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**Conference of the Parties to the  
Minamata Convention on Mercury**  
Online, 1–5 November 2021\*  
Item 4 (c) of the provisional agenda\*\*

**Matters for consideration or action by the  
Conference of the Parties: releases of mercury**

## **Report on the intersessional work on mercury releases**

### **Note by the secretariat**

1. Article 9 of the Minamata Convention on Mercury concerns controlling and, where feasible, reducing releases of mercury and mercury compounds to land and water from the relevant point sources not addressed in other provisions of the Convention. Subparagraph 2 (b) of that article defines “relevant source” as “any significant anthropogenic point source of release as identified by a party that is not addressed in other provisions of this Convention”. Paragraph 3 of the same article provides that “each party shall, no later than three years after the date of entry into force of the Convention for it and on a regular basis thereafter, identify the relevant point source categories”. Paragraph 6 provides that “each party shall establish, as soon as practicable and no later than five years after the date of entry into force of the Convention for it, and maintain thereafter, an inventory of releases from relevant sources”. Paragraph 7 provides that “the Conference of the Parties shall, as soon as practicable, adopt guidance on best available techniques and on best environmental practices” and on “the methodology for preparing inventories of releases”.
2. The Conference of the Parties, in its decision MC-2/3, on releases, established a group of technical experts to develop draft guidance on methodologies for the preparation of inventories for a list of potentially relevant point source categories. In its decision MC-3/4, on releases of mercury, the Conference requested the group to continue to work by electronic means, with the possibility of one face-to-face meeting if necessary and subject to the availability of resources, to produce a report including draft guidance on the methodology for preparing inventories of releases, the proposed categories of point source of releases and a road map for the development of guidance on best available techniques and best environmental practices.
3. The group of technical experts comprises 22 members, nominated through their respective Bureau representatives, as follows: Eswatini, Gabon, Nigeria, Rwanda and Zambia from the African States; China, Indonesia, Japan, Saudi Arabia and Sri Lanka from the Asia-Pacific States; the European Union (two members) from the Eastern European States; Argentina, Brazil, Chile, Costa Rica and Guyana from the Latin American and Caribbean States; and Canada, Germany, Norway, Sweden and the United States of America from the Western European and other States.
4. In response to the call by the secretariat for the submission of existing information on the calculation of releases and on other methodologies for the estimation of releases from identified source categories, information was received from Canada, Colombia, Japan and Norway. The secretariat also

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\* The resumed fourth meeting of the Conference of the Parties to the Minamata Convention on Mercury is to convene in person in Bali, Indonesia, and is tentatively scheduled for the first quarter of 2022.

\*\* UNEP/MC/COP.4/1.

collected information on mercury releases from point sources from pollutant release and transfer registers and other existing literature.

5. The group held 13 online meetings. It elected Ms. Bianca Dlamini (Eswatini) and Mr. Greg Helms (United States) as co-chairs. It agreed to invite observers from parties, intergovernmental organizations and non-governmental organizations to its meetings. The group worked electronically to develop a draft report, which was posted on the website of the Convention for comments from 25 June to 23 July 2021. The group adopted the report at its thirteenth online meeting.

6. A draft decision on mercury releases, based on the work of the group, is set out in annex I to the present note. The report of the group is contained in annex II. Annex III sets out draft guidance on the methodology for preparing inventories of releases pursuant to article 9 of the Minamata Convention, which includes a list of potentially relevant point source categories in an appendix. Annex IV sets out a draft road map for the development of guidance on best available techniques and best environmental practices to control releases from relevant sources.

### **Suggested action by the Conference of the Parties**

7. The Conference of the Parties may wish to take note of the report of the group of technical experts as set out in annex II to the present note; consider adopting the draft guidance on the methodology for preparing inventories of releases pursuant to article 9 of the Minamata Convention as set out in annex III; and consider requesting the group of technical experts to develop draft guidance on best available techniques and best environmental practices to control releases from relevant sources in line with the road map set out in annex IV. The Conference of the Parties may wish to adopt a draft decision as proposed in annex I to the present note.

## Annex I

### Draft decision MC-4/[--]: Mercury releases

*The Conference of the Parties,*

*Welcoming* the report of the group of technical experts on the development of guidance in relation to mercury releases established pursuant to decision MC-2/3 on releases and given an updated mandate in decision MC-3/4 on releases of mercury,

1. *Invites* parties to take into account the list of potentially relevant point source categories as set out in the appendix to annex III to the note by the secretariat on the report on the intersessional work on mercury releases<sup>1</sup> when identifying relevant point source categories pursuant to paragraph 3 of article 9 of the Minamata Convention on Mercury;
2. *Adopts* the guidance on the methodology for preparing inventories of releases pursuant to article 9 of the Convention,<sup>2</sup> and invites parties to take into account of the guidance when preparing their inventory of releases from relevant sources pursuant to paragraph 6 of article 9;
3. *Invites* parties to confirm the current members of the group of technical experts, nominate new members or replace members, as appropriate, through the Bureau representatives of each of the five United Nations regions, taking into account the expertise needed for developing guidance on best available techniques and best environmental practices to control releases from relevant sources;
4. *Requests* the group to work electronically, in line with the road map for the development of guidance on best available techniques and best environmental practices to control releases from relevant sources<sup>3</sup>, to develop draft guidance on best available techniques and best environmental practices to control releases from relevant sources, for consideration by the Conference of the Parties at its fifth meeting, with a view to its adoption pursuant to paragraph 7 of article 9 of the Convention;
5. *Requests* the secretariat to continue to support the work of the group.

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<sup>1</sup> UNEP/MC/COP.4/7.

<sup>2</sup> Ibid., annex II.

<sup>3</sup> Ibid., annex IV.

## Annex II

### Report of the group of technical experts on the development of guidance in relation to mercury releases

#### Background

1. At its second meeting, the Conference of the Parties to the Minamata Convention on Mercury, in its decision MC-2/3, on releases, established a group of technical experts to develop draft guidance on methodologies for the preparation of inventories for a list of potentially relevant point source categories of mercury release to land and water.
2. At its third meeting, the Conference of the Parties considered a report by the group and, in its decision MC-3/4 on releases of mercury, requested the group to continue to work to produce a report including:
  - (a) Draft guidance on the methodology for preparing inventories of releases;
  - (b) Proposed categories of point source of releases;
  - (c) A road map for the development of guidance on best available techniques and best environmental practices.
3. In the same decision, the Conference of the Parties requested the group to base its work on a number of considerations, as follows:
  - The proposed categories should not include potentially significant relevant point sources for which releases are addressed in other provisions of the Minamata Convention on Mercury, irrespective of whether those other provisions include an inventory obligation.
  - Given that article 9 of the Convention concerns relevant point sources, diffuse sources should not be included in the proposed categories. The categories identified in the guidance should also be limited to those source categories for which mercury releases have been documented.
  - The obligation to ensure the environmentally sound management of waste set out under the Convention addresses significant releases to land and water.
  - While wastewater is addressed under article 9, parties may additionally control wastewater under article 11 of the Convention.
  - Subject to the completion of the work outlined above, and with a view to helping parties that wish to widen the scope of the inventory referred to in paragraph 6 of article 9 to additional point sources other than those covered by article 9, the guidance on the methodology for preparing inventories of releases should also provide information on significant point sources of releases covered by other provisions of the Convention.

#### Relationship between article 9 and other articles

4. The group of technical experts looked at the relationship between article 9 and other articles of the Convention when considering whether certain releases were addressed in those other articles and therefore were not subject to the provisions of article 9.
5. The objective of the Convention is to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. Articles 3 to 12 cover the life cycle of mercury and mercury compounds to accomplish this objective.
6. Article 9 defines “releases” as releases of mercury or mercury compounds to land or water, and “relevant source” as any significant anthropogenic point source of release as identified by a party that is not addressed in other provisions of the Convention. Accordingly, in identifying relevant point sources, it is for a party to determine what releases are significant for that party and which point sources are within its territory, noting that some sources are addressed in other articles of the Convention.

7. For the purpose of identifying potentially relevant point source categories, the expert group noted the following:

- (a) That discharges of wastewater to a body of water were candidates for releases under article 9, whether discharged directly to the body of water or indirectly to an off-site wastewater treatment plant or a common discharge pipe;
- (b) That the deposit of mercury or mercury compounds into controlled containment areas, such as impoundments or piles, were not regarded as releases under article 9, although releases to the environment could occur from containment areas through intentional controlled discharges.<sup>1</sup> Releases from containment areas could be potentially relevant point source releases that were subject to the provisions of article 9.

8. Article 11 defines “mercury wastes” as substances or objects consisting of, containing or contaminated with mercury or mercury compounds in a quantity above the thresholds defined by the Conference of the Parties that are disposed of or are intended or required to be disposed of by the provisions of national law or the Minamata Convention. The definition excludes overburden, waste rock and tailings, except from primary mercury mining, unless they contain mercury or mercury compounds above thresholds defined by the Conference of the Parties.

9. Article 11 provides that each party shall take appropriate measures so that mercury waste is managed in an environmentally sound manner, taking into account the guidelines developed under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. Article 11 thereby addresses releases of mercury to land and water that arise from the generation and management of mercury waste from a broad range of facilities and activities.

10. Some experts believe that wastes that are not mercury wastes as defined under article 11 cannot be considered as “addressed” because they are not covered by the Convention, and the control measures of article 11 or other provisions of the Convention, therefore, do not apply. In their view, such wastes include:

- Overburden, waste rock and tailings from mining other than primary mercury mining, until the Conference of the Parties establishes thresholds for these wastes;
- Tailings from mining other than primary mercury mining not contaminated with mercury or mercury compounds above the thresholds to be established by the Conference of the Parties;
- Waste contaminated with mercury (e.g., ashes, slag and air-pollution-control sludges) beneath the threshold to be established by the Conference of the Parties.

11. Other experts believe that the risks posed by mining overburden and waste rock have been considered, because the Conference of the Parties determined, in its decision MC-3/5 on mercury waste thresholds, that there was no need to establish thresholds for overburden and waste rock at the time of adoption, because they posed minimal risks. Thus, as these wastes and the risks they pose have been considered, and a related decision thereon has been adopted by the Conference of the Parties, they should be deemed to have been addressed under article 11.

12. Additionally, some experts have highlighted that overburden and waste rock are not point sources and therefore would not be considered releases under article 9. Some experts are of the view that tailings from mining (except from primary mercury mining) are also addressed by article 11, even if they contain mercury or mercury compounds below the thresholds. The development of thresholds for tailings from mining other than primary mercury mining is the subject of active discussion by the group of technical experts established by the Conference of the Parties in its decision MC-2/2 on mercury waste thresholds, with recommendations expected to be submitted for consideration by the Conference of the Parties at its fourth meeting.

13. The present group of technical experts on the development of guidance in relation to mercury releases could not reach agreement on whether wastes that were not mercury wastes as defined under article 11 might be relevant point sources under article 9.

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<sup>1</sup> Containment failures could lead to mercury releases to the environment, although such releases may be regarded as a diffuse source.

**Draft guidance on the methodology for preparing inventories of releases**

14. The draft guidance on the methodology for preparing inventories of releases pursuant to article 9 of the Minamata Convention on Mercury, which includes a list of potentially relevant point source categories, is set out in annex III to the present note by the secretariat.

**Draft road map for the development of guidance on best available techniques and best environmental practices**

15. The draft road map for the development of guidance on best available techniques and best environmental practices to control releases from relevant sources is set out in annex IV to the present note by the secretariat.

## Annex III

# Draft guidance on the methodology for preparing inventories of releases pursuant to article 9 of the Minamata Convention on Mercury

## Background

The present document provides guidance on the methodology for preparing inventories of mercury releases to land and water. It is intended to provide general advice to parties to the Minamata Convention on Mercury in non-prescriptive language, taking into account the diverse nature of parties' national circumstances, including socioeconomic and cultural considerations.

Article 9 of the Minamata Convention concerns releases of mercury and mercury compounds to land and water from the relevant point sources not addressed in other provisions of the Convention. Paragraph 6 of article 9 provides that each party shall establish, as soon as practicable and no later than five years after the date of entry into force of the Convention for it, and maintain thereafter, an inventory of releases from relevant sources.

A "relevant source" is any significant anthropogenic point source of release as identified by a party that is not addressed in other provisions of the Convention. Paragraph 3 of article 9 provides that each party shall, no later than three years after the date of entry into force of the Convention for it and on a regular basis thereafter, identify the relevant point source categories. The table in the appendix lists potentially relevant categories of point source of mercury releases to assist parties in identifying relevant point source categories within their territories.

Paragraph 7 of article 9 provides that the Conference of the Parties shall, as soon as practicable, adopt guidance on the methodology for preparing inventories of releases and on best available techniques and best environmental practices that may be applicable to article 9 releases.

Many countries, as part of their preparations for becoming a party to the Convention and for its early implementation, have developed a national mercury profile, including identification of significant sources of emissions and releases, and national inventories of mercury and mercury compounds. Parties are also required to prepare an inventory of emissions under article 8 (emissions) and may prepare inventories under other articles of the Convention too, such as pollutant release and transfer registers under article 18 (public information, awareness and education) and inventories of use, consumption and anthropogenic emissions to air and releases to water under article 19 (research, development and monitoring). These may involve processes that are distinct from those used to prepare the inventory required under article 9, but a party may choose to use the same methodology or similar methodologies for all of its inventories to enhance consistency and synergies.

A robust inventory will support parties in their domestic implementation of the Convention in terms of actions such as the development of a national plan setting out targets, goals and outcomes, the establishment of limit values, use of best available techniques and best environmental practices and the elaboration of multi-pollutant control strategies. It will also enable them to demonstrate the extent to which implementation is leading to achievement of the objective of the Convention and to report on the effectiveness of the implementation measures pursuant to article 21 (reporting). It will furthermore contribute to the effectiveness evaluation under article 22 (effectiveness evaluation) by providing comparable data on releases of mercury. The benefit of a robust inventory is not limited to the implementation of the Minamata Convention; it can also extend to the implementation of the Sustainable Development Goals and other global, regional and national policies.

For the purposes of completeness, to the extent possible, parties could include in their inventory information about releases from all point sources within the categories identified pursuant to paragraph 3 of article 9. This could be particularly useful for parties in identifying which specific point sources would be significant in their territory and thus addressed as relevant sources to control releases.

## Use of existing inventories

Paragraph 2 of article 18 provides that each party shall use existing mechanisms or give consideration to the development of mechanisms, such as pollutant release and transfer registers where applicable, for the collection and dissemination of information on estimates of its annual quantities of mercury

and mercury compounds that are emitted, released or disposed of through human activities.<sup>1</sup> Currently, almost half the parties to the Minamata Convention have existing pollutant release and transfer registers or are developing new systems or have expressed interest in doing so.<sup>2</sup> Where a pollutant release and transfer register programme does not exist, an alternative approach is to use the toolkit for identification and quantification of mercury releases (mercury inventory toolkit) produced by the United Nations Environment Programme (UNEP). Where a party has established a pollutant release and transfer register, data about point sources of mercury releases, including from sources identified as relevant by the party, are likely to be included. The search function of the pollutant release and transfer register should make it possible to identify and easily obtain data about point source mercury releases.

### Steps to follow to establish an inventory of releases

In the event that a party has not established a pollutant release and transfer register, or decides to establish a release inventory that is separate from or complementary to an existing pollutant release and transfer register, the basic methodology for establishing a release inventory typically involves many or all of the following steps:

- Planning of the approach for development of the release inventory, using available resources, and consideration of how to collect, handle and review data, including any quality-control and quality-assurance processes.
- Collection of existing release data as a useful starting point.
- Identification of relevant sources within each source category.
- Establishment of facility-based requirements for reporting on releases.
- Collection of the release reports from facilities on a periodic basis (e.g., annually).

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<sup>1</sup> Initial source identification may be carried out with minimal effort by using the toolkit for identification and quantification of mercury releases produced by the United Nations Environment Programme (UNEP). There is also a wealth of experience to draw on from countries and international bodies and organizations that are active in the development of pollutant release and transfer registers, such as the Organisation for Economic Co-operation and Development (OECD), the Economic Commission for Europe, UNEP and the United Nations Institute for Training and Research (UNITAR).

In addition, the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean covers the establishment of pollutant release and transfer registers in its article 6, paragraph 4. The Agreement is available at <http://www.cepal.org/en/escazuagreement> (accessed 10 August 2021).

More information on the establishment and implementation of pollutant release and transfer registers may be found on the website of PRTR.NET, which has been developed and is maintained by OECD, in cooperation with the Economic Commission for Europe. See <https://prtr.unece.org/> (accessed 10 August 2021).

Other useful resources include the internet-based toolbox for decision-making in chemicals management of the Inter-Organization Programme for the Sound Management of Chemicals; detailed guidance developed by OECD; and the Guidance on Implementation of the Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters by the Economic Commission for Europe, available at <https://unece.org/environment-policy/publications/guidance-protocol-pollutant-release-and-transfer-registers> (accessed 10 August 2021).

UNITAR also makes available a number of resources that can facilitate countries' implementation of pollutant release and transfer registers. These are available at <https://prtr.unitar.org/site/resources> (accessed 10 August 2021). There are links to international guidelines, factsheets, videos and a network of international experts, and e-learning opportunities are available at <https://prtr.unitar.org/site/prtr-learn> (accessed 10 August 2021).

It should be noted that pollutant release and transfer registers may specify thresholds for reporting, meaning that facilities with emissions below the threshold have no obligation to do so. A party may consider using thresholds for mercury that are low enough to capture relevant sources. A party may also complement the reported release amount with estimates of releases from smaller sources.

Pollutant release and transfer registers and their related legislation cover multiple pollutants and source categories. They regulate reporting requirements in terms of the reporting cycle, data collection and record keeping, quality assessment by the competent authority and the dissemination of information to the public and other stakeholders.

<sup>2</sup> A map of countries with activities relating to pollutant release and transfer registers can be found in the presentation on the report on International Pollutant Release and Transfer Register Coordinating Group Activities given at the eighth meeting of the Working Group of the Parties to the Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, held in December 2020, available at [https://unece.org/sites/default/files/2021-01/4%28a%29\\_ICG\\_8thWGPP.pdf](https://unece.org/sites/default/files/2021-01/4%28a%29_ICG_8thWGPP.pdf) (accessed 10 August 2021). Furthermore, according to OECD, in 2016, 75 countries were working on pollutant release and transfer registers.

- Development of a database to store the reported data on releases.
- Completion of relevant quality-control and quality-assurance processes.
- Analysis of the results.
- Ensuring that the data are publicly accessible and searchable.

Once the inventory has been established, arrangements must be made to maintain it and keep it up to date, in line with paragraph 6 of article 9.

The following sections provide guidance to parties in relation to some of the steps.

### **Identification of relevant point source categories and facilities**

When preparing to implement the Minamata Convention, a party will elaborate a plan for developing the inventory, including how to collect, review and validate data. An initial step for the party may then be to identify the sources of mercury releases present within its territory and any existing inventories.

In doing so, a party ought to identify the relevant point source categories pursuant to paragraph 3 of article 9. As mentioned, a “relevant source” is defined in the article as any significant anthropogenic point source of release as identified by a party that is not addressed in other provisions of the Convention. The table in the appendix lists potentially relevant categories of point source to assist parties in identification of relevant point source categories. Parties are to determine which anthropogenic point sources of releases to land or water within their territory are significant. They may take into account the quantity of the releases, their location, the environmental conditions, exposure pathways and other factors of national concern.

After identifying relevant point source categories, a party will need to identify the facilities within each of the point source categories present at the national level; existing inventories may already have much of this information. The development of a quantitative inventory would follow, through the collection of information from facilities considered to be a relevant source within the source category.

### **Collection of release information from individual facilities**

A party will need to collect recorded or estimated data about the point source releases from individual facilities covered by article 9 over a defined time period. This may be done under legislation covering the pollutant release and transfer register, using licensing conditions associated with the relevant source category, or statistical surveys. Typically, inventories are based on a calendar year, so releases are calculated on an annual basis. Developing countries may start with a longer time interval. The inventory under article 9 is required within five years of the entry into force of the Convention for the party concerned. The collection of data earlier than that date, however, would contribute to robust estimates.

Ideally, the inventory should be based on the direct measurement of point source releases<sup>3</sup> where it is possible to measure representative release levels and where supporting information on the frequency and duration of mercury releases is available. This will produce the most robust estimates. In such cases, samples should be taken in conditions representative of normal facility operations. If the releases are highly variable, or from a batch process, the duration of the sample-taking should be longer or more samples collected.

In practice, it may not always be possible to obtain measured data from facilities, or the measured data may not be of sufficient quality and frequency to enable calculation of the level of releases. In such cases, methodologies exist for engineering estimates or mass balance calculations,<sup>4</sup> and for estimating the releases through the use of release factors, as in the UNEP mercury inventory toolkit. A release

<sup>3</sup> Guidance on analytical measurement includes:

- International Organization for Standardization standard ISO 12846:2012 Water quality – Determination of mercury – Method using atomic absorption spectrometry (AAS) with and without enrichment.
- International Organization for Standardization standard ISO 17852:2006 Water quality – Determination of mercury – Method using atomic fluorescence spectrometry.
- United States Environmental Protection Agency Method 105 – Mercury in Wastewater Treatment Plant Sewage Sludge.

<sup>4</sup> A mass balance approach calculates releases on the basis of the amount of substance going into the system and the amounts created or destroyed in that system. Engineering calculations use models based on knowledge of the inputs and outputs of the system and what is likely to happen within the system. See, for example, OECD guidance on release estimation techniques, available at [www.oecd.org/chemicalsafety/pollutant-release-transfer-register/publications-series-on-pollutant-release-and-transfer-registers.htm](http://www.oecd.org/chemicalsafety/pollutant-release-transfer-register/publications-series-on-pollutant-release-and-transfer-registers.htm) (accessed 10 August 2021).

factor is a representative value that relates the quantity of mercury released to the activity level associated with the source (for example, the throughput of raw material).

A party could also choose to use a combination of approaches. The use of release factors may provide a better estimate of emissions from a category of source rather than from any individual source. It may be particularly useful, for example, to use aggregated releases for sources that are too numerous or costly to monitor individually or where individual reporting would be too burdensome. The methodology may differ from one source category to another and could even be different for different types of facility within a source category.

There are advantages to progressively adopting new and more accurate methods, such as, replacing data based on estimation techniques with actual monitored data as they become available, or replacing generic release factors with factors that are more representative of the circumstances in the party's territory or at a specific source. At the same time, however, it is also necessary to ensure the comparability of data obtained over time, so that trends can be clearly seen for the purposes of tracking progress in reducing releases.

A party may wish to establish policies on and procedures for how methodological changes are to be introduced and how frequently that is done and to have arrangements in place, where possible, to help identify the changes over time that are the result of real changes in releases and those that reflect improvements in estimating techniques.

Where there are no national approaches in place, a party may find it useful to adopt the methodologies set out in international guidance, such as the UNEP mercury inventory toolkit. When a party lacks national release factors, it is suggested that internationally accepted values be used.

In practice, the decision about which methodology to use should be based on a combination of factors and may change over time, reflecting what is practical and affordable and what is most suitable in the light of national circumstances. At a minimum, however, there should be transparency about the methodology being used to ensure that the information in the inventory is accurate, comparable, consistent and complete and can be interpreted correctly.

Where the information can practicably be obtained, it is useful to record details of the speciation of the releases, i.e. whether the released substance is elemental mercury, an inorganic mercury compound or an organic mercury compound. This information may be useful in predicting the fate of mercury and mercury compounds in the aqueous and terrestrial environment and their risk to human health and the environment and in identifying effective control strategies and technologies.

Where the information can practicably be obtained, it is also useful to record details of other pollutants released together with the mercury, as together they act as a kind of "finger print" of the specific release source. This information may be useful in tracking and identifying sources of mercury observed/monitored in the aqueous and terrestrial environment and linking direct abatement measures to the right release sources.

Once the national methodologies have been established, parties should provide specific guidance to facilities on the estimation methods to be used, quality-control and quality-assurance considerations and the format for data submission. National authorities should also undertake quality-control/validation processes to ensure that the data is robust and reliable. Where a pollutant release and transfer register system exists, this is usually a part of the reporting.

### **Development of a reporting and data management system**

To facilitate reporting, a party could set up a dedicated release-inventory website to disseminate information and enable industries to download the relevant guidance materials, including reporting templates. Industries should be encouraged to submit their reports in an electronic format to allow for easier data handling and analysis. A party should require facilities to meet fixed reporting requirements and follow specified timelines.

A party should create internal databases to store facility information (such as the facility's name, location, corporate ownership and other details) and the reported release data. This database should be searchable, easy to use and conducive to further data analysis.

### **Ensuring that the data are publicly accessible and searchable**

Release data from individual facilities, release summary reports containing non-confidential information and information on the methodologies or monitoring methods used should be made available to the public, consistent with the party's obligation under article 18. If a party has set up a

website to assist industries in reporting their releases, the same website could be used to disseminate the release data, subject to suitable security arrangements to protect those data. The website should allow users to conduct customized data searches, such as for an individual facility, an industrial sector, a geographical region, or a specific reporting year.

## **UNEP mercury inventory toolkit**

UNEP has developed a set of tools, consistent with the above methodology, for use in establishing inventories. The UNEP mercury inventory toolkit is a good starting point for parties developing their own release inventories. The toolkit potentially covers all sources of mercury emissions and releases to all environmental media and is therefore not intended only for article 9 inventories. It can, however, be used to establish more limited inventories covering the point source releases to land and water from relevant sources under article 9 as identified by the party. Over time, a party should strive to improve and develop its release inventories, and the guidance outlined above provides the basis for such an undertaking.

The toolkit can help parties at two levels: inventory level 1 and inventory level 2.

Inventory level 1 uses factors derived from experience to calculate mercury inputs and releases to all environmental media and presents the results as estimates.

Inventory level 2 aims to lead countries through the process of enhancing and refining their initial inventories. It provides guidance on the different techniques for and stages of development of the inventory and includes illustrative examples and extensive information on mercury release sources. It provides a simple methodology, together with an accompanying database to ensure consistency in the development of national inventories. Inventory level 2 encourages the use of country-specific calculation factors; using such factors, the emission and release estimates developed at inventory level 1 can be refined to a higher level of precision, provided that the data required are available in the country.

The methodology for level 2 is aimed at the identification and quantification (where possible) of all sources of emissions and releases of mercury at the national level. The first step is the establishment of a screening matrix, along with identification of the main source categories present. A party could choose to include only the relevant source categories that it has identified. The second step is the classification of the main source categories into subcategories, to identify individual activities that potentially release mercury. This produces a qualitative identification of the source types. The third step involves the development of a quantitative inventory. For a detailed quantitative inventory, data on activity volume and process-specific information are gathered for the purposes of calculating estimated mercury releases from the identified sources. The toolkit contains procedures and equations for the calculation of all emissions and releases. Whenever reported releases are based on calculations or other estimation methods, confirmatory testing of releases from the facilities identified by the inventory should be conducted. The aim is to conduct a census of the facilities in the different point-source categories and the releases of mercury measured at each facility.

At the final stage, the results of the inventory are compiled. The toolkit recommends the use of a standardized presentation format to ensure that all known sources have been considered (whether or not they are quantified). This allows any data gaps to be revealed and assists in ensuring that inventories are comparable and transparent. It also provides an opportunity to review, over time, changes in the national emissions and releases of mercury from all sources. This kind of quantitative review, conducted under level 2, would contribute to reporting requirements under paragraph 8 of article 9 of the Convention.

## **Appendix:<sup>5</sup> List of potentially relevant point source categories**

Table 1 lists potentially relevant categories of point source to assist parties in identifying relevant point source categories pursuant to paragraph 3 of article 9. The table indicates the information sources where releases of mercury to land and water from the listed source categories have been documented. As parties are to determine whether a source of releases to land or water within their territory is “significant” or not, some of the sources below may not be considered significant in all cases (e.g., the releases may be low in terms of quantity).

The Conference of the Parties in its decision MC-3/4 requested the group of experts, subject to the completion of other work requested therein, to provide information on significant point sources of

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<sup>5</sup> This is an appendix to the draft guidance set out as annex III to document UNEP/MC/COP.4/7. The present footnote will be removed when the guidance is published.

releases covered by provisions of the Convention other than article 9, with a view to helping parties that wished to widen the scope of the inventory to additional point sources. Table 2 lists such point sources that were considered by the group of experts when developing Table 1. It should be noted that table 2 is only indicative and has not undergone extensive review.

Table 1

**List of potentially relevant point source categories**

Source category in the UNEP mercury inventory toolkit		Release sources (not addressed in other provisions of the Minamata Convention) <sup>6</sup>	Documentation of the releases
Source category: Extraction and use of fuels/energy sources			
5.1.1	Coal combustion in power plants	Releases to land and water from coal storage, coal washing and air-pollution-control systems.	Global Mercury Assessment 2018. Reference report of the UNEP mercury inventory toolkit.
5.1.2.1	Coal combustion in coal-fired industrial boilers	Releases to land and water from coal storage, coal washing and air-pollution-control systems.	Global Mercury Assessment 2018. Reference report of the UNEP mercury inventory toolkit.
5.1.2.2	Other coal use	Releases to land and water from coal storage, coal washing and air-pollution-control systems.	Reference report of the UNEP mercury inventory toolkit.
	Coal mining	Releases to land and water from wet processing methods, such as coal flotation and coal washing.	Pollutant release and transfer registers of the European Union and the United States.
5.1.3	Extraction, refining and use of petroleum	Releases to land and water from oil extraction, oil refining and air-pollution-control systems.	Global Mercury Assessment 2018. Reference report of the mercury inventory toolkit.  Gallup, Darrell L. (Thermachem), Removal of mercury from water in the petroleum industry, Twenty-first International Petroleum Environmental Conference.  Pollutant release and transfer registers of the European Union and the United States.
5.1.4	Extraction, refining and use of natural gas	Releases to land and water from natural-gas extraction and refining.	Reference report of the UNEP mercury inventory toolkit.  Pollutant release and transfer registers of the European Union and the United States.
5.1.6	Biomass-fired power and heat production	Releases to land and water from air-pollution-control systems.	Reference report of the UNEP mercury inventory toolkit.
Source category: Primary (virgin) metal production			
5.2.1	Mercury (primary) mining and mineral processing	Releases to land and water from mining and mineral processing.	Global Mercury Assessment 2018. Reference report of the UNEP mercury inventory toolkit.
	Mining, mineral processing, smelting and roasting of non-ferrous metals other than mercury	Releases to land and water from collected mine drainage, mineral processing, air-pollution-control systems, associated smelting and roasting and process residues.	Global Mercury Assessment 2018 (aluminium, copper, gold, lead, zinc).  Reference report of the UNEP mercury inventory toolkit.

<sup>6</sup> According to paragraph 2 of article 9, “releases” means releases of mercury or mercury compounds to land and water and “relevant source” means any significant anthropogenic point source of release as identified by a party that is not addressed in other provisions of the Convention. In its decision MC-3/4, the Conference of the Parties noted that “while wastewater is addressed under article 9, parties may additionally control wastewater under article 11 of the Convention”.

Source category in the UNEP mercury inventory toolkit		Release sources (not addressed in other provisions of the Minamata Convention) <sup>6</sup>	Documentation of the releases
			Pollutant release and transfer registers of Australia, Canada, the European Union, Norway and the United States.
	Primary ferrous-metal production	Releases to land and water from air-pollution-control systems associated with coke production, coal-tar processing, pig-iron production and process residues.	Pollutant release and transfer registers of Australia and Norway.
Source category: Production of other minerals and materials with mercury impurities			
5.3.1	Cement clinker production	Releases to land and water from air-pollution-control systems; possible releases to land from disposal of process residues such as cement-kiln dust.	Reference report of the UNEP mercury inventory toolkit. Pollutant release and transfer registers of the European Union and Norway. National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry and Standards of Performance for Portland Cement Plants; Final Rule, of the United States Environmental Protection Agency, anticipating wet scrubbers for mercury control. Kogut, Krzysztof, Jerzy Górecki and Piotr Burmistrz (2021), Opportunities for reducing mercury emissions in the cement industry. Journal of Cleaner Production, vol. 29 (April). Du, Wen, and others (2018), Mercury release from fly ashes and hydrated fly ash cement pastes. Atmospheric Environment, vol. 178 (April), pp.11–18.
5.3.2	Pulp and paper production	Releases to land and water from air-pollution-control systems and from process residues.	Pollutant release and transfer registers of Canada, the European Union and the United States.
5.3.4	Production of other chemicals, minerals and materials	Releases to land and water from fertilizer production, dyes, pigments and other chemicals.	Submission by Norway.
Source category: Intentional use of mercury in industrial processes			
5.4.1	Chlor-alkali production using mercury cell technology	Releases to land and water from the production process and from contaminated plants.	Global Mercury Assessment 2018. Reference report of the UNEP mercury inventory toolkit. Pollutant release and transfer register of Norway. Former mercury plant in the United Kingdom of Great Britain and Northern Ireland (Runcom). Euro Chlor Guideline for Decommissioning of Mercury Chlor-Alkali Plants, fifth edition, September 2009.

Source category in the UNEP mercury inventory toolkit		Release sources (not addressed in other provisions of the Minamata Convention) <sup>6</sup>	Documentation of the releases
Source category: Manufacturing of products with intentional use of mercury			
5.5.1–5.5.9	Manufacturing of products containing mercury	Releases to land and water from the manufacture of product categories not listed in annex A to the Convention and product categories below the mercury content limits in annex A.	Global Mercury Assessment 2018. Reference report of the UNEP mercury inventory toolkit.
Source category: Other intentional products/process uses			
5.6.1	Dental	Releases to water, such as from new fillings or from the drilling of old fillings in dental clinics. (Note: parties may, but are not required to, address such releases under article 4.)	Global Mercury Assessment 2018. Reference report of the UNEP mercury inventory toolkit. Dental Effluent Guidelines of the United States Environmental Protection Agency.
5.6.3	Laboratory	Reagents containing mercury and mercury compounds discharged in wastewaters.	
Source category: Production of recycled metals (secondary metal production)			
5.7.1	Production of recycled mercury (secondary production)	Releases to land and water from air-pollution-control systems.	Reference report of the UNEP mercury inventory toolkit. Finster, Molly E., and others (2015), Mercury impacted scrap metal: Source and nature of the mercury, <i>Journal of Environmental Management</i> , vol. 161 (September), pp. 303–308.
5.7.2	Production of recycled ferrous metals (iron and steel). (This includes the recycling of scrap vehicles.)	Releases to land and water from air-pollution-control systems.	Reference report of the UNEP mercury inventory toolkit. Finster, Molly E., and others (2015), Mercury impacted scrap metal: Source and nature of the mercury. <i>Journal of Environmental Management</i> , vol. 161 (September), pp. 303–308. US state of New Jersey, which has imposed air pollution control requirements on electric arc furnace facilities.
	Reuse or recycling of used industrial equipment	Releases may take place during the dismantling of factories, oil rigs, etc. where mercury-contaminated equipment (e.g., pipelines, tanks, heat exchangers) is recycled.	Science for Environment Policy: Ship recycling: reducing human and environmental impacts, European Commission 2016.
Source category: Waste incineration			
5.8.1–5.8.4	Waste incineration	Releases to land and water from air-pollution-control systems associated with hazardous waste, medical waste, municipal waste/industrial waste, and sewage sludge incinerators.	Reference report of the UNEP mercury inventory toolkit. European Union best available techniques reference documents. European Union Best Available Techniques Conclusions for Waste Incineration, which refer to specific limits on releases of mercury from waste incineration.

Source category in the UNEP mercury inventory toolkit		Release sources (not addressed in other provisions of the Minamata Convention) <sup>6</sup>	Documentation of the releases
Source category: Waste deposition/landfilling and wastewater treatment			
5.9.1	Controlled municipal/general waste landfills	Releases to water from landfill leachate.	Reference report of the UNEP mercury inventory toolkit.
5.9.5	Wastewater systems/treatment	Releases/treated wastewater from industrial and municipal wastewater treatment processes. When residues/sludges are incinerated, releases/wastewater from air-pollution-control systems.	Global Mercury Assessment 2018. Reference report of the UNEP mercury inventory toolkit. Pollutant release and transfer register of the European Union. Submission by Norway.
Source category: Crematoria			
5.10.1	Crematoria	Releases to land and water from air-pollution-control systems.	Reference report of the UNEP mercury inventory toolkit.

Table 2

**Additional point source categories that may be included in the broadened release inventories**

Source category in the UNEP mercury inventory toolkit		Release sources (not addressed in other provisions of the Minamata Convention)	Documentation of the releases	Whether addressed in other articles
Source category: Intentional use of mercury in industrial processes				
5.4.2	Vinyl-chloride-monomer production with mercury-dichloride as catalyst	Releases to land and water from the production process and air-pollution-control systems.	Reference report of the UNEP mercury inventory toolkit.	Addressed by article 5.
5.4.4	Other production of chemicals and polymers with mercury compounds as catalysts	Releases to land and water from the production of mercury-containing chemicals and from the use of mercury in production processes (e.g., alcoholate production).	Reference report of the UNEP mercury inventory toolkit.	Production of sodium or potassium methylate and ethylate is addressed by article 5.
	Gold-plating using the fire-gilding process		Minamata initial assessments of Nepal and Sri Lanka.	
	Other processes using mercury or mercury compound catalyst, not listed in annex B to the Convention			
Source category: Manufacturing of consumer products with intentional use of mercury				
5.5.5	Polyurethane with mercury catalyst	Releases to land and water from the polyurethane production process.	Reference report of the UNEP mercury inventory toolkit.	Manufacturing is addressed by article 5.

## **Annex IV**

### **Draft road map for the development of guidance on best available techniques and best environmental practices to control releases from relevant sources**

#### **Release sources covered by the guidance**

At its fourth meeting, the Conference of the Parties to the Minamata Convention will consider the categories of point source of releases proposed by the group of technical experts established in decision MC-2/3, as set out in the appendix to annex III to the present note. These point sources are expected to be covered by the guidance on best available techniques and best environmental practices to be developed by the Conference of the Parties.

Some point source categories may be prioritized for the development of the guidance. As article 9 of the Convention requires each party to identify relevant point source categories no later than three years after the entry into force of the Convention for it, and on a regular basis thereafter, information on the point source categories that have been identified by parties may be compiled for prioritization in the development of guidance on best available techniques and best environmental practices. The first full national reports under article 21, which are to be submitted by 31 December 2021, will include relevant information on the implementation of the provisions of article 9. Minamata initial assessment reports may also contain relevant information on the point source categories for which guidance on best available techniques and best environmental practices is most needed.

#### **Technical information on best available techniques and best environmental practices**

Existing information on specific technologies and practices, taking into account the national circumstances and capacities of developed and developing countries, may be collected for the development of the guidance. Information sources include technical documents used in national and regional contexts, such as best available technique reference documents and national wastewater treatment standards for relevant sources. Parties may be invited to submit such relevant information. International industry associations, other non-governmental organizations and the UNEP Global Mercury Partnership may also wish to submit relevant information.

#### **Structure of the guidance on best available techniques and best environmental practices**

Subparagraph 7 (a) of article 9 of the Convention provides that the guidance should take into account any difference between new and existing sources and the need to minimize cross-media effects. The guidance on best available techniques and best environmental practices in relation to mercury emissions, prepared pursuant to subparagraph 8 (a) of article 8, which sets out a similar requirement, may serve as an example when the Conference of the Parties considers the structure of the guidance on mercury releases.

The guidance should also take into account parties' national capabilities and circumstances, particularly those of developing countries and countries with economies in transition.

#### **Involvement of technical experts**

The group of technical experts may be requested to collect the technical information and draft the guidance. Parties may wish to change the membership of the group, considering the need for further expertise in wastewater treatment and other abatement technologies and practices. The group may wish to cooperate with experts in best available techniques and best environmental practices for specific point source categories.

## Steps to be taken and the related timeline

The table below presents possible stages in the development of the guidance and a related timeline.

Steps and timeline for development of guidance on best available techniques and best environmental practices

<i>Step</i>	<i>Timing</i>
Secretariat to start collecting technical information on best available techniques and best environmental practices, possibly supported by consultants within the resources available.	Immediately after the conclusion of the resumed fourth meeting of the Conference of the Parties.
Secretariat to invite parties, through their respective Bureau representatives, to confirm or change the membership of the group of experts.	Immediately after the conclusion of the resumed fourth meeting of the Conference of the Parties.
Secretariat to compile information on relevant point sources based on the article 21 national reports and other submissions.	Immediately after the conclusion of the resumed fourth meeting of the Conference of the Parties.
Secretariat to circulate a call to parties and other stakeholders to submit existing information on national regulations or industry practices relating to the control of mercury releases from relevant sources.	Immediately after the conclusion of the resumed fourth meeting of the Conference of the Parties.
Group of technical experts to elect co-chairs, identify observers to be invited and agree on its working modalities, including online meetings and face-to-face meetings, within the resources available.	One month after the confirmation of the members of the group.
Group of technical experts to have reviewed the information compiled by the secretariat, with the support of consultants, including the submissions by parties and other stakeholders.	Two months after the submission of the information.
Group of technical experts, with the support of the secretariat and the consultants, to have prepared a first draft of the guidance on best available techniques and best environmental practices.	Three months after its review of the information.
First draft of the guidance to be posted on the Convention website for comments and input.	Immediately after the preparation of the draft.
Deadline for comments from parties and other stakeholders on the first draft.	Two months after the posting of the guidance.
Group of technical experts to have revised the draft guidance taking into consideration the comments received.	Three months after receipt of the comments.
Draft guidance finalized for submission to the Conference of the Parties at its fifth meeting.	Five months before the fifth meeting of the Conference of the Parties.

## Relationship with other articles

In the process of developing the guidance, information relevant to other articles of the Convention, such as article 8 (emissions) and article 11 (mercury waste) may become available. Such information may be incorporated into relevant guidance documents or made available on the website of the Convention.