Hazardous Characteristic H13 – Its Meaning and Importance to the Basel Convention

Submission to the Parties of the Basel Convention by the Basel Action Network (BAN)

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1. Introduction

The Basel Action Network (BAN) believes that the Parties of the Basel Convention can no longer afford to delay implementation of hazardous characteristic H13 found in Annex III of the Basel Convention. Delays in implementation stem from a variety of reasons including the difficulty in understanding the meaning and implication of H13. However after 8 years (since entry into force of the Convention) it is time to come to terms with this important characteristic in order to fulfill the original mandate of the Convention to protect the environment from the threat posed by hazardous wastes. Not only is H13 a legal requirement of the Convention, but without it, regulators are left without an important safety-net which can help them at times to prevent serious environmental harm.

BAN hopes with this paper to demystify H13, to clarify its unique necessity, to offer a practical approach for its implementation, and to provide recommendations to begin to move this process forward. We welcome your comments on this paper.

2. Definition

H13 is the last hazardous characteristic listed in Annex III of the Basel Convention. It is defined as follows:

“Capable, by any means, after disposal, of creating another substance (e.g. leachate) that exhibits any of the hazardous characteristics listed above (H1-H12).”

It is important to isolate and then examine the key phrases and terms of this definition in order to gain an understanding of the utility of this characteristic to regulators.

“capable, by any means” -- There are two possible literal interpretations of these words. First one could read this as meaning any means possible that one might envisage, or alternatively, any means possible in the specific disposal instance that will be carried out or is intended to be carried out.
BAN would argue that the only workable interpretation is the latter one -- the capability “by any means” at a proposed disposal destination utilizing a known process there. Otherwise one might imagine a disposal operation which could render any Annex I material hazardous by H13 and therefore every waste could be hazardous under H-13. This was clearly not the intent of the framers of this characteristic. Consequently we believe that “capable by any means” implies “any means possible within the context of a known waste disposal (Annex IV) destination.”

“after” -- At first this word might appear controversial as some have argued that the word “after” might exclude some by-products of disposal operations such as products of combustion as these can be said to be formed “during” disposal as well as “after”. However the idea of excluding by-products that might form very close to the act of combustion or even during the act of disposal is not correct from either a scientific, legal or “common sense” interpretation.

First, in the example of incineration, the recombination of atoms into new molecules for example, follows the application of heat by some element of elapsed time – that is the physical act of atoms splitting and recombining takes time following the application of heat which commences the disposal operation. Several studies have indicated in fact that the recombination most often occurs during the moments when the chemicals are cooling again following high heat. Thus from a scientific point of view, the recombination does occur “after” the disposal operation (incineration, or application of heat) takes place.

However that explanation is really not necessary when one realizes that under the Convention, the definition of disposal (Annex IV) includes “storage pending” disposal and “accumulation” pending recycling. Thus even the holding of waste in a facility prior to actually processing or depositing it, is considered disposal under the definition. Thus legally, anything that follows those actions that are inevitably part of almost any operation can be considered to be “after” disposal.

Finally, common sense dictates that “splitting the hairs” of just precisely when “another material” appears is besides the point from an environmental point of view. We are concerned in the Basel Convention about addressing environmental problems. Certainly if they occur days following disposal as is the case with leachate, we should be as concerned if these new problems occur at once, or within milliseconds. The important matter is whether or not the waste creates an unforeseen hazardous material as a result of disposal.

“disposal”-- Quite simply this is already defined in the Convention in Article II: Any of the operations listed in Annex IV. Some, in order presumably to protect their incineration industry and investment in it, have argued for limiting the operations to ones which might only produce leachate. However this is not possible without re-defining disposal by amending the Convention.
“of creating another material” -- According to the example given, “(e.g. leachate)” it is clear that the framers of H13 did not intend a strict interpretation of “another material.” “Leachate” does not refer to the arising of different chemical species but rather refers to existing chemicals that have become dissolved in solution and thus gain significantly new characteristics (e.g. become mobile in water). This interpretation seems to indicate that significant changes that might have otherwise kept the waste from being considered a hazard under H1-H12 are relevant here. The interpretation will thus likely include changes to the material such that produce new chemical composition, different phase, enter into solution, or perhaps even change concentration (e.g. in the case of exceeding a de-minimus level”). These examples all indicate a material that has transformed via disposal in a significant way from the original input material.

“e.g. leachate” — “e.g.” stems from the Latin “exempli gratia” which means “for example”. Thus it is absolutely clear that this is but one example of many possible examples, which is given here for illumination and not for limitation.

“that exhibits one of the hazardous characteristics listed above” -- Quite simply, H13 will not apply unless the new substance is hazard according to the H1-H12.

3. H13 – A Unique and Necessary Characteristic

BAN believes that H13 is a unique but nevertheless very necessary characteristic. It is unique for two reasons:

a) The H13 characteristic can involve substances that are not listed in Annex I (but that are derived from Annex I wastes).

b) The H13 characteristic must be determined with knowledge not only of the intrinsic properties of the waste, but its eventual fate as well. This knowledge will most often need to be site and situation specific.

H13 is seen as a very necessary characteristic as it captures some serious environmental problems within the scope of hazardous waste management that would otherwise remain uncontrolled and outside of the scope of the Basel Convention.

In actuality there will likely be three main categories of H13 wastes:

1. Materials that become more biologically available or exceed a de-minimus due to disposal (e.g. leachate)
2. New chemical compounds by virtue of thermal treatment or combustion.
3. Chemical degradation or transformation products due to disposal.

Of the above categories, a case can be made that the first and second categories will likely be the most important. While attention has already been paid to the H13 application with respect to leachate, very little attention has been paid by the Parties to
date to the very important concern of new by-products of combustion or thermal treatment. Dioxins and Furans (two unwanted recombinant compounds) have recently been indicated in a draft United States Environmental Protection Agency Dioxin Reassessment to be ten times more hazardous to humans than previously believed and a definite human carcinogen.

These dangerous by-products are known to come from a variety of disposal and recycling operations. Wastes on Annex I which otherwise might not be considered hazardous under the Basel Convention can produce dioxins in hazardous concentrations following disposal. As combustion technologies for waste disposal are already prevalent and are still being marketed aggressively around the world, this poses serious concerns particularly in developing countries that are likely to lack the resources to install the necessary end-of-pipe, dioxin/furan containment and disposal systems.

The current UNEP negotiations to elaborate a convention for the elimination of persistent organic pollutants (POPs) considers the elimination or reduction of dioxins and furans to be a high priority and therefore the Basel Convention should likewise cooperate in ensuring the achievement of that goal.

4. H13 -- Myths and False Fears

1. “H13 will make everything a hazardous waste” – This statement is untrue as only inputs which are on Annex I can be considered to be a hazardous waste under the Basel Convention and then only those which are not already considered hazardous by virtue of H1-H12 and produce “another material” which is hazardous by virtue of H1-H12. In fact very few wastes will actually qualify for H13 consideration. Even if one were to consider the case where a waste material is considered on Annex I by virtue of being contaminated by an Annex I constituent, it still can only be considered if the material of concern is indeed an Annex I constituent. In other words, the fear that materials such as waste paper and rags would always be considered hazardous wastes under H13 is unfounded unless these materials are contaminated for example with PCBs in which case they will certainly need to be scrutinized carefully.

2. “H13 was historically only meant to apply to leachate” -- This can hardly be considered to be true as the definition is very explicit in using leachate only as an example. If leachate had been the only concern the definition would have read more simply “Capable, by any means, after disposal, of producing leachate….”

3. “after disposal” rules out products of combustion as these occur during and not after disposal” – This is a dubious and non-useful attempt at legal hair-splitting. As explained previously, it is erroneous from a scientific, legal and common sense point of view. The point here is clearly does “another material” form as a result of disposal.
4. “H13 is redundant with respect to the Basel Convention’s requirement that there be Environmentally Sound Management (ESM) -- ESM is a Basel Convention requirement that will not be invoked unless a waste falls under the scope of the Basel Convention. H13 is needed to determine whether ESM will need to be applied and thus there is no redundancy whatsoever.

5. “H13 is unworkable as it demands that the eventual destination of the waste be fully understood.” -- H13 does add an extra step to a regulators process but only in those cases where the waste in question appears on Annex I and does not present an H1-H12 characteristic. It will also likely require an updating of Annexes VIII and IX once the examples of H13 problems are revealed. But the extra H13 step can hardly be seen to be unworkable and it is a legal requirement of the Convention.

5. H13 in Practice

To date H13 has largely been ignored by the Parties in their implementation of the Convention. Further delay in the implementation of H13 can no longer be seen as acceptable from a legal or environmental standpoint. Rather, its time to move forward and come to terms with a pragmatic approach.

Annexes VIII and IX and H13

It is also important to note that in all of the work done in the development of Annexes VIII and IX it appears that at times H13 was considered, such as in footnotes and caveats which reflect undesirable disposal methods, whereas, in other instances it does not appear to be considered at all, as in the case of asbestos recycling operations. The truth is that H13 has not really been considered in the development of Annexes VIII and IX. The attempt to adjust those annexes according to H13 will require an investigation of disposal operations around the world and the problems that arise from them. This will for many reasons be an invaluable addition to environmental literature but is essential if we are to thoughtfully apply H13 to Annexes VIII and IX. Once this type of research is conducted, it is clear that the new Annexes can and must be adjusted with clear distinctions spelling out the H13 concerns with respect to the disposal of various waste streams. To date however, Annexes VIII and IX can be seen as particularly useful with respect to H1-H12 determinations but not useful for H13.

Decision Maker’s Flow Chart

Perhaps the best way to discuss the utility and implementation of the H13 characteristic is by describing a decision maker’s step-by-step strategy for determining whether any waste is a Basel hazardous waste, with an accompanying decision flow-chart. Next it will be useful to provide some specific examples of H13 applications.
It is important to realize that H13 will not need to be considered at all except in those cases where the waste in question is actually on Annex I and does not seem to be covered by Annex III (H1-H12). H13 potential then should be examined as a final safety-net check to determine whether the waste might cause problems according to H13 which otherwise may not be controllable under the Basel Convention.

As a prerequisite, a decision maker will need to determine whether the material in question is a waste. This can be accomplished by virtue of national legislation defining waste and by utilizing the Basel definition that defines waste in terms of its Annex IV destination, including all recycling destinations. If the material is a waste then we can begin the steps of determining whether it is a hazardous waste under the Convention.

**Step one** entails determining whether the waste in question is on Annex I. Annex VIII may provide some extra insurance in this regard as presumably all wastes listed on Annex VIII contain Annex I constituents. Special concern must be given to the issue of wastes that on their own are not seemingly on Annex I but which may be contaminated with Annex I constituents. This is especially a concern when only small quantities of halogens which might appear in Annex I, can in thermal treatment and disposal produce very hazardous concentrations of dioxins/furans. If the waste does not contain significant quantities of Annex I constituents then the waste cannot be a Basel hazardous waste unless it is considered hazardous waste by a state of concern (importing, exporting or transit state by virtue of Basel Article 1.1,b).

If the waste is on Annex I, then the **second step** entails determining whether it is hazardous by virtue of H1-H12. Again Annex VIII can be useful here as presumably all of these wastes do exhibit an H1-H12 characteristic. This determination should be made prior to making an H13 determination as it is far easier to accomplish this than to the final H13 step which may in fact prove to be unnecessary. If the waste is hazardous according to the criteria H1 – H12 then the waste is hazardous under the Basel Convention. If it does not exhibit these characteristics it must undergo the safety-net test of H13.

The **third step** (shaded in the chart) is the H13 step. This step entails an understanding of the disposal operation and its propensity to create an H13 hazard. Ideally, testing of pollution generated by the facility should be undertaken, including such issues as fugitive emissions, concentration increases, dioxins and furan generation and release, mobility in air and water, occupational and community exposure, uptake in food, etc. should be considered here. If the waste can be said to exhibit an H13 hazardous characteristic then it is indeed a Basel hazardous waste.

If it does not, then a decision maker must consider the **fourth and final step** -- the determination of whether the waste is considered to be hazardous under the national law of the exporting, importing or transit state according to Article 1, paragraph 1, b.

**Examples of Possible H13 Application**
1. **Waste wood treated with pentachlorophenol** can be said to be an Annex I waste by virtue of Y39, yet can also be argued not to exhibit any of the H1-H12 hazardous characteristics in its whole less-dispersable state. However, it is being exported and imported for the purposes of burning in a wood furnace to heat the schools of a certain village. This process is known to produce high levels of dioxins and furans. The entry of this material that is so dangerous when burned, is controllable under the Basel Convention by the utilization of H-13.

2. **Waste transformers containing PCBs** are listed on Annex I (Y10) but contain levels below 50 ppm. These levels have been determined by the TWG as levels that ordinarily do not possess a hazardous characteristic and thus are excluded on Annex VIII. These wastes however are being exported for processing in a manner which involves using handheld blowtorches. The fumes from this operation are known to produce significant concentrations of dioxins and furans even from these low levels of PCBs. This export and disposal operation might be outside of the scope of the Basel Convention without the use of H-13.

3. **Waste brake pads and shoes which contain asbestos**, are on Annex I (Y36) but can be considered to not exhibit an H1-H12 characteristic by virtue of the fact that they are bound in what appears to be a non-dispersable matrix of the brake pad. However they are to be exported and imported to a facility that in the open air, grinds the asbestos pads away in order to reuse the brake shoe. Just as leachate can be considered to be a new material as it enters solution phase, airborne asbestos can be considered to be a new material from the original bound asbestos form and thus can be regulated through H13.

4. **Slag from copper smelting containing the Annex I material arsenic (Y24)** is deemed by authorities not to exhibit the hazardous characteristic of H1- H12 following laboratory leach testing. However, the slag is to be exported for a recycling process that involves grinding the material up and depositing it on school playgrounds. This practice is shown to harm workers as well as leach into rain puddles in the schoolyard. The airborne dust from the grinding and the subsequent leaching from the roadway were not foreseen by the laboratory testing. H13 can be utilized in this case to claim that the dust and leachate are “another material” significantly different from the original waste slag and thus ensure that the waste trade in question falls under the scope of the Basel Convention and its obligations.
Flow Chart to Determine Whether a Waste is a Basel Hazardous Waste

Waste (material destined for Annex IV destination)

On Annex I and/or Annex VIII?

NO

Is it considered a hazardous waste by a State of Concern? (Article 1, 1, b)

YES

Is it a Basel Hazardous Waste

NO

Is the waste on Annex VIII and/or does it exhibit H1-H12?

YES

Is the waste capable by any means of producing another material following the proposed disposal operation that exhibits H1-H12?

NO

NOT A BASEL HAZARDOUS WASTE

YES

BASEL HAZARDOUS WASTE
6. Conclusion and Recommendations

The hazardous characteristic known in Annex III of the Basel Convention as H13 is a vital safeguard to ensure that wastes that have the ability to become significantly transformed to the detriment of the environment as a result of disposal processes, are covered under the Basel Convention. H13 is a unique but necessary characteristic that serves as a final safety-net when making a determination as to whether a waste will be hazardous given its ultimate disposal fate, and thus whether or not it will be regulated under the scope of the Convention.

For too long the Basel Parties have chosen to ignore implementing H13. This “head-in-the-sand” approach is not legally acceptable, nor is it responsible from an environmental point of view. Rather the Basel Parties must now take steps to implement this hazardous characteristic even if it is not currently being used to date by many Parties. Far from being an ill-conceived waste management headache, H13 will serve regulators as an extra, invaluable tool that can be used to prevent unforeseen waste catastrophe resulting from unforeseen hazards hidden within a seemingly harmless waste.

However, it is our view that the nature of H13 is such that until it is more fully explored it will be impossible to provide sufficient guidance on it other than an interpretation of the definition. For this reason the finalization of the H13 guidance paper and the adjustment of the Annexes according to the H13 criteria should follow and not lead a much more thorough investigation.

BAN recommends the following:

1. First the Basel Parties must agree that it is time to collectively commit to seriously addressing all aspects of the H13 characteristic beyond the one example given of leachate.

2. The Basel Parties should submit this desire to the Basel Secretariat as soon as possible in response to the questionnaire sent to all of the Parties on June 1, 2000.

3. The Technical Working Group (TWG) must undertake to better understand the H13 implications of common waste disposal methods by conducting a thorough examination of the historical and current experiences of pollution coming from Annex IV disposal operations around the world. Just as the TWG has recently examined the intrinsic hazards of wastes in the development of Annexes VIII and IX, it is important to do the same for disposal operations.

4. The TWG, on the basis of the study in (3) above, should undertake to propose amendments to Annexes VIII and IX and to finally prepare the final guidance paper on the use of H13.

END