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United States Environmental Protection Agency
Washington, D.C. 20460
Office of Solid Waste and Emergency Response

Jan 13, 1988

MEMORANDUM

SUBJECT: Request for Guidance in Designating POHC's

FROM: Marcia Williams, Director
Office of Solid Waste (WH-563)

TO: Conrad Simon, Director
Air and Waste Management Division
Region II

This memorandum is in response to your December 9, 1987, memorandum requesting guidance in designating POHCs, particularly with respect to use of the Thermal Stability at Low Oxygen incinerability ranking system under development. I agree with your proposed interim policy for designating POHCs. Following are responses to the outstanding issues you raised as well as some comments on your proposed approach.

First, contrary to the comments which you have received, current guidance does not preclude use of methods of incinerability ranking other than heat of combustion. Although the 1983 Guidance Manual for Hazardous Waste Incinerator Permits presents a method of POHC selection based on heat of combustion, it states that other parameters may be used to establish an incinerability hierarchy. EPA is currently providing funds to the University of Dayton Research Institute to develop an Appendix VIII ranking based on thermal stability at low oxygen (TSLoO2). Preliminary comparisons with field data have shown a fairly good correlation with the thermal stability ranking, as compared with a poor correlation between heat of combustion and field data. We have plans to conduct a directed field validation program, as well as a technical peer review, prior to issuing guidance specifically recommending use of the thermal stability index.

In the interim, your proposed approach of selecting POHC's

based on both of the methodologies is acceptable. Additional considerations which can be applied to POHC selection include concentration of the constituent in the waste stream (the higher the concentration, the more likely the compound is to be chosen as a POHC), toxicity (choosing a particularly toxic compound in the waste to be sure it is destroyed), and compound structure (choosing a compound to represent each of the structural classifications of compounds, such as aromatics and chlorinated compounds, in the waste). These criteria reflect the general consensus of the Incinerator Permit Writers' Workgroup at its November 17-19, 1987, workgroup meeting.

Incinerability indices other than heat of combustion can be used without a regulatory change since the regulations do not mention any specific incinerability hierarchy. This was done in order to allow flexibility in POHC selection. At the time OSW developed the current regulations, we recognized that thinking might change as new data became available. The preamble to the upcoming proposed incineration amendments will discuss the thermal stability ranking being developed and will include a copy of the current version of the index.

When the thermal stability ranking is used, it is recommended that POHCs be chosen from those compounds for which actual experimental data exists. Since the ranking will be changing as additional laboratory testing is done, compounds fairly close together in the ranking should not be considered significantly different with respect to incinerability. Therefore, when there are testing or availability problems with the preferred POHC, it would be reasonable to choose another POHC from the same class.

Some of the compounds in Class I of the TSLoO2 ranking present sampling and analysis problems. For example, reactive compounds such as hydrocyanic acid and cyanogen, and water soluble compounds such as acetonitrile, would require either special sampling techniques or choice of alternative POHCs. Sampling and analysis problems should not be encountered with compounds such as chlorinated benzenes. We are currently evaluating the applicability of present methods to the compounds high on the thermal stability ranking and will keep you informed as this information becomes available. As you progress with choosing POHCs for trial burns, please keep in touch with us so that we may keep you up to date on our current knowledge. Future sampling and analysis methods development and validation work will concentrate on priority POHCs

identified through this process.

Regarding your question on availability of compounds for use as surrogates, some Regions have mentioned problems with availability of surrogate compounds such as hexachlorobenzene at an economically feasible price. Availability of the compounds should be evaluated on a case-by-case basis.

You also inquired how the new approach will impact in-house trial burn plans or completed trial burns. Guidance on use of the thermal stability index will be issued when further field validation and peer review of the index are completed. In this guidance, we plan to recommend that once the trial burn plan for a facility is approved, the new index or any changes to the index only be incorporated with the agreement of the facility. In the interim, until the guidance is issued, I agree with your proposed policy of amending trial burn plan proposals to incorporate thermal stability considerations where possible (i.e., where it would not pose major obstacles) and also considering completed trial burns based on heat of combustion to be valid.

Please keep in mind that any incinerability hierarchy is only approximate and that the thermal stability ranking will be updated periodically as additional data comes in. The goal should be to work with the best data available at the time the trial burn is planned. Attached is the most current version of the ranking. If you have any comments on our tentative policy of using the trial burn plan approval date as a cut-off date, or any questions on incinerability and POHs selection, feel free to contact Sonya Stelmack of my staff at FTS 382-4500.

cc: Bruce Weddle
Elizabeth Cotsworth
Deb Martin
Sonya Stelmack
Bob Holloway
Incinerator Permit Writers' Workgroup

Attachment

APPENDIX 4. UDRI THERMAL STABILITY-BASED INCINERABILITY RANKING

HAZARDOUS ORGANIC COMPOUND	RANKING
CLASS 1	1-24
HYDROCYANIC ACID {HYDROGEN CYANIDE}	1
CYANOGEN {ETHANEDINITRILE}	2
CHLOROBENZENE**	3
ACETONITRILE {ETHANENITRILE}**	4-6
CHLOROMETHANE {METHYL CHLORIDE}**	4-6
CYANOGEN CHLORIDE {CHLORINE CYANIDE}	4-6
DICHLOROBENZENE {1,2-DICHLOROBENZENE}	7-9
DICHLOROBENZENE {1,3- DICHLOROBENZENE}**	7-9
DICHLOROBENZENE {1,4- DICHLOROBENZENE}	7-9
TRICHLOROBENZENE (1,2,4-)**	10
ACRYLONITRILE {2-PROPENENITRILE}	11,12
BENZENE {CYCLOHEXATRIENE}**	13-16
METHACRYLONITRILE {2-METHYL-2-PROPENENITRILE}	13-16
METHYL BROMIDE {BROMOMETHANE}**	13-16
PENTACHLOROBENZENE**	13-16
CHLOROANILINE {CHLOROBENZENAMINE}	17
ANILINE {BENZENAMINE}**	18,19

HEXACHLOROBENZENE 18,19

TRIFLUOROCHLOROMETHANE {FREON 13} 20

DICHLOROBENZIDINE (3,3'-)
{[1,1'-DIPHENYL]-4,4'-DIAMINE,3,3'- DICHLORO-} 21

AMINOBIPHENYL (4-) {[1,1'- BIPHENYL]-4-AMINE} 22

BENZIDINE {[1,1'-BIPHENYL]-4,4'- DIAMINE} 23,24

TETRACHLOROETHENE** 23,24

CLASS 2 25-56

DIPHENYLAMINE {N- PHENYLBENZENAMINE} 25-27

PHENYLENEDIAMINE {BENZENEDIAMINE} 25-27

TETRACHLORODIBENZODIOXIN (2,3,7,8-) {TCDD} 25-27

DICHLOROETHENE (1,1-)** 28,29

DICHLOROPROPENE (1,1-)** 28,29

PROPIONITRILE {ETHYL CYANIDE}** 30,31

TRICHLOROETHENE** 30,31

FORMIC ACID {METHANOIC ACID} 32,33

PHOSGENE {CARBONYL CHLORIDE} 32,33

CHLORONAPHTHALENE (2-) 34,35

FLUOROACETIC ACID 34,35

CHLOROMETHYL METHYL ETHER
{CHLOROMETHOXYMETHANE} 36-41

FORMALDEHYDE {METHYLENE OXIDE} 36,41

MALONONITRILE {PROPANEDINITRILE} 36-41

METHYL CHLOROCARBONATE {CARBONOCHLORIDIC ACID, METHYL ESTER} 36-41

METHYL ISOCYANATE {METHYLCARBYLAMINE} 36-41

TOLUENE {METHYLBENZENE}** 36-41

ISOBUTYL ALCOHOL {2-METHYL-1-PROPANOL} 42

bis(CHLOROMETHYL)ETHER {METHANE-OXYbis [2-CHLORO-]} 43-47

DICHLOROMETHANE {METHYLENE CHLORIDE}** 43-47

DIMETHYLBENZIDINE (3,3'-) {[1,1'- DIPHENYL]-4,4'- DIAMINE,3,3'- DIMETHOXY-} 43-47

FLUOROACETAMIDE (2-) 43-47

PROPYN-1-OL (2-) {PROPARGYL ALCOHOL} 43-47

ACROLEIN {2-PROPENAL} 48-56

ACRYLAMIDE {2-PROPENAMIDE} 48-56

CROTONALDEHYDE {2-BUTENAL} 48-56

DDE{1,1-DICHLORO-2,2-BIS(4- CHLOROPHENYL) ETHYLENE 48-56

DICHLOROETHENE (1,2-)** 48-56

DIMETHYL-2-PHENETHYLAMINE (alpha, alpha-) {ETHANAMINE,1,1-DIMETHYL-2-PHENYL-} 48-56

METHYL METHACRYLATE {2- PROPENOIC ACID, 2-METHYL-, METHYL ESTER} 48-56

n-PROPYLAMINE {1-PROPANAMINE} 48-56

NAPHTHALENE 48-56

CLASS 3 57-92

FLUORANTHENE {BENZO[j,k]FLUORENE}	57
BENZO[j]FLUORANTHENE {7,8-BENZOFLUORANTHENE}	58
BENZO[b]FLUORANTHENE {2,3-BENZOFLUORANTHENE}	59
BENZANTHRACENE (1,2-) {BENZ[a]ANTHRACENE}	60
CHRYSENE {1,2- BENZPHENANTHRENE}	61
INDENO(1,2,3-cd)PYRENE {1,10-(1,2- PHENYLENE)PYRENE}	62
ACETYL CHLORIDE {ETHANOYL CHLORIDE}	63-67
AURAMINE {BENZENAMINE,4,4'-CARBONIMIDOYLbis [N,N'-DIMETHYL-,MONOHYDROCHLORIDE}	63-67
DICHLOROPROPENE (cis-1,3-)	75-83
DICHLOROPROPENE (trans-1,3-)	75-83
PRONAMIDE {3,5-DICHLORO-N-[1,1- DIMETHYL-2-PROPYNYL] BENZAMIDE}	75-83
DICHLOROPROPENE (2,3-)	84-85
DIFLUORODICHLOROMETHANE {FREON 12}**	84-85
ACETOPHENONE {ETHANONE,1- PHENYL-}	86-92
ALFATOXINS	86-92
CHLOROACETALDEHYDE	86-92
DICHLORO-2-BUTENE (1,4-)	86-92
DICHLOROPROPENE (trans-1,2-)	86-92
FLUOROTRICHLOROMETHANE {FREON 11}	86-92
THIOACETAMIDE {ETHANETHIOAMIDE}	86-92

CLASS 4	93-117
BENZOQUINONE {1,4-CYCLOHEXADIENEDIONE}	93-96
HEXACHLOROBUTADIENE** {1,1,2,3,4,4-HEXACHLORO-1,3-BUTADIENE}	93-96
METHYL ETHYL KETONE {2- BUTANONE}**	93-96
NAPHTHOQUINONE (1,4-) {1,4- NAPHTHALENEDIONE}	93-96
ACETONYLBENZYL-4- HYDROXYCOUMARIN (3-alpha-) {WARFARIN}	97-99
MALEIC ANHYDRIDE {2,5- FURANDIONE}	97-99
METHYLLACTONITRILE (2-) {PROPANENITRILE, 2-HYDROXY-2-METHYL}	97-99
CHLORAL {TRICHLOROACETALDEHYDE}	100-102
CYANOGEN BROMIDE {BROMINE CYANIDE}	100-102
DIMETHYL PHTHALATE {1,2-BENZENEDICARBOXYLIC ACID, DIMETHYL ESTER}	100-102
DIHYDROXY-ALPHA-[METHYLAMINO]METHYL BENZYL ALCOHOL (3,4-) {ADRENALINE} {EPINEPHRINE}	103
BENZENETHIOL {THIOPHENOL}**	104
DIMETHYLPHENOL (2,4-)	105-106
PHENOL {HYDROXYBENZENE}**	105-106
RESORCINOL {1,3-BENZENEDIOL}	107
CHLOROPHENOL (2-)	108
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DIMETHOATE {PHOSPHORODITHIOIC ACID, 0,0- DIMETHYL S-[2-(METHYALMINO)-2-OXYETHYL]ESTER} 109-113

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HYDRAZINE {DIAMINE}** 114-117

MELPHALAN {ALANINE,3-[p-bis(2- CHLOROETHYL) AMINO] PHENYL-,L-} 114-117

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ARAMITE {SULFUROUS ACID, 2- CHLOROETHYL-,2-[4-(1,1-DIMETHYLETHYL) PHENOXY]-1-METHYLETHYL ESTER} 118-123

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NITROTOLUIDINE (5-) {BENZENAMINE,2-METHYL-5-NITRO-} 125-130

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BENZOTRICHLORIDE {TRICHLOROMETHYLBENZENE} 131-133

BROMOACETONE {1-BROMO-2- PROPANONE} 131-133

DIOXANE (1,4-) {1,4-DIETHYLENE OXIDE}** 131-133

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DICHLORO-2-PROPANOL (1,3-) 175-177

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BENZ[c]ACRIDINE {3,4- BENZACRIDINE} 188-190

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ETHYL METHACRYLATE {2-PROPENOIC ACID, 2-METHYL-, ETHYL ESTER} 191-195

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N,N-DIETHYLHYDRAZINE {1,2- DIETHYLHYDRAZINE} 215-218

DIMETHYL-1-(METHYLTHIO)-2-BUTANONE, 0-[(METHYLAMINO)-CARBONYL]OXIME {3,3-} 219-221

MALEIC HYDRAZINE {1,2-DIHYDRO-3,6-PYRIDAZINEDIONE} 219-221

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