



## **INFORMATION RELEVANT TO THE IDENTIFICATION OF “RELEVANT SOURCE” CATEGORIES OF RELEASES UNDER ARTICLE 9 FOR WHICH GUIDANCE ON METHODOLOGIES FOR INVENTORY PREPARATION SHOULD BE DEVELOPED**

February 15, 2019

### Executive Summary

The identification of potential “relevant sources” requires interpreting the meaning of three terms in Article 9(2)(b) of the Convention: “significant”, “point source”, and “addressed”. In this document, NRDC interprets these terms, and based upon this interpretation, identifies the following sources as not potentially “relevant sources” under Article 9 since they are currently addressed elsewhere in the Convention:

- Facilities producing mercury-added products subject to a 2020 termination of production obligation in Part I of Annex A (excluding products subject to mercury content limits only);
- Industrial processes using mercury identified in Annex B;
- ASGM sites;
- Interim storage facilities; and
- Waste units managing discarded mercury-added products.

Additional waste management units may be excluded based upon further analysis of the current Basel guidelines by the expert group, or because they do not meet the definition of point source (i.e., waste rock). Whether a source is “addressed” elsewhere in the Convention is not a one-time determination for either the COP or a Party, since applicable obligations and guidelines may change over time. Even though industrial processes using mercury are not potential “relevant sources” under Article 9, the expert group (and the COP) should consider developing inventory and BAT/BEP guidance for the Article 5 sources, since the obligation in Article 5 (and Annex B) to “address” releases to land and water is analogous to the Article 9 obligations.

All other significant sources of releases to land and water are potential “relevant sources” under Article 9. A non-exclusive list of such sources is provided below, accompanied by references in most cases.

## Introduction

The Natural Resources Defense Council (NRDC) submits this information in response to the Secretariat's December 3, 2018 request for information on identifying relevant sources of releases to land and water under Article 9 of the Convention. This information is in two parts. In the first part, NRDC examines the pertinent Article 9 text, to provide the legal basis for the definition of "relevant source". In the second part, NRDC applies this legal reasoning, and identifies potentially relevant sources along with selected references regarding the significance of the sources.

## Definition of "Relevant Source"

Article 9(2) defines "relevant source" to mean "any significant anthropogenic point source of release as identified by a Party that is not addressed in other provisions of the Convention". The word "release" is itself defined to mean "releases of mercury or mercury compounds to land and water". Accordingly, the keys to identifying "relevant sources" under Article 9 are the meaning of "point source", "significant" and "addressed".

*Point source:* The term "point source" is undefined in the Convention. Merriam Webster defines a point source as "an identifiable confined source (such as a smokestack or wastewater treatment plant) from which a pollutant is discharged or emitted."<sup>1</sup> Confined means limited to a particular location.<sup>2</sup> Under this reasoning, the determinative factor is whether the source has clear, finite boundaries.<sup>3</sup> Significantly, the confined area may be the entire unit or structure, or it may apply to the portion of the unit or structure causing the release.<sup>4</sup> For example, in the case of liner failure, the source is the liner failure location (similar to a pipe from a wastewater treatment unit) acting as the conduit for the release.<sup>5</sup> Accordingly, release modes should be considered in identifying whether a source may become a release "point source". It cannot be emphasized enough that under Article 9, the term "point source" applies to releases to both land and water. Relying exclusively upon existing national definitions that apply only to surface water releases would thus be incomplete and create unnecessary complexity, since such definitions were not intended for land releases.<sup>6</sup>

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<sup>1</sup> See <https://www.merriam-webster.com/dictionary/point%20source>.

<sup>2</sup> See <https://www.merriam-webster.com/dictionary/confined>.

<sup>3</sup> In contrast, non-point sources have no discernable boundaries, such as urban or agricultural runoff.

<sup>4</sup> The operative phrase in Article 9 is "point source of release", not facility, structure, or unit point sources.

<sup>5</sup> Under the USA Clean Water Act for example, the definition of "point source" includes any "conduit" or "discrete fissure". See Clean Water Act, Section 502(14); 33 USC Section 1362(14).

<sup>6</sup> For example, in the USA, courts are divided as to whether releases from surface impoundments to groundwater, and then ultimately to adjacent rivers, constitute point source releases to surface waters, because the intervening groundwater may not be a "point source" carrying the pollutants to surface waters. See <http://www.babstcalland.com/wp-content/uploads/sixth-circuit-decisions-create-circuit-split-on-clean-water-acts-regulation-of-discharges-to-groundwater.pdf>. However, for the purposes of the Convention, releases to land are also covered, thus the status of groundwater as a non-point source is irrelevant. The determining factor for the

*Significant:* The term “significant” is also undefined in the Convention. However, the Convention text makes clear that Parties have the discretion to determine which release sources are “significant” (“as determined by the Party”). Further evidence of this intent under Article 9 is the contrasting approach taken in Article 8(2), where relevant air emission sources are defined according to a numeric and objective threshold of relevance (coverage of at least 75% of emissions within the source category). There is no comparable objective criterion in Article 9.<sup>7</sup>

Based upon this understanding of the term “significant”, the inventory guidance should not exclude potential sources based upon the potential magnitude of their releases, unless it could be demonstrated that such sources are universally de minimis (regardless of location or proximity to vulnerable populations), and therefore **could not be** construed as significant by any Party. For other reasons, such as space or resource constraints, the expert group may choose to recommend priorities for inclusion in inventory guidance, but the expert group should be clear on the basis for doing so, and expressly acknowledge the COP may decide other eligible sources should be covered in the inventory guidance as well.

*Addressed:* “Addressed” means “to give attention to or deal with a matter or problem”.<sup>8</sup> Therefore, a source is otherwise “addressed” in the Convention if releases to land and water are, in fact, dealt with outside of Article 9. It is not sufficient if the source is merely mentioned or subject to unrelated control measures. For example, while existing primary mercury mines are subject to a 15-year phase out obligation under Article 3, there are no requirements related to addressing releases to land and water during the period of time the mines remain in operation. Accordingly, existing primary mercury mines cannot be considered “addressed” for the purposes of Article 9.

Based upon this meaning of the term “addressed”, an evaluation of whether sources fall within this meaning has both legal and factual elements. In some cases, the explicit text of the Convention (and related guidance) definitively provide a basis for excluding sources from Article 9 consideration as a legal matter. In other cases, the Convention text is less specific, and associated guidelines less detailed, thus a closer factual inquiry and the exercise of judgment are required.<sup>9</sup>

In our view, there are three categories of facilities which, as a legal matter, can be categorically considered otherwise “addressed” under the Convention: (1) Annex B

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Convention is whether the surface impoundment or the portion of the impoundment where the release originates has a clear, finite boundary.

<sup>7</sup> Indeed, this flexibility in determining “significance” argues for a permissive interpretation of “relevant sources” under Article 9. Where a Party finds a source category causes “significant” releases to land and/or water, and intends to address the category under Article 9, there is little global purpose served by precluding such action under a restrictive interpretation of the potential sources covered.

<sup>8</sup> See <https://dictionary.cambridge.org/us/dictionary/english/addressed>.

<sup>9</sup> Where the Convention obligation expressly requires a Party to “take into account” guidelines developed for this purpose, the content of those guidelines should be evaluated when determining if releases to land and water are otherwise “addressed”.

manufacturing processes in which mercury is used; (2) ASGM sites; and (3) interim mercury storage facilities. Parties which have industrial processes using mercury that are identified in Annex B are expressly required to “address” releases under Article 5, Paragraph 5 (a), and related requirements in Annex B.<sup>10</sup> The similarity in Convention terminology allows for a legal conclusion that such facilities are “addressed” under Article 5.<sup>11</sup>

Similarly, all Parties with ASGM sites are subject to the Article 7(2) obligations to reduce emissions and releases from ASGM sites. In addition, Parties required to prepare ASGM National Action Plans (NAPs) must take actions to eliminate the worst practices, some of which can lead to releases to land and/or water, such as the use of cyanide on mercury-contaminated tailings, and using mercury for whole ore amalgamation. In addition, Parties must include in the NAPs “strategies for promoting the reduction of emissions and releases” and reducing mercury exposures, pursuant to Annex C, paragraph 1(e).<sup>12</sup>

Finally, Parties with interim storage facilities are required under Article 10 to take measures which ensure environmentally sound storage, taking into account the guidelines finalized at COP 2. These guidelines seek to prevent releases to land and water through impermeable barriers, spill prevention, and other means.<sup>13</sup>

Three other Articles of the Convention warrant further evaluation and a closer analysis.<sup>14</sup> Facilities manufacturing mercury-added products are regulated under Article 4 and Annex A. For those mercury-added products specifically listed in Annex A and subject to a 2020 manufacturing phaseout date, the production facilities can be considered otherwise “addressed” under Article 4, since ongoing releases should be prevented or minimized due to the termination of production.<sup>15</sup>

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<sup>10</sup> Industrial processes using mercury not listed in Annex B are not otherwise addressed under Article 5 of the Convention, and thus may be identified as “relevant sources” under Article 9.

<sup>11</sup> However, the COP may choose to include Annex B sources in Article 9 BAT/BEP guidance, since such guidance may be useful in “addressing” releases from Annex B sources under Article 5.

<sup>12</sup> See the ASGM NAP Guidance for recommended elements of such strategies, pp. 53-57, available at [http://www.mercuryconvention.org/Portals/11/documents/forms-guidance/English/ASGM\\_guidance\\_e.pdf](http://www.mercuryconvention.org/Portals/11/documents/forms-guidance/English/ASGM_guidance_e.pdf).

<sup>13</sup> See e.g., Chapter IV.B of the Guidelines.

<sup>14</sup> Whether a source is otherwise addressed under the Convention is not a one-time fixed decision, for either the COP or a Party. As additional guidance is developed, and/or Annexes are amended or added (such as the waste management annex to be developed under Article 11), the universe of sources otherwise “addressed” may change as well, thus the scope of Article 9 should be viewed as subject to change. These comments reflect the current status of applicable Convention text and guidance.

<sup>15</sup> While it could be argued the availability of Article 6 exemptions delaying the phase-out effective date to 2025 means the releases may not actually be addressed by Parties registering for the exemption, the Article 9 obligation to take release control measures is not subject to a deadline, and thus it is not clear the Article 9 control measures would be undertaken well before 2025. Therefore, we do not believe the registration of an exemption until 2025 should alter the application of Article 9 to the product manufacturing sources. NRDC is not addressing potential exemptions beyond 2025 at this time, since COP approval is required for such exemptions, thus the availability of the exemptions is hypothetical at this juncture.

However, if the mercury-added products are not listed in Annex A, or are exempt from Annex A, those sources are not otherwise “addressed”. For example, zinc air and silver oxide button cell batteries are not subject to the phase-out requirements in Annex A, thus releases from facilities manufacturing those batteries are not “addressed” under Article 4. Similarly, products listed in Annex A that are subject to mercury content limits rather than a complete production phase-out, such as some lamp categories, cannot be considered “addressed”, since the content limits were not set based upon release potential and significant releases may still occur from ongoing production.

Finally, dental offices cannot be considered “addressed” since the application of best practices to reduce mercury releases is only one of nine potential measures Parties may take under Annex A, Part II. Since Parties are obligated to choose only two of the nine measures listed, it is possible that release prevention will not be one of the options chosen by many Parties.<sup>16</sup>

Under Article 8 and Annex D, five categories of facilities are subject to air emission control measures. And under the Convention definition of “best available techniques”, technologies identified as BAT are the “most effective to prevent and, where that is not practicable, to reduce emissions and releases on the environment as a whole....” However, under Article 8, Parties are provided five options for controlling air emissions from existing sources, and only one of the five options involve applying BAT/BEP technologies. The other four options under Paragraph 5 of Article 8 do not even mention releases to land or water. Accordingly, releases from existing Annex D facilities to land and water cannot be considered addressed by Article 8.

Moreover, although application of BAT/BEP is required for new facilities under Article 8, releases to land and water are still not “addressed” for new facilities. As the excerpt from the BAT/BEP guidance immediately below acknowledges, the primary emphasis in identifying BAT/BEP was air emissions control, and other Articles of the Convention are still relevant for addressing releases to land and water.

#### 1.10 Cross-media effects

Mercury emissions from the source categories listed in Annex D can be controlled or reduced using the techniques described in this guidance. Information on cross-media effects relevant to each source category is provided in the respective chapters on those source categories. The mercury that is removed from flue gases will appear elsewhere – for example, in solid phases such as fly ash or bottom ash, or in liquid or solid-liquid mixed phases such as sludge. Because mercury may be more concentrated in these materials than in input materials, care should be taken to avoid the potential for mercury release through leaching, or cross-media transfers of mercury and other constituents of

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<sup>16</sup> Other possible dental amalgam measures listed in Annex A may not materially affect current mercury releases to water, such as the setting of national objectives aimed at dental care, and the promotion of research of mercury-free alternatives.

concern resulting from the disposal of such residues, or from their use as components in other processes. In defining BAT/BEP at the national level, regulators should take into account these factors. *Other articles of the Convention may be relevant, in particular Article 11, on mercury wastes.*<sup>17</sup>

For example, coal washing is a method for reducing air emissions, and is a major source of releases to adjacent surface waters.<sup>18</sup> The Article 8 BAT/BEP guidance focuses on the air emission aspects, and simply notes the potential for releases without specifying techniques for preventing or minimizing releases –

*Cross-media effects of coal washing*

Coal washing generates waste slurry which contains mercury. There is potential soil or groundwater contamination if coal washing slurry is not safely managed<sup>19</sup>

Mere exhortations of safe management, and the complete omission of treating/managing releases to surface waters, cannot be considered actually “dealing with” releases to land and water.

Moreover, releases to land and water from these facilities may be caused by portions of new facilities unrelated to the source category listing in Annex D.<sup>20</sup> This is because Annex D sometimes targets only a specific portion of the facilities subject to emission control measures, not the entire facility.<sup>21</sup> Therefore, at industrial gold facilities for example, releases to land and water may be associated with heap leaching operations, which are not covered by the source description in Annex D.<sup>22</sup>

The third category of facilities warranting further discussion are waste management facilities regulated under Article 11 of the Convention. Under Paragraph 2 of Article 11, the definition of mercury waste currently excludes overburden, waste rock, and tailings from non-primary mercury mining sites, thus these sources of releases to land and water cannot be considered “addressed” under Article 11.<sup>23</sup>

For other mercury wastes, Paragraph 3(a) of Article 11 obligates Parties to take measures so that mercury waste is managed in an “environmentally sound manner, taking into account guidelines developed under the Basel Convention....” For certain

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<sup>17</sup> See BAT/BEP Guidance Introduction, 2016, Section 1.10.

<sup>18</sup> See e.g., Liu et al, Mercury Release to Aquatic Environments from Anthropogenic Sources in China from 2001 to 2012, *Environ. Sci. Technol.* 2016, 50, 8169-8177.

<sup>19</sup> Coal Fired Power Plant and Industrial Boiler BAT/BEP Guidance, 2016, Section 3.1, available at <http://www.mercuryconvention.org/Convention/Formsandguidance/tabid/5527/language/en-US/Default.aspx>.

<sup>20</sup> See e.g., [http://www.mercuryconvention.org/Portals/11/documents/forms-guidance/English/BATBEP\\_nonferrous.pdf](http://www.mercuryconvention.org/Portals/11/documents/forms-guidance/English/BATBEP_nonferrous.pdf), Chapter I.

<sup>21</sup> See e.g. “smelting or roasting processes used in the production of non-ferrous metals”, or “coal-fired industrial boilers” which may be located at a large variety of industrial facilities and institutions.

<sup>22</sup> See <https://archive.epa.gov/epawaste/nonhaz/industrial/special/web/pdf/gold.pdf>, pp. I-52, I-53.

<sup>23</sup> Should the COP set thresholds for these wastes, they may subsequently be addressed under Article 11.

Overburden and waste rock may not be confined to well defined areas, and thus may not be point sources. Tailings are typically in dammed impoundments, and thus are in confined areas. Releases from such impoundments can occur through dam breakage (conduits) or liner failure (discrete fissures).

wastes, such as discarded mercury-added products, the current Basel guidelines contain detailed descriptions of recycling/treatment/disposal options, such as engineering descriptions for landfills receiving such wastes. Where the guidelines provide such coverage, waste management sources of releases are “addressed” under Article 11.

However, as a generic matter, the current Basel guidelines contain only a cursory discussion of wastewater discharged directly to surface waters, the principle water release pathway covered by the upcoming Global Mercury Assessment.<sup>24</sup> There are several short paragraphs discussing several potential wastewater treatment techniques (i.e., chemical oxidation, chemical precipitation), but virtually nothing regarding appropriate discharge limits; BAT/BEP for controlling releases from any of the relevant sources; or considerations for designing, constructing, or maximizing performance of wastewater treatment facilities.<sup>25</sup> In short, the Basel guidelines lack sufficient information to prevent or minimize releases of wastewater to surface waters, and thus cannot be considered “addressed” under Article 11.

For other wastes, NRDC recommends the expert group conduct a factual inquiry as to whether the Basel guidelines sufficiently “address” releases to land and water. The expert group should identify priority waste facility types, such as fly ash disposal sites, and determine whether the Basel guidelines can be considered “addressing” potential releases to land and water.<sup>26</sup>

### Partial List of Potential Relevant Sources Under Article 9

Based upon the context discussion above, the following sources may be considered potential relevant sources under Article 9:

- Primary mercury mines<sup>27</sup>
- Oil and gas production facilities<sup>28</sup>

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<sup>24</sup> See [https://wedocs.unep.org/bitstream/handle/20.500.11822/25462/GMA%202018-ReviewDraft\\_250518\\_CLEAN\\_SEC.pdf?sequence=1&isAllowed=y](https://wedocs.unep.org/bitstream/handle/20.500.11822/25462/GMA%202018-ReviewDraft_250518_CLEAN_SEC.pdf?sequence=1&isAllowed=y), pp. 36-41 (hereafter “Draft 2018 Global Mercury Assessment”)

<sup>25</sup> See Basel Technical Guidelines on the Environmentally Sound Management of Wastes, pp. 45-6.

<sup>26</sup> We note that a draft decision has been prepared for the upcoming Basel Convention COP to revise and update the mercury waste management guidelines. The release expert group should follow these deliberations, and the scope of the revisions planned, to determine how such revisions may impact the identified Article 9 relevant sources.

<sup>27</sup> Vishnivetskaya et al., Microbial Community Structure with Trends in Methylation Gene Diversity and Abundance in Mercury-Contaminated Rice Paddy Soils in Guizhou, China, *Environ. Sci. Proc. Impacts*, 2018, 20, 673; Streets et al., Total Mercury Released to the Environment by Human Activities, *Environ. Sci. Technol.* 2017, 51, 5969-5977, Table 1.

<sup>28</sup> Draft 2018 Global Mercury Assessment, pp. 36-41, available at [https://wedocs.unep.org/bitstream/handle/20.500.11822/25462/GMA%202018-ReviewDraft\\_250518\\_CLEAN\\_SEC.pdf?sequence=1&isAllowed=y](https://wedocs.unep.org/bitstream/handle/20.500.11822/25462/GMA%202018-ReviewDraft_250518_CLEAN_SEC.pdf?sequence=1&isAllowed=y).

- Product manufacturing, except those listed in Annex A as subject to a complete 2020 production termination deadline<sup>29</sup>
- Dental offices<sup>30</sup>
- Coal-fired power plants<sup>31</sup>
- Coal washing facilities<sup>32</sup>
- Coal-fired industrial boilers
- Non-ferrous metal production (zinc, copper, lead, industrial gold) facilities, including but not limited to tailings waste management units<sup>33</sup>
- Silver production, including tailings management units<sup>34</sup>
- Waste incineration facilities
- Cement production facilities<sup>35</sup>
- Municipal wastewater discharge sources<sup>36</sup>

In addition to the potential sources listed, the expert group should evaluate whether significant sources of releases from waste management are, in fact, addressed under the Basel guidelines. Of particular concern is coal ash managed in units other than engineered landfills, such as surface impoundments, and waste recycling facilities.<sup>37</sup>

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<sup>29</sup> Hu Y, Cheng H, Mercury risk from fluorescent lamps in China: Current status and future perspective, *Environ Int* (2012), doi:10.1016/j.envint.2012.01.006.

<sup>30</sup> 82 Fed. Reg. 27154 (June 14, 2017), available at <https://www.govinfo.gov/content/pkg/FR-2017-06-14/pdf/2017-12338.pdf>; <https://www.epa.gov/eg/dental-effluent-guidelines#documents>.

<sup>31</sup> Wastewater associated with wet scrubbers is a major contributor to releases from this source category. Draft 2018b Global Mercury Assessment; pp. 36-41 and the associated Draft Technical Background Document (hereafter “GMA Technical Background Document”), Chapter 5, p. 21, available at [https://wedocs.unep.org/bitstream/handle/20.500.11822/25464/TechnicalBackgroundReport\\_250518.pdf?sequence=1&isAllowed=y](https://wedocs.unep.org/bitstream/handle/20.500.11822/25464/TechnicalBackgroundReport_250518.pdf?sequence=1&isAllowed=y); [https://www.epa.gov/sites/production/files/2015-06/documents/steam-electric\\_detailed\\_study\\_report\\_2009.pdf](https://www.epa.gov/sites/production/files/2015-06/documents/steam-electric_detailed_study_report_2009.pdf);

<sup>32</sup> Draft 2018 Global Mercury Assessment, pp. 36-41; GMA Technical Background Document, Chapter 5, pp. 22-23.

<sup>33</sup> Draft 2018 Global Mercury Assessment, pp. 36-41; Streets et al., supra, Table 1: <https://worldminetailingsfailures.org/>.

<sup>34</sup> Streets, et al., supra, Table 1; Diaz, An Assessment of Primary and Secondary Mercury Supplies in Mexico, Commission for Economic Cooperation, 2013, available at <http://www3.cec.org/islandora/en/item/11208-assessment-primary-and-secondary-mercury-supplies-in-mexico-en.pdf>.

<sup>35</sup> Streets, et al., supra, Table 1.

<sup>36</sup> Draft 2018 Global Mercury Assessment, pp. 36-41.

<sup>37</sup> See e.g., <https://www.epa.gov/coalash/frequent-questions-about-2015-coal-ash-disposal-rule>.