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United States
Environmental Protection Agency
New England Region
1 Congress Street
Boston, MA 02114

EPA Releases Human Health Risk Assessment for GE/Housatonic River Site, Rest of River, for Public Comment and Peer Review

EPA has released the Human Health Risk Assessment (HHRA) report for the GE/Housatonic River, Rest of River, for public comment and Peer Review. The HHRA is one of a series of reports being prepared by EPA under a Consent Decree negotiated with General Electric Company, EPA and other government agencies.

The Human Health Risk Assessment characterizes the cancer and noncancer risks to adults and children who are exposed to PCBs and other contaminants from the GE facility in Pittsfield, MA, while living or working near the Housatonic River, or using the river and floodplain for recreation or agricultural purposes.

The report evaluates three primary routes through which people may be exposed to PCBs and other contaminants that originated from the GE facility in Pittsfield, MA. These include:

- **Direct contact** with soil and sediment during recreational, residential, commercial and agricultural activities in the floodplain.
- **Consumption of fish and waterfowl** taken from the Housatonic River.
- **Consumption of agricultural products** produced in the floodplain such as milk, eggs and plants.

This fact sheet summarizes the conclusions of the HHRA. Copies of the full report are available for public review at the repositories listed on the back page, or on EPA's web site at **www.epa.gov/ne/ge**.

The release of the HHRA report starts the 30-day Public Comment Period, during which individuals, organizations, and other interested parties are encouraged to comment on the Risk Assessment to the Peer Review Panel and/or submit nominations for individuals to be considered to serve on the Peer Review Panel (see box to left and back page).

PUBLIC COMMENT PERIOD

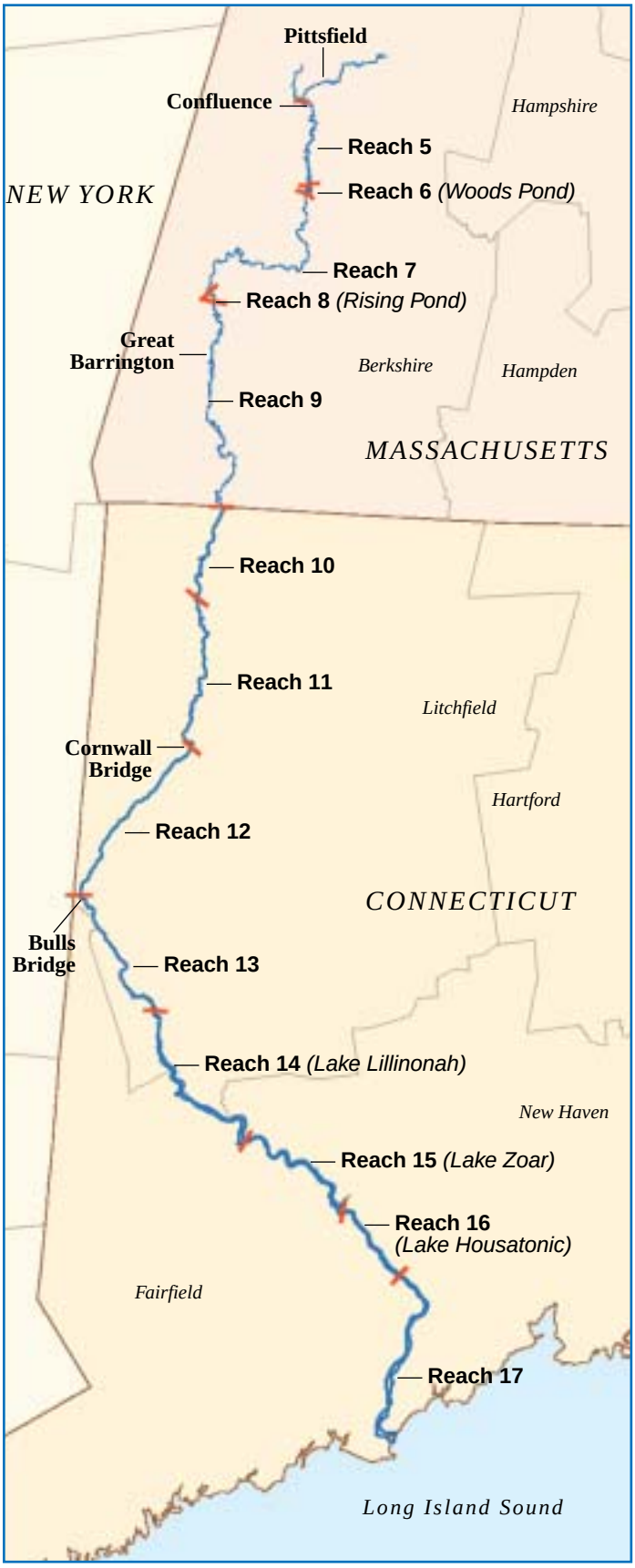
EPA is holding a 30-day Public Comment Period on the Human Health Risk Assessment (HHRA) from **June 13** through **July 14**, 2003. After the Comment Period, the HHRA will be reviewed by a panel of nationally recognized experts in the field. All input is welcomed, and EPA encourages everyone to participate. The public is encouraged to:

- Submit comments on the HHRA to the MNG Center at SRA, a consultant hired by EPA to maintain third-party neutrality during the Peer Review process.
- Submit nominations for people to be considered to serve on the Peer Review Panel to the MNG Center at SRA.

Public comments and Peer Review Panel nominations must be sent by July 14 to the MNG Center at SRA (see back page for information on submitting comments and nominations).

How Are People Exposed to Contaminants?

Direct Contact Exposure	Fish and Waterfowl Consumption	Agricultural Product Consumption



Rest of River

SITE HISTORY

GE used PCBs at its 254-acre facility in Pittsfield beginning in 1932 and ending in 1977. During this time, the Transformer Division manufactured and repaired transformers containing dielectric fluids, some of which included PCBs. PCBs were released to soil, groundwater, Silver Lake, and the river, and used and disposed of within and around the facility in landfills, former river oxbows, and other locations.

The Pittsfield facility is the only known source of PCBs to the Housatonic River in Massachusetts. Many of these PCBs are now located in the sediment and floodplain soil between the confluence of the East and West Branches of the Housatonic River and Woods Pond, but PCBs have also been found throughout the Rest of River, as far downstream as Long Island Sound.

In addition to the river, other areas in Pittsfield and surrounding communities have been discovered over the years to have received PCB-contaminated waste from the GE facility. These areas include 11 former oxbows on the East Branch, residential properties, the Pittsfield Landfill, Rose Disposal Site in Lanesboro, MA, and Dorothy Amos Park located on the West Branch of the Housatonic River.

The Consent Decree for the General Electric/Housatonic River Site was approved by the federal court in October 2000. The Consent Decree (CD) calls for the river to be addressed in three phases: the cleanup of the Upper 1/2-Mile Reach (conducted by GE in 1999-2002); the cleanup of the 1 1/2-Mile Reach (currently being conducted by EPA, with funding shared by GE and EPA); and the investigation of the Rest of River, which includes the downstream portions of the river in Massachusetts and Connecticut. The CD requires that EPA conduct the Human Health and Ecological Risk Assessments and Modeling Study, and that these undergo public Peer Review before any potential cleanup alternatives are considered for the Rest of River.

In addition to these river cleanup activities, the Consent Decree calls for the investigation and cleanup of contamination outside the river. Several major soil investigations have been completed or are in progress on the GE property, including the 50-acre parcel to be transferred to the Pittsfield Economic Development Authority (PEDA) for redevelopment.

WHAT IS THE "REST OF RIVER"?

The area known as the "Rest of River" includes the main stem of the Housatonic River and floodplain from the confluence of the East and West Branches in Pittsfield downstream to Long Island Sound (see map to left).

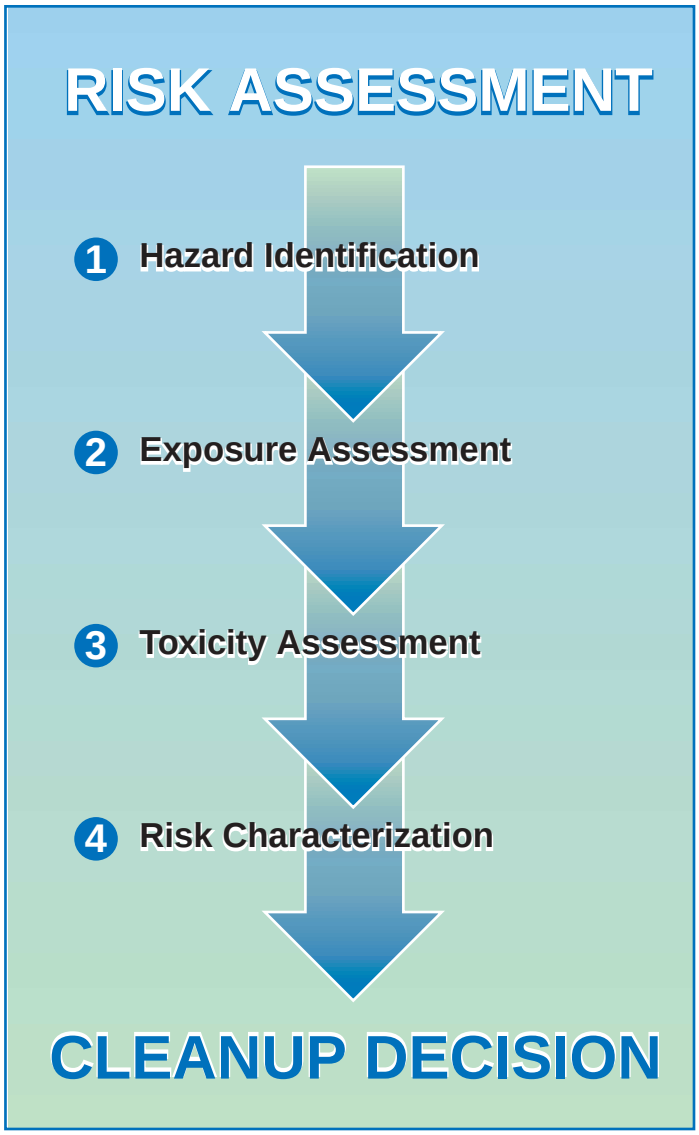
For the purposes of the HHRA and other EPA studies, the Rest of River has been divided into 17 reaches. EPA and GE studies show that the greatest mass of PCBs is within the 10 1/2 miles of river and floodplain between the confluence and Woods Pond Dam. This area (Reaches 5 and 6) is called the Primary Study Area.

Assessment?

A Human Health Risk Assessment is conducted to find out what possibility there is that chemicals from a hazardous waste site will cause current or future health risks to individuals who come into contact with them. The risk assessment provides the community and decision makers with an understanding of the potential health risks posed by contamination at a hazardous waste site in the absence of any cleanup. Risk estimates are conservative, to prevent underestimating the health risks to the public.

To find out what the current and future health risks are, the risk assessment answers the following questions:

- ***Are toxic compounds present? (Hazard Identification)*** Samples of soil, water, air, fish, waterfowl and vegetation were collected to find out what chemicals are present in the Housatonic River and its floodplain.
- ***Who is exposed? How often? (Exposure Assessment)*** Chemicals may enter the body through breathing (inhalation), eating or drinking (ingestion), or by skin contact (dermal). The Exposure Assessment is an estimate of how people may come into contact with chemicals and how often (for example, the number of times a person eats fish from the Housatonic River). A reasonable maximum exposure (RME) is used to represent a person who is more highly exposed, and a central tendency exposure (CTE) is used to represent the "average" person.
- ***How toxic are they? (Toxicity Assessment)*** EPA used information from animal and human studies to assess the potential for chemicals to cause cancer or noncancer effects.
- ***Are there potential health risks? (Risk Characterization)*** The Risk Characterization describes the potential health risks and identifies which chemicals are causing the risk.



RISKS ARE PRESENTED AS NUMBERS

Cancer Risk is the increased probability, or chance, of getting cancer as a result of exposure to chemicals at a site. In the reports for this site, a 1 in 1,000,000 chance is written as 1E-06.

Noncancer Risk is a comparison of an allowable exposure to the amount of exposure estimated at a site. The comparison is called the Hazard Index (HI).

$$\text{HI} = \frac{\text{site exposure}}{\text{allowable exposure}}$$

An HI greater than 1 indicates that the site exposure exceeds the allowable exposure.

Acceptable Risks for cancer are considered by EPA to be less than 1 in 1,000,000. Between a 1 in 1,000,000 and a 1 in 10,000 chance, EPA looks at the site-specific factors affecting risk and the uncertainties with the estimate. For noncancer health effects, an HI less than 1 means people are unlikely to be harmed.

HUMAN HEALTH RISK ASSESSMENT FOR THE HOUSATONIC REST OF RIVER

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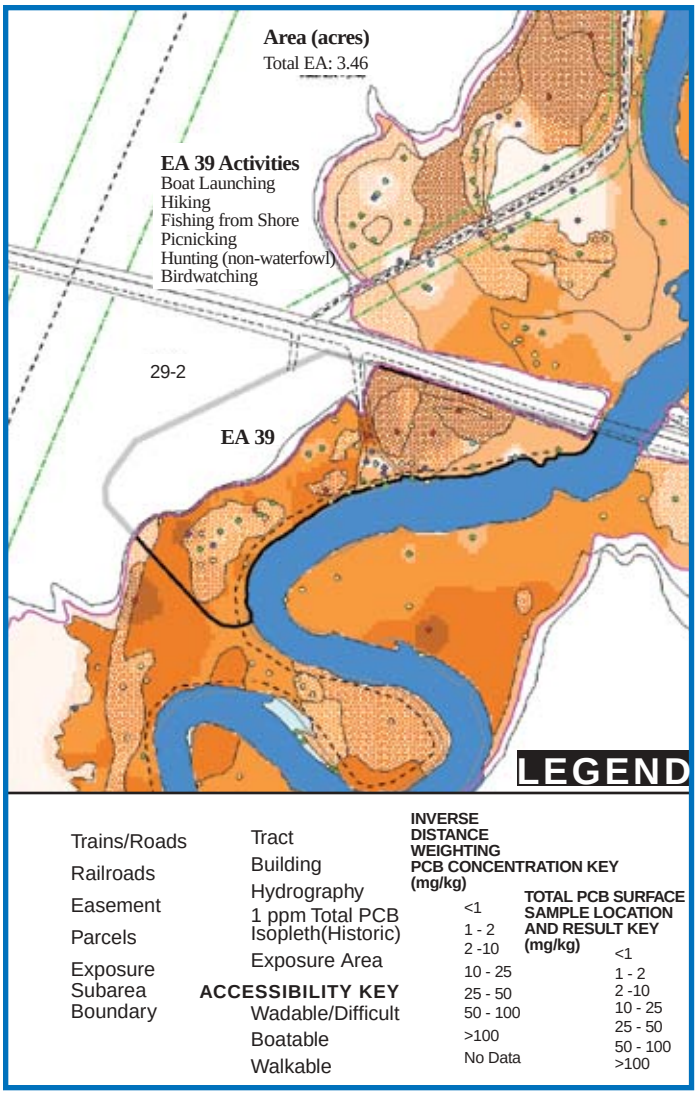


Map of Decker Canoe Launch Exposure Area

Direct contact exposure occurs when a person comes into contact with contaminated floodplain soil or river sediment during recreational or other activities. For example, it might involve getting soil on skin or the ingestion of small amounts of soil through unintentional hand-to-mouth transfer. In some cases, these exposures are of greater concern for children than for adults.

EPA evaluated a number of activities that could result in direct contact exposure. These include residential exposure for people who have homes with some property in the floodplain, multiple recreational exposures, agricultural exposure for farmers working in the floodplain, and other worker exposures in occupations such as utility workers and groundskeepers.

SUMMARY OF FINDINGS

- Cancer risks from exposure to PCBs in soil are within the EPA risk range, with the exception of one recreational exposure (adult angler) in one exposure area.
- Noncancer hazard indices (HIs) from soil exposure to PCBs exceeded the EPA benchmark of 1 in some exposure areas for almost all exposure scenarios. Most of these HIs were below 10.
- Cancer risks from exposure to PCBs in sediment were within the EPA risk range at all eight sediment exposure areas.
- Noncancer hazard indices exceeded 1 at four of the eight sediment exposure areas.

Direct contact with soils and sediment was assumed to occur randomly across an exposure area, but if people spend more time in a more contaminated part of the property, the risks will be higher. Conversely, if they spend more time in a less contaminated area, the risks will be lower.

DEFINITIONS

PCBs (polychlorinated biphenyls): A class of chemicals consisting of 209 individual compounds, known as congeners. PCBs are classified by EPA as probable human carcinogens. EPA recognizes neurological and developmental effects as additional toxic effects of PCBs, and considers all PCB mixtures to be toxic.

Toxic Equivalence (TEQ): A method of comparing the toxicity of mixtures of congeners based upon the toxicity of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). The toxicity of some PCB congeners and dioxin/furans (referred to as "dioxin-like") that exhibit toxic behavior similar to 2,3,7,8-TCDD are added together using this method to derive a TEQ.

Cancer Slope Factor (CSF): A measure of the cancer-causing potency of a contaminant. Risk assessors use the CSF to calculate the risk of developing cancer as a result of a lifetime of exposure to a particular dose of a carcinogen.

Risk Range: A cancer risk between 1 in 10,000 (10^{-4} or 1E-04) and 1 in 1,000,000 (10^{-6} or 1E-06); within this range, EPA considers other factors when deciding whether to take action.

Parts per million (ppm): Contaminant concentrations in soil and tissue are often given in ppm (or, as shown in the report, as milligrams per kilogram [mg/kg]). One ppm is approximately one drop in 13 gallons of water.

aterfowl Consumption

The Housatonic River offers attractive recreational opportunities for people who fish and hunt. However, because both fish and waterfowl (ducks and geese) accumulate contaminants such as PCBs in their tissue (for example, fish fillet or breast meat), consumption of these food sources has been a concern of Massachusetts, Connecticut, and EPA (see box to the right) and is a primary focus of the Human Health Risk Assessment.

The HHRA evaluates the risks to people who consume fish and waterfowl from the Housatonic River area. These risks are based on assumptions about the amounts and types of fish and waterfowl consumed, meal preparation methods, and concentrations of contaminants. There is also an evaluation of risks from eating frogs and turtles.

Although current advisories are assumed to reduce the amount of fish and waterfowl that people eat, the Human Health Risk Assessment evaluates the risks to people in the absence of these advisories, using reasonable exposure assumptions based on expected consumption in the absence of contaminants.

SUMMARY OF FINDINGS

- Potential risks from eating fish and waterfowl exceed the EPA risk range. These activities present a higher risk than direct contact or eating locally grown agricultural products.
- In general, the risks are higher from fish or waterfowl taken closer to the site of the PCB releases, at the GE facility in Pittsfield, than those caught progressively farther downstream.
- For both fish and waterfowl consumption, the cancer risks from PCBs and TEQ greatly exceed EPA's risk range in both Massachusetts and Connecticut.
- For both fish and waterfowl consumption, the noncancer risk greatly exceeds the EPA benchmark of an HI of 1.
- The HIs for locations in the Massachusetts portion of the study area are higher than those at the Connecticut locations.
- Although the amount of frogs and turtles consumed was assumed to be much less than fish and waterfowl, concentrations of contaminants in these species would also result in risk if consumed in large quantities.

CURRENT HOUSATONIC RIVER CONSUMPTION ADVISORIES

In 1982, the Massachusetts Department of Public Health issued an advisory to the public that the consumption of fish, frogs and turtles from the Housatonic River should be avoided. In 1999, a similar advisory was issued with respect to waterfowl consumption.

Beginning in 1977, the Connecticut Department of Public Health issued advisories for the consumption of fish from the Housatonic River. The current advisory states that high-risk groups should avoid consumption of all fish species, with the exception of some panfish, for which no more than one meal per month is advised. High-risk groups include pregnant women, women who may become pregnant, and young children. For all others, no consumption is advised, with the following exceptions: no more than one panfish meal per week, and no more than one meal every other month for bass, perch and bullhead.

Massachusetts Advisory

The agricultural assessment evaluated risk to people who eat vegetables from their gardens and other foods (such as milk, beef, eggs or wild foods) from commercial or backyard farms in the Housatonic River floodplain.

SUMMARY OF FINDINGS

- Risk was estimated assuming that 100% of the food is produced in areas with hypothetical PCB soil concentrations of either 0.5 ppm or 2 ppm. These risks can then be used to approximate risk for any parcel. For example, if 20% of a farm's silage is grown in soil with an average PCB concentration of 10 ppm, this would be roughly equivalent to the risk estimated for 2 ppm.
- Highest risks are from consumption of animal products produced in a backyard farm, followed by those produced at a commercial farm.
- Consumption of home garden produce does not result in significant risk.

Home Gardens and Wild Plants

People have home gardens and also pick fiddlehead ferns within the floodplain. EPA collected fiddlehead ferns and squash grown in the floodplain to assess these exposures. Also, site-specific information on beets and turnips was available from previous studies.

Summary of Findings

- Consumption of home garden produce is not a health risk, even in combination with soil exposure during gardening activities.
- Risk from consumption of wild plants is unlikely because consumption rates are assumed to be lower than for home garden produce.

Commercial Farms

Consumption of products from commercial dairy farms and beef and poultry farms is a potential risk to farm families.

Although dairy cows do not graze in the floodplain, some of their corn silage and grass-based feed may be grown in contaminated soil. At beef and poultry farms, cattle and free-range poultry may ingest contaminated soil while grazing in the floodplain. In these cases, contaminants may accumulate in milk and meat.

Summary of Findings

For commercial farm families who consume their dairy products:

- Cancer risks from PCBs are within EPA's risk range, but exceed the range when risks from PCBs and TEQ are combined.
- Noncancer hazards are below EPA's benchmark.

For commercial farm families who consume their beef and poultry products:

- Cancer risks from PCBs are within, but at the high end of, EPA's risk range. Risks exceed the range when PCB and TEQ risks are combined.
- Noncancer hazards exceed EPA's benchmark.

Backyard Farms

People who raise a few cows, cattle, chickens, or other animals (such as sheep or goats) on their property for dairy, meat or eggs have a potential risk from consuming these products.

Summary of Findings

For families consuming backyard-raised dairy, beef and poultry products:

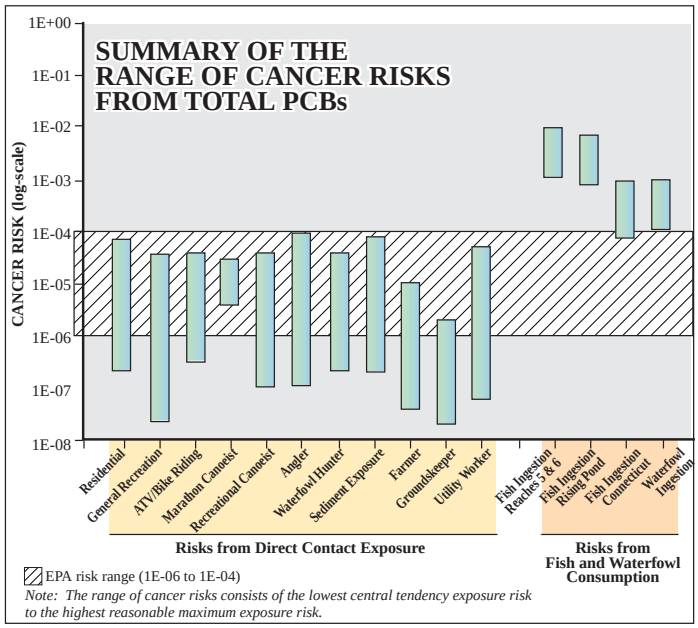
- Cancer risks from PCBs are within, but at the high end of, EPA's risk range. Risks exceed the range when PCB and TEQ risks are combined.
- Noncancer hazards exceed EPA's benchmark.

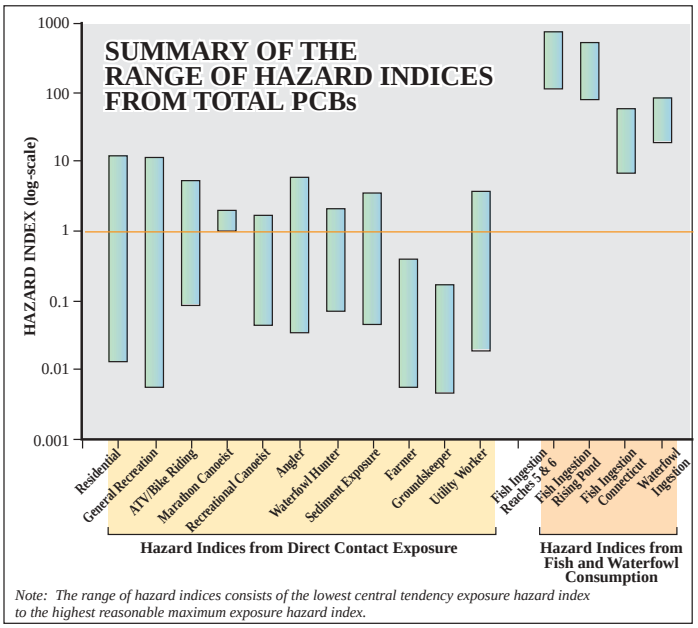
Human health risks were estimated for exposure to PCBs and TEQ from the GE facility in Pittsfield. Exposure could occur from (1) direct contact with soil and sediment, (2) eating fish or waterfowl, and (3) eating agricultural products grown in the floodplain. A person may experience one or more of these exposures. Exposure may also occur from eating other wildlife such as frogs and turtles, but risks are not expected to be more than those for fish and waterfowl.

The cancer and noncancer risks in the Rest of River were determined based on exposure over a 70-year lifetime. A comparison of these risks is shown in the figures below.

SUMMARY OF RISKS

- Risks from eating fish in the Rest of River, from the confluence in Pittsfield, Massachusetts, to Lake Zoar in Connecticut, exceed the EPA risk range. The risks from consumption of waterfowl are also above the EPA risk range.
- Backyard gardens with PCB soil concentrations of 2 ppm do not present elevated risks, either alone or in combination with residential exposure; however, properties with greater concentrations may pose a risk.
- Risks from backyard beef, dairy, and/or poultry operations that occur 100% within the floodplain, assuming an average PCB soil concentration of 2 ppm, are within the EPA risk range. However, where the average concentrations exceed 2 ppm, there may be unacceptable risks.
- Risks to commercial farmers who eat their dairy products and vegetable crops (assuming that all the feed and crops are grown in soil with an average of 2 ppm PCB) are within the EPA risk range for cancer risk and below the EPA benchmark of 1 for noncancer hazards. However, where the average concentrations exceed 2 ppm, both cancer risks and noncancer hazards may be greater than the EPA risk range.
- On a parcel-specific basis, there may be some risks exceeding EPA benchmarks from direct contact exposures.





Peer Review Process

Consistent with EPA's goal to involve interested parties, and as part of the agreement between EPA and GE, the HHRA will be reviewed by a panel of independent experts in a formal Peer Review. The Consent Decree established the objectives for the Peer Review. The Peer Review Charge translates these objectives into a series of technical questions that the Panel members must consider in conducting their review.

The Public Comment Period provides an important opportunity for the public to both nominate experts for the Peer Review Panel and to submit comments on the HHRA relevant to the technical questions in the Charge for consideration by the Panel. Both the nominations and comments must be submitted to the MNG Center at SRA by the close of the Public Comment Period, which is **July 14** (see box to the right).

At the close of the Public Comment Period, the Panel will be selected by a neutral expert in the field, and will have approximately 13 weeks to review the HHRA and comments submitted by the public.

In November, the Panel will meet in Berkshire County. The public can present verbal comments to the Panel at the meeting (speakers must pre-register). The Panel will publicly discuss the HHRA in the context of the Charge, and will also consider the input received during the public comment period and the verbal comments.

After the meeting, final comments will be submitted by the Panel for consideration by EPA. EPA will then issue a Responsiveness Summary and revise the HHRA as necessary.

For More Information . . .

For more information on the HHRA and the Peer Review Charge, go to: www.epa.gov/ne/ge

or visit an information repository at:

Berkshire Athenaeum Public Library Reference Department
Pittsfield, MA 01201 (413) 499-9480

Simon's Rock College of Bard Library
Great Barrington, MA 01230 (413) 528-7274

Cornwall Public Library
Cornwall, CT 06796 (860) 672-4959

Kent Memorial Library (Kent Library Association)
Kent, CT 06757 (860) 927-3761

Housatonic Valley Association
Cornwall Bridge, CT 06754 (860) 672-6678

EPA Records Center
Boston, MA 02114 (617) 918-1440

Massachusetts Department of Environmental Protection
Springfield, MA 01103 (413) 784-1100

Connecticut Department of Environmental Protection
Hartford, CT 06106 (860) 424-3854

To submit comments or to nominate Peer Reviewers, email: GEPittsfield@sra.com or contact:

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