



CHEMTrust

Protecting humans and wildlife
from harmful chemicals

Consultation response

“DEFRA Consultation on the Marine Strategy Part 1: UK Updated Assessment and Good Environmental Status”

Comments from CHEM Trust
June 2019

Introduction

CHEM Trust welcomes the opportunity to respond to this consultation, as the evidence shows that chemical pollution remains a major and complex challenge for the marine environment. The Marine Strategy Part 1 out for consultation, in our opinion, will not protect the marine environment and its wildlife and human health from persistent, bioaccumulative and toxic chemicals. It is woefully lacking in ambition and concrete action to reduce chemical contamination in the marine environment.

CHEM Trust is a UK registered charity that works at European, UK and International levels to prevent man-made chemicals from causing long term damage to wildlife or humans, by ensuring that chemicals which cause such harm are substituted with safer alternatives.

We have expressed concerns about the impact of some man-made synthetic chemicals on wildlife and the environment on several occasions in the past, see for instance our reports “*Effects of Pollutants on the Reproductive Health of Male Vertebrate Wildlife – Males Under Threat*”¹ and “*Medicines in the Environment: A Growing Threat to Wildlife and Drinking Water*”². See also our presentation on the non-toxic environment at the “SOLUTIONS” project Final Conference in June 2018: “*Filling the gaps on a path to a non-toxic environment*”³.

An ambitious plan is needed to properly address the complexity of the issue of chemical pollution and to tackle the flow of synthetic chemicals with hazardous properties reaching UK marine waters. However, since the 2010 Bergen statement of the OSPAR commission with

¹ CHEM Trust, 2008. Effects of Pollutants on the Reproductive Health of Male Vertebrate Wildlife – Males Under Threat. <https://www.chemtrust.org/wp-content/uploads/Male-Wildlife-Under-Threat-2008-full-report.pdf>

² CHEM Trust, 2014. Medicines in the Environment: A Growing Threat to Wildlife and Drinking Water. <https://chemtrust.org/medicines-in-the-environment-a-growing-threat-to-wildlife-and-drinking-water/>

³ Ninja Reineke, 2018. Filling the gaps on a path to a non-toxic environment.

https://www.chemtrust.org/wp-content/uploads/Reineke-SOLUTIONS_CHEM-Trust-June-2018.pdf

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the aim to “*achieving concentrations in the marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances*”⁴ by 2020, a lot of this ambition has been lost. Indeed, the unambitious objectives of the UK Marine Strategy regarding contaminants in territorial waters, to keep heavy metals and a couple of groups of regulated synthetic chemicals below a defined threshold while ignoring the threats posed by many other contaminants, fall far short of the vision set out in the Bergen statement.

In our response to this consultation we will address descriptor 8: contaminants and descriptor 9: contaminants in seafood.

Our main comments are:

- The current assessment concluding that Good Environmental Status has been largely achieved for contaminants is highly misleading and doesn't reflect the reality of the situation;
- The list of chemical contaminants monitored in territorial waters by the UK Government in the context of the UKMS is insufficient and outdated and should be expanded;
- A clear process should be put in place to provide early warnings for emerging contaminants of concerns;
- The threshold approach presents limitations and is not suited for the whole range of chemicals of concern;
- Operational targets should be set to reduce the production and emission of contaminants in order to address the chronic effects of chemical pollution and not just the acute;
- The UKMS should clarify post-Brexit plans.

Q1: Does the UK Marine Strategy Part One provide an accurate reflection of the state of UK marine waters and the economic and social uses of those waters?

Regarding Descriptor 8 (Contaminants) the UKMS Part 1 provides an extremely misleading and narrow reflection of the state of UK Marine Waters. The UKMS Part 1 states that the GES for contaminants as of 2018 has been largely achieved, suggesting that marine pollution from contaminants is under control. But the reality is:

- Marine pollution from legacy persistent organic pollutants (POPs) subject to a global ban, such as PCBs which are jeopardizing the survival of the UK orca population⁵, will remain a major issue for decades given that “*the removal and remediation of contaminated sediments on a large scale is regarded as being technically infeasible*”⁶;
- Many emerging very persistent, bioaccumulative and toxic synthetic chemicals that are still widely used (and not assessed in the UKMS) are finding their way into the marine environment. They have the potential to create a similar situation to that seen with PCBs, in that they may reach critical concentrations that endanger marine biodiversity and be impossible to remove from the marine environment. Examples of such chemicals include per- and poly-fluorinated substances (a chemical family made up of more than 4,000 substances, which are also known as ‘forever

⁴ OSPAR, 2010. Bergen Statement. Ministerial Meeting of the OSPAR Commission, Bergen: 23-24 September 2010. https://www.ospar.org/site/assets/files/1498/ospar_2010_bergen_statement.pdf

⁵ Desforges, J. P., et al., 2018. Predicting global killer whale population collapse from PCB pollution. Science 361: 1373–1376. <https://doi.org/10.1126/science.aat1953>

⁶ Marine Strategy Part 3: UK programme of measures. December 2015.

chemicals' due to their extreme persistence⁷) and unregulated brominated flame retardants;

- Pharmaceuticals are being found in UK estuaries⁸, but are not assessed in the UKMS. Pharmaceuticals can have adverse impacts on organisms even at low concentrations²;
- Several pesticides not assessed in the UKMS and present on the WFD watch list (e.g. neonicotinoids) are being found in UK rivers⁹, the pathways to the marine environment. Many ingredients in pesticide formulations are potentially toxic to marine organisms¹⁰;
- Finally, over 22,000 substances produced or imported at over 1 tonne/year are registered for use in the EU¹¹; 1,045 chemicals are classified as “very toxic to aquatic life” under the EU harmonized classifications; new substances are being added to the market each year and many legacy pollutants are being replaced by chemicals with similar properties¹²; a recent study demonstrated that “the diversity and quantity of synthetic chemicals created, distributed, and released into ecosystems have been increasing at rates greatly surpassing those of other drivers of global environmental change”¹³.

Therefore, as concluded in the recent report ‘Contaminants in Europe’s seas’ from the European Environment Agency (EEA)¹⁴, contamination of our seas remains a “large-scale challenge” and not a battle that has been won.

The conclusions drawn in the UKMS are scientifically incorrect as progress against the targets for Descriptor 8 (Contaminants) has been conducted in a misleading way, for the following reasons:

- Even though the estuary waters were monitored for a larger group of contaminants in agreement with the Water Framework Directive¹⁵, the list of contaminants assessed in territorial waters is extremely limited. In addition to metal contaminants, and polycyclic aromatic hydrocarbons (PAHs) the strategy assessed just 2 groups of synthetic chemicals (PCBs and PBDEs) in sediment and biota in territorial waters. This is unambitious and does not reflect the full range of chemical substances that

⁷ Fair, P.A. and Houde, M., 2018. Chapter 5 - Poly- and Perfluoroalkyl Substances in Marine Mammals. Marine Mammals Ecotoxicology. Impacts of Multiple Stressors on Population Health. Pages 117-145. <https://doi.org/10.1016/B978-0-12-812144-3.00005-X>

⁸ Letsinger, S., et al., 2019. Spatial and temporal occurrence of pharmaceuticals in UK estuaries. Science of The Total Environment, 678, pp.74-84. <https://doi.org/10.1016/j.scitotenv.2019.04.182>

⁹ Casado, J., et al., 2019. Screening of pesticides and veterinary drugs in small streams in the European Union by liquid chromatography high resolution mass spectrometry. Science of The Total Environment. V 670, p 1204-1225. <https://doi.org/10.1016/j.scitotenv.2019.03.207>

¹⁰ IPEN, 2018. Ocean pollutants guide. Toxic threats to human health and marine life. https://ipen.org/sites/default/files/documents/ipen-ocean-pollutants-v2_1-en-web.pdf

¹¹ <https://echa.europa.eu/information-on-chemicals/registered-substances>

¹² CHEM Trust, 2019. Regulating substances as groups: creating more rapid and effective risk management of hazardous chemicals. <https://chemtrust.org/regulating-substances-as-groups/>

¹³ Bernhardt, E. S., et al., 2017. Synthetic chemicals as agents of global change. Frontiers in Ecology and the Environment 15(2), pp. 84-90. https://www.caryinstitute.org/sites/default/files/public/downloads/news/fee_1450_rosi.pdf

¹⁴ EEA, 2019. Contaminants in Europe's seas. Moving towards a clean, non-toxic marine environment. Publications Office of the European Union, Luxembourg, European Environment Agency. <https://publications.europa.eu/en/publication-detail/-/publication/f778c998-713e-11e9-9f05-01aa75ed71a1>

¹⁵ Environmental Quality Standards Directive (EQSD) list for WFD assessments. <https://www.gov.uk/government/publications/list-of-chemicals-for-water-framework-directive-assessments/environmental-quality-standards-directive-egsd-list-for-wfd-assessments>

pollute UK marine waters. By assessing such a limited list of chemical substances, the UK Government is effectively wearing blinkers when it comes to monitoring contaminants in UK marine waters.

- A number of UK biogeographic regions were not monitored in sediment and biota for all substances assessed in the UKMS, and there was a lack of assessment criteria for PBDEs and alkylated PAHs. With such gaps in assessment criteria and a lack of monitoring data for a number of regions, it is doubtful that the UKMS can provide an accurate reflection of the state of UK marine waters.
- It is encouraging to see that levels of PCBs in biota and sediment were below the Environmental Assessment Criteria thresholds in many regions. However, the UK was granted an exception for this descriptor as the PCB-contaminated sediment cannot be removed for 'technical and financial reasons'¹⁶. It is therefore entirely misleading to state that GES has been achieved for Descriptor 8, as the target for PCBs set out in the UKMS has not been met, and by the UK Government's own admission historic contamination from PCBs will not be resolved. It should not be possible to state GES has been largely achieved when contamination from PCBs has been exempted from the assessment, particularly given that PCBs continue to pose a threat to the health of marine wildlife, such as orca, and to humans^{1, 17}.
- The EEA monitored similar groups of substances in their report¹⁴, but reached a different overarching conclusion compared to the UKMS. The conclusion in the UKMS is completely inappropriate for the reasons outlined above, and will likely result in the continuation of insufficient action on chemical substances in UK marine waters, and the continuation of environmental contamination.

For these reasons the UKMS Part 1 is failing to provide an accurate reflection of the state of UK marine waters.

Descriptor 9 (Contaminants in Seafood)

Regarding Descriptor 9 (Contaminants in Seafood), it is encouraging to see the high level of compliance with regulatory thresholds for the fish tested. However, many of the thresholds are under revision or will be revised soon and we cannot be confident that the current situation will continue. Moreover, the limited number of substances monitored, and the small sample sizes mean that we cannot be confident that the UKMS provides an accurate reflection of contaminants in seafood.

Q2: To what extent are the proposed new criteria and associated targets sufficient to guide progress towards achievement of GES?

The new criteria and associated targets being 'sufficient' is entirely dependent on an appropriate list of contaminants to be monitored. The current list of contaminants monitored in territorial waters has not been updated from the previous version, and as stated in our responses to Q1 and Q4 is highly inappropriate to assess contaminants in UK marine waters. The criteria must also contain an explorational aspect to assess emerging chemicals of concern and to look for chemicals in the marine environment that are not currently monitored in the UKMS. The criteria are therefore not sufficient to guide progress towards achievement of GES for contaminants.

The criteria and associated targets for Descriptor 9 (Contaminants in Seafood) are also inadequate for similar reasons.

¹⁶ <https://moat.cefas.co.uk/pressures-from-human-activities/contaminants/>

¹⁷ CHEM Trust, 2017. No Brainer: The impact of chemicals on children's brain development: a cause for concern and a need for action. <https://www.chemtrust.org/wp-content/uploads/chemtrust-nobrainier-mar17.pdf>

Q3: To what extent are the proposed operational targets sufficient to achieve GES?

The operational targets listed in the UKMS are good in principle, and we welcome the target to work with other countries to investigate the cumulative effects of combinations of contaminants on sea life populations. But, they are incredibly vague and lack concrete details, and could not be described in any way as S.M.A.R.T. Based on this we cannot be confident that they are sufficient to achieve GES.

We would also like to point out that logically, operational targets 1 and 2 should be reversed in order: The priority target should be to establish which substances are contaminating UK marine waters, with clear steps on how these substances will be identified and prioritised. Once contaminants are identified, threshold values should be established.

It is concerning that no progress has been made on the first two operational targets since the previous Marine Strategy in 2012. We want to see a detailed plan and timeline on how the UK Government will achieve these targets over the next 5 years.

It is also concerning that there is no operational target outlining the measures that will be taken to reduce the production and emission of contaminants, nor the removal of contaminants from UK marine waters. This is needed to address the chronic effects of chemical pollution and not just the acute.

Q4: Where gaps have been identified do you have suggestions on how these could be filled?

Firstly, we recommend reformulating the high-level objective for Descriptor 8 (Contaminants) to include 'specified contaminants', in the same way it is formulated for Descriptor 9 (Contaminants in Seafood). This will better reflect that the UKMS is not monitoring all possible contaminants. That being said, work needs to be done to extend the list of contaminants to monitor.

Gap 1: Need to extend the list of contaminants to monitor

Since the 2012 UKMS strategy, the list of contaminants to be monitored in territorial waters hasn't been updated, despite stating in the UKMS Part 2 that "further substances of concern may need to be targeted in future". The list has remained the same, focusing on metals, hydrocarbons and two groups of legacy contaminants that have been banned for decades. The list of synthetic chemicals to be monitored is obsolete, being highly insufficient and outdated.

The Technical guidance on monitoring for the Marine Strategy Framework Directive published by the JRC in 2014¹⁸ states that: "*As the type and quantities of emissions have changed and environmental legislation has led to reductions in pollution for certain substances and areas, the monitoring of contaminants needs to be adapted and focused to address present and upcoming risks that might affect the achievement of Good Environmental Status (GES).*" The guidance document gives some indication on where to look for new compounds to be monitored (e.g. Substance of Very High Concern (SVHC) in REACH; problem substances identified in river basin districts).

¹⁸ Zampoukas, N., et al., 2014. Technical guidance on monitoring for the Marine Strategy Framework Directive. Publications Office of the European Union, Luxembourg.
<https://mcc.jrc.ec.europa.eu/documents/201702074231.pdf>

In 2018, the JRC published a list of substances to consider for MSFD Descriptor 8¹⁹. This list is based on a refining of an initial list of 2,700 potential marine contaminants²⁰. Experts from 17 Member States (including the UK) shortlisted 333 substances or groups of substances. Following a survey on monitoring practices in the Member States, the report noted: “*The number of contaminants reported also varies considerably between MS, with some countries reporting on less than 20 substances or groups of substances and others on more than 100 and until 164.*” The report also stated: “*While it is true that the substances of concern can vary depending upon the local area, country and (sub)region, the differences found, also between countries sharing regional waters, seem to point to a lack of harmonized criteria for selecting relevant contaminants.*”

The list of contaminants to monitor should include, at a minimum, the following key synthetic chemicals and groups of chemicals of concern for the marine environment:

- Per- and Polyfluorinated substances from the PFAS (Per- and polyfluoroalkyl substances) family²¹. Both legacy PFAS (e.g. PFOA, Perfluorooctanoic acid and PFOS, Perfluorooctanesulfonic acid) and emerging PFAS (such as PFBS, Perfluorobutane sulfonate) used as substitute for legacy PFAS should be monitored^{7,22}. 70 PFAS substances are present in the List of Emerging Substances from the NORMAN Network²³, and some are already listed in the priority list of the WFD. OSPAR published guidelines on how to monitor for perfluorinated substances²⁴.
- Flame retardants chemicals, including those that are still on the market such as ‘novel’ brominated flame retardants²⁵ and organophosphorous flame retardants²⁶.
- Pharmaceuticals, such as those identified in CHEM Trust’s 2014 report².
- Pesticides⁹, see for instance those listed in OSPAR, the WFD watch list etc.

¹⁹ Tornero, V. and Hanke, G., 2018. Marine chemical contaminants – support to harmonized MSFD reporting: Substances considered for MSFD descriptor 8. Publications Office of the European Union, Luxembourg <https://mcc.jrc.ec.europa.eu/documents/201808102056.pdf>

²⁰ Tornero, V. and Hanke, G., 2017. Potential chemical contaminants in the marine environment: An overview of main contaminants lists. Publications Office of the European Union, Luxembourg http://publications.jrc.ec.europa.eu/repository/bitstream/JRC108964/potential_chemical_contaminants_in_the_marine.pdf

²¹ PFAS are detected on the French coast of the English Channel: Munshy, C., et al., 2019. Perfluoroalkyl substances (PFASs) in the marine environment: Spatial distribution and temporal profile shifts in shellfish from French coasts. *Chemosphere*, 228, pp.640-648. <https://doi.org/10.1016/j.chemosphere.2019.04.205>

²² Emerging PFAS have been detected in UK rivers: Pan, Y., et al., 2018. Worldwide distribution of novel perfluoroether carboxylic and sulfonic acids in surface water. *Environmental science & technology*, 52(14), pp.7621-7629. <https://doi.org/10.1021/acs.est.8b00829>

²³ See List of Emerging Substances available here: <https://www.normandata.eu/?q=node/19>

²⁴ See EMP Guidelines for Monitoring Contaminants in Sediments (Agreement 2002-16). Technical annexe 9 and JAMP Guideline on the analysis of PFCs in Seawater (Agreement 2010-08). Both available here: <https://www.ospar.org/work-areas/cross-cutting-issues/cemp>

²⁵ de Wit, C.A., et al., 2010. Emerging brominated flame retardants in the environment. In *Brominated flame retardants* (pp. 241-286). Springer, Berlin, Heidelberg. <https://link.springer.com/chapter/10.1007/978-2010-73>

²⁶ Wei, G.L., et al., 2015. Organophosphorus flame retardants and plasticizers: sources, occurrence, toxicity and human exposure. *Environmental Pollution*, 196, pp.29-46. https://www.researchgate.net/profile/Siyi_Zhang7/publication/266561267_Organophosphorus_flame_retardants_and_plasticizers_Sources_occurrence_toxicity_and_human_exposure/links/5bd212b8a6fcc3a8da641a6/Organophosphorus-flame-retardants-and-plasticizers-Sources-occurrence-toxicity-and-human-exposure.pdf

- Other groups of chemicals known to contaminate the marine environment which have EDC or other properties of concern¹⁰, including UV filters²⁷, parabens²⁸, bisphenols²⁹, phthalates³⁰.

Gap 2: A process to identify new chemicals of concern

The current proposal reiterates the need to investigate emerging contaminants, but no progress has been made at all in this area since the 2012 UKMS.

The Technical guidance on monitoring for the Marine Strategy Framework Directive published by the JRC in 2014 insists that the monitoring plans need to be proactive, not reactive: “*Monitoring programs need to (...) be adaptive, responding to new and emerging pollution issues.*” It also states that “*The effective monitoring of time trends, the investigation of emerging issues and pollution incidents and the identification of contaminant pathways and sources are additional aims of the monitoring programme.*”

Lessons should be learned from the PCB case and monitoring processes should be put in place to provide earlier warnings. A starting point in identifying emerging chemicals is to consider groups of chemicals that are similar in structure to those that are already examined in the UKMS. Moreover, nontarget analysis³¹ could be used to identify novel contaminants of concern. For additional resources, see the EU project SOLUTIONS³² for present and future emerging pollutants in land and water resources management. Many resources are available on their website in the category results and products.

Gap 3: Need to formulate a clear process to revise working thresholds as new evidence emerges and to deal with non-threshold substances.

The threshold approach bears several issues and limitations:

- 1) Threshold values change over time. Often when new scientific evidences arise, it appears that threshold values in use have been underestimated and need revision. See for instance the revision of Tolerable Weekly Intake (TWI) for dioxins and dioxin-like PCBs in food by the European Food Safety Agency (EFSA) in November 2018. The new TWI are 7 times lower than the previous ones³³. The UKMS should provide a clear plan on how threshold values will be kept up to date.
- 2) Threshold values are missing for many contaminants. In the absence of adequate data, the approach we recommend is to use grouping of chemicals with similar structures.

²⁷ Gago-Ferrero, P., et al., 2013. First determination of UV filters in marine mammals. Octocrylene levels in Franciscana dolphins. *Environmental science & technology*, 47(11), pp.5619-5625. <https://doi.org/10.1021/es400675y>

²⁸ Jeong, Y., et al., 2018. Tissue-Specific Accumulation and Body Burden of Parabens and Their Metabolites in Small Cetaceans. *Environmental science & technology*, 53(1), pp.475-481. <https://doi.org/10.1021/acs.est.8b04670>

²⁹ CHEM Trust, 2018. From BPA to BPZ: a toxic soup? How companies switch from a known hazardous chemical to one with similar properties, and how regulators could stop them. <https://www.chemtrust.org/wp-content/uploads/chemtrust-toxicsoup-mar-18.pdf>

³⁰ Hart, L., B., et al., 2018. Urinary phthalate metabolites in common bottlenose dolphins (*Tursiops truncatus*) from Sarasota Bay, FL, USA. *Geohealth*, 2, pp. 313-326. <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2018GH000146>

³¹ Samanipour, S., et al., 2019. Letter to the Editor: Optimism for Nontarget Analysis in Environmental Chemistry. *Environ. Sci. Technol.*, 53, 10, p 5529-5530. <https://doi.org/10.1021/acs.est.9b01476>

³² <https://www.solutions-project.eu/>

³³ EFSA, 2018. Dioxins and related PCBs: tolerable intake level updated. <https://www.efsa.europa.eu/en/press/news/181120>

Chemicals with a similar structure should be assumed to have the toxicological properties as harmful as those of the most toxic known substance in the group²⁹.

Moreover, we suggest that the development of group thresholds should have priority over a single substance risk assessment.

3) Some substances are non-threshold. For some chemicals, particularly Endocrine Disrupting Chemicals (EDCs), Persistent, Bioaccumulative and Toxic (PBT) chemicals and very Persistent / very Bioaccumulative (vPvB) chemicals, the uncertainties in the risk assessment are very high and it is doubtful if a protective safe level of exposure exists³⁴. Therefore, a threshold approach might not be the best approach for these types of contaminants. All remaining emissions should be minimised and an assessment that remaining exposure levels are 'safe' would be misleading.

Gap 4: Lack of post-Brexit plans

The UKMS makes no reference to the UK's departure from the EU, despite stating the many links between the strategy and many pieces of EU legislation. Given these links, we are deeply concerned by the lack of information on how GES will be achieved and maintained post-Brexit.

The UKMS consultation document declares that "there are strong links between the UK Marine Strategy and the Water Framework Directive" and Part One of the Marine Strategy Assessment states that "many existing pieces of EU legislation, such as the Water Framework Directive, the Birds and Habitats Directives, and the Environmental Impact Assessment Directive are contributing to improving the state of the UK's marine and coastal environments. This document also states that "many of the most significant activities that impact our seas, such as fisheries, are managed at a European or international level". Other pieces of EU law, including the Industrial Emissions Directive, have been identified in the UK's Marine Strategy as necessary measures to achieve GES for contaminants.

The Government has not yet made a commitment to remain dynamically aligned to the EU's chemical related laws, including the Water Framework Directive and the Industrial Emissions Directive which are implicated in the success of the UK's marine strategy. The UK Government must consider the impact of post-Brexit regulatory divergence in these areas on achieving and maintaining GES for the UK's marine waters.

REACH itself is also listed as a significant regulation in relation to GES targets for contaminants. The UK Government has stated in its White Paper that it wishes to have 'associate membership' of ECHA and accepts that the UK will have to follow EU REACH decisions without a vote on them. CHEM Trust's analysis (based on information on EU negotiations with Switzerland), is that the UK will also need to commit to remain fully aligned with the EU's chemical-related laws, in order to achieve associate membership of ECHA.

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³⁴ CHEM Trust, 2013. CHEM Trust's position on the REACH review of the authorization of Endocrine Disrupting Chemicals (EDCs). <https://www.chemtrust.org/wp-content/uploads/CHEM-Trust-Briefing-on-REACH-EDC-review-FINAL.pdf>