Monsanto

MONSANTO INDUSTRIAL CHEMICALS CO.
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Phone: (314) 694-1000

January 18, 1974

postmarked 1/18/74

RECEIVED
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HEARING CLERK

Hearing Clerk
U.S. Environmental Protection Agency
Washington, D.C. 20460

Re: Environmental Protection Agency
(40 CFR Part 129)
Water Program
Proposed Toxic Pollutant Effluent Standards
Federal Register, Vol. 38, No. 247,
Pages 35388-35395
Thursday, December 27, 1973

Gentlemen:

As a major producer and supplier of polychlorinated biph(enyls) to the electrical industry for [illegible] dielectric fluid applications, we have reviewed with considerable interest the effluent standards for these materials proposed in new Part 129, Subpart I, Chapter I of Title 40, Code of Federal Regulations.

We appreciate and concur with the Agency's intent to control the presence of persistent PCBs in the navigable waters of the United States to prevent environmental dam We have already taken positive steps toward this end. We strongly support realistic action designed to preve irresponsible introduction of persistent PCBs in[to] env[ironment].

We note, however, with considerable dismay that proposa included in Subpart I are, in our considered opinion, unrealistically restrictive, not supported by currently available data and not warranted under the present conditions of manufacture and use.

In accordance with Section 104.6, Part 104, Chapter I of Title 40, Code of Federal Regulations, we offer the following objections. These objections indicate our deep concern for this matter and are in as much detail

DEPOSITION EXHIBIT
Papageorge
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PENCAD-Bayonne, N.J.

as available time has allowed. We respectfully request an opportunity to present testimony describing our objections in greater detail at public hearings which we understand will be conducted at a future date.

1. We object to the unavailability of all the information used in the establishment of the proposed effluent standards. The short time available between the publication of the standards on December 27, 1973 and the published filing date of January 18, 1974; the unavailability of new Part 104, Title 40 CFR until January 4, 1974 and of the Statement of Basis and Purpose, Toxic Pollutant Effluent Standards until January 14, 1974, have prevented completion of a thorough evaluation of the proposed standards at this time. Further, a full copy of the EPA Water Quality Criteria dated October, 1973 is not yet available to us to review and evaluate nor is the long heralded report of the National Academy of Sciences and the National Academy of Engineering entitled "Water Quality Criteria, 1972."

2. We object to the proposed definition of polychlorinated biphenyls which implies that all the isomers have similar chemical, physical, toxicological, and degradation characteristics. Significant differences do exist and should be considered in developing a clear definition of those PCBs which affect the environment.

3. We object to the limitation of a maximum flow of 10,000 cubic feet per second in determining the quantity of PCBs which can be discharged into a stream, lake, estuary or coastal water. We find it difficult to understand the rationale which results in the conclusion that a PCB concentration which is acceptable in a slow moving body of water must be proportionately reduced when the flow exceeds an arbitrarily designated rate.

4. We object to the establishment of an effluent level for PCBs based on a concentration level which has been suggested as the threshold for salmon egg mortality. Information supporting the validity of this data is not available. Secondly, we seriously question that salmon truly qualify for the requirement under Section 307(a)(2) of the Act which states that the standard must take into account "....the usual or potential presence of the affected organisms...."

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5. We object to the establishment of an effluent level for PCBs based on calculations in which a biological accumulation factor of 200,000 was used. Biomagnification observed in environmental samples has been reported as ranging from 1 to 200,000 fold varying with the type of PCBs and wildlife species studied. We question the appropriateness of using the non-typical higher value.

6. We object to the establishment of effluent standards for PCBs before the development of approved sampling and analytical procedures which will assure accurate and reproducible results when performed in qualified laboratories. Further, the proposed critical chronic limit for fresh water streams of 0.0012 µg/l is below the present normal limit of detection with the analysis performed by an experienced analyst using sensitive measuring equipment.

7. We object to the lack of a published statement containing a full and complete assessment of the economic impact of the proposed effluent standards, if adopted, as required by the National Environmental Policy Act of 1969.

8. We object to the establishment of the PCB effluent standards without acknowledgment and full consideration of the presence at point sources of significant quantities of residual PCBs due to past discharges. Because of this inherent background level and because of the extremely low levels which resulted from the use of unrealistic premises, to which we objected in our foregoing comments, the proposed PCB effluent standards are not, in our opinion, practicably attainable.

The Monsanto Industrial Chemicals Company has commented and made recommendations relating to the inclusion of PCBs on the Toxic Pollutants List and to the establishment of an effluent standard for our manufacturing facility to representatives of the Agency and to the Effluent Standards and Water Quality Information Advisory Committee. Copies of our comments are enclosed.

Our purpose in commenting on the proposed standards is to aid the Agency in the development of realistic effluent standards which will achieve the intended objectives without serious technical, social and economic disruptions.

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To achieve our purpose we believe we must have access to, and review with Agency representatives, all of the information which was used in the establishment of the basis and purpose of the proposed PCB standard. We, therefore, respectfully request that the time period during which testimony is to be submitted and the dates on which the hearings will be conducted be extended.

Respectfully submitted,

WB Papageorge

W. B. Papageorge
Manager, Product Acceptability
Functional Product Groups

WBP/bt

Enclosure

WATER_PCB-SD0000040491

Monsanto

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July 13, 1973

Dr. Martha Sager, Chairman
Effluent Standards and Water Quality
Information Advisory Committee
Environmental Protection Agency
Room 821, Crystal Mall, Building 2
Washington, D.C. 20460

Re: Effluent Standards and Water Quality
Information Advisory Committee
Agenda and Notice of Public Hearings
Federal Register, Vol. 38, No. 116, Page 11868
Monday, June 18, 1973

Dear Dr. Sager:

Monsanto Company, as an interested party and a manufacturer of polychlorinated biphenyl (PCB), would like to take this opportunity to share with the Committee, and present for the record, our experiences regarding the manufacture, sale and handling of PCB and its relationship to the environment.

We hope this information, along with the attached exhibits, will be helpful to the Committee and the Administrator when proposing effluent standards for toxic pollutants.

BACKGROUND

Monsanto Company has been a major manufacturer of chemical products since 1901. These products are used in numerous American industries, and in fact, through our research department, we have played a role in developing new products to meet the needs of industry and the consumer.

On some occasions a chemical compound with specific properties is developed to meet a need in a certain application. In other cases a chemical compound with unique properties is developed first -- possibly through innovative research or even by happenstance -- and then an end-use is found.

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The chemical structure of PCB has been known for nearly 100 years. It was not until the late 1920s that a use for PCB was found -- as a dielectric fluid in transformers and capacitors. The properties of PCB -- inertness, fire resistance and a nonconductor of electricity -- seemed to be perfectly suited to these electrical applications where high-voltage arcing could occur, possibly resulting in serious fires or damage to the equipment.

Monsanto began commercial production of PCB in 1929. As the unique properties of the material became known new uses were found. For example, their fire-resistant nature made them excellent choices for use in heat-transfer fluids. Their inertness gave long-lasting qualities to lubricants. Their use in surface coatings improved waterproofing characteristics.

Handling of the product at the manufacturing level has not presented problems so long as the proper industrial hygiene practices were followed and PCB has always been considered less hazardous than many other chemicals in everyday use.

Therefore, it appeared that PCBs were a very suitable product which met the needs of industry.

Late in the 1960s, sophisticated analytical procedures were developed which could detect very minute quantities of PCB in nature. Following this analytical breakthrough, researchers discovered that PCB could possibly be affecting certain forms of aquatic, marine, terrestrial and avian wildlife.

The persistent nature and stability of PCB, while so desirable from the standpoint of many industrial applications appeared to be undesirable in terms of our environment.

INDUSTRY ACTIONS

When questions about the effect of PCB on the environment first surfaced, Monsanto Company reviewed its product line and the applications for these products. As more data were developed and the environmental controversy grew, Monsanto took steps intended to reduce the entry of PCB into the environment. The company stopped the sale of PCB for use in various applications, except where no acceptable alternatives were available.

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Today, PCB manufactured by Monsanto Company is sold to the electrical industry where it is used in closed systems as a dielectric fluid in transformers and capacitors -- applications for which we understand there continue to be no acceptable substitutes.

Our manufacturing and sales reduction program was a unilateral action taken by Monsanto and was based on our evaluation of developing environmental data.

Recognizing the need for proper controls in the handling and use of PCBs, representatives of the transformer and capacitor industries, utilities, and governmental agencies under the initial auspices of the National Electrical Manufacturers Association formed American National Standards Institute Committee C-107. A copy of the Committee's recently issued proposed guidelines for the handling and disposal of dielectric fluids is attached. These guidelines reflect the industry's understanding of the need for proper control and should contribute significantly toward this objective.

TOXICITY IN PERSPECTIVE

In Section 502 (13) of the current Federal Water Pollution Control Act, the term "toxic pollutant" is defined as "those pollutants or combinations of pollutants including disease causing agents, which after discharge or upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains will, on the basis of information available to the Administrator, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such organisms or their offspring."

While the breadth of this definition can be so construed as to permit the inclusion of many substances on a list of "toxic pollutant(s)," we concur with the recent suggestion of the EPA's Acting Administrator (Federal Register Vol. 38 No. 129, page 18044) that Congress intended the Administrat under the Act "... to be selective in determining which of the potentially large number of candidate substances

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actually should be listed at various times." Although not spelled out in the definition, we feel it important to consider the degree of toxicity of the substance; differences in biological species' sensitivity; and whether or not the substance poses a threat to man, animals, birds, the aquatic environment or some other aspect of the ecosystem.

For example, there is a material difference between the threat to human health posed by equal amounts of the "cyanide ion" and "PCBs," both of which substances appear on your proposed list of pollutants. We feel certain the members of your committee will agree that these two substances should not be considered on the same basis merely because they are both suggested for inclusion in the same list.

We trust that comparative differences in the potential hazard to health and our environment of the various substances proposed for your list will be an important factor in your deliberations and determinations.

On the basis of available evidence, it would appear that PCBs pose less of an acute toxic health hazard than many substances not proposed for your list, and at the levels found in the total environment are not a threat to public health. We believe these views agree with the conclusions reached by the Interdepartmental Task Force on PCBs in its report dated May, 1972 (COM-72-10419).

We sincerely believe, because of Monsanto's sales policies discussed elsewhere, and actions of others throughout the world, that the levels of PCB in the aquatic environment are even lower now than at the time the Task Force report was prepared.

BIODEGRADATION

A valid assessment of the environmental impact of polychlorinated biphenyls must include consideration of the persistence of these materials. Certain reports have been made that PCBs are non-degradable. However, although much work remains to be done, an analysis of available information and information from studies by Monsanto indicate beyond any reasonable doubt that the many PCB

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isomers degrade in the environment at different rates. This information indicates that under the proper conditions of use and control, some of the commercial PCBs, which are mixtures of several isomers, can be utilized and their safety benefits can be realized without serious adverse consequences to the environment.

In May, 1972 we shared with members of the Federal Interdepartmental Task Force on PCBs the results of studies of residual PCBs in animal tissues and biodegradation by activated sludges. A copy of this presentation is attached for review by your Committee. Articles describing in more detail the results of the degradation studies in activated sludges and soils are being prepared for publication. Copies of these reports will be mailed to your Committee when they are completed.

EFFLUENT STANDARDS

The worldwide interest in PCBs and their environmental impact has resulted in an abundance of published articles. To assist the Committee we have attached a bibliography of some of the pertinent literature, copies of selected articles and a copy of the Interdepartmental Task Force report. This report, in our opinion, is an excellent reference document and we recommend it to the Committee as a valuable source of information as you consider possibl effluent standards.

Although much has been published, much more scientific information is required. This critical need for more knowledge was recognized by the Task Force and is highlighted in its report under "Findings, Conclusions and Recommendations".

It is our considered opinion that in the absence of critic basic scientific data any attempt to establish a PCB standard for water effluents at point sources would be premature at this time.

Pending the availability of the data which would contribu to the establishment of a realistic effluent standard, it is appropriate to consider that the restricted use and proper control of PCBs have and will continue to result in a diminished impact on the environment. Furthe more, the recent ruling by the Food and Drug Administrati

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(Federal Register, Volume 38, Number 129, July 6, 1973) provides for temporary PCB tolerances in food, animal feeds and food packaging materials, thereby limiting exposure to humans and domestic animals.

We appreciate the opportunity the Committee has provided for interested parties to contribute information. If you have any questions concerning our comments or any of the attachments we will be pleased to supply further explanations or information upon request.

Respectfully submitted,

W. B. Papageorge
Manager
Product Acceptability

WBP/bt

Enclosures

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Monsanto

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August 6, 1973

Dr. C. H. Thompson
Office of Air and Water Programs
Environmental Protection Agency
Washington, D.C. 20460

Re: Environmental Protection Agency
(40 CFR Part 129)
Water Pollution Prevention and Control
Proposed List of Toxic Pollutants
Federal Register, Volume 38, No. 129
Pages 18044 and 18045
Friday, July 6, 1973

Dear Dr. Thompson:

Monsanto Company, as a manufacturer of polychlorinated biphenyls (PCBs), appreciates the opportunity to comment on the proposed list of toxic pollutants.

Recently we submitted comments to Dr. Martha Sager, Chairman, Effluent Standards and Water Quality Information Advisory Committee, to assist the Committee in its evaluation of effluent standards for toxic pollutants.

We believe these comments to be timely and relevant to the proposal being considered by your Office and have enclosed copies for your use.

If you have any questions concerning our comments or any of the attachments, we will be please to supply further explanations or information upon request.

Sincerely,

W. B. Papageorge
Manager
Product Acceptability

WBP/bt

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Polychlorinated Biphenyl (PCB)

- A PRESENTATION TO THE EFFLUENT STANDARDS AND WATER QUALITY INFORMATION ADVISORY COMMITTEE
- BY MONSANTO INDUSTRIAL CHEMICALS COMPANY

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I certainly appreciate the opportunity to participate in this meeting of the Effluent Standards and Water Quality Information Advisory Committee. My name is Bill Papageorge. I am Manager, Product Acceptability, for the Functional Product Groups of Monsanto Industrial Chemicals Company.

In this presentation, I would like to consider several questions about polychlorinated biphenyl (PCB). Why was it developed and produced? What has industry done to keep it out of the environment? What has Monsanto done to contain the product through improved manufacturing procedures? What are the problems involved in sampling and analyzing PCB's in manufacturing effluents? And finally, is PCB biodegradable?

I would also like to present some comments on the so-called Toxic Pollutant List.

And finally, I would like to summarize the points I'm trying to make.

Polychlorinated Biphenyl (PCB)

- WHY WAS PCB DEVELOPED AND PRODUCED?

The chemical structure of PCB has been known for nearly 100 years. It was not until the late 1920's that a use for PCB was found - as a dielectric fluid in transformers and capacitors. Its properties (stability, fire-resistance, high dielectric strength and conductivity) seemed perfectly suited to these electrical applications, where high-voltage arcing, serious fires, and damage to property and people could result.

Monsanto began commercial production of PCB in 1929. Other uses soon developed: in heat-transfer fluids (because of its fire resistance), in lubricants (because of its stability), and for water-proofing.

As long as proper industrial hygiene practices were followed, the manufacture of this product represented no safety or handling problems for employes.

- WHAT HAS INDUSTRY DONE TO KEEP PCB OUT OF THE ENVIRONMENT?

In the late 1960's, sophisticated analytical procedures were developed which could detect very minute quantities of PCB in nature. Following this breakthrough, researchers discovered that PCB could possibly be affecting certain forms of wildlife.

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As more data were developed, Monsanto voluntarily undertook a two-phased program to keep the product out of the environment.

•FIRST: WE LIMITED SALES

First: we limited sales of PCB for use in many, many applications where there was any danger of it getting into the environment. Today, PCB manufactured by Monsanto Company is sold only to the electrical industry, where it is used in closed systems as a dielectric fluid in transformers and capacitors - applications where there are no known substitutes of acceptable quality and none that are fire resistant.

In addition, representatives of the transformer and capacitor industries, utilities, and governmental agencies (under the initial auspices of the National Electrical Manufacturers Association) formed the American National Standards Institute Committee C-107. This committee issued guidelines (which have already been supplied to the committee) for handling and disposing of dielectric fluids. They reflect the industry's understanding of the need for proper control.

•SECONDLY: WE DEVELOPED AN AGGRESSIVE CONTROL PROGRAM AT OUR MANUFACTURING LOCATION.

Secondly, since 1969, we have invested more than 22 man years of work and millions of dollars in this program. Since we are quite proud of our results, let me take a few minutes to summarize it:

--In our manufacturing area, we have taken a number of significant steps to contain PCB's. In essence, we have made the department a "concrete bathtub". Drainage is directed to trenches and piping, and then to one of two 3,000-gallon settling basins. This insures PCB containment in case of accidental spill or equipment failure.

We have also installed an incinerator to safely dispose of PCB's. This is accomplished through incineration at or above 2000° +F.

When small quantities of PCB's are collected into the settling basins in the manufacturing area they are later pumped into drums, and eventually incinerated. In the incinerator area itself, drainage is directed to trenches and piping which flow into a 10,000-gallon basin. Recovered PCB's are periodically pumped to storage, or incinerated.

In the manufacturing area, we have also rerouted rupture disc lines and atmospheric vents through catch tanks, or redirected them to settling basins. This insures that if a rupture does occur, PCB's will not get into the environment, but will be contained in a

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We also provide nitrogen blanketing on storage tanks to eliminate any "breathing" of the tanks and resultant PCB escape.

We have installed mist eliminators in vapor lines - once again to eliminate the possibility of PCB's leaving the manufacturing area through these lines.

Finally, we have replaced underground sewers with above-ground sewers, and repaired or combined others, so that we can monitor the effluent from the department. In addition, this will prevent any unknown buildup of PCB's in our sewer systems or any contamination of PCB's into other sewers.

Much of the success of our efforts also depends on maintaining a high housekeeping level in the department itself. Among the housekeeping responsibilities our operators have assumed are these:

--All pumps are checked for leakage on every shift. Drip pans that collect leaks are emptied into scrap PCB drums.

--All leaks are reported and documented so that corrections can be made and settling basins observed.

--"FloorDry" is used to absorb any liquid PCB's that have spilled or leaked. If it becomes necessary to flush PCB's to the settling basin, a minimum amount of water is used.

--Sampling drums and scrap-PCB drums are quickly palletized, labeled, and transferred to the incineration area.

Through these kinds of programs, we feel we have literally built a "concrete bathtub" to catch and safely dispose of PCB's at our manufacturing location.

--We have also developed sophisticated systems to monitor our effluent. Monitoring effluent streams for PCB's is not an easy effort. Measurement can be changed dramatically by taking the sample at different places along the sewer main, by changing the level at which the sample is taken, by changing the speed at which the sample is taken, or by varying the velocity of the effluent. But we have purchased the best available laboratory equipment, which enables us to determine PCB content in the parts-per-billion range. Here again, however, many factors affect our findings. Dr. Scott Tucker, our analytical expert, advises that the minimum detection level of PCB's on a routine basis contained in distilled water is one part per billion (± 25%). If "dirty" water - i.e., that containing other materials which

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interfere with the determination of PCB - is analyzed, the minimum detection level is 100 ppb ± 25%. Monitoring is a very tricky business. But we feel with our experience and acquired "know-how", we're doing the best possible job. And we do this job 24 hours a day, 365 days a year.

We have also established loading and shipping safeguards to minimize accidental PCB loss during transportation. Specific written instructions are on every container we ship.

--And finally, we have provided facilities for safely disposing of used PCB's returned from customers. As I mentioned above, we installed a specially designed PCB incinerator, at a cost of $790,000. We have received an operating permit from the Illinois EPA for this incinerator, which meets all EPA requirements. This incinerator completely destroys PCB's received either from our manufacturing area or from customers.

Finally, we have moved toward the manufacture of a more biodegradable polychlorinated biphenyl. In 1971, we installed a new distillation column in our manufacturing department at a cost of $970,000. This allowed us to separate the higher chlorinated, less biodegradable compounds from the lower chlorinated, more biodegradable ones. Our PCB's are known by the trade name Aroclor. We manufacture different grades of Aroclor (1016, 1242, 1254, for example). The lower the grade number, the less chlorinated and more biodegradable is the product.

The attached table reflects how our production mix has changed to more biodegradable products while the production of higher chlorinated less biodegradable products has declined.

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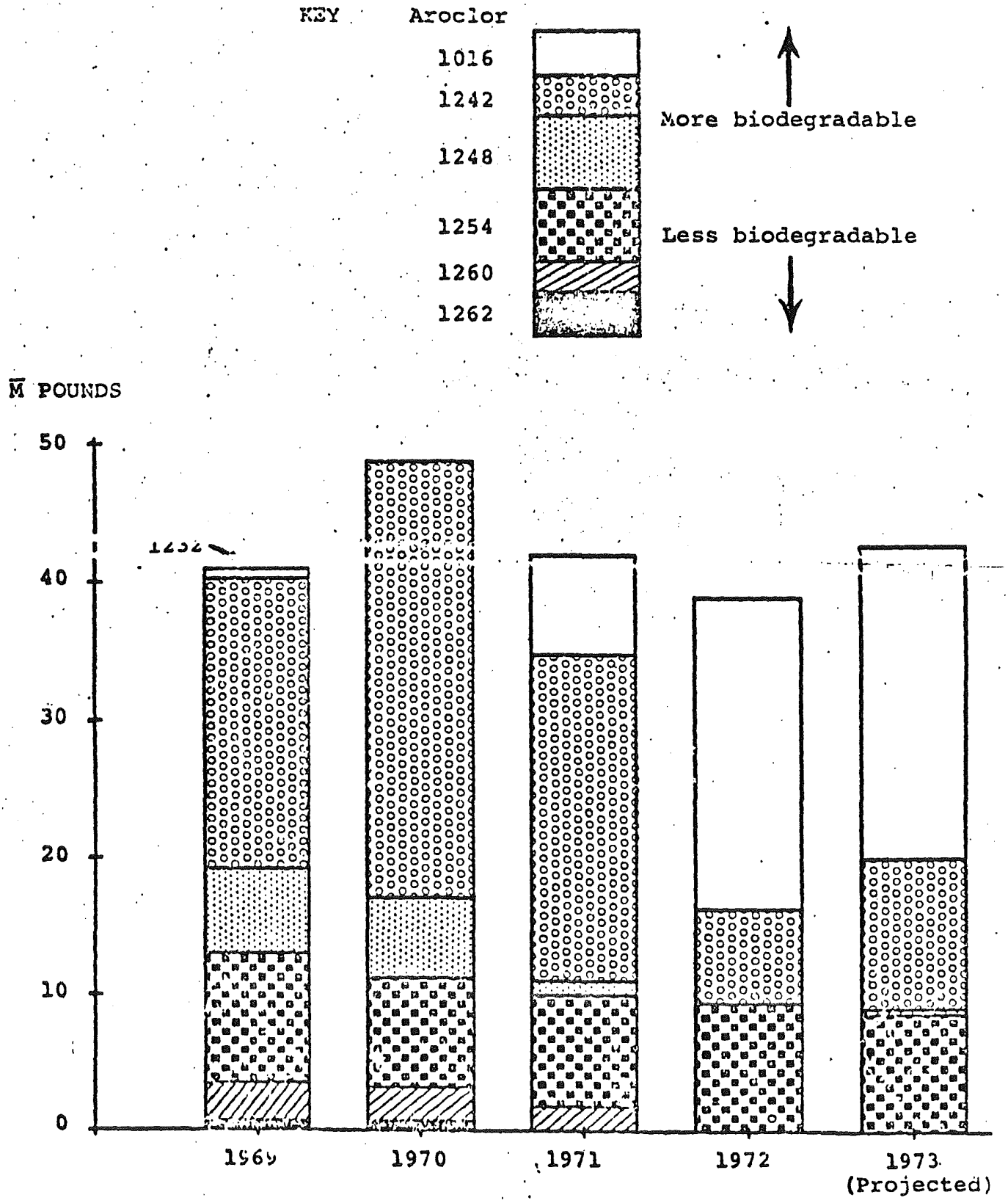
AROCLOR PRODUCTION AT THE Wm. G. KRUMMRICH PLANT



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So I think we can safely assert that industry and Monsanto have taken strong measures to contain PCB's and keep them out of the environment.

IS PCB BIODEGRADABLE?

I mentioned before that we are presently manufacturing more biodegradable PCB's. We feel all information points out - beyond any reasonable doubt - that many PCB isomers do degrade, and they do degrade at different rates. Under proper conditions of use and control, PCB's can be utilized without serious adverse consequences to the environment.

To support this view, we have previously sent the reports of Monsanto studies which were submitted to the Federal Interdepartmental Task Force on PCB's. Articles describing the results of biodegradation studies in activated sludges are also being prepared, and we will send copies when they are completed.

The Toxic Pollutant List

Neither Mr. Hosmer nor myself are toxicologists. We are chemical engineers.

But we would like to make some comments on the toxic pollutant list. In Section 502 (13) of the current Federal Water Pollution Control Act, the term "toxic pollutant" is defined as "those pollutants or combinations of pollutants including disease causing agents, which after discharge or upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains will, on the basis of information available to the Administrator, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such organisms or their offspring."

We have also read the Federal Register, Volume 38, No. 173, dated September 7, 1973. Part 129 (beginning on page 24343) is concerned with the Toxic Pollutant Effluent Standards.

We are concerned with the "catch-all" nature of these definitions and criteria. Depending on how they are defined and applied, the toxic pollutant list could conceivably cover all chemicals and many, many other materials which are relatively innocuous in their impact on the environment.

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We concur with the recent suggestion of the EPA's Acting Administrator (Federal Register Volume 38, No. 129, page 18046) that Congress intended the Administrator under the Act "... to be selective in determining which of the potentially large number of candidate substances actually should be listed at various times". Although not spelled out in the definition, we feel it important to consider the degree of toxicity of the substance; whether or not the substance poses a threat to man, animals, birds, the aquatic environment or some other aspect of the ecosystem.

Whether or not PCB's remain on the "enemy list", it is our recommendation that an effluent limit no more stringent than one pound of PCB per 100,000 pounds of production be established for our manufacturing operation. To keep this in perspective, this would correspond to a concentration in the Mississippi River of 1.4 parts per trillion, based on that river's average flow. We believe this concentration would have no adverse effect on the aquatic environment.

In Summary

First: Monsanto began producing PCB to fill a market need. The product has excellent qualities to fill these needs.

When the "alarm bell" sounded in the late '60's, Monsanto and the concerned industries took positive steps to keep PCB out of the environment. At our manufacturing location, we developed a many-sided program to contain PCB, and keep any of the product from the environment. Because of this, levels of PCB in the aquatic environment are reported to be lower now than before.

We feel that some PCB's are biodegradable, and we are developing supporting evidence.

Secondly: We are concerned that the criteria for the Toxic Pollutant List are too general and susceptible to "fishing expeditions". (Excuse the pun.) Whether PCB should be on that list at all is questionable.

Finally: We recommend that a limit no more stringent than one pound of PCB's per 100,000 pounds of production be established for our manufacturing location. This corresponds to 1.4 parts per trillion in the Mississippi River.

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