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November 6, 1991

Mr. Douglas Tomchuk
Region II
US EPA
26 Federal Plaza
New York, NY 10278

Re: Hudson River Reassessment Process

Dear Doug:

Enclosed are Scenic Hudson's comments on the Synopses of the Phase I Report. Our comments are keyed to several highlighted and numbered sections of the text.

Please call if you would like to discuss these concerns in further detail.

Sincerely,

Cara

Cara Lee
Environmental Director

/gm
Enclosure

10.3907

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Scenic Hudson's Comments on Synopses for the Phase I Report Interim Characterization and Evaluation

Hudson River PCB Reassessment Remedial Investigation/Feasibility Study prepared for US EPA Region II

November 6, 1991

10.3908

INTRODUCTION

Scenic Hudson provided extensive comments delineating our concerns with the text of the Executive Summary for the Phase I document. The following comments are directed to the synopses which appear in the Phase I report, summarizing each major issue area.

Overall, we are concerned that the abbreviated conclusions and explanations provided in the synopses which preface each chapter minimize the scope and severity of PCB contamination in the Hudson River which is more fully laid out in the text of the report. We remain firmly convinced that the Executive Summary and Synopses of the Phase I document must be rewritten to accurately reflect this information.

For the sake of brevity, we have keyed our comments to the attached highlighted and numbered text of the synopses.

Lower Hudson Characterization (Sections A.1 through A.4)

1) The emphasis on additional PCB sources in the lower Hudson that are "important to consider" is left open-ended and is therefore subject to misinterpretation. The synopsis does not explain what the significance of PCB discharges from throughout the lower Harbor is in relation to the clean-up of PCB laden sediments from a known source in the upper Hudson. The implication is that the presence of PCBs from other sources reduces the need or advisability of remedying up-river sources.

2) Throughout the synopses, there is a focus on the "decline" of PCB concentrations in fish, water, and sediments without an adequate explanation of why the process has occurred or how that trend could be reversed.

   However, on page A.3-2, the Phase I Report explains that "The decrease in sediment PCB levels from 1977 to the most recent measurement is attributed to the reworking, resuspension, and gradual dispersion by the river of the sediments released after the Fort Edward dam was removed. In addition, "the discontinued use of PCBs by GE since 1977 may have also contributed to decreased PCB sediment levels."

   Both the text and the synopses would be more balanced with a discusssion of the "single runoff event in the spring of 1983 which accounted for a 50 per cent increase in annual PCB transport from the upper Hudson River over the prior year" as reported in the "Case for Reconsideration" by the Department of Environmental Conservation's Project Sponsor Group, August 1989. This "blip" in the data reflects a ten year flood event; a higher flow event would be likely to have an even greater effect.

3) The synopsis states that the Thomann model "indicates that PCB load to the Lower Hudson via the Upper Hudson had declined substantially since 1973." It therefore allows the reader to draw conclusions without a thorough understanding of the shortcomings of the Thomann model.

However, an extensive discussion of the Thomann model in the text includes explanatory statements such as page A.4-4 "... a constant sedimentation rate was assumed, which may be **unrealistic** in light of the historic channel destabilization and sediment scour following the removal of the Fort Edward dam," and A.4-9 "In any model, there is often a great deal of skepticism concerning the various simulations.....spatial and temporal variability in PCB water concentrations, loading estimates, and variable striped bass migration patterns may contribute to overall model uncertainty."

Nature and Extent of Contamination (Section B.3)

4) Reference to a "high degree of spatial variability" in PCB concentrations implies that the location of highly contaminated deposits is unknown. The Department of Environmental Conservation Project Sponsor Group has identified riverbed "hotspots" and has proposed a plan for their remediation.

7) This statement implies that we will never be able to make a resource management decision about PCBs because we can not measure and define everything about them. This is not the case: several important regulatory decisions have called for the remediation of PCB contamination in the Hudson River and elsewhere by the removal of contaminated sediments.

* In 1988, the conclusion reached in the Recommended Decision and Hearing Report by Administrative Law Judge (ALJ) Louis following the Industrial Hazardous Waste Facility Siting Board Hearing found that "substantial environmental benefits would be derived from the (Department of Environmental Conservation's) proposed Project with either few or relatively minor adverse environmental impacts."

* In January 1989, in its final decision, a majority of the New York State Siting Board determined that the project was necessary and in the public interest, although it did not approve the proposed disposal site, (Site G.) As of the same date, Department of Environmental Conservation Commissioner Jorling directed the Project Sponsor Group within DEC to proceed with the development of a revised project using another disposal site (Site 10.)

* Removal of PCB laden sediments is the proposed remedial alternative at several Superfund sites including New Bedford Harbor, Massachusetts, Waukeegan Harbor, Illinois and Massena, New York.

Data Synthesis and Evaluation of Trends (Section B.4)

8) Again, this suggests a static condition in the Hudson and there is no mention of how variations in the flow regime might change these findings.

9) The reasoning in this statement is backward, and should be stated that there has been little <u>decrease</u> in total load.

10) The noted "decline and leveling out of PCB levels in fish" does not address the fact that PCB concentrations currently remain above the FDA tolerance level throughout the Hudson, that natural processes may reverse this trend, and that the greatest decline is related to the end of PCB discharge.

    Arriving at estimates of total PCB levels in fish in the next 30 years is an academic exercise because of the assumption that the current declining trends will continue. Reliance on such estimates to draw conclusions demonstrates a poor understanding of the dynamics of the estuarine system.

11) Assuming that "the current declining trend continues" is a bold assumption without a fuller explanation including the aforementioned factors.

12) Regulatory decisions have been made successfully at numerous sites with regard to PCB remediation without congener specific analysis, therefore it is misleading to present the need for this kind of additional information before a decision can be reached.

Preliminary Human Health Risk Assessment (Section B.6)

13) There are unacceptable health risks associated with ingestion of fish from the lower Hudson as well, or there would not be health advisories on all species from the New York State Department of Health.

SYNOPSIS

LOWER HUDSON CHARACTERIZATION

(Sections A.1 through A.4)

Part A provides an interim characterization and evaluation of Lower Hudson River characteristics pertinent to the Hudson River PCB reassessment. Presented here are physical site characteristics, sources of PCB contamination, the nature and extent of Lower Hudson PCB contamination and an overview of a published mathematical model by Thomann et al. (1989) on PCB dynamics in the Lower Hudson.

The discussion of physical site characteristics (A.1) contains information on basin characteristics, hydrology, water quality and aquatic resources. The description of basin characteristics (drainage areas and climate) covers both the Upper and Lower Hudson to establish a framework for the entire site. The discussions of hydrology and water quality for the Lower Hudson describe the physical/chemical factors that affect each. The review of aquatic resources, relying upon published studies, demonstrates a diverse aquatic ecosystem.

There are several sources of PCB contamination (A.2) in the Lower Hudson. PCB loadings to the Lower Hudson have occurred from the Upper Hudson, but also from sewage effluent discharges, tributary contributions, combined sewer/storm water and storm water outfalls, atmospheric deposition, landfill leachate and other sources within the New York City metropolitan area, all within the Lower Hudson Basin itself. These additional PCB sources are important to consider, since some have been estimated to contribute PCB inputs of similar magnitude to current loads from the Upper Hudson. 1

The nature and extent of PCB contamination is analyzed, using available data for sediments, water and fish (A.3). As demonstrated by dated sediment cores, maximum PCB deposition in the Lower Hudson occurred around 1973 and has decreased subsequently. Sediment cores also indicate that sediment influenced by New York City metropolitan area inputs has recently been accumulating higher PCB levels than those farther upstream. Although water column PCB measurements since 1981 are lacking, 1978-81 data show that PCB levels declined during that period. Studies indicate that PCB concentrations in striped bass have declined. For migrant/marine fish species and freshwater resident species, data are limited or dated. 2

A mathematical model of PCB dynamics in the Lower Hudson (Thomann et al., 1989) is examined (A.4). This model considers many aspects of mass transport, geochemistry and ecology and evaluates the time history of PCB inputs. The model indicates that PCB load to the Lower Hudson via the Upper Hudson had declined substantially since 1973. Various assumptions used in the model regarding mass transport estimates, geochemical processes and ecological parameters are discussed in order to provide perspective on its results. 3

SYNOPSIS

NATURE AND EXTENT OF CONTAMINATION

(Section B.3)

Available environmental data on the distribution of PCBs in the sediments, water, fish, air and plants of the Upper Hudson River as well as supporting data on flow and sediment transport are summarized and evaluated. As a foundation for continued analyses, available data have been compiled into a computerized, relational database management system (B.3.1).

Data on PCB concentrations in river-bottom sediments (B.3.2) are drawn primarily from the 1976-1978 NYSDEC sampling efforts and the 1984 Thompson Island Pool investigation, along with several other sources. Sediments are the major environmental repository for PCBs in the Upper Hudson, but there is a high degree of spatial variability in PCB concentrations. The 1984 study covered only the Thompson Island Pool and relatively little data have been collected since. It is difficult to determine the current mass and distribution of PCBs in sediments without further investigation. 4

The discussion of surface water monitoring (B.3.3) concentrates on data collected by the USGS. Transport of PCBs is affected by hydrologic processes, particularly flood events. A discussion of flow monitoring is followed by presentation of time series data, to the extent available, for suspended sediment and PCBs in the water column. Current full-year and summer average PCB concentrations are calculated, taking into account the problem of numerous measurements below analytical detection limits.

NYSDEC has monitored Upper Hudson fish on a regular basis since 1975; data are presently available for PCBs in fish through 1988. The extensive data collected in this program (nearly 3,000 Upper Hudson samples) are discussed (B.3.4). Total PCB burdens in fish declined sharply from 1978-1981. Levels of the higher chlorinated congeners in fish appear to have remained relatively constant since 1982. Results of NYSDOH macroinvertebrate monitoring are also described. 5 6

PCB monitoring data for air and plants near the Upper Hudson (B.3.5) are generally insufficient to assess the impact from PCBs in the river. Isolating the contribution of the river from other possible PCB sources is a particularly difficult problem.

For various other media there is a notable lack of monitoring data (B.3.6). Only limited groundwater sampling has been performed and surface soils near the river have not been monitored.

Data quality and analysis methods for the various monitoring programs are evaluated. PCBs have many different variations in chemical structure and differing physical properties. Uncertainties surrounding PCB measurement, particularly the specific variations in PCBs, results in considerable difficulties in interpreting the results. Furthermore, differing PCB measurement methods used for water, sediments or fish confound direct comparisons among them. 7

SYNOPSIS

DATA SYNTHESIS AND EVALUATION OF TRENDS

(Section B.4)

Detailed interpretation and analyses of the Upper Hudson monitoring data have focused on the potential for migration and redeposition of PCBs in sediments and evaluation of statistical relationships among PCB concentrations in sediments, water and fish.

Three questions posed as the objectives of these analyses concern the cycling of PCBs in sediments and water and their impact on the fish population (B.4.1).

Flood flow and sediment transport (B.4.2) are addressed first. USGS data are used to analyze flood recurrence intervals and the relationships between flow and sediment load. The flood frequency analysis suggests that other investigations may have overestimated the magnitude of the 100-year flood in the Thompson Island Pool by 25 percent. This finding implies that the potential for scour of contaminated sediments may be less than previously estimated. Analyses also suggest that a decline in suspended sediment load has occurred over time.

An investigation of the relationship between PCB concentrations and flow and estimation of mass loading from the Upper to Lower Hudson is presented. PCBs in the water column and mass discharge (B.4.3) are difficult to evaluate, because relatively few samples are taken at a station in a typical year, whereas PCB concentrations may change rapidly with changes in river flow. PCB concentrations and trends must, therefore, be inferred from an incomplete time series of measurements. PCB concentrations in the Upper Hudson have shown a bimodal relationship to flow, increasing at both high and low river flows. Separate multiple regression models, fit for high and low flow regimes at each station, do not yield great predictive strength. A negative correlation between PCB concentration and year is found at all stations, indicating a gradual decline of PCB concentrations in the water column over time. Estimates of PCB mass loading from the Upper to the Lower Hudson are evaluated. PCB measurements are biased toward high flow events. Mass load, not measured directly, must be estimated statistically. To correct the sampling bias, this analysis adopted a new method of estimating the load. In the period of 1984-1989, little increase in total load between Fort Edward and Waterford appears to have occurred. This finding led to the unexpected conclusion that much of the load in recent years appears to come from locations upstream of the Thompson Island Pool. Use of the new analysis also indicates that of PCB loading from the Upper to the Lower Hudson may have been overestimated previously.

PCB levels in fish have declined over the last ten years, exhibiting approximate exponential decline patterns, with a leveling out or stabilization in recent years (B.4.4). For the 11-year sampling record at River Mile 175, levels of a less chlorinated mixture of PCBs (Aroclor 1016) in fish exhibit an apparent half-life of 3 to 4 years. The rate of decline of the higher chlorinated congeners (Aroclor 1254) appears to be much slower, with an apparent half-life of 7 to 40 years. Time-trend regression equations are used to obtain an approximate estimate of *total PCB levels in fish over the next 30 years, assuming the current declining trend continues.*

PCB mass transport and PCB levels in fish in the Upper Hudson both exhibit generally declining trends over time. Despite the large number of sediment samples that have been analyzed, shifting sediments, widely disparate sampling densities and uncertainties in PCB measurement methods all confound the interpretation of the sediment sample results. Available data are insufficient to relate PCB concentrations in fish to PCBs in sediments. In order to 12 *understand better the exchange of PCBs between sediment, water and fish, detailed PCB analyses related to specific forms of PCBs (congeners) will be necessary. Among the questions still to be answered are whether the PCB levels will continue their observed decline and what specific conditions would alter their decline.*

SYNOPSIS

PRELIMINARY HUMAN HEALTH RISK ASSESSMENT
(Section B.6)

This section sets forth the objectives, method and results of a preliminary baseline human health risk assessment. The main objective of the preliminary assessment (B.6.1) is to examine the quality of the available site data for risk assessment purposes and identify where additional data are needed to perform a more complete assessment of potential health risks. For the purposes of this assessment, only risks associated with exposure to PCBs are evaluated. Future land uses in the area are assumed to be similar to current land uses.

There are several potential pathways by which people might be exposed to PCBs originating from the Hudson River (B.6.2). Potential exposure to PCBs originating from the Hudson River via dietary intake includes exposure from ingestion of fish, home-garden crops, beef or dairy products, human breast milk and drinking water. Of these dietary intake pathways, only potential exposures from ingestion of fish and drinking water are quantified. Remaining dietary intake pathways could not be quantified, because insufficient data exist to determine whether or from what source PCB exposure may occur. While potential exposure as a consequence of inhalation of PCBs in ambient air is discussed, exposures occurring via this pathway could not be evaluated quantitatively. Sampling data are too sparse and/or inadequate to determine: 1) representative PCB concentrations in ambient air; or 2) the contribution of volatilization of PCBs from the Hudson River as opposed to contributions from other sources. Recreational exposures include dermal contact with sediments and river water as well as incidental sediment ingestion during recreational activities, all of which were quantified. The analysis has revealed that estimated PCB intake through consumption of fish from the Hudson River appears to be the most significant, potential pathway of human exposures to PCBs from the site.

A discussion of the current understanding of potential carcinogenic and non-carcinogenic toxic effects associated with exposure to PCBs (B.6.3) summarizes methods used by USEPA to derive toxicity values and estimate potential health risks associated with exposures to PCBs.

Quantitative exposure estimates are evaluated in conjunction with the toxicity information in order to predict the potential for human health effects (B.6.4) associated with exposure to Hudson River PCBs. Two types of health risk evaluations are presented: non-carcinogenic health effects and carcinogenic risks. The potential health risks associated with all quantified pathways other than the ingestion of fish are estimated to be within the acceptable range.

Based on available data, there appear to be unacceptable potential cancer and non-cancer risks associated with regular ingestion of fish from the Upper Hudson River. Assuming consumption of PCB-contaminated fish for 30 years, cancer risks are estimated to be as high as 2 in an exposed population of 100. With respect to non-cancer risks, the average daily exposure to PCBs resulting from consumption of fish from the Upper river may be as high as 51 times the reference dose. This evaluation shows that the population that regularly consumes *fish from the Upper Hudson River is at risk from PCB exposure. The working assumption is that people still consume fish, despite the fishing ban. This assumption may require further quantification, because, as the operative risk, it will be useful to ascertain the effectiveness of the fishing ban.*