STATEMENT OF THE CANADIAN PAINT MANUFACTURERS ASSOCIATION FOR THE WORKSHOP ON HAZARDOUS WASTE, WEDNESDAY OCTOBER 25, 1978

Richard W. Murry
Technical Director

STATEMENT OF INTEREST

The Canadian Paint Manufacturers Association, the industry's national organization, was founded in 1913. Located in Montreal, it has a permanent staff and represents around 80% of the industry's sales. In addition, the principal raw materials suppliers to the industry are also members of CPMA.

In order to produce the wide variety of paints and coatings currently marketed by the paint manufacturing industry, CPMA members use literally thousands of raw materials. By virtue of the variety of raw materials used to fabricate the products of our industry, (all having the potential to become "waste" in one form or another) we have a deep interest in the management of "hazardous" waste. We are, therefore, most concerned that the definition and identification of "hazardous waste" be based on sound scientific principles and the "real world" situation relating to waste disposal and its effect on the ambient environment.

INTENT OF THE WORKSHOP

After reviewing the supportive information supplied as background for the workshop, CPMA notes that the intent is to develop a "...universally acceptable definition of what constitutes a hazardous waste ". Further, it is noted that the definitions offered for review were developed on the "statutory" or "regulatory" level. It appears then that this is the level on which the Workshop hopes to develop a definition. This intended level is confirmed by the statement that "Implementation definitions go beyond the scope and level of detail possible in this subproject."

While CPMA can agree that it would be most difficult to develop "implementation definitions" or an identification system for hazardous waste, we urge that the element of the identification system (which will ultimately be the compliance working tools) be addressed in the development of any "statutory definition".

ELEMENTS FOR THE IDENTIFICATION OF A HAZARDOUS WASTE

In the identification of a hazardous waste there are a number of considerations that must be addressed before a material can be properly deemed a hazardous waste. The utilization of these considerations, in

arriving at that final pronouncement, is far from simple given the number of variables present that relate to waste disposal.

In order to identify any "hazardous material" such as "hazardous waste", there are two prime factors to consider. First, is an assessment of the dangerous physical or chemical characteristics inherent in the substance and secondly, the availability of the substance to adversely affect the organism in question; be it man, animal, vegetable or microbe. This adverse effect may take the form of a direct effect, or an action on the "environment", which may have a secondary, tertiary (etc.) effect on an organism.

CPMA notes that many jurisdictions, in attempting to identify a "hazardous waste" often use the word "hazardous" interchangeably with words such as "dangerous" ("poisonous", "toxic" etc.). It is important that a distinction be made between a dangerous characteristic of the substance such as toxicity, and the hazard that may develop as a result of that characteristic. Therefore, these comments regarding the elements to be considered in the identification of a hazardous waste presupposes the fact that the assumption has not been made that once a material has been disposed of in the environment, it is automatically capable of fulfilling its inherent dangerous properties and becoming a hazard.

Among the dangerous characteristics to be considered are:

1) Toxicity
2) Flammability (often called Ignitability)
3) Reactivity
4) Corrosiveness (often classified under toxicity)
5) Radioactivity
6) Infectiousness (often classified under toxicity)

In order for these dangerous properties to fulfill the hazardous potential, a second group of "availability" considerations must be taken into account. These are:

1) Bioavailability
2) Persistence
3) Presence of an Initiating or Catalytic Agent

A brief discussion of each of the dangerous characteristics and applicable interface with the availability criteria follows. It should be noted that the first four characteristics have the potential for applicability to wastes generated by the paint manufacturing industry. Radioactivity and Infectiousness would not be a real concern relative to paint wastes.

TOXICITY

Toxicity has been often confused with hazard in a number of arenas, and attempts to develop definitions on hazardous waste have not been immune. All materials possess a degree of toxicity. Paracelsus, a sixteenth century Austrian scientist noted this, when he said: "All substances are poisons. The right dose differentiates a poison and a remedy". It is therefore, inexact to define a material as a hazardous material solely on its toxicity. Considering the toxicity of a substance without considering its ability to initiate the toxic effect is an error. For example, consider the three availability characteristics.

The bioavailability of the substance is of prime importance, when considering toxicity. Obviously, if the material is not available to the organism, or more appropriately, available to the specific site of attack in the organism, then the material does not present a hazard through its toxicity. As an example, Asbestos is a material, whose toxic nature has been demonstrated to cause several lung diseases, including cancer. It has also been indited in several other cases as being responsible for the development of disease, including diseases of the gastro-intestinal tract. For asbestos, to present a hazard through its toxic nature, it must be available to be inhaled and/or ingested.

Consider then an asbestos waste dumped into a body of water where it has the possibility of introduction into a public water system. Or what of asbestos fiber wastes discarded in an open dump, where the wind could carry the fiber dust into the ambient air of a nearby town. In both instances, the asbestos waste would be properly classified as a hazardous waste.

However, consider asbestos fibers dispersed in a resinous medium or a bituminous binder. The fibers, completely encapsulated. still possess the inherent toxic ability to cause the aforementioned disease states. However, by virtue of the encapsulation, they are not available (and indeed are not likely to be available) to the lung or G.I. tract. Hence, in this instance, asbestos based on its toxic nature, would cease to be a hazardous waste.

Persistence is the second consideration of the toxicity of a material. This would involve the ability of the substance to retain its original toxicity in light of environmental factors. In other words, its "persistence in the environment". This persistence factor is a two edged sword. The change (usually a "break-down" or "degradation") may form a less toxic substance or substances, or form more toxic substances.

The toxicity of the end product of the chemical reaction of two or more substances would be most difficult to quantify. However, the likely presence of an initiating or catalytic agent to form a more toxic material must be addressed.

FLAMMABILITY (Or IGNITABILITY)

Here again flammability is an inherent characteristic of the substance. Acetone is an extremely flammable material having a flash point of around -18°C. A drum of waste, in which the volatiles are 100% acetone, would indeed be properly classified as a hazardous waste. But, consider a drum of waste, in which the volatiles consisted of 98% water and 2% acetone. Although the flashpoint of the acetone is still - 18°C the flammability hazard presented by a 2% acetone - 98% water mixture is substatially reduced, if not eliminated. Like the persistence example given in the toxicity discussion, if the flammable substance is capable of undergoing a conversion or degradation process, it may lose (or also gain) the flammable nature.

The presence of an initiating or catalytic agent is, with flammability, A PRIME CONSIDERATION. Going back to the old "Oxygen-Fuel-Source of Ignition" triad, if one of the other two (oxygen or source of ignition) is not available (or potentially available) the flammable waste is not hazardous.

REACTIVITY

Like flammability and toxicity, reactivity is an inherent property of the substance in question. Consider a reactive material like Methyl Ethyl Ketone Peroxide. A five gallon pail, consisting of a high percentage of MEK Peroxide, if exposed to sudden shock or a reducing agent would constitute, a hazard by anyone's identification system. However, if the material is sufficiently dilute or dispersed in an "inert" material then, the hazard might be eliminated.

With respect to persistence, the same concern exists for a reactive material as for the other dangerous properties. If, under ambient conditions, the substance has the potential for breaking down or converting to other compounds, then, the hazard should be assessed in that light.

The presence of an initiating or catalytic agent is an important factor in the consideration of a reactive material. While the hazard associated with some reactive materials can be realized without the presence of an initiating agent, most involve an outside influence. If that influence is not present (or potentially available) to the reactive material then the hazardous potential cannot be fulfilled.

CORROSIVENESS

It is interesting to note that several jurisdictions addressing hazardous wastes define corrosiveness as a dangerous property. While the ability of a "corrosive" material to do harm to an organism has often been classified as a "toxic" property, there has also been the inclusion of

Corrosive definitions that would address damage to buildings or "the environment" thus having the secondary or tertiary effect cited above.

Persistence might affect the ability of the substance to retain its original corrosive nature (pH etc.) in light of environmental factors. Here again, consider if the material can convert to a more hazardous form (or if a relatively innocuous material become hazardous).

The presence of an initiating agent or a catalyst could or could not impact on the corrosive nature of a substance. While the corrosive material "per se" would not involve the need for a catalyst, another chemical could be responsible for converting one material to a more corrosive end product. It would, however, be difficult to depend on a catalytic effect to neutralize the corrosive nature.

RADIOACTIVITY

Although not a consideration in the wastes that might be generated by the paint manufacturing industry, radioactivity is indeed a physical characteristic of an increasing number of waste materials.

In a review of available or proposed criteria that would identify the hazardous nature of radioactive wastes, it appears that the element of persistence, in the case of radioactivity the half life of the radioactive species, and bioavailability, the type of radiation emitted and its ability to cause harm, have been identified.

INFECTIOUSNESS

Wastes that could present a hazard due to their ability to cause infection (bacteria etc.) are also not a consideration in the wastes generated by the paint manufacturing process. In fact, the paint manufacturing industry takes great pains to assure that such agents are not present during the manufacture of the paint product.

In considering the availability criteria bioavailability is of course a prime concern. Tied with this is the persistence or ability of the bacteria to survive in the ambient environment for a period of time sufficient to infect an organism.

EXTRAPULATION OF OCCUPATIONAL HEALTH AND SAFETY EXPERIENCE TO THE AMBIENT ENVIRONMENT

In developing standards to control ambient exposure to a number of materials, we note that many jurisdictions will draw upon the experience of the workplace environment. Specifically, we have seen a number of jurisdictions develop ambient air exposures levels with reference to the Threshold Limit Values (TLV) developed by the American Conference of

Governmental Industrial Hygienists. These TLV's were set on the basis of the workplace exposure to the materials and have no direct relevancy to ambient air exposures.

Additionally, CPMA noted that several jurisdictions in defining a toxic chronic danger, and hence inclusion as a hazardous material, utilize occupational exposures. We have seen epidemiological studies conducted in the workplace used as the basis for assessing an environmental hazard. Additionally animal exposure studies conducted at levels normally found in the workplace have been cited in determining that a specific material presents a hazard in the ambient environment.

While CPMA does acknowledge that it is most difficult to conduct studies on ambient exposures to materials, we strongly caution against the summary extrapolation of data based on the workplace experience. If some degree of extrapolation must be done, in the absence of hard data, we urge that this process acknowledge the limitations, and potential errors, of such actions.

CONCLUSION

CPMA feels it is most important that the subject of "Hazardous Wastes" is being addressed by Fisheries and Environment Canada, and a definition and means of identification developed. However, we stress that the process for this development must be based on soundscientific thinking. Additionally, the definition of hazardous waste must be developed with an acknowledgement of how the materials to fall under that definition will be identified.