length; for mussels it refers to the length of the valve; for crustaceans it refers to the length of the carapace.	
Specimen_lenght_SD_SE	Standard deviation/standard error of average length of specimens in a pool in cm. The standard deviation (SD) is a measure of variability. The standard error of the sample depends on both the standard deviation and the sample size.	
Specimen_weight	Weight of specimen in g. In case of pooling, indicate mean weight. (precision at 0,1 g)	
Specimen_weight_SD_SE	Standard deviation/standard error of average weightof specimens in a pool in g.	
Pooling	In case of pooling, describe the contentof pooling andother methodological issues	

Pooling_N	Specify the number of specimens pooled	
Pooling_SD_SE	Specify which statistical measure is provided. Enter one value of the List of values.	<b>SD</b> = Standard Deviation <b>SE</b> = Standard Error
*Liver_weight	Weight of liver in grammes (precision at 0,01 g) to define hepatosomatic index (HSI)	
*Gonad_weight	Weight of Gonad in grammes (precision at 0,01 g) to define gonadosomatic index (GSI)	
Tissue	Tissue element of the monitored species, enter one of the values in the list.	<p><b>BL</b> = Fluids - Blood. Includes erythrocytes, haemocytes, serum (blood component without cells and clotting factors) and plasma (serum including clotting factors)</p> <p><b>EG</b> = Eggs. Includes bird eggs and fish eggs (roe). Use the remarks field to provide additional information, if necessary.</p> <p><b>GO</b> = Organs - Gonads. Includes female gonads (ovaries) and male gonads (testes). Use the remarks field to provide additional information, if necessary.</p> <p><b>LI</b> = Organs - Liver. Includes hepatopancreas. Use the remarks field to provide additional information, if necessary.</p> <p><b>MU</b> = Tissues - Muscle. Any type of muscle tissue or organ. Includes the former code TM for "Tail muscle".</p> <p><b>ST</b> = Tissues - Soft tissue. Includes any body tissue except mineralised tissue (hard tissue)</p> <p><b>GI</b> = Organs - Gills</p> <p><b>OT</b> = Other. Use the remarks field to provide additional information, if necessary.</p>
Tissue_weight	Weight of tissue in g. In case of pooling, indicate mean weight.	
Tissue_weight_SD_SE	Standard deviation/standard error of average weight of specimens in a pool in g.	
AnalyticalMethod	Analytical method used. Reference methodological protocol used for analysis – indicate method elaborated in	

	<p>Monitoring Guideline/Protocols for Biomarker Analysis (UNEP/MED WG. 492/4-5);</p> <p>Add any other methods different from these by specifying name of scientific paper</p>	
Biomarker_Name	Name of biomarker. Enter one value of the column 'Biomarkers' of the list 'List_Biomarkers'	
Biomarker_Name_NM	Specify the name of biomarker if the 'Biomarker_Name' field has been filled in with 'NM'	
Biomarker_Value	Value of each biomarker. Precision to the second decimal place (ex.:0,01), except for MN where the precision is to the first decimal place (e.g.: 1) and for LMS-HEXO and for LMS-NRRT where the precision is to the integer number (ex.:1).	
Biomarker_Unit	<p>Unit of measure (different for each biomarker). Enter one of the values in the List of Values. For the 'LMS biomarker' the unit of measure is 'min' both in the case of LMS-HEXO and LMS-NRRT but, in the first case it refers to 'labilization time' in the second case it refers to 'retention time'.</p> <p>If the CP wishes to report data on Additional – not Mandatory Biomarkers, other than mandatory biomarkers insert 'NM' and specify unit of measure in the 'Biomarker_Unit_NM' field.</p>	<p>min = Lysosomal Membrane Stability (LMS) (labilization /retention minutes)</p> <p>nmol/min/mg protein = Acetylcholinesterase (AChE) activity (nmol/min/mg protein in gills (bivalves) )</p> <p>% = Mean percentage lysosomal membrane stability in mussel (%LMS)</p> <p>number of cases /1000 cells = Micronucleus test (MN)(frequency)</p> <p>µg/g = Metallothioneins level (MT) (µg/g digestive gland)</p> <p>LT50 (days) = Stress on Stress (SoS)</p>

		NM = unit for additional not mandatory biomarker
Biomarker_Unit_NM	Unit of measure for 'Biomarker_Name_NM'. Fill in this field if the 'Biomarker_Unit' field has been filled in with 'NM'	
Remarks	Notes	

\* non-mandatory under IMAP Guidance Factsheets

**Table 3: DSs&DDs Module PMO1 (Level of pollution effects) for IMAP CI 18 – List of species <sup>11</sup>**

ID_Species	Label
8006460	<i>Anarhichas lupus</i>
2392194	<i>Anarhichas minor</i>
5212973	<i>Anguilla anguilla</i>
2389391	<i>Aphanopus carbo</i>
2440728	<i>Balaenoptera acutorostrata</i>
2420330	<i>Bathyraja brachyurops</i>
2401415	<i>Bathysaurus ferox</i>
5210955	<i>Boops boops</i>
2415752	<i>Boreogadus saida</i>
2415505	<i>Brosme brosme</i>
2481312	<i>Cepphus grylle</i>
2286583	<i>Cerastoderma edule</i>
2336668	<i>Chelidonichthys kumu</i>
2417343	<i>Chimaera monstrosa</i>
8351946	<i>Clupea harengus</i>
2403490	<i>Conger conger</i>
5215150	<i>Coryphaenoides rupestris</i>
2222188	<i>Crangon crangon</i>
8534921	<i>Crassostrea angulata</i>
2286069	<i>Crassostrea gigas</i>
5220003	<i>Delphinapterus leucas</i>

<sup>11</sup> List of available reference species (Code list) for EO9.



8324617	<i>Delphinus delphis</i>
5729032	<i>Donax trunculus</i>
2287072	<i>Dreissena polymorpha</i>
2287250	<i>Ensis siliqua</i>
2336597	<i>Eutrigla gurnardus</i>
7832266	<i>Fucus</i>
3196291	<i>Fucus ceranoides</i>
3196437	<i>Fucus serratus</i>
8222574	<i>Fucus vesiculosus</i>
2481433	<i>Fulmarus glacialis</i>
8084280	<i>Gadus morhua</i>
2415827	<i>Gadus ogac</i>
2440596	<i>Globicephala melas</i>
5213996	<i>Glyptocephalus cynoglossus</i>
2376483	<i>Gobius</i>
7788295	<i>Haematopus ostralegus</i>
2434806	<i>Halichoerus grypus</i>
2293076	<i>Haliotis tuberculata</i>
2409108	<i>Hippoglossoides platessoides</i>
2279156	<i>Holothuria tubulosa</i>
2357093	<i>Hoplostethus atlanticus</i>
2481126	<i>Larus</i>
2481156	<i>Larus glaucoides</i>
2481127	<i>Larus hyperboreus</i>
2409391	<i>Lepidorhombus whiffiagonis</i>
2419875	<i>Leucoraja naevus</i>
5213960	<i>Limanda limanda</i>
2301117	<i>Littorina littorea</i>
2415070	<i>Lophius budegassa</i>
2415075	<i>Lophius piscatorius</i>
2291262	<i>Lymnaea palustris</i>
2286995	<i>Macoma balthica</i>
5214420	<i>Mallotus villosus</i>

2415822	<i>Melanogrammus aeglefinus</i>
2415788	<i>Merlangius merlangus</i>
2415643	<i>Merluccius merluccius</i>
2415777	<i>Micromesistius poutassou</i>
5214022	<i>Microstomus kitt</i>
5214883	<i>Molva dypterygia</i>
5214880	<i>Molva molva</i>
5220008	<i>Monodon monoceros</i>
4284897	<i>Mullus barbatus</i>
7791733	<i>Mya arenaria</i>
7865139	<i>Mya truncata</i>
2333785	<i>Myoxocephalus scorpius</i>
841	<i>Mysida</i>
2285679	<i>Mytilus</i>
8288896	<i>Mytilus edulis</i>
2285683	<i>Mytilus galloprovincialis</i>
2303019	<i>Nassarius reticulatus</i>
2226962	<i>Nephrops norvegicus</i>
5193449	<i>Nucella lapillus</i>
2286060	<i>Ostrea edulis</i>
2224987	<i>Palaemon serratus</i>
2222355	<i>Pandalus borealis</i>
2285980	<i>Pecten maximus</i>
2409966	<i>Pegusa lascaris</i>
8140485	<i>Perca fluviatilis</i>
2434773	<i>Phoca hispida</i>
2434793	<i>Phoca vitulina</i>
2440669	<i>Phocoena phocoena</i>
2409330	<i>Platichthys flesus</i>
7700106	<i>Pleuronectes platessa</i>
2415872	<i>Pollachius pollachius</i>
2415861	<i>Pollachius virens</i>
2409416	<i>Psetta maxima</i>

5216024	<i>Raja clavata</i>
5216014	<i>Raja montagui</i>
5216208	<i>Raja radiata</i>
2409383	<i>Reinhardtius hippoglossoides</i>
2481205	<i>Rissa tridactyla</i>
5175681	<i>Saduria entomon</i>
7595433	<i>Salmo salar</i>
8215487	<i>Salmo trutta</i>
4284021	<i>Salvelinus alpinus</i>
2413224	<i>Sardina pilchardus</i>
2374149	<i>Scomber scombrus</i>
2409403	<i>Scophthalmus rhombus</i>
2418684	<i>Scyliorhinus canicula</i>
2335392	<i>Sebastes marinus</i>
2335427	<i>Sebastes mentella</i>
5214139	<i>Solea solea</i>
2498352	<i>Somateria mollissima</i>
2413452	<i>Sprattus sprattus</i>
5216368	<i>Squalus acanthias</i>
5229227	<i>Sterna hirundo</i>
2373946	<i>Thunnus alalunga</i>
2373980	<i>Thunnus thynnus</i>
8635	<i>Triglidae</i>
2481342	<i>Uria aalge</i>
2481339	<i>Uria lomvia</i>
2433451	<i>Ursus maritimus</i>
2287751	<i>Venerupis decussata</i>
2287753	<i>Venerupis philippinarum</i>
7744449	<i>Zeus faber</i>
2381013	<i>Zoarces viviparus</i>

**Table 4: DSs&DDs Module PMO1 (Level of pollution effects) for IMAP C.I. 18 – List of Biomarkers**

<b>Biomarker</b>	<b>Description (EN)</b>	<b>Organism</b>	<b>Tissue</b>	<b>Mandatory</b>	<b>Additional (Not-mandatory)</b>
LMS-HEXO	Lysosomal membrane stability on cryostat sections - enzymatic determination	Fish/Mussel	Liver/Digestive gland	Y	
LMS-NRRT	Lysosomal membrane stability in mussel haemocytes - in vivo determination (neutral red retention time (NRRT) assay)	Mussel	Haemocytes (in vivo)	Y	
MN_F	Micronuclei frequency in fish blood cells	Fish	Erythrocytes	Y	
MN_MH	Micronuclei (MNi) frequency in mussel gill cells and haemocytes	Mussel	Gill cells, Haemocytes	Y	
AChE	Acetylcholinesterase activity - enzymatic determination	Mussel / Fish	Gills / Muscle	Y	
% LMS	% LMS Mean percentage of Lysosomal membrane stability in mussel	Mussel	Haemocytes		Y
MT	Metallothioneins	Fish	Digestive gland		Y
SoS	Stress on stress	Mussel			Y
NM	Other: not mandatory biomarker	Specify	Specify	-	Y

## Data Standards and Data Dictionaries for IMAP Contaminants (EO9): Common Indicators 20

4. The present document provides proposal of the Data Standards and Data Dictionaries (DSs & DDs) for IMAP Common Indicator 20 aimed at collecting data on actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood in the Mediterranean Sea.

1. The initial proposal of the elements that have been agreed by the Meeting of CorMon on Pollution Monitoring (Annex III) were used for preparing this proposal of the Data Standards (DS) and Data Dictionaries (DDs) specific for CI 20 as provided here-below.

2. The list of reference for chemicals proposed for IMAP CI 20 ( Table 7) is also in use by the European Environmental Agency (EEA, WISE-Marine) and includes either the CAS numbers (Chemical Abstract Service reference number) or the EEA reference number (for particular EEA requirements). The mandatory contaminants<sup>12</sup> are represented in black (Cd, Hg, Pb, four PAHs (benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene and chrysene), dioxins, dioxin-like and non dioxin-like PCBs and radionuclides) and the non-mandatory ones in red color.

3. The list of commercial species reported in Table 8 refers to JRC list of marine species of commercial interest in the different Mediterranean Regions (Marine strategy framework directive Task group 9 contaminants in fish and other seafood, April 2010)<sup>13</sup>.

4. If any species is not present among those listed, it is always possible to insert related data by filling in the SpeciesNameOther field.

5. The proposal of DSs and DDs provides broader data sets and associated dictionaries than requested as mandatory by related IMAP Guidance Factsheets and Metadata Templates. In the Data Standards the **mandatory** data are represented in **black** and the **non-mandatory** ones in **red color**. The possibility to fill in also non-mandatory fields is given to allow the Contracting Parties that already have monitoring systems collecting a wider set of data to also report them as the additional data. Although it is at the discretion of the Contracting Parties to decide, reporting on non-mandatory data sets is **strongly encouraged** to avoid knowledge gaps between IMAP and other national data flows.

**Table 5: DSs & DDs Module PSF1 (Levels of contaminants in seafood for IMAP CI20: Stations**

Field	Description	List of value
CountryCode	Member country code as ISO two digits, for example "IT" for Italy.	
NationalStationID	Specify the station code of the sample collection. In case information on location of collection is not available, then provide code of the fishing area. Specifically, in the case of fishing area, insert one of the Geographical Subarea number present in the 'Value' column of the Excel sheet 'List_GSA'.	

<sup>12</sup> This list has been included in Annex III of the Monitoring Guideline for Reporting Monitoring Data for IMAP Common Indicators 13, 14, 17, 18 and 20 (UNEP/MED WG. 492/08)

<sup>13</sup> This list has been included in Annex I of the Monitoring Guidelines/Protocols for Sampling and Sample Preservation of Sea Food for IMAP Common Indicator 20: Heavy and Trace Elements and Organic Contaminants (UNEP/MED WG. 482/17)

NationalStationName	Specify the station name of the sample collection. In case information on location of collection is not available, then provide name of the fishing area. Specifically, in the case of fishing area, insert one of the Geographical Subarea name present in the 'Description' column of the Excel sheet 'List_GSA'.	
*Region	Administrative subdivision of first level which the station belongs to (according to the country subdivision)	
Latitude	Latitude of the sample collection in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx). In case information on location of collection is not available, then provide the latitude of the centroid of the Fishing Area, referring to the Geographical Subarea (GSA) specified in NationalStationID.	
Longitude	Longitude of the sample collection in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx). Use positive values without '+' before numbers (for ex. 13.98078) for coordinates east of the of the Greenwich Meridian (0°) and negative values with '-' for coordinates west of the Greenwich Meridian (0°) (for ex. -2.6893).  In case information on location of collection is not available, then provide the longitude of the centroid of the Fishing Area, referring to the Geographical Subarea (GSA) specified in NationalStationID.	
SampleCollectionType	Specify if the geographical information, entered in "Latitude" and "Longitude" fields, refers to the collection location (CL) or to the fishing area (FA), in case information on location of collection is not available. Enter one value in the list.	CL = Collection Location FA = Fishing Area
*ClosestCoast	Station distance from the coast in km	
TCMatrix	Environmental matrix measured in the station, enter one of the values in the list.	B = Biota
SeaDepth	Sea depth in meters	
AreaTypology	Indicate the typology of the monitored area, enter one of the values in the list	R = Reference sites C = Coastal HS = Hot spot O = Others
Remarks	Notes	

\* non-mandatory under IMAP Guidance Factsheets

**Table 6: DSs & DDs Module PSF1 (Levels of contaminants in seafood) for IMAP CI 20: Contaminants**

Field	Description	List of value
CountryCode	Member country code as ISO two digits, for example "IT" for Italy.	
NationalStationID	Specify the station code of the sample collection. In case information on location of collection is not available, then provide code of the fishing area. Specifically, in the case of fishing area, insert one of the Geographical Subarea number present in the 'Value' column of the Excel sheet 'List_GSA'.	
Year	Year of sampling in YYYY format	
Month	Month of sampling in 1-12 format	
Day	Day of sampling in 1-31 format	
Time	Hours-minutes-seconds of sampling in HH:MM:SS format	
SampleID	Sample Code if multiple sampling are made with the same value as Year, Month, Day and Time.	
Matrix	Sample matrix, enter one value of the list	B = Biota
SampleDepth	Sampling depth in meters	
Salinity	Salinity (psu)	
Temperature	Temperature (°C)	
DissolveOxygen	Dissolved oxygen (µmol O <sub>2</sub> /l)	
SpeciesID	Monitored species. Enter one value of the column 'ID_Species' of the list 'List_species'	
SpeciesName	Monitored species. Enter one value of the column 'Label' of the list 'List_species'	
SpeciesNameOther	Name of species, in case not included in the list 'List_species'	
Specimen_lenght	Lenght of specimen in cm. In case of pooling, indicate mean lenght. (precision at 0,1 cm)	
*Specimen_lenght_sd	Standard deviation of average length of specimens in a pool in cm.	
Specimen_weight	Weight of specimen in g. In case of pooling, indicate mean weight. (precision at 0,1 g)	
*Specimen_weight_sd	Standard deviation of average weight of specimens in a pool in g.	
*Pooling	In case of pooling, describe the content of pooling as number of specimens and other methodological issues, taking into consideration the sampling requirements	

	described in IMAP Monitoring Guidelines UNEP/MED WG.482/17	
DeterminHazSubsName	Name of the contaminant, enter one value of the column 'Label' of the list 'List_contaminants'	
DeterminHazSubsID	ID of the contaminant, enter one value of the column 'ID_Contaminant' of the list 'List_contaminants'	
CASNumber	CAS number of contaminant, enter one value of the column 'CASNumber' of list 'List_contaminants'	
Concentration	Concentration value of detected contaminant (DeterminHazSubsID)	
MRL	Maximum Regulatory Level for contaminant (DeterminHazSubsID)	
HazSubs_unit	Unit of measurement for the contaminant. Enter one value of the list	mg/kg = metals ug/kg = not metals
MRL_Flag	Enter the value '>' in case the concentration value of detected contaminant is above the Maximum Regulatory Level for contaminant (MRL). In the other cases, leave the field empty.	> = Concentration value of detected contaminant above MRL
Remarks	Notes	

\* non-mandatory under IMAP Guidance Factsheets

**Table 7: DSs & DDs Module PSF1 (Levels of contaminants in seafood) for CI 20: List of contaminants**

ID_Contaminant	Label	CASNumber
*CAS_90-12-0	1-methylnaphthalene	90-12-0
*CAS_75-34-3	1,1-dichloroethane	75-34-3
*CAS_75-35-4	1,1-dichloroethene	75-35-4
*CAS_563-58-6	1,1-dichloropropene	563-58-6
*CAS_71-55-6	1,1,1-trichloroethane	71-55-6
*CAS_630-20-6	1,1,1,2-tetrachloroethane	630-20-6
*CAS_1070-78-6	1,1,1,3-tetrachloropropane	1070-78-6
*CAS_79-00-5	1,1,2-trichloroethane	79-00-5
*CAS_79-34-5	1,1,2,2-tetrachloroethane	79-34-5
*CAS_96-12-8	1,2-dibromo-3-chloropropane	96-12-8
*CAS_106-93-4	1,2-dibromoethane	106-93-4
*CAS_95-50-1	1,2-dichlorobenzene	95-50-1
*CAS_107-06-2	1,2-dichloroethane	107-06-2
*CAS_540-59-0	1,2-dichloroethene	540-59-0



*CAS_78-87-5	1,2-dichloropropane	78-87-5
*CAS_87-61-6	1,2,3-trichlorobenzene	87-61-6
*CAS_96-18-4	1,2,3-trichloropropane	96-18-4
*CAS_35822-46-9	1,2,3,4,6,7,8-H7CDD	35822-46-9
*CAS_67562-39-4	1,2,3,4,6,7,8-H7CDF	67562-39-4
*CAS_3268-87-9	1,2,3,4,6,7,8,9-O8CDD	3268-87-9
*CAS_39001-02-0	1,2,3,4,6,7,8,9-O8CDF	39001-02-0
*CAS_39227-28-6	1,2,3,4,7,8-H6CDD	39227-28-6
*CAS_70648-26-9	1,2,3,4,7,8-H6CDF	70648-26-9
*CAS_55673-89-7	1,2,3,4,7,8,9-H7CDF	55673-89-7
*CAS_57653-85-7	1,2,3,6,7,8-H6CDD	57653-85-7
*CAS_57117-44-9	1,2,3,6,7,8-H6CDF	57117-44-9
*CAS_40321-76-4	1,2,3,7,8-P5CDD	40321-76-4
*CAS_57117-41-6	1,2,3,7,8-P5CDF	57117-41-6
*CAS_19408-74-3	1,2,3,7,8,9-H6CDD	19408-74-3
*CAS_72918-21-9	1,2,3,7,8,9-H6CDF	72918-21-9
*CAS_120-82-1	1,2,4-trichlorobenzene	120-82-1
*CAS_95-63-6	1,2,4-trimethylbenzene	95-63-6
*CAS_3194-55-6	1,2,5,6,9,10-hexabromocyclododecane	3194-55-6
*CAS_541-73-1	1,3-dichlorobenzene	541-73-1
*CAS_142-28-9	1,3-dichloropropane	142-28-9
*CAS_542-75-6	1,3-dichloropropene	542-75-6
*CAS_108-70-3	1,3,5-trichlorobenzene	108-70-3
*CAS_108-67-8	1,3,5-trimethylbenzene	108-67-8
*CAS_25637-99-4	1,3,5,7,9,11-hexabromocyclododecane	25637-99-4
*CAS_106-46-7	1,4-dichlorobenzene	106-46-7
*CAS_123-91-1	1,4-dioxane	123-91-1
*CAS_4904-61-4	1,5,9-cyclododecatriene	4904-61-4
*CAS_57-63-6	17alpha-ethinylestradiol (EE2)	57-63-6
*CAS_50-28-2	17beta-estradiol (E2)	50-28-2
*CAS_288-88-0	1H-1,2,4-Triazole	288-88-0
*CAS_25140-90-3	2-(2,6-dichlorophenoxy)propionic acid (2,6-DCPP)	25140-90-3
*CAS_3307-39-9	2-(4-chlorophenoxy)propionic acid (4-CPP)	3307-39-9

*CAS_16672-87-0	2-chloroethylphosphonic acid	16672-87-0
*CAS_95-57-8	2-chlorophenol	95-57-8
*CAS_95-49-8	2-chlorotoluene	95-49-8
*CAS_5466-77-3	2-Ethylhexyl 4-methoxycinnamate	5466-77-3
*CAS_1668-54-8	2-methyl-4-amino-6-methoxy-s-triazine	1668-54-8
*CAS_95-48-7	2-methyl-phenol	95-48-7
*CAS_91-57-6	2-methylnaphthalene	91-57-6
*CAS_135-19-3	2-naphthol	135-19-3
*CAS_594-20-7	2,2-dichloropropane	594-20-7
*CAS_526-75-0	2,3-dimethyl-phenol	526-75-0
*CAS_4901-51-3	2,3,4,5-tetrachlorophenol	4901-51-3
*CAS_58-90-2	2,3,4,6-tetrachlorophenol	58-90-2
*CAS_60851-34-5	2,3,4,6,7,8-H6CDF	60851-34-5
*CAS_57117-31-4	2,3,4,7,8-P5CDF	57117-31-4
*CAS_50-31-7	2,3,6-trichlorobenzoic acid	50-31-7
*CAS_51207-31-9	2,3,7,8-T4CDF	51207-31-9
*CAS_94-82-6	2,4-DB	94-82-6
*CAS_133-53-9	2,4-dichloro-3,5-dimethylphenol	133-53-9
*CAS_120-83-2	2,4-dichlorophenol	120-83-2
*CAS_94-75-7	2,4-dichlorophenoxyacetic acid, 2-4 D	94-75-7
*CAS_105-67-9	2,4-dimethyl-phenol	105-67-9
*CAS_121-14-2	2,4-dinitrotoluene	121-14-2
*CAS_93-76-5	2,4,5-T	93-76-5
*CAS_95-95-4	2,4,5-trichlorophenol	95-95-4
*CAS_732-26-3	2,4,6-tri-tert-butylphenol	732-26-3
*CAS_36065-30-2	2,4,6-tribromophenyl 2-methyl-2,3-dibromopropyl ether	36065-30-2
*CAS_88-06-2	2,4,6-trichlorophenol	88-06-2
*CAS_118-96-7	2,4,6-trinitrotoluene	118-96-7
*CAS_95-87-4	2,5-dimethylphenol	95-87-4
*CAS_2008-58-4	2,6-dichlorobenzamide	2008-58-4
*CAS_50-30-6	2,6-dichlorobenzoic acid	50-30-6
*CAS_87-65-0	2,6-dichlorophenol	87-65-0
*CAS_576-26-1	2,6-dimethyl-phenol	576-26-1

*CAS_128-37-0	2,6-Ditert-butyl-4-methylphenol	128-37-0
*CAS_16655-82-6	3-hydroxycarbofuran	16655-82-6
*CAS_59-50-7	3-methyl-4-chlorophenol	59-50-7
*CAS_55525-54-7	3,3'-(ureylenedimethylene)bis(3,5,5'- trimethylcyclohexyl) diisocyanate	55525-54-7
*CAS_95-76-1	3,4-dichloroaniline	95-76-1
*CAS_95-65-8	3,4-dimethyl-phenol	95-65-8
*CAS_108-68-9	3,5-dimethyl-phenol	108-68-9
*CAS_793-24-8	4-(dimethylbutylamino) diphenylamin (6PPD)	793-24-8
*CAS_101-55-3	4-bromophenyl phenyl ether	101-55-3
*CAS_1570-64-5	4-chloro-2-methylphenol	1570-64-5
*CAS_106-43-4	4-chlorotoluene	106-43-4
*CAS_99-87-6	4-isopropyltoluene	99-87-6
*CAS_106-44-5	4-methyl-phenol	106-44-5
*CAS_104-40-5	4-nonylphenol	104-40-5
*CAS_84852-15-3	4-nonylphenol, branched	84852-15-3
*CAS_98-51-1	4-tert-butyltoluene	98-51-1
*CAS_1570-65-6	4,6-dichloro-2-methylphenol	1570-65-6
*CAS_83-32-9	Acenaphthene	83-32-9
*CAS_208-96-8	Acenaphthylene	208-96-8
*CAS_160430-64-8	Acetamiprid	160430-64-8
*CAS_34256-82-1	Acetochlor	34256-82-1
*CAS_187022-11-3	Acetochlor ESA	187022-11-3
*CAS_194992-44-4	Acetochlor OA	194992-44-4
*EEA_3151-01-7	Acid neutralizing capacity	
*EEA_3153-01-3	Acid neutralizing capacity to pH 4.5	
*CAS_74070-46-5	Aclonifen	74070-46-5
*CAS_79-06-1	Acrylamide	79-06-1
*CAS_107-13-1	Acrylonitrile	107-13-1
*CAS_15972-60-8	Alachlor	15972-60-8
*CAS_142363-53-9	Alachlor ESA	142363-53-9
*CAS_171262-17-2	Alachlor OA	171262-17-2
*CAS_116-06-3	Aldicarb	116-06-3
*CAS_1646-87-3	Aldicarb sulfoxide	1646-87-3

*CAS_1646-88-4	Aldoxycarb	1646-88-4
*CAS_309-00-2	Aldrin	309-00-2
*EEA_33-01-2	Alkalised benzene	
*CAS_959-98-8	Alpha-Endosulfan	959-98-8
*CAS_319-84-6	Alpha-HCH	319-84-6
*CAS_134237-50-6	alpha-Hexabromocyclododecane	134237-50-6
*CAS_7429-90-5	Aluminium and its compounds	7429-90-5
*CAS_834-12-8	Ametryn	834-12-8
*CAS_120923-37-7	Amidosulfuron	120923-37-7
*CAS_1066-51-9	Aminomethylphosphonic acid (AMPA)	1066-51-9
*CAS_7664-41-7	Ammonia	7664-41-7
*CAS_14798-03-9	Ammonium	14798-03-9
*CAS_120-12-7	Anthracene	120-12-7
*CAS_7440-36-0	Antimony	7440-36-0
*CAS_59473-04-0	AOX	59473-04-0
*CAS_140-57-8	Aramite	140-57-8
*CAS_12767-79-2	Aroclor	12767-79-2
*CAS_7440-38-2	Arsenic and its compounds	7440-38-2
*CAS_1332-21-4	Asbestos	1332-21-4
*CAS_3337-71-1	Asulam	3337-71-1
*CAS_29122-68-7	Atenolol	29122-68-7
*CAS_1912-24-9	Atrazine	1912-24-9
*CAS_2642-71-9	Azinphos-ethyl	2642-71-9
*CAS_86-50-0	Azinphos-methyl	86-50-0
*CAS_83905-01-5	Azitromycin	83905-01-5
*CAS_131860-33-8	Azoxystrobin	131860-33-8
*CAS_7440-39-3	Barium	7440-39-3
*CAS_189084-64-8	BDE 100 (2,2',4,4',6-pentabromodiphenyl ether)	189084-64-8
*CAS_182677-30-1	BDE 138 (2,2',3,4,4',5'-hexabromodiphenyl ether)	182677-30-1
*CAS_68631-49-2	BDE 153 (2,2',4,4',5,5'-hexabromodiphenyl ether)	68631-49-2
*CAS_207122-15-4	BDE 154 (2,2',4,4',5,6'-hexabromodiphenyl ether)	207122-15-4
*CAS_68928-80-3	BDE 183 (Heptabromodiphenylether)	68928-80-3
*CAS_41318-75-6	BDE 28 (2,4,4'-tribromodiphenyl ether)	41318-75-6

*CAS_5436-43-1	BDE 47 (2,2',4,4'-tetrabromodiphenyl ether)	5436-43-1
*CAS_182346-21-0	BDE 85 (2,2',3,4,4'-pentabromodiphenyl ether)	182346-21-0
*CAS_60348-60-9	BDE 99 (2,2',4,4',5-pentabromodiphenyl ether)	60348-60-9
*CAS_3813-05-6	Benazolin	3813-05-6
*CAS_22781-23-3	Bendiocarb	22781-23-3
*CAS_1861-40-1	Benfluralin	1861-40-1
*CAS_83055-99-6	Bensulfuron-methyl	83055-99-6
*CAS_25057-89-0	Bentazone	25057-89-0
*CAS_71-43-2	Benzene	71-43-2
CAS_56-55-3	Benzo(a)anthracene	56-55-3
CAS_50-32-8	Benzo(a)pyrene	50-32-8
CAS_205-99-2	Benzo(b)fluoranthene	205-99-2
*CAS_191-24-2	Benzo(g,h,i)perylene	191-24-2
*CAS_207-08-9	Benzo(k)fluoranthene	207-08-9
*EEA_33-02-3	Benzol	
*CAS_95-14-7	Benzotriazol	95-14-7
*CAS_7440-41-7	Beryllium	7440-41-7
*CAS_33213-65-9	Beta-Endosulfan	33213-65-9
*CAS_319-85-7	Beta-HCH	319-85-7
*CAS_134237-51-7	beta-Hexabromocyclododecane	134237-51-7
*CAS_41859-67-0	Bezafibrate	41859-67-0
*CAS_42576-02-3	Bifenox	42576-02-3
*CAS_1163-19-5	Bis(pentabromophenyl) ether	1163-19-5
*CAS_80-05-7	Bisphenol A	80-05-7
*EEA_3133-01-5	BOD5	
*EEA_3133-02-6	BOD7	
*CAS_7440-42-8	Boron	7440-42-8
*CAS_188425-85-6	Boscalid	188425-85-6
*CAS_314-40-9	Bromacil	314-40-9
*CAS_15541-45-4	Bromate	15541-45-4
*CAS_24959-67-9	Bromide	24959-67-9
*EEA_32-04-2	Brominated diphenylethers (congener numbers 28, 47, 99, 100, 153 and 154)	
*EEA_33-04-5	Brominated flame retardants	

*CAS_108-86-1	Bromobenzene	108-86-1
*CAS_74-97-5	Bromochloromethane	74-97-5
*CAS_75-27-4	Bromodichloromethane	75-27-4
*CAS_75-25-2	Bromoform	75-25-2
*CAS_74-83-9	Bromomethane	74-83-9
*CAS_1689-84-5	Bromoxynil	1689-84-5
*CAS_1689-99-2	Bromoxynil octanoate	1689-99-2
*CAS_52-51-7	Bronopol	52-51-7
*EEA_33-05-6	BTEX	
*CAS_41483-43-6	Bupirimate	41483-43-6
*CAS_3766-60-7	Buturon	3766-60-7
*CAS_85-68-7	Butyl benzyl phthalate (BBP)	85-68-7
CAS_7440-43-9	Cadmium and its compounds	7440-43-9
*CAS_58-08-2	Caffeine	58-08-2
*CAS_7440-70-2	Calcium	7440-70-2
*CAS_133-06-2	Captan	133-06-2
*CAS_298-46-4	Carbamazepin	298-46-4
*CAS_63-25-2	Carbaryl	63-25-2
*CAS_10605-21-7	Carbendazim	10605-21-7
*CAS_16118-49-3	Carbetamide	16118-49-3
*CAS_1563-66-2	Carbofuran	1563-66-2
*CAS_7440-44-0	Carbon	7440-44-0
*CAS_56-23-5	Carbon tetrachloride	56-23-5
*CAS_3812-32-6	Carbonate	3812-32-6
*CAS_786-19-6	Carbophenothion	786-19-6
*EEA_123-06-8	Charaphytes presence	
*CAS_10599-90-3	Chloramide	10599-90-3
*CAS_14866-68-3	Chlorates	14866-68-3
*CAS_13360-45-7	Chlorbromuron	13360-45-7
*CAS_57-74-9	Chlordane	57-74-9
*CAS_143-50-0	Chlordecone (Kepone)	143-50-0
*CAS_6164-98-3	Chlordimeform	6164-98-3
*CAS_470-90-6	Chlorfenvinphos	470-90-6

*CAS_7790-93-4	Chloric acid	7790-93-4
*CAS_1698-60-8	Chloridazon	1698-60-8
*CAS_6339-19-1	Chloridazon desphenyl	6339-19-1
*CAS_17254-80-7	Chloridazon methyl desphenyl	17254-80-7
*CAS_16887-00-6	Chloride	16887-00-6
*EEA_33-06-7	Chlorinated benzene	
*EEA_33-07-8	Chlorinated phenol	
*EEA_3142-02-7	Chlorine Cl-	
*CAS_14998-27-7	Chlorite	14998-27-7
*CAS_85535-84-8	Chloroalkanes C10-13	85535-84-8
*CAS_85535-85-9	Chloroalkanes C14-17,MCCP	85535-85-9
*CAS_108-90-7	Chlorobenzene	108-90-7
*CAS_75-01-4	Chloroethene (vinylchloride)	75-01-4
*EEA_3164-01-0	Chlorophyll a	
*CAS_1897-45-6	Chlorothalonil	1897-45-6
*CAS_1418095-02-9	Chlorothalonil ESA (VIS-01)	1418095-02-9
*CAS_1982-47-4	Chloroxuron	1982-47-4
*CAS_2921-88-2	Chlorpyrifos	2921-88-2
*CAS_5598-13-0	Chlorpyrifos-methyl	5598-13-0
*CAS_64902-72-3	Chlorsulfuron	64902-72-3
*CAS_1918-13-4	Chlorthiamid	1918-13-4
*CAS_15545-48-9	Chlortoluron	15545-48-9
*EEA_33-08-9	Chromium (III)	
*CAS_18540-29-9	Chromium (VI)	18540-29-9
*CAS_7440-47-3	Chromium and its compounds	7440-47-3
*CAS_1333-82-0	Chromium trioxide (CrO3)	1333-82-0
CAS_218-01-9	Chrysene	218-01-9
*CAS_156-59-2	cis-1,2-dichloroethene	156-59-2
*CAS_10061-01-5	cis-1,3-dichloropropene	10061-01-5
*CAS_81103-11-9	Clarithromycin	81103-11-9
*CAS_81777-89-1	Clomazone	81777-89-1
*CAS_1702-17-6	Clopyralid	1702-17-6
*CAS_210880-92-5	Clothianidin	210880-92-5

*CAS_23593-75-1	Clotrimazole	23593-75-1
*CAS_7440-48-4	Cobalt and its compounds	7440-48-4
*EEA_3133-03-7	CODCr	
*EEA_3133-04-8	CODMn	
*CAS_7440-50-8	Copper and its compounds	7440-50-8
*CAS_56-72-4	Coumaphos	56-72-4
*CAS_21725-46-2	Cyanazine	21725-46-2
*EEA_11-06-3	Cyanobacteria biomass	
*EEA_11-07-4	Cyanobacteria proportion	
*CAS_506-77-4	Cyanogen chloride	506-77-4
*CAS_28159-98-0	Cybutryne	28159-98-0
*CAS_294-62-2	Cyclododecane	294-62-2
*CAS_101205-02-1	Cycloxydim	101205-02-1
*CAS_57966-95-7	Cymoxanil	57966-95-7
*CAS_52315-07-8	Cypermethrin	52315-07-8
*CAS_121552-61-2	Cyprodinil	121552-61-2
*CAS_75-99-0	Dalapon	75-99-0
*CAS_789-02-6	DDT, o,p'	789-02-6
*CAS_50-29-3	DDT, p,p'	50-29-3
*CAS_3397-62-4	Deisopropyldeethylatrazine	3397-62-4
*CAS_319-86-8	Delta-HCH	319-86-8
*CAS_52918-63-5	Deltamethrin	52918-63-5
*CAS_919-86-8	Demeton-S-methyl	919-86-8
*CAS_17040-19-6	Demeton-S-methylsulfon	17040-19-6
*CAS_52236-30-3	Desamino-diketo-metribuzin	52236-30-3
*CAS_6190-65-4	Desethylatrazine	6190-65-4
*CAS_30125-63-4	Desethylterbuthylazine	30125-63-4
*CAS_1007-28-9	Desisopropylatrazine	1007-28-9
*CAS_13684-56-5	Desmedipham	13684-56-5
*CAS_1014-69-3	Desmetryn	1014-69-3
*EEA_33-09-0	Detergents	
*CAS_84-66-2	Di-ethyl phthalate	84-66-2
*CAS_84-69-5	Di-iso-butyl phthalate	84-69-5



*CAS_117-81-7	Di(2-ethylhexyl)phthalate (DEHP)	117-81-7
*CAS_333-41-5	Diazinon	333-41-5
*CAS_53-70-3	Dibenzo(a,h)anthracene	53-70-3
*CAS_262-12-4	Dibenzodioxin	262-12-4
*CAS_3252-43-5	Dibromoacetonitrile	3252-43-5
*CAS_124-48-1	Dibromochlorometane	124-48-1
*CAS_74-95-3	Dibromomethane	74-95-3
*CAS_84-74-2	Dibutylphthalate	84-74-2
*CAS_1002-53-5	Dibutyltin	1002-53-5
*CAS_1918-00-9	Dicamba	1918-00-9
*CAS_1194-65-6	Dichlobenil	1194-65-6
*CAS_79-43-6	Dichloroacetic acid	79-43-6
*CAS_3018-12-0	Dichloroacetonitrile	3018-12-0
*EEA_33-10-3	Dichlorobenzene	
*CAS_75-71-8	Dichlorodifluoromethane	75-71-8
*CAS_75-09-2	Dichloromethane	75-09-2
*EEA_33-11-4	Dichlorophenol	
*CAS_120-36-5	Dichlorprop (2,4-DP)	120-36-5
*CAS_15165-67-0	Dichlorprop-P	15165-67-0
*CAS_62-73-7	Dichlorvos	62-73-7
*CAS_15307-86-5	Diclofenac	15307-86-5
*CAS_15307-79-6	Diclofenac sodium	15307-79-6
*CAS_99-30-9	Dicloran	99-30-9
*CAS_115-32-2	Dicofol	115-32-2
*CAS_60-57-1	Dieldrin	60-57-1
*CAS_134-62-3	Diethyltoluamide (DEET)	134-62-3
*CAS_35367-38-5	Diflubenzuron	35367-38-5
*CAS_83164-33-4	Diflufenican	83164-33-4
*CAS_56507-37-0	Diketo-metribuzin	56507-37-0
*CAS_50563-36-5	Dimethachlor	50563-36-5
*CAS_87674-68-8	Dimethenamid	87674-68-8
*CAS_205939-58-8	Dimethenamid ESA	205939-58-8
*CAS_380412-59-9	Dimethenamid OA	380412-59-9

*CAS_60-51-5	Dimethoate	60-51-5
*CAS_110488-70-5	Dimethomorph	110488-70-5
*CAS_131-11-3	Dimethyl phthalate	131-11-3
*CAS_534-52-1	Dinitro-o-cresol (DNOC)	534-52-1
*CAS_88-85-7	Dinoseb	88-85-7
*CAS_2813-95-8	Dinoseb acetate	2813-95-8
*CAS_512-04-9	Diosgenin	512-04-9
EEA_33-54-5	Dioxin-like polychlorinated biphenyls (12 PCB-DLs: 77,81,105,114,118,123,126,156,157,167,169,189)	
EEA_33-58-9	Dioxins and dioxin-like compounds (7 PCDDs + 10 PCDFs + 12 PCB-DLs)	
*CAS_131-18-0	Dipentyl phthalate	131-18-0
*CAS_131-16-8	Dipropyl phthalate	131-16-8
*EEA_3133-05-9	Dissolved organic carbon (DOC)	
*EEA_3132-01-2	Dissolved oxygen	
*CAS_298-04-4	Disulfoton	298-04-4
*CAS_330-54-1	Diuron	330-54-1
*EEA_33-13-6	DOX	
*CAS_60-00-4	EDTA	60-00-4
*EEA_3142-01-6	Electrical conductivity	
*CAS_115-29-7	Endosulfan	115-29-7
*CAS_72-20-8	Endrin	72-20-8
*CAS_106-89-8	Epichlorohydrin	106-89-8
*CAS_133855-98-8	Epoxiconazole	133855-98-8
*CAS_6108-10-7	Epsilon-HCH	6108-10-7
*CAS_114-07-8	Erythromycin	114-07-8
*CAS_53-16-7	Estrone (E1)	53-16-7
*CAS_135410-20-7	Ethanimidamide	135410-20-7
*CAS_29973-13-5	Ethiofencarb	29973-13-5
*CAS_563-12-2	Ethion	563-12-2
*CAS_23947-60-6	Ethirimol	23947-60-6
*CAS_26225-79-6	Ethofumesate	26225-79-6
*CAS_2104-64-5	Ethyl O-(p-nitrophenyl) phenyl phosphonothionate (EPN)	2104-64-5
*CAS_100-41-4	Ethylbenzene	100-41-4

*CAS_75-21-8	Ethylene oxide	75-21-8
*CAS_96-45-7	Ethylenethiourea (ETU)	96-45-7
*CAS_80844-07-1	Etofenprox	80844-07-1
*EEA_33-14-7	Extractable organically bound chlorine	
*CAS_120928-09-8	Fenazaquin	120928-09-8
*CAS_13356-08-6	Fenbutatin oxide	13356-08-6
*CAS_299-84-3	Fenchlorphos	299-84-3
*CAS_122-14-5	Fenitrothion	122-14-5
*CAS_93-72-1	Fenoprop	93-72-1
*CAS_95617-09-7	Fenoxaprop	95617-09-7
*CAS_67564-91-4	Fenpropimorph	67564-91-4
*CAS_134098-61-6	Fenpyroximate	134098-61-6
*CAS_55-38-9	Fenthion	55-38-9
*CAS_101-42-8	Fenuron	101-42-8
*EEA_14-03-9	FishEQR_A	
*EEA_14-04-0	FishEQR_E	
*EEA_14-01-7	FishEQR_G	
*EEA_14-02-8	FishEQR_H	
*CAS_79241-46-6	Fluazifop-P-butyl	79241-46-6
*CAS_70124-77-5	Flucythrinate	70124-77-5
*CAS_142459-58-3	Flufenacet	142459-58-3
*CAS_201668-32-8	Flufenacet ESA	201668-32-8
*CAS_206-44-0	Fluoranthene	206-44-0
*CAS_86-73-7	Fluorene	86-73-7
*CAS_16984-48-8	Fluoride	16984-48-8
*CAS_7782-41-4	Fluorine	7782-41-4
*CAS_144-49-0	Fluoroacetic acid	144-49-0
*CAS_54910-89-3	Fluoxetine	54910-89-3
*CAS_136426-54-5	Fluquinconazole	136426-54-5
*CAS_69377-81-7	Fluroxypyr	69377-81-7
*CAS_81406-37-3	Fluroxypyr-meptyl	81406-37-3
*CAS_133-07-3	Folpet	133-07-3
*CAS_72178-02-0	Fomesafen	72178-02-0

*CAS_944-22-9	Fonofos	944-22-9
*CAS_50-00-0	Formaldehyde	50-00-0
*CAS_2540-82-1	Formothion	2540-82-1
*CAS_57-12-5	Free cyanide	57-12-5
*CAS_121776-33-8	Furilazole	121776-33-8
*CAS_58-89-9	Gamma-HCH (Lindane)	58-89-9
*CAS_134237-52-8	gamma-Hexabromocyclododecane	134237-52-8
*CAS_1071-83-6	Glyphosate	1071-83-6
*EEA_34-02-6	Groundwater Directive Annex II pollutant	
*EEA_33-15-8	Halogenated organic compounds	
*EEA_31-01-6	Hardness	
*EEA_32-25-7	Heavy metals - aggregated	
*CAS_76-44-8	Heptachlor	76-44-8
*EEA_33-50-1	Heptachlor and heptachlor epoxide	
*CAS_1024-57-3	Heptachlor epoxide	1024-57-3
*CAS_32241-08-0	Heptachloronaphthalene	32241-08-0
*CAS_2440-02-0	Heptachloronorborene	2440-02-0
*CAS_36355-01-8	Hexabromobiphenyl	36355-01-8
*EEA_33-57-8	Hexabromocyclododecanes (HBCDD)	
*CAS_36483-60-0	Hexabromodiphenylether	36483-60-0
*CAS_118-74-1	Hexachlorobenzene	118-74-1
*CAS_87-68-3	Hexachlorobutadiene	87-68-3
*CAS_608-73-1	Hexachlorocyclohexane	608-73-1
*CAS_77-47-4	Hexachlorocyclopentadiene (HCCP)	77-47-4
*CAS_1335-87-1	Hexachloronaphthalene	1335-87-1
*CAS_107-46-0	Hexamethyldisiloxane (HMDS)	107-46-0
*CAS_51235-04-2	Hexazinone	51235-04-2
*EEA_33-17-0	Hydrocarbons	
*CAS_71-52-3	Hydrogen Carbonate (Bicarbonate) HCO <sub>3</sub>	71-52-3
*CAS_74-90-8	Hydrogen cyanide	74-90-8
*CAS_7783-06-4	Hydrogen sulphide	7783-06-4
*CAS_2163-68-0	Hydroxyatrazine	2163-68-0
*CAS_2599-11-3	Hydroxysimazine	2599-11-3

*CAS_66753-07-9	Hydroxyterbutylazine	66753-07-9
*CAS_15687-27-1	Ibuprofen	15687-27-1
*CAS_182636-13-1	Imazamox	182636-13-1
*CAS_138261-41-3	Imidacloprid	138261-41-3
*CAS_105827-78-9	Imidacloprid (Watch list only alternative code)	105827-78-9
*CAS_193-39-5	Indeno(1,2,3-cd)pyrene	193-39-5
*EEA_32-27-9	Industrial pollutants - aggregated	
*EEA_13-03-6	InvertebrateEQR_A	
*EEA_13-04-7	InvertebrateEQR_E	
*EEA_13-01-4	InvertebrateEQR_G	
*EEA_13-02-5	InvertebrateEQR_H	
*CAS_20461-54-5	Iodide	20461-54-5
*CAS_18181-70-9	Iodofenphos	18181-70-9
*CAS_185119-76-0	Iodosulfuron-methyl	185119-76-0
*CAS_1689-83-4	Ioxynil	1689-83-4
*CAS_36734-19-7	Iprodione	36734-19-7
*CAS_140923-17-7	Iprovalicarb	140923-17-7
*CAS_7439-89-6	Iron and its compounds	7439-89-6
*CAS_297-78-9	Isobenzane	297-78-9
*CAS_465-73-6	Isodrin	465-73-6
*EEA_123-07-9	Isoetides presence	
*CAS_98-82-8	Isopropylbenzene	98-82-8
*CAS_34123-59-6	Isoproturon	34123-59-6
*CAS_141112-29-0	Isoxaflutole	141112-29-0
*CAS_4234-79-1	Kelevan	4234-79-1
*EEA_3161-01-1	Kjeldahl nitrogen	
*CAS_143390-89-0	Kresoxim-methyl	143390-89-0
CAS_7439-92-1	Lead and its compounds	7439-92-1
*CAS_2164-08-1	Lenacil	2164-08-1
*CAS_330-55-2	Linuron	330-55-2
*CAS_7439-93-2	Lithium	7439-93-2
*CAS_108-38-3	M-xylene	108-38-3
*EEA_123-05-7	Macrophyte depth limit	

*EEA_123-03-5	MacrophyteEQR_A	
*EEA_123-04-6	MacrophyteEQR_E	
*EEA_123-01-3	MacrophyteEQR_G	
*EEA_123-02-4	MacrophyteEQR_H	
*CAS_7439-95-4	Magnesium	7439-95-4
*CAS_121-75-5	Malathion	121-75-5
*CAS_123-33-1	Maleinhydrazid	123-33-1
*CAS_7439-96-5	Manganese and its compounds	7439-96-5
*CAS_94-74-6	MCPA	94-74-6
*CAS_94-81-5	MCPB	94-81-5
*CAS_7085-19-0	Mecoprop	7085-19-0
*CAS_16484-77-8	Mecoprop-P (MCP-P)	16484-77-8
CAS_7439-97-6	Mercury and its compounds	7439-97-6
*CAS_104206-82-8	Mesotrione	104206-82-8
*EEA_33-18-1	Meta xylene + para xylene	
*CAS_57837-19-1	Metalaxyl	57837-19-1
*CAS_70630-17-0	Metalaxyl-M	70630-17-0
*CAS_41394-05-2	Metamitron	41394-05-2
*CAS_67129-08-2	Metazachlor	67129-08-2
*CAS_172960-62-2	Metazachlor ESA	172960-62-2
*CAS_1231244-60-2	Metazachlor OA	1231244-60-2
*CAS_18691-97-9	Methabenzthiazuron	18691-97-9
*CAS_10265-92-6	Methamidophos	10265-92-6
*CAS_950-37-8	Methidathion	950-37-8
*CAS_2032-65-7	Methiocarb	2032-65-7
*CAS_16752-77-5	Methomyl	16752-77-5
*CAS_72-43-5	Methoxychlor	72-43-5
*CAS_136-85-6	Methylbenzotriazol	136-85-6
*CAS_3060-89-7	Metobromuron	3060-89-7
*CAS_51218-45-2	Metolachlor	51218-45-2
*CAS_171118-09-5	Metolachlor ESA	171118-09-5
*CAS_152019-73-3	Metolachlor OA	152019-73-3
*CAS_37350-58-6	Metoprolol	37350-58-6

*CAS_139528-85-1	Metosulam	139528-85-1
*CAS_19937-59-8	Metoxuron	19937-59-8
*CAS_21087-64-9	Metribuzin	21087-64-9
*CAS_35045-02-4	Metribuzin-DA	35045-02-4
*CAS_74223-64-6	Metsulfuronmethyl	74223-64-6
*CAS_7786-34-7	Mevinphos	7786-34-7
*CAS_77238-39-2	Microcystin	77238-39-2
*CAS_2385-85-5	Mirex	2385-85-5
*CAS_2212-67-1	Molinate	2212-67-1
*CAS_7439-98-7	Molybdenum and its compounds	7439-98-7
*EEA_33-19-2	Mono basic phenols	
*EEA_33-20-5	Monochlorophenols	
*CAS_1746-81-2	Monolinuron	1746-81-2
*CAS_150-68-5	Monuron	150-68-5
*CAS_4636-83-3	Morfamquat	4636-83-3
*CAS_1634-04-4	MTBE	1634-04-4
*CAS_81-15-2	Musk xylene	81-15-2
*CAS_104-51-8	n-butylbenzene	104-51-8
*CAS_4245-76-5	N-methyl-N'-nitroguanidine	4245-76-5
*CAS_103-65-1	n-propylbenzene	103-65-1
*CAS_3984-14-3	N,N-dimethylsulfamide	3984-14-3
*CAS_91-20-3	Naphthalene	91-20-3
*CAS_70776-03-3	Naphthalene, chloro derivatives	70776-03-3
*CAS_15299-99-7	Napropamide	15299-99-7
*CAS_22204-53-1	Naproxen	22204-53-1
*CAS_555-37-3	Neburon	555-37-3
*CAS_7440-02-0	Nickel and its compounds	7440-02-0
*CAS_111991-09-4	Nicosulfuron	111991-09-4
*CAS_14797-55-8	Nitrate	14797-55-8
*EEA_3164-08-7	Nitrate to orthophosphate ratio	
*CAS_14797-65-0	Nitrite	14797-65-0
*EEA_33-21-6	Nitrobenzene	
*CAS_556-88-7	Nitroguanidine	556-88-7

*CAS_1836-75-5	Nitrophen	1836-75-5
*CAS_100-02-7	Nitrophenol	100-02-7
*EEA_31613-01-1	Non-ionised ammonia	
*EEA_33-59-0	Nonylphenol and nonylphenol ethoxylates (NP + NPEs)	
*CAS_9016-45-9	Nonylphenol ethoxylate	9016-45-9
*CAS_139-13-9	NTA	139-13-9
*CAS_95-47-6	O-xylene	95-47-6
*CAS_53-19-0	o,p'-DDD	53-19-0
*CAS_3424-82-6	o,p'-DDE	3424-82-6
*CAS_32536-52-0	Octabromodiphenyl ether	32536-52-0
*CAS_2234-13-1	Octachloronaphthalene	2234-13-1
*CAS_1806-26-4	Octylphenol	1806-26-4
*CAS_140-66-9	Octylphenol (4-(1,1',3,3'-tetramethylbutyl)-phenol)	140-66-9
*EEA_33-55-6	Octylphenols (CAS 1806-26-4) including isomer 4-(1,1',3,3'-tetramethylbutyl)-phenol (CAS 140-66-9)	
*EEA_33-22-7	Oil fractions (C10-40)	
*CAS_1113-02-6	Omethoate	1113-02-6
*CAS_34622-58-7	Orbencarb	34622-58-7
*EEA_33-60-3	Organotin compounds (as total Sn)	
*EEA_00-00-0	Other chemical parameter	
*EEA_34-03-7	Other pollutants - aggregated	
*CAS_19666-30-9	Oxadiazon	19666-30-9
*CAS_23135-22-0	Oxamyl	23135-22-0
*EEA_3131-01-9	Oxygen saturation	
*CAS_79-57-2	Oxytetracycline	79-57-2
*CAS_106-42-3	P-xylene	106-42-3
*CAS_72-54-8	p,p'-DDD	72-54-8
*CAS_72-55-9	p,p'-DDE	72-55-9
*CAS_56-38-2	Parathion	56-38-2
*CAS_298-00-0	Parathion-methyl	298-00-0
*EEA_3161-04-4	Particulate organic nitrogen	
CAS_37680-73-2	PCB 101 (2,2',4,5,5'-pentachlorobiphenyl)	37680-73-2
*CAS_60145-21-3	PCB 103 (2,2',4,5',6-pentachlorobiphenyl)	60145-21-3



*CAS_32598-14-4	PCB 105 (2,3,3',4,4'-pentachlorobiphenyl)	32598-14-4
*CAS_70362-41-3	PCB 106 (2,3,3',4,5'-pentachlorobiphenyl)	70362-41-3
*CAS_74472-37-0	PCB 114 (2,3,4,4',5-pentachlorobiphenyl)	74472-37-0
*CAS_31508-00-6	PCB 118 (2,3',4,4',5-pentachlorobiphenyl)	31508-00-6
*CAS_65510-44-3	PCB 123 (1,2,3-trichloro-5-(2,4-dichlorophenyl)benzene)	65510-44-3
*CAS_57465-28-8	PCB 126 (3,3',4,4',5-pentachlorobiphenyl)	57465-28-8
CAS_35065-28-2	PCB 138 (2,2',3,4,4',5'-hexachlorobiphenyl)	35065-28-2
CAS_35065-27-1	PCB 153 (2,2',4,4',5,5'-hexachlorobiphenyl)	35065-27-1
*CAS_38380-08-4	PCB 156 (2,3,3',4,4',5-hexachlorobiphenyl)	38380-08-4
*CAS_69782-90-7	PCB 157 (2,3,3',4,4',5'-hexachlorobiphenyl)	69782-90-7
*CAS_52663-72-6	PCB 167 (1,2,3-trichloro-5-(2,4,5-trichlorophenyl)benzene)	52663-72-6
*CAS_32774-16-6	PCB 169 (3,3',4,4',5,5'-hexachlorobiphenyl)	32774-16-6
*CAS_35065-30-6	PCB 170 (1,2,3,4-tetrachloro-5-(2,3,4-trichlorophenyl)benzene)	35065-30-6
CAS_35065-29-3	PCB 180 (2,2',3,4,4',5,5'-heptachlorobiphenyl)	35065-29-3
*CAS_39635-31-9	PCB 189 (1,2,3,4-tetrachloro-5-(3,4,5-trichlorophenyl)benzene)	39635-31-9
*CAS_35694-08-7	PCB 194 (1,2,3,4-tetrachloro-5-(2,3,4,5-tetrachlorophenyl)benzene)	35694-08-7
*CAS_2051-24-3	PCB 209 (5,5',6,6'-decachlorobiphenyl)	2051-24-3
CAS_7012-37-5	PCB 28 (2,4,4'-trichlorobiphenyl)	7012-37-5
CAS_35693-99-3	PCB 52 (2,2',5,5'-tetrachlorobiphenyl)	35693-99-3
*CAS_41464-42-0	PCB 72 (2,3',5,5'-Tetrachlorobiphenyl)	41464-42-0
*CAS_32598-13-3	PCB 77 (3,3',4,4'-tetrachlorobiphenyl)	32598-13-3
*CAS_70362-50-4	PCB 81 (3,4,4',5-tetrachlorobiphenyl)	70362-50-4
*CAS_66246-88-6	Penconazole	66246-88-6
*CAS_40487-42-1	Pendimethalin	40487-42-1
*CAS_32534-81-9	Pentabromodiphenylether	32534-81-9
*CAS_85-22-3	Pentabromoethylbenzene	85-22-3
*CAS_1825-21-4	Pentachloroanisole	1825-21-4
*CAS_608-93-5	Pentachlorobenzene	608-93-5
*CAS_16478-18-5	Pentachloriodobenzene	16478-18-5
*CAS_1321-64-8	Pentachloronaphthalene	1321-64-8
*CAS_87-86-5	Pentachlorophenol	87-86-5
*CAS_1763-23-1	Perfluorooctane sulfonic acid (PFOS) and its derivatives	1763-23-1
*CAS_52645-53-1	Permethrin-cis+trans	52645-53-1

*EEA_32-26-8	Pesticides - aggregated	
*EEA_34-01-5	Pesticides (Active substances in pesticides, including their relevant metabolites, degradation and reaction products)	
*CAS_106700-29-2	Pethoxamid	106700-29-2
*EEA_33-23-8	Petroleum hydrocarbons	
*EEA_33-24-9	Petroleum products	
*CAS_335-67-1	PFOA	335-67-1
*EEA_3152-01-0	pH	
*CAS_85-01-8	Phenanthrene	85-01-8
*CAS_108-95-2	Phenol	108-95-2
*CAS_64743-03-9	Phenols	64743-03-9
*CAS_298-02-2	Phorate	298-02-2
*CAS_2310-17-0	Phosalone	2310-17-0
*CAS_14265-44-2	Phosphate	14265-44-2
*EEA_124-03-8	PhytobenthosEQR_A	
*EEA_124-04-9	PhytobenthosEQR_E	
*EEA_124-01-6	PhytobenthosEQR_G	
*EEA_124-02-7	PhytobenthosEQR_H	
*EEA_11-03-0	PhytoplanktonEQR_A	
*EEA_11-04-1	PhytoplanktonEQR_E	
*EEA_11-01-8	PhytoplanktonEQR_G	
*EEA_11-02-9	PhytoplanktonEQR_H	
*CAS_1918-02-1	Picloram	1918-02-1
*CAS_137641-05-5	Picolinafen	137641-05-5
*CAS_23103-98-2	Pirimicarb	23103-98-2
*CAS_23505-41-1	Pirimiphos-ethyl	23505-41-1
*CAS_29232-93-7	Pirimiphos-methyl	29232-93-7
*CAS_1336-36-3	Polychlorinated biphenyls	1336-36-3
EEA_33-38-5	Polychlorinated biphenyls(7 PCB: 28,52,101,118,138,153,180)	
*EEA_33-26-1	Polychlorinated dibenzodioxins (PCDD)	
*CAS_136677-10-6	Polychlorinated dibenzofurans (10 PCDFs)	136677-10-6
*CAS_7440-09-7	Potassium	7440-09-7
*CAS_86209-51-0	Primisulfuron-methyl	86209-51-0

*CAS_67747-09-5	Prochloraz	67747-09-5
*CAS_32809-16-8	Procymidone	32809-16-8
*CAS_1610-18-0	Prometon	1610-18-0
*CAS_7287-19-6	Prometryn	7287-19-6
*CAS_1918-16-7	Propachlor	1918-16-7
*CAS_709-98-8	Propanil	709-98-8
*CAS_139-40-2	Propazine	139-40-2
*CAS_31218-83-4	Propetamphos	31218-83-4
*CAS_60207-90-1	Propiconazole	60207-90-1
*CAS_114-26-1	Propoxur	114-26-1
*CAS_525-66-6	Propranolol	525-66-6
*CAS_23950-58-5	Propyzamide	23950-58-5
*CAS_52888-80-9	Prosulfocarb	52888-80-9
*CAS_94125-34-5	Prosulfuron	94125-34-5
*CAS_129-00-0	Pyrene	129-00-0
*CAS_96489-71-3	Pyridaben	96489-71-3
*CAS_55512-33-9	Pyridate	55512-33-9
*CAS_53112-28-0	Pyrimethanil	53112-28-0
*CAS_124495-18-7	Quinoxifen	124495-18-7
*CAS_82-68-8	Quintozene	82-68-8
*CAS_76578-12-6	Quizalofop	76578-12-6
*CAS_100646-51-3	Quizalofop-P-ethyl	100646-51-3
EEA_33-27-2	Radionuclides	
*CAS_122931-48-0	Rimsulfuron	122931-48-0
*CAS_7286-69-3	Sebuthylazine	7286-69-3
*CAS_135-98-8	sec-butylbenzene	135-98-8
*CAS_26259-45-0	Secbumeton	26259-45-0
*EEA_3111-01-1	Secchi depth	
*CAS_7782-49-2	Selenium and its compounds	7782-49-2
*EEA_3163-01-7	Silicate	
*CAS_7440-21-3	Silicon	7440-21-3
*CAS_7440-22-4	Silver	7440-22-4
*CAS_122-34-9	Simazine	122-34-9

*CAS_7440-23-5	Sodium	7440-23-5
*CAS_151-21-3	Sodium dodecyl sulfate	151-21-3
*CAS_118134-30-8	Spiroxamine	118134-30-8
*CAS_7440-24-6	Strontium	7440-24-6
*CAS_100-42-5	Styrene	100-42-5
*CAS_99105-77-8	Sulcotrione	99105-77-8
*CAS_723-46-6	Sulfamethoxazol	723-46-6
*CAS_141776-32-1	Sulfosulfuron	141776-32-1
*CAS_18785-72-3	Sulphate	18785-72-3
*EEA_33-28-3	Surfactants (anionic and nonionic)	
*EEA_33-29-4	Surfactants (anionic)	
*CAS_994-05-8	TAME	994-05-8
*CAS_1746-01-6	TCDD (2,3,7,8-tetrachlorodibenzo-p-dioxin)	1746-01-6
*CAS_107534-96-3	Tebuconazole	107534-96-3
*CAS_112410-23-8	Tebufenozide	112410-23-8
*CAS_13071-79-9	Terbufos	13071-79-9
*CAS_33693-04-8	Terbumeton	33693-04-8
*CAS_5915-41-3	Terbutylazine	5915-41-3
*CAS_886-50-0	Terbutryn	886-50-0
*CAS_98-06-6	tert-butylbenzene	98-06-6
*CAS_79-94-7	Tetrabromobisphenol A (TBBP-A)	79-94-7
*CAS_40088-47-9	Tetrabromodiphenylether	40088-47-9
*CAS_1461-25-2	Tetrabutyltin	1461-25-2
*CAS_127-18-4	Tetrachloroethylene	127-18-4
*CAS_1335-88-2	Tetrachloronaphthalene	1335-88-2
*CAS_25167-83-3	Tetrachlorophenols	25167-83-3
*CAS_2227-13-6	Tetrasul	2227-13-6
*CAS_7440-28-0	Thallium	7440-28-0
*CAS_111988-49-9	Thiaclopid	111988-49-9
*CAS_153719-23-4	Thiamethoxam	153719-23-4
*CAS_79277-27-3	Thifensulfuron-methyl	79277-27-3
*CAS_28249-77-6	Thiobencarb	28249-77-6
*CAS_23564-05-8	Thiophanate-methyl	23564-05-8

*CAS_137-26-8	Thiram	137-26-8
*CAS_7440-31-5	Tin and its compounds	7440-31-5
*CAS_36756-79-3	Tiocarbazil	36756-79-3
*CAS_7440-32-6	Titanium	7440-32-6
*CAS_108-88-3	Toluene	108-88-3
*CAS_13351-73-0	Tolyltriazole	13351-73-0
*EEA_32-23-5	Total Benzo(b)fluor-anthene (CAS_205-99-2) + Benzo(k)fluor-anthene (CAS_207-08-9)	
*EEA_32-24-6	Total Benzo(g,h,i)perylene (CAS_191-24-2) + Indeno(1,2,3-cd)pyrene (CAS_193-39-5)	
*EEA_33-63-6	Total brominated diphenylethers (penta-BDE + octa-BDE + deca-BDE)	
*EEA_33-31-8	Total chrysene + triphenylene	
*EEA_33-64-7	Total cyanide	
*EEA_32-02-0	Total cyclodiene pesticides (aldrin + dieldrin + endrin + isodrin)	
*EEA_33-32-9	Total DDD (DDD, o,p' + DDD, p,p')	
*EEA_32-03-1	Total DDT (DDT, p,p' + DDT, o,p' + DDE, p,p' + DDD, p,p')	
EEA_33-40-9	Total dioxins and furans (PCDD + PCDF)	
*EEA_31-03-8	Total dissolved solids	
*EEA_33-53-4	Total Estrone (E1) + 17beta-estradiol (E2)	
*EEA_33-44-3	Total highly volatile halogenated hydrocarbons	
*EEA_33-36-3	Total hydrocarbons	
*EEA_3161-05-5	Total inorganic nitrogen	
*EEA_33-51-2	Total macrolide antibiotics (erythromycin + clarithromycin + azithromycin)	
*EEA_33-52-3	Total neonicotinoid insecticides (imidacloprid + thiacloprid + thiamethoxam + clothianidin + acetamiprid)	
*EEA_31615-01-7	Total nitrogen	
*EEA_3164-07-6	Total nitrogen to total phosphorus ratio	
*EEA_3133-06-0	Total organic carbon (TOC)	
*EEA_3161-03-3	Total organic nitrogen	
*EEA_3161-02-2	Total oxidised nitrogen	
EEA_33-62-5	Total PAHs (4 PAHs: Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(1,2,3-cd)pyrene)	
EEA_33-56-7	Total PAHs (Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)perylene, Indeno(1,2,3-cd)pyrene)	
*CAS_7723-14-0	Total phosphorus	7723-14-0
*EEA_11-05-2	Total phytoplankton biomass	

*EEA_31-02-7	Total suspended solids	
*EEA_33-41-0	Total tri-, tetra- and pentachlorophenol	
*EEA_33-42-1	Total trichloroethylene + tetrachloroethylene	
*EEA_33-43-2	Total trihalomethanes	
*CAS_8001-35-2	Toxaphene	8001-35-2
*CAS_87820-88-0	Tralkoxydim	87820-88-0
*CAS_156-60-5	trans-1,2-dichloroethene	156-60-5
*CAS_10061-02-6	trans-1,3-dichloropropene	10061-02-6
*CAS_39765-80-5	trans-Nonachlor	39765-80-5
*CAS_2303-17-5	Tri-allate	2303-17-5
*CAS_43121-43-3	Triadimefon	43121-43-3
*CAS_55219-65-3	Triadimenol	55219-65-3
*CAS_82097-50-5	Triasulfuron	82097-50-5
*CAS_24017-47-8	Triazophos	24017-47-8
*CAS_36643-28-4	Tributyltin-cation	36643-28-4
*CAS_76-03-9	Trichloroacetic acid	76-03-9
*CAS_12002-48-1	Trichlorobenzenes (all isomers)	12002-48-1
*CAS_79-01-6	Trichloroethylene	79-01-6
*CAS_75-69-4	Trichlorofluoromethane	75-69-4
*CAS_67-66-3	Trichloromethane	67-66-3
*CAS_1321-65-9	Trichloronaphthalene	1321-65-9
*CAS_55335-06-3	Triclopyr	55335-06-3
*CAS_3380-34-5	Triclosan	3380-34-5
*CAS_1912-26-1	Trietazine	1912-26-1
*CAS_1582-09-8	Trifluralin	1582-09-8
*CAS_126535-15-7	Triflusulfuron-methyl	126535-15-7
*CAS_738-70-5	Trimethoprim	738-70-5
*CAS_603-35-0	Triphenyl phosphine	603-35-0
*EEA_33-61-4	Triphenyltin and compounds	
*CAS_10028-17-8	Tritium	10028-17-8
*CAS_7440-33-7	Tungsten and its compounds	7440-33-7
*EEA_3112-01-4	Turbidity	
*CAS_7440-61-1	Uranium	7440-61-1

*CAS_7440-62-2	Vanadium and its compounds	7440-62-2
*CAS_50471-44-8	Vinclozolin	50471-44-8
*CAS_51000-52-3	Vinyl neodecanoate	51000-52-3
*EEA_33-45-4	Volatile halogenated hydrocarbons (VHH)	
*EEA_33-46-5	Volatile organic halogens (VOX)	
*EEA_3121-01-5	Water temperature	
*CAS_1330-20-7	Xylene	1330-20-7
*CAS_7440-66-6	Zinc and its compounds	7440-66-6
*CAS_137-30-4	Ziram	137-30-4

\* non-mandatory under IMAP Guidance Factsheets

**Table 8:** DSs & DDs **Module PSF1** (Levels of contaminants in seafood) for CI 20: **List of species**

ID_Species	Label
Alosa spp	125715
Argyrosomus regius	127007
Aristeus antennatus	107083
Auxis rokei	127015
Boops boops	127047
Brevoortia pectinata	275501
Dicentrarchus labrax	126975
Engraulis encrasicolus	126426
Epinephelus spp	126068
Loligo vulgaris	140271
Lophius piscatorius	126555
Merluccius merluccius	126484
Micromesistius poutassou	126439
Mugil cephalus	126983
Mullus barbatus	126985
Mullus spp.	126034
Mullus surmuletus	126986
Mytilus galloprovincialis	140481
Nephrops norvegicus	107254
Octopus vulgaris	140605
Pagellus bogaraveo	127059
Pagellus erythrinus	127060
Pagrus pagrus	127063
Parapenaeus longirostris	107109
Penaeus kerathurus	246388
Ruditapes decussates	231749
Ruditapes philippinarum	231750
Sarda sarda	127021
Sardina pilchardus	126421
Sardinella aurita	126422
Sardinella spp	125721
Scomber japonicus	127022
Scomber scombrus	127023
Scomber spp	126063
Scomberesox saurus	126392
Sepia officinalis	141444

Sparus aurata	151523
Sphyraena spp	126084
Spicara spp	125949
Squilla mantis	136137
Thunnus thynnus	127029
Trachurus mediterraneus	126820
Trachurus spp	125946
Trachurus trachurus	126822
Xiphias gladius	127094

**Table 9: DSs & DDs Module PSF1 (Levels of contaminants in seafood) for CI 20: List of GSA**

Value	Description
1	Northern Alboran Sea
2	Alboran Island
3	Southern Alboran Sea
4	Algeria
5	Balearic Islands
6	Northern Spain
7	Gulf of Lion
8	Corsica
9	Ligurian Sea and Northern Tyrrhenian Sea
10	Southern and Central Tyrrhenian Sea
11.1	Western Sardinia
11.2	Eastern Sardinia
12	Northern Tunisia
13	Gulf of Hammamet
14	Gulf of Gabes
15	Malta
16	Southern Sicily
17	Northern Adriatic Sea
18	Southern Adriatic Sea
19	Western Ionian Sea
20	Eastern Ionian Sea
21	Southern Ionian Sea
22	Aegean Sea
23	Crete
24	Northern Levant Sea



25	Cyprus
26	Southern Levant Sea
27	Eastern Levant Sea
28	Marmara Sea
29	Black Sea
30	Azov Sea



**Annex V**  
**References**



UNEP/MAP, 2019. UNEP/MED WG.467/5. IMAP Guidance Factsheets: Update for Common Indicators 13, 14, 17, 18, 20 and 21: New proposal for candidate indicators 26 and 27.

UNEP/MAP, 2019a. UNEP/MED WG.463/6. Monitoring Protocols for IMAP Common Indicators related to pollution.

UNEP/MAP, 2019b. UNEP/MED WG.467/13. Schemes for Quality Assurance and Control of Data related to Pollution.

UNEP/MAP, 2019c. UNEP/MED WG.467/8. Data Standards and Data Dictionaries for Common Indicators related to Pollution and Marine Litter.

UNEP/MAP, 2019d. UNEP/MAP WG. 467/12. MAP Pilot Info System: Quality Assurance and Quality Controls.

Commission Regulation (EC) No 1881/2006, setting maximum levels for certain contaminants in Seafood.

Commission Regulation (EC) No 835/2011 amending Regulation (EC) No 1881/2006 as regards maximum levels for polycyclic aromatic hydrocarbons in foodstuffs.

Commission Regulation (EC) No 1259/2011, amending Regulation (EC) No 1881/2006 as regards maximum levels for dioxins, dioxin-like PCBs and non-dioxin-like PCBs in foodstuffs.