Monsanto

FROM (NAME & LOCATION) N. T. Johnson St. Louis

DATE February 16, 1970

SUBJECT

REFERENCE POLLUTION LETTER

TO :

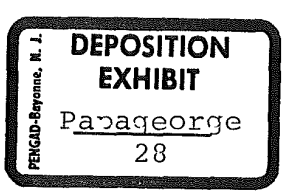
P. Craska - Wilmington
C. Clay - St. Louis
J. H. Davidson - Los Angeles
R. A. Damiani - Chicago
G. F. Fague - Detroit
R. A. Garcia - Akron
R. Garnsworthy - Melbourne
J. A. Heilala - Akron
R. Irwin - Houston
J. S. Pullman - New York
J. J. Roder - Chicago
R. Giles - Melbourne

cc:
P. J. A. Marsh - Brussels
R. Enrhardt - New York
T. W. Oneson - Montreal
J. N. Haggart - Brussels
V. Morse - St. Louis
J. Brydon - Montreal
R. Graham - New York
P. G. Benignus
J. G. Bryant
D. E. Roush
J. R. Fallon
D. A. Hall
D. R. Pogue
D. F. Smith
D. A. Olson

Attached is a list of questions and answers which may be asked of you by customers receiving our Aroclor-PCB letter. You can give verbal answers; no answers should be given in writing. If the customer asks a question you can't answer or if he wants an answer in writing, then send his questions to me and we will answer from here.

We want to avoid any situation where a customer wants to return fluid. The new reformulated products will be available within a month. We would prefer that the customer use up his current inventory and purchase Pydraul 625A, Pydraul ACA, Pydraul ACA Winter Grade and Pydraul 540A when available. He will then top off with the new fluid and eventually all Aroclor 1254 and Aroclor 1260 will be out of his system. We don't want to take fluid back. Sell him the replacement.

We must be very positive in our approach with each customer relative to our decision to eliminate the use of Aroclor 1254 and Aroclor 1260 in our Pydraul products. We (your customer and Monsanto) are not interested in using a product which may present a problem to our environment. We certainly have no reason to be defensive or apologetic about making this change. The decision to change makes good sense and our customers should commend us, not criticize our actions. No one has forced us to make this



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change. We have done it to keep our customers out of possible trouble. They should appreciate our effort, and stay with us as a customer on the reformulated Pydrauls. To make this change has cost us research monies and time. Fortunately, we possess the technical skills to make a change in our formulations without affecting the performance of products. Be positive, Take the offense. Don't let a customer or competitor intimidate you. I doubt if our competitors know whether their product could present a problem to our environment. You might ask your customer, if he has ever asked Houghton or Stauffer, Carbine, etc. about the effects of their products.

We should also recognize (point this out to your customer) we must clean-up. The Chemical Week article gives him an idea of laws in effect in his state. Read this yourself. Be familiar with the data on each state in which your customers are located. Use this in your discussions.

We have no replacement products for Aroclor 1254 and Aroclor 1260. We will continue to make these products; however, customers will have to use their own judgement on continued use.

We can't afford to lose one dollar of business. Our attitude in discussing this subject with our customer will be the deciding factor in our success or failure in retaining all our present business. Good luck.

(We have also attached a copy of the letter sent to transformer customers.)

N. T. Johnson

lb

0001359

WATER_PCB-00054823

Monsanto

ORGANIC CHEMICALS DIVISION

Monsanto Company
800 N. Lindbergh Boulevard
St. Louis, Missouri 63166
Phone: (314) 694-1000

February 9, 1970

Dear Sir:

Recently several newspaper and magazine articles have been published indicating that Polychlorinated Biphenyls (PCBs) have been discovered at some points in some marine, aquatic and wildlife environments. The quantities detected are said to be in the parts per million and parts per billion categories.

It is claimed that the PCBs found strongly resemble chlorinated biphenyls containing 54% and 60% chlorine by weight. Products which are sold by Monsanto under the trade names of Aroclor® 1254 and 1260 do contain chlorinated biphenyls. In addition to Aroclor® 1254 and 1260, Monsanto sells certain functional fluids containing Aroclor® 1254. These include Pydraul® 625, Pydraul® AC, Pydraul® AC - Winter Grade, Pydraul® 540, Therminol® FR-3 and certain dielectric formulations. Several other companies around the world also produce products containing chlorinated biphenyls.

As your supplier of Aroclor® 1254 and 1260 and formulated products containing 1254, we wish to alert you to the potential problem of environmental contamination as referred to in the newspaper and magazine articles.

We would like to point out the following additional facts.

1. Products such as Pydraul® 90, 135, 230, 312, A-200, F-9, 150 and 60, Turbinol® 153 and Therminol® FR-1 and FR-2 are not formulated with Aroclor® 1254 or 1260.

2. PCBs with a chlorine content of less than 54% have not been found in the environment and appear to present no potential problem to the environment.

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WATER_PCB-00054824

We have developed, and are now testing, new formulations to replace the Aroclor® 1254 and 1260 components in our Pydraul® products. The new products appear to be equal in performance and to have similar physical properties.

We feel that all possible care should be taken in the application, processing and effluent disposal of these products to prevent them becoming environmental contaminants. Of interest to you may be an article in Chemical Week, October 29, 1969 regarding water pollution standards set by each state in the Union. It is attached. This article reflects that good manufacturing practice in the future may require that no products used by any company should find their way into waterways.

Sincerely yours,

Donald A. Olson
Director of Sales
Functional Fluids Group

nlc
Attachment

0001361

Monsanto

ORGANIC CHEMICALS DIVISION

Monsanto Company
800 N. Lindbergh Boulevard
St. Louis, Missouri 63166
Phone: (314) 694-1000

February 18, 1970

Dear Sir:

Recently several newspaper and magazine articles have been published indicating that Polychlorinated Biphenyls (PCBs) have been discovered at some points in some marine, aquatic and wildlife environments. The quantities detected are said to be in the parts per million and parts per billion categories.

It is claimed that the PCBs found strongly resemble chlorinated biphenyls containing 54% and 60% chlorine by weight. Products which are sold by Monsanto under the trade names of Aroclor® 1254 and 1260 do contain chlorinated biphenyls. In addition to Aroclor® 1254 and 1260, Monsanto sells certain functional fluids containing Aroclor® 1254. These include Pydraul® 625, Pydraul® AC, Pydraul® AC - Winter Grade, Pydraul® 540, Therminol® FR-3 and certain dielectric formulations. Several other companies around the world also produce products containing chlorinated biphenyls.

As your supplier of Aroclor® 1254 and 1260 and formulated products containing 1254, we wish to alert you to the potential problem of environmental contamination as referred to in the newspaper and magazine articles.

We would like to point out the following additional facts:

1. Products such as Pydraul® 90, 135, 230, 312, A-200, F-9, 150, and 60, Turbinol® 153 and Therminol® FR-1 and FR-2 are not formulated with Aroclor® 1254 or 1260.

2. PCBs with a chlorine content of less than 54% have not been found in the environment and appear to present no potential problem to the environment.

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We have developed, and are now testing, new formulations to replace the Aroclor®1254 and 1260 components in our Pydraul® products. The new products appear to be equal in performance and to have similar physical properties.

We feel that all possible care should be taken in the application, processing and effluent disposal of these products to prevent them becoming environmental contaminants. Of interest to you may be an article in Chemical Week, October 29, 1969, regarding water pollution standards set by each state in the Union. It is attached. This article reflects that good manufacturing practice in the future may require that no product used by any company should find their way into waterways.

We realize that you have marketed or may now market transformers and other electrical equipment containing dielectric fluids which include Aroclor® 1254 and 1260. Although these fluids are sealed into such equipment it is recognized that occasionally the fluid may be lost through leaks resulting from equipment misuse or equipment repair necessitating replacement of the fluid. Since the dielectric fluid contained in this equipment is only an incidental part of the over-all unit manufactured by you, we are not notifying the purchasers of such equipment of the potential environmental contamination problem described in this letter. We do recommend, however, that you notify such equipment users of this problem.

Sincerely yours,

Don Olson

Donald A. Olson
Director of Sales
Functional Fluids Group

lb

Attachment

0001383

Environment

The huge water requirements of the chemical industry—now the nation's third largest user—make water quality and availability increasingly important factors for site selectors. Legislation enacted in recent years has forced planners to pay close attention to pollution control standards.

All 50 states have had their water quality standards approved entirely or in part by the Federal Water Pollution Control Administration (FWPCA). Recently a state-by-state summary of key standards was put together for the first time. Surprisingly, it was not the FWPCA that did the job. Instead it was handled by an American Public Health Assn. (APHA) subcommittee headed by TVA Health Director F. E. Gartrell, assisted by the APHA Engineering and Sanitation Section. A portion of the study, covering standards for surface industrial water, is summarized in the tables starting on p. 80.

Contrary to widely held opinions, there is considerable variation in state standards. Take the dissolved oxygen (DO) standard, for example. Minimum allowable DO (as milligrams per liter or percent saturation) is the single most important standard to chemical site evaluators. As a rough rule of thumb, a 2-mg./l. standard is considered to be one industry can live with comfortably, while a 6.0 mg./l. value is pegged "extremely tough."

California, Wyoming and Washington have set the standard at 6 mg./l. or higher. But a few states such as Connecticut, Maine, Illinois, Indiana, Massachusetts, Virginia and Wisconsin require 2 mg./l. or lower.

Other standards—notably turbidity, taste, odor, color and solids—may also be important, depending upon the nature of the chemical plant's waste effluents. These standards also exhibit state-by-state differences. Moreover, they are generally less specific than the straight numerical DO standards.

Although chemical plant site experts see little point in "running from tough standards," the criteria do make a difference: Plans for two nonferrous metals plants in Puerto Rico are now on the shelf, because of standards that call for a 4.5 mg./l. DO, no wastes that interfere with the esthetics of the waters and other specifications.

No compilation of ground water standards has yet been published. Ground water standards may prove important in the future as companies are forced to use costly deep-well disposal for wastes. Availability of ocean waste disposal services is also looming more important.

Waste Cost.: The price tag for pollution control is high. A recent FWPCA study on the organic chemicals industry estimated that water waste-treatment facilities can increase installed capital equipment costs 40% or more. Between '69-'73, the organic chemical industry would have to shell out $182.5 million to remove 10% of its biological and chemical oxygen demand waste and 65% of its suspended solids. Removal levels of 83%, 13% and 71%, respectively, for biologic oxygen demand, chemical oxygen demand and suspended solids would require $242.6 million, while 98%, 30% and 89%, respectively, would up the ante to $608 million.

Cleaner Air: Establishment of air quality standards is not nearly as far advanced as are water standards. The National Air Pollution Control Administration (NAPCA) is still designating regional air control regions. At last count, 16 regions had been formally designated and another 41 had been proposed. NAPCA has issued air quality criteria and control technology data for sulfur oxides and particulate matter, will follow with similar studies for other pollutants.

Once criteria and control data have been issued for a pollutant and control regions have been designated, a complicated process involving standards, hearings and implementation and enforcement plans will be initiated that can take over a year to produce standards.

So far, no firm sulfur oxide or particulate standards have emerged. But NAPCA's criteria for setting the standards suggest they'll be tough. The oxide criteria report, for example, emphasizes that there are deleterious effects to man at concentrations as low as 0.04 ppm.

NAPCA's control data reports present detailed appraisals of various methods and equipment, along with estimated costs. As in the case of water, the costs will be high, although some pollutants—mainly sulfur dioxide—will have recovery values. NAPCA is sponsoring a number of research projects to improve technology. Pollution control is being spurred by financial assistance programs (mandated by state law) now operative in the following 28 states:

Arizona, Arkansas, California, Connecticut, Florida, Georgia, Idaho, Illinois, Indiana, Maine, Massachusetts, Michigan, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, Washington, Wisconsin and West Virginia.

In addition, Pennsylvania offers financial aid sanctioned by administrative regulation. Several states, including Utah and Maryland have legislative studies under way.

The incentives take a variety of forms. Most common are exemption from personal property taxes (e.g., Arkansas), fast depreciation (Arizona), exemption from ad valorem equipment and structures taxes (Connecticut), exemption from local taxes for stated period of time (New Hampshire), operating loss deductions (New York); credit against state income tax (Oregon).

Quantity: The large chemical complexes now in vogue make water—and lots of it—a major site criterion. The cooler the water is, the better, for it can reduce the investment in heat-exchange equipment. Occasionally, plants can manage on ground water, but usually surface water is required. That means location on or near the big, drought-resistant rivers. There are less than 200 rivers in the U. S. with minimum flows over 50 cu. ft. per second *(CW Oct. 5, '68, pp. 94-95).* For companies whose plant needs at least 100 cu. ft/second, the list numbers only 150 (excluding Alaska). Sea water is generally avoided because of high equipment corrosion costs.

Piping water in is expensive. Duval, now opening a 1.5 million tons/year sulfur mine in the arid Northwest area, was forced to install a 36-in., 38-mile-long water line and a 40-million-gal. reservoir. Cost of the water supply system hasn't been disclosed, but it is estimated that the tab was at least several million dollars.

The adequacy of domestic water resources in the year 2000 has recently been evaluated by the Geological Survey. Nationally, projected demand will be 173% of potentially assured supply. Only in three regions, New England, Ohio, and the South Atlantic Eastern Gulf, will future water requirements be easily met. Economic growth may be handicapped in nine regions: Eastern Great Lakes, Lower Mississippi, Upper Missouri-Hudson Bay, Lower Missouri, Western Gulf—Rio Grande, Pecos, Colorado, Great Basin, and Central and South Pacific.

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WATER_PCB-00054828

For the first time, a summary of water quality standards set by all 50 states.

	pH Allowable		Temperature (°F) allowable		Dissolved oxygen	Other Requirements
	Range	Deviation	Maximum	Increase above ambient	(minimum, mg./1. or %)	
Alabama	6.0–8.5	1.0	90° (24 hrs.) 93° (any 8 hrs.) 93° (cooling water)	10% — 10°	2.0 at 5 ft. or middepth if less than 10 ft.	**Radioactivity, Color, Taste and Odor, Toxic Substances:** Only in amounts that would not render waters unsuitable for industrial-cooling and process-water supply purposes. **Solids:** Free from waste materials that cause unsightly or putrescent conditions or interfere directly or indirectly with industrial use.
Alaska	7.0–8.0	0.5	70°	—	5.0	**Radioactivity:** Not to exceed limits of PHS Drinking Water Standards. **Turbidity:** No imposed values that would interfere with established levels of treatment. **Color:** True color less than 50 color units. **Taste and Odor:** Shall not unreasonably impair esthetic considerations. **Solids:** No dissolved solids above natural conditions causing corrosion or scaling problems. No visible evidence of other floating solids or sludge deposits. No imposed sediment loads that would interfere with established treatment levels.* **Toxic Substances:** Chemical constituents should be below concentrations found to be of public health significance.*
Arizona	6.5–8.6	0.5	93°	5°	—	**Radioactivity:** Not to exceed 1/30 of the MPC$_w$ value given for continuous occupational exposure in NBS Handbook 69. **Turbidity:** 50 JCU (streams); 25 JCU (lakes). **Color:** Free from waste materials in amounts sufficient to change existing color enough to interfere with industrial use or to create a nuisance. **Taste and Odor:** Free from wastes in amounts sufficient to produce enough taste and odor to create a nuisance or interfere with industrial use. **Solids:** Free from wastes that would be unsightly, putrescent, odorous or in amounts that would interfere with industrial use. **Toxic Substances:** Free from wastes toxic to human, animal, plant or aquatic life or in amounts that would interfere with industrial use.
Arkansas	6.0–9.0	1.0 (24 hrs.)	95°	5°	4.0 (average for any cross section)	**Radioactivity:** "Rules and Regulations for the Control of Ionizing Radiation," Arkansas Board of Health, apply. **Turbidity:** No distinctly visible increases due to wastes. **Color:** Shall not be increased to the extent that it interferes with industrial use, present or future. **Taste and Odor:** Must not cause offensive odors or otherwise interfere with industrial use. **Solids:** No distinctly visible persistent solids, bottom deposits or sludge banks due to wastes. **Toxic Substances:** Must not be present in amounts toxic to human, animal, plant or aquatic life.
California	6.5–8.6 7.0–8.6 (Coastal waters)	—	71.6°* (fresh water)	None that would cause ecological change or harm aquatic life (coastal waters)*	6.0 Coastal water: 5.0 (unless naturally lower)	**Radioactivity:** Shall not exceed 1/10 of the MPC$_w$ values given for continuous occupational exposure in NBS Handbook 69. **Turbidity:** Free from wastes that could alter water's existing turbidity. **Color:** Free from substances attributable to wastes that produce detrimental color. **Taste and Oder:** No substances that impart foreign taste or odor. **Solids:** Dissolved solids in fresh water must not exceed 300 mg./1. at any time; annual mean: 175 mg./1. Settleable solids must not be able to change nature of stream bottom or harm aquatic environment. **Toxic Substances:** At all times free from concentrations harmful to humans, aquatic life or wild or domestic animals.
Colorado	5.0–9.0	—	93°	—	3.0	**Radioactivity:** Not to exceed 1/30 of the 168-l.r.-week values in NBS Handbook 69. **Turbidity:** Must not interfere with established levels of treatment. **Color:** Wastes present must not cause appreciable change in color or interfere with industrial use. **Taste and Odor:** Free from wastes that cause odor or appreciable change in taste. **Solids:** Free from wastes that are unsightly, putrescent or odorous or would interfere with use. **Toxic Substances:** Free from wastes in concentrations or combinations sufficient to harm human or animal life.
Connecticut	6.0–9.0	—	—	None unless it does not exceed recommended limits for industrial use	2.0	**Radioactivity:** Limits to be approved by appropriate state agency. **Turbidity, Color, Taste and Oder:** None in such quantities that would impair industrial use. **Solids:** Limited to small amounts that may result from discharge of appropriately treated wastes. **Toxic Substances:** Free from chemical constituents in concentrations or combinations harmful to human, animal or aquatic life.
Delaware	6.5–8.5	—	—	5°	50%* or 4.0	**Radioactivity:** Alpha emitters limited to 3 pc/1.; beta emitters, to 1,000 pc/1. **Color, Taste and Odor:** None in concentrations that cause color, taste or odor. **Solids:** Free from unsightly and malodorous nuisances due to floating solids or sludge deposits. **Toxic Substances:** None in concentrations harmful (synergistically or otherwise) to humans, fish, shellfish, wildlife or aquatic life.
Florida	6.0–8.5	1.0	—	—	4.0	**Radiation:** Gross beta—1,000 pc/1. (in absence of Sr-90 and alpha emitters). **Turbidity:** 50 JCU. **Color:** Must not render water unfit for industrial-cooling or process-water supply purposes. **Taste:** Must not render water unfit for industrial use; phenols 0.001 maximum. **Solids:** Dissolved solids must not exceed 1,000 mg./1.; monthly average: 500 mg./1. Must be free from floating wastes that are unsightly or deleterious or other wastes that settle to form putrescent or objectionable sludge deposits. **Toxic Substances:** Free from wastes harmful to human, animal or aquatic life. Cu, 0.5 mg./1.; Zn, 1.0; Cr, 0.05; Pb, 0.05; Fe, 0.3; As, 0.05; F, 10.0; Cn, none detectable.

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WATER_PCB-00054829

	pH Allowable		Temperature (°F) allowable		Dissolved oxygen	Other Requirements
	Range	Deviation	Maximum	Increase above ambient	(minimum mg./l. or %)	
Georgia	6.0–8.5	—	93.2°	10° (above intake)	2.5 3.0 (daily average)	**Radioactivity:** Must conform to state statutes. **Turbidity, Color, Taste and Odor:** Free from wastes that cause objectionable conditions or interfere with industrial use. **Solids:** Free from wastes that are unsightly, putrescent or otherwise objectionable or would interfere with industrial use. **Toxic Substances:** . No wastes in concentrations that would prevent fish survival or interfere with industrial use.
Hawaii	6.5–8.5	—	—	—	4.5	**Radioactivity:** Not to exceed 1/30 of the values given by NBS Handbook 69. **Turbidity:** Free from soil particles from erosion caused by land development or agricultural use. **Taste and Odor:** Wastes, after dilution and mixture, must not interfere with industrial use. **Toxic Substances:** Free from substances in concentrations harmful to human, animal, or marine life or that make waters unsuitable for industrial use.
Idaho	6.5–9.0	0.5	—	2° Only if water 68° or less	75% (at seasonal low)	**Radioactivity:** Not to exceed limits of '62 PHS Drinking Water Standards. **Turbidity:** No objectionable turbidity that can be traced to a point source. **Solids:** No floating or submerged matter; no sludge deposits that could adversely affect industrial use. **Toxic Substances:** No wastes of other than natural origin in concentrations of public health significance or that could adversely affect industrial use.
Illinois	5.0–9.0	—	95°	—	2.0 3.0 (for 16 hrs. in any 24-hr. period)	**Color, Taste and Odor:** Free from wastes that produce color, odor or taste in such a degree as to create a nuisance. **Solids:** Free from floating wastes that settle and form unsightly, deleterious or putrescent deposits. **Toxic Substances:** Free from wastes in concentrations or combinations harmful to human, animal, plant or aquatic life.
Indiana	5.0–9.0	—	95°	—	1.0 2.0 (daily average)	**Color, Taste and Odor:** Free from wastes that produce color, taste or odor in such a degree as to create a nuisance. **Solids:** Dissolved solids must not exceed 1,000 mg./l.; monthly average. 750 mg./l. Must be free from unsightly, putrescent, deleterious or otherwise objectionable wastes. **Toxic Substances:** Free from wastes in concentrations or combinations harmful to human, animal, plant or aquatic life.
Iowa	—	—	—	—	—	**Color, Taste and Odor:** Free from wastes that produce color, taste or odor in such a degree as to be detrimental to industrial use. **Solids:** Free from floating wastes in amounts that would be unsightly or deleterious or other wastes that settle to form putrescent or objectionable sludge deposits. **Toxic Substances:** No wastes in concentrations or combinations detrimental to human, animal or aquatic life or to industrial use.
Kansas	6.5–9.0	—	90°*	—	4.0*	**Turbidity:** No increase that causes substantial visible contrast with natural appearance or that is detrimental to industrial use. **Color:** Discharges of color-producing substances limited to concentrations not detrimental to industrial use. **Taste and Odor:** Concentrations limited to those that would not result in noticeable offensive odors or otherwise interfere with industrial use. **Solids:** Free from floating debris or material in amounts that would be unsightly or detrimental to industrial use. **Toxic Substances:** Pollutional substances must be maintained below concentrations detrimental for industrial use.
Kentucky	5.0–9.0	—	95° 73° (Dec.–Feb.)	2°/hr 10°/day	—	**Color, Taste and Odor:** Wastes must not create a nuisance. **Solids:** Dissolved solids must not exceed 1,000 mg./l.; monthly average: 750 mg./l. No floating wastes in unsightly or deleterious amounts; no other wastes that settle to form putrescent or objectionable sludges. **Toxic Substances:** No wastes in concentrations or combinations harmful to human, animal, plant or aquatic life.
Louisiana	6.0–9.0	—	96.8°	5.4°	50%	**Radioactivity:** Specific limits set for all radioactive isotopes released as waste. **Solids:** None that would produce floating masses, sludge banks or beds on bottom, either organic or inorganic. **Toxic Substances:** No wastes in concentrations or combinations harmful to animal or plant life.
Maine	6.0–9.0*	0.5*	90°*	—	2.0*	**Radioactivity:** Not to exceed '62 PHS Drinking Water Standards. **Turbidity, Color, Taste and Odor:** Free from wastes that impart turbidity, color, taste or odor or impair industrial use. **Solids:** Free from sludge deposits, solid refuse and floating solids. **Toxic Substances:** No chemical constituents from waste sources harmful to humans or that adversely affect industrial use.
Maryland	5.0–9.0 (unless natural)	—	100°	—	4.0 (unless naturally lower)	**Color, Taste and Odor:** Free from waste materials that change existing color or produce taste and odor to such a degree as to create a nuisance or interfere with industrial use. **Solids:** Free from wastes that float, settle to form deposits, create a nuisance or interfere with industrial use and are unsightly, putrescent or odorous. **Toxic Substances:** Free from toxic wastes that interfere with industrial use or that are harmful to human, plant, animal or aquatic life.
Massachusetts	6.0–9.0	—	90°	—	2.0	**Radioactivity:** None in concentrations harmful to human, animal or aquatic life. **Turbidity, Color, Taste and Odor:** None in concentrations that would impair industrial use. **Solids:** None allowed except that which may result from the discharge from waste-treatment facilities providing appropriate treatment. **Toxic Substances:** None in concentrations or combinations harmful to human, animal or aquatic life.

WATER_PCB-00054830

Water quality standards

	pH Allowable Range	pH Allowable Deviation	Temperature (°F) allowable Maximum	Temperature (°F) allowable Increase above ambient	Dissolved oxygen (minimum mg./l. or %)	Other Requirements
Michigan	6.5–8.8	0.5	—	10°	Enough to prevent nuisance	**Radioactivity:** Standards to be established when information is available on deleterious effects. **Turbidity, Color:** No objectionable unnatural turbidity or color in quantities sufficient to interfere with industrial use. **Taste and Odor:** Below levels that are or may become injurious to industrial use. **Solids:** Dissolved solids must not exceed 750 mg./l.; monthly average: 500 mg./l. No floating solids or objectionable deposits in quantities that would interfere with industrial use. **Toxic Substances:** Limited to concentrations less than those that are or may become injurious to this use.
Minnesota	6.0–9.0	—	86°	—	—	**Color, Taste and Odor, Solids:** Free from wastes that cause nuisance conditions, such as material discoloration, obnoxious odors, significant floating solids, excessive suspended solids or sludge deposits.
Mississippi	6.0–8.5	1.0	93°	10°	3.0	**Color, Taste and Odor:** Free from wastes that produce color or odor in such degree as to create a nuisance. **Solids:** Dissolved solids must not exceed 1,500 mg./l.; monthly average 750 mg./l. Must be free from floating wastes that settle to form unsightly, deleterious, objectionable or putrescent deposits. **Toxic Substances:** No wastes in concentrations or combinations harmful to human, animal or aquatic life.
Missouri	6.5–9.0	—	90°	9° (average of cross section)	4.0*	**Radioactivity:** Gross beta: 1,000 pc/l. (in absence of Sr-90 and alpha emitters). Sr-90: 10 pc/l. Dissolved Ra-226: 3 pc/l. **Color:** Wastes must not cause substantial visible contrast with natural appearance of stream or interfere with industrial use. **Taste and Odor:** Limited to concentrations that would not result in noticeable offensive odors or otherwise interfere with industrial use. **Solids:** No noticeable organic or inorganic deposits or floating materials in unsightly or deleterious amounts. **Toxic Substances:** Concentrations not detrimental to industrial use or toxic to humans, fish, wildlife. F:1.2.
Montana	6.5–9.5	0.5	—	No adverse change	—	**Radioactivity:** Not to exceed '62 PHS Drinking Water Standards. **Turbidity:** Must not interfere with established levels of treatment. **Color, Taste and Odor:** Water shall be maintained in condition not offensive to sense of sight or smell. **Solids:** No floating solids and sludge deposits in amounts deleterious to industrial use; no sediments or settleable solids that affect treatment levels. **Toxic Substances:** Amounts present must not adversely affect industrial use.
Nebraska	6.5–9.0	1.0	90°	5° (May-Oct.) 10° (Nov.-Apr.) Rate: 2°/hr.	5.0	**Radioactivity:** Must conform with Radiological Health Regulations (1st. ed.), State of Nebraska, '66. **Turbidity:** No more than 10% increase above normal level. **Color:** No evidence of matter that creates nuisance conditions. **Taste and Odor:** Less than amounts that would degrade water quality for industrial use; phenol: 0.001 mg./l. **Solids:** Dissolved solids must not exceed 1,500 mg./l. No more than 20% increase (limit 100 mg./l.) from any point source. No waste solids that permit deposition or are deleterious to industrial use. **Toxic Substances:** None in concentrations or combinations that would render water unsuitable for industrial use.
Nevada	6.5–8.5 Annual median: 7.4–8.3	—	77.0° (summer) 57.2° (winter)	—	5.0 6.0 (average, June-Sept.)	**Radioactivity:** Limited to 1/10 of the 168-hr.-week values in NBS Handbook 69. **Turbidity, Color, Taste and Odor:** Free from wastes in amounts sufficient to change existing turbidity or color enough to create a nuisance or interfere with industrial use, or to produce taste or odor in the water. **Solids:** Free from floating or other wastes that settle to form sludge banks or deposits in amounts that would be unsightly or oderous or interfere with industrial use. **Toxic Substances:** Free from wastes in concentrations or combinations toxic to human, animal, plant or aquatic life or that interfere with industrial use.
New Hampshire	6.0–8.5 (unless natural)	—	90°*	No increase that would interfere with this use*	5.0	**Turbidity, Color, Taste and Odor:** None in objectionable amounts. **Solids:** No floating solids or sludge deposits in objectionable amounts. **Toxic Substances:** None in toxic concentrations or combinations.
New Jersey	6.5–8.5 (unless natural)	—	87° (unless natural)	5° (up to 87°)	4.0*	**Turbidity, Solids:** None noticeable in water or deposited along shore. **Color, Taste and Odor:** None that are offensive to humans or detrimental to aquatic biota. **Toxic Substances:** None that would affect humans or be detrimental to aquatic biota.
New Mexico	6.6–8.6	—	—	Must not pollute or make water unfit for this use	No oxygen demand that would cause pollution	**Radioactivity:** Not greater than 1/10 of the 48-hr. value in NBS Handbook 69. **Turbidity:** Shall not cause substantial visible contrast with natural appearance. **Color:** Should not create an esthetically undesirable condition. **Taste and Odor:** No odors, other than of natural origin, that are esthetically objectionable or obnoxious. **Solids:** No objectionable floating solids or debris and sediment that significantly alter properties of bottom. **Toxic Substances:** No amounts toxic to humans, plants, fish, animals.
New York	6.0–9.5	—	86°	5° (average 7 days) Rate: 2°/hr. 9°/24 hrs.	3.0	**Color:** No colored wastes that alone or in combinations make water unsuitable for industrial use. **Solids:** No floating or settleable solids or sludge deposits that are readily visible and attributable to wastes. **Toxic Substances:** None alone or in combinations that would impair industrial use.

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WATER_PCB-00054831

Water quality standards

	pH Allowable Range	pH Allowable Deviation	Temperature (°F) allowable Maximum	Temperature (°F) allowable increase above ambient	Dissolved oxygen (minimum) mg./l. or %	Other Requirements
North Carolina	Normal for area, usually 6.0–8.5; as low as 4.3 in swamps	—	95°*	7°	3.0	**Color:** Must not render water unfit for industrial cooling. **Solids:** Must not, after dilution and mixture, make water unfit for industrial cooling. **Toxic Substances:** Must not make water unfit for industrial cooling.
North Dakota	6.0–9.0	0.5	93°	10°	3.0 5.0 (for 16 hrs./day)	**Radioactivity:** No discharge allowed unless materials are readily soluble or dispersible and of quantities acceptable to state health department. **Color, Taste and Odor:** No wastes that color water or result in objectionable odors to a degree that impairs industrial use. **Solids:** No unsightly floating wastes that would adversely affect industrial use or wastes that settle to form putrescent or objectionable deposits. **Toxic Substances:** No concentrations or combinations harmful to human, animal or aquatic life.
Ohio	5.0–9.0	—	95°	—	1.0 2.0 (daily average)	**Color, Taste and Odor:** Free from wastes that produce color or odor to a degree that creates a nuisance. **Solids:** Dissolved solids must not exceed 1,000 mg./l.; monthly average: 750 mg./l. Must be free from floating or other wastes that settle to form putrescent or objectionable deposits or that are unsightly or deleterious. **Toxic Substances:** No wastes in concentrations or combinations harmful to human, animal or aquatic life.
Oklahoma	6.5–8.5	—	93°	5°	4.0	**Radioactivity:** Average concentration at points of controlled release shall not exceed State Board of Health Radiation Protection Regulations. **Turbidity:** None that causes visible contrast with natural conditions. **Color:** None that is persistent in concentrations detrimental to industrial use. **Taste and Odor:** No concentrations that would cause offensive odors in vicinity of water or otherwise interfere with industrial use. **Solids:** Free from floating debris, bottom deposits or other materials. **Toxic Substances:** None in quantities that make water toxic to human, animal, plant or aquatic life.
Oregon	6.5–9.0	—	—	2° (only if water 70° or less)	5.0	**Radiation:** Shall not pose external hazard. **Turbidity:** 5 JCU above natural. **Color, Taste and Odor:** No objectionable discoloration or conditions esthetically offensive to human senses of taste or smell. **Solids:** No floating solids, organic or inorganic deposits injurious to industry. **Toxic Substances:** No conditions injurious to public health.
Pennsylvania	6.0–9.0	—	93°	2°/hr.	4.0 5.0 (daily average)	**Color, Taste and Odor:** No wastes that produce colors, tastes or odors in amounts harmful to industrial use. **Solids:** Dissolved solids must not exceed 750 mg./l.; monthly average: 500 mg./l. No floating wastes or substances that settle to form sludge in amounts harmful to industrial use. **Toxic Substances:** None in amounts harmful to industrial use.
Rhode Island	6.0–8.5	—	—	4°	3.0* 5.0* (16 hrs./day)	**Radioactivity, Toxic Substances:** No concentrations or combinations harmful to human, animal or aquatic life. **Turbidity, Taste and Odor:** None in concentrations that would impair industrial use. **Solids:** No solid refuse, floating solids or sludge deposits.
South Carolina	6.0–8.5 5.0–8.5 (swamps)	—	93.2°*	10°*	3.0* 2.5* (swamps)	**Turbidity, Color, Taste and Odor:** Free from wastes that change the existing turbidity or color or that produce taste or odor to such a degree as to cause a nuisance or interfere with industrial use. **Solids:** None from waste sources in amounts that are unsightly, putrescent, odorous or that cause a nuisance or interfere with industrial use. **Toxic Substances:** Free from wastes harmful to human, animal, plant or aquatic life or that interfere directly or indirectly with industrial use.
South Dakota	6.0–9.5	1.0	—	—	—	**Radioactivity:** None permitted in water unless readily soluble or dispersible and in quantities allowed by federal or state agencies. **Color, Taste and Odor:** No wastes that produce material discoloration or undesirable odors. **Solids:** Dissolved solids must not exceed 2,000 mg./l. No wastes producing floating solids, sludge deposits or other offensive effects. **Toxic Substances:** None in concentrations toxic to human, animal or aquatic life.
Tennessee	6.0–9.0	1.0 (24 hrs.)	93°	10° Rate: 3°/hr.	Enough to prevent offensive conditions	**Radioactivity:** None that could adversely effect industrial use. **Turbidity, Color:** None in amounts or concentrations that could not be reduced to acceptable levels by conventional treatment. **Taste and Odor:** None that would result in taste or odor that would prevent use for industrial processing. **Solids:** Dissolved solids must not exceed 500 mg./l. No distinctly visible solids, bottom deposits or sludge banks that could be detrimental to industrial use. **Toxic Substances:** None that produces toxic conditions that would adversely affect water for industrial use.
Texas	5.0–8.5 5.0–9.0 (cooling water)	—	—	—	4.0	**Radioactivity:** Regulated by Texas Radiation Control Act and Texas Regulations for Control of Radiation. **Turbidity:** No substantial increase due to wastes. **Color:** No substantial visible contrast with natural appearance of receiving waters after wastes receive best practical treatment. **Taste and Odor:** No concentrations that produce offensive odors. **Solids:** Dissolved solids must not exceed 1,000 mg./l., unless water used only for cooling. Must be essentially free from floating or settleable suspended solids that would adversely affect industrial use. **Toxic Substances:** Shall not show acute or chronic toxicity to humans, animals or aquatic life to such an extent as to interfere with industrial use.

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WATER_PCB-00054832

Water quality standards

	pH Allowable Range	pH Allowable Deviation	Temperature (°F) allowable Maximum	Temperature (°F) allowable Increase above ambient	Dissolved oxygen (minimum mg./l. or %)	Other Requirements
Utah	6.5-9.0	—	—	—	—	Radioactivity: Shall not exceed 1/30 of MPC_w values for continuous occupational exposure in NBS Handbook 69. Turbidity, Color: No wastes in amounts that would change existing turbidity or color enough to create public nuisance or interfere with industrial use. Taste and Odor: No wastes in amounts that would produce taste or odor. Solids: No floating wastes that are unsightly or that interfere with industrial use; no wastes that settle to form unsightly or odorous sludge or bottom deposits. Toxic Substances: No wastes in concentrations or combinations toxic to human, animal, plant or aquatic life or that would interfere with industrial use.
Vermont	6.0-8.5	—	—	4°	3.0* 5.0* (16 hrs./day)	Radioactivity: To be approved by appropriate state agency. Turbidity, Color, Taste and Odor: None in concentrations that would impair industrial use. Solids: No floating solids, sludge deposits or solid refuse. Toxic Substances: No chemical constituents in concentrations or combinations harmful to human, animal or equatic life.
Virginia	5.0-9.0 (swamps as low as 4.3)	—	95°* (unless naturally higher)	No sudden changes that could harm aquatic life	1.0* 2.0* (daily average)	Color, Taste and Odor: No wastes that change existing color or produce odor to such a degree as to create a nuisance or interfere with industrial use. Solids: No floating wastes that are unsightly or create a nuisance or other wastes that settle to form unsightly, putrescent or odorous deposits. Toxic Substances: No wastes in concentrations or combinations that would interfere directly or indirectly with industrial use.
Washington	6.5-8.5	0.5	70°	t = 110/(T+15)††	6.5 or 70%	Radioactivity, Toxic Substances: Below concentrations that could adversely affect industrial use. Turbidity: Less than 10 JCU over natural conditions. Color, Taste and Odor, Solids: Dissolved, suspended, floating or submerged matter shall not reduce esthetic values so as to affect industrial use.
West Virginia	Process water: 5.5-9.0 Cooling water: 5.0-9.0	—	Cooling water: 93° (May-Nov.) 73° (Dec.-Apr.) Process water must permit fish passage	5° Rate: 2°/hr. (Dec.-Apr.)	1.0 2.0 (daily average)	Color: None that is objectionable. Taste and Odor: No objectionable odors in vicinity of the water. Solids: No distinctly visible floating, settleable or suspended solids of unreasonable kind or quantity. No objectionable bottom deposits or sludge banks. Toxic Substances: No concentrations of materials poisonous to human, animal or fish life.
Wisconsin	6.0-9.0	0.5	89°	—	1.0 2.0 (daily average)	Color, Taste and Odor: No materials producing color, taste or odor in amounts that would create a nuisance. Solids: Dissolved solids must not exceed 1,000 mg./l.; daily average: 750 mg./l. No floating or submerged debris or waste substances that would cause objectionable deposits in amounts to create a nuisance. Toxic Substances: None in concentrations or combinations toxic to humans or of public health significance.
Wyoming	6.5-8.5	—	—	4° 2° (for streams where temp. not over 70°)	6.0	Radioactivity: Not to exceed 1/30 of NBS Handbook 69 values. Turbidity: No more than 15 JCU above natural (when turbidity is 150 JCU or less); otherwise, no more than 10% above natural. Color: Essentially free of wastes that visibly alter natural color of water or impart color to vessels or structures. Taste and Odor: Essentially free from substances that would produce detectable odor at site of use. Solids: Essentially free from floating or settleable solids that are unsightly or settle to form sludge, bank or bottom deposits. Toxic Substances: Free from toxic substances in concentrations or combinations toxic to human, animal or equatic life.

* Standard reserved from Federal Water Pollution Control Administration approval.
†† t = total cumulative heat addition allowed from unnatural waste sources, at any point throughout the given stream reach. T = highest occurring temperature for a given period, in a specific stream reach.
Abbreviations: PHS—Public Health Service; NBS—National Bureau of Standards; JCU—Jackson Candle Units; pc/l.—picocuries per liter.
Source: Water Quality Standards of the United States, Territories, and the District of Columbia, American Public Health Assn., Subcommittee on Water Quality Control, and Engineering and Sanitation Section.
Note: Specific limits for coliforms, biologic oxygen demand, plant nutrients, oil, grease, scum, bottom deposits, pesticides, specific conductance, carbon chloroform extract, synthetic detergents not included. Some states set standards for each stream reach or river basin; in such cases, table shows least stringent requirement.

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POSSIBLE CUSTOMER QUESTIONS ON PCBs

PUBLICITY

Question 1

What articles have appeared on the PCB problem?
Will you send me copies?

Answer:

In the U.S., newspaper articles have appeared in the San Francisco Chronicle on Feb. 24, 1969, the San Francisco Examiner on Feb. 25, 1969, and the Hartford Times on Aug. 3, 1969. Numerous articles were generated by the Wisconsin "DDT Hearings" in May, 1969. At the hearings, witnesses discussed the problem of PCBs as "interfering substances" in their search for DDT in the environment. PCBs, they said, produced peaks on a gas chromatograph similar to the peaks produced by DDT. In no case was PCB indicted at the Wisconsin hearings.

Copies of the articles will be made available on request. Regional managers should contact E. V. John, Public Relations Manager Organic Chemicals Division, in St. Louis and copies will be forwarded to the customer through the regional manager's office.

In addition to the newspaper articles mentioned above, there have been radio broadcasts. At the time of the San Francisco Chronicle and Examiner articles, radios in the San Francisco area also carried the story. In August, the sports editor of the Hartford Times syndicated a radio broadcast on the subject of PCBs, and in Dec., 1969, the Canadian Broadcasting Co. (radio) carried an interview they taped with a member of our medical department.

Question 2

Were Monsnato's Aroclors specifically mentioned in these articles?
If so, which ones?

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Answer

Monsanto's Aroclors were mentioned in some of the articles but only in the San Francisco Chronicle story in Feb., 1969, was Aroclor 1262 specifically mentioned by number. In several of the articles, Monsanto was also identified as the sole U.S. producer of polychlorinated biphenyls, marketed under the tradename of Aroclor.

Question 3

What did the articles on the PCB problem say?

Answer

Since the outset of the "PCB problem", when the first article appeared in the U.S. press in Feb., 1969, the whole question has been closely interwoven with the question of DDT as a possible environmental contaminant.

The San Francisco Chronicle article carried a headline, "A Menacing New Pollutant." In rather sensational style, it identified PCB as a threat to birds and humans, highly toxic in a gaseous state and related to known cancer-causers. PCB presence in the environment is rising swiftly, the article stated.

The Examiner article called PCB a "plastic pollutant in the Bay and Mothers' Milk." This article called PCB an "alarming" new chemical pollutant that is playing a role in the declining peregrine falcon population, has been found in mothers' milk, and is the "latest addition to a growing list of chemicals in the ocean---- the newest symptom of man's chemical invasion of the ocean."

These two articles quoted Dr. Robert Risebrough, a researcher at the Institute of Marine Resources in the University of California's Department of Nutritional Scientists, on the detrimental effects of PCBs. Later Dr. Risebrough said he had been misquoted in some newspaper stories.

The Hartford Times story called PCB pollution a "new puzzle." Less sensational than the San Francisco articles, the Times gave an account of PCBs being found in the environment and the studies under way to determine their biological effects. This article, says Dr. Risebrough, tends to clear PCB of blame.

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Articles generated by the Wisconsin DDT hearings generally discussed PCB as an interfering substance discovered in scientists' search for DDT in the environment. Dr. Risebrough said at the hearings that there was no proof at the moment that PCB alone can cause thin eggshells, one of the phenomenon that he had discovered in studying the declining population of the peregrine falcon.

LEGISLATION

Question 1

Are there any Federal/State/local laws under which the use or discharge of Aroclors could be prohibited?

Answer:

No existing Federal, State, or local laws prohibit the discharge of Aroclors. However, in a number of states the basic water pollution control legislation is so broad that state agencies can prohibit chemicals, deemed necessary, from being discharged.

Question 2

Is the DDT and the PCB problem related?

Answer:

We are not a manufacturer of DDT or other chlorinated hydrocarbon pesticide and, therefore, have no knowledge of the seriousness of the charges against DDT other than what has been so widely publicized on TV, in the press and in technical journals. To the extent that both DDT and PCB are chlorinated hydrocarbons, then there is a similarity. They are sufficiently different in their chemical structures, however, that it would be entirely wrong to assume that both behave in the same way in the environment. There is another and more obvious difference. DDT and other chlorinated hydrocarbon pesticides were specifically designed for a job that obviously leads to their being scattered in wide spread fashion across the countryside. Rain, birds, wind, insects further scatter these pesticides in an uncontrollable manner. PCBs are not used in this fashion and

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Monsanto has never sought to promote this. This, we believe, is an important distinction that should not be overlooked if DDT and PCB are linked as a common pollutant of the environment. To our knowledge PCBs have never been identified in the absence of DDT or other chlorinated hydrocarbon pesticides.

Question 3

Could it be PCB that's causing the environmental problems and not DDT?

Answer:

We believe that present-day GLC and mass spectrometric techniques are sufficiently accurate to be able to differentiate between DDT, related pesticides, their metabolites and PCB.

Question 4

What authority do State and local governments have in banning/controlling the use of PCBs.

Answer:

They do have authority to ban or control use of any substances they consider harmful.

EFFLUENT AND ITS CONTROL

Question 1

How do I dispose of Aroclor 1254/1260, etc. effluent from my plant?

Answer:

We would suggest collecting all process effluent, equipment washings, tank or drum washings and then regularly taking to the nearest toxic materials dump. You may also be able to use a sanitary landfill if permits are issued for this in your locality. We don't recommend feeding this material to local sewage treatment plants or taking out to sea in drums for dumping. These methods do not

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solve the problem of contamination. We are working on the disposal of these materials by incineration and biodegradation. Our work in these areas has not yet reached the stage where we can offer practical suggestions. It is of interest to note, however, that research is underway fo find catalysts to make DDT self-destructive. The possibility exists that we could find catalysts that would destroy PCBs in settling tanks constructed to catch all your effluents.

Question 2

Can I test my effluent to see if my effluent has no Aroclor 1254, etc.?

Answer:

Yes. Analytical equipment is available that can do this if the proper technique is used. The basis of the method is GLC or gas liquid chromatography. Are you or anyone in your company familiar with this? Do you have GLC equipment? If you do, we can send you a description of a method that could identify PCB. If not, there may be a good analytical testing laboratory in the vicinity where you could send samples and rely on the results if you want to test your effluent.

Question 3

What is a "safe" PCB level for effluent leaving my plant?

Answer:

As our letter points out, parts per million (ppm) and parts per billion (ppb) have been mentioned in the published articles. There is still a lot of doubt as to how absolute any quoted values are. To bring this into the realms of reality, this definition of ppm and ppb may help clarify things.

To give you a practical example, the escape of one-two gallons per day could lead to samples in a stream beside the plant showing 10-50 ppb on analysis.

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Question 4

You must have quite a control problem at your plants--I would think Monsanto's Aroclor plants are the major polluters--how are you handling control?

Answer:

The Aroclor products we make to sell at a profit, so economics dictate maximum housekeeping, minimum loses. The Aroclor process is a "dry process" or closed system.

Question 5

How does Monsanto think Aroclors can get into the environment and cause so much pollution?

Answer:

Disposal, leakage from systems using it, spills, etc.

Question 6

If I analyze my effluent stream and find ppb there, how do I know it didn't come from air-borne contamination or was present in the process water that I pump from the XYZ river into my plant?

Answer:

Analyze water entering your plant and compare. There is a method available for sampling air.

Question 7

You seem to think from the tone of your letter that the source of pollution is from effluent disposal into streams. In my process, Aroclor 1254, 1260, etc. vapors escape. What precautions can I take to prevent (a) employee problems and (b) escape of vapors into the atmosphere?

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Answer (7):

Articles on PCB interference with pesticides analysis have mentioned the possibility of loss to the atmosphere from vaporization when Aroclors are heated. We find this hard to believe and it warrants considerable investigation.

TOXICITY

Question 1

If PCB is a danger to fish and birds, how about humans?

Answer:

The amounts being found in the environment are not considered a danger to humans or fish. The whole question on chlorinated pesticides relates to birds.

Question 2

Are Aroclor 1254/1260, etc. more toxic than other Aroclors? Why?

Answer:

There is a difference in toxicity depending on degree of chlorination. This is not to say that higher chlorination is more toxic than lower chlorination. The alleged PCB problem is not really related to degree of toxicity.

DIFFERENCES BETWEEN AROCLORS

Question 1*

In your letter, you state that Aroclor® 5060, 5442 and 5460 are not PCBs. What are they?

Answer:

They are chlorinated terphenyls.

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Question 2*

What's the difference between a chlorinated biphenyl and a terphenyl?

Answer:

A terphenyl has three benzenes linked together and biphenyl only two. They are, therefore, similar but different, just as naphthalene is different from benzene.

Question 3*

Why should PCB be an environmental contaminant and chlorinated terphenyls not?

Answer:

I don't think there is any positive answer on this and I can't give you any theories. However, I would emphasize that not all PCBs appear to be contaminants. Those such as Aroclor 1221, 1232, and 1242 haven't been identified in marine, aquatic and wildlife environments. Chlorinated terphenyls - at least those made by Monsanto - have not been identified in the environment either.

Question 4

Since you sell other PCBs beside Aroclor 1254 and 1260, why are they not found in the environment?

Answer:

One reason could be that they biodegrade and hence never build up to a level where they can be labelled persistent contaminants. Therefore, although you would find it in an effluent stream if you analyzed it just after you poured PCB into it, its absence when a river, for example, is analyzed downstream at a later date would indicate degradation by bacterial organisms.

We are actively working on this aspect of biodegradability in our laboratories at this time. Results of this type of work won't come to hand quickly but our preliminary work on PCBs of less than 54% chlorine looks promising.

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Question 5

In your letter, you make no mention of Aroclor 1262 and 1268. What is their status?

Answer:

It could be that their semi-solid/solid water insoluble nature means they are far, far less likely to become "mobile" contaminants. It could be that their structural differences from Aroclor 1254 and 1260 are responsible for the apparent lack of a problem. In any event, they have not been identified by scientists in the environment and--believe me-- a lot of scientists seem to be looking for PCBs.

Question 6*

Both Aroclor 5460 and 1260 contain 60% chlorine. Why is one a problem (1260) and apparently not the other (5460)?

Answer:

A terphenyl has three benzenes linked together and biphenyl only two. They are, therefore, similar but different, just as naphthalene is different from benzene.

I would emphasize that not all PCBs appear to be contaminants. Those such as Aroclor 1221, 1232, and 1342 haven't been identified in marine, aquatic and wildlife environments. Chlorinated terphenyls--at least those made by Monsanto--have not been identified in the environment either.

Question 7*

Does this PCB problem mean that you have discontinued efforts to get Aroclor 5460 approved by FDA?

Answer:

No.

0001378

Question 8*

Is the reason for not resubmitting your petition to the FDA for approval of Aroclor 5460 due to this PCB publicity?

Answer:

No.

Question 9

What's the problem then?

Answer:

We are bringing a new solid Aroclor plant on-stream in the next two-three months. We want to make sure it produces the same quality Aroclor 5460 we used in our feeding studies for the FDA. Once we're sure that's O.K. -- and we feel it will be--then we'll get the petition moving again but FDA clearances do take time.

Question 10

Does this PCB publicity mean that FDA approval of Aroclor 5460 is not going to be obtained?

Answer:

We have no reason to think the two things are related. Aroclor 5460 is not chemically a PCB. The delay resulted from the need to set up certain analytical methods to satisfy FDA. This involved analytical instrumentation and is being completed now. It is my understanding we plan to resubmit our petition although I personally don't know the exact date.

CONTAINERS

Question 1

Joe Doe buys all my used Aroclor drums without me having to wash them. I get $3.00 a piece. I can't afford to wash them out. Even if I did, what would I do with the washings?

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(Question 1 con't)

What should I do? Should I tell Joe Doe? Will Monsanto take them back or pay me $3.00 plus my costs to take them to a dump?

Answer:

Don't have an answer at this time. We just don't know.

APPLICATIONS

Question 1*

Could Aroclor 1254/1260 escape from my sealant/adhesive/coating whatever into the environment?

Answer:

This will depend entirely on the final use to which your product is used--its ultimate disposition.

Question 2*

My product X contains Aroclor 1254/1260. What should I tell my customers?

Answer:

Tell your customer--We want to advise you of a possible environmental problem. Without knowing what your customer does with product X, this is hard to answer. (We would say that it would not seem wise to use Aroclor 1254 or 1260 for keeping dust down on the roads, for use in dental sealing compounds or as carriers for pesticides.)*

*Only if you suspect or are told this is what the application is.

Question 3

Does Monsanto intend to continue manufacture of Aroclor 1254/1260, etc.?

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Answer (3):

I have been given no indication otherwise.

Question 4*

Should I look for replacement for Aroclor 1254/1260, etc. ?

Answer:

I think only you can decide this. How easy would this be for you? Do you have any other replacement product in mind?

Question 5*

Does Monsanto have replacement products for Aroclor 1254 and 1260?

Answer:

As you know, we have over eighty plasticizers in our line and there's quite a bit of product interplay so it is possible that there is another product in our line that might replace them. What resin do you use? Perhaps we could look at these resin/plasticizer Selector Charts in the back of the Blue Book. I've got it with me.

Question 6*

Is Monsanto working on replacements for Aroclor 1254 and 1260?

Answer:

These research fellows are always busy on things like that. To some people Aroclor 1254 and 1260 have draw-backs.-- quite apart from present publicity on PCB. Aroclor 1254 is fairly volatile. Aroclor 1260 is very viscous and difficult to handle. For polysulfide sealants, for example, the technical people in St. Louis have just sent us data on products that will behave better than Aroclor 1254 in polysulfide sealants. Maybe there's something here for you to look at. Let's go over it.

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