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August 1, 1978

Office of Toxic Substances (TF-794)
Environmental Protection Agency
401 "M" Street, S.W.
Washington, D. C. 20460

ATTENTION: Ms. Joni T. Repasch

Dear Ms. Repasch:

On June 7, 1978 the EPA published proposed rules in 43 Federal Register beginning on page 24,802 covering Manufacturing, Processing, Distribution in Commerce, and Use Bans of Polychlorinated Biphenyls (PCB's). This letter sets forth Monsanto Company's comments on the proposed rules, with particular emphasis directed to the application of these rules to owners and operators of heat transfer systems containing residual PCB's. Request entry into record transition paragraph outlining what is covered

The proposed immediate mandatory removal from service of heat transfer systems containing fluids whose PCB concentration equals 50 ppm or greater is not justifiable in view of the lack of any significant risk to health or the environment. To require industry immediately to remove from service and drain all these systems or to replace the systems entirely to meet a 50 ppm concentration level is an arbitrary mandate and will generate a substantial, immediate risk of injury and environmental harm from spillage and result in an abrupt, massive buildup of PCB contaminated fluid without available disposal facilities or time to develop orderly plans to carry out the disposal. Furthermore, the EPA cites no evidence in the preamble relative to any environmental or

express dissatisfaction with accuracy of preamble

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health hazard to support the proposed reduction in the regulated concentration of PCB's in a PCB mixture under Section 761.2(w) from 500 ppm to 50 ppm, and Monsanto strongly recommends the EPA withdraw this proposed reduction. Imperative that use of HT systems be continued
Further, the evidence conclusively establishes that the heat transfer system use activity meets the requirements for granting an authorization to allow continued operation, and Monsanto requests the EPA to grant such an authorization. On page 42 of the May, 1978 EPA Support Document/Draft Voluntary Environmental Impact Statement for the proposed rule, the EPA states that before it grants an authorization for continuation of a non-totally enclosed use activity the following two requirements must be met:

(1) the activity authorized must not pose an unreasonable risk of injury to health or the environment, and

(2) the ban would cause major and extensive economic disruptions.

Regarding the first requirement, an analysis of potential PCB exposure from various sized PCB contaminated heat transfer systems is illustrative of the insignificant risk of injury to health or the environment posed by authorizing continued use of these systems. The highest risk area for leakage in these systems is in the pump seals, but inspection maintenance for pump seals is also emphasized because of user awareness of this risk. A pump seal failure would be rapidly detected by inspectors and loss of fluid would be unlikely to exceed from 1% to 5% of the total fluid volume in the system.

For example, a 500 gallon system containing 1% volume of PCBs has a total PCB content equal to 60 pounds, and a leak

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of 5% of the total fluid (which is unlikely) would release only 3 pounds of PCB's. Similarly, a 10,000 gallon system containing a PCB contamination of 500 ppm has a total PCB content of 60 pounds, and a leak of 5% of the total fluid (again unlikely) would release only 3 pounds of PCB's. A leakage of 3 pounds of PCB's is below the EPA's designated harmful quantity for PCB spills into navigable waters (10 pounds) under 40 CFR 119.5 issued pursuant to the Federal Water Pollution Control Act and, in Monsanto's opinion, does not create a significant risk to health or the environment. Furthermore, the above examples are worst case situations because they assume no spill prevention program (for example, diking) or effluent control programs in effect, because if such programs were in effect it would be highly unlikely for any amount of PCB's approaching 3 pounds to escape into the environment.

The proposed immediate, mandatory removal of these systems from service also meets the standards for the second requirement for an authorization by resulting in substantial, widespread economic disruption. The following information clearly and conclusively demonstrates this economic impact:

1. Number of systems contaminated. It is estimated that when the sale of PCB heat transfer fluids was discontinued in 1972 there were 400 heat transfer systems using this fluid, ~~in existence~~. This estimate is based on (a) the current level of new systems introduction, (b) the ten year period (1962-72) during which PCB heat transfer systems were specified, and (c) the total volume of 20 million pounds of PCBs sold for heat transfer systems from 1962 through 1971 as reported by the 1972 Interdepartmental Task Force on PCBs COM-72-10419 pages 6 and 7, and (d) ~~the approximately 600 Monsanto customers with non-PCB heat transfer fluid serviced in 1977~~.

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2. The average liquid volume of the systems. It is estimated that about one-half of all PCB contaminated heat transfer systems have less than a 500 gallon liquid volume. Systems greater than 500 gallon volumes are estimated to average ~~between 1,000 to~~ about 2,000 gallons. These estimates are based upon a review of systems filled in 1977 and 1978 and upon the average system size of Monsanto units converted in the 1970-72 period - a typical cross section of the industry pattern.

3. The range of liquid volume. Heat transfer systems of greater than 10,000 gallons are unusual. Small pilot plant units may contain 50 gallons.

4. Fluid top-off. Heat transfer fluids are designed to be thermally stable within the recommended temperature range of operation and to operate at low pressure. Accordingly, routine top off is minimal. Average top off may be higher becaue of fluid removal from parts of the system when maintenance is performed on other components of the system such as pumps, valves and heaters or in the event a system malfunction causes a thermal degradation of the fluid. Monsanto's experience indicates that some systems may require no top-off for three to five years; other systems may require a top-off of 50% in one year if major maintenance programs requiring drainage are undertaken. However, systems are not routinely drained.

5. Efforts to reduce PCB contamination. We estimate greater than 90% of the plants operating with PCB heat transfer systems converted to alternative non-PCB fluids in 1970-72. Some of those converting drained and refilled the system with non-PCB fluid; some drained, flushed and refilled; some drained, chemically cleaned

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and refilled; and other dismantled and discontinued use of liquid systems. These efforts have resulted in current system PCB levels ranging from 100 ppm to several thousand ppm. Recovery from heat transfer systems would generally be expected to be greater than 90%. Note that for the purposes of these comments the term "recovery" is defined as the percentage of total system fluid volume extracted from the system by draining.

6. Servicing fluids to remove PCB's from Systems. Following is a review and analysis of the potential success of three methods the EPA has considered for PCB removal:

(a) Drain and refill. Small systems (500 gallons or less) are drained and refilled with a non-PCB fluid and a 98-99% recovery of dissolved PCB's can be expected. This service method will not, however, remove PCB absorbed by the heat transfer system ~~tube~~ walls. In the case of systems larger than 500 gallons a 90-99% recovery can be expected depending on the complexity of the piping layout and heat exchanger design.

(b) Distillation is of questionable efficiency in separating and removing PCB's from heat transfer fluid due to the similarity in boiling ranges of PCB's and non PCB heat transfer fluids. The boiling ranges for these respective fluids are as follows:

PCB	Therminol FR 1	617°F - 690°F
	Therminol FR 2	644°F - 707°F
Non-PCB	Therminol 55	635°F - 734°F
	Therminol 66	643°F - 668°F

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(c) Carbon treatment experiments to remove PCB's are currently being conducted to investigate the carbon treatment removal method, but no data are presently available.

7. Present PCB levels in systems - We estimate the range of PCB concentration levels in heat transfer systems to be from 100 ppm to 30,000 ppm.

8. Cost of new systems - The cost of a new system could result in a ~~multimillion~~ many million dollar expenditure compared to the much lower cost of replacing fluid. Replacing a heat transfer system may well mean totally rehabilitating a plant, which is usually a multimillion dollar expenditure, because these systems are integral parts of chemical ~~processes~~ plants and replacement of heat transfer systems is impossible without replacement of reactors, coolers and heat exchangers. Further, the costs of lost production would be extraordinarily high in terms of lost wages, lost sales, and product shortages which could impact a wide area of other manufacturing industries using finished products during the length of time required to replace each system. The immediate, mandatory removal of these systems from service would result in substantial, widespread economic disruption in industries using heat transfer systems and the products produced from processes using such systems. ~~The end result being higher consumer prices.~~

9. Cost of draining and refilling systems - The cost of draining and refilling systems would be from $10 million - $30 million, depending on authorized PCB level. For example, PCB reduction to a concentration level of 500 ppm in a 2,000 gallon system, with a current 1% PCB volume (10,000 ppm) and assuming a 90% fluid recovery,

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would result in a marginal removal cost of approximately $220 per pound. It is estimated that to reduce from a 500 ppm level to a 50 ppm level would require a marginal removal cost of about $50,000 per pound. Starting with a PCB content in the 2,000 system of 240 pounds, draining the system (90% recovery) would leave 200 gallons of fluid containing 2 gallons PCB or 24 pounds~~, (1,500 ppm)~~. ~~Flushing~~ and refilling with flushing fluid ~~would~~ immediately drop PCB's to 2.4 pounds or 150 ppm, but this amount would shortly increase as PCB's are released from the surface walls into the fluid. The direct cost estimates of flushing and draining, excluding costs associated with lost production and resulting disruption of supply to consumers, are as follows:

(a)	Flushing fluid - 2x2,000 gallons at $2.00 per gallon	$8,000
(b)	New fill of non-PCB heat transfer fluid - 2,000 gallons at $8.00 per gallon	$16,000
(c)	Disposal of initial drained fluid and 2 flushing fluid changes - 6,000 gallons at $2.26 per gallon	$16,000
(d)	Labor and overhead - 4 men 10 to 15 days	$12,000
	Total	$52,000

This estimate assumes that draining and flushing proportionately reduces PCB concentration level without a major breakdown of the system involving gasket replacement or rewelding which could easily double or triple costs. The cost of removal of 235 pounds would give a marginal removal cost of $220 per pound to achieve a residual level below 500 ppm. To achieve a level of 50 ppm it is likely that at

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least two further drain and flush procedures and chemical cleaning would be required. At $50,000 per procedure, the final 1.6 pound removal would carry a marginal removal cost of $23,800 per pound.

The above information relative to environmental and health injury and economic impact is clear evidence meeting the two requirements necessary to support the grant of a use authorization for heat transfer systems containing Hundred PCB's. Accordingly, Monsanto recommends the proposed rules be revised to authorize for a period of 5 years the continued use and servicing of all 500 gallon capacity or less heat transfer systems used and serviced in a manner other than a totally enclosed manner to the extent these systems contain 1% or less by volume of PCB's, provided users attain this 1% PCB volume within one year after the effective date of the rule. For systems with greater than 500 gallon capacity, Monsanto recommends the EPA authorize for 5 years continued use and servicing of these systems in a manner other than a totally enclosed manner to the extent they contain a PCB concentration of 500 ppm or less, provided users attain this 500 ppm PCB concentration within 2 years after the effective date of the rule. These transition time periods would permit an orderly reduction of PCB levels during which disposal of fluids by incineration could be planned, thereby avoiding spillage and buildup of PCB contaminated fluid inventories awaiting disposal.

More specifically, this proposed revision would be a new section 761.31(h) and be as follows:

(h) Heat Transfer Sytems - Use. (1) Heat transfer systems containing PCB mixtures may be used and serviced in a manner other than a totally enclosed manner until five years after the effective date of this rule subject to the following conditions:

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(i) One year after the effective date of this rule no heat transfer systems of 500 gallon capacity or less may contain fluid whose PCB mixtures volume is greater than 1%.

(ii) Two years after the effective date of this rule no heat transfer systems of greater than 500 gallon capacity may contain fluid whose concentration of PCB mixtures concentration exceeds 500 ppm.

(iii) Ninety days after the effective date of this rule each person who owns a PCB heat transfer system shall report to EPA, and retain records of, the number of such systems he owns, the volume capacity of each such system, and the PCB volume or concentration, as appropriate, of the fluid contained in such systems. This report shall be sent to the Pesticides and Toxic Substances Enforcement Division (EN-342), Environmental Protection AGency, 401 M Street S.W., Washington, D. C. 20460. Each person who owns such a PCB system shall also keep a current record of the dates of each draining or refilling and the measured PCB concentration or volume, as appropriate, of the fluid in the refilled systems on those dates for each system. If any such system is sold, the transaction and the parties thereto shall be reported to EPA by the Seller. At its discretion, EPA may require the submission of a copy of a person's current record.

(iv) Each report submitted to EPA under paragraph (h)(i)(iii) of this section shall contain the certification found in §761.31(b)(2).

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(v) Each person who owns a heat transfer system ~~that~~ contains a PCB ~~heat transfer system~~ shall develop and implement a plan for the control of PCB exposures and contamination in accordance with Annex VII.

(2) Heat transfer systems containing PCB mixtures may be used and serviced subject to the conditions in paragraph (h)(1) of this section in the following manner:

(i) Fluid containing PCB chemical substance ~~concentration~~ of 500 ppm or greater, or volumes as appropriate, in heat transfer systems may be drained from the system for the purpose of reducing the concentration or volume or for disposal.

(ii) Heat transfer systems may be flushed and refilled using only non-PCB fluid.

(iii) Fluid removed from PCB heat transfer systems."

Regarding the hydraulic die-casting sytems use authorization in section 761.31(f), we recommend this authorization be expanded to include all industrial hydraulic systems. There is no justification for treating the die-casting and non-die-casting hydraulic systems differently.

Specific Comments on Proposed Definitions in the Rules

Sec. 761.2(w) "PCB mixture." As discussed above, the proposed reduction in PCB concentration in this definition from 500 ppm to 50 ppm will have a substantial adverse economic impact on the non-die-casting hydraulic system industry and

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the heat transfer system industry with no demonstrated benefit to health or the environment. In addition, the definition includes any material, no matter how dilute in PCB concentration if the material is contaminated by a substance containing a PCB concentration of 50 ppm or greater. For example, if a gallon of heat exchange fluid containing 500 ppm PCB were diluted to 1,000 gallons with a non-PCB material (final concentration 0.5 ppm PCB), the resulting fluid would still be arbitrarily considered a PCB mixture. We recommend the definition be changed to delete the reference to dilution.

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Sec. 761.2(bb) "Manufacture 'for commercial purposes'." We recommend for clarification the addition of the following subsection to the definition, which is consistent with the discussion by the EPA set forth in column 1, 43 FR 24805:

> "(3) As the desired product. Inadvertent manufacture as a by-product in the manufacture of another chemical is not 'manufacture for ~~chemical~~ commercial purposes.'"

Sec. 761.2(cc) "PCB sealant, coating, or dust control agent" is defined based on the state of the analytical art. In complex mixtures such as waste oils, analysis for PCB's is not sensitive ~~as it is in "cleaner" media~~ because of background interference. The lower limit of detection is now about 100 ppm, and we recommend that this concentration be used in the definition to avoid a moving target definition depending upon the sophistication of the analytical equipment used. We suggest amending the definition to read:

> "PCB sealant, coating, or dust control agent" means any sealant, coating, or dust control agent that is made from any waste oil having a PCB concentration of 100 ppm or greater."

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Sec. 761.2(dd) "Process 'for commercial purposes.'" We recommend the addition of the following subsection to the definition. This is consistent with the discussion in column 1, 43 FR 24805 and our proposed modification of section 761.2(bb).

> "(3) for means other than PCB removal. Processing which removes PCB from the material to be used for commercial purposes does not constitute "processing for commercial purposes."

Sec. 761.2(ff) "Significant exposure" is defined based on the state of the analytical art. We believe that significant exposure should be related to the toxicological properties of PCB's which are related to human or environmental exposure. Based on evidence cited in the 1977 American Conference of Governmental and Industrial Hygenists publication of threshold limit values for chemical substances in the workplace, we recommend amending this section to read as follows:

> "Significant human exposure" means any exposure of humans to PCB chemical substances or PCB mixtures in excess of 0.5 mg/cu. meter TWA for a 40 hour week by an applicable analytical method.
>
> "Significant environmental exposure" means any exposure of the environment to PCB chemical substances or PCB mixtures in excess of the lowest detectable limit by an applicable analytical method or 0.1 ppm, whichever is higher."

Sec. 761.1(gg) "Small quantities for research and development" as defined is unjustified and arbitrary. No data is presented in the preamble by the EPA that use in research has posed any measurable risk of injury to health or harm to the

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environment. Monsanto has no evidence of any adverse effect of PCB's in laboratory use. We suggest as an alternative replacing section 761.2(ff) with the following wording taken in part from the TOSCA Inventory Reporting Regulations (42 FR 64576, section 710.2(4):

> (gg) "Small quantities for research and development' means any quantity of PCB chemical substance or PCB mixture manufactured or processed only for purposes of scientific experimentation or analysis of chemical research on, or analysis of, PCB's, including research or analysis for the development of a product that (1) are no greater than reasonably necessary for such purposes, and (2) are used by, or directly under the supervision of, a technically qualified individual(s)."

It would also seem appropriate to include as new section 761.2(kk) the definition of "Technically qualified individual" from section 710.2(aa) of the TOSCA Inventory Reporting Regulations.

Sec. 761.2(hh) "Totally enclosed manner" is defined with reference to section 761.2(ff) and, consistent with our recommended changes above to that action, we suggest section 761.2(hh) be changed to read:

> "Totally Enclosed Manner" means any manner that will ensure any exposure of human beings or the environment to PCB chemical substances will be insignificant."

Sec. 761.2(jj) "Applicable Analytical Method" is proposed as a new definition as follows:

> "Applicable Analytical Method" is a method (other than the perchlorination procedure) which distinguishes 'PCB

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Chemical Substance' as defined in section 761.2(t) from all other materials.

The basis for exclusion of the perchlorination procedure is discussed more fully in the attached letter dated March 15, 1976 from J. Coleman Weber of Monsanto to Dr. I. E. Wallen of the EPA.

We request that this letter and the attachment be included in the record of the proceedings for this proposed rule.

Winthrop R. Cory

J. C. Masson

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