

AUG 20 1974

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, ONE RIVER ROAD, SCHENECTADY, NEW YORK 12345
Phone (516) 374-2211

W. Papageorge
REAL ESTATE
AND CONSTRUCTION
OPERATION

August 15, 1974

Dr. C. H. Thompson
Chief of Hazardous and Toxic
Substances Branch
Room 2824 - The Mall
Mall Stop Code WH 448
401 M Street, S.W.
Washington, D.C. 20460

Dear Dr. Thompson:

During our telephone conversation on August 2 we discussed the biological bases for the proposed PCB effluent standards and the technical means for identifying and reducing PCB losses from electrical manufacturing plants.

In response to your request, we have begun to compile the relevant technical data and have completed our review of the various documents that have been introduced into the hearing records pertaining to biological matters.

On the basis of the latter review, we present in this letter a summary of suggested alternatives to the proposed standards and a justification for our proposals.

I. ALTERNATIVES

A. Short Range

1. Based upon data from the National Water Quality Laboratory, adopt a WQC chronic limit for fresh water of 2 $\mu\text{g/l}$; or
2. Adopt an interim standard in the form of a freeze on current (average) levels of discharge.

B. Long Range

After adopting one of the above alternatives, EPA should provide an opportunity for cognizant state agencies, affected industrial dischargers, and members of the public to cooperate



SERVING
PROGRESS

MONS 094757

PCB
Sec 307

August 15, 1974

with it in identifying and quantifying the factors specified in Section 307 (a)(2) as a basis for long range standards.

II. JUSTIFICATION

These suggested alternatives are based on the following material, culled from the hearing records:

- A. The essence of the rationale used in the Basis and Purpose Document.
- B. GE comments on that rationale.
- C. Detailed basis for the foregoing GE proposed alternatives.

A. Basis and Purpose Document

According to the Basis and Purpose Document (PCBs), the following sequence of steps was followed: (pp. 32, 38, 51).

1. Preliminary data from Jensen had suggested that 0.5 mg/l of PCB in whole salmon eggs might be the threshold for egg mortality (underlining added).

2. Such a level in eggs would be associated with levels in general body tissue of 2.5 to 5 $\mu\text{g/g}$.

3. Data obtained by other workers on other species had indicated bioaccumulation factors as high as 200,000.

4. Thus, the suggested threshold for salmon egg mortality would correspond to an aqueous PCB concentration of

$$\frac{2.5 \text{ ppm}}{2 \times 10^5} = 1.25 \times 10^{-5} \text{ ppm}$$

5. To provide adequate protection for egg development, a further factor of 5 reduction was recommended, leading to a WQC chronic limit:

$$\begin{aligned} \text{WQC chronic limit} &= \frac{1.25 \times 10^{-5}}{5} = 2 \times 10^{-6} \text{ ppm} \\ &= 2 \times 10^{-3} \mu\text{g/l. (ppb)} \end{aligned}$$

6. Then, an additional safety correction of 0.6 was used to arrive at a critical chronic limit:

$$\text{Critical chronic limit} = (0.6) (2 \times 10^{-3}) = 1.2 \times 10^{-3} \text{ ppb}$$

August 15, 1974

7. Finally, this critical chronic limit was combined with the appropriate conversion factors to arrive at the final chronic standard for fresh water streams:

Pounds/day = (6.48×10^{-6}) (cfs of receiving stream)

B. GE Comments

1. In response to EPA's invitation for comments that might assist it in setting effluent standards, I wrote you a letter on November 21, 1973. After reading EPA's "Proposed Criteria for Water Quality - Vol. I", I stated on p. 2 of my letter: "The rationale given for this level (2×10^{-3} ppb) is based upon an exceedingly tenuous chain of reasoning beginning with a PCB residue level that had been suggested (not demonstrated) as the threshold for salmon egg mortality and continuing through several other vaguely defined multiplicative factors. Further, this number has no operational significance because no analytical techniques are available for the reliable determination of so low a concentration of PCBs in water."

2. In his sworn affidavit testimony, our biological consultant, Dr. Gerald J. Lauer, amplified our criticism of the chain of reasoning used in the Basis and Purpose Document by questioning both the data themselves and the way in which they were used.

- a. He pointed out two bases for questioning the validity of the published data on salmon eggs, which were the starting point for deriving the proposed standard. (pp. 5, 6).
- b. He also asserted that the coupling of salmon egg data with the "maximum value for bioconcentration observed for another species of fish exposed under entirely different conditions to possibly another type of PCB ... may have been justified for the purpose of developing criteria or guidelines, but does not provide a reasonable basis for proposing a standard that would apply to all homologs of PCBs and to bodies of water containing neither of these species. Salmon are not indigenous to any of the three streams (the upper Hudson, the Housatonic and the Coosa rivers) on which GE manufacturing plants are located." (p. 4).

Dr. Lauer's distinction between criteria and standards was also made by the NAS - NAE Committee on Water Quality Criteria, whose report (EPA Exhibit 12) was used as the basis for the EPA proposed standards:

"The distinction between criteria and standards is important, and the words are not interchangeable nor are they synonyms for such commonly used terms as objectives or goals ... They (the Committee's recommendations) are meant as guidelines only, to be used in conjunction with a thorough knowledge of local conditions."

Our testimony also cited the opinion voiced in an important predecessor document⁽¹⁾:

"An authoritative origin does not necessarily mean that the standard is fair, equitable, or based on sound scientific knowledge, for it may have been established on the basis of inadequate technical data tempered by a cautious factor of safety ... There is a tendency, which should be avoided assiduously, to let criteria become rigid and perhaps ripen into standards."

C. GE Proposed Alternatives

Short Range

In the last section of his affidavit testimony (p. 6), Dr. Lauer referred to results reported by the National Water Quality Laboratory⁽²⁾ showing that survival, growth, and reproduction of several fresh water invertebrate species were unaffected by exposure to aqueous PCB concentrations in the range 2-10 $\mu\text{g/l}$, which is 1,000 to 5,000 fold higher than the chronic limit of 0.002 $\mu\text{g/l}$ used by EPA.

These are direct observations that exposure to a given environment was not harmful to a test species. No inferences had to be drawn from imputed correlations between observed tissue levels and mortality rates, nor was it necessary to calculate an associated concentration by assuming the validity of an unrelated bioaccumulation factor. Dr. Lauer concluded with his professional opinion that

"These data (from the NWQ Laboratory) would be much more relevant as bases for standards to protect aquatic life from chronic effects than those used to generate the proposed standards."

Under cross-examination by Mr. Eckert of EPA on May 9, Dr. Lauer reviewed his criticism of the procedure used to derive the proposed standard and then stated (Transcript of Proceedings pp 2904-2905):

- (1) Water Quality Criteria, Second Edition, McKee and Wolf, State Water Resources Control Board of California April 1971, pp 4-5.
- (2) Selikoff, Irving J., 1972. Polychlorinated Biphenyls-Environmental Impact: A review by the Panel on Hazardous Trace Substances, Environmental Research Vol. 5(3) pp. 249-362; see p. 326.

Dr. C. H. Thompson

-5-

August 15, 1974

"I would not argue that any one of these pieces of data is the relevant piece of data that ought to have been used instead of what was used. My main point is that in fact there was some more relevant data I would have picked to have applied to fresh water situations that has been developed by the Duluth Laboratory that should have been used in the standards.

"I don't know why EPA doesn't use their own laboratory's data -- It's the best that exists -- in coming up with these standards when it's there, instead of reaching out to some ambiguous salmon data that the authors of which even question the validity of at this stage of the game."

This section of the transcript was subsequently quoted by Messrs. Eckert and Rogers in EPA's appeal (June 5) of rulings disallowing testimony by certain witnesses; and we referred to it again in Mr. Richel's memorandum of June 12 in opposition to the appeal. All of this is designed to emphasize that well before the date of publication of the proposed standards, EPA had available to it from its own laboratories data that were at least as relevant and valid (if not more so) as the data upon which the proposals were based.

Two short range alternatives to the proposed standards are possible:

1) Based upon Dr. Lauer's citation of data from the NWQ Laboratory, the WQC chronic limit for fresh water can be changed from 0.002 $\mu\text{g/l}$ to 2 $\mu\text{g/l}$. If no other changes were made in the Basis and Purpose Document, this would lead to the following relationship:

Pounds per day $2(6.48 \times 10^{-3})$ (cfs)

2) Adopt an interim standard in the form of a freeze on current (average) levels of discharge (see E. L. Simons Testimony, Section 4, p. 4).

Long Range

In my written testimony (E. L. Simons, Section 4, p. 3) I cited the language of Section 307 (a) (2) and stated:

"We submit that such a requirement makes it impermissible to set an effluent standard for all streams that varies only in proportion to the flow of the stream, irrespective of its location or the nature of the species indigenous to it."

Dr. C. H. Thompson

-6-

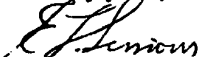
August 15, 1974

Therefore, we urged (Section 4, p. 4) that concurrently with adoption of an interim standard, "EPA should initiate a formal review of that standard, under Section 307 (a)(3), to provide an opportunity for cognizant state agencies, affected industrial dischargers, and members of the public to cooperate in identifying and quantifying the above factors."

Under cross-examination by Mr. Eckert, Dr. Lauer amplified on the kind of studies that would be required (Transcript of Proceedings, pp. 2891-2894), and subsequently (pp. 2911-2912) our counsel, Mr. Richel, stated: "We would participate in the funding of studies that would carry out the concepts that have been indicated by Dr. Lauer as, of course, related to our sites."

Thus, we think that there already exists, on the record, sufficient evidence to warrant the adoption of alternatives to the proposed effluent standards.

Sincerely yours,



Dr. E. L. Simons, Manager
Environmental Protection Operation

ELS:1

P.S. After the close of hearings, I sent a summary letter to Mr. M. R. Eastin; I enclose a copy in the event you have not seen it. In this letter we refer to the main features of our plant controls, as described in the major portion of my replies to Mr. Eckert's cross examination on May 8 (Transcript of Proceedings). The further details that you asked about will be described in a subsequent letter.

E.L.S.