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MEMORANDUM **NOTE DE SERVICE**

EICD/CCB/A.D.PITTUCK/7-1640/jl

TO / À: Mr. P.G. Rodgers
A/Chief, Hazardous Waste Management Division
Waste Management Branch

FROM / DE: Coordinator
Transport Regulations
Contaminants Control Branch

SECURITY - CLASSIFICATION - DE SÉCURITÉ:

OUR FILE — N/RÉFÉRENCE: 1475-87/T33

YOUR FILE — V/RÉFÉRENCE:

DATE: October 16, 1979

SUBJECT / OBJET: MEETING OF TASK FORCE ON DEFINITION OF HAZARDOUS WASTE, OCTOBER 18-19, 1979

Please excuse the delay in relaying my views on the hazardous waste definition. As you know, my main concern regarding hazardous wastes involves liaison with the Department of Transport to ensure that environmental consideration (including hazardous wastes) are adequately addressed in their proposed Transportation of Dangerous Goods Act, the National Code of Regulations (which will become regulations under the Act) and their Hazard Information and Emergency Manual. With respect to dangerous goods under the Transport Act, these are delineated in the schedule to the Act under the following categories (classes):

SCHEDULE	ANNEXE
Class 1 - Explosives, including explosives within the meaning of the Explosives Act.	Classe 1 - Explosifs, y compris les explosifs au sens de la Loi sur les explosifs.
Class 2 - Gases: compressed or deeply refrigerated, liquified or dissolved under pressure	Classe 2 - Gaz comprimés, liquéfiés, dissous sous pression ou liquéfiés à très basse température.
Class 3 - Inflammable liquids	Classe 3 - Liquides inflammables
Class 4 - Inflammable solids; substances liable to spontaneous combustion; substances that on contact with water emit inflammable gases	Classe 4 - Solides inflammables; matières sujettes à l'inflammation spontanée; matières qui, au contact de l'eau, dégagent des gaz inflammables.
Class 5 - Oxidizing substances; organic peroxides	Classe 5 - Matières comburantes; peroxydes organiques.
Class 6 - Poisonous (toxic) and infectious substances	Classe 6 - Matières toxiques et matières infectieuses.
Class 7 - Radioactive materials and prescribed substances within the meaning of the Atomic Energy Control Act.	Classe 7 - Matières radioactives et substances réglementées, au sens de la Loi sur le contrôle de l'énergie atomique.

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Class 8 - Corrosives	Classe 8 - Matières corrosives.
Class 9 - Products, substances or organisms not included in any of the other classes listed herein and considered by the Governor in Council to be dangerous to life, health, property or the environment when handled or transported.	Classe 9 - Produits, matières ou organismes non compris dans les autres classes de la présente annexe et dont le transport ou la manutention présentent, de l'avis du gouverneur en conseil, des risques de dommages corporels ou matériels ou des menaces pour l'environnement.

The criteria by which a substance may qualify as a dangerous good for any particular class or classes will be prescribed in the regulations to the Act.

With respect to hazardous wastes, I had offered the following definitions of "waste" and "hazardous waste" to be included in the interpretation section of the regulations. These were included in draft II of the Code but have been deleted from draft III.

1. "waste material" means any material for which no use or reuse is possible or intended which is being offered for ultimate disposal.

2. "hazardous waste" means a solid, liquid or gaseous waste material or combination, thereof, which because of its quantity, concentration, physical, chemical, toxic or infectious characteristics, may

   (i) cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or

   (ii) pose a substantial present or potential hazard to human health or the environment when improperly treated, handled, stored, transported, or disposed of, or otherwise managed.

I think it is apparent that substances which qualify as a waste material and meet the criteria for inclusion in any one or more of the nine hazard classes for dangerous goods will obviously qualify as a hazardous waste. (Hazardous ≡ Dangerous).

The problem with many wastes however as far as Environment is concerned is the lack of quantifiable criteria for the more exotic, chronic and long range hazards such as mutagenicity, phyto toxicity, carcinogenicity, etc. although the U.S. have made some significant progress in this area.

Another problem, with respect to the transportation of hazardous wastes is the apparent incompatability of criteria between the transport and environment factions. I have reviewed the criteria for hazardous wastes as proposed by the U.S. EPA (FR Vol.43, No.243, Dec.18, 1978) and compared this with the existing criteria for dangerous goods in the current Canadian

draft regulations. (see table I). In several instances, the criteria are quite compatible (eg. reactive, flammable, infectous). However, the criteria for corrosives, toxicity, radioactivity and the more exotic hazards of phyto-toxicity, carcinogenicity, teratogenicity, mutagenicity, and bioaccumulation either vary quite markedly or are non existant.

A very important and useful feature of the classification of substances into hazard classes is the further sub-classification of the substance according to its degree of hazard into three groups (I, II & III) for the purpose of packaging. A group I substance requires a package of higher integrity than that for a group II substance. Performance and/or specification standards are prescribed for the three groups in the regulations.

A.D. Pittuck

Attach.

Table I

Comparison of Criteria for Classification of Hazards

Canadian DOT-TDG and U.S. E.P.A.

Hazard Classification	DOT-TDG, Canada	EPA - USA	Comments
Reactive	Class 1 Class 4.2 all groups Class 4.3 Class 5.2	Reactivity as defined in FR.43.243	Compatible
Corrosive	Class 8 Grp I visible necrosis on skin for 3 minutes or for 60 minutes and exhibiting inhalation toxicity Grp II $\geq$ 3 $\leq$ 60 minutes on skin Grp III up to 4 hrs on skin or corrosion of SAE 1020 steel or aluminum $>$ 6.25 mm/yr @ 55°C	pH $\leq$ 3 $\geq$ 12 or corrosion of SAE 1020 steel $>$ 0.250 in/yr (6.35mm) @ 130°F (54.4°C)	Compatible with Grp III corrosives only.
Flammable (inflammable)	Grp I FP $<$ -18°C Grp II FP -18°C $<$ 37.8°C Grp III FP 37.8°C $\leq$ 60.5°C	$<$ 60°C	Compatible $\pm$ 0.5°C
Infectious	reasonably infectious to humans or other animals	as listed in FR.43.243	Compatible
Radioactive	Radioactivity is defined as $>$ 0.002 µCi /gm ($\equiv$ 2000 pCi /gm)	Solid $>$ 5pCi/g Ra226 Liquid $>$ 50pCi/l Ra226 For single source Total Ra-226 $>$ 10µCi	Not considered radioactive by DOT definition Compatible
Phytotoxic	not defined	uncertain	no compatibility
Teratogenic Mutagenic Bioaccumulative	" " "	as per prescribed tests	
Carcinogenic	"	uncertain	

Table I (cont'd)

Hazard Classification	DOT-TDG, Canada	EPA - USA	Comments
Toxic	Grp I Oral $\leq$5mg/kg BW Dermal $\leq$40 mg/kg BW Inhal vap $\leq$50 ml/m^3 dust $\leq$0.5mg/l Grp II Oral >5$\leq$50 mg/kg BW Dermal >40$\leq$200 mg/kg BW Inhal vap >50$\leq$200 ml/m^3 dust >0.5$\leq$2.0 mg/l Grp III Oral (Liq)>50$\leq$2000 mg/kg BW (Solid)>50$\leq$500 mg/kg Dermal >200$\leq$1000 mg/kg Inhal, vap >200$\leq$1000 ml/m^3 dust >2.0$\leq$10 mg/l in addition to above there are also three prescribed methods of determining the degree of hazard for inhalation toxicity for volatile substances.	Toxic - the maximum permissible Extraction procedure level for various substances is delineated Toxic Organic based on a maximum calculated human toxicity of $<$800 mg/kg BW by multiplying (a) LD_{50}(rat) X 0.16 or (b) LD_{50} (mouse) X 0.066 Either (a) or (b) is multiplied by 0.35 to produce a mg/l value. If the EP value is greater than value obtained above, then waste is hazardous.	No apparent compatibility The US method for calculating equivalent human toxicity appears to be in error with respect to the rat and mouse factors.