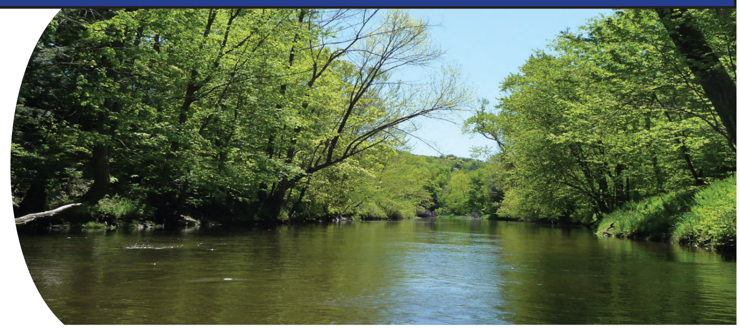
Housatonic River Mini Workshops



Mini Workshop One:

Why Working with River Processes Matters
History, Ecology, and PCBs

All Workshops • 5:30pm - 8:30pm

TONIGHT	WED. APRIL 6	THU. APRIL 7
Mini Workshop One: Why Working with River Processes Matters *History, Ecology, and PCBs*	Mini Workshop Two: Getting the Facts on PCBs *Human Health Risks, Ecological Risks, and PCBs*	Mini Workshop Three: Exploring Alternatives for Cleanup *Remediation, Restoration, Alternatives, and Environmentally Sensible Remediation Concepts*

Public Charrette • 8:30am - 5:30pm

SAT. MAY 7

The Community Contributes
A Practical, All-Day, Hands-On Workshop for the Community to Better Understand the "Rest of River" Issues, to Explore the Pros and Cons of the Alternatives, and for EPA to Hear the Community's Ideas

All events will be held at Shakespeare & Co., 70 Kemble Street, Lenox, MA

This Workbook contains key information and materials being presented at the Mini Workshop. Additional information and full presentations will be available at:
www.housatonicworkshops.org

United States Environmental Protection Agency
5 Post Office Sq.,
Suite 100
Boston, MA 02109-3912

Dear Friends,

It is my pleasure to welcome you to this important series of workshops regarding the Housatonic River. First, I would like to thank you for taking the time to participate in these important public engagement and education programs. I am keenly aware of the high level of interest in EPA's upcoming decision about the scope and type of work that will be required of GE in the "Rest of River" portion of the Housatonic, as the river winds south from Pittsfield through Berkshire County and Connecticut. I have been very impressed with everyone's commitment to the River and its connection to the people in the communities through which it flows. There is a lot at stake – including protecting the character of the Housatonic and making the right decisions for current and future generations to safely enjoy the river environment.

EPA has designed this series of workshops and subsequent charrette not only to help you better understand what we've learned about the River and the PCB contamination but to also help us better understand your views as we move forward in our decision-making process. I am committed to making decisions based on sound science, and based on the best available information. I am also committed to an open, inclusive and transparent process that allows the communities of the Berkshires and Connecticut to weigh in with their concerns and priorities. These workshops are important steps towards that goal.

EPA hopes to use what we learn from you and others at these workshops to aid in our ongoing evaluation of cleanup options. We also hope that, through this process, you gain a broader understanding of the numerous technical and policy issues at hand. After EPA issues our formal cleanup proposal, all members of the public will, once again, have an opportunity to comment on the proposal. EPA will then review those comments and make our final cleanup decision. I will ensure that whatever plan EPA ultimately decides is best, it will be implemented by GE in a manner that is sensitive to the unique character of the river and to the community.

Thank you again for attending and I hope you find these workshops informative and worthwhile.

Curt Spalding
Regional Administrator

LEARN MORE AT: www.epa.gov/region1/ge

Tonight's Agenda

- **Welcome and Introduction; EPA's Public Outreach and Decision Making Criteria** – Jim Murphy, *EPA*
- **Panelists' Introduction** – Steve Shapiro, *Certus Strategies*
- **Presentation One: History of the River – Richard DiNitto** (Presenter), *The Isosceles Group* and John Field, Ph.D, *Field Geology Services*
    - *Brief Q&A*
- **Presentation Two: Geomorphology/River Processes – Keith Bowers** (Presenter), *Biohabitats Inc*., and David Bidelspach and George Athanasakes with *Stantec Consulting Inc.*
    - *Brief Q&A*

Brief Break

- **Presentation Three: Ecological Characterization – John Lortie**, *Stantec Consulting Inc.*
    - *Brief Q&A*
- **Presentation Four: PCBs – Richard McGrath**, *The Isosceles Group*
- **Q&A – Full Panel**
- **Conclusion/Wrap-Up**

Please register for May 7 Public Charrette on Registration form or at www.HousatonicWorkshops.org!

EPA's Public Outreach and Decision Making Criteria

Under the Consent Decree for the GE Housatonic River Site, GE was required to submit its Corrective Measures Study (CMS) to evaluate cleanup alternatives for the Rest of River to reduce risk to human health and the environment from PCBs, and to prevent further downstream transport of PCBs. The initial CMS was submitted in March 2008. After receiving public input, EPA submitted comments to GE on the CMS. GE then submitted the Revised CMS (RCMS) in October of 2010. In the RCMS, GE evaluated 10 sediment alternatives, 9 floodplain alternatives, and 5 treatment and disposal alternatives.

EPA held an informal public input period on the RCMS, and the comment period closed on January 31, 2011. EPA has now begun its decision making process for the cleanup of the Rest of River, considering the RCMS, other relevant information, and public input.

As part of its public input process, EPA's consultant held a series of interviews with stakeholders regarding their view of the process and information needs. An outgrowth of these interviews is this series of mini workshops designed to address the information needs identified by the stakeholders. The goal of the workshops is to provide a better understanding of the issues associated with selecting a cleanup for Rest of River. In addition, an all-day hands-on session, or charrette, will be held on May 7th for stakeholders to learn and interact regarding the Rest of River cleanup.

Please keep in mind that under the terms of the Consent Decree, EPA must evaluate all cleanup alternatives against the following 9 criteria:

General Standards

- Overall protection of human health and the environment
- Control of sources of releases
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Selection Decision Factors

- Long-term reliability and effectiveness
- Attainment of Interim Media Protection Goals (IMPGs, or cleanup goals)
- Reduction of toxicity, mobility, volume
- Short-term effectiveness
- Implementability
- Cost

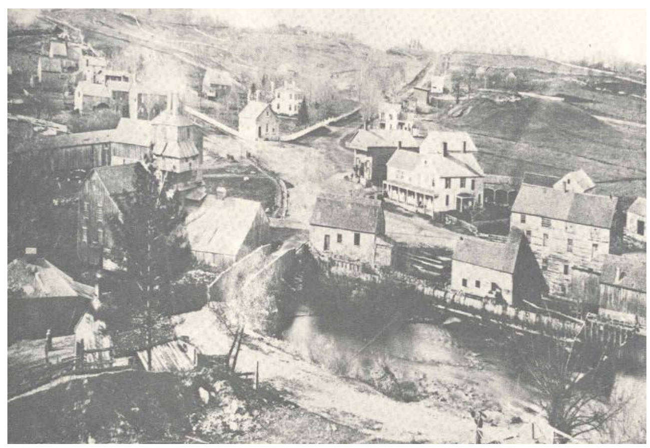
For additional information see "EPA's Cleanup Decision Process" and "Cleanup Alternatives in the Revised CMS" information sheets at http://www.epa.gov/ne/ge/thesite/restofriver-reports.html#CommunityUpdates.

Presentation One: History of the River

Richard DiNitto, *The Isosceles Group*, and John Field, Ph.D, *Field Geology Services*

This history of the Housatonic River begins in the recent geologic past when the last great ice sheets covered North America from 25,000 to 14,000 years ago. The ice sheets extended from Canada down to the southern edges of Long Island Sound. As the ice sheets melted and the ice fronts receded northward, meltwaters began to cut into the uncovered landscape and, with remnant blocks of ice acting as dams, form large glacial lakes. One was Glacial Lake Housatonic, covering much of the present-day valley from north of Pittsfield down to Connecticut. Once these ice dams melted, the remaining meltwater and rainwater runoff created the current Housatonic River and valley.

The first people to inhabit the area were Paleo-Indians, settling into the Housatonic valley perhaps as early as 13,000 years ago. Radiocarbon dating firmly places people in the valley as far back as 10,000 years ago. Although European settlers and subsequent generations developed extensive settlements and industries along the River, Native Americans were the first people to use the River and manipulate it for their benefit through the use of fish weirs and related stone-based structures. These simple acts had the potential for creating changes in the River's flow, albeit minor. More significant changes occurred shortly after the region was settled in the very late 1600s and early 1700s. By the mid-1700s, most of western Massachusetts and Connecticut was fully incorporated, delineated and settled.

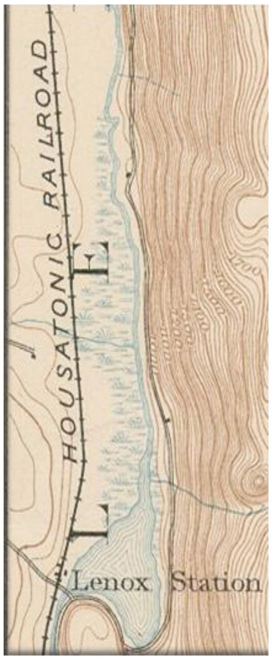


Lenox Furnace (c. 1875)

Land clearing for homes, industry, and farming dramatically increased after the discovery of iron ore in several locations in northwestern Connecticut and western Massachusetts. Blast furnaces, fueled by wood, were needed to smelt the iron ore. The area of today's Lenox Dale was once the home of one of the larger blast furnace and smelting operations, known as Lenox Furnace. The effect of all this land clearing, which by 1850 was as much as 80% of all the land in the Berkshires, was to cause more runoff and associated soil to enter the River than would have occurred otherwise. Early descriptions depict Lenox as a desolate-looking village stripped of trees.[1]

The advent of the 19th Century saw the start of paper mill operations along the River and dams to channel water to power them. These dams had the added effect of creating backwaters and slowing the velocity of the River. All of these actions had the unintended effect of changing the River's dynamic processes. For example, the creation of Woods Pond Dam around 1890 resulted in a significant expansion of the floodplain upstream.

[1] See http://www.townoflenox.com/Public_Documents/LenoxMA_WebDocs/about.



USGS Topographic Map 1886

Further significant changes occurred during the 1800s when railroads arrived and agriculture became more prevalent in the valley. It was during this period that the River channel, which naturally seeks equilibrium through the development of meanders, was extensively modified and straightened along many sections of the River. Actions like these created larger tracts of contiguous properties for farming and allowed the installation of railroad beds.

The clearing of rivers and rechannelization has a long history in the Northeast, with many local governments passing laws and ordinances allowing local businesses and towns to clear materials such as boulders, and even to use dynamite to modify rivers. For instance, in the 1940s, the East Branch of the river was straightened for flood control through its once natural course just south of East Street in Pittsfield, eliminating a number of River meanders and side channels.

Channelization of the East Branch in Pittsfield (Source: City of Pittsfield Department of Public works & Utilities)

Today the effects of these changes and the subsequent natural evolution of the River is evident when comparing older maps and present-day topographical surveys. Portions of the River are clearly shown to have been straightened and/or moved.

All of the human activity that has occurred over the past several hundred years, from the simple fish weirs of Native Americans to logging, industrialization, and rechannelization, has changed the River and surrounding ecology, so that what exists today, while appearing to be a natural pristine environment, is actually a disturbed river system trying to naturally restore itself. In many cases since the 1800s (through the mid-20th Century), the course of the River has naturally returned, albeit over several decades, to a more meandering pattern. Since the 1950s few additional changes to the River's course have occurred. Also, in many areas new woodlands have replaced the once-deforested terrain, and many species of plants and animals have returned.

The history of the River makes it clear that today's landscape and surrounding natural environments are not the same as existed thousands of, or even one hundred years ago.

Presentation Two: Geomorphology/River Processes

Keith Bowers, *Biohabitats, Inc.*, George Athanasakes and David Bidelspach with *Stantec Consulting Inc.*

Fluvial geomorphology is a multidiscliplinary science concerned with the influence of rivers and streams on the Earth's surface. Many features have been formed by running water due to erosion and depositional processes. By analyzing sediment transport and other processes, geomorphology is a useful tool to predict channel and riverbank responses.

RIVER STABILITY

A stable river transports the water and sediment produced by its watershed without aggrading (building up) or degrading (cuttting into the channel bed) over the long term.

- Stable systems maintain dimension, pattern, and profile.
- Stable rivers are connected to their floodplains. Rivers that are disconnected from their floodplains experience increased shear stress and mass bank failure.
- This can be expressed by a formula used for qualitative analysis: (Sediment LOAD) x (Sediment SIZE) is directly proportional to (Stream SLOPE) x (Stream DISCHARGE). This is called Lane's Relationship. Both sides of the equation are balanced in a stable system.
- Excess shear stress caused by impacts to the watershed results in a shift in the balance of Lane's Relationship. Channel evolution is the stream's tendency to morph back to a state of equilibrium through a series of predictable unstable channel succession stages.

INDICATORS OF INSTABILITY

These include Incision and Headcutting, Channel Filling, Entrenchment/Eroding Stream Banks, Lateral Migration**,** Over-Widening, two of which are illustrated below.

Over-Widening:

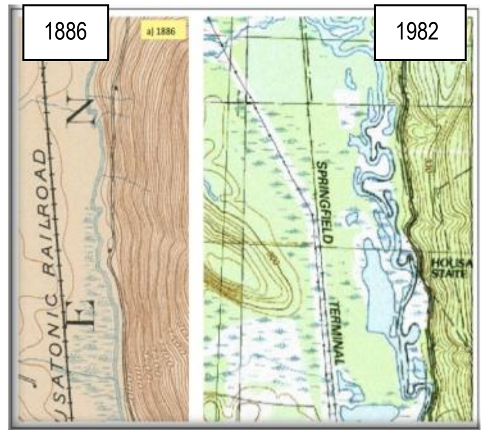
Entrenchment/Eroding Stream Banks:

PAST IMPACTS ON THE HOUSATONIC RIVER

The Housatonic River has a long history of human impacts, including river straightening, logging activities and agricultural uses. Examples of specific impacts include:

- Lenox Iron Works operation (1780s)
- Housatonic Railroad construction (1850s)
- Gravel and wood harvesting up to the 1970s
- Construction of Woods Pond Dam (c. 1890)

The River has also undergone channel relocation, channelization, channel impoundments, and placement of significant confining floodplain fill over the last 300 years.

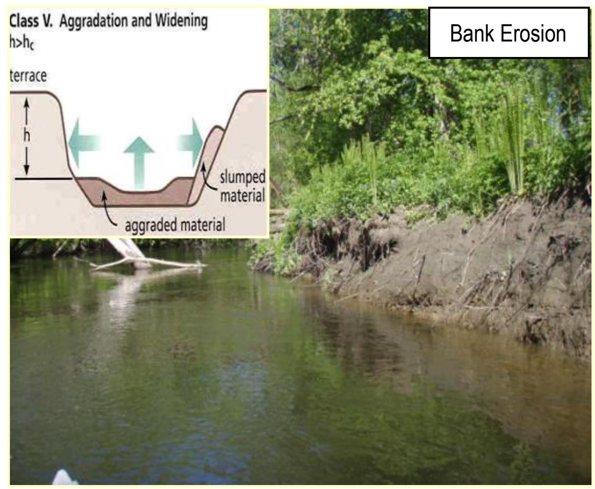


(Source: US Geological Service)

INSTABILITY OF THE HOUSATONIC RIVER

The Housatonic River is currently recovering from these and other historical impacts and modifications. However the River still faces:

- Horizontal instability evidenced by bank erosion
- Bank erosion rate of 6,600 tons per year of sediment (± 25%)
- Accelerated bank erosion over ten times the rate of a stable channel
- The River cannot attain stability through natural geomorphic processes without the accelerated erosion of the floodplain and stream banks contaminated with PCBs.



(Source: Stream Corridor Restoration: Principles, Processes, and Practices: October 1998)

HOUSATONIC RIVER RECOVERY PROCESS

An essential requirement for restoration planning associated with any remediation of the River is a comprehensive understanding of the geomorphologic function of the River channel and floodplain.

- Restoration should be consistent with natural geomorphic processes
- Restoration can restore the dimension, pattern, and profile of the River
- Restoration should achieve a dynamic state of equilibrium (stability) in the River
- Restoration provides an opportunity to restore ecosystem processes

Presentation Three: Ecological Characterization

John Lortie, *Stantec Consulting Services, Inc.*

During the last decade, extensive characterization of the physical setting, habitats, and biological communities of the Housatonic River and its floodplain was conducted by EPA, General Electric, the Massachusetts Natural Heritage & Endangered Species Program (MA NHESP), and numerous consultants. The result of these surveys describes in great detail the ecology of the River and the surrounding watershed and provides more in-depth understanding of the natural communities and biological species inhabiting the site than is typical for hazardous waste sites in the US.

The primary objectives of the ecological characterization were to:

- Identify the type and spatial distribution of natural communities/habitats
- Identify the plants and animals in each community and specify in which of the natural communities they occur (Species:Habitat Associations)
- Describe interrelationships between plants and animals and exposure pathways
- Collect information for the ecological risk assessment, human health risk assessment and remedial action decision-making

EPA's study was focused primarily on the portion of the River and floodplain between the confluence of the East and West Branches and Woods Pond Dam, a distance of approximately 10 ½ miles. To estimate whether there were differences in animal populations between this area which contains elevated levels of PCBs, and other similar areas nearby with no or low levels of PCBs, several reference areas were also chosen for study. These included the Hinsdale Flats State Wildlife Management Area (SWMA), October Mountain State Forest, Ashley Lake, and Threemile Pond SWMA.

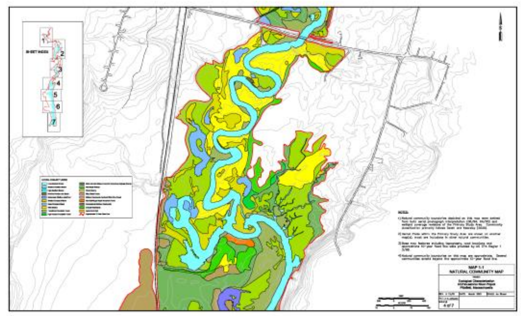
Although the Housatonic River and surrounding areas have been significantly altered by many generations of humans, the area also has a number of unique features. Portions of the River valley are known as "marble valley" because of the bedrock that occurs in this region. While most of the glaciated northeast is dominated by acidic soil conditions, the marble valley has calcium-rich soils which support a different array of plants and animals, many of which are rare or only locally-common (the watershed contains 110 plant species and 51 animal species listed by the Massachusetts Endangered Species Act (MESA)). Adjacent to the River and floodplain in this area is a large amount of protected land.

While some of the identified communities, such as the bur oak forest, older silver maple forest, and some of the older oxbows, are essentially in a natural state, other communities show the effects of farming or other man-made influences in spite of the current diversity and abundance of their biota. Such resilience and ability to recover from short-term disruption is also evident in the rapid re-establishment of animal populations in the floodplain following periodic flooding events that result in widespread mortality for species unable to rapidly leave the area, as well as temporary disruption of the riparian corridor.

A good example of ecosystem resilience is found upstream on the East Branch where PCBs in sediment and bank soil were remediated approximately 70 years after much of the area was cleared when the river was channelized. The aquatic insects in the River reestablished themselves quickly following cleanup and with a community that was more diverse than before remediation, and reflective of non-polluted rivers.

At the same time, however, there are clear indications that the system downstream of the confluence, while appearing normal and healthy, is experiencing stress due to elevated concentrations of PCBs. Chief among these is the near-complete absence of resident mink and otter populations in spite of what otherwise would be optimal habitat. Although other populations, such as invertebrates, fish, and amphibians appear healthy, site-specific studies for the ecological risk assessment have shown that these taxonomic groups are experiencing reproductive and other problems due to the effects of PCBs, problems that are not always evident when observing individual adults.

Eighteen natural communities, defined as recurring assemblages of plants, animals, and their habitat showing minimal effects from human intervention, were identified in the area of the River and floodplain between the confluence and Woods Pond; an additional 7 natural communities were identified in the reference areas. The communities identified in the study area included a single lacustrine (lake) community (Woods Pond), 3 different riverine communities distinguished by the gradient of the River, 9 palustrine (wetland) communities, and 5 terrestrial communities. The 3 most common natural community types, each comprising over 80 hectares (approx. 200 acres) of area, were low-gradient stream, shrub swamp, and transitional floodplain forest. Maps showing the location and extent of each community type were prepared, as were example transects across different areas of the floodplain showing the typical interrelationships of the communities.



Sample map showing location and extent of natural communities in the study area

Surveys conducted by EPA during the ecological characterization field work found 13 rare plant species per the Massachusetts Endangered Species Act (MESA): 2 endangered; 4 threatened; 4 special concern; and 3 watch list. Two rare natural communities were found: bur oak forest and circumneutral floodplain forest. Additional surveys by the MA NHESP and their consultants have recorded additional sites. Invasive plants are common or abundant in many parts of the River and floodplain, reflective of past land alteration and disturbances.

Rare species, including the American bittern, were catalogued

During EPA surveys 16 rare[2] animals were observed in the area including: triangle floater (SC), riffle snaketail (T), zebra clubtail (E), arrow clubtail, Jefferson salamander (SC), four-toed salamander (SC), wood turtle (SC), American bittern (E), bald eagle (E), northern harrier (T), sharp-shinned hawk (SC), common moorhen (SC), northern parula (T), blackpoll warbler (SC), water shrew (SC), and small-footed myotis (SC).

[2] Based on MESA, E = Endangered; T = Threatened; SC = Species of Special Concern.

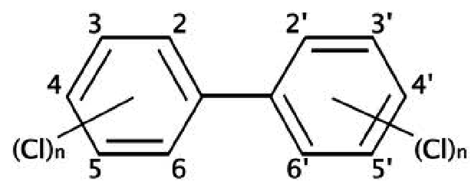
Presentation Four: What Are PCBs and How Do They Behave in the Environment?[3]

Richard A. McGrath, *The Isosceles Group, Inc.*

"PCBs" is an abbreviation for **p**oly**c**hlorinated **b**iphenyls, a group of man-made organic chemicals that are members of a larger class of chemicals known as chlorinated hydrocarbons including many pesticides and industrial solvents. PCBs were first synthesized in the late 1800s and were manufactured in the US by Monsanto from 1929 until 1977; their manufacture was banned by the government in 1979. PCBs vary in consistency from thin, light-colored liquids to yellow or black waxy solids. Due to their non-flammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications, including in electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments, dyes, carbonless copy paper; and in many other industrial applications.

In general, PCBs tend to be non-volatile and relatively insoluble in water. In a river environment they typically are associated with particles, especially particles of organic carbon. They preferentially partition into fats, and so they both bioaccumulate and biomagnify (increase in concentration up the food chain) in animals. They are resistant to chemical and biological degradation, and are therefore extremely persistent in the environment, with some PCBs requiring decades or even centuries to degrade.

PCBs have a chlorine atom substituted for the hydrogen atom attached to one or more of the 10 carbon atoms in the 12-carbon double ring structure known as biphenyl, which is related to the chemical known as benzene (the other two carbons hold the rings together, so are not available for chlorine substitution). A single chlorine atom can be added to each of the 10 carbons, so individual PCB molecules may contain from one to 10 chlorine atoms. The number of chlorine atoms in the molecule, and their exact location on the biphenyl ring structure, is extremely important in determining PCB biogeochemical behavior and toxicity.



Generic biphenyl ring structure of the PCB molecule

Because different numbers of chlorines can be added to the biphenyl molecule and they can be added in different positions there are many distinct PCB molecules – in fact, there are 209 different PCBs, each of which is known as a **congener**. Congeners that have the same number of chlorine atoms tend to have similar physical properties, and so are referred to as being members of the same **homologue** group. Each of the homologue groups is referred to by a name derived from the number of chlorines: Monochlorobiphenyl = 1 chlorine, Dichlorobiphenyl = 2 chlorines, and so forth, using the prefixes Tri-, Tetra-, Penta-, Hexa-, Hepta-, Octa-, Nona-, and Deca- for 3, 4, 5, 6, 7, 8, 9, and 10 chlorines, respectively. There are only three different ways to add a single chlorine atom to the biphenyl molecule, so there are three monochlorobiphenyls. There are six different ways to add two chlorines, so there are six dichlorobiphenyls. As the number of chlorines increases to five, there are more possibilities, so these homologue groups have more congeners in them. After that, the number of possibilities begins to decrease again until, upon reaching the 10-chlorine decachlorobiphenyl, there is just a single congener in the group.

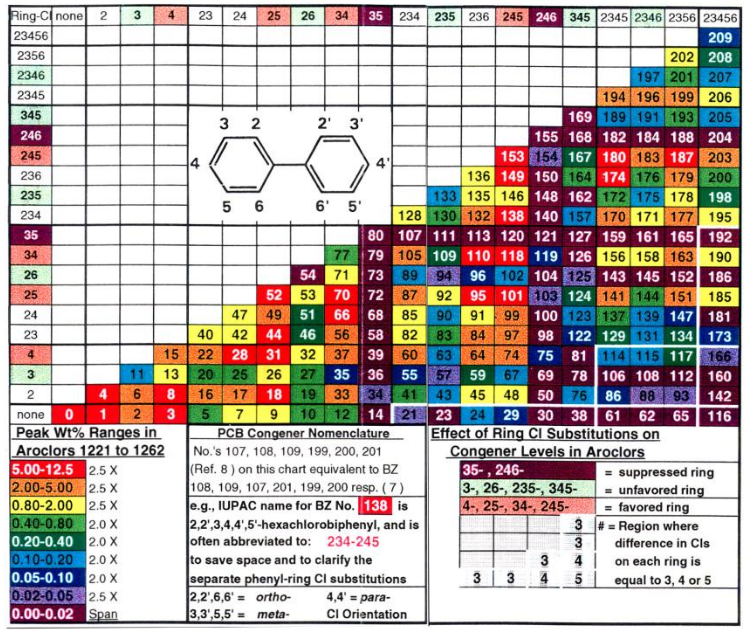
---

[3] For more information see EPA's fact sheet on PCBs at http://www.epa.gov/ne/ge/thesite/restofriver/reports/477424.pdf

Aroclor, a trade name of the Monsanto Company, is just one of several names under which PCBs were produced. Aroclors are mixtures of many different congeners that were created to have particular physical properties. Different Aroclors are generally referred to by a four-digit number starting with “12” in reference to the number of carbons, followed by two digits ranging from 10 to 68 which indicate the percent of chlorine (by weight) in the Aroclor mixture.

Aroclors with a fewer number of chlorines tend to be thin, oily liquids while those with higher amounts of chlorine are heavier oils and, for the most-chlorinated Aroclors, waxy solids. The PCBs used at GE’s Pittsfield facility and now found in the Housatonic River and floodplain are on the “heavier” end of the range – mostly Aroclor 1260, with some Aroclor 1254. They are very different from the “lighter” Aroclors (mostly 1242) present in the Hudson River. Different Aroclors behave differently in the environment, which is one of the reasons why it is difficult to make comparisons between the PCB contamination at different sites.

Once released into a river environment, PCBs for the most part adsorb onto sediment particles and ultimately end up in riverbed sediments due to the settling of the sediment particles carrying the PCBs with them. Each congener has a characteristic ratio between the amount attached to sediment and the amount dissolved in water, known as the partitioning coefficient or K_d. In general, the lower-chlorinated homologues are less associated with sediments and are more soluble and volatile, while the reverse is true for the higher-chlorinated homologues. Because Aroclors are mixtures of many congeners, this, among other things, makes simulating the movement of PCBs in the environment using numerical models complex.



”Periodic Table” of PCB congener nomenclature, showing the structure associated with each congener number (Source: George Frame, GE Research Laboratory)

PCBs have been shown to be toxic in a very large number of studies conducted over approximately 80 years, although the seriousness of the problem was not initially appreciated during the early days of their manufacture. The number and location of the chlorines on the biphenyl ring structure is an important determinant of PCB toxicity. PCBs that lack chlorines in the “ortho” positions – the carbons next to where the two rings are joined—are able to assume a structure similar to that of dioxin. As a result, these so-called “co-planar” or “dioxin-like” PCBs act similarly to dioxin in the body.

The toxicity of PCBs to animals came to notice in the 1970s, when emaciated seabird corpses with very high levels of PCBs in their bodies washed up on beaches. Since then, PCBs have been shown to be toxic to numerous and varied species.

PCBs are classified by most public health agencies around the world as “probable” human carcinogens; “probable” meaning that they have been shown to cause cancer in laboratory animals and so are assumed to also cause cancer in humans. In addition, they have been shown to have numerous serious non-cancer (*i.e.* toxic) health effects in humans, including, for example, skin and liver damage and disruption of hormone systems.

Presentation One - Biographies

Richard G. DiNitto, Principal/Co-Owner
The Isosceles Group, Inc.
Boston, MAC

Mr. DiNitto is a Principal of The Isosceles Group of Boston, Massachusetts with more than 30 years of environmental consulting experience. During the past 11 years, Mr. DiNitto has been working on the GE/Housatonic River Rest of River Site in several roles: as a Project Hydrogeologist and Geomorphologist, Site Assessment Analyst, Chemical Fate and Transport Scientist, Public Communications Specialist, and as a Project Coordinator. Mr. DiNitto has been one of the principal investigators in determining the nature and extent of PCB contamination at the site. He worked with the modeling and risk assessment teams to evaluate the data in conjunction with fate and transport mechanisms and human and ecological exposures. He also assisted in the coordination of a variety of subcontractors and their efforts, primarily the fate and transport modeling using HSPF, EFDC, and FCM. Recently, Mr. DiNitto has been involved with the historical land use analyses associated with the Housatonic River valley and its influence on fate and transport characteristics. Mr. DiNitto's 30 years of experience includes environmental multi-media assessments and remediation of contaminated sediments, riverine and groundwater systems. He has completed more than 1000 environmental assessment projects across the United States and internationally, and has successfully managed several environmental, engineering and energy-related consulting firms.

John J. Field, Ph.D.
Field Geology Services
Farmington, ME

Dr. John Field is a fluvial geomorphologist and hydrologist with 25 years of experience specializing in assessments of stability and habitat conditions of rivers and streams, identifying restoration strategies at the watershed scale, and evaluating results to ensure improvements to channel stability and aquatic habitat are sustainable. For the Housatonic River Project, Dr. Field provided historical analysis and interpretation of shifts in the morphology of the Housatonic River over time and is reviewing proposed remedial alternatives for their effects on river geomorphology and long-term stability. During eight years as a university professor, Dr. Field was active in training teachers and government agency personnel on techniques for the practical application of river morphology. His research has included previous work in Massachusetts, including an erosion control study of Turners Falls Pool on the Connecticut River, an assessment of causes for channel instability on the Sawmill River in Montague, and the design for a bank stabilization project on the South River in Ashfield. Dr. Field's research on flooding and habitat issues both in the United States and internationally has been published in numerous peer-reviewed scientific publications and presented at professional conferences.

Presentation Two - Biographies

J. George Athanasakes, P.E., Ecosystem Restoration Services Manager
Stantec Consulting Services, Inc., Louisville, KY

George Athanasakes leads the Ecosystem Restoration Group for Stantec, Inc. He has a diverse background which includes civil engineering, stream restoration, wetland restoration, and watershed planning. For the Housatonic River Project, Mr. Athanasakes provides review of GE submittals and proposed remedial alternatives with particular emphasis on habitat restoration following remediation. Mr. Athanasakes completed his first stream restoration project nearly 20 years ago and has served as the Project Manager and/or Design Engineer on over 100 stream restoration and assessment projects incorporating natural channel design principles and soil bioengineering techniques. His involvement with these projects has included conceptual level planning, preliminary and final design, permitting, assistance during construction, and post-construction monitoring. Mr. Athanasakes has also helped to bring innovation to the field of stream restoration by leading the development of the RIVERMorph software, which is the industry standard for software providing a tool for stream assessment, monitoring and Natural Channel Design throughout the United States and internationally. Because of his broad stream restoration experience, Mr. Athanasakes has instructed several stream restoration training workshops and has presented at many national conferences on the subject. In addition, he has authored a number of technical papers on the subject of stream restoration.

David A. Bidelspach, P.E., Stream Restoration Specialist,
Stantec Consulting Services, Inc., Raleigh, NC

Dave Bidelspach is an environmental engineer with 10 years of experience designing and constructing river restoration projects. He has been recognized for the development of a 3D design process that allows the rapid evaluation of numerous iterations to optimize the designs for river restoration, and has piloted the use of Survey Grade GPS equipment to lower the costs associated with pre- and post-construction surveys. Mr. Bidelspach has worked hand-in-hand with contractors to couple his 3D designs with GPS-enabled construction equipment to speed the construction process and insure the right outcome, and has been responsible for the development and application of several new in-stream structures which have proven to be robust yet easy to construct. As one of the few stream restoration designers who has actually operated equipment and constructed restoration projects, Mr. Bidelspach is known for producing accurate estimates and designs that are both constructible and have long-term stability and effectiveness. For the Housatonic River Project, Mr. Bidelspach has conducted the detailed study of river bank stability and erodability from the Confluence to Woods Pond Dam. He is reviewing and evaluating proposed remedial options with regard to restoration and geomorphic stability issues.

Keith Bowers, RLA, PWS, President and Founder
Biohabitats, Inc., North Charleston, SC

Mr. Keith Bowers is the President and Founder of Biohabitats, Inc., one of the premier firms specializing in environmental restoration, conservation planning and regenerative design. He is an internationally recognized landscape architect who has planned, designed, and managed the construction of over 200 ecological restoration projects throughout the United States. Mr. Bowers also teaches ecological restoration seminars and workshops and participates on numerous industry panels. He is currently serving as Chairman of the Board for the Society for Ecological Restoration International. For the Housatonic River Project, he has a lead role in evaluating remedial alternatives with respect to their ecological restoration components, and provides senior level expertise in the feasibility and expected effectiveness of proposed restoration plans and techniques. He also assists in community outreach and meeting facilitation.

Presentation Three - Biography

John Lortie, Vice President
Stantec Consulting Services, Inc.
Topsham, ME

John Lortie is a Professional Wetland Scientist, a Certified Wildlife Biologist, an accomplished botanist, and an experienced ecological risk assessor. He has directed numerous projects involving complex environmental regulations at hazardous waste sites and marine facilities, and has taught short courses at international environmental conferences on ecological risk assessment protocols, field methods, and restoration design. For the Housatonic River Project, Mr. Lortie serves as the lead ecologist for the G.E./Housatonic River Site Ecological Risk Assessment, with particular responsibility for the Ecological Characterization and in evaluating risks to amphibians. In his previous position as President of Woodlot Alternatives, Inc. (now part of Stantec), Mr. Lortie was responsible for many aspects of the site investigations, including the field studies program, and was the lead investigator for the Ecological Characterization of the site. In addition to managing significant habitat restoration projects and ecological risk projects, he has also led large-scale ecological inventories to search for rare animals and plants, directed coastal migratory bird studies, and evaluated complex natural communities throughout the northern Atlantic region. A former National Wildlife Refuge manager, he also offers special expertise in migratory bird studies. As a Professional Wetland Scientist, Mr. Lortie also specializes in interpretation of wetland regulations, and wetland identification, evaluation, mitigation and restoration.

Presentation Four - Biography

Richard A. McGrath, Principal/Co-Owner
The Isosceles Group, Inc.
Boston, MA

Dick McGrath is an aquatic ecologist with 40 years of experience conducting and managing research in oceans, estuaries, and rivers. He has served as the Technical Director for the Rest of River investigations for the last 10 years and, for 2 years prior to that, was the Quality Assurance Manager. In addition to his continuing wide-ranging technical oversight and coordination responsibilities on the project, he also provides specialized expertise in PCB analysis and biogeochemistry and has provided assistance to EPA on many of the technical documents presenting the results of the studies conducted on the project. Mr. McGrath specializes in the assessment and remediation of contaminated sediments, particularly sediments contaminated with PCBs and other organic compounds. In his career, he has been a Vice President and/or General Manager for three large international consulting organizations, and has conducted investigations of contaminated sediments on all three coasts of the United States as well as in the Great Lakes. He has authored, edited, and reviewed hundreds of scientific papers, reports, and other documents and has been an invited participant at national and international technical conferences. He has also been an invited participant on the PBS NOVA television series, discussing his work on PCB-contaminated sediments in New Bedford Harbor.

www.epa.gov/region1/ge

KEY CONTACTS:

JIM MURPHY
U.S. EPA Community Involvement Coordinator
(617) 918-1028
murphy.jim@epa.gov

SUSAN SVIRSKY
U.S. EPA Rest of River Project Manager
(617) 918-1434
svirsky.susan@epa.gov

GENERAL INFO:

EPA NEW ENGLAND
5 Post Office Sq.,
Suite 100
Boston, MA 02109-3912

TOLL-FREE CUSTOMER SERVICE
1-888-EPA-7341

STATE AND LOCAL RESOURCES

Berkshire Athenaeum Public Library
(413) 499-9480

Cornwall Public Library
(860) 672-6874

Kent Memorial Library
(860) 927-3761

Housatonic Valley Association
(860) 672-6678

Massachusetts DEP
(413) 784-1100

Connecticut DEP
(860) 424-3854