



HUDSON RIVER PCBs REASSESSMENT RI/FS - PHASE 2

The Reassessment Remedial Investigation and Feasibility Study (RI/FS) for the Hudson River PCBs Superfund site was started in Fall 1990. Since that time, the project has expanded from a relatively simple review of existing data to a major study of the transport and fate of PCBs in the upper Hudson River. This fact sheet is an update on the status of the Reassessment as of July 1995.

Prior to the Reassessment

PCBs from two General Electric (GE) capacitor plants were discharged into the Hudson River until 1977. (In addition, continuing PCB releases from one of these plant sites have been detected during the last several years, as discussed below.) Many of the PCBs accumulated in the sediments behind the Fort Edward dam. However, when the Fort Edward dam was removed in 1973, it allowed redistribution of the contaminated sediments throughout the Hudson River. High concentrations of PCBs were found in the sediments of the next dam pool, the Thompson Island pool, and additional PCB hot spots were identified as far downstream as the Troy Dam. PCB contamination in fish tissue is a concern throughout the site (the site includes the Hudson River from the Fenimore Bridge in Hudson Falls to the Battery in New York City). Fishing bans and restrictions have been in place since 1976.

Since the mid-1970s, EPA, the New York State Department of Environmental Conservation (NYSDEC), the U.S. Geological Survey (USGS), and several other agencies have conducted numerous studies to determine the extent of the PCB contamination relating to the site and an appropriate course of action to address the upper Hudson River sediments. In

1984, an interim no-action decision was selected, under the Superfund program, with respect to the sediments. In December 1989, EPA announced that it would reassess that no-action decision, and the Reassessment study commenced shortly thereafter.

Reassessment - Phase 1

During Phase 1, EPA compiled existing data relevant to PCB contamination in the Hudson, analyzed the data, and produced an interim report which presented the findings of the analyses conducted for that phase of work (August 1991). Some of the preliminary conclusions from the Phase 1 Report follow:

- PCB concentrations in fish had generally decreased;

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SCHEDULE FOR DOCUMENT RELEASE

DOCUMENT	DATE
PHASE 2 REPORTS:	
DATABASE REPORT	OCT 95
PRELIMINARY MODEL CALIBRATION	DEC 95
DATA EVALUATION & INTERPRETATION	FEB 96
BASELINE MODELING	JUN 96
ECOLOGICAL RISK ASSESSMENT	JUL 96
HUMAN HEALTH RISK ASSESSMENT	AUG 96
PHASE 3 REPORT	NOV 96
PROPOSED PLAN	MAR 97
RECORD OF DECISION	SEPT 97

- consumption of fish is the primary risk exposure pathway and it presents an unacceptable human health risk;
- there is an ongoing source of PCBs to the water column upstream of the PCB contaminated sediments in the Thompson Island Pool; and,
- there is a need to collect additional data.

During Phase 1, EPA also established a community interaction program (CIP) to provide an opportunity for all interested parties to participate in the Reassessment process. The CIP provides opportunities for the public to raise concerns, questions and issues regarding the study, and to maintain a two-way flow of information between the public and the management of the project.

Phase 2 Work Plan

EPA then developed a work plan for the collection of data during Phase 2. The sample collection started in December 1991 and was completed in August 1994. Data collection efforts included:

- geophysical investigations
- water-column sampling
- sediment sampling
- ecological sampling (fish, benthics and sediment)
- TSS/TOC sampling (total suspended solids/total organic carbon, from water column during high flow)

A more complete description of these efforts can be found in the Final Phase 2 Work Plan, issued in September 1992, or the appropriate sampling and analysis plan/quality assurance project plan (SAP/QAPP). One significant aspect of the Phase 2 data collection efforts is that all PCB analyses conducted were done on a congener-specific basis (analysis for individual PCB compounds). This information enables EPA to better understand the fate and transport of PCBs in the river system and in the identification of PCB source areas.

EPA has made several changes to the work effort since the final Work Plan was issued. The most significant of these changes include the increased scope of the modeling effort, the cancellation of the archived sample analysis, and the addition of the TSS/TOC sampling program.

GE Hudson Falls Plant Site

In 1991 and 1992, a "new" source of PCBs released large quantities of PCBs to the river. In October 1992, GE reported a continuing release in the area of its Hudson Falls plant site (a.k.a., the Bakers Falls source). In Summer 1993, GE and NYSDEC signed an order to investigate and conduct a Feasibility Study for the plant site (including adjacent mill building and other areas). As a provision to the order, GE implemented several interim remedial measures which significantly reduced the "new" load of PCBs entering the river. GE continues to investigate the Hudson Falls Plant site and implement interim remedial measures as appropriate.

In connection with the Reassessment, EPA is not conducting an investigation of the GE Hudson Falls Plant site per se, except that as part of the Reassessment study EPA is considering how PCBs released from the plant site into the river affect the PCB-contamination problem in the river. EPA has considered any available, valid data pertaining to PCBs entering the river from the Hudson Falls Plant site. The loading from the Hudson Falls Plant site complicates EPA's investigation, but the data collection efforts were designed with the knowledge of an upstream source (a Phase 1 finding) taken into consideration.

Phase 2 Reports

After the completion of the data collection and analysis, the data are then reviewed to ensure that they are valid. EPA is currently completing this step of the process. After the data are validated, they are entered into the database that has been created for this project. The database includes EPA's Phase 2 data and data from NYSDEC, GE, USGS and other

sources. EPA's database will be made available to the public on CD-ROM. An explanation of the database will be available in the **Database Report**, but the report will not include any analyses or findings.

The analysis of the data is being done via two different, but complimentary methods. First, the data are looked at from a geochemical perspective. This is an empirical analysis which includes representing the data graphically and performing statistical analyses in order to understand current conditions, relationships between parameters, past trends and potential future trends. For the water column and high resolution coring programs, this type of geochemical analysis will be found in the **Data Evaluation and Interpretation Report**.

The other type of data analysis being conducted is the computer modeling effort. This type of analysis uses site data to set up a model of the river, which can then be used to make projections of future conditions in the river under various scenarios. The modeling efforts for the Reassessment include development of a long-term mass balance for the upper Hudson River, a short-term erosion event model for the Thompson Island Pool, and a bioaccumulation model that will be linked to the long-term mass balance model. In addition, an existing model, developed by Dr. Robert Thomann of Manhattan College, will be run for the fresh water portion of the lower Hudson. The basic assumptions that will be used in the model will be found in the **Preliminary Model Calibration Report**. The mass balance model will be run to project the baseline conditions that will be used in the ecological and human health risk assessments. The baseline model projections will be documented in the **Baseline Modeling Report**.

The **Ecological Risk Assessment** will present the findings of the ecological field sampling program. Correlations between PCBs in the sediment, water-column, benthic organisms, residential fish, and high trophic level fish will be analyzed through both food chain modeling and empirical bioaccumulation methods. Fish

tissue concentrations will be used to determine the potential impacts on several species that may consume such fish. Any impacts to the ecology that were observed during the field program will be discussed.

The **Human Health Risk Assessment** will present the human health risks associated with the Hudson River PCBs site. The Phase 1 Report included a preliminary human health risk assessment which will be elaborated upon for this risk assessment. Updated information such as the most recent PCB concentrations in fish tissue will be included in the risk assessment. The risk assessment will reflect the most current PCB toxicity values that have been adopted by EPA. It is expected that some type of Monte Carlo analysis (a statistical simulation) will be included.

Public comment will be accepted on the Phase 2 Reports until the end of the public comment period of the Proposed Plan (see below).

Phase 3 and Beyond

The Phase 3 Report will contain the Feasibility Study upon which EPA bases its decision for an appropriate course of action to address the contaminated sediments. It will include numerous modeling runs which will simulate various remedial action scenarios. It will also include the interpretation of the low resolution sediment cores. Given the large amount of information that is anticipated to be in the Phase 3 Report, it will be released prior to the Proposed Plan.

EPA will identify what it believes is the appropriate remedy for the site, and present that to the public in the Proposed Plan. Public meetings will be held at both upriver and downriver locations to discuss the alternatives and the preferred remedy, and a public comment period will be held. EPA will consider all public comment as a part of the remedy selection process. The comments will be addressed in a responsiveness summary which will be released along with EPA's final decision for the site, the Record of Decision.

Community Interaction Program

As stated previously, one of the Phase 1 accomplishments was the establishment of the community interaction program (CIP). The CIP allows interested parties to have access to EPA management regarding the Reassessment. Four liaison groups were formed, representing citizens, agricultural, environmental and governmental interests. The Steering Committee, consisting of the chairs of these groups and EPA and NYSDEC representatives, channels communications to the Hudson River PCB Oversight Committee (HROC). HROC has representatives from the government agencies that are involved in the project, as well as the chairs of the liaison groups and a GE representative. In addition, EPA established a Scientific and Technical Committee (STC), consisting of engineers and scientists that are experts on the Hudson River PCB problem, PCBs, modeling, or other related fields. The STC facilitator is also a member of HROC.

To date, we have had 11 joint liaison group meetings, 7 steering committee meetings, 6 HROC meetings, and 7 STC meetings. Most of these meetings were held during the planning stages of the Reassessment (Phase 1 and the Phase 2 Work Plan). Meetings have been less frequent recently, while the data were collected and analyzed, and the reports are being drafted. Once the Phase 2 and Phase 3 Reports are issued, CIP meetings will be held more frequently.

In addition, "River Voices," an update produced jointly by EPA and the liaison group members, is published 2 or 3 times a year. This update serves as a open forum for the exchange of ideas, opinions and information pertinent to the Hudson River PCBs issue.

Documents prepared for the Reassessment are available for public review at the information repositories listed below.

INFORMATION REPOSITORY LOCATIONS (* Administrative Record File available at these locations.)

Adriance Memorial Library*
93 Market Street
Poughkeepsie, NY 12601

Catskill Public Library
1 Franklin Street
Catskill, NY 12414

County Clerk's Office
Washington County Office Bldg.
Upper Broadway
Fort Edward, NY 12828

Crandall Library*
City Park
Glens Falls, NY 12801

Cornell Cooperative Extension
New York Sea Grant
74 John Street
Kingston, NY 12401

NYSDEC - Region 3
21 South Platt Corners Road
New Paltz, NY 12561

NYSDEC - Region 4
2176 Guelderland Avenue
Schenectady, NY 12406

NYSDEC - Region 5
Route 86
Ray Brook, NY 12977

NYSDEC
Division of Hazardous Waste
Remediation
50 Wolf Road
Albany, NY 12233

New York State Library
CEC Empire State Plaza
Albany, NY 12230

Ossining Public Library
53 Croton Avenue
Ossining, NY 10562

Saratoga County Environmental
Management Council
50 W. High Street
Ballston Spa, NY 12020

Saratoga Springs Public Library
320 Broadway
Saratoga Springs, NY 12866

Troy Public Library
100 Second Street
Troy, NY 12180

USEPA - Region 2*
Superfund Records Center
290 Broadway, 18th Floor
New York, NY 10007-1866

White Plains Public Library
100 Martine Avenue
White Plains, NY 12601

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FREQUENTLY ASKED QUESTIONS ABOUT EPA'S HUDSON RIVER PCB REASSESSMENT

What are PCBs?

PCBs or polychlorinated biphenyls are a class of chemicals consisting of 209 individual compounds. PCBs were widely used as a fire preventive and insulator in the manufacture of transformers and capacitors because of their ability to withstand exceptionally high temperatures.

Why are PCBs of concern to humans?

PCBs are classified by the U.S. EPA as potential human carcinogens, and are associated with developmental health effects.

Why are PCBs of concern to the environment?

PCBs build up (bioaccumulate) in the environment, increasing in concentration as you move up the food chain. This is of special concern in areas where fish are exposed to PCB contamination and may be consumed by humans.

What is the history of the PCBs in the Hudson River?

During a 30-year period ending in 1977, it is estimated that approximately 1.1 million pounds of PCBs were discharged into the Hudson River from two General Electric (GE) capacitor manufacturing plants located in Fort Edward and Hudson Falls, New York. Much of this PCB load adhered to fine sediments which accumulated behind the Fort Edward Dam. When the deteriorating dam was removed in 1973, the PCB-contaminated sediments were washed downstream. Studies conducted to evaluate the extent of the problem revealed that most of the contaminated sediments were in 40 "hot spots" which are situated in a 40-mile stretch of the river between Fort Edward and the Troy Dam.

Why is the EPA reassessing the Hudson River PCBs site?

The Hudson River was classified as a Superfund site in 1983 along a 200-mile long stretch of the river from Hudson Falls to the Battery in New York City. In 1984, EPA made an interim no-action decision, leaving the contaminated sediments in the Upper Hudson River in place. The decision was considered "interim" because it left a re-opener to reassess the site based on the development of treatment methods or dredging techniques during the interim evaluation period. EPA decided it was appropriate to start the Reassessment in December 1989.

What is the purpose of the Reassessment?

The purpose of the Reassessment is to evaluate whether any action is required for the PCB-contaminated sediments in the upper Hudson River to be protective of human health and the environment.

How far along is the EPA in the Reassessment?

The EPA's Reassessment is being done in three phases. Phase 1 was completed in 1991, and Phase 2 is about halfway done. The Phase 2 Report is being released in a series of six separate documents. As of August 1997, three of the Phase 2 documents have been released, with three yet to come. Phase 3, The Feasibility Study, is scheduled to be released in 1999, prior to the EPA's decision on whether a clean up of the river is possible, and if so, how that clean up will be done.

What has the EPA learned so far?

The two most important facts that EPA has learned over the course of the study are:

The PCB-contaminated sediments in the Thompson Island Pool are the major source of PCBs to the water column in the freshwater Hudson (from Hudson Falls to Kingston), and,

Natural dechlorination has only reduced PCB mass in the sediment by approximately 10 percent--not enough to be considered a remedy for the site. In addition, dechlorination will not reduce the PCBs in the sediment significantly in the future.

Note: Dechlorination refers to the stripping of one or more chlorine atoms from the PCB molecule. With very limited exception, dechlorination does not breakdown PCB molecules. The end product of dechlorination is simply a PCB molecule containing fewer chlorine atoms.

Why is the Reassessment taking so long?

EPA's Reassessment began in 1990 with Phase 1, basically consisting of collecting existing data on the Hudson River, from a wide variety of sources (e.g., NYSDEC, USGS, GE) and placing that data into one database. Analysis of that data uncovered significant data gaps, strongly indicating that additional data collection was necessary in order to fill those gaps. Phase 2, which consists of field sampling and analysis, computer modeling and human and ecological risk assessments has been expanded beyond its initial scope to allow for a comprehensive study which will fill those gaps and provide us with as full a portrait of the Hudson River as possible. Much of this expansion of Phase 2 was suggested by members of the public as part of the public comment received on the Phase 1 Report.

When will EPA be finished and how much has the study cost so far?

EPA projects that a decision will be made by the Agency in 1999. To date, the Reassessment has cost approximately \$12 million. The total cost is expected to be approximately \$16 million.

Who pays for this study and who will pay for the cleanup?

The study is being financed out of the Superfund. By law, EPA is authorized to pursue recovery of costs expended at a Superfund site (from studies to clean up). This reimbursement is sought from the potentially responsible party, or the polluter. The potentially responsible party at this site is the General Electric Corporation.

What, if anything is EPA doing in the lower Hudson River?

EPA's Reassessment includes a comprehensive program of sampling and analysis in the Hudson River from Hudson Falls in Washington County to the Battery in New York City. It is important that we understand the various ecosystems that make up the Hudson as a whole. However, the main areas of study remains the contaminated sediments in the forty-mile stretch of river between the Federal Dam at Troy and Hudson Falls. This is the area that will be cleaned up, if a clean up is feasible.

Is EPA taking the "new" PCB source at the GE Hudson Falls Plant into consideration in its Reassessment?

Yes. The data that are being used to determine the PCB contributions from the sediments are the same data as those being used to evaluate the contribution from and impacts of actions at the GE Hudson Falls Plant Site. Therefore, any analysis of the water column data inherently looks at both the sediment and plant site contributions. Separating the contributions of these sources is one of the complexities that we have had to deal with, which has delayed the completion of the study. However, the focus of the Reassessment remains the contaminated sediments of the upper Hudson.

If EPA decides to dredge, won't dredging resuspend PCB contaminated sediments, actually making matters worse?

Dredging has been successfully employed at a number of sites, such as the General Motors Superfund site in Massena, NY, on the St. Lawrence River. The dredging of the G.M. site has been very closely monitored not just by EPA, but also by the State of New York, the tribal nations, and Environment Canada, which was especially concerned since Quebec draws its drinking water from the St. Lawrence River. Other sites where PCB dredging has occurred are the ALCOA site in Massena, NY, the Sheboygan River, WI, the OMC site on Waukegan Harbor, IL, New Bedford Harbor, MA, and the Manistique site, MI.

If dredging is selected, then what would be done with the dredged material?

The ultimate destiny of the dredged material would depend on factors such as the amount of material to be dredged, the levels of contamination, and the properties of the sediment in which the contaminants were found (e.g., clay content). Alternatives that EPA would consider include treatment to remove PCBs, local landfill disposal or transport to a remote TSCA-permitted landfill.

What is the community's role in the Reassessment?

Community input is essential if the needs and concerns of the community are to be taken into consideration. "Community Acceptance" is one of the nine EPA criteria by which a remedy is selected. To provide enhanced participation, EPA has established an extensive Community Interaction Program specifically designed for the Reassessment.

Will the decision include an analysis of economic impacts to the surrounding community?

While the Superfund process does not directly factor in the economic impacts of a remedy into the remedial decision, public comments to the Proposed Plan that deal with this issue will be considered and must be answered by EPA under the criteria "Community Acceptance".

What is GE's role in the Reassessment?

Under the Superfund law, the Potentially Responsible Party (in this case, GE) is considered a member of the public and is entitled to the same level of public input as any other member of the public. GE can and does offer comment on EPA's work, attends public meetings, and at times, actively participates in public meetings relevant to the Reassessment. In addition, GE has been conducting its own study of the Hudson River PCB problem, and shares the data generated by that study with EPA. Therefore, in addition to the meetings held for the Community Interaction Program, EPA has held numerous technical meetings with GE to discuss various scientific issues.

What is the meaning of Natural Resource Damages Claim?

A Natural Resource Damage Claim seeks financial compensation for damages done by a polluter to a natural resource (such as a river). It is completely separate from EPA's Reassessment Study and any remedial action that may be warranted. Certain agencies are given the title of "Natural Resource Trustee" under the Superfund law and are empowered to pursue Natural Resource Damage Claims.

Who are the Trustees?

The Trustees are the following agencies or entities: the State of New York, the U.S. Department of Commerce, represented by the National Oceanic and Atmospheric Administration (NOAA), and the U.S. Department of the Interior, represented by the U.S. Fish and Wildlife Service. The EPA is not a Trustee.

Can this claim affect the Reassessment?

No. The Reassessment deals only with the remediation of the Hudson River, not restoration for damages to it. The Natural Resource Damages Claim is a separate legal pursuit.

Is EPA considering volatilization in its Reassessment?

This actually is better addressed in two separate questions:

a) Is the volatilization of PCBs from the river and adjacent mud flats a health risk to the people of the Hudson River Valley?

No. Based on preliminary analysis, volatilization of PCB from the Hudson does **not** represent an unacceptable risk. It should be noted that the preliminary analysis does not include a calculation for dispersion from the source to the point of exposure, which means that it is a conservative assumption, *i.e.*, it would err on the side of safety. EPA is aware of ongoing research on volatilization and will follow the progress of the research for consideration in the Reassessment.

b) If EPA decides to dredge, would volatilization losses from the dredged material be considered?

Volatilization will be considered as part of the Feasibility Study in the evaluation of dredging alternatives.